Geologic, Soil Water and Groundwater Report - 2000

Grant Kohrs Ranch National Historic Site

United States National Park Service, Department of the Interior

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Executive Summary

The soil and water resources of the upper Clark Fork River basin are contaminated by arsenic and metal contamination from historical mining and smelting activities (Moore and Luoma, 1990; Smith et al, 1998). The primary purpose of this study was to determine the volume of contaminated geologic resources (soil, soil water and groundwater resources) on the Grant Kohrs Ranch National Historic Site (GKR). Contamination is defined as the occurrence of levels of arsenic and/or metals exceeding baseline concentrations. Baseline concentrations are defined as the probable concentration levels prior to mining activity.

141 (including duplicates and splits) surface soil samples at 126 sites and 273 (including duplicates and splits) soil profile samples at 36 sites were collected to determine aerial and vertical distribution of contaminates of concern (COC) in soils on GKR. Soil samples were analyzed for pH, aluminum, arsenic, calcium, cadmium, chromium, copper, iron, potassium, magnesium, manganese, sodium, phosphorus, lead, and zinc. Areas of unvegetated tailings were also mapped in the field.

Instrumentation for groundwater and soil pore water sample collection, soil matrix potential, and water level measurements were installed at 36 locations. Water samples (305, including duplicates and splits) were collected and measurements recorded during the months of May 2000 thru December 2000. Water samples were analyzed for pH, conductivity, chloride, nitrate, sulfate, alkalinity, aluminum, arsenic, calcium, cadmium, chromium, copper, iron, potassium, magnesium, manganese, sodium, phosphorus, lead, and zinc.

All surface soil samples in the floodplain had arsenic, copper, lead and zinc concentrations greater than 5 times the baseline value determined for the Ranch. Many samples outside the bounds of the floodplain (in the fields and uplands) also showed elevated metal concentrations. Copper concentrations in surface soil samples were up to 525 times the calculated baseline.

The total volume of contaminated soil ranges from 293,000 m^3 (median depth) to 1,660,000 m^3 (maximum depth). This includes the total area of exposed or unvegetated tailings, ~12,600 m^2.

The calculated volume of contaminated groundwater (contaminated by one or more of the following hazardous substances: arsenic, cadmium, copper and/or zinc) is 1,510,00 m^3. The volume of contaminated soil pore water (contaminated by one or more of the hazardous substances: arsenic, cadmium, copper, and/or zinc) is 10,300 m^3.

Soil matrix potential gradients indicated that during the summer and fall hazardous substances had the potential to move mostly toward the land surface. Groundwater flow transports hazardous substances reaching the water table laterally from the uplands to the floodplain and into the river system.

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1) Introduction

a) Setting

Assessment of contamination of soils, soil water and groundwater by hazardous substances was conducted at Grant Kohrs Ranch National Historic Site (GKR) near Deer Lodge, Montana (See Figure 1). The primary study area was 1,379 acres of Clark Fork River floodplain, river-irrigated fields and upland areas (Plate1). Surface soils (approximately the upper 30 cm), soil profiles (maximum depths to approximately 120 cm), shallow groundwater and soil pore water were characterized for a variety of hazardous substances.

b) Objectives

Objectives of the surface soil and soil profile sampling were to:

- characterize the type, aerial distribution and vertical extent of hazardous substances in soils on the Clark Fork River floodplain, irrigated fields and uplands;
- determine baseline values of hazardous substances;
- compute the volume of contaminated soils.

Objectives of the groundwater and soil pore water sampling were to:

- characterize the patterns of soil water and groundwater movement;
- characterize the type, aerial distribution and vertical extent of hazardous substances in the soil water and groundwater systems of the Clark Fork River floodplain and irrigated fields;
- determine baseline of hazardous substances;
- compute the volume of contaminated water resources.

2) Materials and Methods

a) Sampling Design

i) Surface Soils

Surface sampling locations on the study site were based on a systematic grid sampling design. Sampling locations in the upland areas were selected to include various geomorphic conditions. Sample sites were photographed (see Standard Operating Procedures Manual - SOP QA-1) and located by GPS (Global Positioning System) using the following coordinate system: UTM (Universal Transverse

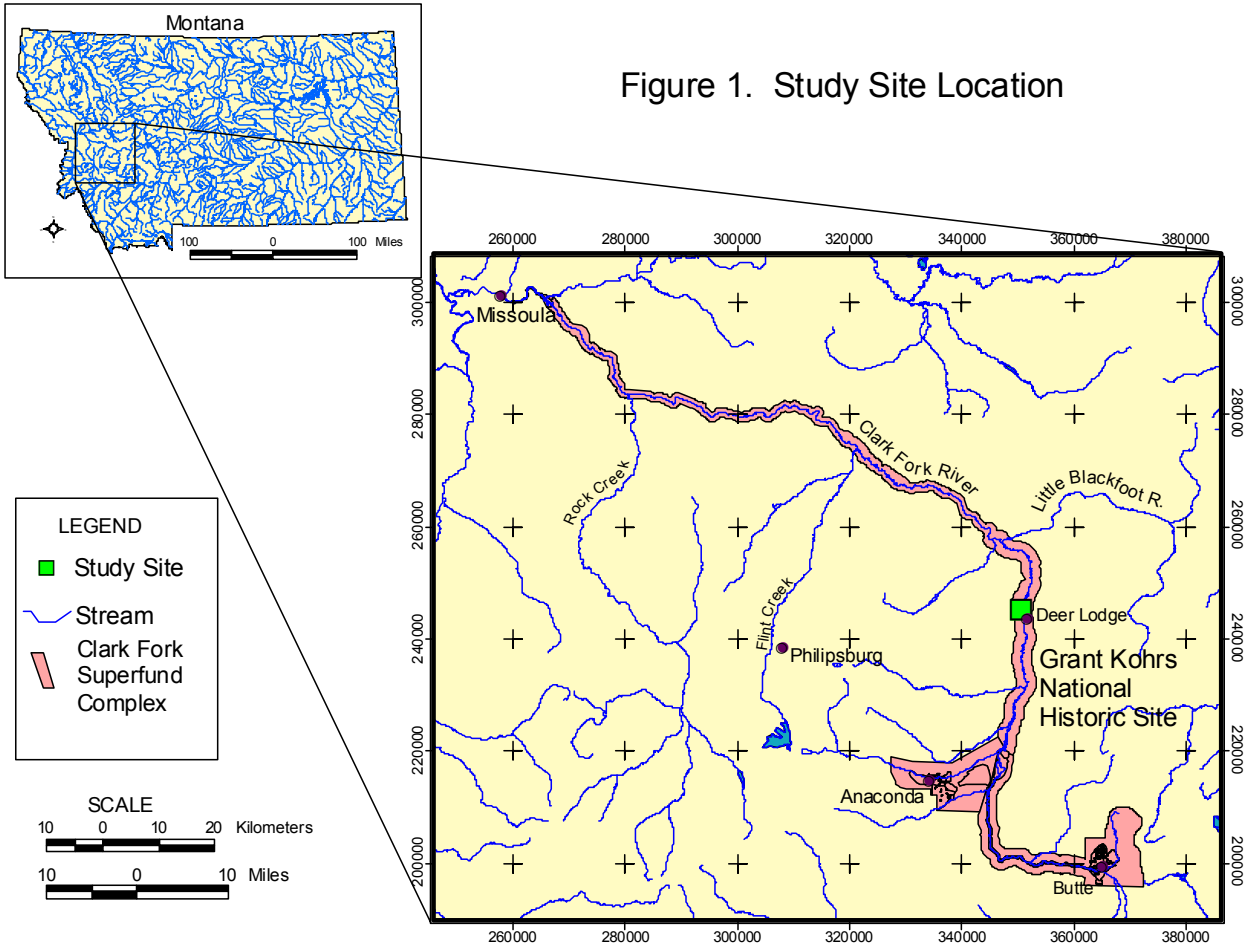


Figure 1. Study Site Location

Mercator), 12 North, NAD 1983, HPGN (Idaho/Montana). Sampling locations are illustrated in Plate 1.

ii) Profile Soils

Sampling locations were concentrated in areas along the Clark Fork River floodplain and on the Clark Fork River channel cut banks. Profile locations were based on accessibility (Geoprobe for coring) and cut bank exposures (river bank profiles). Results of the surface soil analyses were used to locate profile sites in areas of potentially differing surface soils contamination levels. All sites were located by GPS using the following coordinate system: UTM 12 North, NAD 1983, HPGN (Idaho/Montana). The sampling locations are illustrated in Plate 2.

iii) Sediment Samples

Sampling locations were established on the main irrigation ditches running through the Grant Kohrs Ranch to determine the potential for contaminated sediment transport through irrigation. All sites were located by GPS using the following coordinate system: UTM 12 North, NAD 1983, HPGN (Idaho/Montana). Sampling locations are illustrated in Plate 1.

iv) Groundwater and Soil Water

Well locations were selected to characterize general site groundwater conditions and to compliment hazardous substance migration evaluation. All sites were located by GPS using the following coordinate system: UTM 12 North, NAD 1983, HPGN (Idaho/Montana). Elevation control was derived with a Leica TC307 Total Station using the established elevation of MW3 as a local benchmark. Sampling locations are illustrated in Plate 3.

b) Sample Collection

i) Surface soil sampling

126 surface soil samples and 11 irrigation ditch sediment samples were collected at the project site (Plate 1). Surface samples were collected on GKR upland regions as well as in the floodplain region. Surface soil samples were collected using a 6-inch hand auger (see SOP SS-1). Surface soils were placed in Ziploc™ plastic bags. Irrigation ditch sediment samples were collected into pre-cleaned polypropylene bottles utilizing a wet-sieve method (see SOP SS-2). All samples were then transported to the laboratory and received by authorized personnel, with adherence to chain-of-custody procedures as per the QAP and SOPs QA-7, QA-8, QA-9, and QA-10. Samples were stored at 4^{O} C in a secured area until preparation began.

ii) Profile soil sampling

273 sub-surface soil profile samples were collected at 39 locations (Plate 2). Profile soil samples were collected from Clark Fork River stream banks (15 locations), soil pits (3 locations) and soil cores (21 locations) collected with a Geoprobe (see SOPs SS-8, GW-1, and SS-9,). Soil profile stratigraphy was observed, described, photographed and illustrated; samples were placed in Ziploc™ plastic bags for each distinct stratum sampled in the profile. Samples were then transported to the laboratory and received by authorized personnel, with adherence to chain-of-custody procedures as per the QAP and SOPs QA-7, QA-8, QA-9, and QA-10. Samples were stored in a secured area until preparation began.

iii) Groundwater and soil water instrumentation and monitoring

At the project site, 11 monitoring wells (GKWs) and 9 multi-level piezometers (MLSs) were installed (Plate 3). These wells complimented the existing five wells adjacent to the effluent irrigated fields (MWs). In addition, 9 sets of tensiometers and 9 sets of suction lysimeters were nested near piezometers (see SOPs GW-3, GW-4, GW-5, GW-6, and GW-7). Tensiometers were installed at approximately 6-inches, 12-inches, and 24-inches to monitor soil matrix potential. Suction lysimeters were installed at approximately 10-inches, 20-inches, and 30-inches to sample soil pore water. Instrument installation information can be found in Appendix B.1.

Following installation, monitoring wells and piezometers were developed to remove the residual materials remaining in the wells after installation was complete, and to re-establish the natural hydraulic flow conditions (see SOP GW-8). After well development, the well casings were capped to ensure sample integrity. The well casings were permanently marked with the well number.

Groundwater and soil pore water samples were collected, and water level measurements and tensiometer readings were recorded periodically throughout the months of May 2000 thru December 2000 (see Appendix B.2 for tensiometer readings). Water levels were measured in monitoring wells as per SOP GW-2 (see Appendix B.2). Wells were purged with the appropriate purge volume prior to sampling in order to remove stagnant water (see SOP GW-11). See Appendix B.1 for purge volumes. Groundwater and pore water samples were collected using a peristaltic pump, dedicated tubing, and in-line filtering apparatus when appropriate (see SOPs GW-14 and GW-15). As samples were collected, pH, conductivity, and temperature measurements were performed (see SOPs GE-2, GE-4, and GE-3). All data and relevant information were recorded in the field logbook as per SOP QA-5. See Appendix B.2 for data.

In addition to the instruments installed during the year 2000 field season, 5 extant monitoring wells associated with fields being irrigated with secondary effluent were incorporated into the well network. Three multilevel piezometers and 5 sets of

lysimeters were constructed for the sewage effluent monitoring project. These instruments were also incorporated into the soil water-groundwater network.

The samples were filtered and preserved, when appropriate, and collected in the proper sample containers (see SOPs QA-2, QA-3, GW-14, and GW-15). They were stored on ice in a cooler until transported to the laboratory for preparation and analysis. Samples were transported to the laboratory and received by authorized personnel, with adherence to chain-of-custody procedures as per the QAP and SOPs QA-7, QA-8, QA-9 and QA-10. Samples were stored at 4^{O} C in a secured area until preparation began.

c) Site Locations

i) Samples

All sample sites were located in the field using a Trimble GPS TSC1 Asset Surveyor. Differential corrections were automatically made as data were recorded. Error on location measurements of an individual point is approximately +/-1.5 meters. Appendix C.2 shows data from duplicate measurements in the field and the vertical and horizontal precision and accuracy of measurements. At least 5 readings were taken for each point location measured; 68% horizontal and vertical precisions for the readings for any given site are listed with the location data for that site (Appendix C.3). Data were downloaded into Pathfinder Office and exported to Excel or ArcView for use in data analyses. Data were recorded in the following coordinate system with units of meters: UTM, Zone 12 North, North American Datum 1983, HPGN (Idaho/Montana). The data are also listed in geographic coordinates (latitude and longitude) in Appendix C.3. All GPS and GIS work was done in a single coordinate system for consistency in area calculations.

ii) Unvegetated Tailings

A single person mapped unvegetated tailings in order to maintain consistency in estimating areas and choosing boundaries. A Trimble GPS Surveyor was used to map unvegetated tailings between July 2000 and September 2000. Unvegetated tailings were divided into four categories during mapping. Typical unvegetated tailings are areas of sandy tailings devoid of vegetation (at least 70% bare). Grassy unvegetated tailings had about equal amounts of unvegetated tailings and vegetation (approximately 50% bare). Burn-unvegetated tailings had burned willows and bare ground that had not re-grown vegetation (a large area of the northernmost meander area of the park). Not all burn-unvegetated tailings were mapped, as the boundaries were difficult to define and map consistently. Gravel unvegetated tailings are areas with no vegetation where gravel and slag predominate rather than sandy tailings. Some of these areas may not have been included in the mapping due to difficulties determining whether or not tailings are the cause of the lack of vegetation. Unvegetated tailings were mapped with the GPS using two methods. Small areas of unvegetated tailings (and in/near areas of thick vegetation that obscured satellite/GPS

communication) were mapped as single points. Dimensions were estimated visually and recorded. The perimeters of larger unvegetated tailings were recorded as areas (areas of polygons were calculated using ArcView).

d) Sample Preparation and Analysis

i) Soil and sediment sample preparation and analysis

Samples were agitated and kneaded within their collection bags in order to homogenize them. They were then split approximately in half. One of the portions was placed into the original Ziploc™ plastic bag and was stored in a secured area until relinquished to GKR personnel for archiving. The other portion of each sample was placed in a labeled, clean plastic bag.

An aliquot of the sample was mixed with de-ionized water to create a slurry and pH was measured and recorded as per SOP SS-6.

Following soil pH analysis, soil samples were dried at 70^{o} C, desiccated for at least 24 hours and prepared for total metals analysis. Samples were ground to ensure sample homogeneity (see SOP SS-3), transferred to labeled and sealed plastic containers (e.g. snap-cap vials) and stored in a secure area until digestion. Samples were digested as per a modified EPA Method 3050B (see SOP EPA 3050B) for the extraction of total metals. Sample digests were stored in a secure area until analysis. As soon as reasonably possible, digests were analyzed for total metals by ICAP-ES as per EPA Method 200.7 (see SOP EPA 200.7). Analytes include aluminum (Al), arsenic (As), calcium (Ca), cadmium (Cd), chromium (Cr), copper (Cu), iron (Fe), potassium (K), magnesium (Mg), manganese (Mn), sodium (Na), phosphorus (P), lead (Pb), and zinc (Zn).

The unused portion of prepared sample will be held in a secure area until the end of the investigation. Following the close of the investigation, the samples will be relinquished to GKR.

ii) Groundwater and soil pore water sample preparation and analysis

Alkalinity, anion, and dissolved metals analyses were performed as soon as reasonably possible, adhering to analyte holding time protocol (see SOP QA-3). Samples were stored in a secure area until analysis.

Sample alkalinity was measured by titration as per SOP GW-19.

Samples were prepared as per SOP GW-16 and analyzed for anions by Ion Chromatography as per modified EPA Method 300.0 (see SOP EPA 300.0). Analytes of interest include chloride and sulfate.

Prior to metals analysis, samples were matrix matched to method calibration standards by additions of nitric acid, hydrochloric acid, and 30% hydrogen peroxide. Samples were analyzed for dissolved metals by ICAP-ES using Ultrasonic Nebulization as per EPA Method 200.15 (see SOP EPA 200.15). Elements of interest include aluminum, arsenic, calcium, cadmium, chromium, copper, iron, potassium, magnesium, manganese, sodium, lead, and zinc.

e) Statistical Methods

Nonparametric statistical methods were used because chemistry data from systems having elevated metals and arsenic concentrations often do not exhibit normal distributions and because some sample concentrations are below instrument detection limits. Soils data with concentrations below instrument dilution corrected detection limits were replaced with the dilution corrected pql (probable quantitative limit) or 200*pql for calculations and with ½ the dilution corrected pql for most plots. Groundwater and soil pore water samples falling below the pql were replaced with pql values for calculations. Soils and water data for this study were not normally distributed. Medians were used to calculate baseline concentrations and for other data summaries. Median absolute deviation and maximum and minimum values represent measures of the distribution around the central tendency.

3) Results - Soils

a) Mapping of Unvegetated Tailings

Table 1 summarizes the total area of unvegetated tailings for the four types of areas defined in the methods section. A total of 12,600 m^2 of the Ranch (all in the floodplain area) has tailings unvegetated at the ground surface. Plate 4 shows locations of small unvegetated tailings areas that were mapped as single points (areas estimated in the field). Plate 5 shows the spatial distribution of large areas of unvegetated tailings.

Table 1. Summary statistics Unvegetated Tailings

Split out by Type	*N*	*Area (m^2)*
Burn	32	2,670
Grassy	8	1,690
Gravel	6	715
Unvegetated tailings	268	7,570
All unvegetated tailings	314	**12,600**

b) Soil Profiles

Data from profile samples are in Appendix A.5.3. We discuss results for pH, As, Cu, Cd, Pb and Zn. Summary statistics for As, Cd, Cu, Pb and Zn are listed in Table 2. Stratigraphic descriptions of all profiles and plots of metal or arsenic concentration

against depth below ground surface are shown in Appendix A.5.4. Examples of profile plots are shown in Figures 2 and 3. Profile plots were made for bank profiles (BP), cores (CP) and soil pits (SP).

Table 2. Summary Statistics: Profile Data					
Site	*As*	*Cd*	*Cu*	*Pb*	*Zn*
Average	190	4	1300	200	820
*MAD**	14	1	440	23	430
Interquartile range	220	3.8	1500	230	1300
Max	1600	20	15000	1600	4500
Min	10	1.0	3.0	8.0	14
N	266	266	266	266	266
**Median absolute deviation*					

Figure 2

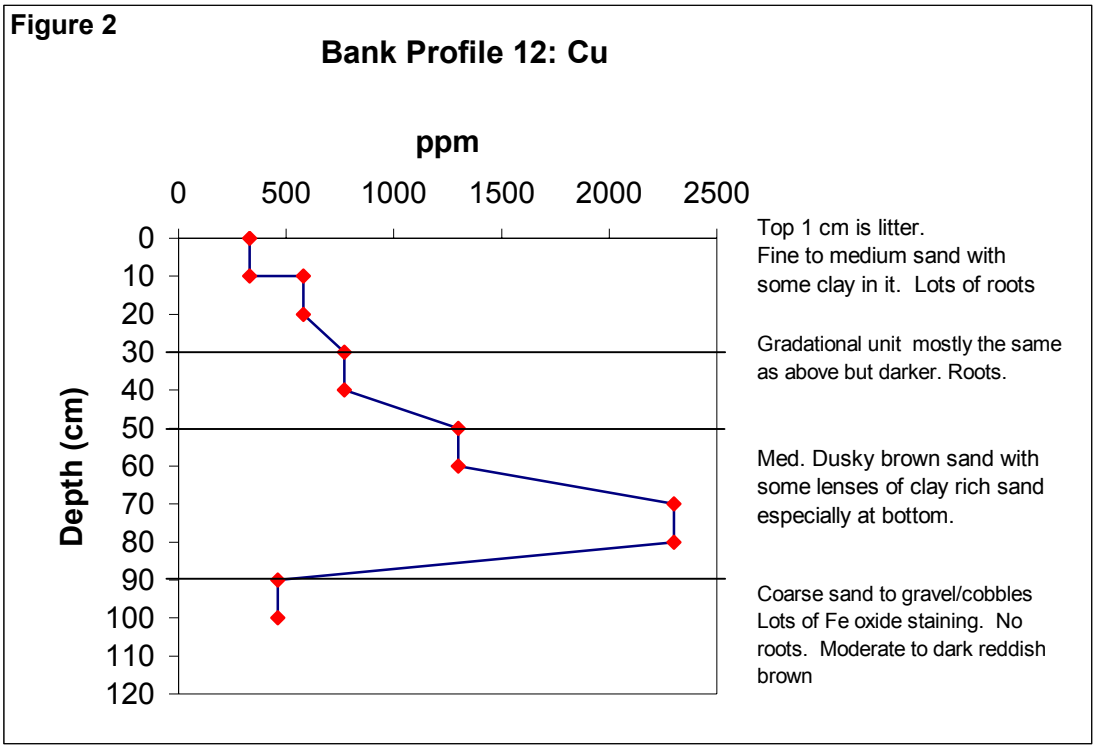
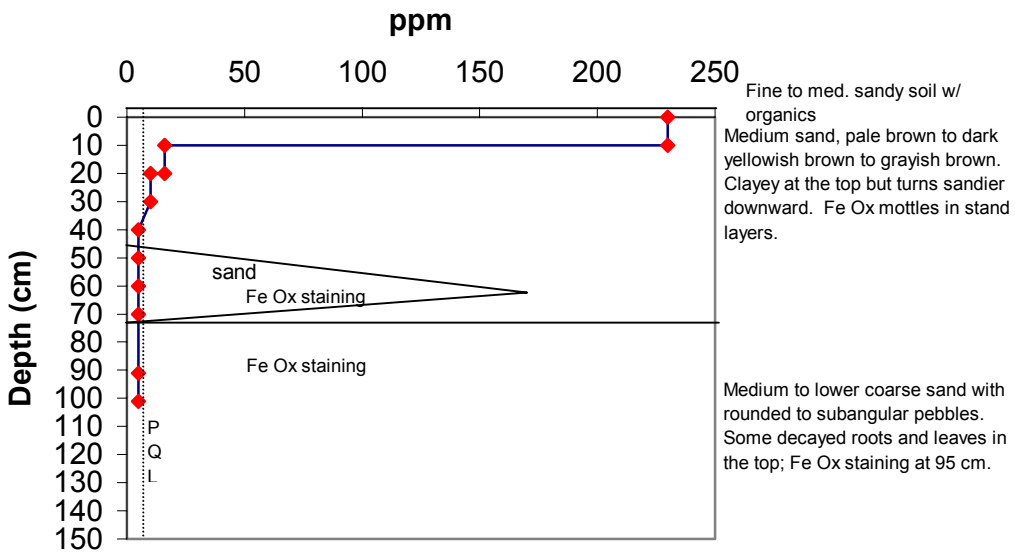


Figure 3



c) Surface Soil Samples

Data for all the elements are summarized in Appendix A.5.1. We discuss results for pH, As, Cd, Cu, Pb and Zn. Summary statistics for the As, Cd, Cu, Pb and Zn are listed in Table 3. Plate 6 shows the distribution of pH values for the surface soil samples (~30 cm/12 inch depth). Plates 7, 8, 9, 10 and 11 are maps of the spatial distribution of surface soil sample metals concentrations for As, Cd, Cu, Pb, and Zn respectively.

Table 3. Summary Statistics: Surface Soils Data

	As	Cd	Cu	Pb	Zn
Median	46	2.4	420	77	610
*MAD**	27	1.3	360	78	490
Interquartile range	180	3.4	1340	230	1100
Max	940	12	8400	920	3200
Min	13	1.0	29	16	43
N	107	107	107	107	107

**Median absolute deviation*

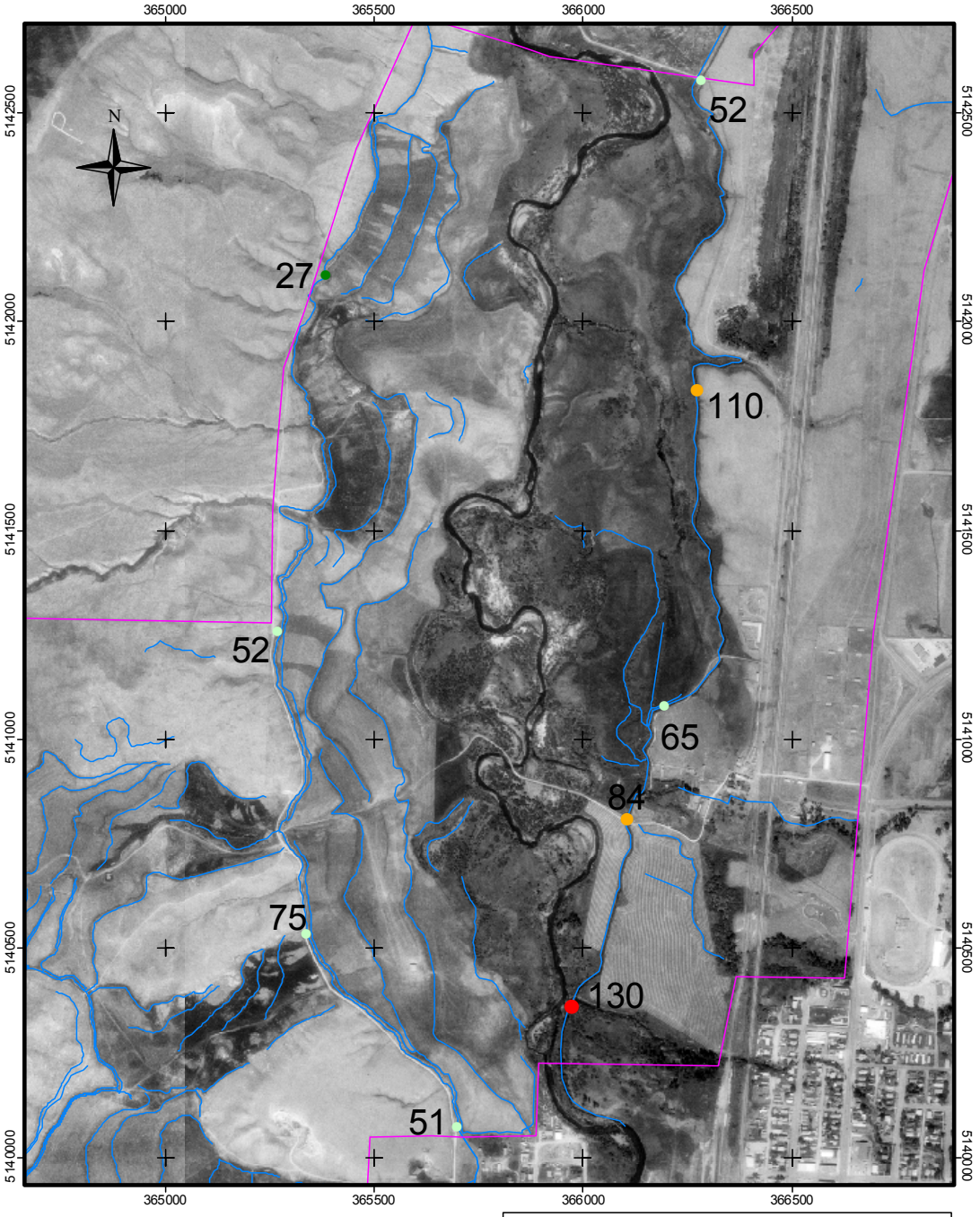


Figure 4. Arsenic: Ditch Sediments (<63 um size fraction)

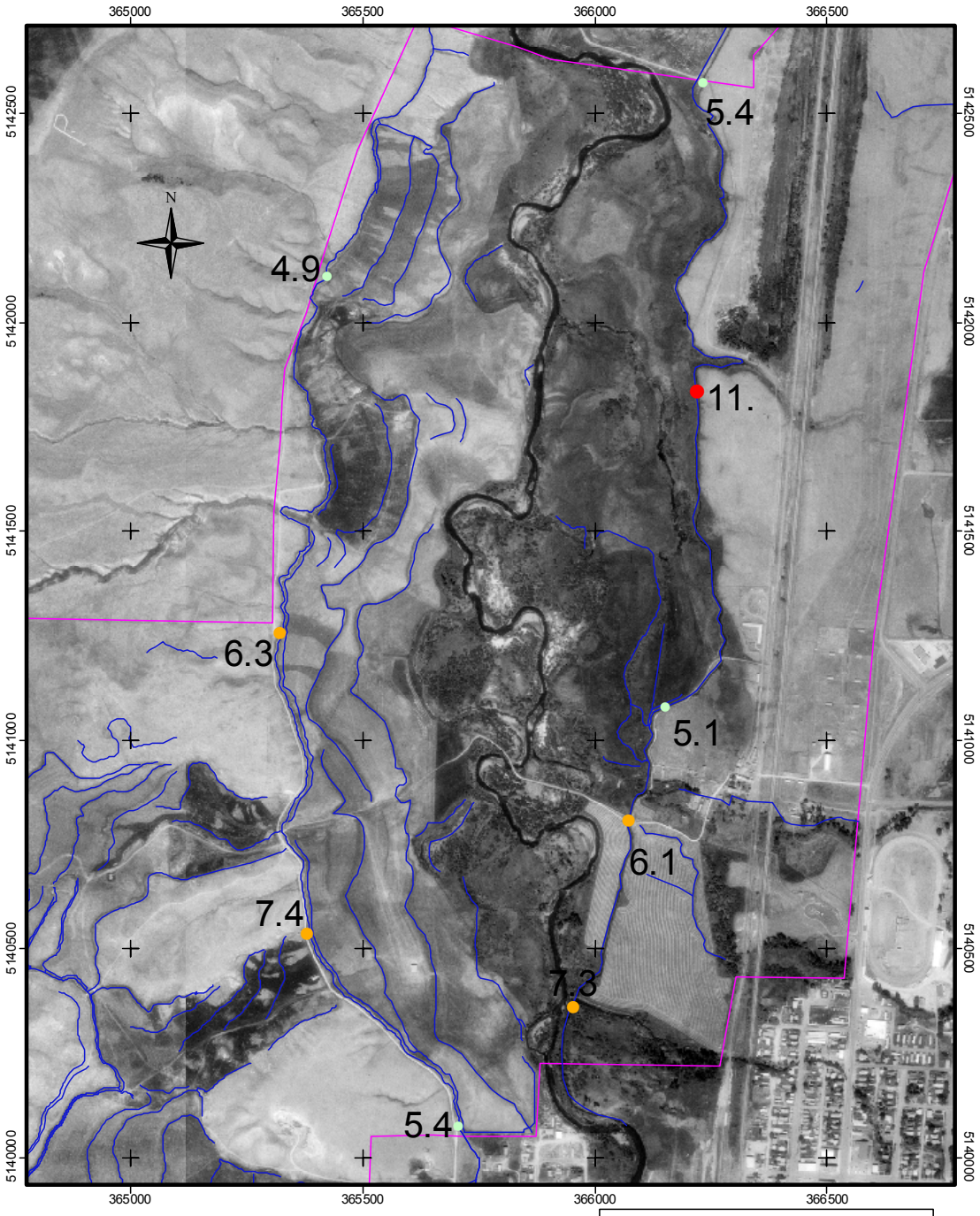


Figure 5. Cadmium: Ditch Sediments
(<63 um size fraction)

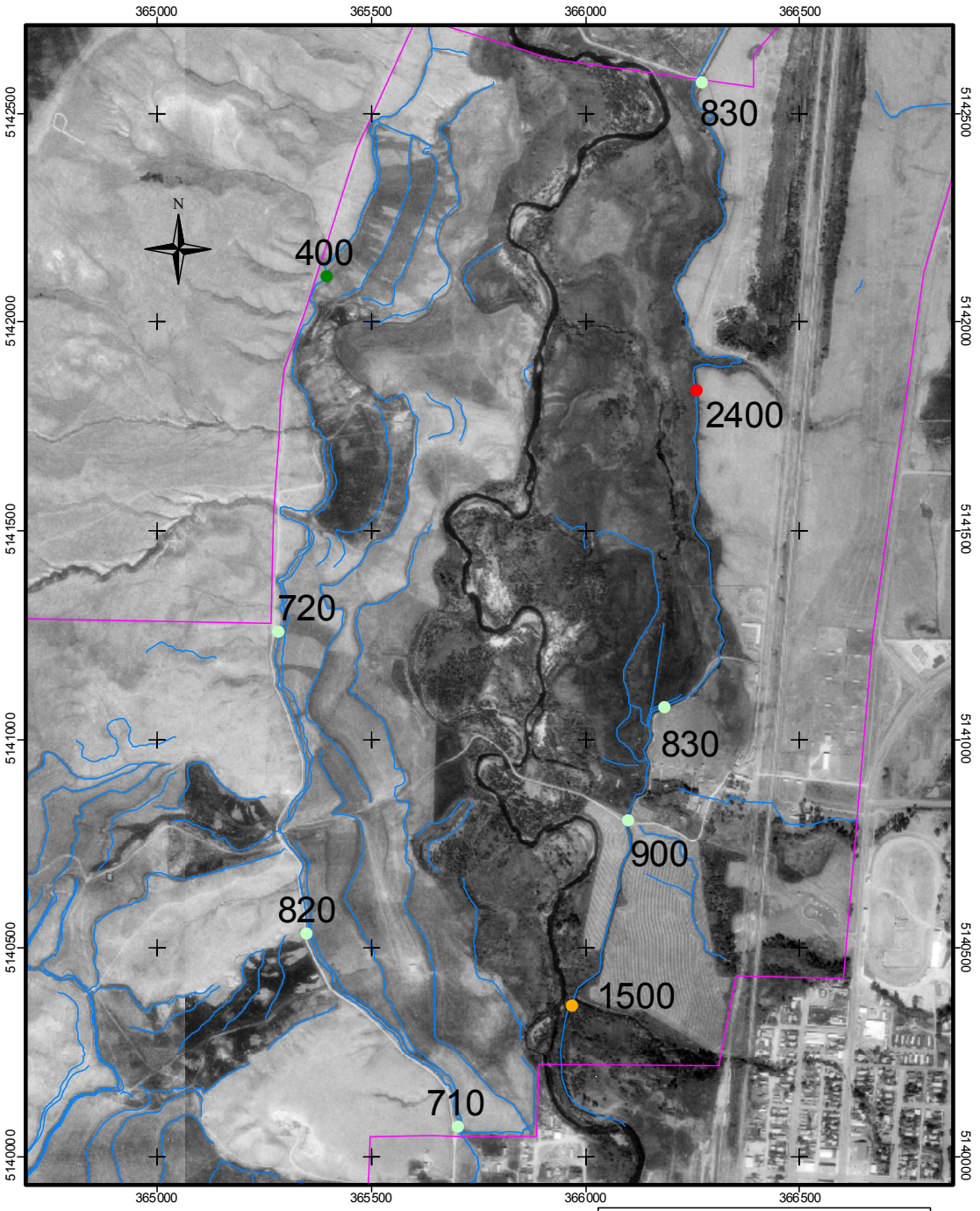


Figure 6. Copper: Ditch Sediments
(<63 um size fraction)

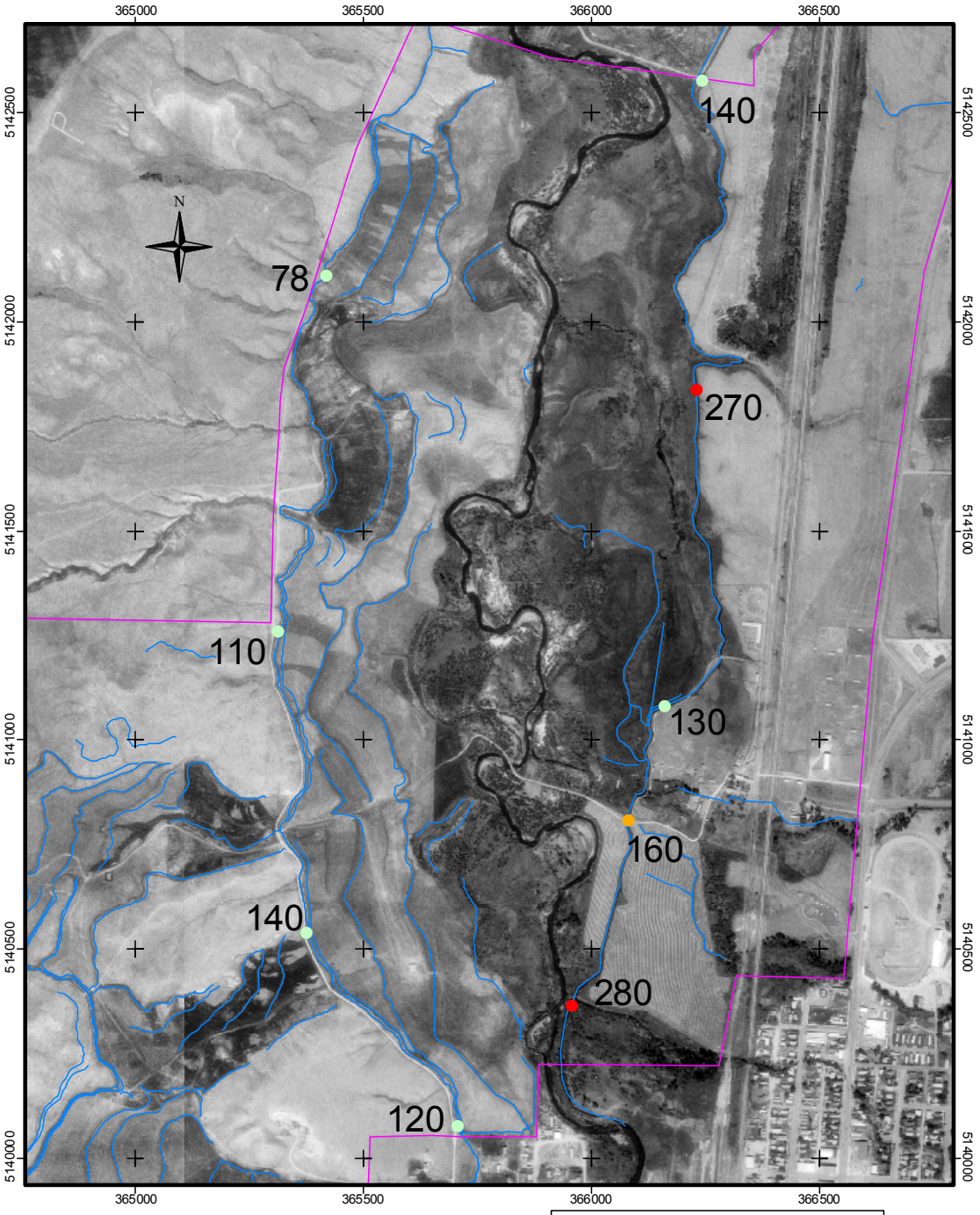


Figure 7. Lead: Ditch Sediments
(<63 um size fraction)

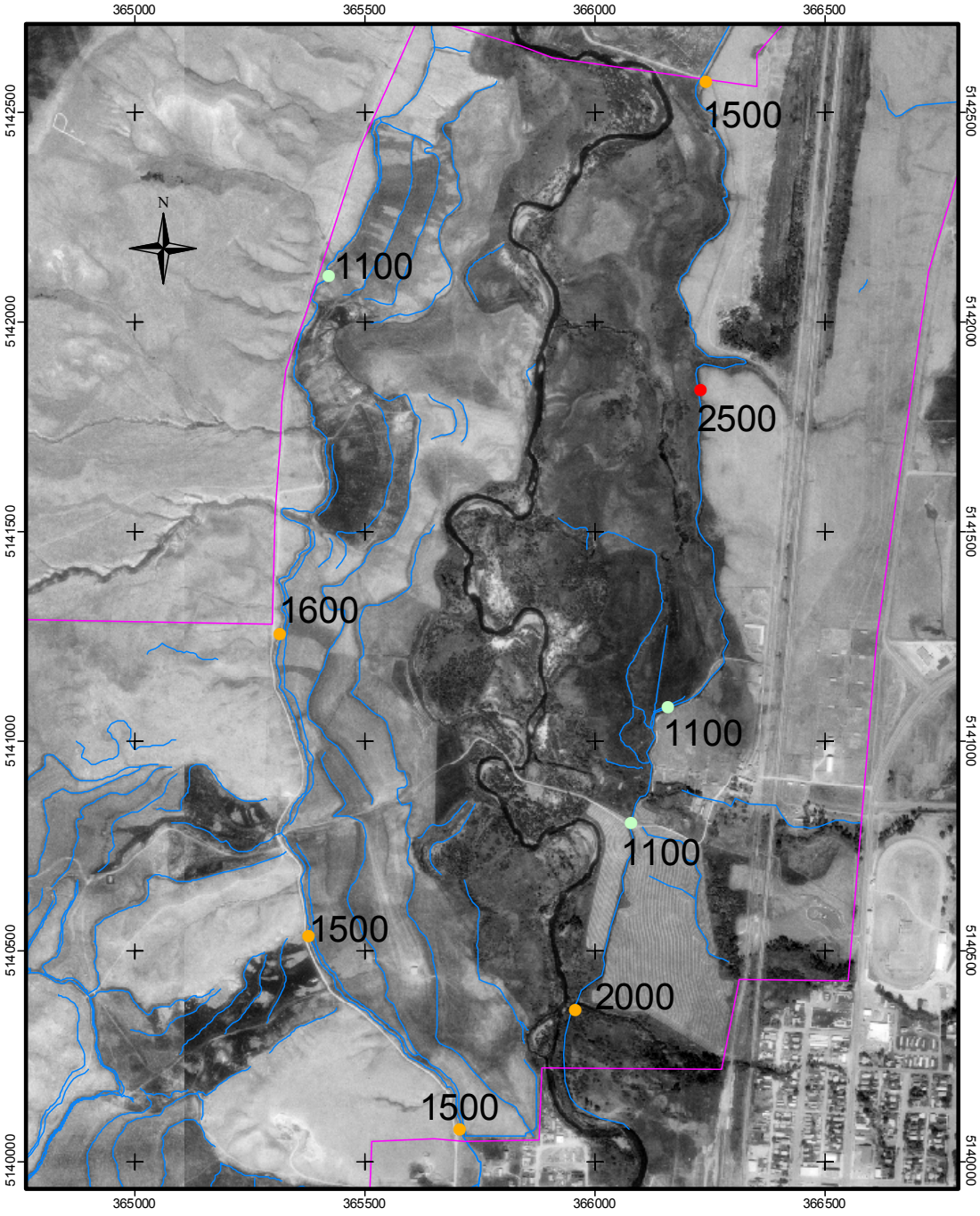


Figure 8. Zinc: Ditch Sediments
(<63 um size fraction)

200 0 200 400 Meters

LEGEND
0 - 700 ppm
700 - 1400 ppm
1400 - 2100 ppm
2100 - 2500 ppm
Ditches
Study boundary

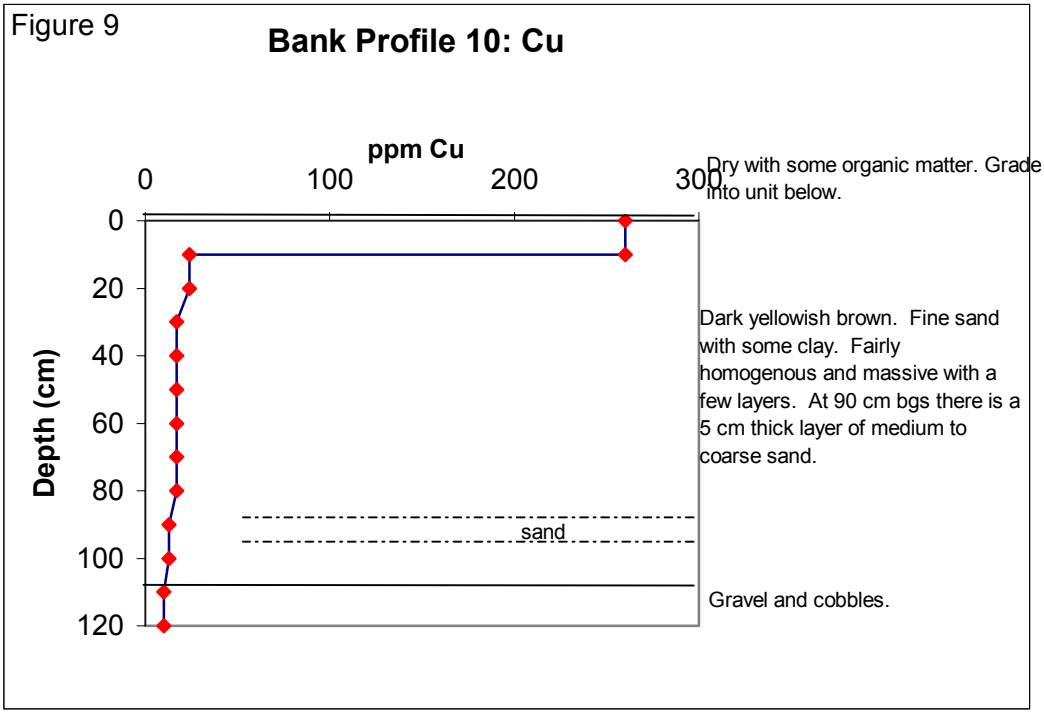
d) Ditch Sediments

Data for all the elements are presented in Appendix A.5.2. We discuss results for As Cd, Cu, Pb and Zn, summarized in Table 4. Figures 4-8 are maps of the distribution of surface sediment sample metals concentrations in the less than 63 µm size fraction along the two major ditches on the Ranch for As, Cu, Cd, Pb, and Zn respectively.

Table 4. Summary Statistics: Ditch Sediments

	As	Cd	Cu	Pb	Zn
Median	65	6.1	830	140	1500
*MAD**	14	1.0	110	20	400
Interquartile Range	39	2.0	330	70	600
Maximum	130	11	2400	280	2500
Minimum	27	4.9	400	78	1100
N	9	9	9	9	9
* *Median absolute deviation*					

Figure 9



e) Determination of Baseline Concentrations for Soils

Figure 9 shows a profile plot for Site BP10, located along the Clark Fork River (see Plate 2 for location). Concentrations are elevated at the surface but drop to a consistent low concentration with increasing depth. We interpret this change to constant concentrations to represent the pre-mining soil metal concentrations at GKR. Nearly all profile plots that showed a similar drop to a consistent low concentration were assumed to demonstrate

this pre-mining baseline level of metals and arsenic concentrations. Both fields and floodplain area sites showed consistent low concentrations at depth (see Appendix A.5.4).

Each element (As, Cd, Cu, Pb and Zn) in each profile, was assessed individually and a depth at which the concentration returned to a constant concentration was determined. This process was repeated for all profiles showing constant values at depth. Data from all profiles containing consistent concentrations at depth were collated and used to calculate baseline concentrations for the study area (Table 5). Appendix A.5.5 lists the samples used to calculate baseline for each of the hazardous substances of concern. Profiles where concentrations did not return to some recognizable and consistent low concentration were omitted from the baseline determination. For example, no samples from BP12 were included in the baseline calculations for Cu (see Figure 2).

Median values were used to represent baseline (the data are not normally distributed and for As and Cd, many baseline values were below the dilution corrected detection limit, pql*200). Values used in the median calculation for some elements required corrected pql values. The dilution corrected pql values for the elements are as follows: As = 10 ppm, Cu = 6 ppm, Pb =4 ppm and Zn = 1 ppm. The dilution corrected pql was used for all values that fell below baseline although half of the dilution corrected pql was used for data plots to show that the values were below the detection limit line drawn on the plots. Cd is not listed because all but 2 values deemed baseline fell below the dilution corrected pql of 1 ppm. The baseline concentration used for Cd is therefore, 1 ppm. 66% of As concentrations from samples designated as baseline were below the dilution corrected pql (BPQL in Table 5) so the baseline is assumed to be the dilution corrected pql (10 ppm).

Table 5. Summary Statistics: Baseline

Element	Median	MAD*	IQR**	Maximum	Minimum	N	% BPQL
As	**10**	0	2	38	10	118	66%
Cd	**1**	0	0	1.3	1	94	98%
Cu	**16**	8.4	20	77	6	98	10%
Pb	**17**	7	13	170	8	125	15%
Zn	**49**	22	45	140	14	95	0%

*Median absolute deviation. **Interquartile range.
Median = Baseline

f) Extent and Magnitude of Hazardous Substances

i) Summary statistics and maps

Baseline concentrations determined from the above methods were used to normalize metal and arsenic concentrations to a single scale. Element concentrations were divided by the baseline to determine the degree to which concentrations were elevated above baseline concentrations. The values then are directly comparable among elements. Plates 12-16 show the spatial distribution of elevation of concentrations above baseline (concentrations normalized to baseline).

ii) Volume calculations

We chose to use a cutoff value of 5 times the baseline values for each of the hazardous substances of concern. Those values encompass potential variation within the baseline dataset and represent a very conservative estimate of the presence of hazardous substances. Volumes of soils greater than 5 times the baseline values were calculated as follows. An area of contaminated soil was determined both in the floodplain area and in the fields areas. The floodplain area is shown on plates 7-11 as a light blue line (determined from interpretation of the geomorphology of the area).

The area with soils concentrations elevated 5 times above baseline was determined using surface soil sample concentrations (upper ~30 cm/12 in). An area encompassing all reasonably contiguous sampling sites with elevated concentrations was created as a theme in ArcView. Rather than contour the data, the boundary was chosen as 1/2 the distance between two sampling points where one was elevated and the other was less than 5 times the baseline unless a nearby major physiographic feature formed a natural boundary (see Figure 10). The upland and floodplain portions of the area were calculated (see Plates 12-16 for areas used). Numeric values of the areas are shown in Table 6.

Table 6. Areas of Contaminated Soil

Units: m^2	Fields	Floodplain	Total
As	308,000	532,000	840,000
Cd	90,700	285,000	375,700
Cu	2,8605,000	544,000	29,149,000
Pb	354,000	544,000	898,000
Zn	1,840,000	544,000	2,384,000

Depths of hazardous substances in soil in the floodplain and in the fields were determined as discussed below and the volume of contaminated soil was determined by multiplying the area times the depth. Volumes were calculated based on two methods for calculating depth in order to provide a range.

All data from the core and bank profile samples in the fields were plotted against depth for each hazardous substance (Figure 11). The maximum and median depths of elevated soil were calculated from these profiles. The maximum and median depths of elevated soil concentrations are listed in Table 7 (see Figure 11 for plots). These depths were used to calculate the volume of contaminated soil. Results are summarized in Table 8. All volume values have two significant figures; the rest of the zeros are placeholders. In order to make them easier to read, values were not presented in scientific notation.

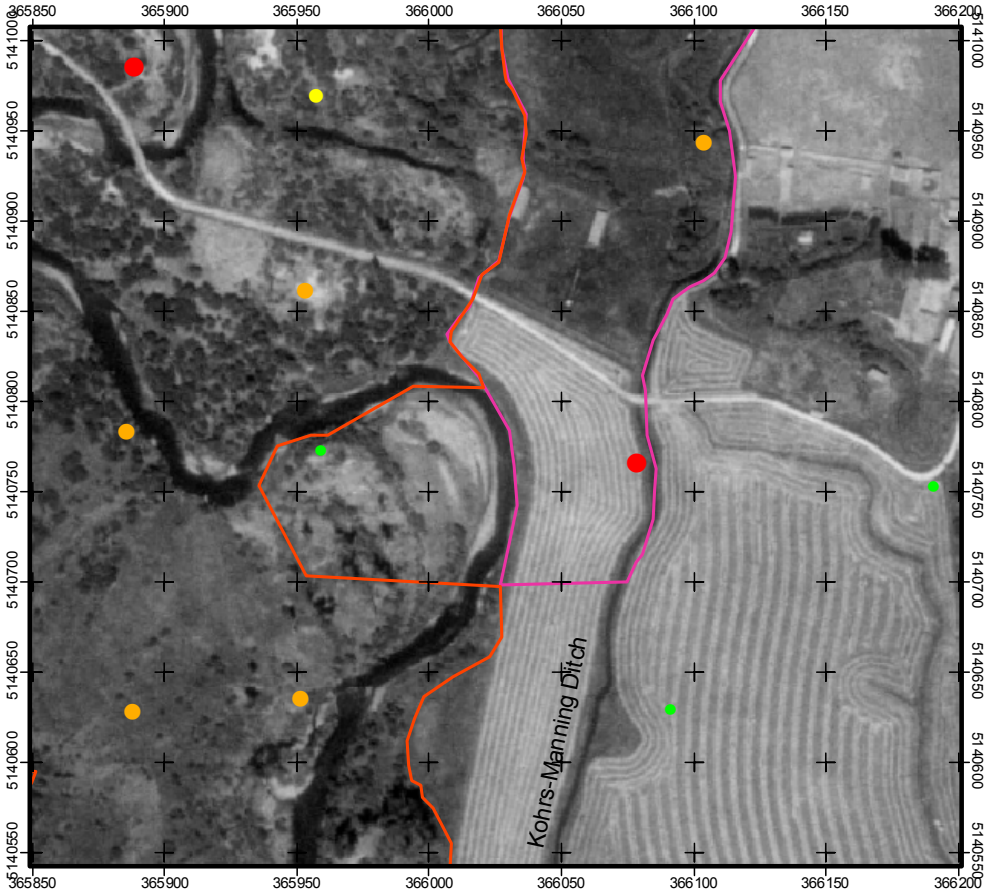
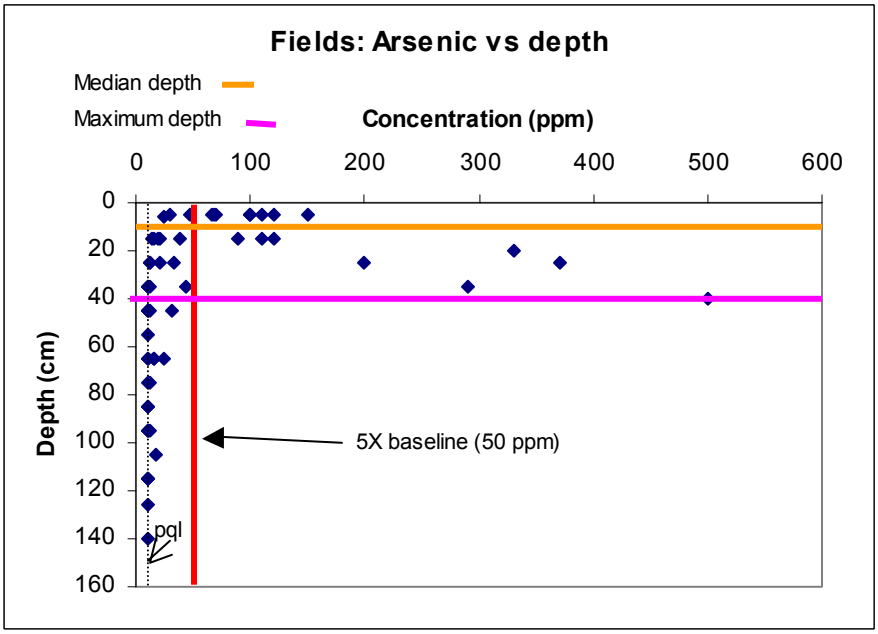
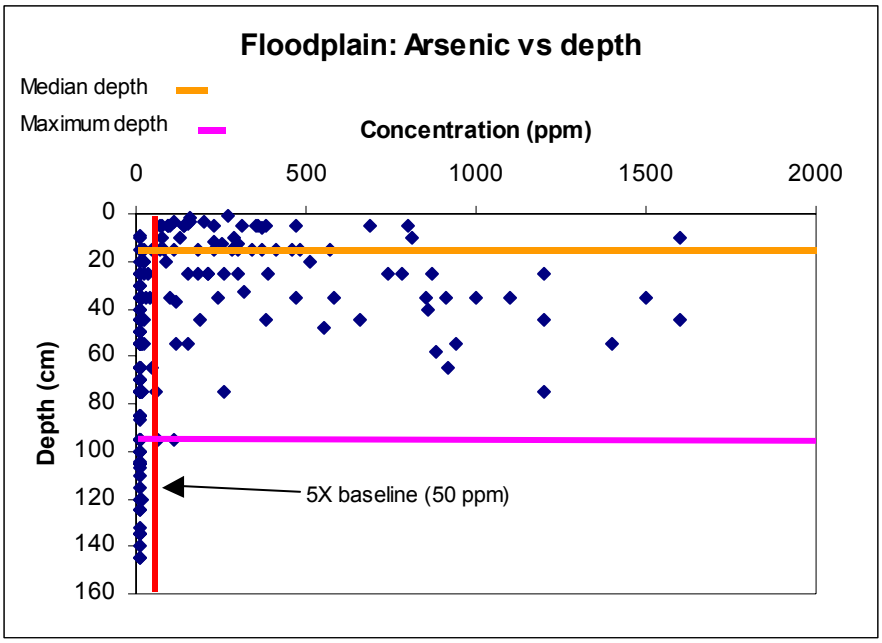


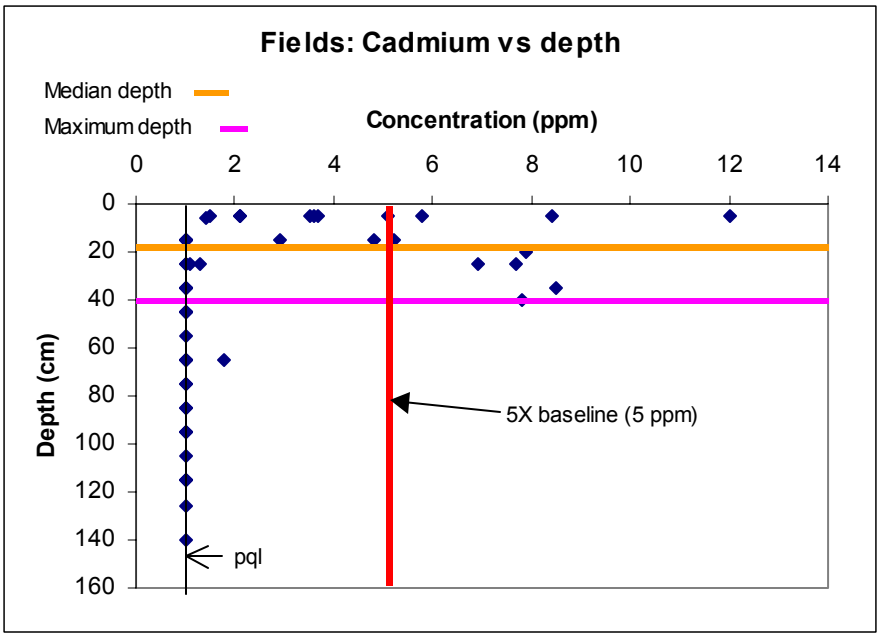
Figure 10 Detail of Plate 12

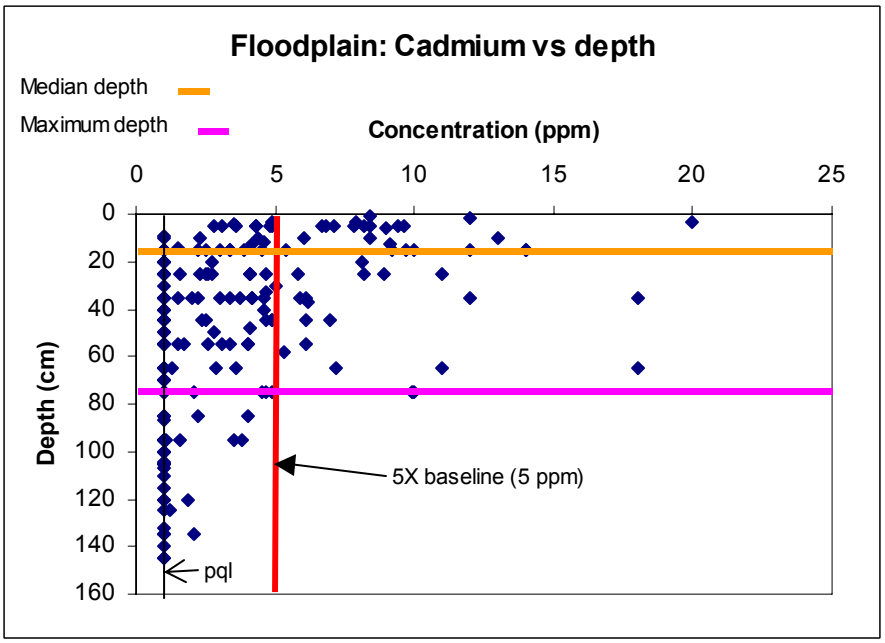
Illustration of exception to rule of thumb used to determine the impacted areas of the Ranch. This is a detail from Plate 12 (arsenic). The site in the center of the map shows significant elevation above the baseline (50-94 X baseline) and the site directly to the east shows little elevation above the baseline (0-5 X baseline). Generally the areas were generated by placing a line 1/2 the distance from the impacted site to the unimpacted site. However, in this case, the Kohrs Manning Ditch is taken into consideration in placing the area boundary for the fields causing the boundary to be very near the elevated site.

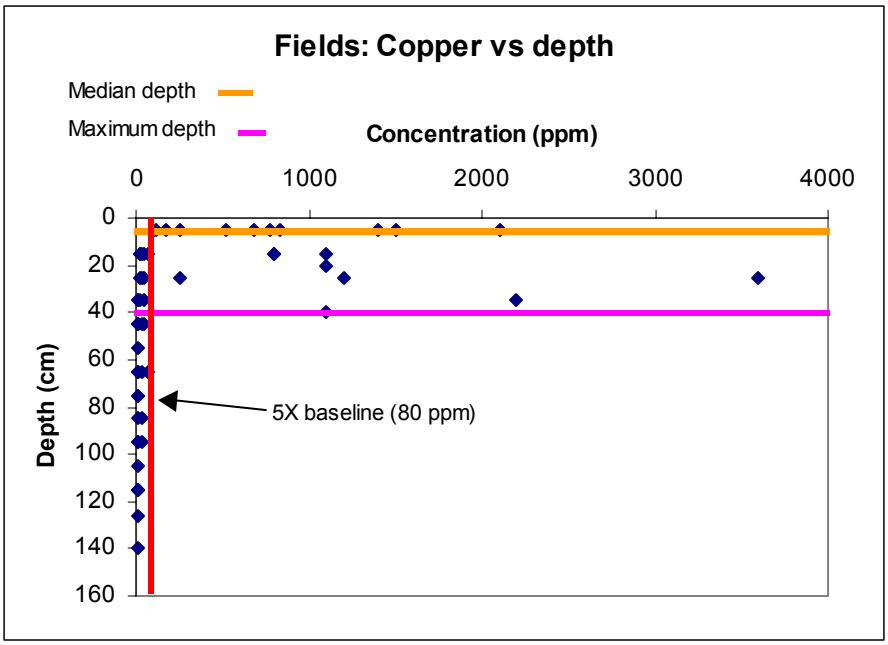
Figure 11. Plots of concentrations versus depth (split by location). The pink line indicates the maximum depth at which concentrations exceed 5 times the baseline. The orange line indicates the median depth at which concentrations exceed 5 times the baseline.

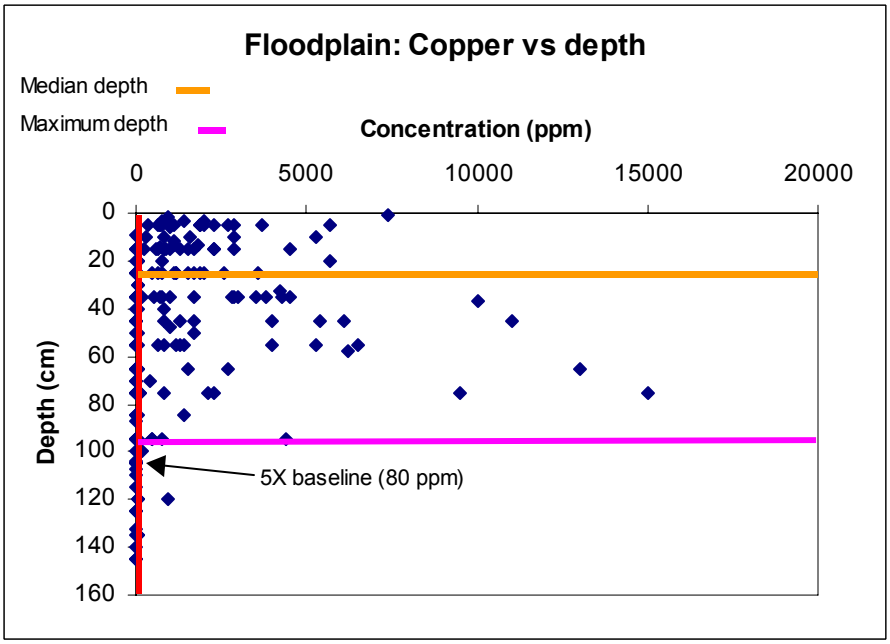


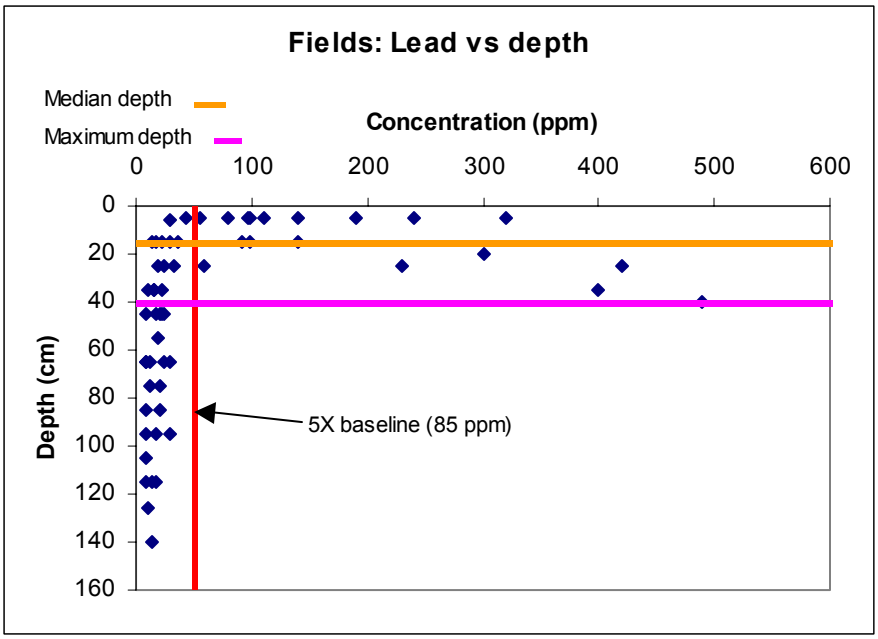


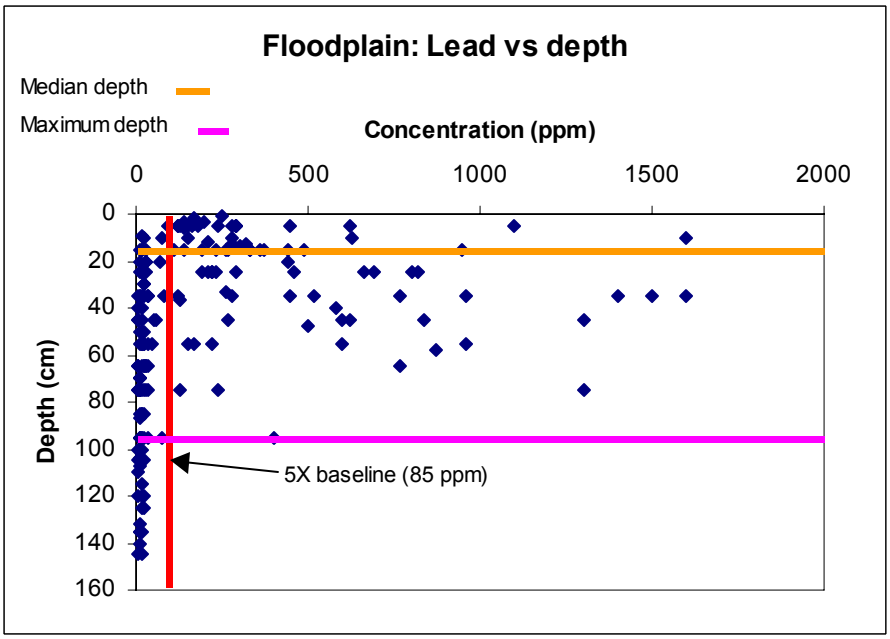

Fields: Cadmium vs depth
Median depth
Maximum depth
Concentration (ppm)
0
2
4
6
8
10
12
14
Depth (cm)
0
20
40
60
80
100
120
140
160
5X baseline (5 ppm)
pql

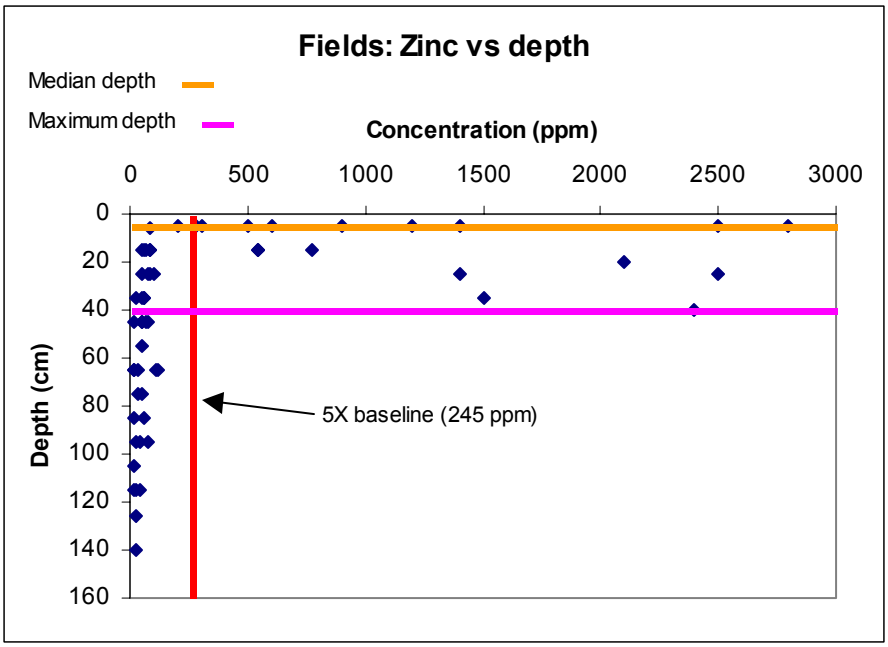

Floodplain: Cadmium vs depth
Median depth
Maximum depth
Concentration (ppm)
0
5
10
15
20
25
Depth (cm)
0
20
40
60
80
100
120
140
160
5X baseline (5 ppm)
pql


Fields: Copper vs depth
Median depth
Maximum depth
Concentration (ppm)
0
1000
2000
3000
4000
Depth (cm)
0
20
40
60
80
100
120
140
160
5X baseline (80 ppm)


Floodplain: Copper vs depth
Median depth
Maximum depth
Concentration (ppm)
0
5000
10000
15000
20000
Depth (cm)
0
20
40
60
80
100
120
140
160
5X baseline (80 ppm)


Fields: Lead vs depth
Median depth
Maximum depth
Concentration (ppm)
0
100
200
300
400
500
600
Depth (cm)
0
20
40
60
80
100
120
140
160
5X baseline (85 ppm)


Floodplain: Lead vs depth
Median depth
Maximum depth
Concentration (ppm)
0
500
1000
1500
2000
Depth (cm)
0
20
40
60
80
100
120
140
160
5X baseline (85 ppm)


Fields: Zinc vs depth
Median depth
Maximum depth
Concentration (ppm)
0
500
1000
1500
2000
2500
3000
Depth (cm)
0
20
40
60
80
100
120
140
160
5X baseline (245 ppm)

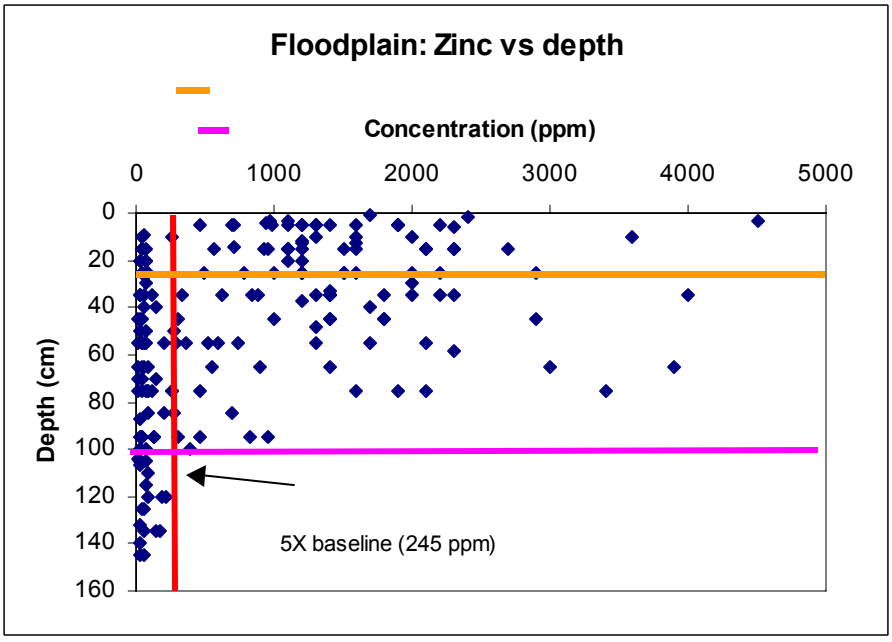

Floodplain: Zinc vs depth
Concentration (ppm)
0
1000
2000
3000
4000
5000
Depth (cm)
0
20
40
60
80
100
120
140
160
5X baseline (245 ppm)

Table 7. Depths of Contaminated Soil

Floodplain (units: meters)			Fields (units: meters)	
	Maximum	Median	Maximum	Median
As	0.95	0.15	0.40	0.20
Cd	0.75	0.15	0.40	0.18
Cu	0.95	0.25	0.40	0.06
Pb	0.95	0.15	0.40	0.15
Zn	1.00	0.25	0.40	0.05

Table 8. Volumes of Contaminated Soil

	Fields		Floodplain		Totals	
Units: m3	Median	Maximum	Median	Maximum	Median	Maximum
Arsenic	62,000	120,000	80,000	510,000	140,000	630,000
Cadmium	16,000	36,000	43,000	210,000	59,000	250,000
Copper	160,000	1,100,000	140,000	520,000	290,000	1,700,000
Lead	53,000	140,000	76,000	480,000	140,000	660,000
Zinc	92,000	740,000	140,000	540,000	230,000	13,080,000

4) Results: Groundwater and Soil Pore Water

a) Groundwater Flow

Groundwater occurs near the ground surface at GKR. The water table is within about 5 ft of land surface in the floodplain portion of the site; 10 to 20 ft below land surface under the gravel terraces to the east and up to 30+ ft below land surface in the upper parts of the west side fields. Contours of the water table in June 2000 and December 2000 show the groundwater system slopes towards the Clark Fork River (Figures 12 and 13). Groundwater flow is from the uplands to the floodplain area.

b) Soil Pore Water Flow

Tensiometer readings generally indicated more negative matrix potentials in at the shallow measuring sites (6 inches) (Figures 14 and 15, see Appendix B.2 for additional of the plots). In addition, the soil matrix potential became more negative as the summer and fall progressed suggesting continued drying of the soil. Interpreted movement of soil water at most sites was toward the land surface. This creates a "wicking" effect, in which soil water moves towards the surface and is evaporated, leaving behind the salts which were dissolved in the water as a white crust layer on the soil surface. This observation is also supported by the observed formation of "salt" crusts in portions of the floodplain during the study period.

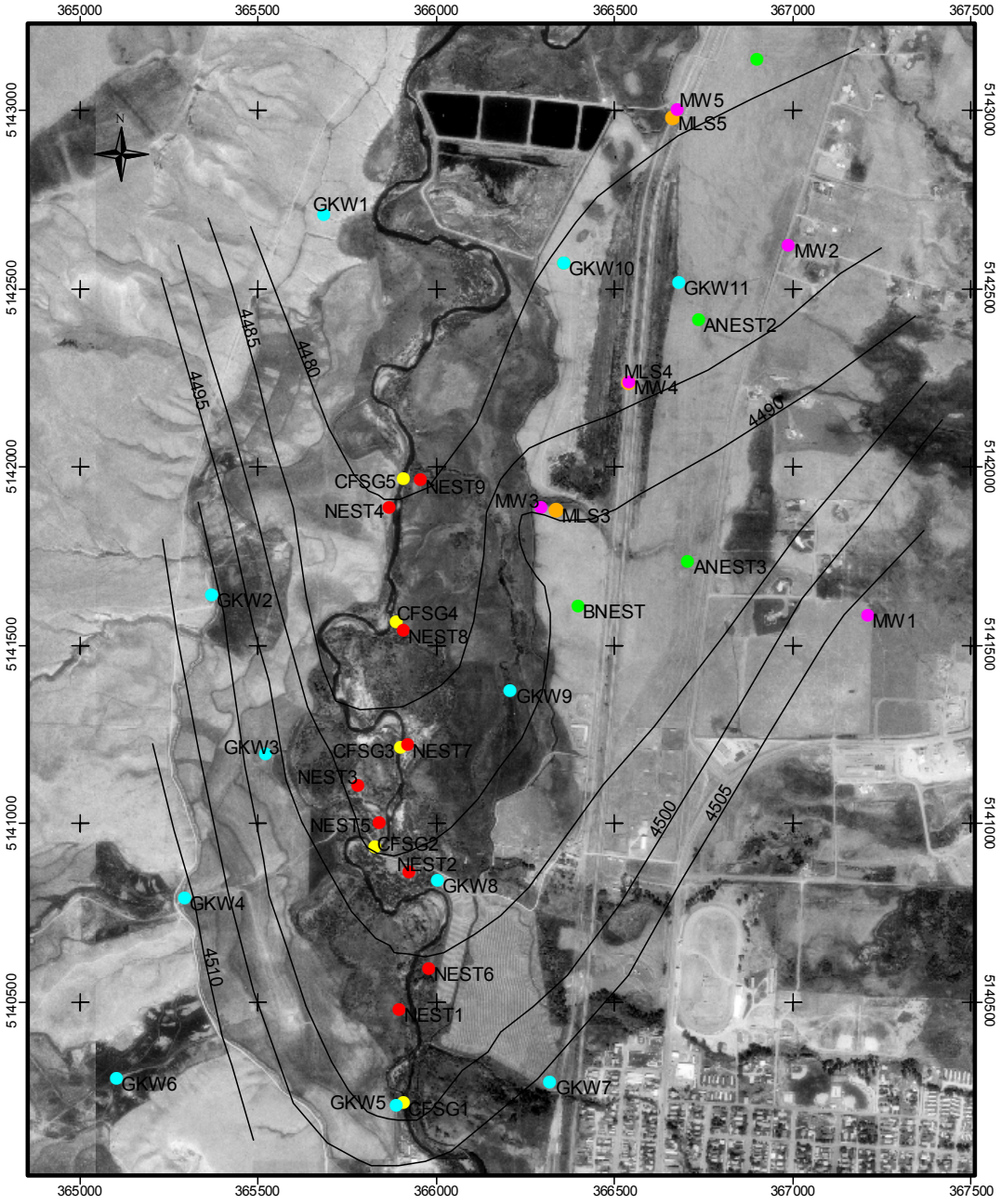


Figure 12. Potentiometric Map: June 2000

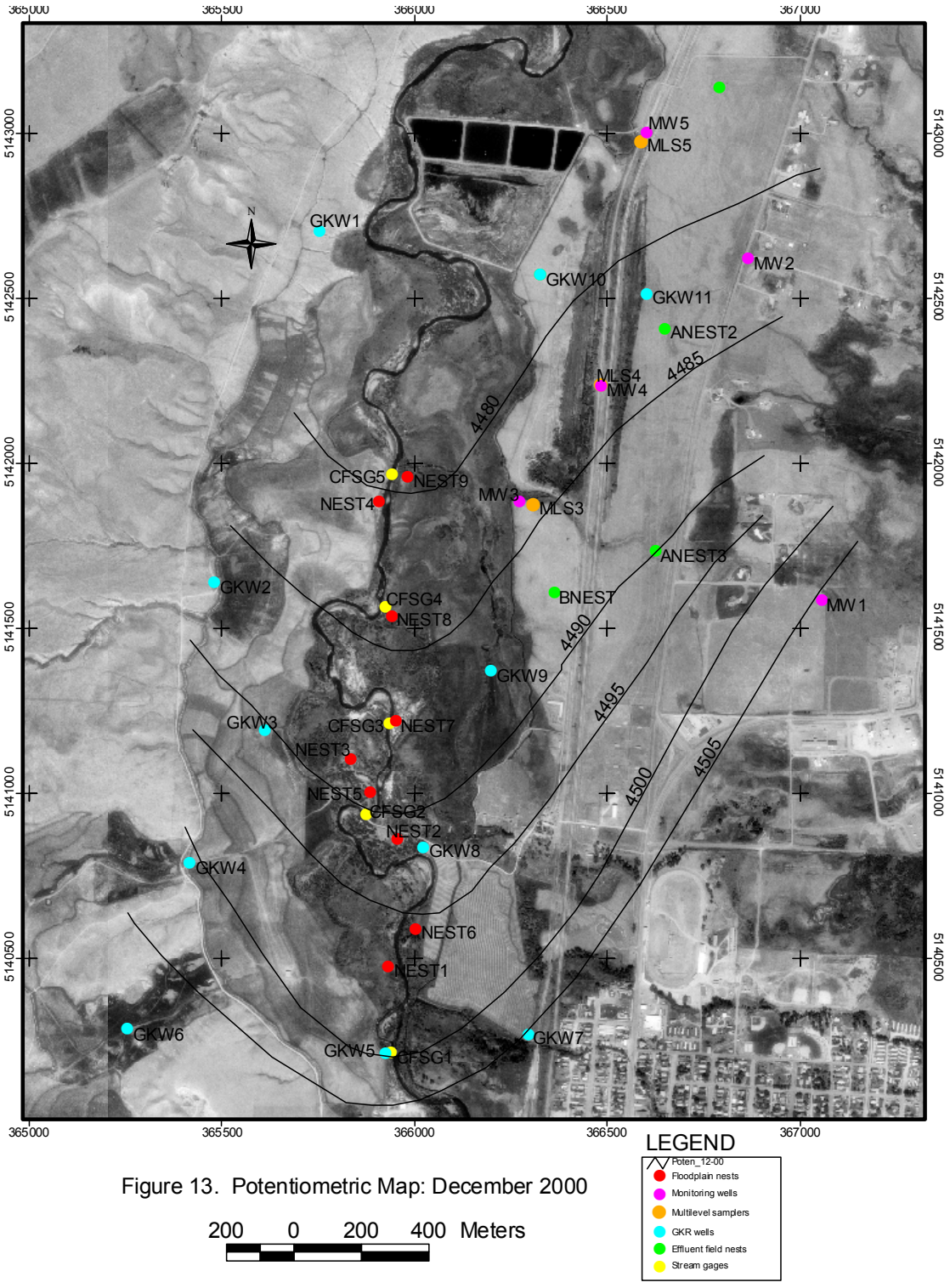


Figure 13. Potentiometric Map: December 2000

Figure 14

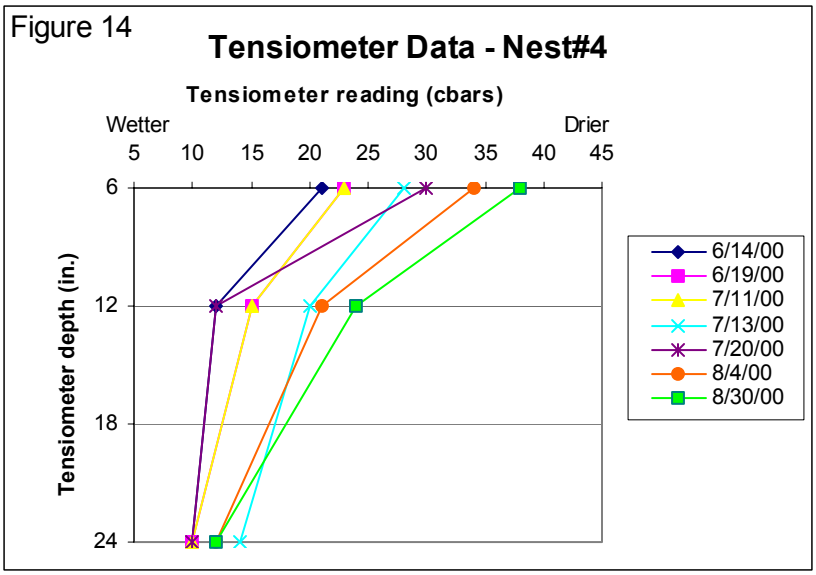
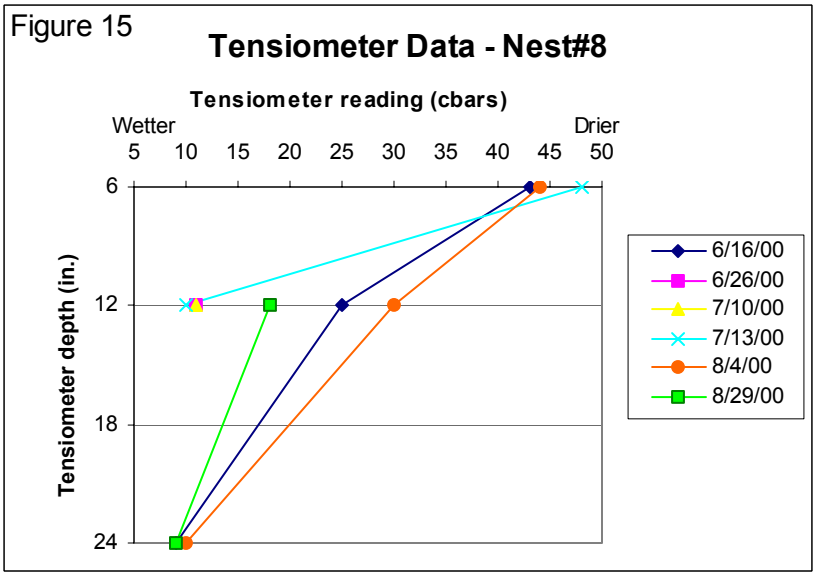


Figure 15



c) Determination of Baseline Soil Water and Groundwater Concentrations

Groundwater concentrations were used to calculate baseline concentrations for both soil water and groundwater. Soil water recharge was considered to become groundwater via downward percolation, thus groundwater baseline values were used as the soil water baseline. It is recognized that uncontaminated soils would typically contain soil water with baseline concentrations lower than groundwater baseline concentrations.

Sites used to calculate baseline concentrations were based on the geologic setting and distance from the contaminated floodplain. The following wells were chosen to use as indicators of a local baseline concentration: GKW1, GKW7, GKW10, GKW11, MW1, MW2, MW4, MW5, MLS4 (MLS-4RED, MLS-4W) and MLS5 (MLS-5BLUE, MLS-

5GREEN, MLS-5RED, and MLS-5W). These wells represent groundwater up hydraulic gradient of the GKR and wells adjacent to the sewage irrigated east bench that appear to be unimpacted by current operations at this time. Figure 16 shows the locations of the wells used for baseline calculations. Baseline values were calculated for As, Cd, Cu, and Zn. Baseline for Pb was not used because nearly all samples had concentrations below the detection limit.

Table 9. Medians: Sites Used for Baseline						
		Median	MAD	Maximum	Minimum	N
As	GKW1	0.005	0.0000	0.005	0.005	4
	GKW7	0.005	0.0000	0.005	0.005	4
	GKW 10	0.005	0.0000	0.005	0.005	4
	GKW11	0.005	0.0000	0.005	0.005	4
	MLS 4	0.005	0.0000	0.005	0.005	9
	MLS 5	0.005	0.0000	0.008	0.005	16
	MW 1	0.005	0.0000	0.005	0.005	5
	MW 2	0.005	0.0000	0.005	0.005	6
	MW4	0.005	0.0000	0.005	0.005	5
	MW5	0.005	0.0000	0.007	0.005	6
Cd	GKW1	0.001	0.0000	0.001	0.001	4
	GKW7	0.001	0.0000	0.001	0.001	4
	GKW 10	0.001	0.0000	0.001	0.001	4
	GKW11	0.001	0.0000	0.001	0.001	4
	MLS 4	0.001	0.0000	0.001	0.001	9
	MLS 5	0.001	0.0000	0.001	0.001	16
	MW 1	0.001	0.0000	0.001	0.001	5
	MW 2	0.001	0.0000	0.001	0.001	6
	MW4	0.001	0.0000	0.001	0.001	5
	MW5	0.001	0.0000	0.001	0.001	6
Cu	GKW1	0.003	0.0000	0.007	0.003	4
	GKW7	0.003	0.0000	0.003	0.003	4
	GKW 10	0.003	0.0000	0.004	0.003	4
	GKW11	0.003	0.0000	0.003	0.003	4
	MLS 4	0.003	0.0000	0.005	0.003	9
	MLS 5	0.003	0.0000	0.003	0.003	16
	MW 1	0.003	0.0000	0.004	0.003	5
	MW 2	0.003	0.0000	0.009	0.003	6
	MW4	0.003	0.0000	0.004	0.003	5
	MW5	0.003	0.0000	0.005	0.003	6
Zn	GKW1	0.0025	0.0005	0.005	0.002	4
	GKW7	0.0025	0.0005	0.003	0.001	4
	GKW 10	0.0035	0.001	0.005	0.002	4
	GKW11	0.002	0.0000	0.002	0.002	4
	MLS 4	0.004	0.001	0.016	0.001	9
	MLS 5	0.002	0.0005	0.004	0.001	16
	MW 1	0.002	0.0000	0.003	0.002	5
	MW 2	0.003	0.0000	0.009	0.001	6
	MW4	0.002	0.0000	0.005	0.002	5
	MW5	0.002	0.0000	0.009	0.002	6
* Median Absolute Distribution						

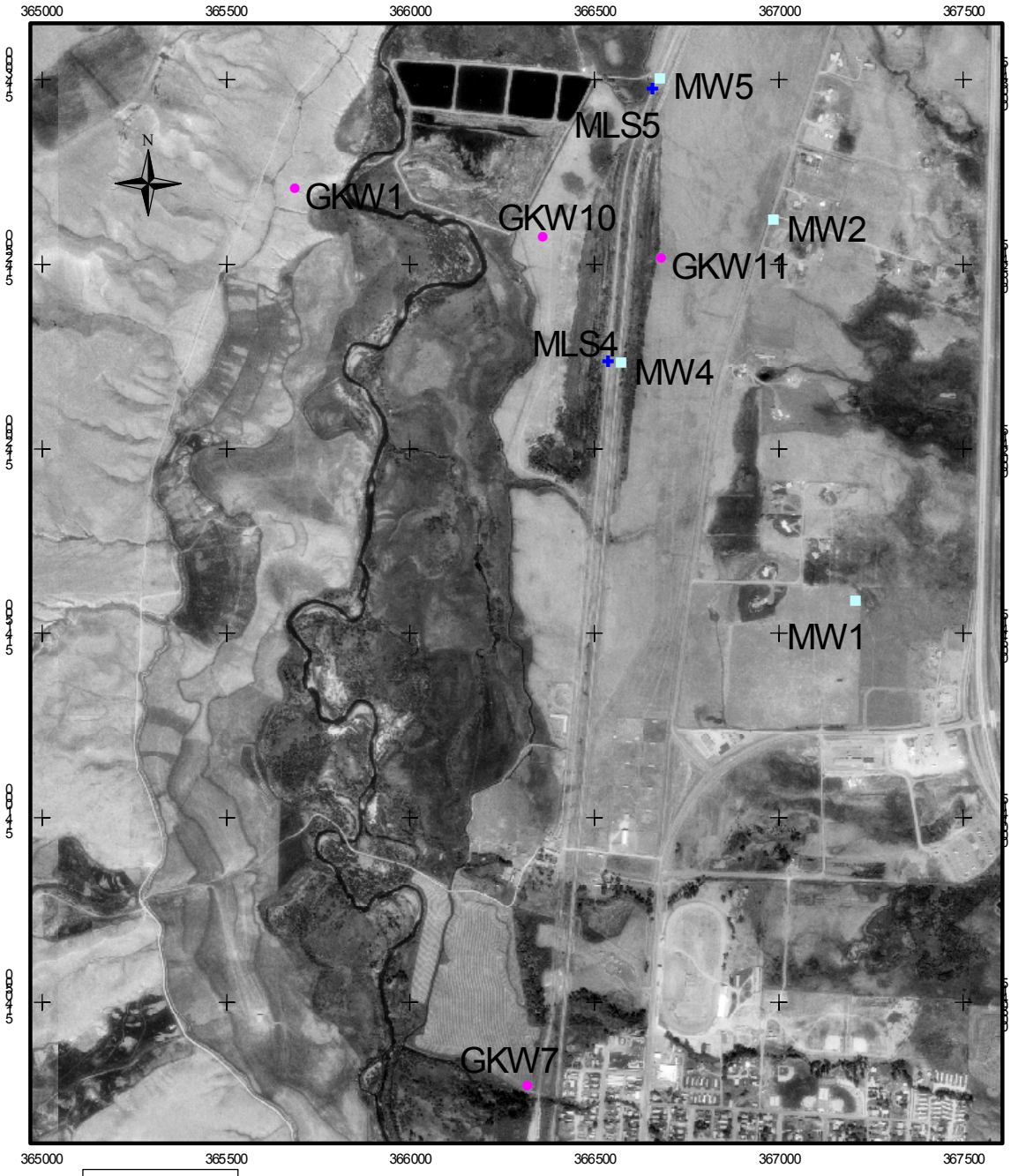


Figure 16. Wells Used for Baseline
Grant Kohrs Ranch, 2000 Field Season

Baseline concentrations were calculated by taking the median concentration of samples collected at all sampling times and depths for an individual site. The baseline was defined to be the median of the median values calculated for individual sites. Samples with concentrations below the instrument detection limit (pql) were assigned the pql. Table 9 gives median values and summary statistics for the median calculations for individual sites used to calculate soil water and groundwater baseline concentrations. Baseline concentrations and summary statistics are given in Table 10. Units are ppm. Because more than half the samples for the baseline sites were below the detection limit, As, Cd and Cu have baseline concentrations at the pql. This is a conservative estimate. The true baseline may be lower than the pql; however, analytical constraints do not allow us to distinguish concentrations lower than the pql.

Table 10 Baseline Calculations

	Median of Medians*	MAD**	Maximum	Minimum	N
As	0.005	0.0000	0.005	0.005	10
Cd	0.001	0.0000	0.001	0.001	10
Cu	0.003	0.0000	0.003	0.003	10
Zn	**0.00225**	0.00025	0.002	0.004	10

* Baseline values (calculated from medians in Table 9). Units: ppm
** Median absolute deviation

d) **Extent and Magnitude of Hazardous Substances**

i) ***Summary***

In order to consider the spatial extent of contaminated groundwater, median concentrations of samples from all depths and all collection times were calculated for each site. These values were imported into ArcView and merged with GPS location data. The baseline values calculated for groundwater wells were used to normalize concentration data for As, Cd, Cu and Zn so that all plots would have units of multiples of baseline. Pb was not included because nearly all samples had concentrations below the detection limit (pql=0.010 ppm). Median concentrations for each site were plotted in units of concentration normalized to the calculated baseline. For example a value of 2.3 for Cu represents a concentration that is 2.3 times the calculated background (2.3 equals 0.0069 ppm Cu divided by the baseline 0.003 ppm). Figures 17-20 show the distributions of well sites with groundwater concentrations elevated above the calculated baseline for As, Cd, Cu and Zn, respectively. Figures 21-24 show the distributions of lysimeter sites with soil water concentrations elevated above the calculated baseline for As, Cd, Cu and Zn respectively.

All sites where one or more of the elements of interest has a concentration greater than two times the baseline were deemed contaminated. Figure 25 shows the distributions of well sites having concentrations of one or more of As, Cd, Cu and Zn greater than two times the baseline. Figure 26 shows the distribution of lysimeter sites having concentrations of one or more of As, Cd, Cu and Zn greater than two times the baseline.

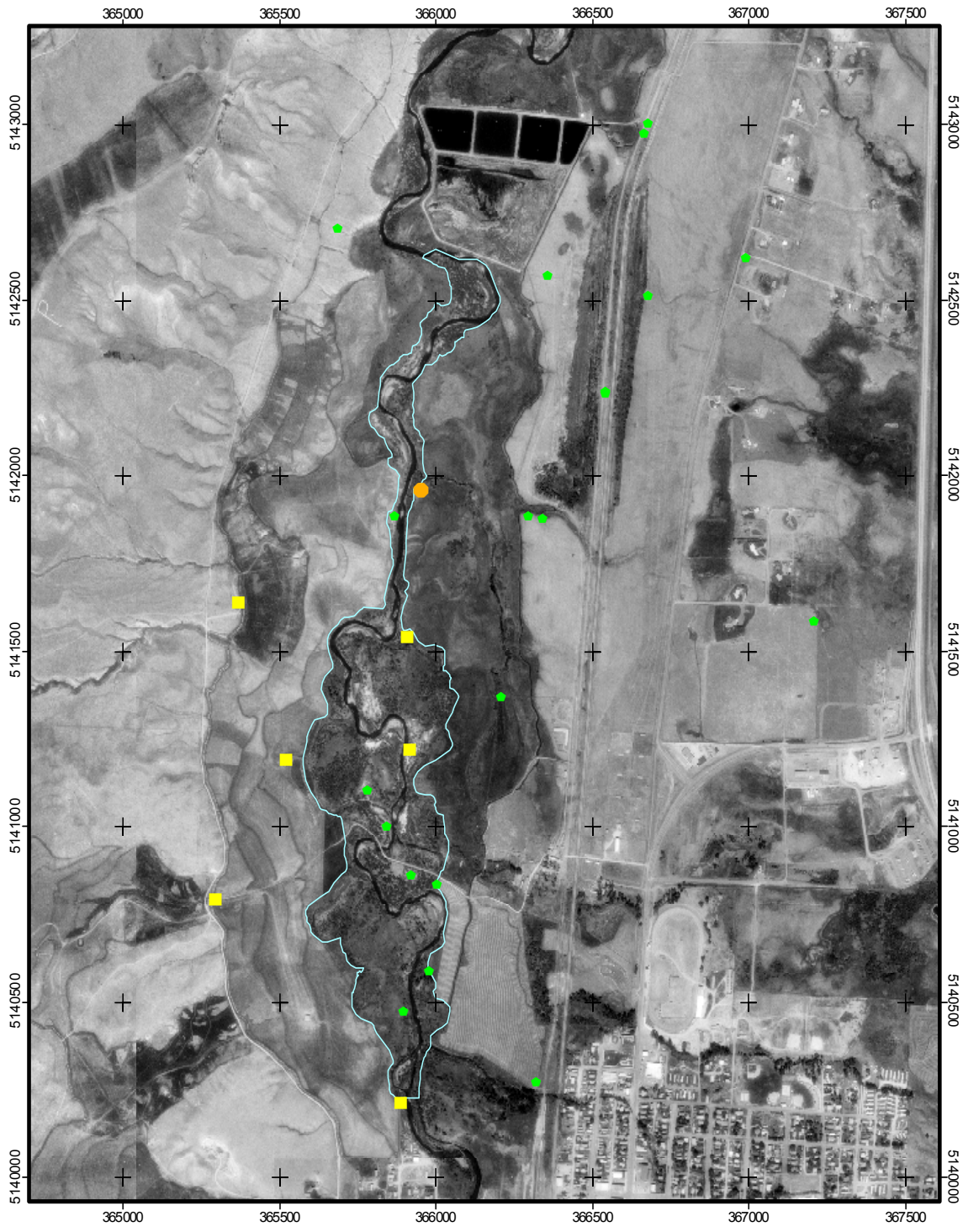


Figure 17. Wells: Arsenic Multiples of Baseline (0.005ppm) Grant Kohrs Ranch, 2000 Field Season

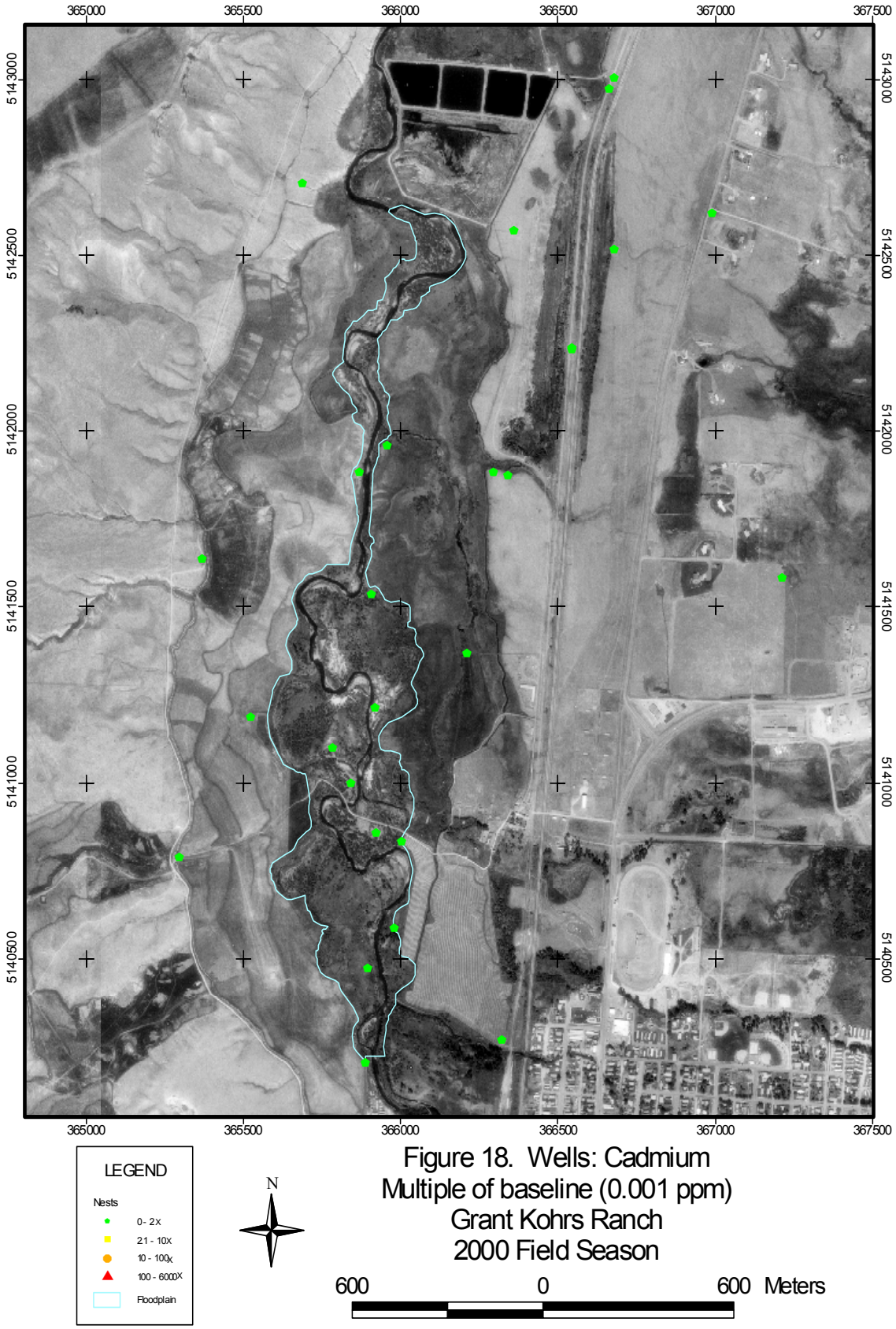


Figure 18. Wells: Cadmium
Multiple of baseline (0.001 ppm)
Grant Kohrs Ranch
2000 Field Season

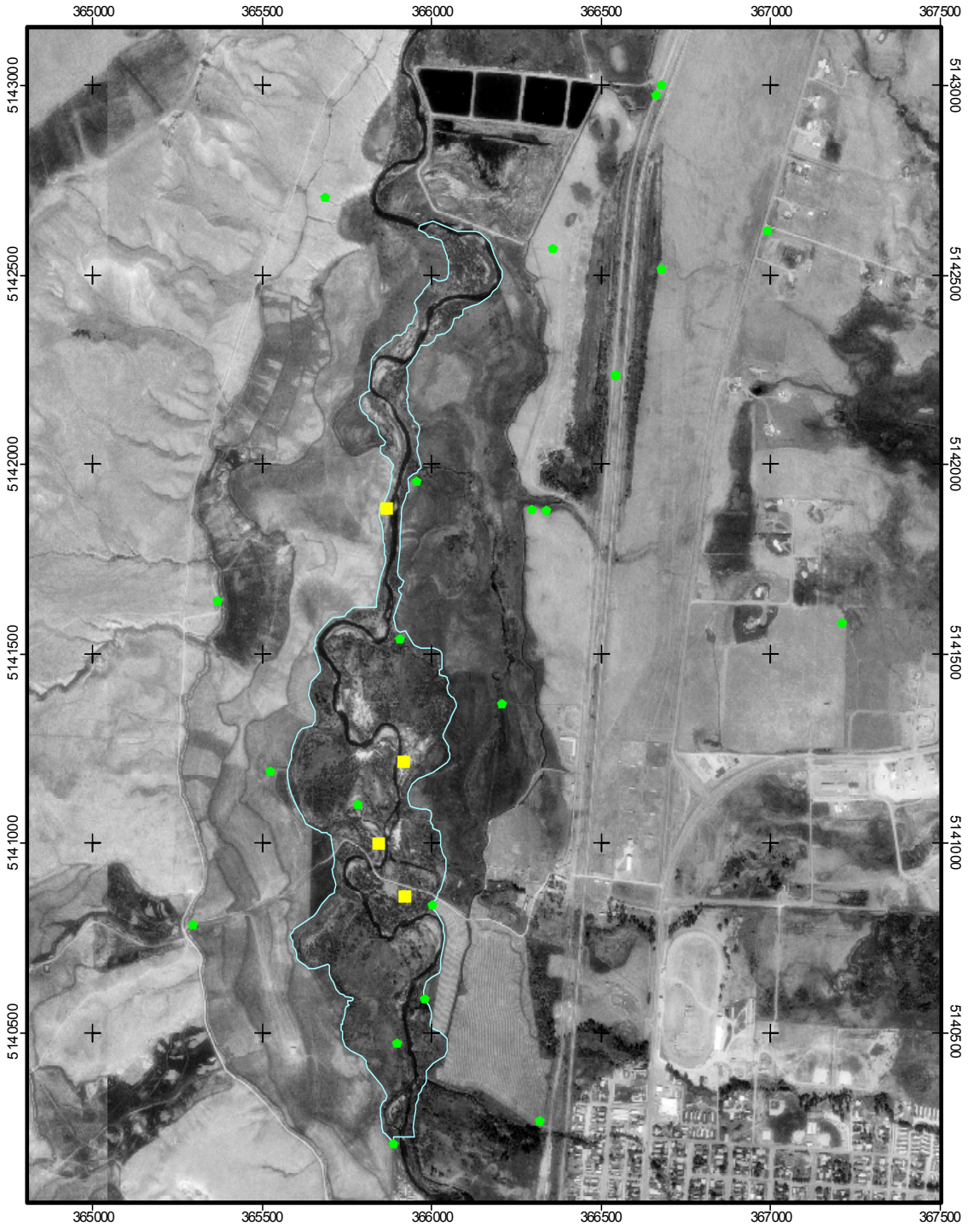


Figure 19. Wells: Copper
Multiples of baseline (0.003 ppm)
Grant Kohrs Ranch, 2000 Field Season

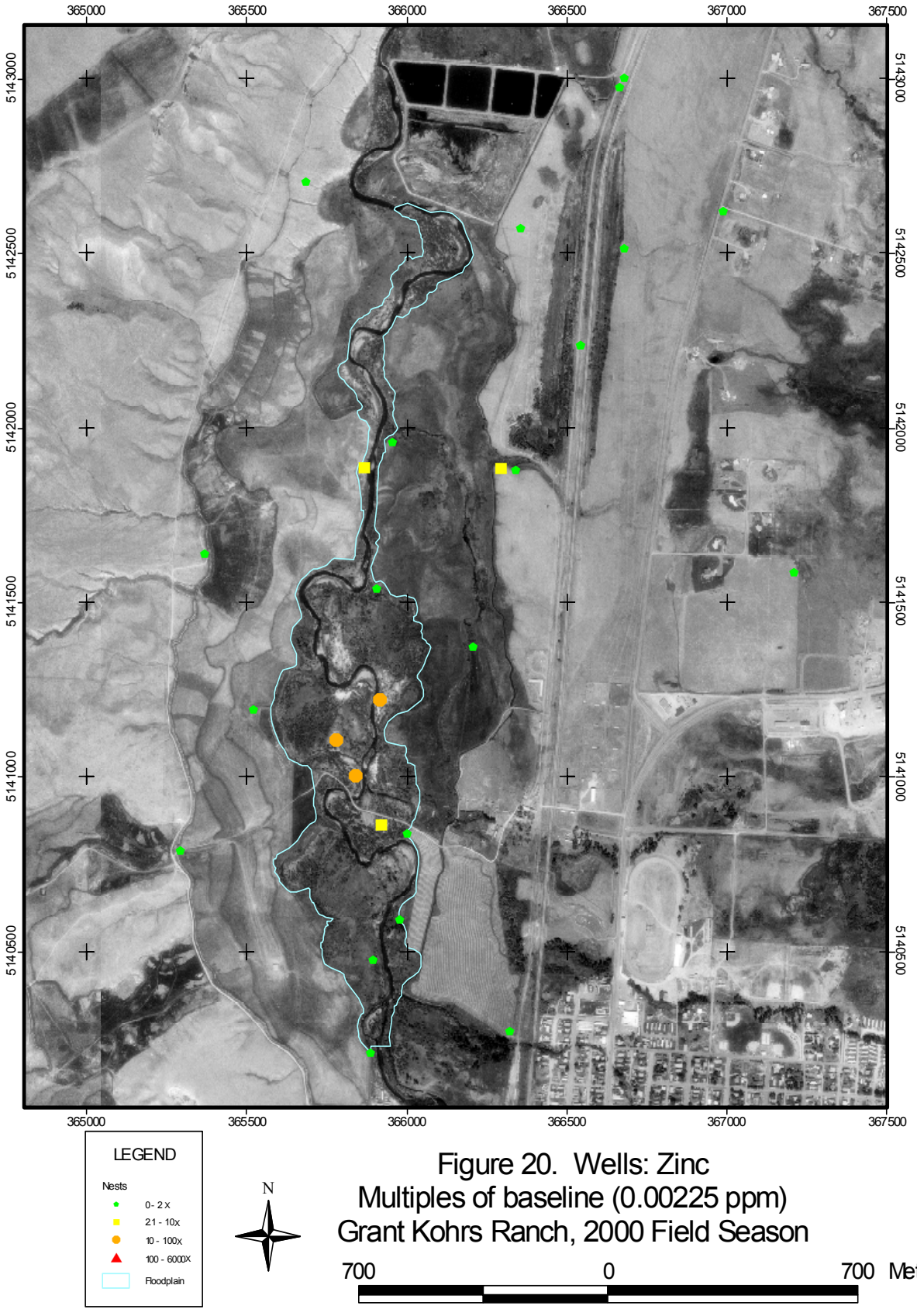


Figure 20. Wells: Zinc
Multiples of baseline (0.00225 ppm)
Grant Kohrs Ranch, 2000 Field Season

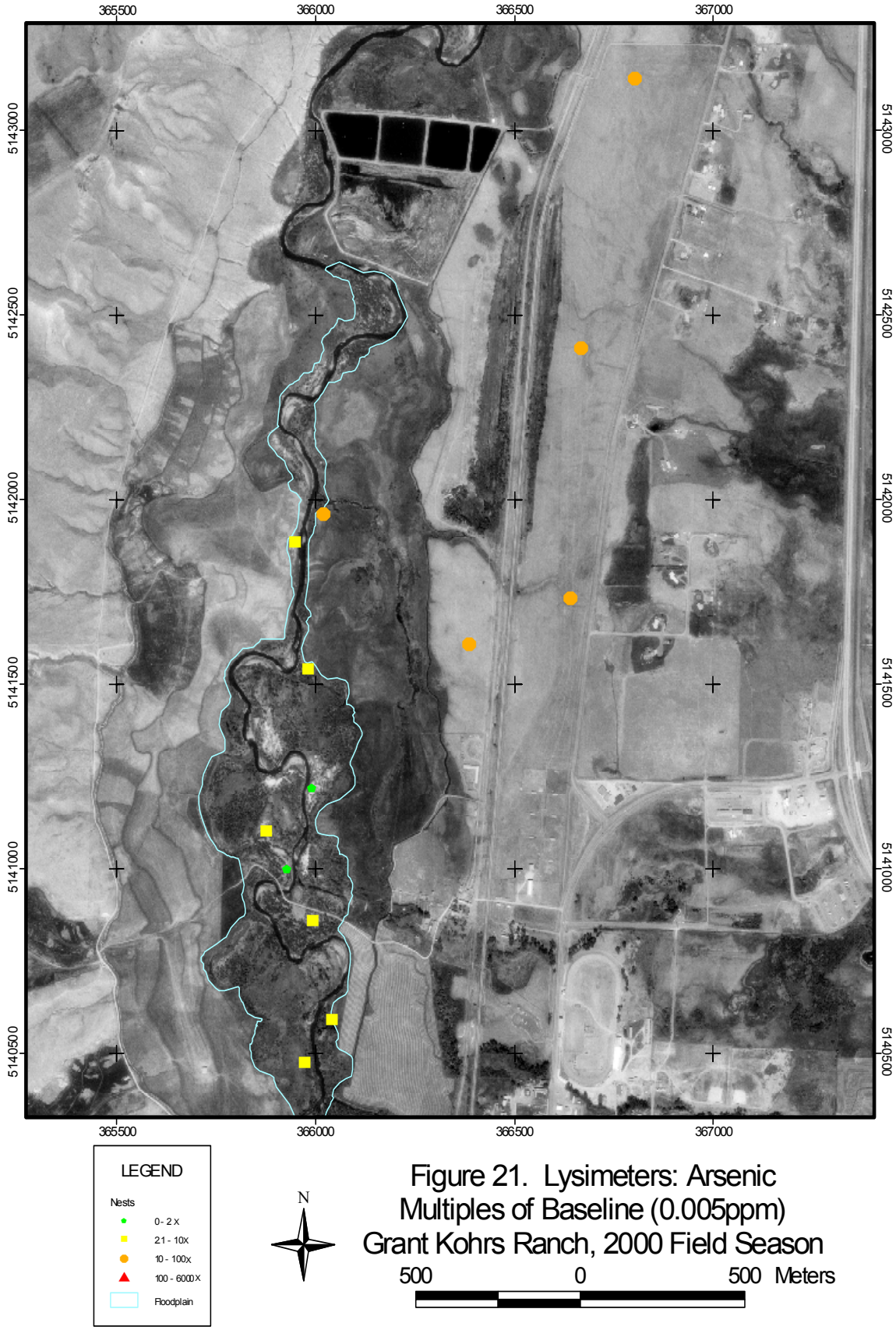


Figure 21. Lysimeters: Arsenic Multiples of Baseline (0.005ppm) Grant Kohrs Ranch, 2000 Field Season

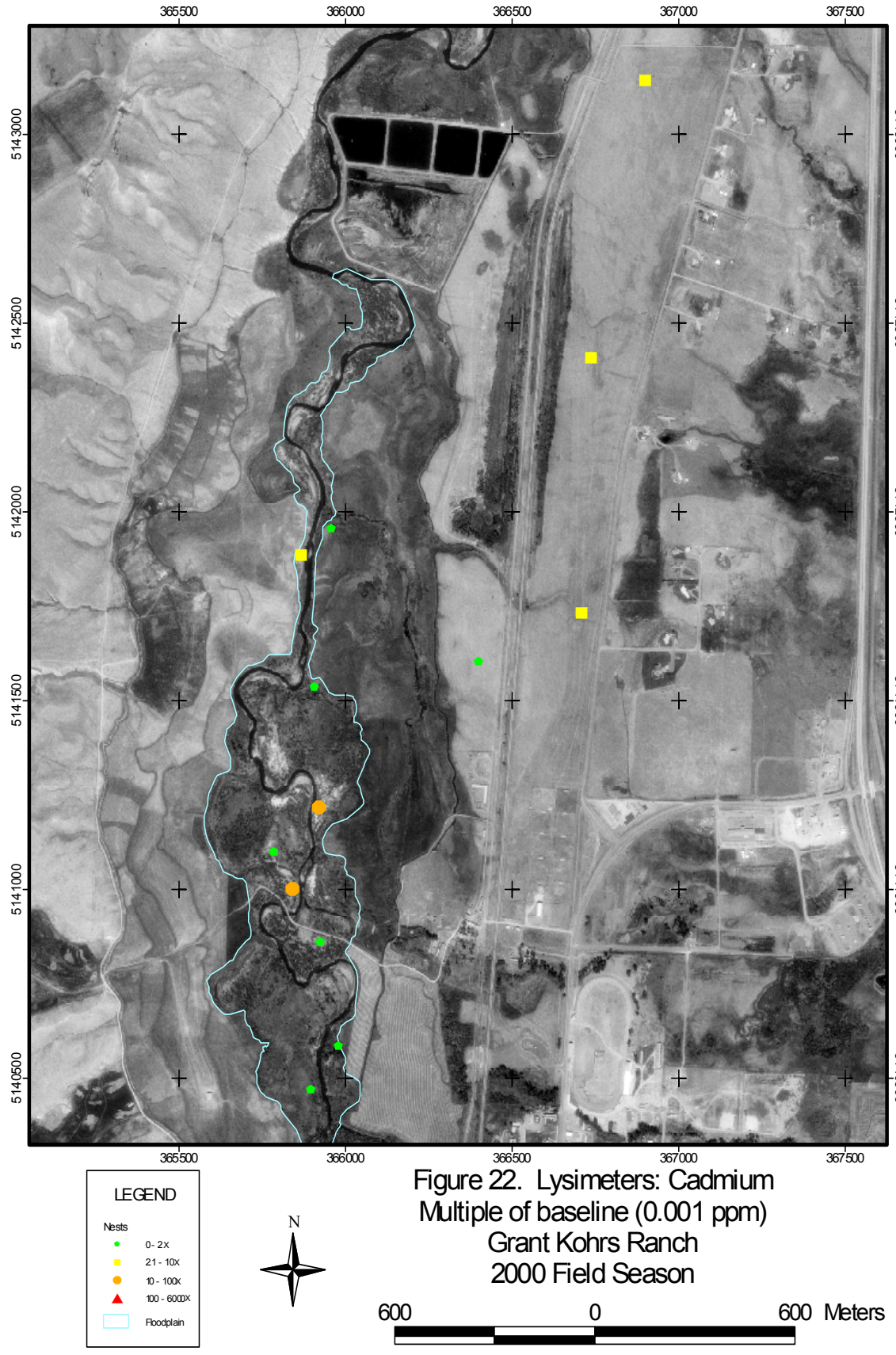


Figure 22. Lysimeters: Cadmium Multiple of baseline (0.001 ppm) Grant Kohrs Ranch 2000 Field Season

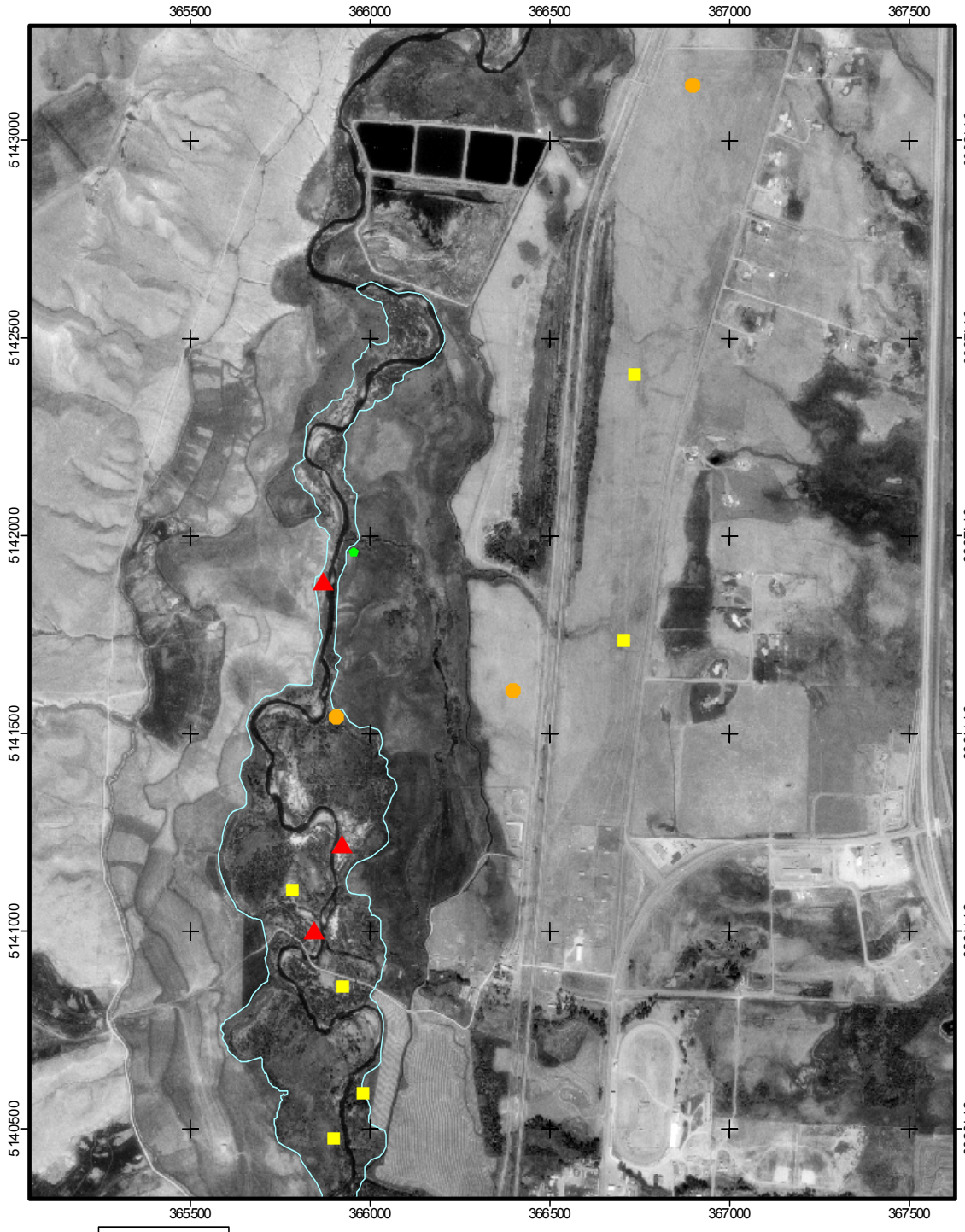


Figure 23. Lysimeters: Copper Multiples of baseline (0.003 ppm) Grant Kohrs Ranch, 2000 Field Season

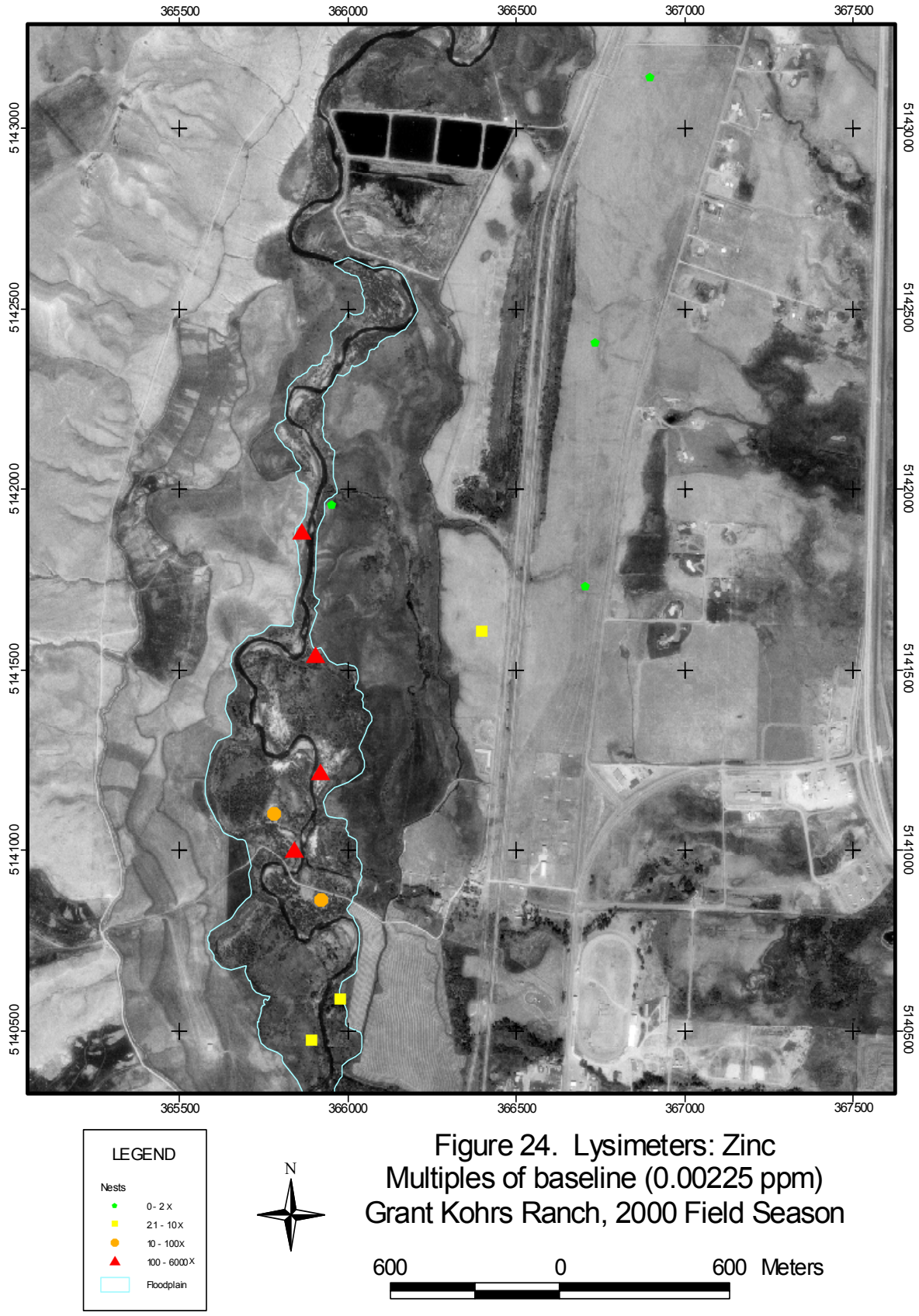


Figure 24. Lysimeters: Zinc
Multiples of baseline (0.00225 ppm)
Grant Kohrs Ranch, 2000 Field Season

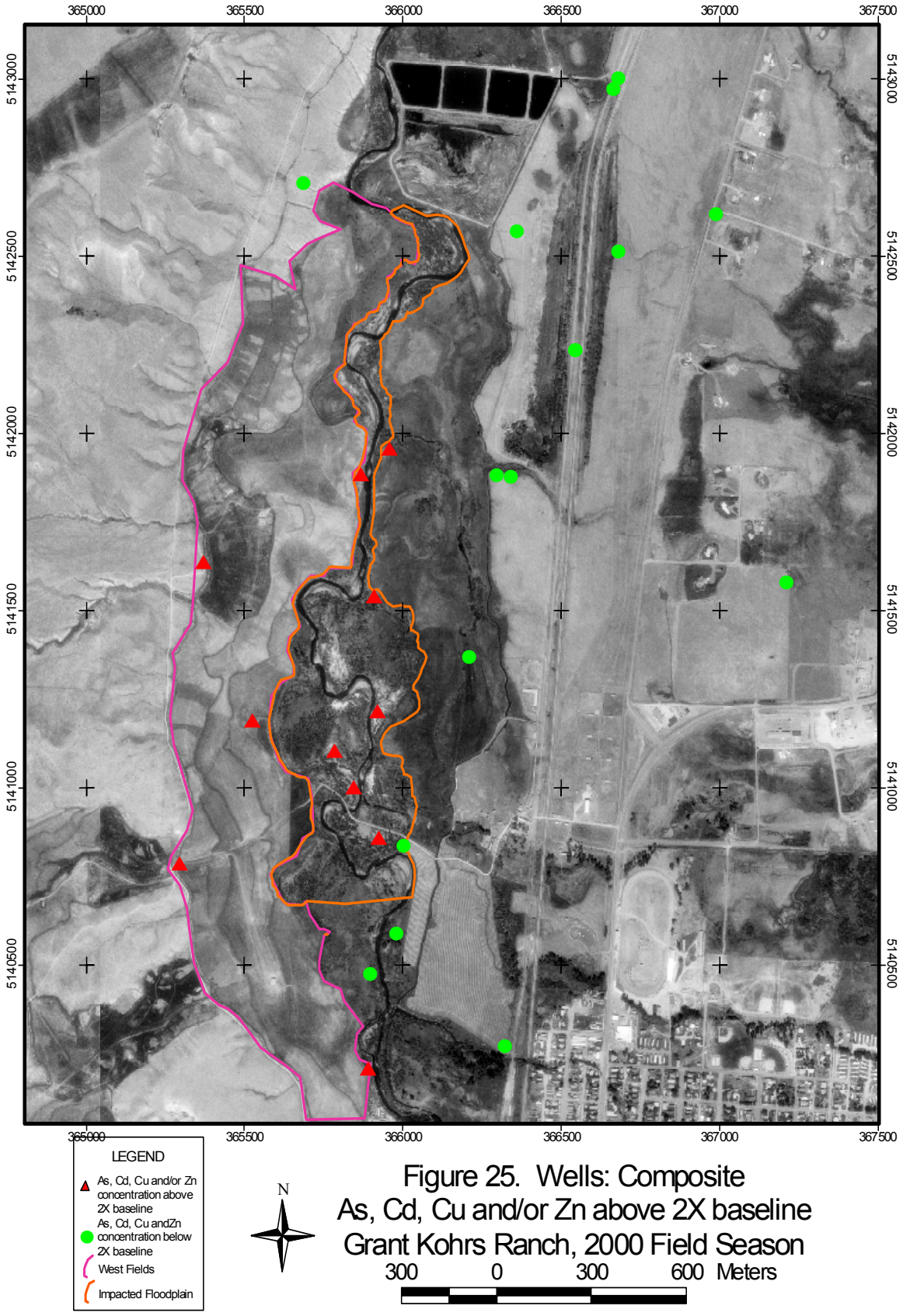


Figure 25. Wells: Composite As, Cd, Cu and/or Zn above 2X baseline Grant Kohrs Ranch, 2000 Field Season

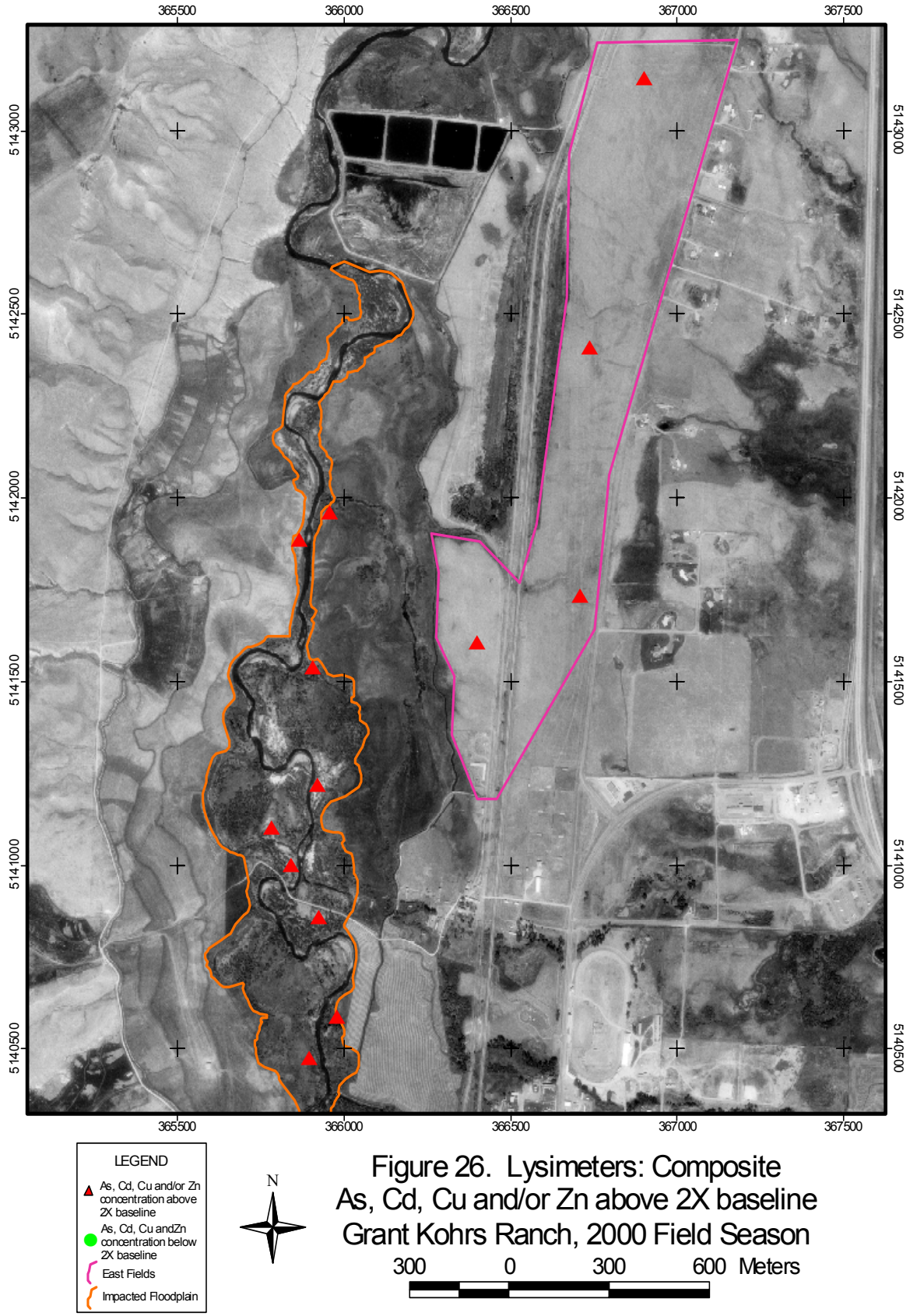


Figure 26. Lysimeters: Composite As, Cd, Cu and/or Zn above 2X baseline Grant Kohrs Ranch, 2000 Field Season

ii) Volume calculations

We chose to use a cutoff value of two times the baseline values for each of the elements as an indicator of soil water and groundwater injury. This value encompasses the variability of the data used in the baseline calculation. Volumes of contaminated groundwater and soil water resources were calculated as follows. Depths of contaminated groundwater for the floodplain and for the fields were determined both in the floodplain and in the field areas for lysimeters (soil pore water) and for wells (groundwater). Areas of contaminated water were determined both in the floodplain and in the field areas for lysimeters (soil pore water) and for wells (groundwater). Figures 17 through 20 show the floodplain boundary (designated by interpreting geomorphology of the area). Finally, using the calculated depths and areas, volumes were calculated using standard porosity and soil moisture values.

The area of contaminated groundwater was determined using a composite map showing a red triangle for sites where one or more median concentrations exceeded two times the baseline (see Figure 25). Wells in the floodplain were contaminated with the exception of the southernmost two wells (GKM 1 and GKM 6). Figure 25 highlights the contaminated floodplain area. Wells in the east fields were not contaminated but wells in the west fields were contaminated (see Figure 25). Lysimeters in the floodplain all were contaminated so the entire area of the floodplain was used for soil water calculations (see Figure 26). All of the east fields also showed contaminated lysimeters (see Figure 26). No soil water data were collected for the west fields.

Areas contaminated by arsenic were also calculated. Areas in which soil water and groundwater fell above the arsenic drinking water standard (10 ppb) were determined in the same manner as the composite impact areas. Areas contaminated by having As concentrations greater than 10 ppb were determined for soil water (Figure 27) and groundwater (Figure 28).

To determine the depths of contaminated groundwater, depth values were normalized relative to the water table (see Figures 29 and 30). For multi-level piezometers, the depth below the water table was calculated by subtracting the water level from the sampling port depth (see Figure 31).

Depths were then plotted against the elevation above background (multiple of baseline) for As, Cd, Cu and Zn together. The maximum depth at which any one of As, Cd, Cu or Zn was greater than two times the baseline was considered depth of contaminated water. Data were plotted separately for wells and lysimeters and were split by location -- floodplain, east fields and west fields. Well depths were plotted against values representing multiples of baseline concentrations for As, Cd, Cu and Zn in Figure 32. Lysimeter depths were plotted against values representing multiples of baselines for As, Cd, Cu and Zn in Figure 33.

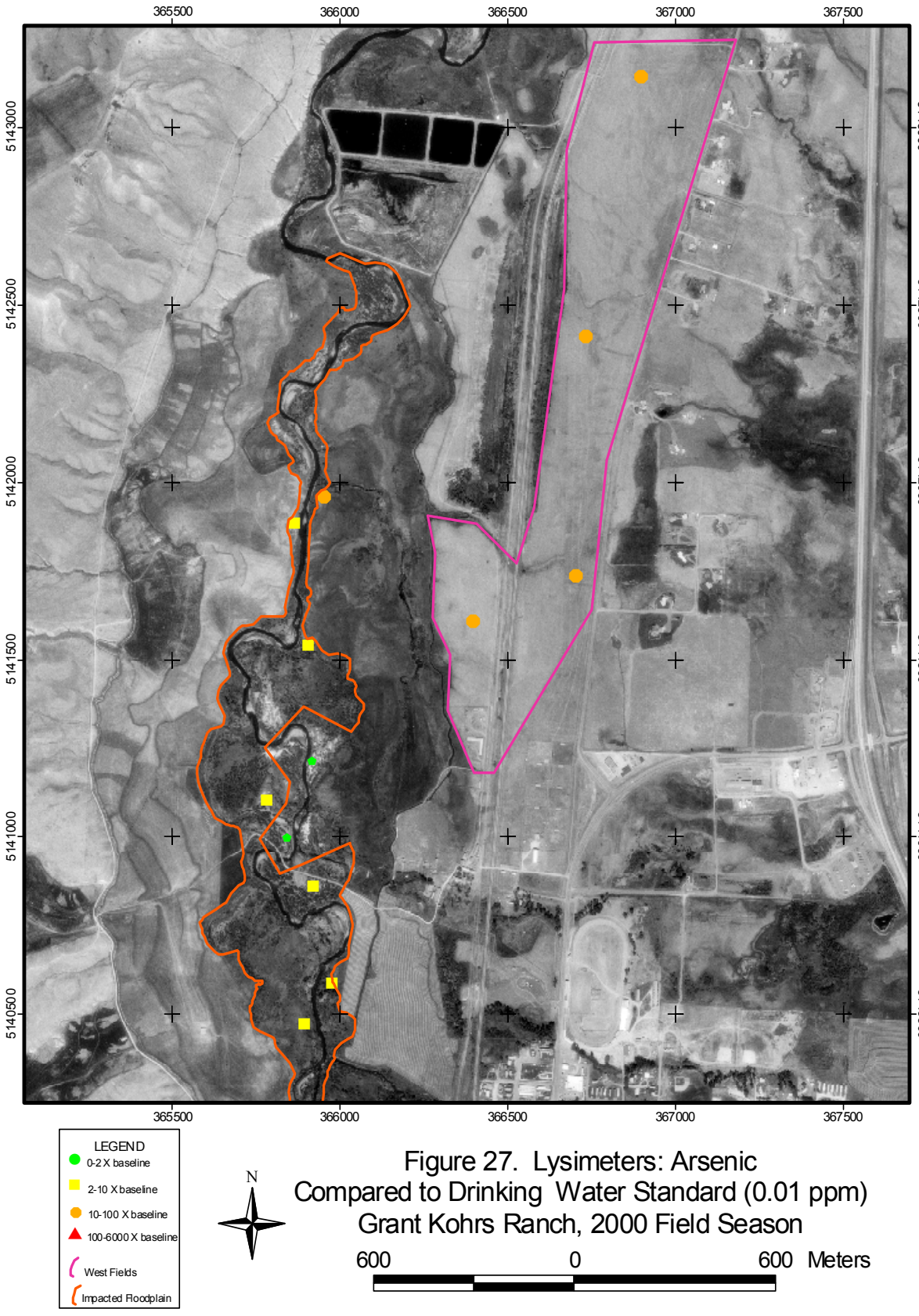


Figure 27. Lysimeters: Arsenic Compared to Drinking Water Standard (0.01 ppm) Grant Kohrs Ranch, 2000 Field Season

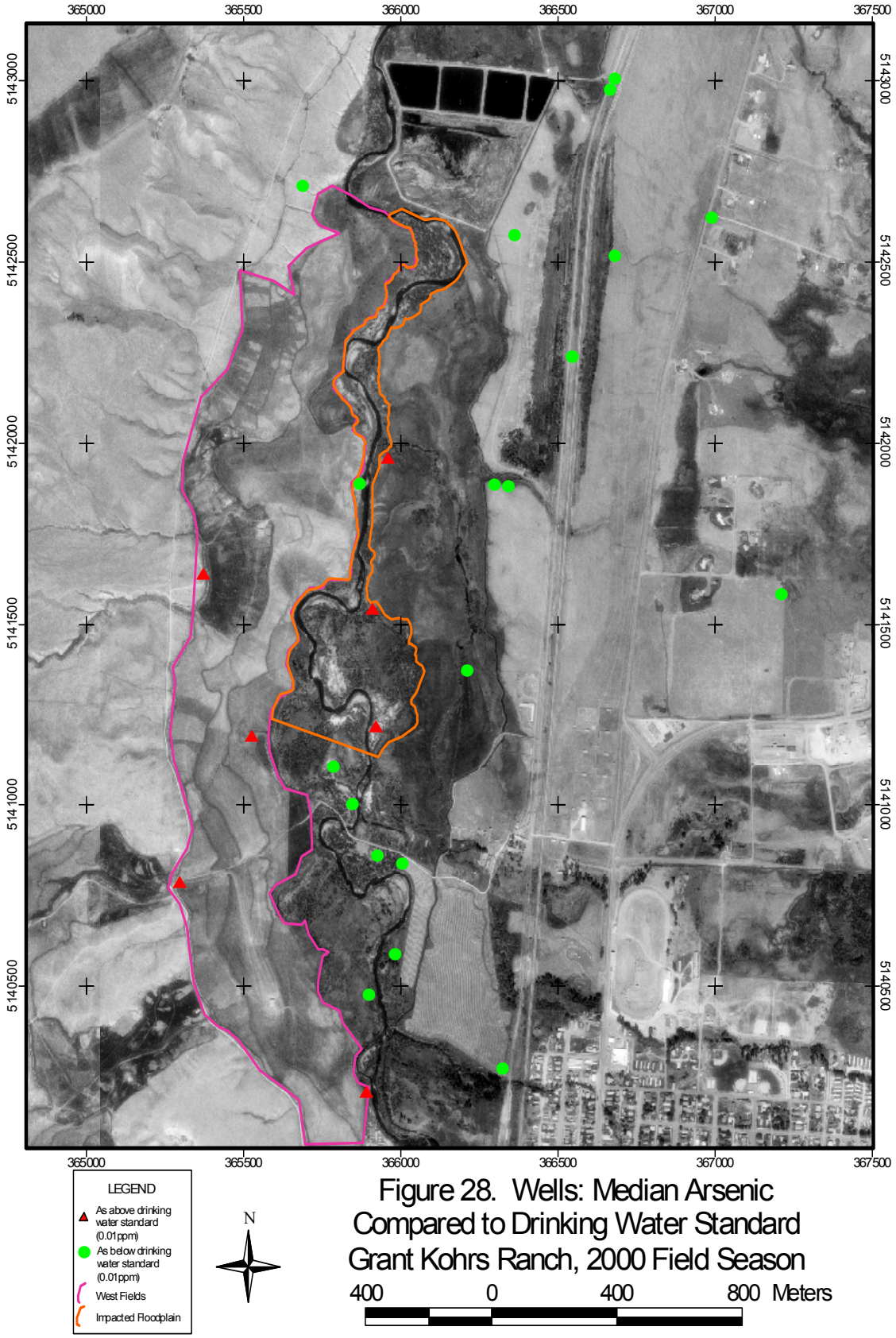
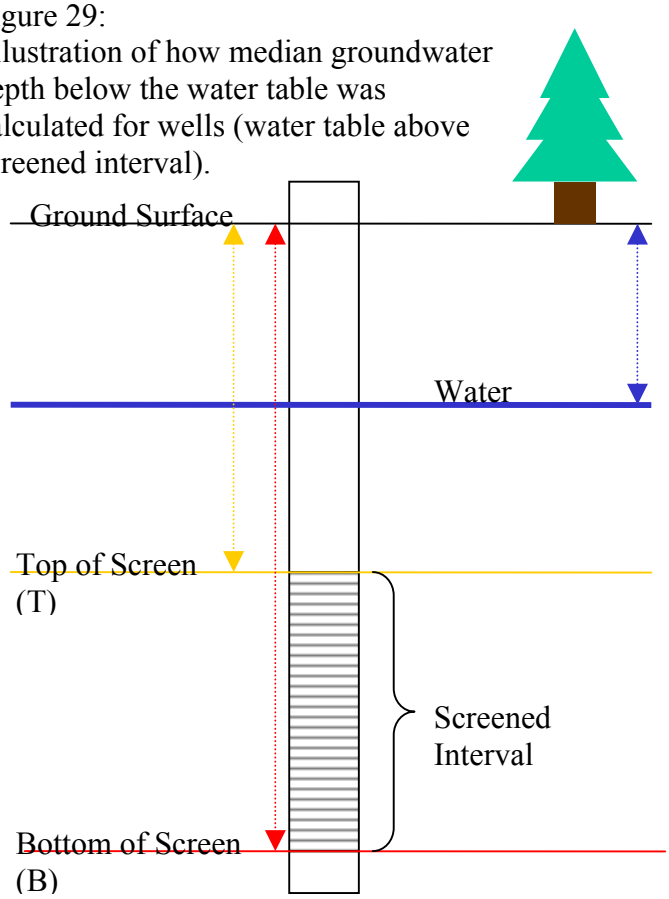


Figure 28. Wells: Median Arsenic Compared to Drinking Water Standard Grant Kohrs Ranch, 2000 Field Season

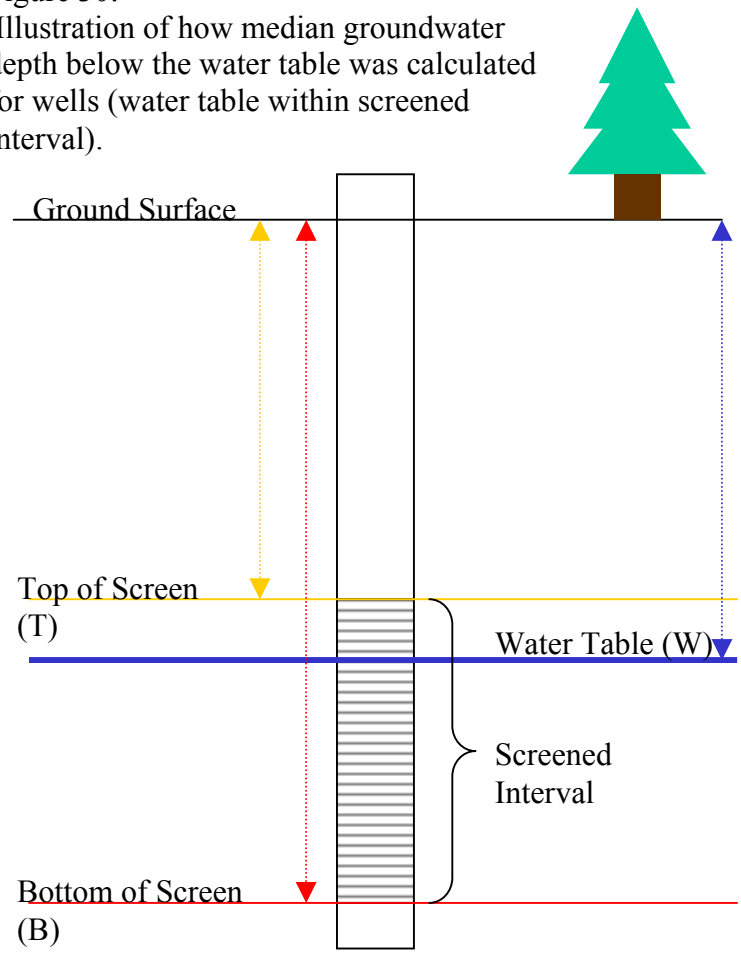
Figure 29:
Illustration of how median groundwater depth below the water table was calculated for wells (water table above screened interval).



Depth Below Ground Surface (X) =(T+((B-T)/2))

Depth Below Water Table = X-W

Figure 30:
Illustration of how median groundwater depth below the water table was calculated for wells (water table within screened interval).



Depth Below Ground Surface (X) =(W+((B-W)/2))

Depth Below Water Table = X-W

Figure 31:
Illustration of how groundwater depth below the water table was calculated for multilevel piezometers.

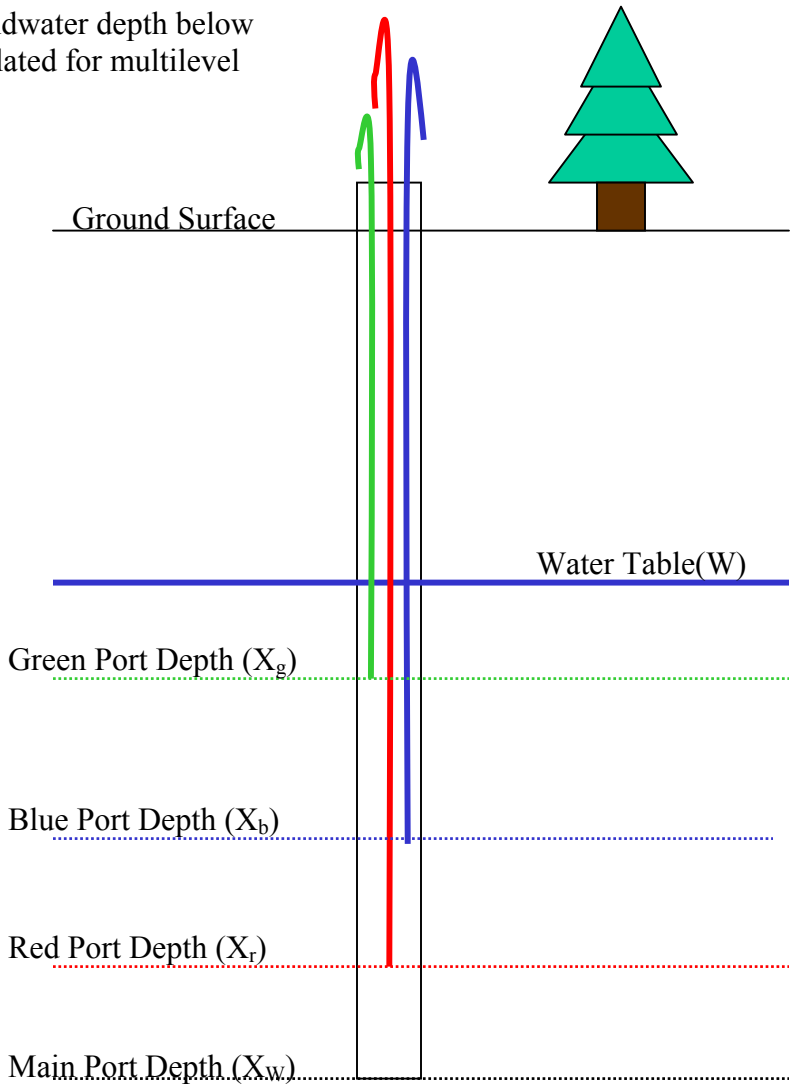


Figure 32 Well Depths vs. Multiples of Baseline

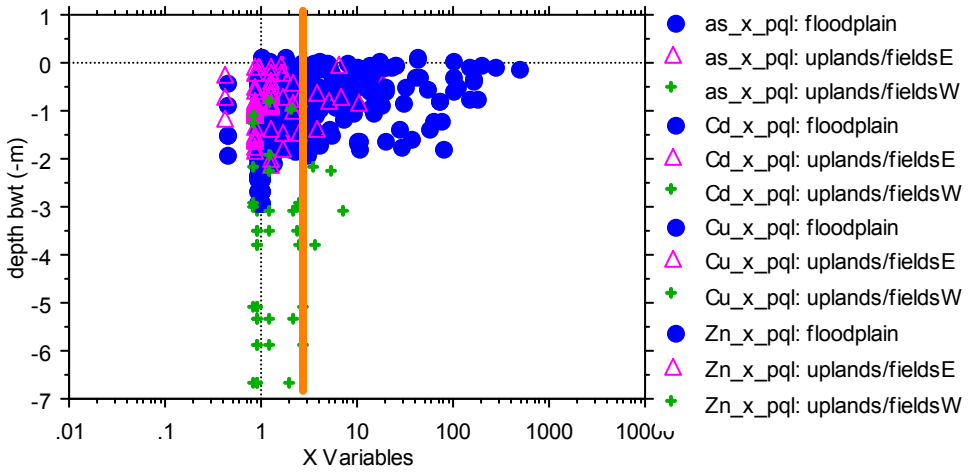
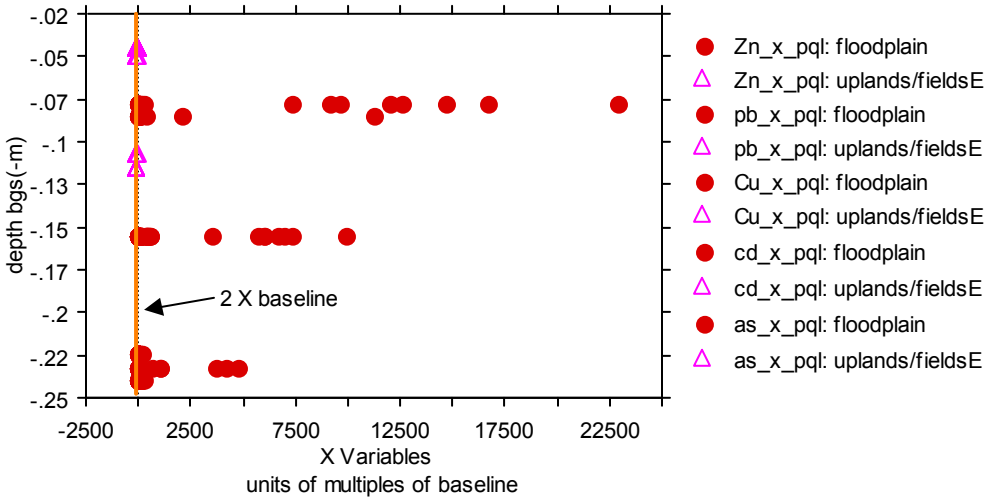


Figure 33 Lysimeter Depths vs Multiples of Baseline



Volumes of contaminated soil water were calculated assuming a soil moisture value of 5%. Specific yield of the groundwater system was assumed to be 20%. Volumes are summarized below in Tables 11-15. All volumes have two significant figures; the rest of the zeros are placeholders.

Table 11

Soil Water: Composite Impact				
(lysimeters)	*Floodplain*	*East Fields*	*West Fields*	*Total*
depth (m)	0.24	0.12	--	--
area (m^2)	544,000	648,000	--	--
volume (m^3)	6,530	3,760	--	10,300
* Depth is measured below the ground surface.				

Table 12

Groundwater: Composite Impact				
(wells/multi-levels)	*Floodplain*	*East Fields*	*West Fields*	*Total*
depth* (m)	1.93	--	6.7	--
area (m^2)	462,000	--	989,000	--
volume (m^3)	174,000	--	1,330,000	1,500,000
** Depth is measured below the water table (to middle of screened interval).*				

Table 13

Soil Water: Arsenic Impact (relative to drinking water standard, 10 ppb)				
(lysimeters)	*Floodplain*	*East Fields*	*West Fields*	*Total*
depth (m)	0.24	0.12	--	--
area (m^2)	466,000	648,000	--	--
volume (m^3)	5,590	3,760	--	9,350
* Depth is measured below the ground surface.				

Table 14

Groundwater: As Impact (relative to drinking water standard, 10 ppb)				
(wells/multi-levels)	*Floodplain*	*East Fields*	*West Fields*	*Total*
depth (m)*	1.93	--	6.7	--
area (m^2)	266,000	--	989,000	--
volume (m^3)	103,000	--	1,330,000	1,430,000
* Depth is measured below the water table (to middle of screened interval).				

5) References Cited

Standard Operating Procedures Manual

EPA Method 200.7

EPA Method 200.15

EPA Method 300.0

Moore, J. N., and S. N. Luoma, 1990, Hazardous wastes from large-scale metal extraction: Environmental Science and Technology, v. 24, no. 9, p. 1278-1285.

Smith, J. D., J. H. Lambing, D. A. Nimick, C. Parrett, M. Ramey, and W. Schafer, 1998, Geomorphology , flood-plain tailings and metal transport in the upper Clark Fork Valley, Montana: USGS Water-Resources Investigations Report 98-4170, 56 pp.

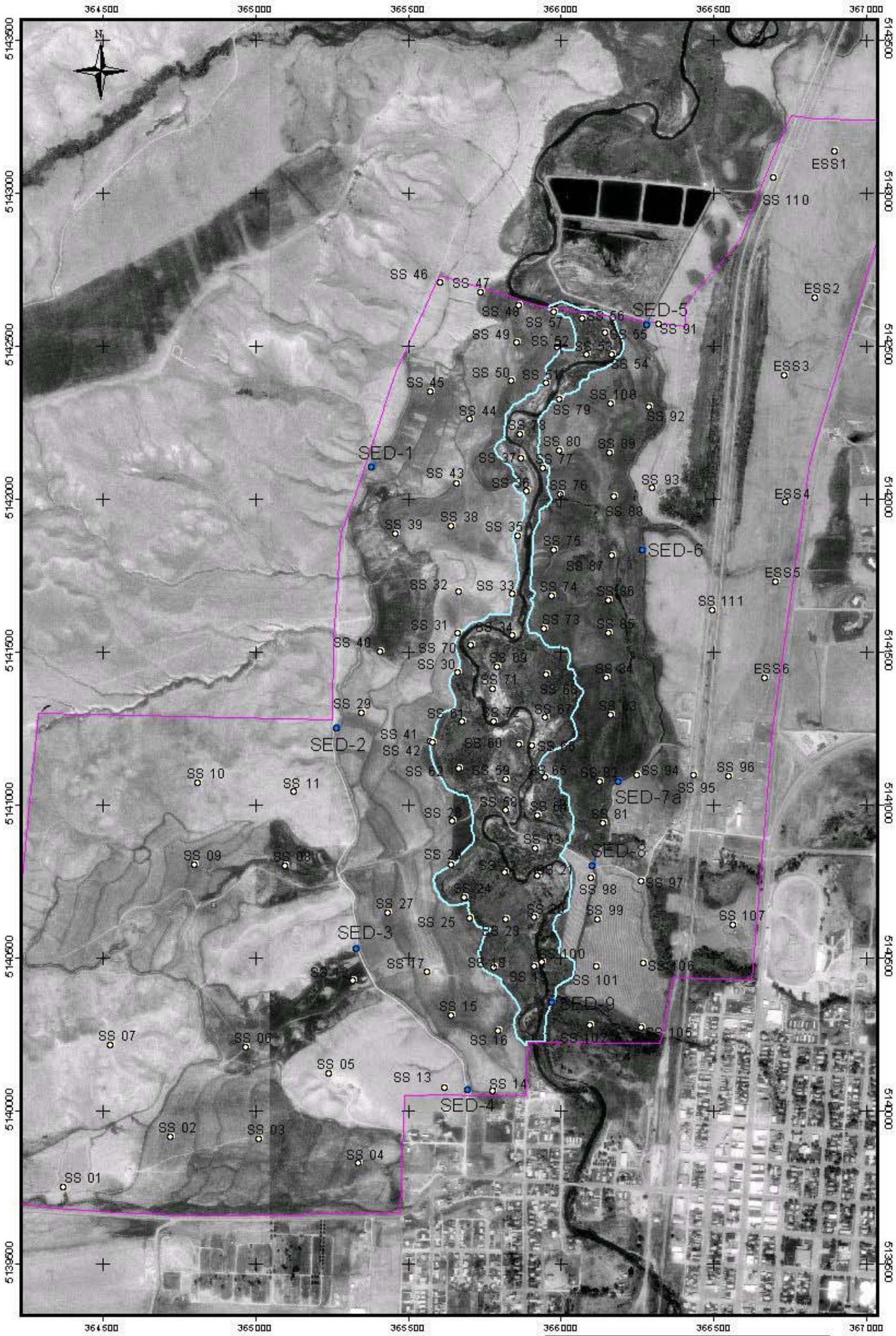


Plate 1. Surface Soil Sample and Ditch Sediment Site Locations

200 0 200 400 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)

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LEGEND

- Surface Soils (12 in/30.5 cm)
- Ditch Sediments (<63 um size)
- Floodplain
- Study boundary

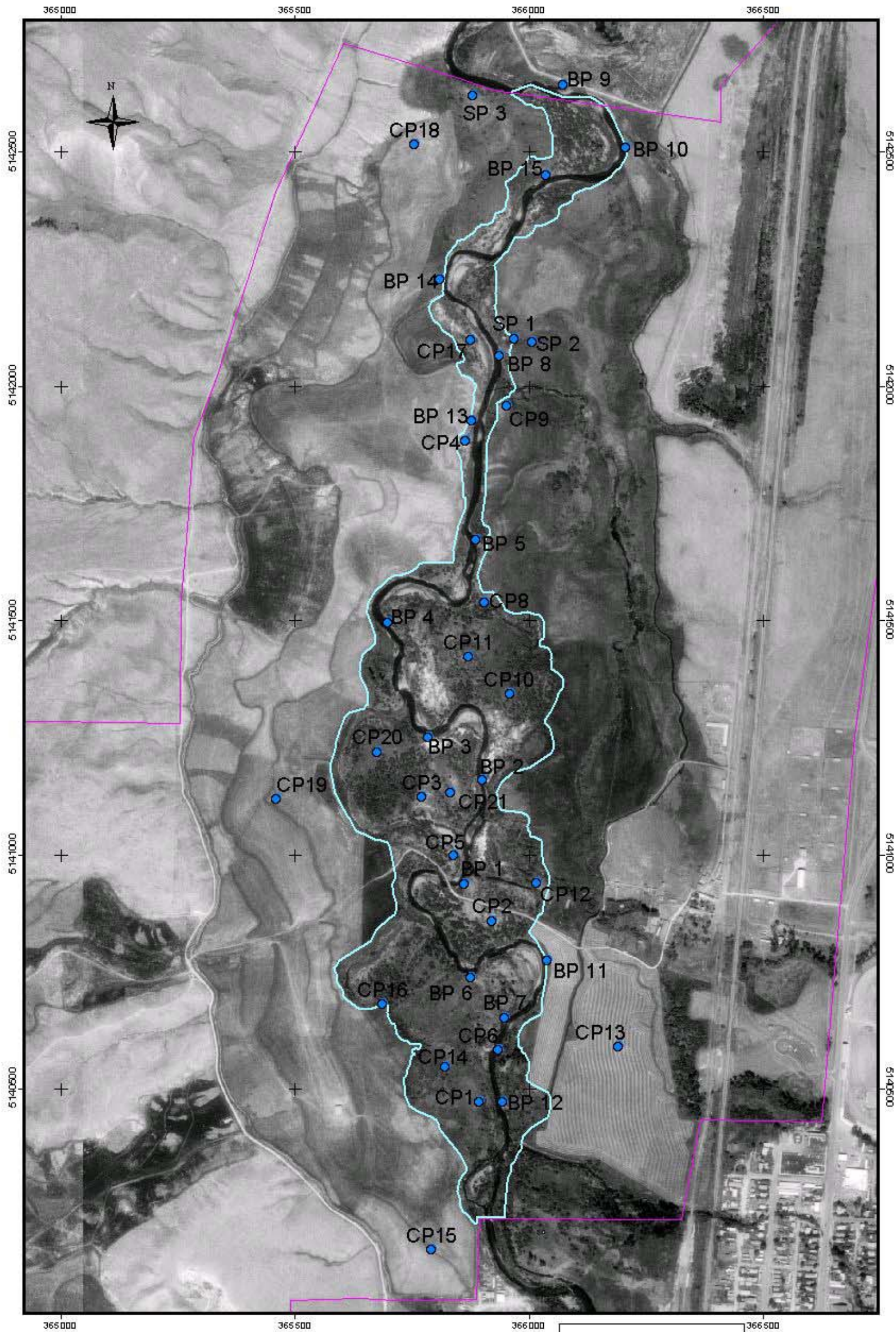


Plate 2. Profile Site Locations

100 0 100 200 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)

Geologic, Soil Water, and Groundwater Report-2000

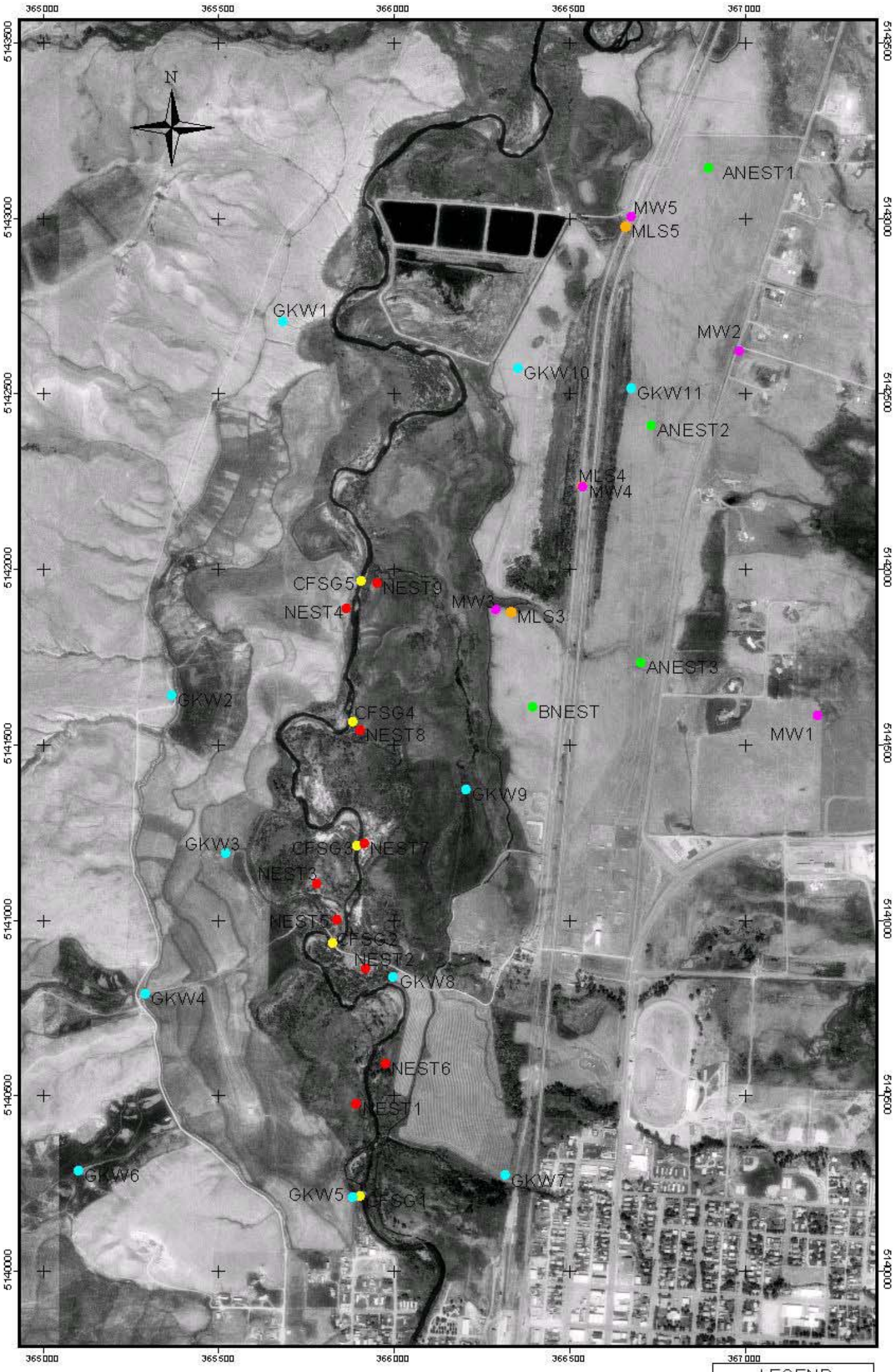


Plate 3. Groundwater and Soil Water Site Locations

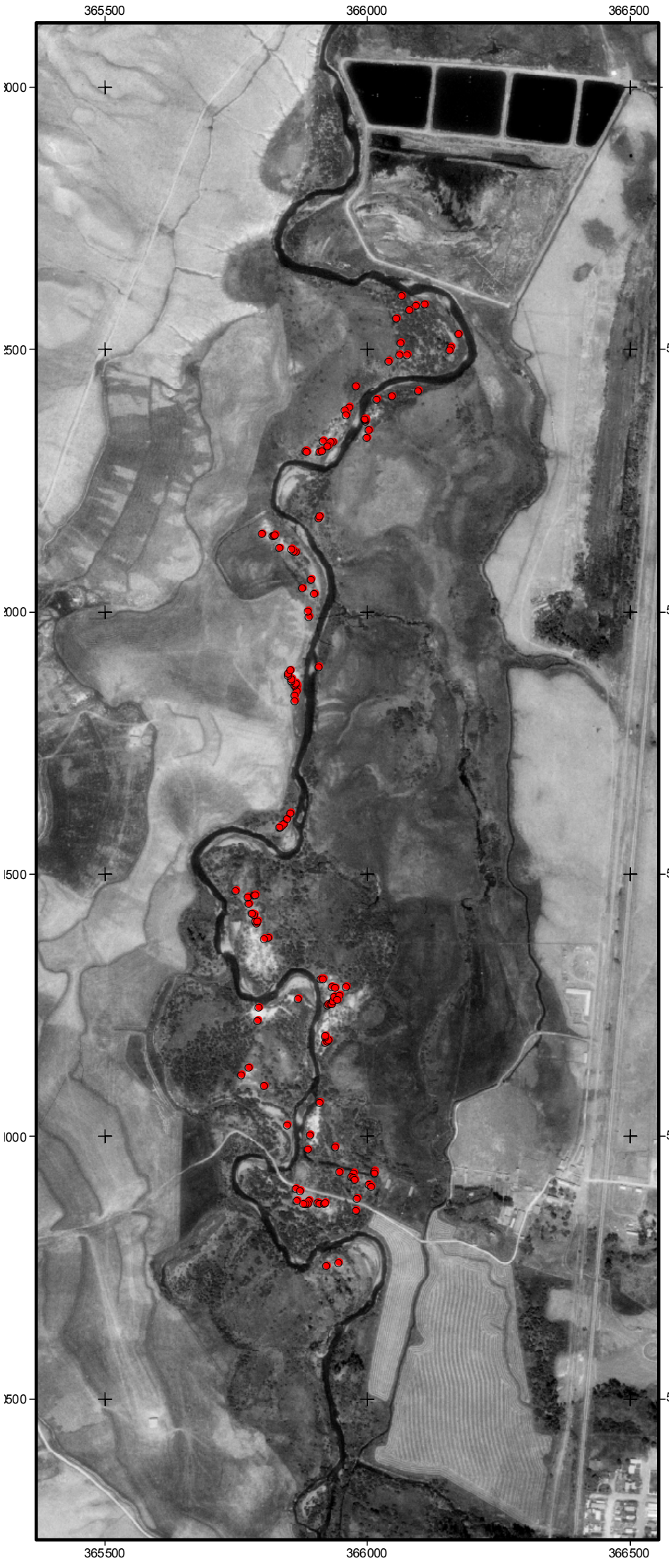


Plate 4.
Unvegetated Tailings

N

LEGEND

Mostly small areas of unvegetated tailings and areas of tailings among dense cover mapped by geologists with GPS.

80 0 80 160 Meters

UTM 12 North, NAD 1983, HPGN (Idaho/ Montana)

Geologic, Soil Water and Groundwater Injury Report

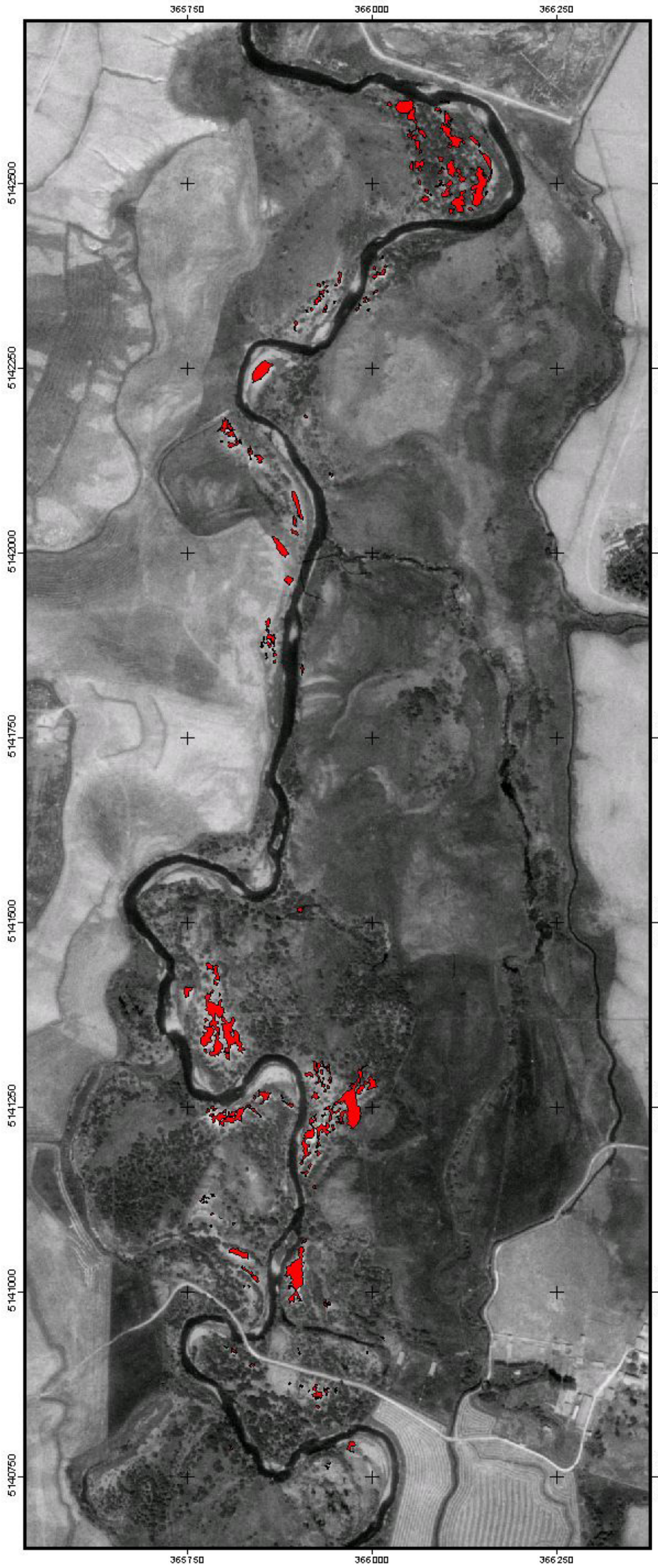


Plate 5.
Unvegetated Tailings

N

LEGEND

Large areas of unvegetated tailings mapped by geologists with GPS

60 0 60 120 Meters

UTM 12 North, NAD 1983, HPGN (Idaho/ Montana)

Geologic, Soil Water, and Groundwater Report-2000

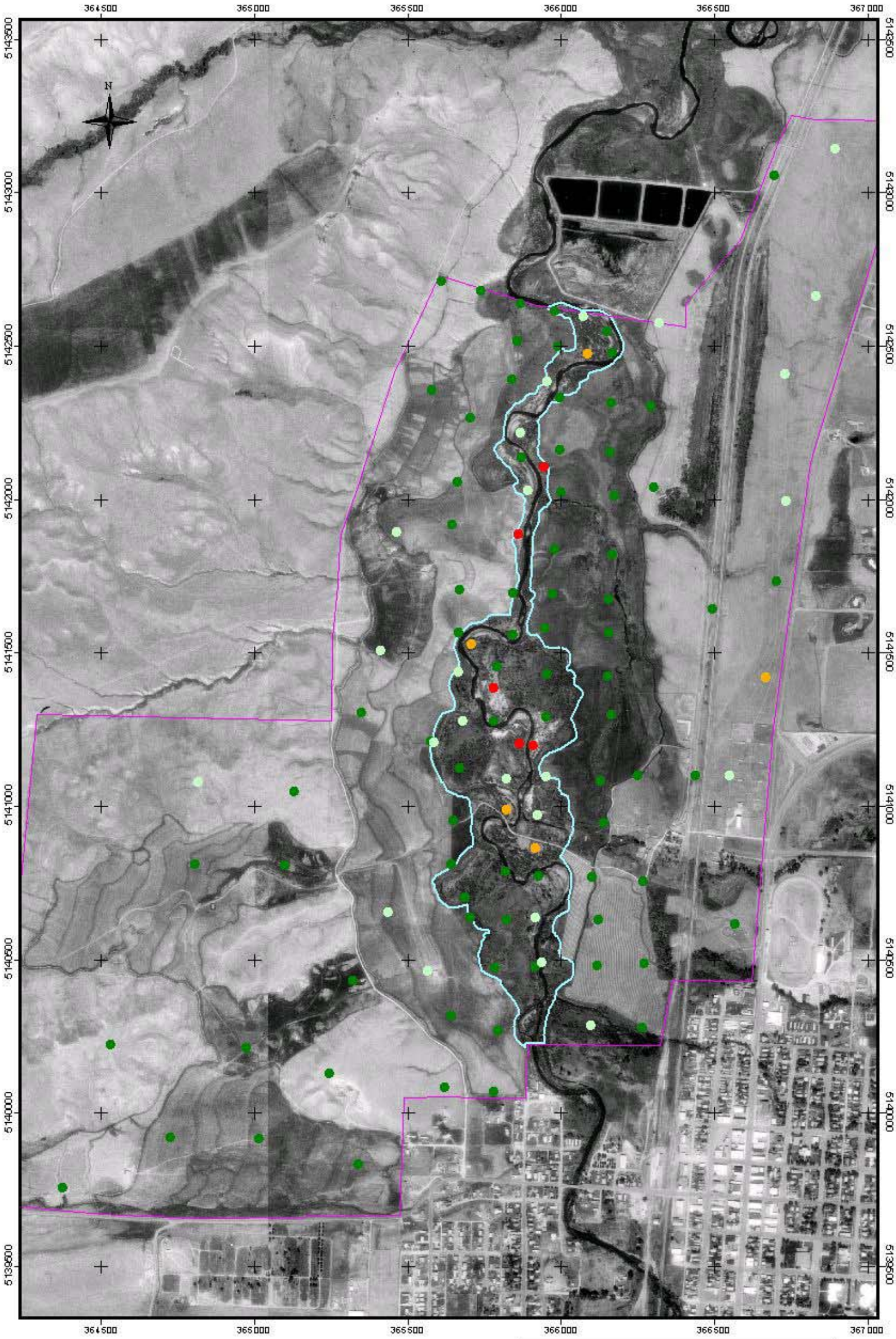


Plate 6. pH: Surface Soil Samples

200 0 200 400 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)

Geologic, Soil Water, and Groundwater Report-2000

LEGEND

- pH
  - 7 - 8.8
  - 6 - 7
  - 5 - 6
  - 4.3 - 5
- Floodplain
- Study boundary

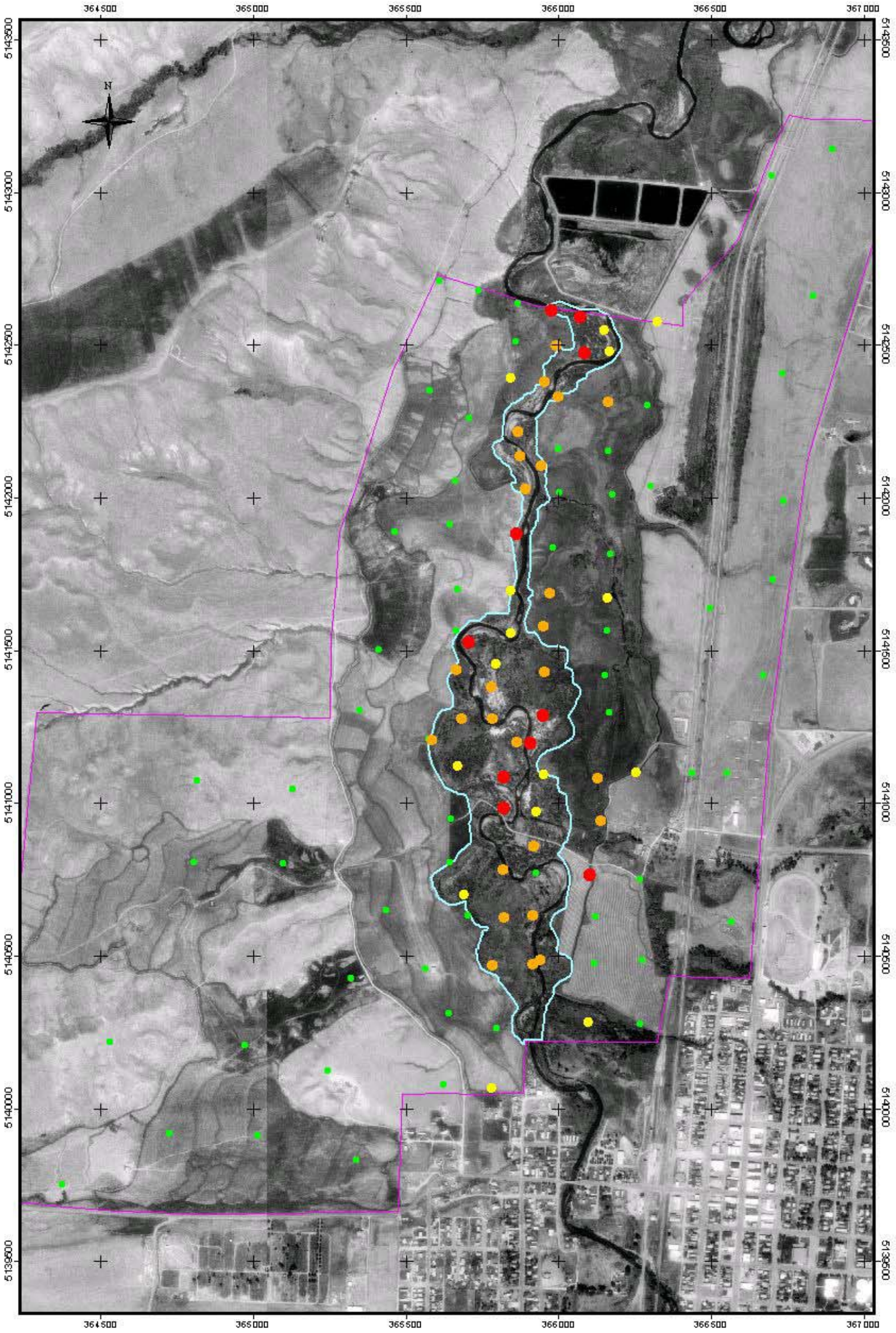


Plate 7. Arsenic Concentrations

200 0 200 400 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)

Geologic, Soil Water, and Groundwater Report-2000

LEGEND

- 0 - 50 ppm
- 50 - 100 ppm
- 100 - 500 ppm
- 500 - 940 ppm
- Floodplain
- Study boundary

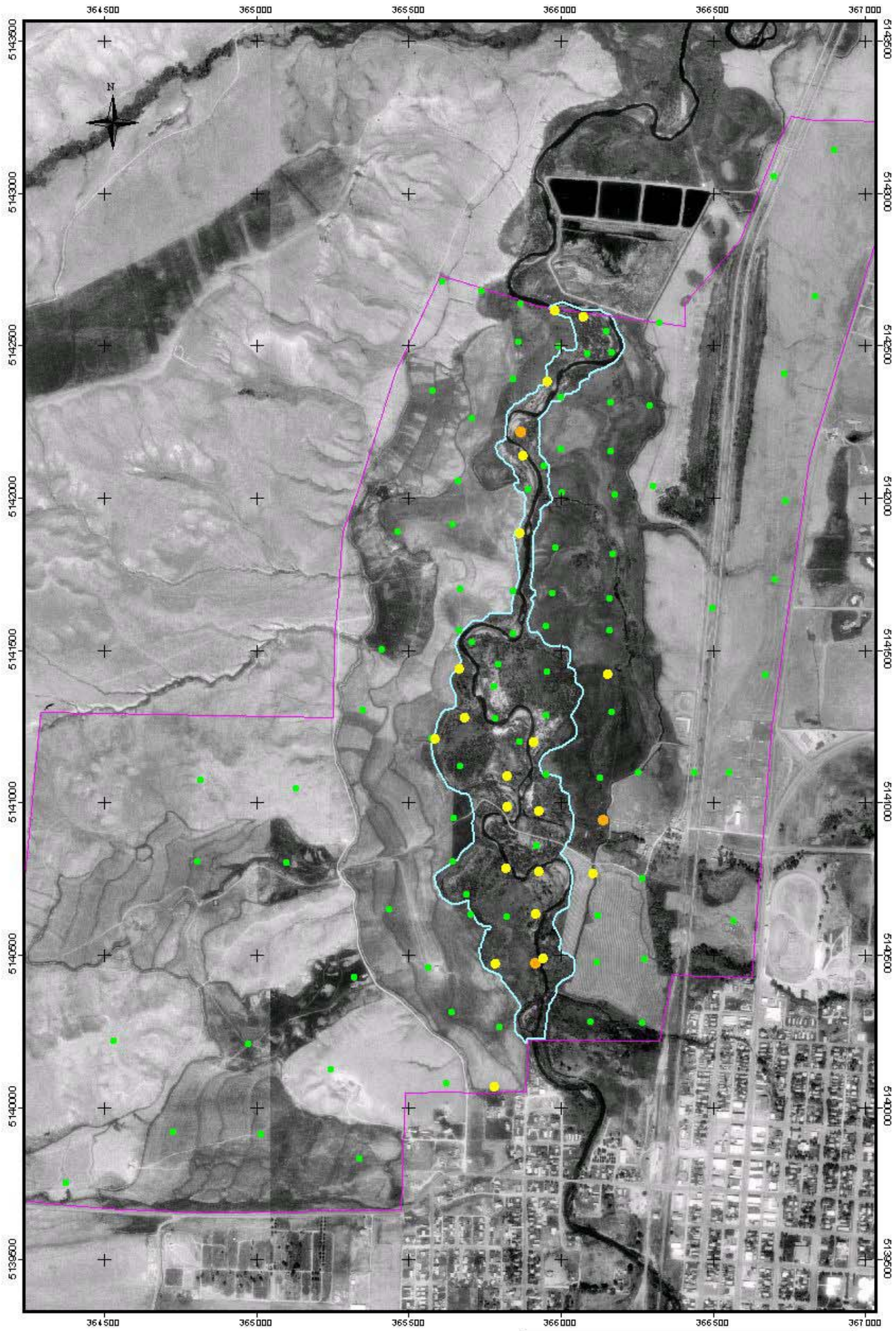


Plate 8. Cadmium Concentrations

200 0 200 400 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)
Geologic, Soil Water, and Groundwater Report-2000

LEGEND

- 0 - 1 ppm
- 5 - 10 ppm
- 10 - 12 ppm
- Floodplain
- Study boundary

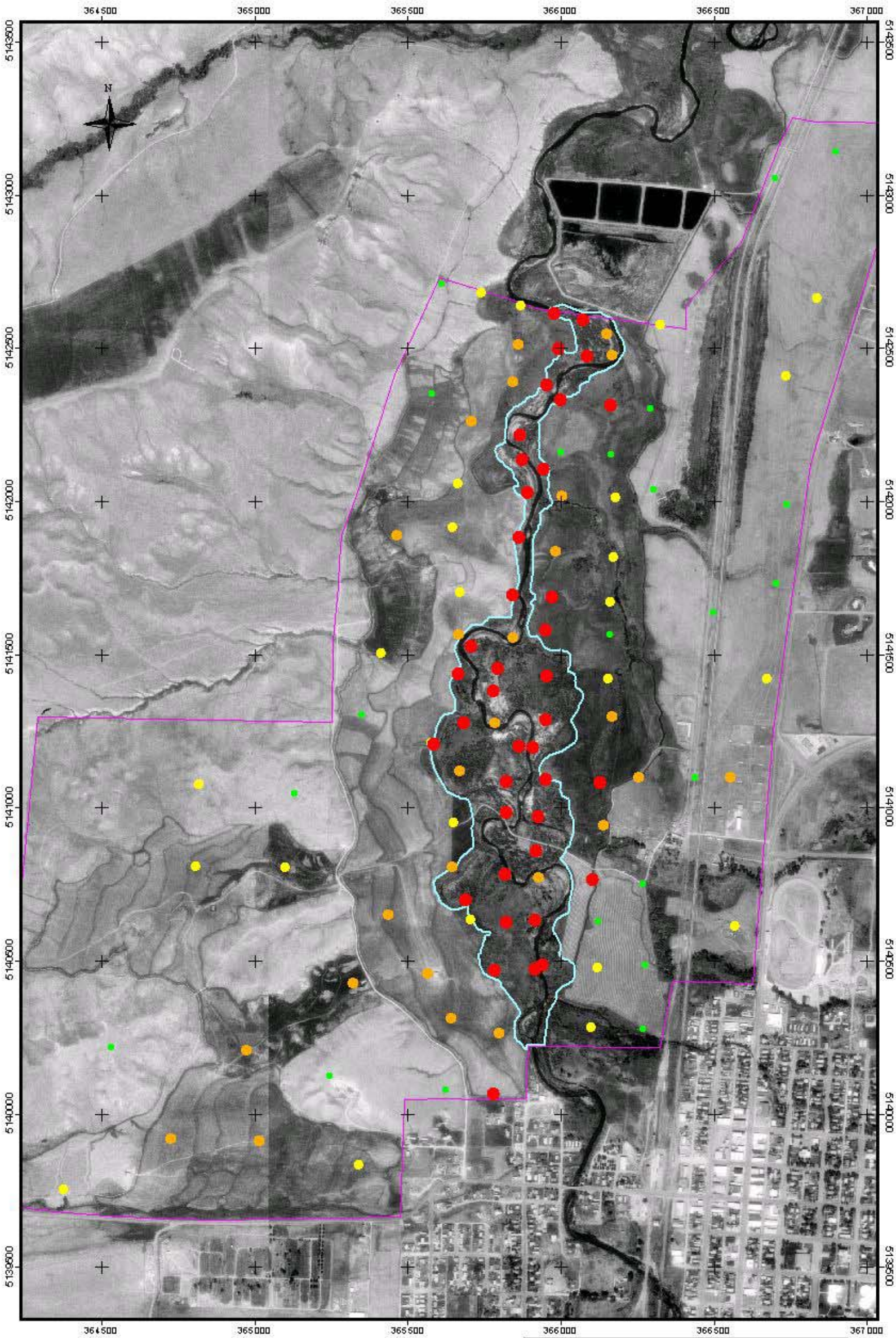


Plate 9. Copper Concentrations

200 0 200 400 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)

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LEGEND

- 0 - 80 ppm
- 80 - 160 ppm
- 160 - 800 ppm
- 800 - 8400 ppm
- Floodplain
- Study boundary

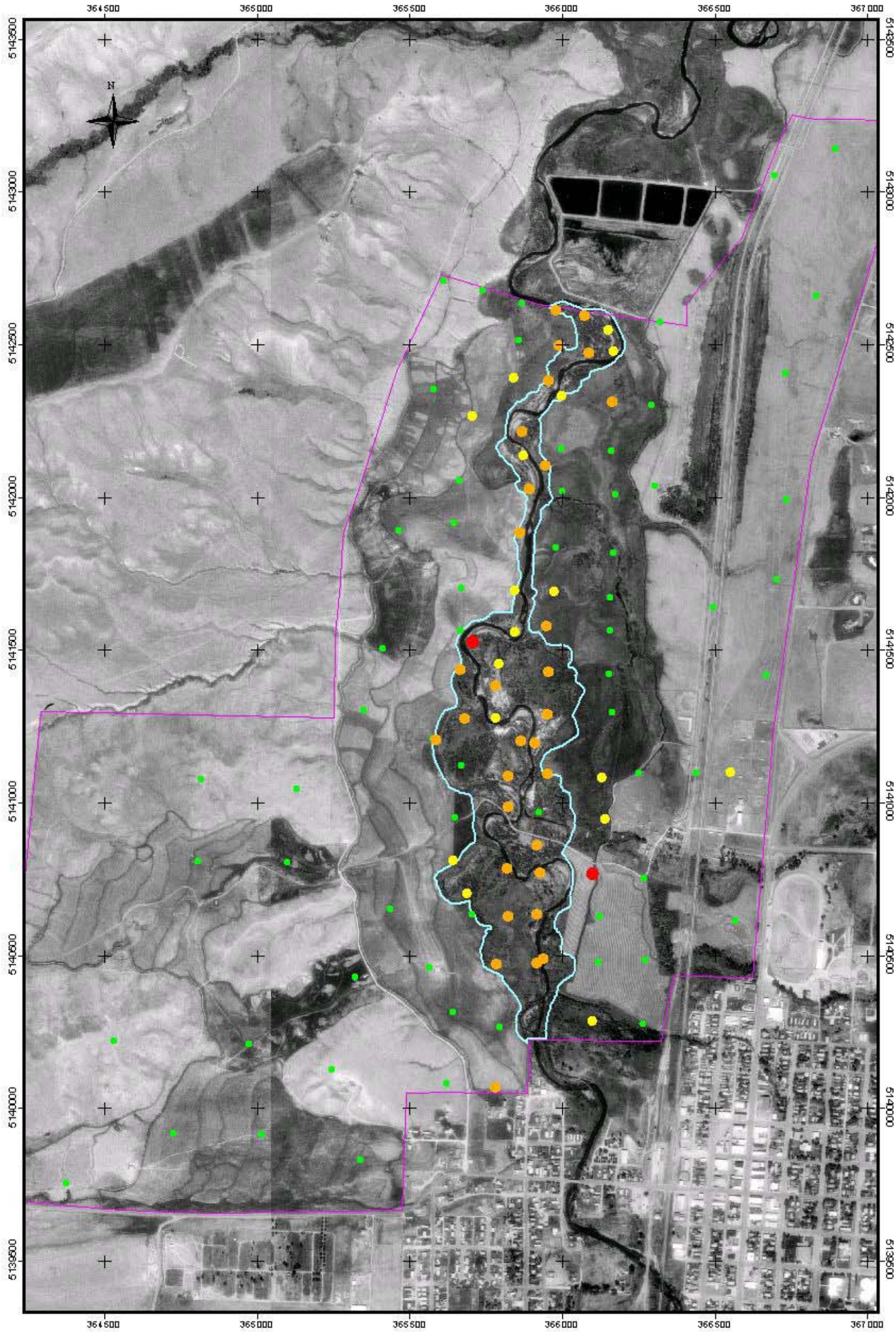


Plate 10. Lead Concentrations

200 0 200 400 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)

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LEGEND

- 0 - 85 ppm
- 85 - 170 ppm
- 170 - 850 ppm
- 850 - 920 ppm
- Floodplain
- Study boundary

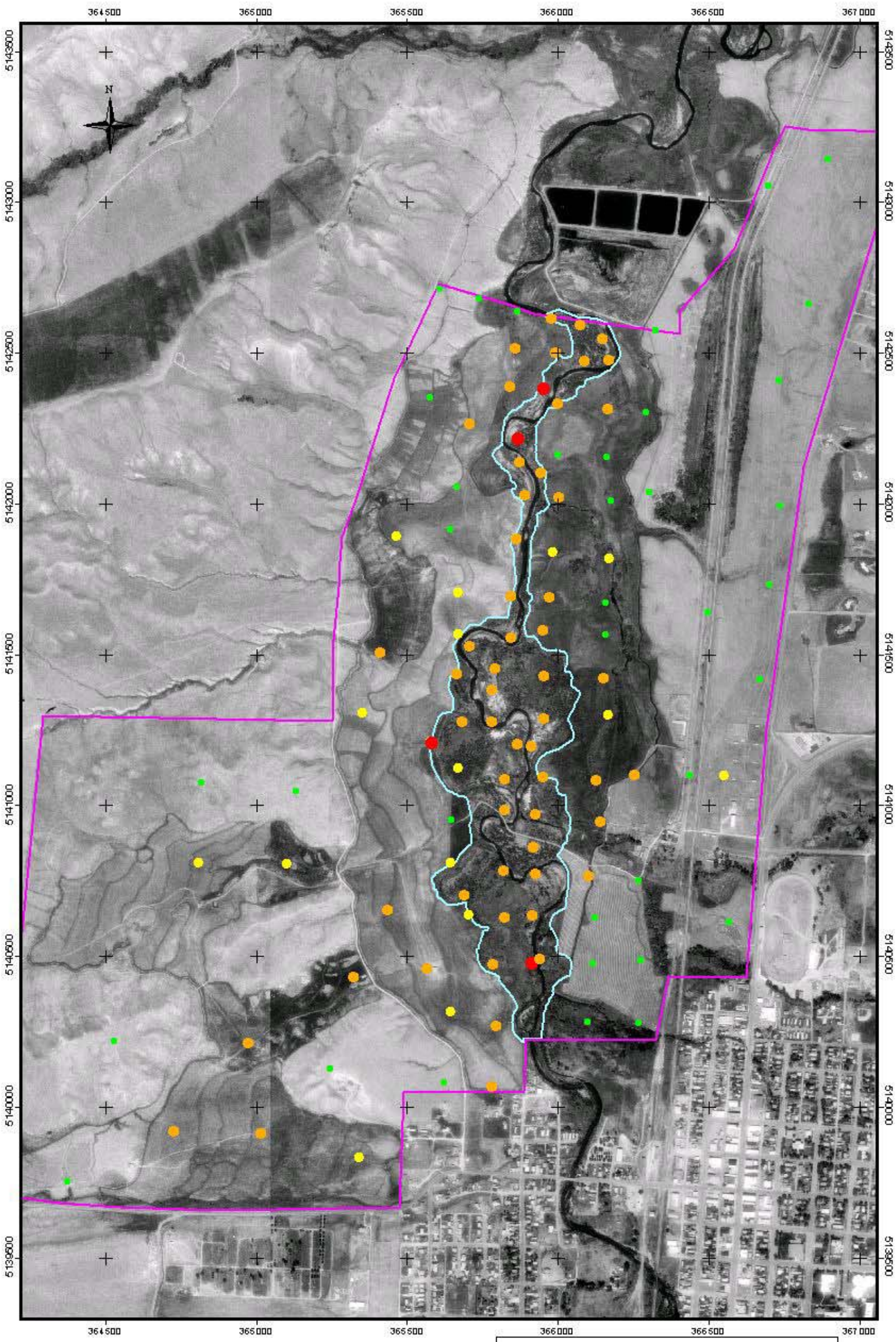


Plate 11. Zinc Concentrations

200 0 200 400 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)

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LEGEND

- 0 - 245 ppm
- 245 - 490 ppm
- 490 - 2450 ppm
- 2450 - 3200 ppm
- Floodplain
- Study boundary

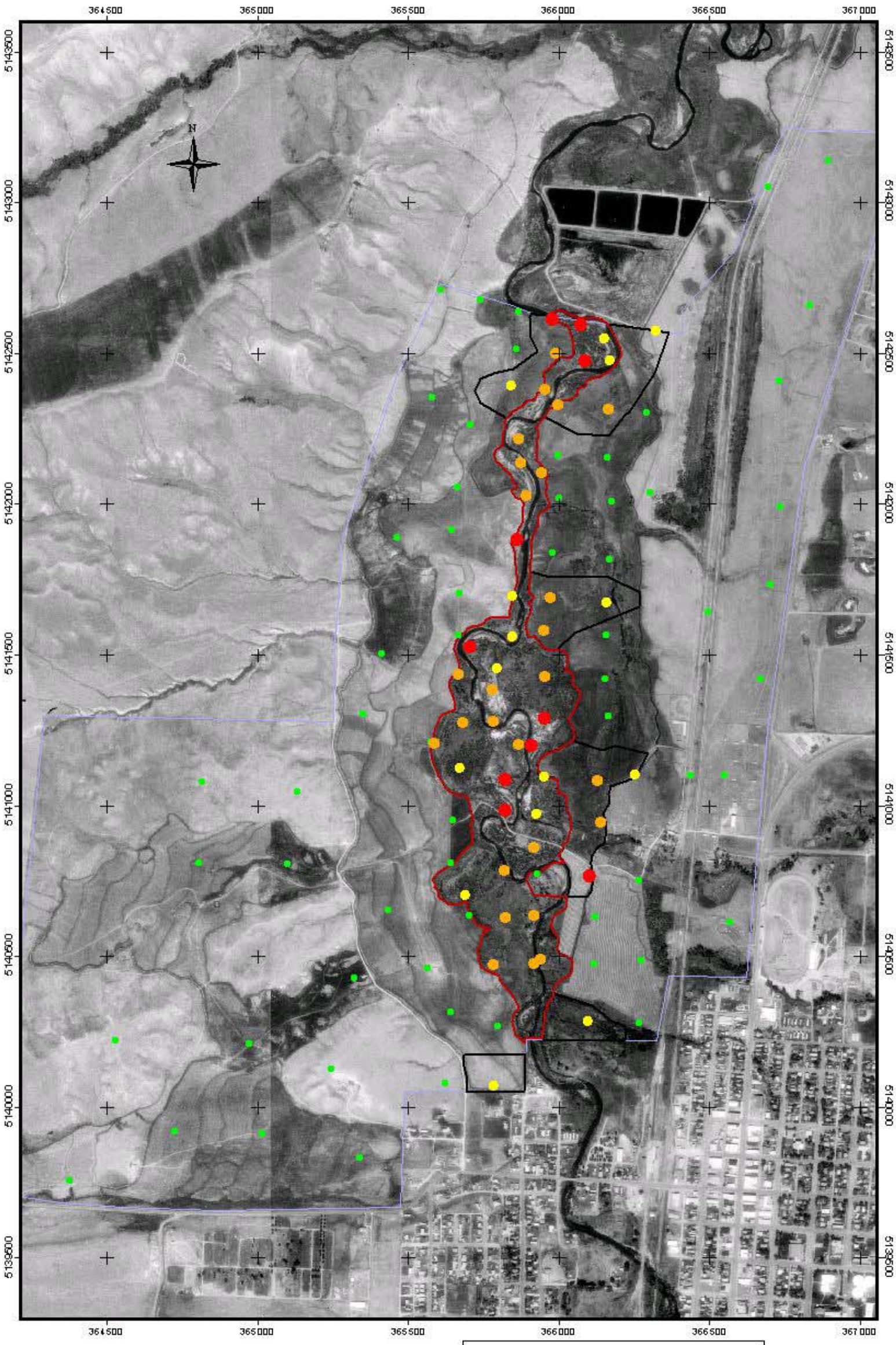


Plate 12. Arsenic: Multiples of baseline
(baseline: 10ppm)

200 0 200 400 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)

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LEGEND

- 0-5 X baseline
- 5-10 X baseline
- 10-100 X baseline
- 100-525 X baseline
- Study boundary
- Elevated fields area
- Elevated floodplain area

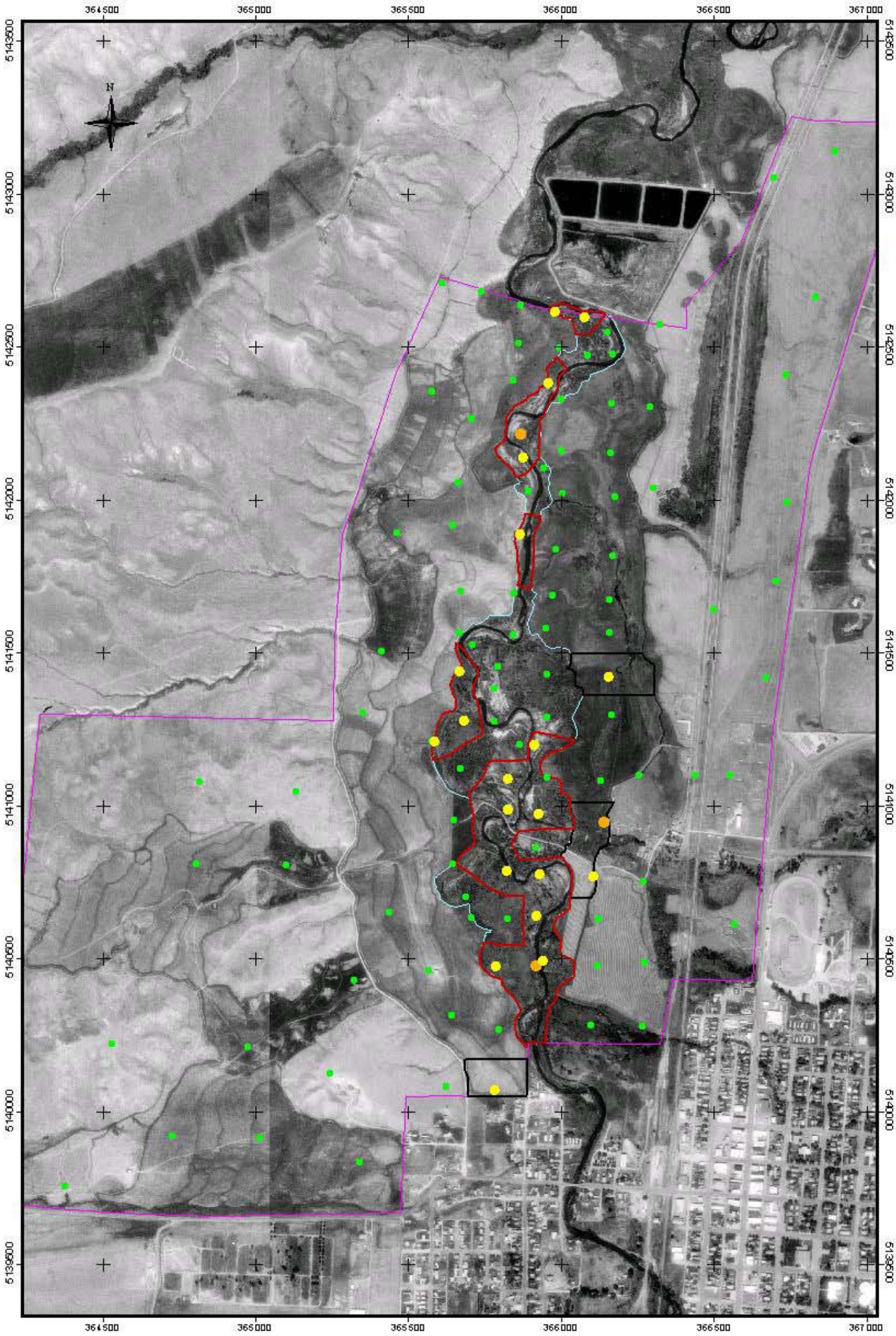


Plate 13. Cadmium: Multiples of baseline
(baseline: 1 ppm)

200 0 200 400 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)

LEGEND

- 0-5 X baseline
- 5-10 X baseline
- 10-100 X baseline
- 100-525 X baseline
- Floodplain
- Study boundary
- Elevated fields area
- Elevated floodplain area

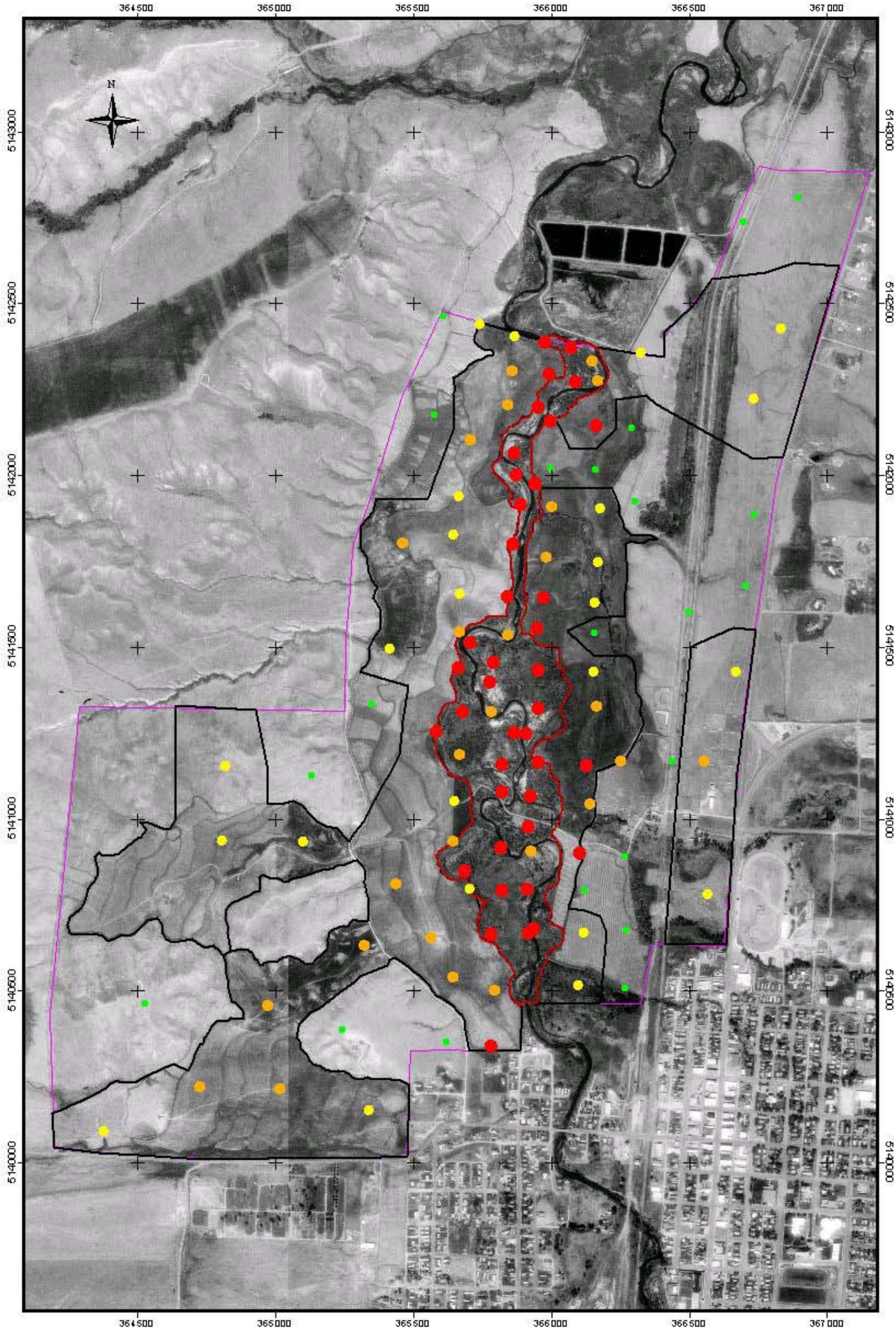


Plate 14. Copper: Multiples of baseline (baseline: 16 ppm)

200 0 200 400 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)

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LEGEND

- 0-5 X baseline
- 5-10 X baseline
- 10-100 X baseline
- 100-525 X baseline
- Study boundary
- Elevated fields area
- Elevated floodplain area

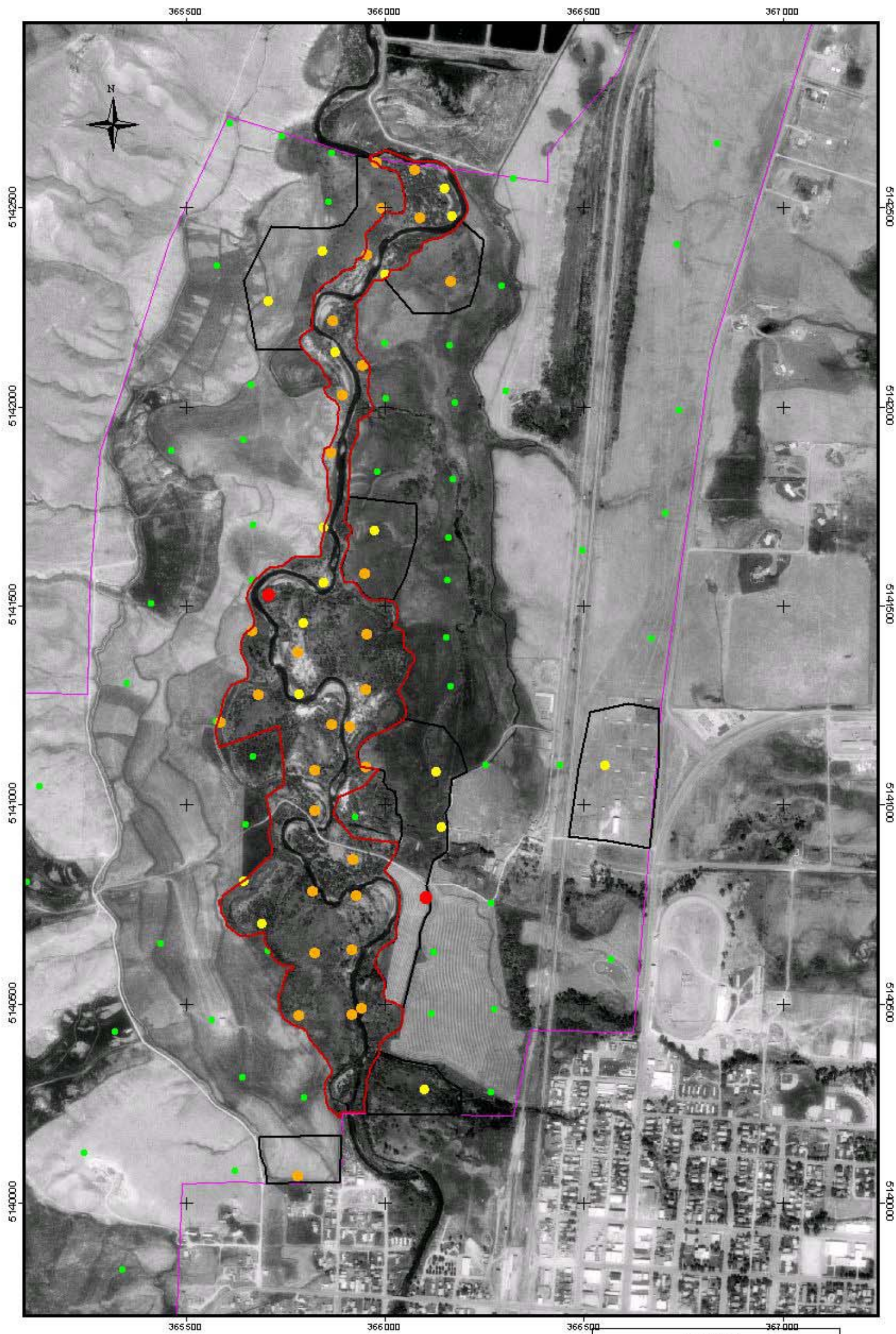


Plate 15. Lead: Multiples of baseline
(baseline: 17 ppm)
100 0 100200 Meters

UTM 12 North NAD 1983, HPGN (ID/MT)
Geologic, Soil Water, and Groundwater Report-2000

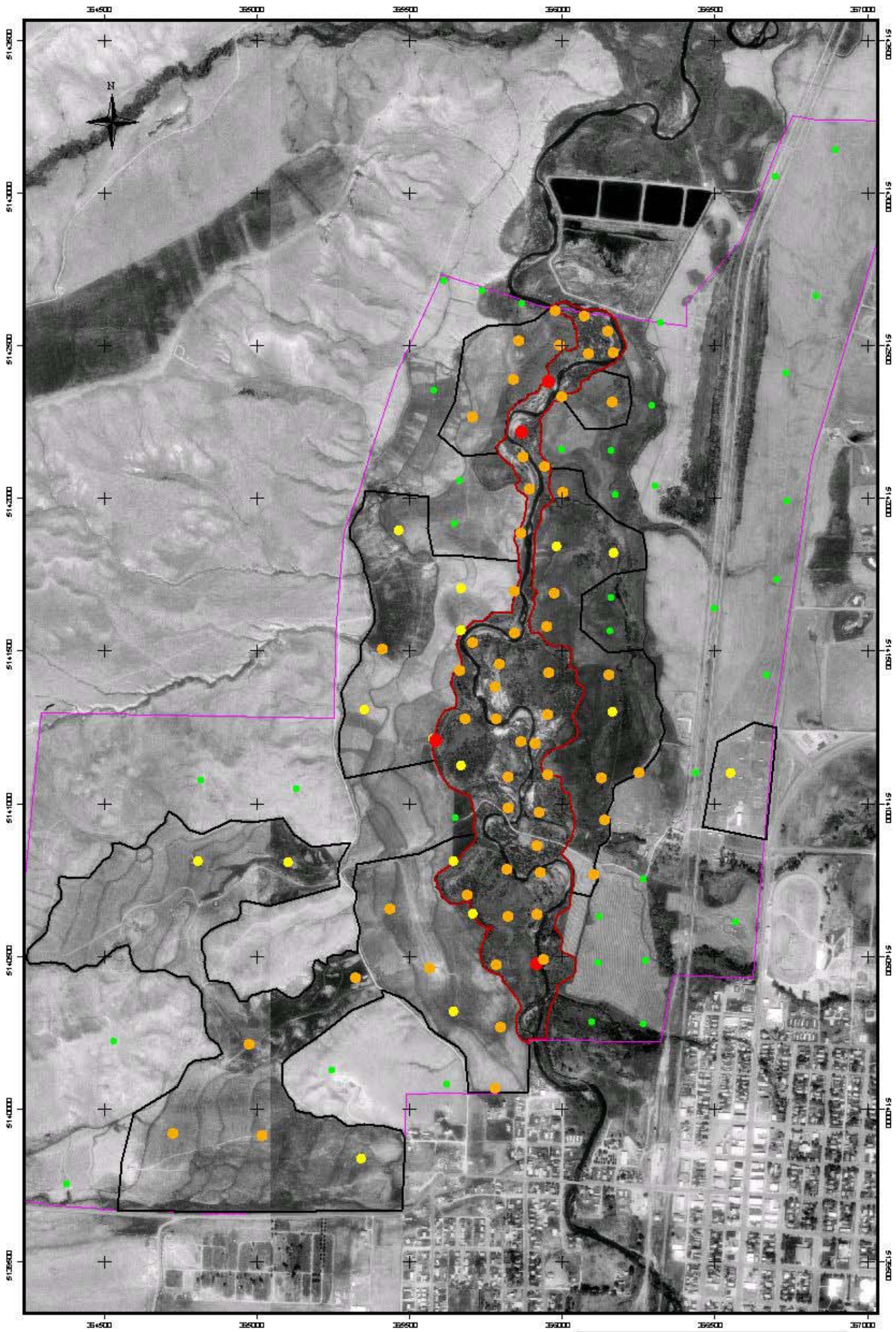


Plate 16. Zinc Multiples of baseline
(baseline: 49ppm)

UTM 12 North NAD 1983, HPGN (ID/MT)

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Soil Resources

APPENDIX A

APPENDIX A

A.1 Laboratory Methods

Tables contain analytical methodologies utilized and probable quantitative limits for metals analysis. Probable quantitative limits were determined by the analysis of the Instrument Performance Check solutions diluted to approximately three-times the Instrument Detection Limit, IDL, (standard deviation of seven exposures of calibration blank). Dilutions greater and less than the three-times IDL concentration were made and analyzed. Probable quantitative limits were defined as the diluted concentration in which the relative percent difference between the analytical value and the given value is nearly or less than ten percent.

Table of Analytical Methodologies

Parameter	Method
Soil pH	Standard Operating Procedure SOP SS-7
Metals (Al, As, Ca, Cd, Cr, Cu, Fe, K, Mg, Mn, Na, Pb, Zn)	EPA 3050B digestion procedure EPA 200.15 analytical procedure

Analyte	Probable Quantitative Limit (ppm)
Aluminum	0.04
Arsenic	0.05
Calcium	0.2
Cadmium	0.005
Chromium	0.05
Copper	0.03
Iron	0.08
Potassium	0.4
Magnesium	0.4
Manganese	0.04
Sodium	0.1
Phosphorus	0.05
Lead	0.04
Zinc	0.008

APPENDIX A

A.2 Sample Collection and Analysis Information

Tables include information pertaining to sample collection and analysis.

GKR Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
ESS-1	5/1/00	Surface Soil	BB, MJ, CW, BW	9/11/00	16:05	CW	5/1/00	CW
ESS-2	5/1/00	Surface Soil	BB, MJ, CW, BW	9/12/00	12:40	CW	5/1/00	CW
ESS-3	5/1/00	Surface Soil	BB, MJ, CW, BW	9/12/00	11:34	CW	5/1/00	CW
ESS-4	5/1/00	Surface Soil	BB, MJ, CW, BW	9/11/00	11:17	CW	5/1/00	CW
ESS-5	5/1/00	Surface Soil	BB, MJ, CW, BW	9/11/00	12:26	CW	5/1/00	CW
ESS-5 Field Dup	5/1/00	Surface Soil	BB, MJ, CW, BW	9/11/00	12:22	CW	5/1/00	CW
ESS-5 Split	5/1/00	Surface Soil	BB, MJ, CW, BW	9/11/00	11:14	CW	no analysis	no analysis
ESS-6	5/1/00	Surface Soil	BB, MJ, CW, BW	9/11/00	13:46	CW	5/1/00	CW
ESS-7	5/1/00	Surface Soil	BB, MJ, CW, BW	9/11/00	13:42	CW	5/1/00	CW
ESS-8	5/1/00	Surface Soil	BB, MJ, CW, BW	9/11/00	11:10	CW	5/1/00	CW
ESS-9	5/1/00	Surface Soil	BB, MJ, CW, BW	9/12/00	12:32	CW	5/1/00	CW
ESS-10	5/1/00	Surface Soil	BB, MJ, CW, BW	9/11/00	14:51	CW	5/1/00	CW
SS-1	5/15/00	Surface Soil	JH, SD, CW	7/11/00	16:49	CW	5/22/00	JH, SD
SS-2	5/15/00	Surface Soil	JH, SD, CW	7/11/00	17:02	CW	5/22/00	JH, SD
SS-3	5/15/00	Surface Soil	JH, SD, CW	7/11/00	17:06	CW	5/22/00	JH, SD
SS-4	5/15/00	Surface Soil	JH, SD, CW	7/11/00	17:10	CW	5/22/00	JH, SD
SS-5	5/15/00	Surface Soil	JH, SD, CW	7/11/00	17:14	CW	5/22/00	JH, SD
SS-6	5/15/00	Surface Soil	JH, SD, CW	7/11/00	17:22	CW	5/22/00	JH, SD
SS-7	5/15/00	Surface Soil	JH, SD, CW	7/11/00	17:26	CW	5/22/00	JH, SD
SS-8	5/15/00	Surface Soil	JH, SD, CW	7/11/00	17:30	CW	5/22/00	JH, SD
SS-8 Field Dup	5/15/00	Surface Soil	JH, SD, CW	7/11/00	17:53	CW	5/22/00	JH, SD
SS-9	5/15/00	Surface Soil	JH, SD, CW	7/11/00	17:58	CW	5/22/00	JH, SD
SS-10	5/15/00	Surface Soil	JH, SD, CW	7/11/00	18:06	CW	5/22/00	JH, SD
SS-11	5/15/00	Surface Soil	JH, SD, CW	7/11/00	18:10	CW	5/22/00	JH, SD
SS-12	5/15/00	Surface Soil	JH, SD, CW	7/11/00	18:14	CW	5/22/00	JH, SD
SS-13	5/15/00	Surface Soil	JH, SD, CW	7/11/00	18:18	CW	5/22/00	JH, SD
SS-13 Split	5/15/00	Surface Soil	JH, SD, CW	7/11/00	18:22	CW	no analysis	no analysis
SS-14	5/15/00	Surface Soil	JH, SD, CW	7/11/00	18:26	CW	5/22/00	JH, SD
SS-15	5/15/00	Surface Soil	JH, SD, CW	7/11/00	18:56	CW	5/22/00	JH, SD
SS-16	5/15/00	Surface Soil	JH, SD, CW	7/20/00	13:42	CW	5/22/00	JH, SD
SS-17	5/15/00	Surface Soil	JH, SD, CW	7/20/00	13:01	CW	5/22/00	JH, SD
SS-18	5/16/00	Surface Soil	JH, SD, CW	7/20/00	14:04	CW	5/22/00	JH, SD
SS-19	5/16/00	Surface Soil	JH, SD, CW	7/20/00	14:09	CW	5/22/00	JH, CW

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
SS-20	5/16/00	Surface Soil	JH, SD, CW	7/20/00	13:37	CW	5/22/00	JH, SD
SS-21	5/16/00	Surface Soil	JH, SD, CW	7/20/00	13:55	CW	5/22/00	JH, SD
SS-22	5/16/00	Surface Soil	JH, SD, CW	7/20/00	13:50	CW	5/22/00	JH, SD
SS-23	5/16/00	Surface Soil	JH, SD, CW	7/20/00	12:37	TMC	5/22/00	JH, SD
SS-24	5/16/00	Surface Soil	JH, SD, CW	7/20/00	11:20	TMC	5/22/00	JH, SD
SS-25	5/16/00	Surface Soil	JH, SD, CW	7/20/00	12:46	CW	5/22/00	JH, SD
SS-26	5/16/00	Surface Soil	JH, SD, CW	7/21/00	11:18	TMC	5/22/00	JH, SD
SS-27	5/16/00	Surface Soil	JH, SD, CW	7/21/00	10:36	TMC	5/22/00	JH, SD
SS-28	5/16/00	Surface Soil	JH, SD, CW	7/21/00	11:50	TMC	5/22/00	JH, SD
SS-29	5/16/00	Surface Soil	JH, SD, CW	7/21/00	11:38	TMC	5/22/00	JH
SS-30	5/16/00	Surface Soil	JH, SD, CW	7/21/00	11:22	TMC	5/22/00	JH
SS-31	5/16/00	Surface Soil	JH, SD, CW	7/21/00	10:28	TMC	5/22/00	JH
SS-32	5/16/00	Surface Soil	JH, SD, CW	7/21/00	10:32	TMC	5/22/00	JH
SS-33	5/16/00	Surface Soil	JH, SD, CW	7/21/00	12:34	CW	5/22/00	JH
SS-34	5/16/00	Surface Soil	JH, SD, CW	7/21/00	12:23	CW	5/22/00	JH
SS-35	5/16/00	Surface Soil	JH, SD, CW	7/21/00	15:04	CW	5/22/00	JH
SS-35 Field Dup	5/16/00	Surface Soil	JH, SD, CW	7/21/00	13:29	CW	5/22/00	JH
SS-36	5/16/00	Surface Soil	JH, SD, CW	7/21/00	15:50	CW	5/22/00	JH
SS-37	5/16/00	Surface Soil	JH, SD, CW	7/21/00	12:46	CW	5/22/00	JH
SS-38	5/16/00	Surface Soil	JH, SD, CW	7/21/00	15:00	CW	5/22/00	JH
SS-39	5/16/00	Surface Soil	JH, SD, CW	7/21/00	15:46	CW	5/22/00	JH
SS-40	5/16/00	Surface Soil	JH, SD, CW	7/21/00	13:33	CW	5/22/00	JH
SS-40 Split	5/16/00	Surface Soil	JH, SD, CW	7/21/00	12:50	CW	no analysis	no analysis
SS-41	5/16/00	Surface Soil	JH, SD, CW	7/21/00	16:02	CW	5/22/00	JH
SS-42	5/16/00	Surface Soil	JH, SD, CW	7/21/00	12:42	CW	5/22/00	SD
SS-43	5/17/00	Surface Soil	JH, SD, AB	7/21/00	14:01	TMC	5/22/00	SD
SS-44	5/17/00	Surface Soil	JH, SD, AB	7/21/00	14:43	CW	5/22/00	SD
SS-45	5/17/00	Surface Soil	JH, SD, AB	7/21/00	15:54	CW	5/22/00	CW
SS-46	5/17/00	Surface Soil	JH, SD, AB	7/21/00	13:40	CW	5/22/00	CW
SS-47	5/17/00	Surface Soil	JH, SD, AB	7/21/00	14:56	CW	5/23/00	SD
SS-48	5/17/00	Surface Soil	JH, SD, AB	7/21/00	13:57	TMC	5/23/00	SD
SS-49	5/17/00	Surface Soil	JH, SD, AB	7/21/00	13:53	TMC	5/23/00	SD
SS-50	5/17/00	Surface Soil	JH, SD, AB	7/21/00	13:04	CW	5/23/00	SD

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
SS-51	5/17/00	Surface Soil	JH, SD, AB	7/21/00	13:45	CW	5/23/00	SD
SS-52	5/17/00	Surface Soil	JH, SD, AB	7/21/00	12:38	CW	5/23/00	SD
SS-53	5/17/00	Surface Soil	JH, SD, AB	7/21/00	14:05	CW	5/23/00	SD
SS-54	5/17/00	Surface Soil	JH, SD, AB	7/21/00	15:41	CW	5/23/00	SD
SS-55	5/17/00	Surface Soil	JH, SD, AB	7/21/00	13:49	TMC	5/23/00	SD
SS-56	5/17/00	Surface Soil	JH, SD, AB	7/21/00	15:37	CW	5/23/00	CW
SS-57	5/17/00	Surface Soil	JH, SD, AB	7/21/00	16:06	CW	5/23/00	CW
SS-57 Field Dup	5/17/00	Surface Soil	JH, SD, AB	7/21/00	16:11	CW	5/23/00	CW
SS-57 Split	5/17/00	Surface Soil	JH, SD, AB	7/21/00	13:00	CW	no analysis	no analysis
SS-58	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	13:07	CW	5/23/00	CW
SS-59	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	14:09	SD	5/23/00	CW
SS-60	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	14:00	SD	5/23/00	CW
SS-61	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	11:51	CW	5/23/00	CW
SS-62	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	13:27	CW	5/23/00	CW
SS-63	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	13:03	CW	5/23/00	CW
SS-64	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	14:18	SD	5/23/00	CW
SS-65	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	11:38	CW	5/23/00	CW
SS-66	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	15:14	SD	5/23/00	CW
SS-67	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	11:46	CW	5/23/00	CW
SS-68	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	15:26	SD	5/23/00	CW
SS-69	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	12:59	CW	5/23/00	CW
SS-70	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	13:23	CW	5/23/00	CW
SS-71	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	14:54	SD	5/24/00	JH
SS-71 Split	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	12:55	CW	5/24/00	JH
SS-72	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	11:24	CW	5/23/00	CW
SS-73	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	13:56	SD	5/23/00	CW
SS-74	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	13:19	CW	5/23/00	CW
SS-75	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	13:15	CW	5/23/00	SD
SS-76	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	12:06	SD	5/23/00	SD
SS-77	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	13:11	CW	5/23/00	SD
SS-77 Field Dup	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	14:14	SD	5/23/00	SD
SS-78	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	14:42	SD	5/23/00	SD
SS-79	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	14:22	SD	5/23/00	SD

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
SS-80	5/18/00	Surface Soil	JH, SD, AB, JM	7/27/00	15:34	SD	5/23/00	SD
SS-81	5/19/00	Surface Soil	SD, AB, CW	7/27/00	14:50	SD	5/23/00	SD
SS-82	5/19/00	Surface Soil	SD, AB, CW	7/27/00	12:51	CW	5/23/00	SD
SS-83	5/19/00	Surface Soil	SD, AB, CW	7/27/00	15:18	SD	5/23/00	JH
SS-83 Field Dup	5/19/00	Surface Soil	SD, AB, CW	7/27/00	11:55	SD	5/23/00	JH
SS-84	5/19/00	Surface Soil	SD, AB, CW	7/27/00	12:11	SD	5/23/00	JH
SS-85	5/19/00	Surface Soil	SD, AB, CW	7/27/00	15:41	SD	5/23/00	JH
SS-86	5/19/00	Surface Soil	SD, AB, CW	7/27/00	16:31	CW	5/23/00	JH
SS-87	5/19/00	Surface Soil	SD, AB, CW	7/27/00	18:29	CW	5/23/00	JH
SS-88	5/19/00	Surface Soil	SD, AB, CW	7/27/00	16:44	CW	5/23/00	JH
SS-89	5/19/00	Surface Soil	SD, AB, CW	7/27/00	18:33	CW	5/23/00	JH
SS-91	5/19/00	Surface Soil	SD, AB, CW	7/27/00	17:38	CW	5/24/00	JH
SS-91 Split	5/19/00	Surface Soil	SD, AB, CW	7/27/00	18:37	CW	5/24/00	JH
SS-92	5/19/00	Surface Soil	SD, AB, CW	7/27/00	16:28	CW	5/23/00	SD
SS-93	5/19/00	Surface Soil	JH, JM	7/27/00	15:45	SD	5/23/00	SD
SS-94	5/19/00	Surface Soil	JH, JM	7/27/00	18:44	CW	5/23/00	SD
SS-95	5/19/00	Surface Soil	JH, JM	7/27/00	17:14	CW	5/23/00	SD
SS-96	5/19/00	Surface Soil	JH, JM	7/27/00	16:24	CW	5/23/00	SD
SS-97	5/19/00	Surface Soil	JH, JM	7/27/00	17:22	CW	5/23/00	SD
SS-98	5/19/00	Surface Soil	JH, JM	7/27/00	18:52	CW	5/23/00	SD
SS-98 Field Dup	5/19/00	Surface Soil	JH, JM	7/27/00	17:26	CW	5/23/00	SD
SS-99	5/19/00	Surface Soil	JH, JM	7/27/00	17:42	CW	5/23/00	SD
SS-100	5/19/00	Surface Soil	JH, JM	7/27/00	18:21	CW	5/19/00	SD
SS-101	5/19/00	Surface Soil	JH, JM	7/27/00	15:49	SD	5/24/00	SD
SS-102	5/19/00	Surface Soil	JH, JM	7/27/00	16:48	CW	5/24/00	SD
SS-105	5/19/00	Surface Soil	JH, JM	7/27/00	16:19	CW	5/24/00	SD
SS-106	5/19/00	Surface Soil	JH, JM	7/27/00	17:34	CW	5/24/00	SD
SS-107	5/19/00	Surface Soil	JH, JM	7/27/00	16:11	CW	5/24/00	SD
SS-108	5/19/00	Surface Soil	SD, AB, CW	7/27/00	17:50	CW	5/24/00	SD
SS-110	5/19/00	Surface Soil	JH, JM	7/27/00	18:40	CW	5/24/00	SD
SS-111	5/19/00	Surface Soil	JH, JM	7/27/00	15:38	SD	5/24/00	SD
SP1-a	6/15/00	Soil Profile Sample	AB, JM, JH	9/13/00	11:27	CW	6/22/00	JH
SP1-b	6/15/00	Soil Profile Sample	AB, JM, JH	9/13/00	12:23	CW	6/22/00	JH

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
SP1-c	6/15/00	Soil Profile Sample	AB, JM, JH	9/14/00	11:08	CW	6/22/00	JH
SP2-a	6/15/00	Soil Profile Sample	AB, JM, JH	9/13/00	12:26	CW	6/22/00	JH
SP2-b	6/15/00	Soil Profile Sample	AB, JM, JH	9/12/00	15:08	CW	6/22/00	JH
SP2-c	6/15/00	Soil Profile Sample	AB, JM, JH	9/11/00	11:25	CW	6/22/00	JH
SP3-a	6/15/00	Soil Profile Sample	AB, JM, JH	9/11/00	12:33	CW	6/22/00	JH
SP3-b	6/15/00	Soil Profile Sample	AB, JM, JH	9/12/00	13:34	CW	6/22/00	JH
SP3-c	6/15/00	Soil Profile Sample	AB, JM, JH	9/11/00	15:03	CW	6/22/00	JH
SP3-d	6/15/00	Soil Profile Sample	AB, JM, JH	9/11/00	16:12	CW	6/22/00	JH
BP1-a	6/6/00	Bank Profile Soil	AB, JM	9/11/00	13:38	CW	6/9/00	CW
BP1-b	6/6/00	Bank Profile Soil	AB, JM	9/12/00	14:42	CW	6/9/00	SD
BP1-c	6/6/00	Bank Profile Soil	AB, JM	9/11/00	11:06	CW	6/9/00	SD
BP1-d	6/6/00	Bank Profile Soil	AB, JM	9/12/00	14:04	CW	6/9/00	SD
BP1-e	6/6/00	Bank Profile Soil	AB, JM	9/11/00	15:54	CW	6/9/00	SD
BP1-e Split	6/6/00	Bank Profile Soil	AB, JM	9/12/00	14:53	CW	6/9/00	SD
BP1-f	6/16/00	Bank Profile Soil	AB, JM, JH	11/8/00	14:36	CW	no analysis	no analysis
BP1-g	6/6/00	Bank Profile Soil	AB, JM	9/12/00	13:38	CW	6/9/00	SD
BP1-h	6/6/00	Bank Profile Soil	AB, JM	9/11/00	15:57	CW	6/9/00	SD
BP1-i	6/6/00	Bank Profile Soil	AB, JM	9/11/00	14:48	CW	6/9/00	SD
BP1-j	6/6/00	Bank Profile Soil	AB, JM	9/12/00	14:49	CW	6/9/00	SD
BP1-k	6/6/00	Bank Profile Soil	AB, JM	9/11/00	16:09	CW	6/9/00	SD
BP2-a	6/6/00	Bank Profile Soil	AB, JM	9/12/00	12:29	CW	6/12/00	SD
BP2-b	6/6/00	Bank Profile Soil	AB, JM	9/11/00	14:40	CW	6/12/00	SD
BP2-c	6/6/00	Bank Profile Soil	AB, JM	9/12/00	11:22	CW	6/12/00	SD
BP2-d	6/6/00	Bank Profile Soil	AB, JM	9/11/00	14:44	CW	6/12/00	SD
BP2-d Split	6/6/00	Bank Profile Soil	AB, JM	9/11/00	12:30	CW	6/12/00	SD
BP2-e	6/6/00	Bank Profile Soil	AB, JM	9/12/00	12:44	CW	6/12/00	SD
BP2-f	6/6/00	Bank Profile Soil	AB, JM	9/12/00	12:36	CW	6/12/00	SD
BP2-g	6/6/00	Bank Profile Soil	AB, JM	8/16/00	11:34	CW	6/12/00	SD
BP2-h	6/6/00	Bank Profile Soil	AB, JM	8/16/00	11:45	CW	6/12/00	SD
BP2-i	6/6/00	Bank Profile Soil	AB, JM	8/16/00	12:44	CW	6/12/00	SD
BP2-j	6/6/00	Bank Profile Soil	AB, JM	8/16/00	12:48	CW	6/12/00	SD
BP3-a	6/6/00	Bank Profile Soil	AB, JM	7/20/00	12:07	TMC	6/13/00	JH
BP3-b	6/6/00	Bank Profile Soil	AB, JM	7/20/00	12:03	TMC	6/13/00	JH

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
BP3-c	6/6/00	Bank Profile Soil	AB, JM	7/20/00	11:59	TMC	6/13/00	JH
BP3-d	6/6/00	Bank Profile Soil	AB, JM	7/20/00	12:33	TMC	6/13/00	JH
BP3-e	6/6/00	Bank Profile Soil	AB, JM	7/20/00	13:06	CW	6/13/00	JH
BP3-f	6/6/00	Bank Profile Soil	AB, JM	7/20/00	11:55	TMC	6/13/00	JH
BP3-g	6/6/00	Bank Profile Soil	AB, JM	7/20/00	11:24	TMC	6/13/00	JH
BP3-h	6/6/00	Bank Profile Soil	AB, JM	7/20/00	14:13	CW	6/13/00	JH
BP3-h Split	6/6/00	Bank Profile Soil	AB, JM	7/20/00	14:17	CW	6/13/00	JH
BP3-i	6/6/00	Bank Profile Soil	AB, JM	7/20/00	14:38	CW	6/13/00	JH
BP4-a	6/6/00	Bank Profile Soil	AB, JM	7/20/00	14:44	CW	6/14/00	SD
BP4-b	6/6/00	Bank Profile Soil	AB, JM	7/20/00	14:48	CW	6/14/00	SD
BP4-c	6/6/00	Bank Profile Soil	AB, JM	7/20/00	14:53	CW	6/14/00	SD
BP4-c Split	6/6/00	Bank Profile Soil	AB, JM	7/20/00	15:10	TMC	6/14/00	SD
BP4-d	6/6/00	Bank Profile Soil	AB, JM	7/20/00	15:14	TMC	6/14/00	SD
BP4-e	6/6/00	Bank Profile Soil	AB, JM	7/20/00	14:57	CW	6/14/00	SD
BP4-f	6/6/00	Bank Profile Soil	AB, JM	7/20/00	16:16	CW	6/14/00	SD
BP4-g	6/6/00	Bank Profile Soil	AB, JM	7/20/00	16:11	CW	6/14/00	SD
BP4-h	6/6/00	Bank Profile Soil	AB, JM	7/20/00	16:03	TMC	6/14/00	SD
BP5-a	6/8/00	Bank Profile Soil	AB, JM	8/16/00	11:19	CW	6/14/00	SD
BP5-b	6/8/00	Bank Profile Soil	JM	9/11/00	11:21	CW	6/14/00	SD
BP5-c	6/8/00	Bank Profile Soil	JM	9/11/00	13:53	CW	6/14/00	SD
BP5-d	6/8/00	Bank Profile Soil	JM	9/12/00	13:31	CW	6/14/00	SD
BP5-d Split	6/8/00	Bank Profile Soil	AB, JM	8/16/00	12:36	CW	6/14/00	SD
BP5-e	6/8/00	Bank Profile Soil	AB, JM	8/16/00	12:10	CW	6/14/00	SD
BP5-f	6/8/00	Bank Profile Soil	JM	9/12/00	13:49	CW	6/14/00	SD
BP5-g	6/8/00	Bank Profile Soil	JM	9/12/00	11:04	CW	6/14/00	SD
BP6-a	6/12/00	Bank Profile Soil	AB, JM	7/20/00	15:59	TMC	6/15/00	SD
BP6-b	6/12/00	Bank Profile Soil	AB, JM	7/20/00	16:21	CW	6/15/00	SD
BP6-c	6/12/00	Bank Profile Soil	AB, JM	7/20/00	16:29	CW	6/15/00	SD
BP6-d	6/12/00	Bank Profile Soil	AB, JM	7/21/00	9:51	TMC	6/15/00	SD
BP6-e	6/12/00	Bank Profile Soil	AB, JM	7/21/00	10:40	TMC	6/15/00	SD
BP6-e Split	6/12/00	Bank Profile Soil	AB, JM	7/21/00	9:39	TMC	6/15/00	SD
BP6-f	6/12/00	Bank Profile Soil	AB, JM	7/21/00	9:35	TMC	6/15/00	SD
BP6-g	6/12/00	Bank Profile Soil	AB, JM	7/21/00	11:26	TMC	6/15/00	SD

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
BP6-h	6/12/00	Bank Profile Soil	AB, JM	7/21/00	9:31	TMC	6/15/00	SD
BP6-i	6/12/00	Bank Profile Soil	AB, JM	7/21/00	10:47	TMC	6/15/00	SD
BP7-a	6/12/00	Bank Profile Soil	AB, JM	9/12/00	13:57	CW	6/15/00	SD
BP7-b	6/12/00	Bank Profile Soil	AB, JM	9/11/00	13:49	CW	6/15/00	SD
BP7-c	6/12/00	Bank Profile Soil	AB, JM	8/16/00	11:42	CW	6/15/00	SD
BP7-d	6/12/00	Bank Profile Soil	AB, JM	8/16/00	11:38	CW	6/15/00	SD
BP7-d Split	6/12/00	Bank Profile Soil	AB, JM	8/16/00	11:15	CW	6/15/00	SD
BP7-e	6/12/00	Bank Profile Soil	AB, JM	8/16/00	11:23	CW	6/15/00	SD
BP7-f	6/12/00	Bank Profile Soil	AB, JM	9/11/00	14:59	CW	6/15/00	SD
BP7-g	6/12/00	Bank Profile Soil	AB, JM	9/12/00	14:01	CW	6/15/00	SD
BP8-a	6/15/00	Bank Profile Soil	AB, JM, JH	9/11/00	14:55	CW	6/19/00	SD
BP8-b	6/15/00	Bank Profile Soil	AB, JH, JM	8/16/00	13:41	CW	6/19/00	SD
BP8-c	6/15/00	Bank Profile Soil	AB, JH, JM	8/16/00	13:10	CW	6/19/00	SD
BP8-c Split	6/15/00	Bank Profile Soil	AB, JH, JM	8/16/00	14:59	CW	6/19/00	SD
BP8-d	6/15/00	Bank Profile Soil	AB, JH, JM	8/16/00	15:18	CW	6/19/00	SD
BP8-e	6/15/00	Bank Profile Soil	AB, JH, JM	8/16/00	15:21	CW	6/19/00	SD
BP8-f	6/15/00	Bank Profile Soil	AB, JM, JH	9/13/00	11:53	CW	6/19/00	SD
BP8-g	6/15/00	Bank Profile Soil	AB, JM, JH	9/13/00	10:53	CW	6/19/00	SD
BP9-a	6/15/00	Bank Profile Soil	AB, JM, JH	9/13/00	14:43	CW	6/20/00	JH
BP9-a Field Dup	6/15/00	Bank Profile Soils	AB, JM, JH	9/14/00	10:34	CW	6/20/00	JH
BP9-b	6/15/00	Bank Profile Soil	AB, JM, JH	9/13/00	11:56	CW	6/20/00	JH
BP9-b Field Dup	6/15/00	Bank Profile Soil	AB, JM, JH	9/13/00	14:21	CW	6/20/00	JH
BP9-c	6/15/00	Bank Profile Soil	AB, JM, JH	9/13/00	14:36	CW	6/20/00	JH
BP9-c Field Dup	6/15/00	Bank Profile Soil	AB, JM, JH	9/12/00	15:44	CW	6/20/00	SD
BP9-d	6/15/00	Bank Profile Soil	AB, JM, JH	9/13/00	10:56	CW	6/20/00	SD
BP9-d Field Dup	6/15/00	Bank Profile Soil	AB, JM, JH	9/13/00	15:45	CW	6/20/00	SD
BP9-e	6/15/00	Bank Profile Soil	AB, JM, JH	9/14/00	11:01	CW	6/20/00	SD
BP9-e Field Dup	6/15/00	Bank Profile Soil	AB, JM, JH	9/14/00	11:50	CW	6/20/00	SD
BP9-f	6/15/00	Bank Profile Soil	AB, JM, JH	9/14/00	10:57	CW	6/20/00	SD
BP9-f Field Dup	6/15/00	Bank Profile Soil	AB, JM, JH	9/14/00	10:42	CW	6/20/00	SD
BP9-g	6/15/00	Bank Profile Soil	AB, JM, JH	9/13/00	11:00	CW	6/20/00	SD
BP9-g Field Dup	6/15/00	Bank Profile Soil	AB, JM, JH	9/13/00	12:04	CW	6/20/00	SD
BP10-a	6/15/00	Bank Profile Soil	AB, JH, JM	7/21/00	11:46	TMC	6/19/00	JH

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
BP10-b	6/15/00	Bank Profile Soil	AB, JH, JM	7/21/00	11:42	TMC	6/19/00	JH
BP10-c	6/15/00	Bank Profile Soil	AB, JH, JM	7/21/00	9:47	TMC	6/19/00	JH
BP10-d	6/15/00	Bank Profile Soil	AB, JH, JM	7/21/00	10:07	TMC	6/19/00	JH
BP10-d Split	6/15/00	Bank Profile Soil	AB, JH, JM	7/21/00	12:06	CW	6/19/00	JH
BP10-e	6/15/00	Bank Profile Soil	AB, JH, JM	7/21/00	12:02	CW	6/19/00	JH
BP10-f	6/15/00	Bank Profile Soil	AB, JH, JM	7/21/00	11:53	TMC	6/19/00	JH
BP10-g	6/15/00	Bank Profile Soil	AB, JH, JM	7/21/00	10:59	TMC	6/19/00	JH
BP11-a	6/16/00	Bank Profile Soil	AB, JM, JH	9/11/00	11:32	CW	6/22/00	SD
BP11-b	6/16/00	Bank Profile Soil	AB, JM, JH	9/11/00	12:41	CW	6/22/00	SD
BP11-c	6/16/00	Bank Profile Soil	AB, JM, JH	9/11/00	15:38	CW	6/22/00	SD
BP11-d	6/16/00	Bank Profile Soil	AB, JM, JH	9/12/00	11:15	CW	6/22/00	SD
BP11-e	6/16/00	Bank Profile Soil	AB, JM, JH	9/12/00	12:17	CW	6/22/00	SD
BP11-f	6/16/00	Bank Profile Soil	AB, JH, JM	11/8/00	13:03	CW	no analysis	no analysis
BP11-g	6/16/00	Bank Profile Soil	AB, JM, JH	9/11/00	13:34	CW	6/22/00	SD
BP11-h	6/17/00	Bank Profile Soil	AB, JH, JM	8/16/00	13:07	CW	6/22/00	SD
BP12-a	6/16/00	Bank Profile Soil	AB, JM, JH	9/14/00	10:53	CW	6/22/00	SD
BP12-b	6/16/00	Bank Profile Soil	AB, JM, JH	9/14/00	10:50	CW	6/22/00	SD
BP12-c	6/16/00	Bank Profile Soil	AB, JM, JH	9/13/00	15:49	CW	6/22/00	SD
BP12-d	6/16/00	Bank Profile Soil	AB, JM, JH	9/13/00	15:23	CW	6/22/00	SD
BP12-e	6/16/00	Bank Profile Soil	AB, JM, JH	9/13/00	15:42	CW	6/22/00	SD
BP12-f	6/16/00	Bank Profile Soil	AB, JM, JH	9/12/00	16:07	CW	6/22/00	SD
BP13-a	6/16/00	Bank Profile Soil	AB, JM, JH	9/12/00	15:00	CW	6/22/00	JH
BP13-b	6/16/00	Bank Profile Soil	AB, JM, JH	9/12/00	16:11	CW	6/22/00	JH
BP13-c	6/16/00	Bank Profile Soil	AB, JM, JH	9/11/00	11:29	CW	6/22/00	JH
BP13-d	6/16/00	Bank Profile Soil	AB, JM, JH	9/11/00	12:37	CW	6/22/00	JH
BP13-e	6/16/00	Bank Profile Soil	AB, JM, JH	9/11/00	13:57	CW	6/22/00	JH
BP13-f	6/16/00	Bank Profile Soil	AB, JM, JH	9/12/00	12:13	CW	6/22/00	JH
BP14-a	7/21/00	Bank Profile Soil	AB, JM	8/16/00	14:08	CW	7/24/00	JH
BP14-b	7/21/00	Bank Profile Soil	AB, JM	8/16/00	15:14	CW	7/24/00	JH
BP14-c	7/21/00	Bank Profile Soil	AB, JM	8/16/00	13:45	CW	7/24/00	JH
BP14-d	7/21/00	Bank Profile Soil	AB, JM	8/16/00	14:15	CW	7/24/00	JH
BP14-d Split	7/21/00	Bank Profile Soil	AB, JM	8/16/00	15:06	CW	7/24/00	JH
BP14-e	7/21/00	Bank Profile Soil	AB, JM	8/16/00	14:47	CW	7/24/00	JH

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
BP14-f	7/21/00	Bank Profile Soil	AB, JM	8/16/00	14:51	CW	7/24/00	JH
BP14-g	7/21/00	Bank Profile Soil	AB, JM	8/16/00	14:00	CW	7/24/00	JH
BP15-a	7/21/00	Bank Profile Soil	AB, JM	8/16/00	13:03	CW	7/24/00	SD
BP15-b	7/21/00	Bank Profile Soil	AB, JM	8/16/00	12:55	CW	7/24/00	SD
BP15-c	7/21/00	Bank Profile Soil	AB, JM	8/16/00	13:53	CW	7/24/00	SD
BP15-d	7/21/00	Bank Profile Soil	AB, JM	8/16/00	15:02	CW	7/24/00	SD
BP15-d Split	7/21/00	Bank Profile Soil	AB, JM	9/13/00	11:04	CW	7/24/00	SD
BP15-e	7/21/00	Bank Profile Soil	AB, JM	9/13/00	12:15	CW	7/24/00	SD
BP15-f	7/21/00	Bank Profile Soil	AB, JM	9/14/00	10:46	CW	7/24/00	SD
CP10-a	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	10:21	CW	8/21/00	JH
CP10-b	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	13:54	CW	8/21/00	JH
CP10-c	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	11:30	CW	8/21/00	JH
CP10-d	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	10:44	CW	8/21/00	JH
CP10-e	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	10:36	CW	8/21/00	JH
CP10-f	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	13:55	CW	8/21/00	JH
CP11-a	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	11:46	CW	10/5/00	JH
CP11-b	8/8/00	Soil Core Sample	AB, BB, DW	11/8/00	13:22	CW	10/5/00	JH
CP11-c	8/8/00	Soil Core Sample	AB, BB, DW	11/8/00	13:07	CW	10/5/00	JH
CP11-d	8/8/00	Soil Core Sample	AB, BB, DW	11/8/00	15:17	CW	10/5/00	JH
CP11-e	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	10:25	CW	10/5/00	JH
CP12-a	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	14:09	CW	10/5/00	JH
CP12-b	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	10:40	CW	10/5/00	JH
CP12-c	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	13:21	CW	10/5/00	JH
CP12-d	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	13:14	CW	10/5/00	JH
CP12-d Split	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	13:18	CW	10/5/00	JH
CP12-e	8/8/00	Soil Core Sample	AB, BB, DW	11/8/00	15:14	CW	10/5/00	JH
CP13-a	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	11:27	CW	10/5/00	JH
CP13-b	8/8/00	Soil Core Sample	AB, BB, DW	11/8/00	13:18	CW	10/5/00	JH
CP13-c	8/8/00	Soil Core Sample	AB	12/4/00	11:55	CW	10/5/00	JH
CP13-d	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	12:47	CW	10/5/00	JH
CP14-a	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	11:49	CW	10/5/00	JH
CP14-b	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	15:11	CW	10/5/00	JH
CP14-c	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	12:51	CW	10/5/00	JH

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
CP14-d	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	11:57	CW	10/5/00	JH
CP14-d Split	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	11:42	CW	10/5/00	JH
CP14-e	8/8/00	Soil Core Sample	AB, BB, DW	11/8/00	14:32	CW	10/5/00	JH
CP15-a	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	13:14	CW	8/21/00	JH
CP15-b	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	15:07	CW	8/21/00	JH
CP15-c	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	11:58	CW	8/21/00	JH
CP15-c Split	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	13:06	CW	8/21/00	JH
CP15-d	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	11:53	CW	8/21/00	JH
CP16-a	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	12:59	CW	8/21/00	JH
CP16-b	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	10:17	CW	8/21/00	JH
CP16-c	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	12:05	CW	8/21/00	JH
CP17-a	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	10:47	CW	8/21/00	JH
CP17-b	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	12:47	CW	8/21/00	JH
CP17-c	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	11:34	CW	8/21/00	JH
CP17-d	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	14:02	CW	8/21/00	SD
CP17-e	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	11:38	CW	8/21/00	SD
CP18-a	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	12:51	CW	8/21/00	JH
CP18-b	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	14:06	CW	8/21/00	JH
CP18-b Split	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	14:25	CW	no analysis	no analysis
CP18-c	8/9/00	Soil Core Sample	AB	12/4/00	11:59	CW	8/21/00	JH
CP18-d	8/9/00	Soil Core Sample	AB	12/4/00	12:17	CW	8/21/00	JH
CP18-e	8/8/00	Soil Core Sample	AB, BB, DW	10/27/00	13:10	CW	8/21/00	JH
CP18-f	8/9/00	Soil Core Sample	AB	12/4/00	12:14	CW	8/21/00	JH
CP19-a	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	13:51	CW	8/21/00	SD
CP19-b	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	13:58	CW	8/21/00	SD
CP19-b Split	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	13:10	CW	no analysis	no analysis
CP19-c	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	15:00	CW	8/21/00	SD
CP20-a	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	14:06	CW	8/21/00	JH
CP20-b	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	15:03	CW	8/21/00	JH
CP20-c Split	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	14:21	CW	no analysis	no analysis
CP20-d	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	12:59	CW	8/21/00	JH
CP21-a	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	11:46	CW	8/21/00	SD
CP21-b	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	12:55	CW	8/21/00	SD

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
CP21-c	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	13:06	CW	8/21/00	SD
CP21-d	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	13:18	CW	8/21/00	SD
CP21-e	8/8/00	Soil Core Sample	AB, BB, DW	11/7/00	11:54	CW	8/21/00	SD
C1-a	6/8/00	Soil Core Sample	BB, MJ	9/12/00	15:59	CW	8/1/00	SD
C1-a Split	6/8/00	Soil Core Sample	MJ, BB	9/13/00	11:08	CW	8/1/00	SD
C1-b	6/8/00	Soil Core Sample	MJ, BB	9/13/00	14:32	CW	8/1/00	SD
C1-c	6/8/00	Soil Core Sample	MJ, BB	9/14/00	12:01	CW	8/1/00	SD
C1-d	6/8/00	Soil Core Sample	MJ, BB	9/13/00	11:15	CW	8/1/00	SD
C1-e	6/8/00	Soil Core Sample	BB, MJ	9/12/00	15:48	CW	8/1/00	SD
C2-a	6/8/00	Soil Core Sample	MJ, BB	9/14/00	11:42	CW	8/1/00	SD
C2-b	6/8/00	Soil Core Sample	MJ, BB	9/13/00	14:40	CW	8/1/00	SD
C2-c	6/8/00	Soil Core Sample	MJ, BB	9/13/00	14:13	CW	8/1/00	SD
C3-a	6/6/00	Soil Core Sample	MJ	9/13/00	15:57	CW	8/1/00	SD
C3-b	6/6/00	Soil Core Sample	MJ	9/14/00	14:15	CW	8/1/00	SD
C3-c	6/6/00	Soil Core Sample	MJ	9/13/00	14:28	CW	8/1/00	SD
C3-d	6/6/00	Soil Core Sample	MJ	9/13/00	15:27	CW	8/1/00	SD
C3-e	6/6/00	Soil Core Sample	MJ	9/14/00	11:54	CW	8/1/00	SD
C4-a	6/6/00	Soil Core Sample	MJ	9/14/00	11:35	CW	8/1/00	SD
C5-a	6/6/00	Soil Core Sample	MJ	9/13/00	15:53	CW	8/1/00	SD
C5-b	6/6/00	Soil Core Sample	MJ	9/13/00	14:10	CW	8/1/00	SD
C5-c	6/6/00	Soil Core Sample	MJ	9/13/00	12:19	CW	8/1/00	SD
C5-c Split	6/6/00	Soil Core Sample	MJ	9/12/00	15:52	CW	8/1/00	SD
C5-d	6/6/00	Soil Core Sample	MJ	9/13/00	14:25	CW	8/1/00	SD
C5-e	6/6/00	Soil Core Sample	MJ	9/13/00	11:19	CW	8/1/00	SD
C6-a	6/6/00	Soil Core Sample	MJ	9/13/00	15:38	CW	8/1/00	SD
C7-a	6/7/00	Soil Core Sample	MJ, BB	9/13/00	12:11	CW	8/1/00	SD
C7-a Split	6/7/00	Soil Core Sample	BB, MJ	9/12/00	15:55	CW	8/1/00	SD
C7-b	6/7/00	Soil Core Sample	BB, MJ	9/12/00	16:03	CW	8/1/00	SD
C7-c	6/7/00	Soil Core Sample	MJ, BB	9/14/00	11:57	CW	8/1/00	SD
C7-d	6/7/00	Soil Core Sample	MJ, BB	9/13/00	15:30	CW	8/1/00	SD
C7-e	6/7/00	Soil Core Sample	MJ, BB	9/14/00	15:29	CW	8/1/00	SD
C8-a	6/7/00	Soil Core Sample	MJ, BB	9/14/00	14:19	CW	8/1/00	SD
C9-a	6/7/00	Soil Core Sample	MJ, BB	9/14/00	17:27	CW	7/31/00	SD

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
C9-b	6/7/00	Soil Core Sample	MJ, BB	9/14/00	12:05	CW	7/31/00	SD
C9-c	6/7/00	Soil Core Sample	MJ, BB	9/14/00	15:13	CW	7/31/00	SD
C9-d	6/7/00	Soil Core Sample	MJ, BB	9/14/00	16:15	CW	7/31/00	SD
C9-e	6/7/00	Soil Core Sample	MJ, BB	9/14/00	16:19	CW	7/31/00	SD
C10-a	6/8/00	Soil Core Sample	MJ, BB	9/14/00	14:07	CW	7/31/00	SD
C10-a Split	6/7/00	Soil Core Sample	MJ, BB	9/14/00	12:52	CW	7/31/00	SD
C10-b	6/7/00	Soil Core Sample	MJ, BB	9/14/00	14:26	CW	7/31/00	SD
C10-c	6/7/00	Soil Core Sample	MJ, BB	9/14/00	16:04	CW	7/31/00	SD
C11-a	6/7/00	Soil Core Sample	MJ, BB	9/14/00	12:55	CW	7/31/00	JH
C11-b	6/7/00	Soil Core Sample	MJ, BB	9/14/00	13:15	CW	7/31/00	JH
C11-c	6/7/00	Soil Core Sample	MJ, BB	9/14/00	16:23	CW	7/31/00	JH
C11-d	6/7/00	Soil Core Sample	MJ, BB	9/14/00	15:17	CW	7/31/00	JH
C11-e	6/7/00	Soil Core Sample	MJ, BB	9/14/00	15:25	CW	7/31/00	JH
C11-e Split	6/7/00	Soil Core Sample	MJ, BB	9/14/00	12:40	CW	7/31/00	JH
C12-a	6/7/00	Soil Core Sample	MJ, BB	9/14/00	16:30	CW	7/31/00	JH
C12-b	6/7/00	Soil Core Sample	MJ, BB	9/14/00	16:34	CW	7/31/00	JH
C13-a	6/8/00	Soil Core Sample	MJ, BB	9/14/00	17:05	CW	7/31/00	JH
C13-b	6/8/00	Soil Core Sample	MJ, BB	9/14/00	12:59	CW	7/31/00	JH
C13-c	6/8/00	Soil Core Sample	MJ, BB	9/14/00	17:35	CW	7/31/00	JH
C13-d	6/8/00	Soil Core Sample	MJ, BB	9/14/00	15:21	CW	7/31/00	JH
C13-e	6/8/00	Soil Core Sample	MJ, BB	9/14/00	17:31	CW	7/31/00	JH
C13-e Split	6/8/00	Soil Core Sample	MJ, BB	9/14/00	14:00	CW	7/31/00	JH
C13-f	6/8/00	Soil Core Sample	MJ, BB	9/14/00	13:52	CW	7/31/00	JH
C14-a	6/8/00	Soil Core Sample	MJ, BB	9/14/00	13:56	CW	7/31/00	JH
C14-b	6/8/00	Soil Core Sample	MJ, BB	9/14/00	15:10	CW	7/31/00	JH
C15-a	6/7/00	Soil Core Sample	MJ, BB	9/14/00	15:06	CW	7/31/00	JH
C15-b	6/7/00	Soil Core Sample	MJ, BB	9/14/00	14:22	CW	7/31/00	JH
C15-c	6/7/00	Soil Core Sample	MJ, BB	9/14/00	16:27	CW	7/31/00	JH
C15-d	6/7/00	Soil Core Sample	MJ, BB	9/14/00	13:03	CW	7/31/00	JH
C15-e	6/7/00	Soil Core Sample	MJ, BB	9/14/00	13:11	CW	7/31/00	JH
C15-f	6/7/00	Soil Core Sample	MJ, BB	9/14/00	14:58	CW	7/31/00	JH
C16-a	6/7/00	Soil Core Sample	MJ, BB	9/14/00	12:44	CW	7/31/00	JH
C17-a	5/19/00	Soil Core Sample	MJ	11/8/00	14:24	CW	10/5/00	JH

GKR Soil and Sediment Sample Information

Soil Sample Name	Collection Date	Sample Type	Sample Collector (s)	ICAP-ES Analysis Date	ICAP-ES Analysis Time	ICAP-ES Analyst (s)	pH Analysis Date	pH Analyst (s)
C17-b	5/19/00	Soil Core Sample	MJ	10/27/00	12:55	CW	10/5/00	JH
C17-c	5/19/00	Soil Core Sample	MJ	11/8/00	13:26	CW	10/5/00	JH
C17-c Split	5/19/00	Soil Core Sample	MJ	11/8/00	12:56	CW	10/5/00	JH
C17-d	5/19/00	Soil Core Sample	MJ	10/27/00	10:32	CW	10/5/00	JH
C17-e	5/19/00	Soil Core Sample	MJ	11/8/00	14:28	CW	10/5/00	JH
C18-a	5/19/00	Soil Core Sample	MJ	11/8/00	14:06	CW	10/5/00	JH
SED-1	7/13/00	Ditch Sediment	AB, JH, CW	9/11/00	11:36	CW	no analysis	no analysis
SED-2	7/13/00	Ditch Sediment	AB, JH, CW	9/11/00	12:45	CW	no analysis	no analysis
SED-3	7/13/00	Ditch Sediment	AB, JH, CW	9/12/00	11:11	CW	no analysis	no analysis
SED-4	7/13/00	Ditch Sediment	AB, JH, CW	9/12/00	12:21	CW	no analysis	no analysis
SED-5	7/13/00	Ditch Sediment	AB, JH, CW	9/12/00	13:46	CW	no analysis	no analysis
SED-6	7/13/00	Ditch Sediment	AB, JH, CW	9/11/00	11:40	CW	no analysis	no analysis
SED-6 Field Dup	7/13/00	Ditch Sediment	AB, JH, CW	9/11/00	14:33	CW	no analysis	no analysis
SED-7a	7/13/00	Ditch Sediment	AB, JH, CW	9/11/00	15:42	CW	no analysis	no analysis
SED-7b	7/13/00	Ditch Sediment	AB, JH, CW	9/11/00	15:46	CW	no analysis	no analysis
SED-8	7/13/00	Ditch Sediment	AB, JH, CW	9/12/00	11:07	CW	no analysis	no analysis
SED-8	7/13/00	Ditch Sediment	AB, JH, CW	9/12/00	11:07	CW	no analysis	no analysis
SED-9	7/13/00	Ditch Sediment	AB, JH, CW	9/11/00	13:31	CW	no analysis	no analysis
SED-9 Split	7/13/00	Ditch Sediment	AB, JH, CW	9/11/00	14:36	CW	no analysis	no analysis

APPENDIX A

A.3 pH QC Data

A.3.1 Soil pH Quality Control Standard Checks

Calibration buffer standards are periodically analyzed as unknowns in order to verify initial instrument calibration and to assess instrument performance over the duration of analysis.

Soil pH Standard

pH STANDARDS

pH Buffer Solution	Analysis Date	Analyst	pH
pH 4.00	5/23/00	SD	4.02
pH 4.00	5/23/00	CW	4.01
pH 4.00	5/23/00	CW	4.04
pH 4.00	5/23/00	SD	4.02
pH 4.00	5/23/00	JH	4.00
pH 4.00	5/24/00	SD	4.00
pH 4.00	5/24/00	SD	3.98
pH 4.00	6/9/00	SD	3.99
pH 4.00	6/12/00	SD	4.02
pH 4.00	6/12/00	SD	4.05
pH 4.00	6/13/00	JH	4.02
pH 4.00	6/13/00	JH	4.04
pH 4.00	6/14/00	SD	4.01
pH 4.00	6/14/00	SD	4.05
pH 4.00	6/14/00	SD	4.05
pH 4.00	6/15/00	SD	4.00
pH 4.00	6/15/00	SD	4.02
pH 4.00	6/15/00	SD	4.02
pH 4.00	6/19/00	SD	4.02
pH 4.00	6/19/00	SD	4.02
pH 4.00	6/19/00	JH	4.03
pH 4.00	6/20/00	JH	4.00
pH 4.00	6/20/00	SD	4.03
pH 4.00	6/22/00	SD	4.02

pH STANDARDS

pH Buffer Solution	Analysis Date	Analyst	pH
pH 4.00	6/22/00	SD	4.04
pH 4.00	6/22/00	SD	4.06
pH 4.00	6/22/00	SD	3.96
pH 4.00	6/22/00	JH	4.01
pH 4.00	6/22/00	JH	4.01
pH 4.00	7/24/00	JH	4.03
pH 4.00	7/24/00	SD	4.05
pH 4.00	7/31/00	SD	4.01
pH 4.00	7/31/00	JH	4.04
pH 4.00	7/31/00	JH	4.05
pH 4.00	7/31/00	JH	4.04
pH 4.00	8/1/00	JH	4.02
pH 4.00	8/1/00	SD	4.03
pH 4.00	8/1/00	SD	4.04
pH 4.00	8/1/00	SD	4.04
pH 4.00	8/21/00	JH	4.03
pH 4.00	8/21/00	JH	4.03
pH 4.00	8/21/00	JH	4.04
pH 4.00	8/21/00	SD	4.04
pH 4.00	8/21/00	SD	4.09
pH 4.00	10/5/00	JH	3.99
pH 4.00	10/5/00	JH	4.04
pH 4.00	10/5/00	JH	4.06
pH 4.00	10/5/00	JH	4.06
		Average	*4.03*
		Standard Deviation	*0.02*

Soil pH Standards

pH STANDARDS

pH Buffer Solution	Analysis Date	Analyst	pH
pH 7.00	5/1/00	CW	6.94
pH 7.00	5/22/00	CW	7.00
pH 7.00	5/22/00	JH, SD	7.01
pH 7.00	5/22/00	JH, SD	7.04
pH 7.00	5/22/00	JH, SD	7.02
pH 7.00	5/22/00	JH, SD	7.03
pH 7.00	5/22/00	JH, SD	7.05
pH 7.00	5/23/00	SD	6.98
pH 7.00	5/23/00	SD	7.01
pH 7.00	5/23/00	CW	7.02
pH 7.00	5/23/00	CW	7.00
pH 7.00	5/23/00	SD	7.03
pH 7.00	5/23/00	JH	7.03
pH 7.00	5/23/00	SD	7.00
pH 7.00	5/24/00	SD	7.05
pH 7.00	5/24/00	SD	7.03
pH 7.00	5/24/00	JH	7.03
pH 7.00	6/9/00	SD	6.98
pH 7.00	6/9/00	SD	7.02
pH 7.00	6/12/00	SD	7.01
pH 7.00	6/12/00	SD	7.05
pH 7.00	6/13/00	JH	7.03
pH 7.00	6/13/00	JH	7.03
pH 7.00	6/14/00	SD	7.02
pH 7.00	6/14/00	SD	7.04
pH 7.00	6/14/00	SD	7.04
pH 7.00	6/15/00	SD	7.01
pH 7.00	6/15/00	SD	7.02
pH 7.00	6/15/00	SD	7.03
pH 7.00	6/19/00	SD	7.00

pH STANDARDS

pH Buffer Solution	Analysis Date	Analyst	pH
pH 7.00	6/19/00	SD	7.03
pH 7.00	6/19/00	JH	7.03
pH 7.00	6/20/00	JH	7.01
pH 7.00	6/20/00	SD	7.03
pH 7.00	6/22/00	SD	7.02
pH 7.00	6/22/00	SD	7.04
pH 7.00	6/22/00	SD	7.07
pH 7.00	6/22/00	SD	6.99
pH 7.00	6/22/00	JH	7.02
pH 7.00	6/22/00	JH	7.01
pH 7.00	7/24/00	JH	7.00
pH 7.00	7/24/00	SD	7.02
pH 7.00	7/31/00	SD	6.97
pH 7.00	7/31/00	JH	7.01
pH 7.00	7/31/00	JH	7.01
pH 7.00	7/31/00	JH	7.00
pH 7.00	8/1/00	JH	7.01
pH 7.00	8/1/00	SD	7.00
pH 7.00	8/1/00	SD	7.00
pH 7.00	8/1/00	SD	7.01
pH 7.00	8/21/00	JH	7.02
pH 7.00	8/21/00	JH	7.04
pH 7.00	8/21/00	JH	7.03
pH 7.00	8/21/00	SD	6.99
pH 7.00	8/21/00	SD	7.00
pH 7.00	10/5/00	JH	7.01
pH 7.00	10/5/00	JH	7.04
pH 7.00	10/5/00	JH	7.06
pH 7.00	10/5/00	JH	7.04
		Average	*7.02*
		Standard Deviation	*0.02*

Soil pH Standards

pH STANDARDS			
pH Buffer Solution	Analysis Date	Analyst	pH
pH 10.00	5/22/00	CW	10.05
pH 10.00	5/22/00	JH, SD	10.05
pH 10.00	5/22/00	JH, SD	10.05
pH 10.00	5/22/00	JH, SD	10.07
pH 10.00	5/22/00	JH, SD	10.07
pH 10.00	5/22/00	JH, SD	10.09
pH 10.00	5/23/00	SD	10.05
pH 10.00	5/23/00	SD	10.05
pH 10.00	5/23/00	CW	10.07
pH 10.00	5/23/00	CW	10.08
pH 10.00	5/23/00	SD	10.06
pH 10.00	5/23/00	JH	10.05
pH 10.00	5/23/00	SD	10.07
pH 10.00	5/24/00	SD	10.03
pH 10.00	5/24/00	SD	10.05
pH 10.00	5/24/00	JH	10.05
pH 10.00	6/9/00	SD	10.02
pH 10.00	6/9/00	SD	10.03
pH 10.00	6/12/00	SD	10.02
pH 10.00	6/12/00	SD	10.06
pH 10.00	6/13/00	JH	10.02
pH 10.00	6/13/00	JH	10.04
pH 10.00	6/14/00	SD	10.03
pH 10.00	6/14/00	SD	10.06
pH 10.00	6/14/00	SD	10.06
pH 10.00	6/15/00	SD	10.06
pH 10.00	6/15/00	SD	10.06
pH 10.00	6/15/00	SD	10.08
pH 10.00	6/19/00	SD	10.05

pH STANDARDS			
pH Buffer Solution	Analysis Date	Analyst	pH
pH 10.00	6/19/00	SD	10.06
pH 10.00	6/19/00	JH	10.06
pH 10.00	6/20/00	JH	10.06
pH 10.00	6/20/00	SD	10.07
pH 10.00	6/22/00	SD	10.07
pH 10.00	6/22/00	SD	10.08
pH 10.00	6/22/00	SD	10.10
pH 10.00	6/22/00	SD	10.06
pH 10.00	6/22/00	JH	10.04
pH 10.00	6/22/00	JH	10.04
pH 10.00	7/24/00	JH	10.02
pH 10.00	7/24/00	SD	10.02
pH 10.00	7/31/00	SD	9.99
pH 10.00	7/31/00	JH	10.01
pH 10.00	7/31/00	JH	10.02
pH 10.00	7/31/00	JH	10.00
pH 10.00	8/1/00	JH	9.99
pH 10.00	8/1/00	SD	9.99
pH 10.00	8/1/00	SD	9.98
pH 10.00	8/1/00	SD	10.01
pH 10.00	8/21/00	JH	10.07
pH 10.00	8/21/00	JH	10.04
pH 10.00	8/21/00	JH	10.08
pH 10.00	8/21/00	SD	10.05
pH 10.00	8/21/00	SD	9.98
pH 10.00	10/5/00	JH	10.09
pH 10.00	10/5/00	JH	10.11
pH 10.00	10/5/00	JH	10.14
pH 10.00	10/5/00	JH	10.13
		Average	*10.05*
		Standard Deviation	*0.03*

APPENDIX A

A.3 pH QC Data

A.3.2 Decontamination Blanks

Decontamination Blanks are “clean” quartz sand that was poured over the surfaces of sample collection apparatus and collected in a sample container. Decontamination blanks were collected in order to ensure that decontamination procedures of apparatus between collections of samples were sufficient in preventing cross-contamination.

Soil pH QC Samples – Decontamination Blanks

Sample Name	Analysis Date	Analyzer	pH
SS-Blank1 (Sand 2)	5/22/00	CW, JH, SD	8.96
SS-Blank2 (Sand 2)	5/22/00	JH	8.98
SS-Blank3 (Sand 2)	5/23/00	SD	8.96
SS-Blank4 (Sand 2)	5/23/00	SD	8.85
SS-Blank5 (Sand 2)	5/23/00	JH	8.92
SS-Blank100 (Sand 2)	5/24/00	SD	8.70
		Average pH	*8.90*
		Standard Deviation	*0.11*
ESS-Blank (Sand 1)	5/1/00	CW	6.51

APPENDIX A

A.3 pH QC Data

A.3.3 Field and Laboratory Duplicates and Splits

Field Duplicates are samples that have been collected approximately three inches from the original sample location using identical sampling techniques and protocols. Field duplicates are collected, digested, and analyzed to provide a measure of the total field sampling and laboratory analytical precision and assess the extent of spatial heterogeneity.

Laboratory Duplicates are random samples analyzed twice, non-consecutively, in order to assess instrument or method performance over the duration of analysis.

Laboratory Split - Splits are randomly chosen samples that are coarsely mixed and divided into two parts in order to assess the homogeneity of the sample prior to grinding.

Percent difference of duplicates samples are calculated by dividing the absolute value of the difference between the original and the duplicate sample by the average value of the two samples. We then multiply this value by 100 to obtain percent units.

Soil pH QC Samples – Field Duplicates

Sample Name	Analysis Date	Analyzer	pH
ESS-5	5/1/00	CW	7.10
ESS-5 Field Dup	5/1/00	CW	7.39
%Difference			*4.0*
SS-8	5/22/00	JH, SD	7.01
SS-8 Field Dup	5/22/00	JH, SD	6.71
%Difference			*4.4*
SS-35	5/22/00	JH	4.85
SS-35 Field Dup	5/22/00	JH	4.95
%Difference			*2.0*
SS-57	5/23/00	CW	7.22
SS-57 Field Dup	5/23/00	CW	7.40
%Difference			*2.5*
SS-77	5/23/00	SD	4.44
SS-77 Field Dup	5/23/00	SD	4.38
%Difference			*1.4*
SS-83	5/23/00	JH	8.11
SS-83 Field Dup	5/23/00	JH	8.05
%Difference			*0.7*
SS-98	5/23/00	SD	7.04
SS-98 Field Dup	5/23/00	SD	7.01
%Difference			*0.4*
BP9-a	6/20/00	JH	7.73
BP9-a Field Dup	6/20/00	JH	7.76
%Difference			*0.4*
BP9-b	6/20/00	JH	7.53
BP9-b Field Dup	6/20/00	JH	7.60
%Difference			*0.9*
BP9-c	6/20/00	JH	7.78
BP9-c Field Dup	6/20/00	SD	7.72
%Difference			*0.8*
BP9-d	6/20/00	SD	8.00
BP9-d Field Dup	6/20/00	SD	7.98
%Difference			*0.3*
BP9-e	6/20/00	SD	8.26
BP9-e Field Dup	6/20/00	SD	8.27
%Difference			*0.1*
BP9-f	6/20/00	SD	8.25
BP9-f Field Dup	6/20/00	SD	8.16
%Difference			*1.1*
BP9-g	6/20/00	SD	7.44
BP9-g Field Dup	6/20/00	SD	7.45
%Difference			*0.1*

Soil pH QC Samples – Laboratory Duplicates

Sample Name	Analysis Date	Analyzer	pH
ESS-9	5/1/00	CW	6.51
ESS-9 Lab Dup	5/1/00	CW	6.6
%Difference			*1.5*
SS-1	5/22/00	JH, SD	7.96
SS-1 Lab Dup	5/22/00	JH, SD	7.96
%Difference			*0.0*
SS-9	5/22/00	JH, SD	8.00
SS-9 Lab Dup	5/22/00	JH, SD	7.85
%Difference			*1.9*
SS-19	5/22/00	JH, SD	7.44
SS-19 Lab Dup	5/22/00	JH, SD	7.48
%Difference			*0.5*
SS-29	5/22/00	JH	7.42
SS-29 Lab Dup	5/22/00	JH	7.31
%Difference			*1.5*
SS-37	5/22/00	JH	7.57
SS-37 Lab Dup	5/22/00	CW	7.50
%Difference			*0.9*
SS-47	5/23/00	SD	7.48
SS-47 Lab Dup	5/23/00	SD	7.23
%Difference			*3.4*
SS-56	5/23/00	CW	6.80
SS-56 Lab Dup	5/23/00	CW	6.70
%Difference			*1.5*
SS-65	5/23/00	CW	6.81
SS-65 Lab Dup	5/23/00	CW	6.99
%Difference			*2.6*
SS-75	5/23/00	SD	7.67
SS-75 Lab Dup	5/23/00	SD	7.74
%Difference			*0.9*
SS-83	5/23/00	JH	8.11
SS-83 Lab Dup	5/23/00	JH	8.10
%Difference			*0.1*
SS-92	5/23/00	SD	7.43
SS-92 Lab Dup	5/23/00	SD	7.52
%Difference			*1.2*
SS-101	5/23/00	SD	7.03
SS-101 Lab Dup	5/23/00	SD	7.12
%Difference			*1.3*
BP1-b	6/9/00	SD	7.85
BP1-b Lab Dup	6/9/00	SD	7.77
% Difference			*1.0*

Soil pH

QC Samples – Laboratory Duplicates

Sample Name	Analysis Date	Analyzer	pH
BP2-h	6/12/00	SD	5.30
BP2-h Lab Dup	6/12/00	SD	5.17
% Difference			*2.5*
BP3-b	6/13/00	JH	4.45
BP3-b Lab Dup	6/13/00	JH	4.40
% Difference			*1.1*
BP4-a	6/14/00	SD	7.43
BP4-a Lab Dup	6/14/00	SD	7.31
% Difference			*1.6*
BP5-a	6/14/00	JH	7.67
BP5-a Lab Dup	6/14/00	JH	7.61
% Difference			*0.8*
BP6-a	6/15/00	SD	7.27
BP6-a Lab Dup	6/15/00	SD	7.45
% Difference			*2.4*
BP7-a	6/15/00	SD	6.73
BP7-a Lab Dup	6/15/00	SD	6.83
% Difference			*1.5*
BP10-b	6/19/00	JH	8.44
BP10-b Lab Dup	6/19/00	JH	8.48
% Difference			*0.5*
BP8-f	6/19/00	SD	6.77
BP8-f Lab Dup	6/19/00	SD	6.59
% Difference			*2.7*
BP11-a	6/22/00	SD	7.94
BP11-a Lab Dup	6/22/00	SD	7.86
% Difference			*1.0*
BP12-f	6/22/00	SD	7.20
BP12-f Lab Dup	6/22/00	SD	7.14
% Difference			*0.8*
BP13-e	6/22/00	JH	6.90
BP13-e Lab Dup	6/22/00	JH	6.75
% Difference			*2.2*
SP2-a	6/22/00	JH	7.96
SP2-a Lab Dup	6/22/00	JH	7.98
% Difference			*0.3*
BP14-a	7/24/00	JH	8.52
BP14-a Lab Dup	7/24/00	JH	8.33
% Difference			*2.3*
BP15-b	7/24/00	SD	6.96
BP15-b Lab Dup	7/24/00	SD	6.99
% Difference			*0.4*

Soil pH QC Samples – Laboratory Duplicates

Sample Name	Analysis Date	Analyzer	pH
C9-a	7/31/00	SD	4.72
C9-a Lab Dup	7/31/00	JH	4.83
% Difference			*2.3*
C13-f	7/31/00	JH	6.09
C13-f Lab Dup	7/31/00	JH	6.05
% Difference			*0.7*
C1-d	8/1/00	SD	4.44
C1-d Lab Dup	8/1/00	SD	4.51
% Difference			*1.6*
C3-b	8/1/00	SD	8.16
C3-b Lab Dup	8/1/00	SD	8.20
% Difference			*0.5*
C5-d	8/1/00	SD	5.63
C5-d Lab Dup	8/1/00	SD	5.63
% Difference			*0.0*
CP10-e	8/21/00	JH	7.78
CP10-e Lab Dup	8/21/00	JH	7.70
% Difference			*1.0*
CP17-d	8/21/00	SD	7.39
CP17-d Lab Dup	8/21/00	SD	7.71
% Difference			*4.2*
CP20-b	8/21/00	JH	8.13
CP20-b Lab Dup	8/21/00	JH	8.01
% Difference			*1.5*
CP18-c	8/21/00	JH	8.68
CP18-c Lab Dup	8/21/00	JH	8.59
% Difference			*1.0*
CP11-e	10/5/00	JH	7.29
CP11-e Lab Dup	10/5/00	JH	7.31
% Difference			*0.3*
CP13-c	10/5/00	JH	7.10
CP13-c Lab Dup	10/5/00	JH	7.02
% Difference			*1.1*
C17-b	10/5/00	JH	5.93
C17-b Lab Dup	10/5/00	JH	5.89
% Difference			*0.7*

Soil pH QC Samples – Splits

Sample Name	Analysis Date	Analyzer	pH
SS-13	5/24/00	JH	7.84
SS-13 Split	5/24/00	JH	7.91
%Difference			*0.9*
SS-40	5/24/00	JH	7.11
SS-40 Split	5/24/00	JH	7.04
%Difference			*1.0*
SS-57	5/24/00	JH	7.39
SS-57 Split	5/24/00	JH	7.45
%Difference			*0.8*
SS-71	5/24/00	JH	4.46
SS-71 Split	5/24/00	JH	4.34
%Difference			*2.7*
SS-91	5/24/00	JH	6.05
SS-91 Split	5/24/00	JH	6.07
%Difference			*0.3*
BP1-e	6/9/00	SD	7.68
BP1-e Split	6/9/00	SD	7.67
%Difference			*0.1*
BP2-d	6/12/00	SD	4.36
BP2-d Split	6/12/00	SD	4.33
%Difference			*0.7*
BP3-h	6/13/00	JH	7.06
BP3-h Split	6/13/00	JH	7.14
%Difference			*1.1*
BP4-c	6/14/00	SD	5.24
BP4-c Split	6/14/00	SD	5.18
%Difference			*1.2*
BP5-d	6/14/00	SD	6.80
BP5-d Split	6/14/00	SD	6.73
%Difference			*1.0*
BP6-e	6/15/00	SD	4.64
BP6-e Split	6/15/00	SD	4.58
%Difference			*1.3*
BP7-d	6/15/00	SD	7.29
BP7-d Split	6/15/00	SD	7.33
%Difference			*0.5*
BP10-d	6/19/00	JH	8.65
BP10-d Split	6/19/00	JH	8.65
%Difference			*0.0*
BP8-c	6/19/00	SD	8.40
BP8-c Split	6/19/00	SD	8.43
%Difference			*0.4*

Soil pH QC Samples – Splits

Sample Name	Analysis Date	Analyzer	pH
BP14-d	7/24/00	JH	8.65
BP14-d Split	7/24/00	JH	8.66
%Difference			*0.1*
BP15-d	7/24/00	SD	5.04
BP15-d Split	7/24/00	SD	5.08
%Difference			*0.8*
C-10-a	7/31/00	SD	8.22
C-10-a Split	7/31/00	SD	8.15
%Difference			*0.9*
C-11-e	7/31/00	JH	7.56
C-11-e Split	7/31/00	JH	7.50
%Difference			*0.8*
C-13-e	7/31/00	JH	6.20
C-13-e Split	7/31/00	JH	6.16
%Difference			*0.6*
C-1-a	8/1/00	SD	6.06
C-1-a Split	8/1/00	SD	5.83
%Difference			*3.9*
C-7-a	8/1/00	SD	4.56
C-7-a Split	8/1/00	SD	4.54
%Difference			*0.4*
C-5-c	8/1/00	SD	7.04
C-5-c Split	8/1/00	SD	7.16
%Difference			*1.7*
CP15-c	8/21/00	JH	8.40
CP15-c Split	8/21/00	JH	8.44
%Difference			*0.5*
CP20-c	8/21/00	JH	8.35
CP20-c Split	8/21/00	JH	8.33
%Difference			*0.2*
CP18-b	8/21/00	JH	8.82
CP18-b Split	8/21/00	JH	8.79
%Difference			*0.3*
CP19-b	8/21/00	SD	7.80
CP19-b Split	8/21/00	SD	7.92
%Difference			*1.5*
CP12-d	10/5/00	JH	5.10
CP12-d Split	10/5/00	JH	5.18
%Difference			*1.6*
CP14-d	10/5/00	JH	7.36
CP14-d Split	10/5/00	JH	7.29
%Difference			*1.0*
C17-c	10/5/00	JH	6.06
C17-c Split	10/5/00	JH	5.80
%Difference			*4.4*

APPENDIX A

A.4 Metals QC Data

A.4.1 Instrument Performance Check Solutions

The Instrument Performance Check (IPC) is a composite solution containing known concentrations of analytes. The IPC is analyzed for initial and continuous calibration verification.

EPA Method 200.7 Instrument Performance Check Solution by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst (s)	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
7/11/00	11:30	CW	IPC	1.950	1.971	1.950	0.4097	1.017	0.4081	2.029	4.114	1.938	0.4000	1.961	2.000	2.026	0.9841
7/11/00	12:27	CW	IPC	1.910	1.929	1.957	0.4051	0.9932	0.4088	2.002	4.193	1.898	0.3930	1.937	2.002	2.003	0.9578
7/11/00	13:52	CW	IPC	1.942	1.934	1.910	0.4065	0.9990	0.4072	2.012	4.127	1.906	0.3969	1.933	1.993	2.005	0.9755
7/11/00	15:12	CW	IPC	1.935	1.930	1.914	0.4043	0.9960	0.4075	2.014	4.100	1.917	0.3908	1.940	1.969	2.000	0.9652
7/11/00	16:32	CW	IPC	1.945	1.933	1.883	0.4010	0.9885	0.4091	1.986	4.014	1.901	0.3914	1.928	1.970	1.986	0.9574
7/11/00	17:35	CW	IPC	1.935	1.928	1.954	0.4007	0.9895	0.4083	1.991	4.037	1.988	0.3909	1.932	1.966	1.976	0.9492
7/11/00	18:40	CW	IPC	1.918	1.911	1.906	0.3931	0.9835	0.3963	1.969	3.921	1.876	0.3817	1.891	1.930	1.955	0.9477
7/11/00	19:12	CW	IPC	1.910	1.903	1.900	0.3993	0.9755	0.3996	1.965	4.097	1.917	0.3909	1.901	1.968	1.964	0.9454
7/20/00	11:05	TMC	IPC	1.964	1.943	1.947	0.4178	1.016	0.4101	1.978	4.028	1.969	0.4034	1.938	1.957	2.044	0.9908
7/20/00	12:15	TMC	IPC	1.976	1.951	1.944	0.4108	1.017	0.4076	2.008	3.940	1.984	0.3964	1.933	1.962	2.030	0.9888
7/20/00	13:33	CW	IPC	1.980	1.931	2.004	0.4087	1.010	0.4106	1.965	3.919	1.980	0.3900	1.937	1.952	1.995	0.9672
7/20/00	14:21	CW	IPC	1.932	1.908	1.895	0.4084	0.9877	0.4040	1.955	3.976	1.902	0.3890	1.921	1.956	1.993	0.9617
7/20/00	15:44	CW	IPC	1.895	1.908	1.897	0.4077	0.9984	0.4028	1.959	3.964	1.963	0.3935	1.929	1.945	1.991	0.9646
7/20/00	16:40	CW	IPC	1.908	1.904	1.946	0.4066	0.9847	0.3972	1.949	3.974	1.918	0.3859	1.930	1.956	1.995	0.9629
7/21/00	9:18	TMC	IPC	1.958	1.943	1.905	0.4115	1.034	0.4091	1.959	3.985	1.939	0.3943	1.922	1.936	2.017	0.9874
7/21/00	10:14	TMC	IPC	1.974	1.982	1.920	0.4116	1.041	0.4112	2.025	3.937	2.001	0.4040	1.935	1.946	2.047	1.006
7/21/00	10:14	TMC	IPC	1.974	1.982	1.920	0.4116	1.041	0.4112	2.025	3.937	2.001	0.4040	1.935	1.946	2.047	1.006
7/21/00	10:20	TMC	IPC	1.970	1.999	1.969	0.4123	1.049	0.4081	2.023	3.866	1.943	0.3992	1.930	1.909	2.040	1.018
7/21/00	11:10	TMC	IPC	1.935	1.995	1.941	0.4088	1.033	0.4042	2.014	3.860	1.959	0.3963	1.928	1.903	2.020	1.006
7/21/00	12:10	TMC	IPC	1.978	1.977	1.948	0.4089	1.047	0.4070	2.013	3.864	1.945	0.3959	1.927	1.917	2.030	1.007
7/21/00	13:23	TMC	IPC	1.972	1.979	1.956	0.4049	1.026	0.4075	1.965	3.758	1.937	0.3884	1.908	1.869	2.001	0.9954
7/21/00	14:09	TMC	IPC	1.975	2.004	1.890	0.4022	1.030	0.4074	1.964	3.668	1.969	0.3901	1.924	1.859	1.992	0.9966
7/21/00	15:12	JH	IPC	1.952	1.984	1.895	0.4025	1.033	0.4092	1.986	3.761	1.969	0.3892	1.928	1.894	1.995	0.9932
7/21/00	16:15	CW	IPC	1.982	1.986	1.874	0.4012	1.020	0.4026	1.990	3.672	1.937	0.3878	1.919	1.890	1.994	0.9894
7/27/00	11:03	CW	IPC	2.000	1.939	1.969	0.4086	1.018	0.4054	1.967	4.108	1.926	0.4064	1.924	1.934	2.010	0.9769
7/27/00	12:23	SD	IPC	2.115	2.034	2.019	0.4100	1.042	0.4155	2.058	3.820	1.990	0.4165	1.947	1.908	2.052	1.010
7/27/00	13:32	SD	IPC	2.128	2.048	1.923	0.4022	1.036	0.4148	2.057	3.689	2.023	0.4055	1.940	1.880	2.027	0.9966
7/27/00	14:58	SD	IPC	2.094	2.050	1.998	0.4062	1.033	0.4107	2.015	3.733	2.000	0.4038	1.934	1.903	2.031	0.9978
7/27/00	15:53	SD	IPC	2.083	2.024	1.977	0.4076	1.030	0.4155	2.021	3.779	1.964	0.4101	1.942	1.901	2.036	0.9954
7/27/00	17:53	SD	IPC	2.112	2.050	1.963	0.4069	1.034	0.4161	2.032	3.738	1.958	0.4138	1.948	1.905	2.038	0.9972
7/27/00	18:56	SD	IPC	2.066	2.053	1.959	0.4050	1.042	0.4120	2.066	3.715	2.017	0.4114	1.959	1.905	2.043	1.003
8/16/00	11:11	CW	IPC	1.920	1.953	1.912	0.3953	0.9835	0.4002	1.927	4.043	1.954	0.3882	1.949	1.941	1.971	0.9514

EPA Method 200.7 Instrument Performance Check Solution by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst (s)	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
8/16/00	12:22	CW	IPC	1.896	1.916	1.920	0.3899	0.9606	0.3957	1.893	4.044	1.987	0.3784	1.930	1.973	1.952	0.9264
8/16/00	13:22	CW	IPC	1.917	1.923	1.876	0.3910	0.9683	0.3991	1.920	4.046	1.954	0.3738	1.935	1.973	1.950	0.9264
8/16/00	14:27	CW	IPC	1.925	1.919	1.926	0.3923	0.9712	0.4029	1.908	4.077	1.945	0.3842	1.946	1.988	1.960	0.9267
8/16/00	15:29	CW	IPC	1.903	1.919	1.866	0.3945	0.9707	0.3998	1.921	4.128	1.959	0.3783	1.946	2.011	1.964	0.9258
9/11/00	10:48	CW	IPC	1.961	2.012	1.942	0.4082	0.9948	0.4050	1.992	4.173	2.001	0.3942	1.993	1.977	2.019	0.9763
9/11/00	11:51	CW	IPC	1.955	1.998	1.913	0.4041	0.9630	0.4123	1.954	4.301	2.043	0.3863	2.073	2.025	1.971	0.9455
9/11/00	12:56	CW	IPC	1.943	1.989	1.989	0.4126	0.9785	0.4148	1.980	4.405	2.049	0.3950	2.064	2.070	2.015	0.9582
9/11/00	14:16	CW	IPC	1.931	1.969	1.903	0.4031	0.9522	0.4129	1.935	4.371	1.987	0.3847	2.056	2.026	1.958	0.9377
9/11/00	15:18	CW	IPC	1.933	1.972	1.900	0.4017	0.9492	0.4122	1.928	4.366	2.027	0.3825	2.058	2.019	1.957	0.9303
9/11/00	16:24	CW	IPC	1.906	1.958	1.888	0.4053	0.9529	0.4110	1.938	4.554	2.007	0.3803	2.079	2.060	1.963	0.9289
9/11/00	16:49	CW	IPC	1.938	1.989	1.901	0.4012	0.9501	0.4112	1.943	4.331	2.078	0.3818	2.074	2.008	1.962	0.9343
9/12/00	10:58	CW	IPC	1.960	2.006	1.968	0.4111	0.9933	0.3990	1.961	4.194	1.920	0.3813	2.034	1.950	2.052	0.9825
9/12/00	11:49	CW	IPC	1.993	2.039	1.962	0.4227	1.012	0.4105	2.025	4.400	2.014	0.3920	2.091	2.047	2.108	0.9956
9/12/00	12:59	CW	IPC	1.947	2.018	1.968	0.4128	0.9924	0.4025	1.983	4.262	1.990	0.3778	2.055	2.002	2.066	0.9763
9/12/00	14:16	CW	IPC	1.927	1.989	1.974	0.4201	0.9898	0.4010	1.987	4.258	1.982	0.3870	2.017	2.030	2.076	0.9842
9/12/00	15:27	CW	IPC	1.917	1.983	1.939	0.4188	0.9962	0.4010	1.995	4.264	1.973	0.3843	2.021	2.031	2.082	0.9826
9/12/00	16:26	CW	IPC	1.908	1.982	1.947	0.4164	0.9884	0.4015	1.980	4.354	2.014	0.3794	2.050	2.007	2.081	0.9719
9/13/00	10:43	CW	IPC	1.932	1.968	1.958	0.4040	0.9957	0.4013	1.920	4.015	1.961	0.3871	1.919	1.950	2.004	0.9657
9/13/00	11:38	CW	IPC	1.934	1.962	1.960	0.4028	0.9897	0.4022	1.925	3.982	1.956	0.3876	1.927	1.952	2.002	0.9616
9/13/00	12:38	CW	IPC	1.915	1.917	1.972	0.4058	0.9833	0.4012	1.906	4.182	1.943	0.3812	1.939	2.004	2.013	0.9516
9/13/00	14:55	CW	IPC	1.916	1.939	1.938	0.4027	0.9818	0.4045	1.926	4.065	1.899	0.3856	1.927	1.985	1.998	0.9490
9/13/00	16:08	CW	IPC	1.921	1.944	1.906	0.4008	0.9815	0.4065	1.902	4.046	1.941	0.3829	1.937	1.971	1.990	0.9418
9/14/00	10:28	CW	IPC	1.935	1.980	2.036	0.4126	1.001	0.4077	1.962	4.164	1.954	0.3909	1.940	2.007	2.059	0.9832
9/14/00	11:20	CW	IPC	1.951	2.017	1.974	0.4147	1.012	0.4091	1.981	4.209	1.988	0.3943	1.961	2.036	2.064	0.9883
9/14/00	12:20	CW	IPC	1.931	2.021	1.998	0.4143	1.011	0.4095	1.982	4.210	2.029	0.3955	1.961	2.034	2.059	0.9886
9/14/00	13:26	CW	IPC	1.919	1.996	1.975	0.4148	1.000	0.4115	1.973	4.308	2.035	0.3859	1.962	2.067	2.065	0.9793
9/14/00	14:38	CW	IPC	1.967	2.013	1.914	0.4061	0.9987	0.4123	1.962	4.002	2.010	0.3902	1.919	1.981	2.024	0.9704
9/14/00	15:44	CW	IPC	1.932	2.000	1.962	0.4131	0.9910	0.4143	1.973	4.227	2.002	0.3871	1.940	2.052	2.057	0.9700
9/14/00	16:46	CW	IPC	1.918	2.018	1.993	0.4160	1.004	0.4107	2.004	4.162	2.029	0.3824	1.935	2.044	2.063	0.9865
9/14/00	17:46	CW	IPC	1.951	1.991	1.910	0.4085	0.9979	0.4089	1.960	4.137	2.016	0.3839	1.946	2.005	2.036	0.9691
10/27/00	10:03	CW	IPC	1.975	2.012	1.947	0.4109	1.004	0.4097	1.988	4.202	1.973	0.3958	2.019	1.996	2.037	0.9844
10/27/00	11:03	CW	IPC	2.000	2.042	1.887	0.4105	1.004	0.4186	1.985	4.345	2.058	0.3892	2.118	2.072	2.023	0.9677

EPA Method 200.7 Instrument Performance Check Solution by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst (s)	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
10/27/00	13:33	CW	IPC	2.025	2.011	1.866	0.4092	0.9942	0.4250	1.979	4.090	2.110	0.3881	2.188	2.092	2.021	0.9528
10/27/00	14:21	CW	IPC	2.005	2.014	1.957	0.4141	0.9858	0.4306	1.995	4.166	2.084	0.3952	2.200	2.120	2.034	0.9508
11/7/00	11:24	CW	IPC	1.927	1.966	1.916	0.4019	0.9901	0.3954	1.981	3.973	1.932	0.3894	1.910	1.972	2.015	0.9771
11/7/00	12:17	CW	IPC	1.933	1.972	1.912	0.4087	0.9895	0.4036	2.007	4.122	1.950	0.3922	1.938	2.040	2.029	0.9781
11/7/00	13:34	CW	IPC	1.961	1.971	1.940	0.4041	0.9926	0.4018	1.986	4.092	1.908	0.3867	1.944	2.001	2.031	0.9713
11/7/00	14:36	CW	IPC	1.960	1.991	1.860	0.4070	0.9946	0.4103	2.004	4.130	1.940	0.3829	1.967	2.020	2.029	0.9716
11/7/00	15:22	CW	IPC	1.878	1.956	1.793	0.3966	0.9727	0.4056	1.964	4.128	2.026	0.3788	1.978	2.033	2.001	0.9415
11/7/00	15:39	TMC	IPC	1.881	1.917	1.814	0.3881	0.9555	0.3962	1.924	4.054	2.029	0.3734	1.937	1.980	1.945	0.9229
11/8/00	12:50	CW	IPC	1.943	1.942	1.930	0.3959	0.9736	0.3965	1.960	3.851	1.923	0.3874	1.938	1.943	1.967	0.9511
11/8/00	13:41	CW	IPC	1.958	1.931	1.986	0.4005	0.9696	0.4069	1.961	4.076	1.969	0.3839	1.953	1.991	1.986	0.9422
11/8/00	14:51	CW	IPC	1.960	1.965	1.912	0.3972	0.9696	0.4095	1.964	3.931	1.989	0.3762	1.962	1.991	1.964	0.9323
11/8/00	15:29	CW	IPC	1.950	1.926	1.994	0.3992	0.9690	0.4105	1.962	4.092	1.950	0.3812	1.965	2.001	1.972	0.9311
12/4/00	10:50	CW	IPC	1.930	1.957	1.940	0.4006	0.9891	0.3944	1.924	3.902	1.916	0.3846	1.921	1.920	1.985	0.9670
12/4/00	11:42	CW	IPC	1.936	2.003	2.074	0.4084	1.001	0.4027	2.036	4.098	1.949	0.4018	1.952	2.033	2.044	0.9977
12/4/00	12:29	CW	IPC	1.947	1.992	1.990	0.4096	0.9871	0.4044	2.043	4.211	1.961	0.3963	1.960	2.059	2.037	0.9951
			Average	*1.96*	*1.97*	*1.94*	*0.41*	*1.00*	*0.41*	*1.98*	*4.07*	*1.98*	*0.39*	*1.97*	*1.98*	*2.01*	*0.97*
			Standard Deviation	*0.30*	*0.30*	*0.27*	*0.06*	*0.15*	*0.06*	*0.30*	*0.60*	*0.25*	*0.06*	*0.30*	*0.31*	*0.31*	*0.15*
			N	*79*	*79*	*79*	*79*	*79*	*79*	*79*	*79*	*79*	*79*	*79*	*79*	*79*	*79*
			Maximum	*2.13*	*2.05*	*2.07*	*0.42*	*1.05*	*0.43*	*2.07*	*4.55*	*2.11*	*0.42*	*2.20*	*2.12*	*2.11*	*1.02*
			Minimum	*0.04*	*0.05*	*0.20*	*0.01*	*0.05*	*0.03*	*0.08*	*0.40*	*0.40*	*0.04*	*0.10*	*0.05*	*0.04*	*0.01*
			Given Value	*2.00*	*2.00*	*2.00*	*0.40*	*1.00*	*0.40*	*2.00*	*4.00*	*2.00*	*0.40*	*2.00*	*2.00*	*2.00*	*1.00*

APPENDIX A

A.4 Metals QC Data

A.4.2 Decontamination Blanks, Preparation Blanks and Calibration Blanks

Decontamination blanks are “clean” quartz sand that was poured over the surfaces of sample collection apparatus and collected in a sample container. Decontamination blanks were collected in order to ensure that decontamination procedures of apparatus between collections of samples were sufficient in preventing cross-contamination.

A preparation blank is an empty digest vessel that is treated exactly like samples throughout the digestion and analytical procedures. Preparation blanks are prepared in order to quantify potential contamination introduced during digestion procedures.

Calibration Blanks are the blank solution used for standardization of the ICAP-ES. Calibration Blanks assess instrument or method performance over the duration of analysis.

EPA Method 200.7 Decontamination Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
7/11/00	15:08	CW	6/19/00	Ground Sand 2 Blank	150	bpql	73	bpql	bpql	9.2	540	150	bpql	bpql	24	32	bpql	3.8
7/11/00	15:38	CW	6/19/00	Ground Sand 2 Blank	200	bpql	83	bpql	bpql	bpql	500	180	bpql	bpql	26	35	bpql	4.0
7/11/00	15:43	CW	6/19/00	Ground Sand 2 Blank	150	bpql	88	bpql	bpql	7.1	560	170	bpql	bpql	27	33	bpql	4.0
7/11/00	15:47	CW	6/19/00	Ground Sand 2 Blank	190	bpql	58	bpql	bpql	9.4	610	220	bpql	bpql	bpql	31	bpql	3.3
7/11/00	15:52	CW	6/19/00	Ground Sand 2 Blank	200	bpql	60	bpql	bpql	bpql	430	210	bpql	bpql	bpql	31	bpql	3.8
7/11/00	15:57	CW	6/19/00	Ground Sand 2 Blank	140	bpql	54	bpql	bpql	bpql	370	130	bpql	bpql	22	32	bpql	3.5
				Average	*171.7*	*n/a*	*69.33*	*n/a*	*n/a*	*8.567*	*501.7*	*176.7*	*n/a*	*n/a*	*24.75*	*32.33*	*n/a*	*3.733*
				Standard Deviation	*27.87*	*n/a*	*14.14*	*n/a*	*n/a*	*1.274*	*88.41*	*34.45*	*n/a*	*n/a*	*2.217*	*1.506*	*n/a*	*0.28*
7/11/00	16:02	CW	6/19/00	SS-Blank 1 (Sand 2)	180	bpql	75	bpql	bpql	bpql	450	220	bpql	bpql	26	35	bpql	4.1
7/11/00	16:07	CW	6/19/00	SS-Blank 2 (Sand 2)	280	bpql	91	bpql	bpql	bpql	460	310	bpql	bpql	23	37	bpql	3.6
7/11/00	16:12	CW	6/19/00	SS-Blank 3 (Sand 2)	180	bpql	82	bpql	bpql	bpql	440	190	bpql	bpql	25	36	bpql	3.9
7/11/00	16:18	CW	6/19/00	SS-Blank 4 (Sand 2)	220	bpql	53	bpql	bpql	bpql	480	230	bpql	bpql	bpql	20	bpql	3.6
7/11/00	16:22	CW	6/19/00	SS-Blank 5 (Sand 2)	310	bpql	68	bpql	bpql	bpql	460	370	bpql	bpql	26	33	bpql	3.6
7/11/00	16:26	CW	6/19/00	SS-Blank 100 (Sand 2)	210	bpql	40	bpql	bpql	bpql	320	250	bpql	bpql	bpql	19	bpql	2.7
9/14/00	16:08	CW	8/21/00	Core-Blank (Sand 2)	184	bpql	64	bpql	bpql	bpql	1308	198	bpql	13	21	37	bpql	bpql
11/7/00	12:01	CW	10/31/00	Core-Blank (Sand 2)	185	bpql	75	bpql	bpql	bpql	428	222	bpql	bpql	bpql	35	bpql	bpql
				Average	*218.6*	*n/a*	*68.57*	*n/a*	*n/a*	*n/a*	*543.3*	*248.8*	*n/a*	*13*	*24.2*	*31.5*	*n/a*	*3.583*
				Standard Deviation	*50.01*	*n/a*	*16.24*	*n/a*	*n/a*	*n/a*	*312.9*	*61.38*	*n/a*	*n/a*	*2.168*	*7.521*	*n/a*	*0.479*
				% difference	*24%*	*n/a*	*1%*	*n/a*	*n/a*	*n/a*	*8%*	*34%*	*n/a*	*n/a*	*2%*	*3%*	*n/a*	*4%*

EPA Method 200.7 Decontamination Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
7/11/00	13:11	CW	6/15/00	Unground Sand 2 Blank	42	bpql	74	bpql	bpql	bpql	340	bpql	bpql	bpql	bpql	32	bpql	4.1
7/11/00	13:36	CW	6/15/00	Unground Sand 2 Blank	39	bpql	bpql	bpql	bpql	bpql	230	bpql	bpql	bpql	bpql	18	bpql	4.7
7/11/00	13:41	CW	6/15/00	Unground Sand 2 Blank	53	bpql	140	bpql	bpql	bpql	270	bpql	bpql	bpql	bpql	61	bpql	4.3
7/11/00	13:48	CW	6/15/00	Unground Sand 2 Blank	43	bpql	50	bpql	bpql	bpql	380	bpql	bpql	bpql	bpql	23	bpql	3.9
7/11/00	14:20	CW	6/15/00	Unground Sand 2 Blank	55	bpql	bpql	bpql	bpql	bpql	490	bpql	bpql	bpql	bpql	17	bpql	4.2
				Average	*46.4*	*n/a*	*88*	*n/a*	*n/a*	*n/a*	*342*	*n/a*	*n/a*	*n/a*	*n/a*	*30.2*	*n/a*	*4.24*
				Standard Deviation	*7.127*	*n/a*	*46.6*	*n/a*	*n/a*	*n/a*	*101.3*	*n/a*	*n/a*	*n/a*	*n/a*	*18.21*	*n/a*	*0.297*
9/11/00	15:50	CW	8/3/00	Sed-Blank (unground Sand 2)	51	bpql	bpql	bpql	bpql	bpql	357	bpql	bpql	bpql	bpql	19	bpql	3.6
				% difference	*9%*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*4%*	*n/a*	*n/a*	*n/a*	*n/a*	*46%*	*n/a*	*16%*
9/11/00	12:14	CW	8/2/00	ESS-Blank (Sand 1)	269	bpql	133	bpql	bpql	bpql	2556	bpql	bpql	24	bpql	12	bpql	6.1

EPA Method 200.7 Calibration Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst (s)	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
7/11/00	12:32	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
7/20/00	11:10	TMC	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
7/20/00	12:20	TMC	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
7/20/00	16:54	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
7/21/00	9:23	TMC	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
7/21/00	10:24	TMC	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
7/21/00	11:14	TMC	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
7/27/00	11:07	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
7/27/00	17:05	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
7/27/00	17:59	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/16/00	11:57	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.48	bpql	bpql	0.55	bpql	bpql	bpql
8/16/00	12:17	CW	CAL BLANK	0.06	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/16/00	13:18	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/16/00	14:23	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/16/00	15:46	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/11/00	11:47	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/11/00	12:52	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/11/00	14:12	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/11/00	15:14	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/11/00	16:20	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/11/00	16:40	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/12/00	11:45	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/12/00	12:51	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/12/00	13:17	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/12/00	14:12	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/12/00	15:23	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/12/00	16:22	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/13/00	11:34	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/13/00	12:34	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/13/00	14:51	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/13/00	15:15	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/13/00	16:04	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql

EPA Method 200.7 Calibration Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst (s)	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
9/14/00	11:16	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/14/00	12:16	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/14/00	13:22	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/14/00	14:34	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/14/00	15:40	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/14/00	16:42	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/14/00	17:43	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/14/00	12:32	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/27/00	10:59	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/27/00	12:04	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/27/00	12:38	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/27/00	13:29	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/27/00	14:17	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
11/7/00	12:13	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
11/7/00	12:34	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
11/7/00	13:25	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
11/7/00	14:32	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
11/7/00	15:18	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
11/8/00	13:37	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
11/8/00	13:57	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
11/8/00	14:47	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
11/8/00	15:25	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
12/4/00	11:38	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
12/4/00	12:25	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
Note: bpql = below probable quantitative limit																	
			# out of 54 runs above PQL	1	0	0	0	0	0	0	1	0	0	1	0	0	0
			Maximum value above PQL	0.06	n/a	n/a	n/a	n/a	n/a	n/a	0.48	n/a	n/a	0.55	n/a	n/a	n/a

EPA Method Digest 3050B Preparation Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
7/11/00	12:38	CW	Prep Blank 061500	bpql	bpql	bpql	bpql	bpql	bpql	32	bpql	bpql	bpql	23	bpql	bpql	3.3
7/11/00	15:04	CW	Prep Blank 061900	bpql	bpql	bpql	bpql	bpql	bpql	42	bpql	bpql	bpql	bpql	bpql	bpql	3.3
7/20/00	12:50	CW	Prep Blank 070600	bpql	bpql	bpql	bpql	bpql	bpql	170	bpql	bpql	bpql	bpql	bpql	bpql	1.8
7/20/00	16:33	CW	Prep Blank 071700	bpql	bpql	bpql	bpql	bpql	bpql	310	bpql	bpql	bpql	bpql	bpql	bpql	4.7
7/21/00	10:03	TMC	Prep Blank 071700	bpql	bpql	bpql	bpql	bpql	bpql	81	bpql	bpql	bpql	bpql	bpql	bpql	3.8
7/21/00	12:30	CW	Prep Blank 072000	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	3.4
7/27/00	12:15	SD	Prep Blank 072400	8.7	bpql	bpql	bpql	bpql	bpql	56	bpql	bpql	bpql	bpql	bpql	bpql	2.4
7/27/00	17:45	CW	Prep Blank 072500	10	bpql	bpql	bpql	bpql	bpql	880	bpql	bpql	bpql	bpql	bpql	bpql	3.5
8/16/00	11:26	CW	Prep Blank 080800	bpql	bpql	bpql	bpql	bpql	bpql	33	bpql	bpql	bpql	bpql	bpql	bpql	3.3
8/16/00	13:56	CW	Prep Blank 080800	bpql	bpql	bpql	bpql	bpql	bpql	27	bpql	bpql	bpql	bpql	bpql	bpql	3.8
9/11/00	12:18	CW	Prep Blank 080200	bpql	bpql	bpql	bpql	bpql	bpql	481	bpql	bpql	bpql	bpql	bpql	bpql	5.3
9/11/00	14:01	CW	Prep Blank 080300	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	3.0
9/12/00	15:12	CW	Prep Blank 081000	bpql	bpql	bpql	bpql	bpql	bpql	145	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/13/00	11:11	CW	Prep Blank 081600	bpql	bpql	bpql	bpql	bpql	bpql	1135	bpql	bpql	10.28	bpql	bpql	bpql	bpql
9/14/00	13:07	CW	Prep Blank 082100	bpql	bpql	bpql	bpql	bpql	bpql	197	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/27/00	13:51	CW	Prep Blank 102500	12	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
11/8/00	15:10	CW	Prep Blank 110200	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
12/4/00	11:27	CW	Prep Blank 120100	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
Note: bpql = below probable quantitative limit																	
			# out of 18 runs above PQL	*3*	*0*	*0*	*0*	*0*	*0*	*13*	*0*	*0*	*1*	*1*	*0*	*0*	*12*
			Maximum value above PQL	*11.86*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*1135*	*n/a*	*n/a*	*10.28*	*23*	*n/a*	*n/a*	*5.28*

APPENDIX A

A.4 Metals QC Data

A.4.3 Field, Preparation and Laboratory Duplicates and Splits

Field Duplicates are samples that have been collected approximately three inches from the original sample location using identical sampling techniques and protocols. Field duplicates are collected, digested, and analyzed to provide a measure of the total field sampling and laboratory analytical precision and assess the extent of spatial heterogeneity.

A preparation duplicate is a randomly chosen ground sample that is weighed out twice and treated identically throughout the digestion and analytical procedures. Preparation duplicates are prepared in order to observe sample homogeneity and to assess the reproducibility of analyte recoveries by the digestion procedure.

Laboratory Duplicates are random sample digests analyzed twice, non-consecutively, in order to assess instrument or method performance over the duration of analysis.

Laboratory Split - Splits are randomly chosen samples that are coarsely mixed and divided into two parts in order to assess the homogeneity of the sample prior to grinding.

Percent difference of duplicates samples are calculated by dividing the absolute value of the difference between the original and the duplicate sample by the average value of the two samples. We then multiply this value by 100 to obtain percent units.

EPA Method 200.7 Field Duplicates by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
SS-8	26,000	23	6,000	1.4	13	100	19,000	5,200	6,500	780	270	550	32	350
SS-8 Field Dup	27,000	24	5,800	1.4	13	89	19,000	5,200	6,600	840	310	470	34	320
% difference	4%	4%	3%	0%	0%	12%	0%	0%	2%	7%	14%	16%	6%	9%
SS-83	23,000	42	25,000	1.5	53	280	26,000	2,000	9,600	660	370	1,100	63	360
SS-83 Field Dup	22,000	44	26,000	1.5	51	260	26,000	2,000	9,400	710	400	1,200	60	300
% difference	4%	5%	4%	0%	4%	7%	0%	0%	2%	7%	8%	9%	5%	18%
SS-77	8,800	310	4,300	2.8	10	2,100	19,000	2,300	3,300	250	480	550	280	1,400
SS-77 Field Dup	11,000	310	5,000	2.8	12	2,300	20,000	2,800	3,800	310	620	580	270	1,500
% difference	22%	0%	15%	0%	18%	9%	5%	20%	14%	21%	25%	5%	4%	7%
SS-98	20,000	530	9,700	9.3	42	6,000	30,000	3,400	8,200	1,900	360	1,400	910	2,400
SS-98 Field Dup	20,000	470	9,600	8.2	44	5,600	32,000	3,400	8,300	1,800	410	1,300	810	2,200
% difference	0%	12%	1%	13%	5%	7%	6%	0%	1%	5%	13%	7%	12%	9%
SS-35	9,600	720	5,200	6.2	10	4,400	24,000	3,400	3,500	560	870	790	440	2,000
SS-35 Field Dup	8,900	780	5,500	5.6	10	2,900	24,000	3,500	3,300	640	1,000	720	460	2,100
% difference	8%	8%	6%	10%	0%	41%	0%	3%	6%	13%	14%	9%	4%	5%
SS-57	16,000	730	14,000	8.5	19	4,300	27,000	4,100	5,400	1,400	750	870	590	2,300
SS-57 Field Dup	16,000	710	14,000	8.0	19	4,800	26,000	3,700	5,600	1,000	660	860	580	2,200
% difference	0%	3%	0%	6%	0%	11%	4%	10%	4%	33%	13%	1%	2%	4%
ESS-5	22,000	21	6,500	1.4	32	78	27,000	5,300	7,500	790	350	900	35	100
ESS-5 Field Dup	23,000	25	6,900	1.6	31	89	25,000	5,600	7,500	820	380	870	40	120
% difference	4%	17%	6%	13%	3%	13%	8%	6%	0%	4%	8%	3%	13%	18%
SED-6	19,000	110	38,000	11	27	2,400	24,000	3,700	13,957	2,000	290	1,500	270	2,500
SED-6 Field Dup	23,000	49	25,000	7.9	34	840	26,000	4,300	13,879	1,400	310	1,500	110	1,700
% difference	19%	77%	41%	33%	23%	96%	8%	15%	1%	35%	7%	0%	84%	38%

EPA Method 200.7 Field Duplicates by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
BP9-b	27,000	10	9,300	bpql	28	33	26,000	4,800	9,300	470	330	890	26	82
BP9-b Field Dup	27,000	bpql	10,695	bpql	26	40	25,000	4,800	9,100	460	360	1,100	20	85
% difference	0%	N/A	14%	N/A	7%	19%	4%	0%	2%	2%	9%	21%	26%	4%
BP9-d	18,000	42	9,200	12	22	2,800	22,000	3,900	6,800	1,600	440	860	32	2,000
BP9-d Field Dup	18,000	51	7,400	9.9	20	4,500	22,000	3,900	7,000	1,600	410	860	34	2,100
% difference	0%	19%	22%	19%	10%	47%	0%	0%	3%	0%	7%	0%	6%	5%
BP9-g	14,000	99	7,800	3.1	18	700	20,000	4,200	5,200	710	530	810	120	710
BP9-g Field Dup	14,000	95	7,400	3	17	690	20,000	4,200	5,100	630	490	840	120	710
% difference	0%	4%	5%	3%	6%	1%	0%	0%	2%	12%	8%	4%	0%	0%
BP9-c	26,000	bpql	6,600	bpql	22	27	23,000	4,600	8,400	530	370	690	22	67
BP9-c Field Dup	25,000	11	6,700	bpql	22	27	24,000	5,000	8,500	580	420	710	22	70
% difference	4%	N/A	2%	N/A	0%	0%	4%	8%	1%	9%	13%	3%	0%	4%
BP9-e	11,000	870	5,500	4.1	15	2,000	31,000	3,400	4,500	780	310	910	660	1,600
BP9-e Field Dup	12,000	830	5,600	4.7	16	2,000	30,000	3,800	4,700	870	380	910	640	1,800
% difference	9%	5%	2%	14%	6%	0%	3%	11%	4%	11%	20%	0%	3%	12%
BP9-a	5,300	bpql	2,800	bpql	13	bpql	16,000	1,500	1,900	110	310	490	9.1	31
BP9-a Field Dup	6,600	bpql	3,900	bpql	16	6.2	18,000	1,800	2,200	150	580	540	12	49
% difference	22%	N/A	33%	N/A	21%	N/A	12%	18%	15%	31%	61%	10%	27%	45%
BP9-f	14,000	370	6,200	10	17	2,300	26,000	4,200	4,800	1,100	500	880	330	2,100
BP9-f Field Dup	13,000	390	6,100	12	17	2,400	26,000	3,900	4,800	1,200	410	900	330	2,200
% difference	7%	5%	2%	18%	0%	4%	0%	7%	0%	9%	20%	2%	0%	5%

Note: bpql = below probable quantitative limit

EPA Method Digest 3050B Preparation Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
7/11/00	16:49	CW	6/19/00	SS-1	19,000	19	6,400	1.0	13	87	17,000	3,700	5,600	440	240	690	36	110
7/11/00	16:54	CW	6/19/00	SS-1 Prep Dup	19,000	18	6,300	1.1	14	90	17,000	3,700	5,600	440	230	710	37	110
				% difference	0%	5%	2%	10%	7%	3%	0%	0%	0%	0%	4%	3%	3%	0%
7/11/00	17:58	CW	6/19/00	SS-9	32,000	23	7,700	1.1	14	87	22,000	4,800	8,500	620	420	530	29	270
7/11/00	18:02	CW	6/19/00	SS-9 Prep Dup	32,000	21	7,700	1.0	15	88	21,000	4,900	8,600	630	430	530	29	270
				% difference	0%	9%	0%	10%	7%	1%	5%	2%	1%	2%	2%	0%	0%	0%
7/11/00	18:26	CW	6/19/00	SS-14	16,000	65	7,300	6.3	15	1,500	21,000	3,300	4,300	2,900	220	890	260	1,900
7/11/00	18:30	CW	6/19/00	SS-14 Prep Dup	15,000	68	7,200	6.4	19	1,500	21,000	3,100	4,200	2,900	200	880	260	1,900
				% difference	6%	5%	1%	2%	24%	0%	0%	6%	2%	0%	10%	1%	0%	0%
7/20/00	13:37	CW	7/6/00	SS-20	11,000	320	4,000	6.4	17	1,100	30,000	2,800	3,800	1,300	320	690	280	1,300
7/20/00	13:46	CW	7/6/00	SS-20 Prep Dup	11,000	310	4,100	6.8	16	1,200	30,000	3,000	3,800	1,400	320	710	280	1,300
				% difference	0%	3%	2%	6%	6%	9%	0%	7%	0%	7%	0%	3%	0%	0%
7/20/00	11:59	TMC	7/6/00	BP3-c	9,400	1,200	1,800	5.8	14	1,200	30,000	3,200	3,800	530	550	760	690	2,000
7/20/00	12:24	TMC	7/6/00	BP3-c Prep Dup	9,700	1,100	1,800	5.6	11	1,200	29,000	3,200	3,700	520	540	740	670	2,000
				% difference	3%	9%	0%	4%	24%	0%	3%	0%	3%	2%	2%	3%	3%	0%
7/20/00	11:24	TMC	7/6/00	BP3-g	9,700	bpql	3,200	4.0	11	1,400	14,000	2,400	3,100	990	470	480	17	700
7/20/00	11:16	TMC	7/6/00	BP3-g Prep Dup	9,700	bpql	3,100	3.9	11	1,400	13,000	2,400	3,100	1,000	480	470	16	700
				% difference	0%	N/A	3%	3%	0%	0%	7%	0%	0%	1%	2%	2%	6%	0%
7/20/00	15:14	TMC	7/6/00	BP4-d	15,000	580	4,300	3.0	17	4,500	26,000	3,600	5,100	2,200	370	820	1,400	1,400
7/20/00	15:18	CW	7/6/00	BP4-d Prep Dup	15,000	590	4,300	2.8	19	4,600	27,000	3,600	5,200	2,200	380	820	1,400	1,500
				% difference	0%	2%	0%	7%	11%	2%	4%	0%	2%	0%	3%	0%	0%	7%
7/20/00	16:11	CW	7/17/00	BP4-g	6,400	bpql	3,000	bpql	11	6	23,000	1,500	2,400	290	330	680	20	86
7/20/00	16:07	TMC	7/17/00	BP4-g Prep Dup	6,600	bpql	3,100	bpql	12	bpql	24,000	1,600	2,400	300	340	690	19	87
				% difference	3%	N/A	3%	N/A	9%	N/A	4%	6%	0%	3%	3%	1%	5%	1%
7/20/00	15:59	TMC	7/17/00	BP6-a	14,000	97	7,100	3.0	18	670	21,000	3,700	5,300	840	340	720	130	690
7/20/00	15:50	CW	7/6/00	BP6-a Prep Dup	13,000	96	6,900	3.0	44	640	20,000	3,500	5,100	810	330	700	120	680
				% difference	7%	1%	3%	0%	84%	5%	5%	6%	4%	4%	3%	3%	8%	1%

EPA Method Digest 3050B Preparation Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
7/20/00	13:37	CW	7/6/00	SS-20	11,000	320	4,000	6.4	17	1,100	30,000	2,800	3,800	1,300	320	690	280	1,300
7/20/00	14:00	CW	7/6/00	SS-20 Prep Dup	11,000	320	4,100	6.4	16	1,200	30,000	3,000	3,900	1,400	330	700	280	1,300
				% difference	0%	0%	2%	0%	6%	9%	0%	7%	3%	7%	3%	1%	0%	0%
7/20/00	11:59	TMC	7/6/00	BP3-c	9,400	1,200	1,800	5.8	14	1,200	30,000	3,200	3,800	530	550	760	690	2,000
7/20/00	12:42	CW	7/6/00	BP3-c Prep Dup	10,000	1,100	1,700	5.5	11	1,200	29,000	3,300	3,700	510	550	720	660	1,900
				% difference	6%	9%	6%	5%	24%	0%	3%	3%	3%	4%	0%	5%	4%	5%
7/20/00	15:14	TMC	7/6/00	BP4-d	15,000	580	4,300	3.0	17	4,500	26,000	3,600	5,100	2,200	370	820	1,400	1,400
7/20/00	15:22	CW	7/6/00	BP4-d Prep Dup	15,000	580	4,200	2.9	19	4,400	26,000	3,500	5,100	2,100	360	800	1,400	1,400
				% difference	0%	0%	2%	3%	11%	2%	0%	3%	0%	5%	3%	2%	0%	0%
7/21/00	11:42	TMC	7/17/00	BP10-b	15,000	bpql	4,400	bpql	22	13	19,000	3,300	5,400	140	260	720	18	39
7/21/00	11:03	TMC	7/17/00	BP10-b Prep Dup	15,000	bpql	4,400	bpql	23	13	19,000	3,200	5,400	140	260	700	15	37
				% difference	0%	N/A	0%	N/A	4%	0%	0%	3%	0%	0%	0%	3%	18%	5%
7/21/00	13:33	CW	7/20/00	SS-40	39,000	16	7,800	1.6	18	93	24,000	6,700	9,800	840	220	810	39	600
7/21/00	12:54	CW	7/20/00	SS-40 Prep Dup	38,000	15	7,600	1.6	17	91	23,000	6,600	9,600	830	210	790	37	590
				% difference	3%	6%	3%	0%	6%	2%	4%	2%	2%	1%	5%	3%	5%	2%
7/21/00	13:53	TMC	7/20/00	SS-49	19,000	35	55,000	2.3	19	290	18,000	4,400	8,900	630	670	730	53	500
7/21/00	14:47	CW	7/20/00	SS-49 Prep Dup	20,000	33	56,000	2.5	19	300	18,000	4,400	9,200	640	690	730	52	510
				% difference	5%	6%	2%	8%	0%	3%	0%	0%	3%	2%	3%	0%	2%	2%
7/21/00	13:45	CW	7/20/00	SS-51	17,000	440	6,000	9.0	17	5,300	23,000	3,800	4,800	2,200	390	780	370	2,600
7/21/00	13:37	CW	7/20/00	SS-51 Prep Dup	16,000	430	5,800	9.0	17	5,200	23,000	3,700	4,700	2,200	380	760	360	2,500
				% difference	6%	2%	3%	0%	0%	2%	0%	3%	2%	0%	3%	3%	3%	4%
7/27/00	11:46	CW	7/24/00	SS-67	23,000	540	7,100	4.5	37	4,300	32,000	3,800	7,800	830	270	980	390	1,300
7/27/00	15:30	SD	7/24/00	SS-67 Prep Dup	23,000	530	7,000	4.1	37	4,200	32,000	3,700	7,800	820	280	970	380	1,300
				% difference	0%	2%	1%	9%	0%	2%	0%	3%	0%	1%	4%	1%	3%	0%
7/27/00	13:56	SD	7/24/00	SS-73	20,000	290	9,400	4.4	25	2,000	25,000	4,800	7,700	860	370	1,100	290	1,200
7/27/00	11:20	CW	7/24/00	SS-73 Prep Dup	20,000	290	9,300	4.7	26	2,000	25,000	4,800	7,600	850	390	1,000	280	1,200
				% difference	0%	0%	1%	7%	4%	0%	0%	0%	1%	1%	5%	10%	4%	0%

EPA Method Digest 3050B Preparation Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
7/27/00	15:41	SD	7/25/00	SS-85	20,000	28	120,000	bpql	23	78	18,000	4,800	17,000	950	660	1,400	30	90
7/27/00	18:48	CW	7/25/00	SS-85 Prep Dup	21,000	29	120,000	bpql	24	79	18,000	4,900	18,000	960	680	1,400	31	97
				% difference	5%	4%	0%	N/A	4%	1%	0%	2%	6%	1%	3%	0%	3%	7%
7/27/00	18:44	CW	7/25/00	SS-94	21,000	89	58,000	4.0	35	440	26,000	4,600	15,000	980	750	1,800	81	770
7/27/00	16:39	CW	7/25/00	SS-94 Prep Dup	20,000	89	58,000	3.7	36	440	26,000	4,600	15,000	970	740	1,800	84	760
				% difference	5%	0%	0%	8%	3%	0%	0%	0%	0%	1%	1%	0%	4%	1%
7/27/00	15:49	SD	7/24/00	SS-101	36,000	48	11,000	bpql	73	99	44,000	1,900	10,000	1,500	510	1,300	54	120
7/27/00	18:25	CW	7/25/00	SS-101 Prep Dup	36,000	47	11,000	bpql	73	98	44,000	1,800	10,000	1,500	490	1,300	54	120
				% difference	0%	2%	0%	N/A	0%	1%	0%	5%	0%	0%	4%	0%	0%	0%
7/27/00	17:50	CW	7/25/00	SS-108	17,000	170	93,000	4.2	22	1,400	20,000	2,700	8,100	1,100	270	1,000	320	1,400
7/27/00	16:15	CW	7/25/00	SS-108 Prep Dup	18,000	180	96,000	4.5	25	1,400	20,000	2,800	8,500	1,100	280	1,100	330	1,400
				% difference	6%	6%	3%	7%	13%	0%	0%	4%	5%	0%	4%	10%	3%	0%
8/16/00	15:14	CW	8/8/00	BP14-b	15,000	bpql	4,700	bpql	24	16	21,000	3,600	6,300	290	410	670	18	44
8/16/00	15:10	CW	8/8/00	BP14-b Prep Dup	15,000	bpql	4,700	bpql	23	16	20,000	3,500	6,200	290	400	660	18	44
				% difference	0%	N/A	0%	N/A	4%	0%	5%	3%	2%	0%	2%	2%	0%	0%
8/16/00	14:00	CW	8/8/00	BP14-g	15,000	110	7,500	3.7	19	830	22,000	4,600	5,500	890	680	830	140	900
8/16/00	14:04	CW	8/8/00	BP14-g Prep Dup	15,000	120	7,700	3.8	19	850	22,000	4,700	5,700	910	710	870	150	930
				% difference	0%	9%	3%	3%	0%	2%	0%	2%	4%	2%	4%	5%	7%	3%
8/16/00	12:44	CW	8/8/00	BP2-i	15,000	bpql	4,300	bpql	19	14	16,000	3,700	5,400	160	530	690	17	50
8/16/00	12:40	CW	8/8/00	BP2-i Prep Dup	14,000	bpql	4,300	bpql	19	14	16,000	3,600	5,300	160	520	680	18	50
				% difference	7%	N/A	0%	N/A	0%	0%	0%	3%	2%	0%	2%	1%	6%	0%
8/16/00	15:18	CW	8/8/00	BP8-d	21,000	bpql	7,000	bpql	24	24	22,000	3,700	7,900	550	500	780	24	65
8/16/00	14:55	CW	8/8/00	BP8-d Prep Dup	21,000	bpql	7,100	bpql	25	24	22,000	3,800	8,000	570	510	780	19	67
				% difference	0%	N/A	1%	N/A	4%	0%	0%	3%	1%	4%	2%	0%	23%	3%
9/11/00	13:57	CW	8/3/00	BP13-e	9,000	510	3,200	2.7	bpql	740	23,000	3,300	3,100	540	270	630	440	1,100
9/11/00	15:07	CW	8/3/00	BP13-e Prep Dup	9,000	510	3,100	2.7	bpql	730	23,000	3,300	3,000	540	270	620	440	1,100
				% difference	0%	0%	3%	0%	N/A	1%	0%	0%	3%	0%	0%	2%	0%	0%

EPA Method Digest 3050B Preparation Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
9/11/00	12:45	CW	8/3/00	SED-2	23,000	52	21,000	6.3	17	720	24,000	5,100	8,400	2,700	260	1,100	110	1,600
9/11/00	14:05	CW	8/3/00	SED-2 Prep Dup	24,000	52	20,000	6.2	17	720	24,000	5,100	8,300	2,700	260	1,000	110	1,500
				% difference	4%	0%	5%	2%	0%	0%	0%	0%	1%	0%	0%	10%	0%	6%
9/11/00	14:40	CW	8/2/00	BP2-b	8,000	230	3,300	4.6	10	1,100	20,000	3,000	3,000	480	310	690	210	1,200
9/12/00	13:42	CW	8/2/00	BP2-b Prep Dup	8,600	230	3,500	4.9	12	1,100	21,000	3,300	3,000	490	330	700	230	1,200
				% difference	7%	0%	6%	6%	18%	0%	5%	10%	0%	2%	6%	1%	9%	0%
9/11/00	15:54	CW	8/2/00	BP1-e	10,000	550	3,600	4.1	bdl	990	25,000	5,900	3,000	330	620	770	500	1,300
9/12/00	11:30	CW	8/2/00	BP1-e Prep Dup	11,000	570	3,700	4.7	12	980	25,000	6,300	3,000	340	650	750	520	1,400
				% difference	10%	4%	3%	14%	N/A	1%	0%	7%	0%	3%	5%	3%	4%	7%
9/11/00	12:26	CW	8/2/00	ESS-5	22,000	21	6,500	1.4	32	78	27,000	5,300	7,500	790	350	900	35	100
9/12/00	11:38	CW	8/2/00	ESS-5 Prep Dup	22,000	24	6,500	2.1	33	78	26,000	5,500	7,500	790	360	890	36	100
				% difference	0%	13%	0%	40%	3%	0%	4%	4%	0%	0%	3%	1%	3%	0%
9/12/00	11:07	CW	8/3/00	SED-8	19,000	84	24,000	6.1	32	900	25,000	3,000	7,200	1,300	290	1,200	160	1,100
9/12/00	12:25	CW	8/3/00	SED-8 Prep Dup	18,000	81	24,000	6.0	30	870	25,000	3,000	6,900	1,200	290	1,200	160	1,100
				% difference	5%	4%	0%	2%	6%	3%	0%	0%	4%	8%	0%	0%	0%	0%
9/12/00	15:08	CW	8/10/00	SP2-b	17,000	89	63,000	5.2	23	1,100	19,000	4,400	12,000	1,100	390	1,500	99	540
9/12/00	16:14	CW	8/10/00	SP2-b Prep Dup	17,000	88	63,000	5.1	22	1,100	18,000	4,300	11,000	1,100	390	1,500	97	540
				% difference	0%	1%	0%	2%	4%	0%	5%	2%	9%	0%	0%	0%	2%	0%
9/12/00	13:57	CW	8/8/00	BP7-a	15,000	140	7,800	7.8	20	1,100	25,000	4,300	5,700	1,400	460	970	180	1,300
9/12/00	11:26	CW	8/8/00	BP7-a Prep Dup	15,000	140	7,700	7.7	19	1,100	25,000	4,200	5,600	1,400	460	950	170	1,300
				% difference	0%	0%	1%	1%	5%	0%	0%	2%	2%	0%	0%	2%	6%	0%
9/12/00	15:00	CW	8/10/00	BP13-a	6,600	bpql	2,900	bpql	13	28	12,000	1,700	2,700	97	390	430	12	130
9/13/00	11:23	CW	8/10/00	BP13-a Prep Dup	6,700	bpql	2,900	bpql	12	27	12,000	1,600	2,600	99	370	430	bpql	130
				% difference	2%	N/A	0%	N/A	8%	4%	0%	6%	4%	2%	5%	0%	N/A	0%
9/13/00	10:56	CW	8/10/00	BP9-d	18,000	42	9,200	12	22	2,800	22,000	3,900	6,800	1,600	440	860	32	2,000
9/13/00	12:00	CW	8/10/00	BP9-d Prep Dup	17,000	42	9,300	11	21	2,800	22,000	3,900	6,800	1,600	440	860	31	2,000
				% difference	6%	0%	1%	9%	5%	0%	0%	0%	0%	0%	0%	0%	3%	0%

EPA Method Digest 3050B Preparation Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
9/13/00	15:53	CW	8/16/00	C5-a	6,800	bpql	3,400	bpql	15	9.9	17,000	1,900	2,300	250	650	500	12	19
9/13/00	15:34	CW	8/16/00	C5-a Prep Dup	6,700	bpql	3,400	bpql	14	10	17,000	1,900	2,300	250	640	490	10	19
				% difference	1%	N/A	0%	N/A	7%	1%	0%	0%	0%	0%	2%	2%	18%	0%
9/13/00	11:15	CW	8/16/00	C1-d	7,500	570	1,600	3.9	bpql	900	23,000	3,000	2,800	630	830	520	440	1,500
9/14/00	10:38	CW	8/16/00	C1-d Prep Dup	7,900	590	1,600	4.2	bpql	900	23,000	3,100	2,800	650	890	510	440	1,600
				% difference	5%	3%	0%	7%	N/A	0%	0%	3%	0%	3%	7%	2%	0%	6%
9/13/00	15:38	CW	8/16/00	C6-a	4,900	bpql	2,100	bpql	bpql	bpql	8,800	1,700	1,700	270	430	330	bpql	90
9/14/00	11:05	CW	8/16/00	C6-a Prep Dup	4,800	bpql	2,100	bpql	bpql	bpql	8,900	1,800	1,700	280	430	330	bpql	95
				% difference	2%	N/A	0%	N/A	N/A	N/A	1%	6%	0%	4%	0%	0%	N/A	5%
9/14/00	16:27	CW	8/21/00	C15-c	14,000	33	5,000	bpql	19	22	18,000	3,600	6,100	540	280	600	19	49
9/14/00	15:32	CW	8/21/00	C15-c Prep Dup	14,000	33	5,000	bpql	21	22	18,000	3,600	6,200	540	280	600	16	47
				% difference	0%	0%	0%	N/A	10%	0%	0%	0%	2%	0%	0%	0%	17%	4%
9/14/00	12:05	CW	8/21/00	C9-b	21,000	86	7,000	8.1	28	5,700	26,000	4,500	7,500	1,100	270	930	68	1,200
9/14/00	16:00	CW	8/21/00	C9-b Prep Dup	20,000	84	6,800	8.1	26	5,700	25,000	4,300	7,400	1,100	270	910	64	1,100
				% difference	5%	2%	3%	0%	7%	0%	4%	5%	1%	0%	0%	2%	6%	9%
9/14/00	13:52	CW	8/21/00	C13-f	15,000	bpql	5,400	bpql	36	55	18,000	2,200	6,100	180	280	750	16	390
9/14/00	14:11	CW	8/21/00	C13-f Prep Dup	15,000	bpql	5,300	bpql	35	53	18,000	2,200	6,100	170	280	740	16	390
				% difference	0%	N/A	2%	N/A	3%	4%	0%	0%	0%	6%	0%	1%	0%	0%
9/14/00	15:17	CW	8/21/00	C11-d	25,000	bpql	7,400	bpql	36	30	26,000	3,800	9,100	340	430	660	26	69
9/14/00	15:02	CW	8/21/00	C11-d Prep Dup	25,000	bpql	7,500	bpql	45	32	26,000	3,700	9,000	340	420	670	25	130
				% difference	0%	N/A	1%	N/A	22%	6%	0%	3%	1%	0%	2%	2%	4%	61%
10/27/00	10:44	CW	10/25/00	CP10-d	22,000	bpql	6,400	bpql	26	20	27,000	3,900	8,200	950	340	730	20	56
10/27/00	14:02	CW	10/25/00	CP10-d Prep Dup	23,000	bpql	6,400	bpql	25	21	27,000	3,800	8,400	940	360	750	19	54
				% difference	4%	N/A	0%	N/A	4%	5%	0%	3%	2%	1%	6%	3%	5%	4%
10/27/00	13:21	CW	10/25/00	CP12-c	13,000	1,000	2,700	4.2	16	1,000	33,000	4,100	4,900	370	300	840	520	1,400
10/27/00	11:23	CW	10/25/00	CP12-c Prep Dup	12,000	990	2,700	4.3	15	1,000	32,000	4,200	4,700	380	290	820	540	1,400
				% difference	8%	1%	0%	2%	6%	0%	3%	2%	4%	3%	3%	2%	4%	0%

EPA Method Digest 3050B Preparation Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
10/27/00	11:38	CW	10/25/00	CP17-e	7,900	bpql	2,900	1.7	19	1,400	21,000	2,600	4,300	990	460	550	150	360
10/27/00	13:58	CW	10/25/00	CP17-e Prep Dup	8,300	bpql	3,100	1.5	17	1,400	21,000	2,500	4,500	1,000	520	560	140	350
				% difference	5%	N/A	7%	13%	11%	0%	0%	4%	5%	1%	12%	2%	7%	3%
10/27/00	12:51	CW	10/25/00	CP18-a	19,000	25	4,300	1.4	15	97	16,000	5,600	6,500	570	1,700	580	29	89
10/27/00	13:03	CW	10/25/00	CP18-a Prep Dup	20,000	26	4,500	1.5	16	100	17,000	5,900	6,800	590	1,800	610	30	91
				% difference	5%	4%	5%	7%	6%	3%	6%	5%	5%	3%	6%	5%	3%	2%
11/7/00	13:54	CW	10/31/00	CP10-b	22,000	23	33,000	bpql	34	71	24,000	3,400	8,700	510	330	1,000	31	77
11/7/00	11:50	CW	10/31/00	CP10-b Prep Dup	22,000	23	32,000	bpql	32	69	23,000	3,300	8,400	510	320	990	30	75
				% difference	0%	0%	3%	N/A	6%	3%	4%	3%	4%	0%	3%	1%	3%	3%
11/7/00	12:51	CW	10/31/00	CP14-c	6,800	12	2,900	bpql	bpql	7.6	9,300	2,200	2,700	93	300	400	10	25
11/7/00	14:13	CW	10/31/00	CP14-c Prep Dup	6,700	12	2,800	bpql	bpql	7.1	9,000	2,200	2,800	91	300	400	11	24
				% difference	1%	0%	4%	N/A	N/A	7%	3%	0%	4%	2%	0%	0%	10%	4%
11/7/00	15:07	CW	10/31/00	CP15-b	15,000	21	17,000	1.1	13	260	14,000	4,000	9,400	560	320	530	58	100
11/7/00	13:03	CW	10/31/00	CP15-b Prep Dup	15,000	20	17,000	1.3	13	250	14,000	3,800	9,000	570	300	520	55	100
				% difference	0%	5%	0%	15%	0%	4%	0%	5%	4%	2%	6%	2%	5%	0%
1/7/00																		
11/8/00	14:36	CW	11/2/00	BP1-f	18,000	880	6,700	5.3	15	6,200	29,000	6,700	6,300	1,200	540	1,100	870	2,300
11/8/00	13:11	CW	11/2/00	BP1-f Prep Dup	19,000	870	6,700	5.3	17	6,100	29,000	6,800	6,300	1,200	550	1,100	860	2,300
				% difference	5%	1%	0%	0%	13%	2%	0%	1%	0%	0%	2%	0%	1%	0%
11/8/00	13:07	CW	11/2/00	CP11-c	23,000	30	8,500	1.5	40	150	26,000	3,500	9,100	650	370	910	37	330
11/8/00	14:40	CW	11/2/00	CP11-c Prep Dup	24,000	30	8,400	1.4	40	150	27,000	3,600	9,300	650	380	920	36	320
				% difference	5%	1%	0%	0%	13%	2%	0%	1%	0%	0%	2%	0%	1%	0%
12/4/00	11:55	CW	12/1/00	CP13-c	32,000	12	8,100	bpql	74	49	32,000	1,700	9,200	480	330	880	32	81
12/4/00	12:10	CW	12/1/00	CP13-c Prep Dup	30,000	12	8,000	bpql	72	49	31,000	1,600	9,100	480	320	890	27	79
				% difference	6%	0%	1%	N/A	3%	0%	3%	6%	1%	0%	3%	1%	17%	3%

Note: bpql = below probable quantitative limit

EPA Method 200.7 Instrument Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
7/11/00	15:38	CW	DIGEST 004	1.02	bpql	0.4172	bpql	bpql	bpql	2.499	0.9283	bpql	bpql	0.1328	0.1759	bpql	0.02
7/11/00	16:36	CW	DIGEST 004 lab dup	1.018	bpql	0.4196	bpql	bpql	bpql	2.487	1.051	bpql	bpql	0.1289	0.1807	bpql	0.0201
			% difference	0%	N/A	1%	N/A	N/A	N/A	0%	12%	N/A	N/A	3%	3%	N/A	0%
7/11/00	16:49	CW	DIGEST 015	94.71	0.0938	31.84	0.005	0.0654	0.4338	83.72	18.63	28.01	2.191	1.186	3.45	0.1802	0.5277
7/11/00	17:40	CW	DIGEST 015 lab dup	95.18	0.0983	31.59	0.005	0.07	0.4324	83.7	18.44	28	2.203	1.197	3.398	0.1794	0.5332
			% difference	0%	5%	1%	0%	7%	0%	0%	1%	0%	1%	1%	2%	0%	1%
7/11/00	17:53	CW	DIGEST 025	132	0.1168	28.59	0.0068	0.0623	0.4441	95.37	25.62	32.76	4.156	1.522	2.331	0.1709	1.611
7/11/00	18:44	CW	DIGEST 025 lab dup	131.1	0.1111	28.49	0.0067	0.064	0.4423	94.73	25.17	32.37	4.128	1.504	2.292	0.1736	1.607
			% difference	1%	5%	0%	1%	3%	0%	1%	2%	1%	1%	1%	2%	2%	0%
7/11/00	18:36	CW	DIGEST 035	221.9	1.35	175.2	0.2298	0.5509	17.87	248	65.79	98.85	37.65	6.81	14.39	6.004	27.23
7/11/00	19:00	CW	DIGEST 035 lab dup	222.6	1.352	173.5	0.2271	0.5509	17.69	246.6	64.89	98.01	37.49	6.728	14.12	5.936	27.16
			% difference	0%	0%	1%	1%	0%	1%	1%	1%	1%	0%	1%	2%	1%	0%
7/20/00	13:37	CW	DIGEST 041	54.45	1.608	20.51	0.0325	0.086	5.849	152.8	14.5	19.15	6.838	1.643	3.513	1.431	6.826
7/20/00	14:26	CW	DIGEST 041 lab dup	54.23	1.579	20.34	0.0322	0.0837	5.77	150.8	14.34	19.04	6.747	1.628	3.427	1.406	6.757
			% difference	0%	2%	1%	1%	3%	1%	1%	1%	1%	1%	1%	2%	2%	1%
7/20/00	12:24	TMC	DIGEST 055	48.92	5.811	8.864	0.0285	0.0558	5.907	147	16.23	18.83	2.627	2.734	3.736	3.391	9.965
7/20/00	13:12	CW	DIGEST 055 lab dup	49.83	5.858	8.915	0.0281	0.0577	6.028	147.9	16.72	19.22	2.658	2.794	3.757	3.404	9.967
			% difference	2%	1%	1%	1%	3%	2%	1%	3%	2%	1%	2%	1%	0%	0%
7/20/00	11:16	TMC	DIGEST 061	48.5	bpql	15.68	0.0194	0.0573	6.893	67.16	11.92	15.71	4.968	2.372	2.346	0.0793	3.47
7/20/00	12:11	TMC	DIGEST 061 lab dup	48.32	bpql	15.72	0.0199	0.0611	6.981	67.3	12.09	15.95	4.948	2.392	2.384	0.0723	3.444
			% difference	0%	N/A	0%	3%	6%	1%	0%	1%	2%	0%	1%	2%	9%	1%
7/20/00	14:38	CW	DIGEST 064	23.3	0.1005	16.7	0.0093	0.0526	4.71	95.5	6.529	6.346	4.902	2.089	2.485	0.0805	1.117
7/20/00	15:28	CW	DIGEST 064 lab dup	23.63	0.0951	16.77	0.0094	0.0563	4.759	96.5	6.643	6.361	4.931	2.142	2.488	0.0759	1.134
			% difference	1%	6%	0%	1%	7%	1%	1%	2%	0%	1%	3%	0%	6%	2%

EPA Method 200.7 Instrument Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
7/21/00	11:18	TMC	DIGEST 050	135.3	0.2268	106.5	0.0102	0.0808	2.662	106.5	26.52	43.12	6.026	1.552	3.316	0.4326	2.328
7/21/00	11:57	TMC	DIGEST 050 lab dup	137.8	0.2377	106.9	0.0104	0.0872	2.69	107.5	26.61	43.37	6.077	1.555	3.329	0.4372	2.348
			% difference	2%	5%	0%	2%	8%	1%	1%	0%	1%	1%	0%	0%	1%	1%
7/21/00	9:31	TMC	DIGEST 089	100.6	bpql	34.66	bpql	0.1167	0.15	117.3	22.19	37.05	1.18	1.414	3.744	0.1871	0.652
7/21/00	10:11	TMC	DIGEST 089 lab dup	101.4	bpql	34.91	bpql	0.1188	0.1534	118.2	22.65	37.64	1.193	1.435	3.785	0.1866	0.6522
			% difference	1%	N/A	1%	N/A	2%	2%	1%	2%	2%	1%	1%	1%	0%	0%
7/21/00	10:28	TMC	DIGEST 107	187.6	0.1361	46.44	0.0075	0.0985	1.616	123.1	37.47	55.85	3.184	1.194	4.635	0.3427	1.955
7/21/00	11:06	TMC	DIGEST 107 lab dup	190	0.1354	46.47	0.0073	0.1045	1.648	123.7	38.39	56.89	3.184	1.194	4.702	0.3567	1.935
			% difference	1%	1%	0%	3%	6%	2%	0%	2%	2%	0%	0%	1%	4%	1%
7/21/00	12:30	CW	DIGEST 112	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0172
7/21/00	13:10	CW	DIGEST 112 lab dup	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.016
			% difference	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7%
7/21/00	13:29	CW	DIGEST 113	44.07	3.865	27.48	0.0278	0.0515	14.23	121.3	17.51	16.39	3.19	5.123	3.573	2.262	10.22
7/21/00	14:14	CW	DIGEST 113 lab dup	44.33	3.868	27.23	0.0276	0.0503	14.24	120.5	17.47	16.61	3.168	5.119	3.546	2.236	10.11
			% difference	1%	0%	1%	1%	2%	0%	1%	0%	1%	1%	0%	1%	1%	1%
7/21/00	12:30	CW	DIGEST 112	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0172
7/21/00	13:10	CW	DIGEST 112 lab dup	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.016
			% difference	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7%
7/21/00	13:29	CW	DIGEST 113	44.07	3.865	27.48	0.0278	0.0515	14.23	121.3	17.51	16.39	3.19	5.123	3.573	2.262	10.22
7/21/00	14:14	CW	DIGEST 113 lab dup	44.33	3.868	27.23	0.0276	0.0503	14.24	120.5	17.47	16.61	3.168	5.119	3.546	2.236	10.11
			% difference	1%	0%	1%	1%	2%	0%	1%	0%	1%	1%	0%	1%	1%	1%
7/21/00	14:01	TMC	DIGEST 124	205.3	0.1692	52.33	bpql	0.1022	0.4681	125.9	43.17	62.13	2.232	4.284	4.047	0.1867	0.9607
7/21/00	15:22	JH	DIGEST 124 lab dup	205.1	0.1692	52.64	bpql	0.0988	0.4696	126.2	43.61	62.6	2.229	4.307	4.094	0.1888	0.9561
			% difference	0%	0%	1%	N/A	3%	0%	0%	1%	1%	0%	1%	1%	1%	0%

EPA Method 200.7 Instrument Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
7/21/00	14:43	CW	DIGEST 125	173.9	0.2112	61.02	0.0118	0.101	2.49	122.8	39.13	51.03	2.553	1.819	3.843	0.5462	3.509
7/21/00	15:17	JH	DIGEST 125 lab dup	179.7	0.2207	61.6	0.0116	0.0986	2.488	121.3	39.14	51.29	2.538	1.828	3.794	0.5223	3.451
			% difference	3%	4%	1%	2%	2%	0%	1%	0%	1%	1%	0%	1%	4%	2%
7/21/00	15:37	CW	DIGEST 140	96.33	2.577	47.09	0.0344	0.113	27.3	133.9	17.63	31.59	4.585	1.713	4.475	2.473	8.166
7/21/00	16:19	CW	DIGEST 140 lab dup	92.13	2.511	47.16	0.0343	0.1052	26.83	132.5	17.53	31.16	4.497	1.713	4.53	2.467	8.082
			% difference	4%	3%	0%	0%	7%	2%	1%	1%	1%	2%	0%	1%	0%	1%
7/27/00	11:20	CW	DIGEST 166	98.93	1.431	46.75	0.0236	0.1293	10.02	125.4	24.24	38.02	4.241	1.938	5.226	1.404	6.04
7/27/00	12:29	SD	DIGEST 166 lab dup	101.1	1.472	47.33	0.0223	0.1278	10.1	127.6	24.29	38.21	4.343	1.952	5.296	1.445	6.174
			% difference	2%	3%	1%	6%	1%	1%	2%	0%	0%	2%	1%	1%	3%	2%
7/27/00	12:51	CW	DIGEST 177	78.55	0.6388	59.28	0.0166	0.1392	5.363	105.4	20.42	40.79	8.431	4.154	5.699	0.6237	3.824
7/27/00	13:37	SD	DIGEST 177 lab dup	78.33	0.6311	58.69	0.016	0.1449	5.257	103.9	19.74	40.35	8.338	4.062	5.515	0.6074	3.795
			% difference	0%	1%	1%	4%	4%	2%	1%	3%	1%	1%	2%	3%	3%	1%
7/27/00	13:56	SD	DIGEST 165	98.84	1.462	47	0.0221	0.1246	10.03	125.8	24.11	38.37	4.294	1.865	5.247	1.422	6.113
7/27/00	15:02	SD	DIGEST 165 lab dup	102.1	1.495	47.17	0.0224	0.1262	10.15	127.6	24.31	39.04	4.357	1.901	5.269	1.435	6.198
			% difference	3%	2%	0%	1%	1%	1%	1%	1%	2%	1%	2%	0%	1%	1%
7/27/00	15:14	SD	DIGEST 155	52.19	2.675	24.38	0.0254	0.0616	12.63	116.2	16.02	17.12	2.103	1.183	3.585	2.101	8.745
7/27/00	15:57	SD	DIGEST 155 lab dup	52.77	2.69	24.2	0.0258	0.0606	12.55	116.2	15.78	17.15	2.113	1.171	3.543	2.09	8.78
			% difference	1%	1%	1%	2%	2%	1%	0%	2%	0%	0%	1%	1%	1%	0%
7/27/00	16:11	CW	DIGEST 209	110.4	0.1493	42.87	0.0051	0.2133	0.57	141.6	26.65	46.96	3.711	1.305	6.527	0.3014	0.7147
7/27/00	16:52	CW	DIGEST 209 lab dup	109.7	0.1612	43.72	0.0056	0.2107	0.5757	143.2	27.15	47.28	3.745	1.341	6.739	0.3054	0.7243
			% difference	1%	8%	2%	9%	1%	1%	1%	2%	1%	1%	3%	3%	1%	1%
7/27/00	17:14	CW	DIGEST 196	116	0.0843	64.54	bpql	0.2589	0.3272	173.5	11.69	72.11	3.112	2.104	6.375	0.138	0.3813
7/27/00	18:08	CW	DIGEST 196 lab dup	114.6	0.0787	65.19	bpql	0.2521	0.3253	173.9	11.74	71.86	3.111	2.115	6.431	0.1382	0.3826
			% difference	1%	7%	1%	N/A	3%	1%	0%	0%	0%	0%	1%	1%	0%	0%

EPA Method 200.7 Instrument Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
7/27/00	18:21	CW	DIGEST 202	79.29	1.475	33.1	0.0261	0.1391	10.72	144.5	15.64	27.37	5.709	1.545	4.36	1.314	5.528
7/27/00	19:02	CW	DIGEST 202 lab dup	76.7	1.446	33.01	0.0247	0.1349	10.51	142.4	15.45	26.8	5.618	1.516	4.335	1.305	5.459
			% difference	3%	2%	0%	6%	3%	2%	1%	1%	2%	2%	2%	1%	1%	1%
8/16/00	12:36	CW	DIGEST 265	47.45	4.636	14.8	0.0162	0.0534	16.09	111.7	13.97	17.62	6.527	1.71	3.158	7.834	10.13
8/16/00	13:14	CW	DIGEST 265 lab dup	47.62	4.676	14.81	0.0162	0.0579	16.22	111.7	14.18	17.97	6.529	1.731	3.16	7.81	10.07
			% difference	0%	1%	0%	0%	8%	1%	0%	1%	2%	0%	1%	0%	0%	1%
8/16/00	11:15	CW	DIGEST 275	51.28	4.195	18.03	0.0233	0.0655	3.756	154.9	17.16	17.48	2.777	1.767	3.357	2.808	8.461
8/16/00	12:13	CW	DIGEST 275 lab dup	51.4	4.203	18.38	0.0228	0.0601	3.775	156.2	17.19	17.74	2.784	1.801	3.383	2.857	8.513
			% difference	0%	0%	2%	2%	9%	1%	1%	0%	1%	0%	2%	1%	2%	1%
8/16/00	13:41	CW	DIGEST 280	78.51	bpql	26.02	bpql	0.1231	0.086	98.96	15.94	32.48	1.782	1.614	3.403	0.0841	0.2309
8/16/00	14:19	CW	DIGEST 280 lab dup	78.76	bpql	26.27	bpql	0.1308	0.0841	99.43	16.21	32.58	1.802	1.657	3.46	0.0958	0.2322
			% difference	0%	N/A	1%	N/A	6%	2%	0%	2%	0%	1%	3%	2%	13%	1%
8/16/00	14:47	CW	DIGEST 367	51.92	2.461	22.57	0.0388	bpql	21.18	101.8	17.73	15.6	8.458	4.451	3.376	2.425	12.12
8/16/00	15:25	CW	DIGEST 367 lab dup	51.62	2.468	22.77	0.0395	bpql	21.31	101.7	18	15.68	8.483	4.485	3.415	2.443	11.99
			% difference	1%	0%	1%	2%	N/A	1%	0%	2%	1%	0%	1%	1%	1%	1%
9/11/00	11:06	CW	DIGEST 233	105.8	1.606	31.66	0.0232	0.1224	20.83	149.9	43.75	34.5	2.599	2.913	5.151	1.305	6.936
9/11/00	11:44	CW	DIGEST 233 lab dup	104.5	1.613	31.68	0.0231	0.1123	21.11	150.4	44.48	35.27	2.558	2.94	5.278	1.315	6.867
			% difference	1%	0%	0%	0%	9%	1%	0%	2%	2%	2%	1%	2%	1%	1%
9/11/00	15:38	CW	DIGEST 337	130.6	0.034	37.83	0.0035	0.2992	0.1927	120.2	15.39	42.88	2.522	1.547	4.441	0.1071	0.3188
9/11/00	16:16	CW	DIGEST 337 lab dup	129.5	0.0352	38.02	0.0035	0.2964	0.1936	120.3	15.57	43.03	2.511	1.565	4.492	0.0955	0.3169
			% difference	1%	3%	1%	0%	1%	0%	0%	1%	0%	0%	1%	1%	11%	1%
9/11/00	14:33	CW	DIGEST 347	112.4	0.2438	122.4	0.0392	0.1685	4.182	127.7	21.29	69.06	6.723	1.529	7.527	0.5413	8.502
9/11/00	15:10	CW	DIGEST 347 lab dup	113.7	0.2375	121	0.0389	0.1771	4.172	127	21.24	69.43	6.707	1.548	7.415	0.5454	8.43
			% difference	1%	3%	1%	1%	5%	0%	1%	0%	1%	0%	1%	1%	1%	1%

EPA Method 200.7 Instrument Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
9/11/00	12:11	CW	DIGEST 352	237.7	1.387	246.3	0.2223	0.608	14.14	259.6	65.83	113.6	28.2	7.654	15.88	5.308	21.88
9/11/00	12:49	CW	DIGEST 352 lab dup	237.6	1.376	252	0.227	0.6128	14.26	263.8	67.2	115.6	28.54	7.714	16.18	5.421	22.28
			% difference	0%	1%	2%	2%	1%	1%	2%	2%	2%	1%	1%	2%	2%	2%
9/11/00	13:31	CW	DIGEST 353	110	0.6719	78.22	0.0365	0.1605	7.687	151.8	17.07	37.95	6.141	1.252	6.45	1.375	10.12
9/11/00	14:08	CW	DIGEST 353 lab dup	107.6	0.6657	77.34	0.0348	0.1546	7.705	149.4	17.32	38.13	5.986	1.272	6.478	1.337	9.891
			% difference	2%	1%	1%	5%	4%	0%	2%	1%	0%	3%	2%	0%	3%	2%
9/12/00	14:42	CW	DIGEST 232	76.7	1.279	31.06	0.0531	0.1085	18.08	120.6	37.29	28.73	4.479	3.334	5.029	1.111	10.97
9/12/00	15:19	CW	DIGEST 232 lab dup	77.27	1.274	30.59	0.0516	0.1079	18.1	119.4	37.44	28.9	4.467	3.355	4.967	1.09	10.79
			% difference	1%	0%	2%	3%	1%	0%	1%	0%	1%	0%	1%	1%	2%	2%
9/12/00	13:31	CW	DIGEST 264	48.24	4.561	15.03	0.0211	bdl	14.45	112.4	15.42	17.27	6.804	2.086	3.208	8.214	10.79
9/12/00	14:08	CW	DIGEST 264 lab dup	48.98	4.648	15.02	0.0208	0.0516	14.27	112.2	14.91	17.15	6.819	2.055	3.136	8.111	10.88
			% difference	2%	2%	0%	1%	N/A	1%	0%	3%	1%	0%	1%	2%	1%	1%
9/12/00	11:04	CW	DIGEST 268	26.65	bdl	12.47	bdl	bdl	0.0472	47.77	8.017	10	1.283	1.875	1.812	0.0626	0.3567
9/12/00	11:41	CW	DIGEST 268 lab dup	26.66	bdl	12.48	bdl	bdl	0.0493	47.98	8.454	10.24	1.282	1.945	1.85	0.0568	0.3541
			% difference	0%	N/A	0%	N/A	N/A	4%	0%	5%	2%	0%	4%	2%	10%	1%
9/12/00	12:10	CW	DIGEST 327	89.56	2.977	18.83	0.1142	0.0953	14.39	139.3	27.08	27.38	38.93	2.761	4.655	27.85	31.74
9/12/00	12:47	CW	DIGEST 327 lab dup	88.99	2.999	19.16	0.1147	0.0918	14.44	140.6	27.37	27.55	39.05	2.778	4.714	28.2	31.93
			% difference	1%	1%	2%	0%	4%	0%	1%	1%	1%	0%	1%	1%	1%	1%
9/12/00	15:40	CW	DIGEST 356	101.5	4.33	34.14	0.0326	0.091	31.42	149.5	37.55	33.56	5.651	3.049	5.644	4.461	11.72
9/12/00	16:18	CW	DIGEST 356 lab dup	102.2	4.37	34.71	0.0317	0.0917	31.43	151.4	36.99	33.61	5.748	3.012	5.69	4.501	11.94
			% difference	1%	1%	2%	3%	1%	0%	1%	2%	0%	2%	1%	1%	1%	2%
9/13/00	11:53	CW	DIGEST 288	44.43	2.327	14.89	0.0152	bpql	4.175	94.06	17.73	13.03	1.554	2.249	3.131	1.666	5.968
9/13/00	12:30	CW	DIGEST 288 lab dup	43.78	2.307	14.8	0.0155	bpql	4.187	94.44	17.88	13.07	1.536	2.249	3.191	1.671	5.951
			% difference	1%	1%	1%	2%	N/A	0%	0%	1%	0%	1%	0%	2%	0%	0%

EPA Method 200.7 Instrument Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
9/13/00	10:53	CW	DIGEST 289	60.81	0.4859	28.89	0.0243	0.085	3.411	96.94	16.76	22.15	5.665	1.625	3.823	0.604	4.958
9/13/00	11:30	CW	DIGEST 289 lab dup	60.25	0.487	29.24	0.0244	0.0852	3.474	97.56	17.31	22.54	5.643	1.657	3.913	0.5998	4.943
			% difference	1%	0%	1%	0%	0%	2%	1%	3%	2%	0%	2%	2%	1%	0%
9/13/00	15:23	CW	DIGEST 309	65.72	0.5195	22.94	0.0295	0.0919	3.844	123	15.75	21.74	8.838	1.695	3.8	0.5898	9.059
9/13/00	16:01	CW	DIGEST 309 lab dup	64.8	0.5178	22.73	0.029	0.0881	3.88	122.4	16.11	22.19	8.73	1.719	3.831	0.5903	8.905
			% difference	1%	0%	1%	2%	4%	1%	0%	2%	2%	1%	1%	1%	0%	2%
9/13/00	14:10	CW	DIGEST 399	27.39	bpql	12.26	bpql	bpql	0.0971	44.2	8.068	8.982	0.9676	1.985	1.992	bpql	0.5231
9/13/00	14:47	CW	DIGEST 399 lab dup	27.52	bpql	12.35	bpql	bpql	0.0956	44.45	8.028	8.955	0.9695	1.98	2.008	bpql	0.5259
			% difference	0%	N/A	1%	N/A	N/A	2%	1%	0%	0%	0%	0%	1%	N/A	1%
9/14/00	10:34	CW	DIGEST 291	32.97	bpql	19.58	bpql	0.079	0.0313	90.67	8.931	10.92	0.757	2.898	2.69	0.0578	0.2478
9/14/00	11:12	CW	DIGEST 291 lab dup	33.29	bpql	19.73	bpql	0.0802	0.0318	91.33	8.978	11.07	0.7607	2.916	2.72	0.0637	0.2499
			% difference	1%	N/A	1%	N/A	2%	2%	1%	1%	1%	0%	1%	1%	10%	1%
9/14/00	11:35	CW	DIGEST 395	30.19	bpql	15.16	bpql	0.0543	0.041	74.16	11.03	11.08	4.089	2.179	2.089	0.0464	0.092
9/14/00	12:12	CW	DIGEST 395 lab dup	30.07	bpql	15.08	bpql	0.0518	0.0425	73.74	10.98	11.25	4.05	2.167	2.088	0.0459	0.0919
			% difference	0%	N/A	1%	N/A	5%	4%	1%	0%	2%	1%	1%	0%	1%	0%
9/14/00	16:00	CW	DIGEST 417	98.16	0.415	33.59	0.0402	0.1282	28.4	124.8	21.53	36.66	5.358	1.332	4.539	0.3184	5.619
9/14/00	16:38	CW	DIGEST 417 lab dup	98.71	0.4347	34.77	0.0396	0.1403	28.6	128	21.33	37.27	5.471	1.316	4.649	0.3362	5.778
			% difference	1%	5%	3%	2%	9%	1%	3%	1%	2%	2%	1%	2%	5%	3%
9/14/00	12:40	CW	DIGEST 434	75.64	bpql	24.4	bpql	0.1132	0.0748	85.67	15.64	26.49	1.026	1.822	3.346	0.0791	0.2093
9/14/00	13:18	CW	DIGEST 434 lab dup	75.58	bpql	24.32	bpql	0.1097	0.0759	85.39	15.43	26.35	1.014	1.808	3.32	0.0808	0.2088
			% difference	0%	N/A	0%	N/A	3%	1%	0%	1%	1%	1%	1%	1%	2%	0%
9/14/00	17:05	CW	DIGEST 437	63.14	1.801	193.6	0.0414	0.0835	28.86	115.7	18.51	25.45	3.075	2.747	4.629	1.468	9.663
9/14/00	17:39	CW	DIGEST 437 lab dup	63.44	1.805	189.6	0.0408	0.0783	28.79	114.8	18.48	25.39	3.044	2.758	4.58	1.428	9.596
			% difference	0%	0%	2%	1%	6%	0%	1%	0%	0%	1%	0%	1%	3%	1%

EPA Method 200.7 Instrument Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
9/14/00	13:52	CW	DIGEST 444	75.84	bpql	27.15	bpql	0.1799	0.2765	91.91	11.08	30.94	0.8885	1.399	3.806	0.0823	1.99
9/14/00	14:30	CW	DIGEST 444 lab dup	76.01	bpql	27.08	bpql	0.1796	0.2782	92.22	10.79	31.09	0.8881	1.377	3.791	0.083	1.993
			% difference	0%	N/A	0%	N/A	0%	1%	0%	3%	0%	0%	2%	0%	1%	0%
9/14/00	14:58	CW	DIGEST 454	23.45	bpql	10.37	bpql	bpql	0.0401	41.89	7.008	9.219	0.3441	1.384	1.778	bpql	0.0848
9/14/00	15:36	CW	DIGEST 454 lab dup	23.43	bpql	10.45	bpql	bpql	0.04	41.84	7.215	9.313	0.3435	1.414	1.789	bpql	0.0842
			% difference	0%	N/A	1%	N/A	N/A	0%	0%	3%	1%	0%	2%	1%	N/A	1%
10/27/00	10:17	CW	DIGEST 458	66.97	bpql	21	bpql	0.0753	0.0698	76.56	18.02	25.8	0.9568	1.556	3.001	0.0753	0.2116
10/27/00	10:55	CW	DIGEST 458 lab dup	68.05	bpql	21.21	bpql	0.0771	0.0745	77.73	18.87	26.93	0.9659	1.617	3.175	0.0742	0.2135
			% difference	2%	N/A	1%	N/A	2%	7%	2%	5%	4%	1%	4%	6%	1%	1%
10/27/00	11:23	CW	DIGEST 468	60.49	4.952	13.45	0.0215	0.0743	5.168	161.7	21.15	23.74	1.9	1.429	4.087	2.692	6.836
10/27/00	12:01	CW	DIGEST 468 lab dup	61.33	5.008	13.59	0.0212	0.0797	5.193	162.5	20.96	23.89	1.915	1.422	4.096	2.704	6.865
			% difference	1%	1%	1%	1%	7%	0%	0%	1%	1%	1%	0%	0%	0%	0%
10/27/00	12:47	CW	DIGEST 478	133.3	bpql	38.15	bpql	0.3799	0.2065	128.2	9.402	50.99	1.448	1.708	5.142	0.1112	0.3413
10/27/00	13:25	CW	DIGEST 478 lab dup	134.4	bpql	37.44	0.0051	0.3771	0.2078	127.1	9.437	51.48	1.439	1.725	5.095	0.1087	0.3353
			% difference	1%	N/A	2%	N/A	1%	1%	1%	0%	1%	1%	1%	1%	2%	2%
10/27/00	13:51	CW	DIGEST 488	0.0593	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/27/00	14:13	CW	DIGEST 488 lab dup	0.0612	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
			% difference	3%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/7/00	12:44	CW	DIGEST 500	149.7	1.077	163.3	0.2143	0.5666	9.874	213.4	56.02	93.44	24.05	8.546	13.19	4.969	19.54
11/7/00	13:21	CW	DIGEST 500 lab dup	148.2	1.086	164.7	0.215	0.5613	10.04	215.5	57.49	95.69	24	8.643	13.57	4.996	19.44
			% difference	1%	1%	1%	0%	1%	2%	1%	3%	2%	0%	1%	3%	1%	1%
11/7/00	13:51	CW	DIGEST 510	153.8	0.1476	39.98	0.0106	0.0801	0.5734	112.9	32.34	44.95	4.115	1.09	3.631	0.2204	1.563
11/7/00	14:28	CW	DIGEST 510 lab dup	154.3	0.1451	40.41	0.0104	0.0857	0.5729	113.1	32.6	45.26	4.133	1.095	3.637	0.2125	1.565
			% difference	0%	2%	1%	2%	7%	0%	0%	1%	1%	0%	0%	0%	4%	0%

EPA Method 200.7 Instrument Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
11/7/00	15:00	CW	DIGEST 520	106	bpql	66.8	bpql	0.0564	0.0781	89.29	20.93	39.37	2.685	1.795	4.08	0.1029	0.2474
11/7/00	15:15	CW	DIGEST 520 lab dup	105.9	bpql	66.41	bpql	0.0597	0.0794	88.86	21.34	40.06	2.662	1.811	4.116	0.0991	0.2437
			% difference	0%	N/A	1%	N/A	6%	2%	0%	2%	2%	1%	1%	1%	4%	2%
11/8/00	12:56	CW	DIGEST 524	24.46	0.8999	16.36	0.0134	bpql	6.045	104	8.278	7.586	5.973	1.033	2.017	1.08	6.284
11/8/00	13:33	CW	DIGEST 524 lab dup	24.29	0.9018	16.31	0.0132	bpql	6.073	104	8.265	7.662	5.941	1.029	2.028	1.072	6.239
			% difference	1%	0%	0%	2%	N/A	0%	0%	0%	1%	1%	0%	1%	1%	1%
11/8/00	14:06	CW	DIGEST 529	34.67	0.5726	19.88	0.0082	bpql	3.79	93.85	12.15	8.331	5.553	3.355	1.79	2.03	4.783
11/8/00	14:43	CW	DIGEST 529 lab dup	36	0.5837	19.75	0.0089	bpql	3.858	94.53	12.45	8.504	5.585	3.491	1.791	2.027	4.78
			% difference	4%	2%	1%	8%	N/A	2%	1%	2%	2%	1%	4%	0%	0%	0%
11/8/00	15:06	CW	DIGEST 542	70.68	3.028	23.76	0.0352	0.0771	17.5	136.3	20.69	24.62	5.46	1.27	4.742	2.681	7.981
11/8/00	15:21	CW	DIGEST 542 lab dup	70.57	3.009	23.53	0.0352	0.0716	17.42	135.1	20.71	24.45	5.416	1.263	4.692	2.631	7.875
			% difference	0%	1%	1%	0%	7%	0%	1%	0%	1%	1%	1%	1%	2%	1%
12/4/00	11:55	CW	DIGEST 548	162.3	0.0598	41.15	bpql	0.374	0.2508	163	8.565	46.53	2.44	1.66	4.442	0.1604	0.4105
12/4/00	12:21	CW	DIGEST 548 lab dup	161.9	0.0573	40.92	bpql	0.374	0.2532	163	8.7	47.41	2.417	1.665	4.489	0.1344	0.4049
			% difference	0%	4%	1%	N/A	0%	1%	0%	2%	2%	1%	0%	1%	18%	1%

Note: bpql = below probable quantitative limit

EPA Method 200.7 Sample Splits by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
SS-13	11,000	22	23,000	bpql	11	45	12,000	2,600	3,800	340	170	560	17	52
SS-13 Split	11,000	24	22,000	bpql	11	46	12,000	2,500	3,700	300	150	550	18	52
% difference	0%	9%	4%	N/A	0%	2%	0%	4%	3%	13%	13%	2%	6%	0%
BP3-h	5,900	bpql	2,100	3.5	bpql	4,400	8,500	1,700	2,100	1,400	370	340	11	470
BP3-h Split	6,400	bpql	2,100	3.6	bpql	4,300	9,200	1,800	2,200	1,600	380	330	8.3	460
% difference	8%	N/A	0%	3%	N/A	2%	8%	6%	5%	13%	3%	3%	28%	2%
BP4-c	13,000	780	3,000	1.6	16	1,900	28,000	3,500	4,100	960	300	770	820	1,000
BP4-c Split	13,000	820	3,000	1.8	16	1,900	29,000	3,600	4,200	980	310	760	820	1,000
% difference	0%	5%	0%	12%	0%	0%	4%	3%	2%	2%	3%	1%	0%	0%
BP6-e	10,000	1,400	1,700	4.0	10	1,200	38,000	3,400	3,600	200	160	700	960	1,700
BP6-e Split	12,000	1,400	1,900	3.9	11	1,200	37,000	4,300	3,800	210	200	730	1,000	1,800
% difference	18%	0%	11%	3%	10%	0%	3%	23%	5%	5%	22%	4%	4%	6%
BP10-d	19,000	bpql	6,200	bpql	21	17	21,000	4,500	7,500	750	490	660	19	48
BP10-d Split	19,000	bpql	6,200	bpql	21	16	21,000	4,500	7,500	770	500	640	20	47
% difference	0%	N/A	0%	N/A	0%	6%	0%	0%	0%	3%	2%	3%	5%	2%
SS-40	39,000	16	7,800	1.6	18	93	24,000	6,700	9,800	840	220	810	39	600
SS-40 Split	32,000	14	7,500	1.6	17	85	21,000	6,200	9,100	780	190	760	38	550
% difference	20%	13%	4%	0%	6%	9%	13%	8%	7%	7%	15%	6%	3%	9%
SS-57	16,000	730	14,000	19	18.6543	4,300	27,000	4,100	5,400	1,400	750	870	590	2,300
SS-57 Split	18,000	680	15,000	20	19.7833	4,400	26,000	4,000	6,000	1,500	750	880	570	2,900
% difference	12%	7%	7%	5%	6%	2%	4%	2%	11%	7%	0%	1%	3%	23%
SS-71	7,500	340	1,300	2.8	bpql	1,300	18,000	2,500	2,300	320	210	520	320	1,100
SS-71 Split	8,100	340	1,300	2.6	bpql	1,300	18,000	2,900	2,400	340	230	530	330	1,100
% difference	8%	0%	0%	7%	N/A	0%	0%	15%	4%	6%	9%	2%	3%	0%

EPA Method 200.7 Sample Splits by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
SS-91	25,000	58	7,200	1.1	42	120	31,000	4,300	9,600	800	330	1,000	41	160
SS-91 Split	25,000	53	7,700	bpql	41	100	33,000	3,900	11,000	810	330	1,000	43	150
% difference	0%	9%	7%	N/A	2%	18%	6%	10%	14%	1%	0%	0%	5%	6%
BP14-d	21,000	16	18,000	bpql	23	32	20,000	4,900	8,400	490	810	710	24	120
BP14-d SPLIT	22,000	20	18,000	bpql	23	34	21,000	5,200	8,900	540	860	740	22	140
% difference	5%	22%	0%	N/A	0%	6%	5%	6%	6%	10%	6%	4%	9%	15%
BP5-d SPLIT	9,500	930	3,000	3.2	11	3,200	22,000	2,800	3,500	1,300	340	630	1,600	2,000
BP5-d	9,700	910	3,000	4.2	bpql	2,900	23,000	3,100	3,500	1,400	420	640	1,600	2,200
% difference	2%	2%	0%	27%	N/A	10%	4%	10%	0%	7%	21%	2%	0%	10%
BP7-d	9,400	860	3,600	4.6	12	810	32,000	3,100	3,500	580	270	690	580	1,700
BP7-d SPLIT	10,000	840	3,600	4.7	13	750	31,000	3,400	3,500	560	350	670	560	1,700
% difference	6%	2%	0%	2%	8%	8%	3%	9%	0%	4%	26%	3%	4%	0%
BP8-c	13,000	bpql	4,500	bpql	19	13	17,000	2,800	5,000	250	420	590	16	37
BP8-c SPLIT	12,000	bpql	4,200	bpql	18	13	16,000	2,600	4,700	250	380	560	14	35
% difference	8%	N/A	7%	N/A	5%	0%	6%	7%	6%	0%	10%	5%	13%	6%
BP2-d	12,000	1,100	2,600	3.7	16	1,700	29,000	3,500	4,500	690	560	730	770	1,300
BP2-d SPLIT	11,000	1,300	2,500	4.1	14	1,700	30,000	3,400	4,500	710	520	730	850	1,500
% difference	9%	17%	4%	10%	13%	0%	3%	3%	0%	3%	7%	0%	10%	14%
ESS-5	22,000	21	6,500	1.4	32	78	27,000	5,300	7,500	790	350	900	35	100
ESS-5 SPLIT	22,000	22	6,300	1.6	31	80	24,000	5,400	7,300	800	380	820	35	110
% difference	0%	5%	3%	13%	3%	3%	12%	2%	3%	1%	8%	9%	0%	10%
SED-9	22,000	130	16,000	7.3	32	1,500	30,000	3,400	7,600	1,200	250	1,300	280	2,000
SED-9 SPLIT	24,000	140	16,000	7.3	32	1,600	31,000	3,600	8,000	1,300	270	1,300	280	2,100
% difference	9%	7%	0%	0%	0%	6%	3%	6%	5%	8%	8%	0%	0%	5%

EPA Method 200.7 Sample Splits by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
C1-a	6,200	bpql	3,400	4.7	10	140	15,000	1,800	1,900	170	610	430	13	260
C1-a SPLIT	5,700	bpql	2,800	7.1	10	160	12,000	1,600	2,000	210	380	440	11	330
% difference	8%	N/A	19%	41%	0%	13%	22%	12%	5%	21%	46%	2%	17%	24%
BP15-d	9,100	940	2,500	3.4	11	660	29,000	3,100	3,400	490	270	700	600	1,300
BP15-d SPLIT	9,000	860	2,300	3.4	11	570	28,000	2,900	3,200	490	260	640	580	1,300
% difference	1%	9%	8%	0%	0%	15%	4%	7%	6%	0%	4%	9%	3%	0%
BP1-e	10,000	550	3,600	4.1	bpql	990	25,000	5,900	3,000	330	620	770	500	1,300
BP1-e SPLIT	9,100	540	3,700	4.8	10	930	24,000	5,400	2,900	330	580	770	500	1,400
% difference	9%	2%	3%	16%	N/A	6%	4%	9%	3%	0%	7%	0%	0%	7%
C5-c	10,000	37	3,600	2.7	13	660	12,000	2,700	3,300	340	320	520	17	490
C5-c SPLIT	11,000	36	3,900	2.8	12	580	13,000	3,500	3,300	330	630	510	17	450
% difference	10%	3%	8%	4%	8%	13%	8%	26%	0%	3%	65%	2%	0%	9%
C7-a	13,000	800	2,600	4.3	17	2,000	24,000	3,700	4,100	1,100	560	710	1,100	1,600
C7-a SPLIT	12,000	780	2,400	4.7	15	2,100	24,000	3,700	4,000	1,200	480	720	1,100	1,600
% difference	8%	3%	8%	9%	13%	5%	0%	0%	2%	9%	15%	1%	0%	0%
C10-a	6,100	bpql	2,600	bpql	12	7.7	8,300	2,000	3,200	83	530	420	bpql	22
C10-a SPLIT	5,700	bpql	2,300	bpql	12	8.0	7,600	2,100	2,400	73	460	450	bpql	21
% difference	7%	N/A	12%	N/A	0%	4%	9%	5%	29%	13%	14%	7%	N/A	5%
C11-e	14,000	bpql	4,600	bpql	21	14	16,000	2,900	5,100	190	300	640	14	39
C11-e SPLIT	15,000	bpql	4,800	bpql	22	15	17,000	3,100	5,300	200	360	660	16	42
% difference	7%	N/A	4%	N/A	5%	7%	6%	7%	4%	5%	18%	3%	13%	7%
C13-e	28,000	11	7,700	9.9	62	9,500	28,000	3,000	9,700	2,900	270	980	27	1,900
C13-e SPLIT	25,000	bpql	7,500	9.5	59	8,300	27,000	2,800	9,100	2,700	250	980	25	1,800
% difference	11%	N/A	3%	4%	5%	13%	4%	7%	6%	7%	8%	0%	8%	5%

EPA Method 200.7 Sample Splits by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
PQL	8	10	40	1	10	6	16	80	80	8	20	10	8	1
CP12-d	25,000	120	7,900	3.1	52	5,300	29,000	3,300	8,700	770	270	1,100	220	520
CP12-d SPLIT	32,000	110	7,600	3.2	55	5,400	29,000	3,800	9,400	680	340	1,100	180	470
% difference	25%	9%	4%	2%	6%	2%	0%	14%	8%	12%	23%	0%	20%	10%
CP14-d	8,000	bpql	3,000	bpql	bpql	bpql	7,700	2,800	2,400	78	990	390	bpql	28
CP14-d SPLIT	4,600	bpql	1,900	bpql	bpql	bpql	5,500	1,900	1,400	51	540	280	bpql	19
% difference	54%	N/A	45%	N/A	N/A	N/A	33%	38%	53%	42%	59%	33%	N/A	38%
CP15-c	20,000	11	28,000	bpql	14	bpql	17,000	4,700	9,400	420	290	670	18	52
CP15-c SPLIT	20,000	11	29,000	bpql	15	17	17,000	4,800	10,000	430	320	720	16	51
% difference	0%	0%	4%	N/A	7%	N/A	0%	2%	6%	2%	10%	7%	12%	2%
CP18-b	23,000	21	7,900	bpql	20	21	22,000	6,700	9,000	500	2,100	710	18	56
CP18-b SPLIT	22,000	22	8,200	bpql	20	19	21,000	6,300	8,400	500	1,800	710	19	56
% difference	4%	5%	4%	N/A	0%	10%	5%	6%	7%	0%	15%	0%	5%	0%
CP19-b	30,000	19	16,000	bpql	16	48	23,000	6,100	9,700	590	260	770	30	89
CP19-b SPLIT	30,000	19	16,000	bpql	14	49	22,000	6,100	9,600	570	270	780	24	93
% difference	0%	0%	0%	N/A	13%	2%	4%	0%	1%	3%	4%	1%	22%	4%
C17-c	5,300	180	3,200	2.6	bpql	1,200	20,000	1,900	1,500	1,200	310	380	210	1,200
C17-c SPLIT	4,900	180	3,300	2.7	bpql	1,200	21,000	1,700	1,500	1,200	210	400	220	1,300
% difference	8%	0%	3%	4%	N/A	0%	5%	11%	0%	0%	38%	5%	5%	8%
CP20-c SPLIT	7,100	bpql	3,400	bpql	15	7.4	11,000	1,900	3,000	100	380	590	15	24
CP20-c	7,600	bpql	3,400	bpql	16	6.1	11,000	2,000	3,000	110	400	580	9.4	25
% difference	7%	N/A	0%	N/A	6%	19%	0%	5%	0%	10%	5%	2%	46%	4%

Note: bpql = below probable quantitative limit

APPENDIX A

A.4 Metals QC Data

A.4.4 Preparation and Laboratory Sample Fortified Matrix Spikes and Fortified Matrix Blanks

Preparation spikes are samples in which analytes of known concentrations have been added just prior to the digestion procedure in order to assess matrix effects on analyte recoveries.

Laboratory spikes are samples in which analytes of known concentrations have been added to and aliquot of the sample digest in order to assess matrix effects on analyte recoveries.

Lab Fortified Blanks (LFBs) are samples in which analytes of known concentrations have been added to an aliquot of the calibration blank in order to assess matrix effects on analyte recoveries.

Spike recoveries are calculated by subtracting the diluted sample value from the spiked sample value and dividing the difference by the amount of spike added. We then multiply this value by 100 to obtain percent units.

EPA Method Digest 3050B Preparation Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
7/11/00	16:49	CW	6/19/00	SS-1	95	0.09	32	0.01	0.07	0.43	84	19	28	2.2	1.2	3.5	0.18	0.53
7/11/00	16:58	CW	6/19/00	SS-1 Prep Spike	250	1.1	180	0.21	0.56	11	240	72	110	27	7.2	14	5.1	19
				% spike recovery	166%	102%	101%	101%	99%	106%	110%	123%	113%	100%	122%	109%	99%	93%
7/11/00	18:26	CW	6/19/00	SS-14	80	0.33	37	0.03	0.07	7.6	110	16	21	14	1.1	4.5	1.3	9.5
7/11/00	18:36	CW	6/19/00	SS-14 Prep Spike	220	1.4	180	0.23	0.55	18	250	66	99	38	6.8	14	6.0	27
				% spike recovery	150%	110%	98%	102%	95%	112%	104%	116%	107%	102%	117%	100%	97%	92%
7/20/00	15:59	TMC	7/17/00	BP6-a	71	0.50	36	0.01	0.09	3.4	110	19	27	4.3	1.7	3.7	0.64	3.5
7/20/00	16:25	CW	7/17/00	BP6-a Prep Spike	200	1.4	170	0.21	0.55	13	240	65	100	26	7.7	13	5.2	21
				% spike recovery	131%	91%	90%	100%	79%	97%	90%	103%	98%	87%	120%	94%	91%	88%
7/21/00	11:42	TMC	7/17/00	BP10-b	73	0.02	22	0.00	0.11	0.06	96	16	27	0.69	1.3	3.6	0.09	0.20
7/21/00	10:44	TMC	7/17/00	BP10-b Prep Spike	220	1.1	170	0.21	0.62	10	250	64	110	25	7.4	14	5.0	20
				% spike recovery	147%	108%	99%	105%	102%	99%	103%	107%	111%	97%	122%	105%	98%	99%
7/21/00	13:33	CW	7/20/00	SS-40	190	0.08	38	0.01	0.09	0.45	110	33	48	4.0	1.1	3.9	0.19	2.9
7/21/00	14:38	CW	7/20/00	SS-40 Prep Spike	340	1.1	180	0.21	0.59	11	270	84	130	29	6.8	14	5.0	22
				% spike recovery	150%	102%	95%	100%	100%	106%	103%	113%	109%	100%	114%	101%	96%	96%
7/21/00	13:53	TMC	7/20/00	SS-49	97	0.18	270	0.01	0.09	1.5	88	22	44	3.1	3.3	3.6	0.26	2.5
7/21/00	15:58	CW	7/20/00	SS-49 Prep Spike	240	1.2	460	0.21	0.59	11	240	72	130	27	9.4	14	5.0	21
				% spike recovery	142%	103%	123%	100%	99%	95%	101%	111%	113%	95%	121%	104%	95%	92%
7/27/00	11:46	CW	7/24/00	SS-67	110	2.7	35	0.02	0.18	21	160	19	39	4.2	1.3	4.9	1.9	6.5
7/27/00	11:28	CW	7/24/00	SS-67 Prep Spike	270	3.6	180	0.22	0.68	31	300	70	120	28	7.3	15	6.6	25
				% spike recovery	160%	95%	97%	100%	100%	100%	93%	113%	108%	95%	119%	102%	94%	93%
7/27/00	13:56	SD	7/24/00	SS-73	99	1.5	47	0.02	0.12	10	130	24	38	4.3	1.9	5.2	1.4	6.1
7/27/00	15:22	SD	7/24/00	SS-73 Prep Spike	260	2.6	180	0.22	0.62	21	280	73	120	28	7.7	15	6.1	25
				% spike recovery	161%	115%	89%	100%	99%	110%	100%	109%	109%	95%	116%	98%	94%	95%
7/27/00	18:44	CW	7/25/00	SS-94	100	0.45	290	0.02	0.17	2.2	130	23	78	4.9	3.8	8.9	0.41	3.9
7/27/00	16:35	CW	7/25/00	SS-94 Prep Spike	250	1.5	470	0.21	0.67	12	270	74	160	29	9.8	18	5.0	22
				% spike recovery	150%	105%	120%	95%	99%	98%	93%	113%	110%	96%	121%	91%	92%	91%

EPA Method Digest 3050B Preparation Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
7/27/00	15:49	SD	7/24/00	SS-101	180	0.24	54	0.00	0.37	0.49	220	9.5	50	7.4	2.5	6.7	0.27	0.60
7/27/00	17:18	CW	7/25/00	SS-101 Prep Spike	400	1.3	200	0.20	0.92	11	380	65	140	32	8.9	17	5.1	20
				% spike recovery	220%	107%	98%	100%	110%	105%	107%	124%	120%	98%	128%	103%	97%	97%
8/16/00	15:14	CW	8/8/00	BP14-b	75	0.04	24	0.00	0.12	0.08	100	18	32	1.5	2.0	3.3	0.09	0.22
8/16/00	13:49	CW	8/8/00	BP14-b Prep Spike	209	1.0	160	0.20	0.59	9.4	250	66	110	24	8.0	13	4.7	18
				% spike recovery	134%	96%	91%	100%	94%	93%	100%	107%	104%	90%	120%	97%	92%	89%
8/16/00	12:44	CW	8/8/00	BP2-i	74	0.03	22	0.00	0.09	0.07	78	18	27	0.82	2.7	3.4	0.09	0.25
8/16/00	12:52	CW	8/8/00	BP2-i Prep Spike	210	1.0	170	0.21	0.57	9.8	220	69	110	24	9.5	14	4.9	19
				% spike recovery	136%	97%	99%	105%	96%	97%	95%	113%	111%	93%	136%	106%	96%	94%
9/11/00	12:26	CW	8/2/00	ESS-5	110	0.11	33	0.01	0.16	0.39	130	26	37	3.9	1.8	4.5	0.17	0.52
9/11/00	16:01	CW	8/2/00	ESS-5 Prep Spike	240	1.1	170	0.21	0.63	10	260	79	120	26	8.5	15	4.8	18
				% spike recovery	130%	99%	91%	100%	94%	96%	87%	118%	111%	88%	134%	105%	93%	87%
9/11/00	15:54	CW	8/2/00	BP1-e	52	2.8	18	0.02	0.04	5.0	120	30	15	1.7	3.1	3.8	2.5	6.7
9/12/00	14:57	CW	8/2/00	BP1-e Prep Spike	190	3.9	170	0.24	0.52	15	260	81	94	25	9.2	14	7.5	26
				% spike recovery	138%	110%	101%	110%	96%	100%	93%	113%	105%	93%	122%	102%	100%	97%
9/11/00	13:57	CW	8/3/00	BP13-e	46	2.6	16	0.01	0.04	3.8	120	17	16	2.7	1.4	3.2	2.3	5.5
9/12/00	11:19	CW	8/3/00	BP13-e Prep Spike	180	3.6	160	0.23	0.52	14	260	72	95	26	7.9	13	7.2	24
				% spike recovery	134%	100%	96%	110%	96%	102%	93%	122%	105%	93%	130%	98%	98%	93%
9/12/00	11:07	CW	8/3/00	SED-8	96	0.41	120	0.03	0.16	4.4	120	15	35	6.3	1.4	6.1	0.79	5.4
9/11/00	12:11	CW	8/3/00	SED-8 Prep Spike	240	1.4	250	0.22	0.61	14	260	66	110	28	7.7	16	5.3	22
				% spike recovery	144%	99%	87%	95%	90%	96%	93%	113%	100%	87%	126%	99%	90%	83%
9/12/00	13:57	CW	8/8/00	BP7-a	74	0.69	39	0.04	0.10	5.4	120	22	28	7.1	2.3	4.8	0.88	6.4
9/12/00	13:53	CW	8/8/00	BP7-a Prep Spike	220	1.8	190	0.25	0.58	16	270	73	110	30	9.1	15	5.9	25
				% spike recovery	146%	111%	101%	105%	96%	106%	100%	113%	109%	92%	136%	102%	100%	93%
9/12/00	15:00	CW	8/10/00	BP13-a	33	0.04	15	0.00	0.06	0.14	61	8.8	14	0.49	2.0	2.1	0.06	0.66
9/12/00	15:04	CW	8/10/00	BP13-a Prep Spike	150	1.1	170	0.23	0.55	10	210	57	93	24	8.6	13	5.1	20
				% spike recovery	117%	106%	103%	115%	98%	99%	99%	107%	105%	94%	132%	109%	101%	97%

EPA Method Digest 3050B Preparation Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
9/13/00	15:38	CW	8/16/00	C6-a	25	0.03	11	0.00	0.04	0.02	45	8.6	8.4	1.4	2.2	1.6	0.03	0.45
9/13/00	12:08	CW	8/16/00	C6-a Prep Spike	140	1.0	160	0.20	0.54	10	190	57	88	25	8.6	12	4.9	19
				% spike recovery	115%	97%	99%	100%	100%	100%	97%	108%	106%	94%	128%	104%	97%	93%
9/13/00	10:56	CW	8/10/00	BP9-d	88	0.21	46	0.06	0.11	14	110	20	34	7.9	2.2	4.3	0.16	10
9/13/00	14:17	CW	8/10/00	BP9-d Prep Spike	220	1.2	190	0.25	0.57	25	250	68	110	30	8.7	14	4.9	27
				% spike recovery	132%	99%	96%	95%	92%	110%	93%	107%	101%	88%	130%	97%	95%	85%
9/13/00	15:53	CW	8/16/00	C5-a	34	0.02	17	0.00	0.08	0.05	86	9.4	12	1.3	3.2	2.5	0.06	0.09
9/14/00	11:39	CW	8/16/00	C5-a Prep Spike	160	1.1	170	0.21	0.57	10	230	60	93	25	11	13	5.1	19
				% spike recovery	126%	108%	102%	105%	98%	100%	96%	112%	108%	95%	156%	105%	101%	95%
9/14/00	15:17	CW	8/21/00	C11-d	130	0.03	37	0.00	0.18	0.15	130	19	45	1.7	2.1	3.3	0.13	0.34
9/14/00	12:48	CW	8/21/00	C11-d Prep Spike	290	1.1	190	0.20	0.71	10	290	70	130	25	7.8	14	5.1	20
				% spike recovery	160%	107%	102%	99%	106%	99%	107%	113%	113%	93%	114%	107%	99%	98%
9/14/00	12:05	CW	8/21/00	C9-b	100	0.43	35	0.04	0.14	28	130	22	37	5.4	1.4	4.6	0.34	5.7
9/14/00	16:12	CW	8/21/00	C9-b Prep Spike	270	1.5	180	0.24	0.63	41	280	74	120	29	7.2	15	5.2	24
				% spike recovery	170%	107%	97%	100%	98%	130%	100%	116%	111%	94%	116%	104%	97%	92%
10/27/00	13:21	CW	10/25/00	CP12-c	63	5.1	14	0.02	0.08	5.1	170	21	25	1.9	1.5	4.2	2.6	6.8
10/27/00	10:29	CW	10/25/00	CP12-c Prep Spike	210	5.9	160	0.21	0.57	15	300	72	100	25	7.5	14	7.3	24
				% spike recovery	147%	80%	97%	95%	98%	99%	87%	113%	100%	92%	120%	98%	94%	86%
10/27/00	11:53	CW	10/25/00	CP15-d	64	0.03	160	0.00	0.05	0.06	65	17	32	1.9	1.2	3.7	0.06	0.18
10/27/00	14:10		10/25/00	CP15-d Prep Spike	210	1.1	300	0.20	0.54	11	210	66	120	25	7.7	14	4.9	18
				% spike recovery	146%	107%	93%	100%	98%	109%	97%	109%	117%	92%	130%	103%	97%	89%
11/7/00	12:05	CW	10/31/00	CP16-c	39	0.04	17	0.00	0.07	0.04	64	10	17	0.43	2.4	2.8	0.06	0.12
11/7/00	12:44	CW	10/31/00	CP16-c Prep Spike	150	1.1	160	0.21	0.57	9.9	210	56	93	24	8.5	13	5	20
				% spike recovery	111%	106%	95%	105%	100%	99%	97%	102%	101%	94%	122%	102%	99%	99%
11/7/00	11:54	CW	10/31/00	CP21-e	24	0.04	12	0.00	0.03	0.04	64	8.3	7.7	2.7	2.5	2.5	0.05	0.1
11/7/00	14:17	CW	10/31/00	CP21-e Prep Spike	140	1.1	160	0.22	0.52	10	210	57	88	26	9.1	13	5	20
				% spike recovery	116%	106%	99%	110%	98%	100%	97%	108%	107%	93%	132%	105%	99%	100%

EPA Method Digest 3050B Preparation Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Digestion Date	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
				PQL	0.04	0.05	0.2	0.005	0.05	0.03	0.08	0.4	0.4	0.04	0.1	0.05	0.04	0.008
11/8/00	12:59	CW	11/2/00	SS-65	96	0.38	39	0.02	0.19	11	140	15	37	1.4	1.3	5.0	2.0	6.3
11/8/00	13:14	CW	11/2/00	SS-65 Prep Spike	250	1.4	180	0.23	0.69	23	290	65	120	25	7.2	15	6.8	24
				% spike recovery	154%	102%	94%	105%	100%	120%	100%	111%	111%	94%	118%	100%	96%	89%
12/4/00	11:59	CW	12/1/00	CP18-c	51	0.04	53	0.00	0.07	0.04	71	15	24	1.4	1.6	3.0	0.06	0.14
12/4/00	12:06	CW	12/1/00	CP18-c Prep Spike	170	1.0	190	0.20	0.54	9.6	220	60	100	24	7.1	13	4.8	19
				% spike recovery	119%	96%	91%	100%	94%	96%	99%	100%	101%	90%	110%	100%	95%	94%

Note: bpql = below probable quantitative limit

EPA Method 200.7 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		*0.04*	*0.05*	*0.2*	*0.005*	*0.05*	*0.03*	*0.08*	*0.4*	*0.4*	*0.04*	*0.1*	*0.05*	*0.04*	*0.008*
		Amount Spike Added		*100*	*1*	*150*	*0.2*	*0.5*	*10*	*150*	*45*	*75*	*25*	*5*	*10*	*5*	*20*
7/11/00	16:40	CW	DIGEST 005 SPK DIL	0.6709	bpql	0.3377	bpql	bpql	0.03	2.5	0.7224	bpql	bpql	0.1218	0.1551	bpql	0.0194
7/11/00	16:45	CW	DIGEST 005 SPK	98.8	1.011	139.7	0.2042	0.4567	9.739	146.6	45.25	74.93	23.59	4.816	10.44	4.824	18.88
			% recovery	98%	N/A	93%	N/A	N/A	97%	96%	99%	N/A	N/A	94%	103%	N/A	94%
7/11/00	17:44	CW	DIGEST 016 SPK DIL	83.07	0.0791	28.63	bpql	0.0654	0.3945	75.5	16.17	24.67	1.961	1.05	3.167	0.154	0.4816
7/11/00	17:49	CW	DIGEST 016 SPK	193.2	1.083	165.2	0.2058	0.5202	10.16	217.4	61.54	99.58	25.23	6.157	13.51	4.905	19.01
			% recovery	110%	100%	91%	N/A	91%	98%	95%	101%	100%	93%	102%	103%	95%	93%
7/11/00	18:48	CW	DIGEST 026 SPK DIL	142.5	0.0964	34.96	bpql	0.0661	0.3911	96.65	21.78	38.44	2.831	1.902	2.422	0.1448	1.254
7/11/00	18:52	CW	DIGEST 026 SPK	257.6	1.113	174.4	0.2072	0.5276	10.27	240.2	67.28	114.6	26.68	7.16	12.85	4.923	19.93
			% recovery	115%	102%	93%	N/A	92%	99%	96%	101%	102%	95%	105%	104%	96%	93%
7/11/00	19:04	CW	DIGEST 036 SPK DIL	89.01	0.1232	17.75	0.0099	0.0689	1.053	74.22	22.41	25.5	2.545	1.257	2.325	0.2288	2.156
7/11/00	19:08	CW	DIGEST 036 SPK	200.7	1.163	159.3	0.2121	0.5423	10.86	217.9	67.29	101.2	26.31	6.407	12.69	5.044	21.27
			% recovery	112%	104%	94%	101%	95%	98%	96%	100%	101%	95%	103%	104%	96%	96%
7/20/00	14:30	CW	DIGEST 037 SPK DIL	63.24	0.1444	334.1	0.0148	0.0571	1.982	51.45	17.94	67.53	4.129	2.071	4.65	0.3913	2.276
7/20/00	14:34	CW	DIGEST 037 SPK	164.1	1.126	524.8	0.2173	0.526	12.09	193.6	65.83	147.9	27.57	7.546	15.22	5.164	20.44
			% recovery	101%	98%	127%	101%	94%	101%	95%	106%	107%	94%	110%	106%	95%	91%
7/20/00	13:24	CW	DIGEST 051 SPK DIL	80.43	2.708	17.21	0.0976	0.0887	13.03	129.4	22.3	24.09	35.99	2.293	4.092	24.94	29.36
7/20/00	13:28	CW	DIGEST 051 SPK	194.8	3.727	160.8	0.3039	0.5595	25.01	269.1	69.28	102	64.12	7.669	14.62	29.47	46.12
			% recovery	114%	102%	96%	103%	94%	120%	93%	104%	104%	113%	108%	105%	91%	84%
7/20/00	11:28	TMC	DIGEST 058 SPK DIL	85.55	0.1051	21.01	0.0279	0.1031	50.57	96.79	16.04	28.85	10.21	1.923	3.988	0.2365	6.248
7/20/00	11:33	TMC	DIGEST 058 SPK	206.6	1.143	170.7	0.2423	0.6071	63.7	243.3	64.49	109.9	35.21	7.521	14.64	5.252	25.41
			% recovery	121%	104%	100%	107%	101%	131%	98%	108%	108%	100%	112%	107%	100%	96%
7/20/00	11:47	TMC	DIGEST 060 SPK DIL	44.26	bpql	14.2	0.0172	0.0522	6.255	61.58	10.62	14.25	4.502	2.143	2.137	0.0755	3.147
7/20/00	11:51	TMC	DIGEST 060 SPK	148.7	1.055	162.5	0.2354	0.5498	16.43	210.1	57.68	92.81	29.29	7.612	12.84	5.142	23.23
			% recovery	104%	N/A	99%	109%	100%	102%	99%	105%	105%	99%	109%	107%	101%	100%

EPA Method 200.7 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		*0.04*	*0.05*	*0.2*	*0.005*	*0.05*	*0.03*	*0.08*	*0.4*	*0.4*	*0.04*	*0.1*	*0.05*	*0.04*	*0.008*
		Amount Spike Added		*100*	*1*	*150*	*0.2*	*0.5*	*10*	*150*	*45*	*75*	*25*	*5*	*10*	*5*	*20*
7/20/00	15:35	CW	DIGEST 065 SPK DIL	58.69	0.6495	26.48	0.016	0.074	4.06	92.86	15.96	20.29	4.374	1.498	3.279	0.7662	3.904
7/20/00	15:39	CW	DIGEST 065 SPK	158.2	1.679	166.8	0.2206	0.5501	13.88	235.2	61.34	96.44	27.81	6.668	13.54	5.551	22.87
			% recovery	100%	103%	94%	102%	95%	98%	95%	101%	102%	94%	103%	103%	96%	95%
7/20/00	16:45	CW	DIGEST 076 SPK DIL	30.11	bpql	14.09	bpql	bpql	bpql	108.2	7.498	11.23	1.365	1.622	3.161	0.1036	0.3959
7/20/00	16:50	CW	DIGEST 076 SPK	125.9	1.041	156.2	0.2081	0.5142	9.696	250	52.15	86.67	24.62	6.68	13.61	4.958	19.38
			% recovery	96%	N/A	95%	N/A	N/A	N/A	95%	99%	101%	93%	101%	104%	97%	95%
7/21/00	9:55	TMC	DIGEST 084 SPK DIL	47.6	7.282	9.435	0.0319	bpql	3.857	119.6	16.8	15.32	1.108	0.9885	2.706	2.723	13.51
7/21/00	9:59	TMC	DIGEST 084 SPK	147.9	8.255	153.9	0.2395	0.5236	13.66	259.1	62.3	91.41	25.12	6.153	12.87	7.537	31.87
			% recovery	100%	97%	96%	104%	N/A	98%	93%	101%	101%	96%	103%	102%	96%	92%
7/21/00	11:30	TMC	DIGEST 088 SPK DIL	65.85	5.288	18.38	0.0472	0.0707	69.11	168.7	16.68	22.59	3.1	1.24	4.287	5.928	15.47
7/21/00	11:34	TMC	DIGEST 088 SPK	184.1	6.33	165.6	0.2519	0.5677	80.91	305.1	63.35	100.8	27.73	6.657	14.35	10.51	33.72
			% recovery	118%	104%	98%	102%	99%	118%	91%	104%	104%	99%	108%	101%	92%	91%
7/21/00	10:51	TMC	DIGEST 090 SPK DIL	80.91	bpql	28.53	bpql	0.0996	0.0882	90.09	20.5	32.84	0.8896	1.727	3.052	0.0899	0.329
7/21/00	10:55	TMC	DIGEST 090 SPK	198.6	1.074	171	0.2069	0.5854	10.01	235	66.1	109.8	25.21	7.066	13.21	4.966	20.1
			% recovery	118%	N/A	95%	N/A	97%	99%	97%	101%	103%	97%	107%	102%	98%	99%
7/21/00	13:14	CW	DIGEST 110 SPK DIL	55.02	0.3189	24.1	0.0074	0.0765	2.008	84.23	13.3	18.98	3.417	1.66	2.667	0.4186	2.449
7/21/00	13:19	CW	DIGEST 110 SPK	157.2	1.379	168.2	0.215	0.5592	11.74	229.1	57.92	94.82	27.56	6.861	12.77	5.292	22.44
			% recovery	102%	106%	96%	104%	97%	97%	97%	99%	101%	97%	104%	101%	97%	100%
7/21/00	14:18	CW	DIGEST 118 SPK DIL	157.9	0.0731	34.06	0.0065	0.08	0.4032	102.1	29.42	42.99	3.652	0.9959	3.501	0.1764	2.607
7/21/00	14:27	CW	DIGEST 118 SPK	277	1.098	175.4	0.2105	0.5616	10.22	243.9	74.95	119.4	27.65	6.265	13.52	4.976	22.19
			% recovery	119%	102%	94%	102%	96%	98%	95%	101%	102%	96%	105%	100%	96%	98%
7/21/00	16:23	CW	DIGEST 138 SPK DIL	45.58	0.3311	19.88	0.0179	0.0828	2.299	90.49	11.46	16.06	6.861	1.572	2.663	0.4388	3.724
7/21/00	16:29	CW	DIGEST 138 SPK	147.8	1.387	163	0.2231	0.5679	12.06	233.4	56.66	92.6	30.58	6.776	12.75	5.288	23.38
			% recovery	102%	106%	95%	103%	97%	98%	95%	100%	102%	95%	104%	101%	97%	98%

EPA Method 200.7 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		*0.04*	*0.05*	*0.2*	*0.005*	*0.05*	*0.03*	*0.08*	*0.4*	*0.4*	*0.04*	*0.1*	*0.05*	*0.04*	*0.008*
		Amount Spike Added		*100*	*1*	*150*	*0.2*	*0.5*	*10*	*150*	*45*	*75*	*25*	*5*	*10*	*5*	*20*
7/21/00	15:28	CW	DIGEST 139 SPK DIL	28.73	0.3636	13.88	0.0207	bpql	2.925	90.17	8.092	9.146	6.294	1.19	1.801	0.4301	7.017
7/21/00	15:32	CW	DIGEST 139 SPK	131.9	1.436	157.2	0.2266	0.5319	12.68	234.1	52.93	85.46	30.26	6.407	11.81	5.301	26.63
			% recovery	103%	107%	96%	103%	N/A	98%	96%	100%	102%	96%	104%	100%	97%	98%
7/27/00	12:37	SD	DIGEST 164 SPK DIL	58.25	0.5276	28.04	0.0107	0.0843	3.453	91.17	13.33	21.07	4.089	1.292	2.937	0.6112	3.024
7/27/00	12:42	SD	DIGEST 164 SPK	163.7	1.632	168.9	0.2162	0.5706	13.32	239	58.9	98.26	28.59	6.618	13.07	5.518	22.96
			% recovery	105%	110%	94%	103%	97%	99%	99%	101%	103%	98%	107%	101%	98%	100%
7/27/00	13:42	SD	DIGEST 163 SPK DIL	36.08	1.523	5.964	0.0122	0.0406	5.939	82.57	12.54	10.65	1.524	1.037	2.348	1.448	5.051
7/27/00	13:46	SD	DIGEST 163 SPK	141.6	2.63	148	0.2158	0.5203	15.69	229.3	58.05	87.51	25.9	6.323	12.32	6.311	24.39
			% recovery	106%	111%	95%	102%	96%	98%	98%	101%	102%	98%	106%	100%	97%	97%
7/27/00	15:06	SD	DIGEST 147 SPK DIL	49.91	2.12	11.1	0.0083	0.06	5.505	97.03	14.54	15.91	2.339	1.031	2.984	1.884	4.105
7/27/00	15:10	SD	DIGEST 147 SPK	153.2	3.214	155	0.2167	0.5375	15.31	243.3	60.48	92.48	26.58	6.316	13.29	6.785	23.65
			% recovery	103%	109%	96%	104%	96%	98%	98%	102%	102%	97%	106%	103%	98%	98%
7/27/00	16:01	SD	DIGEST 178 SPK DIL	103.6	0.1907	112.1	0.0069	0.2427	1.26	119.8	9.064	43.42	2.982	1.672	5.174	0.2958	1.646
7/27/00	16:06	SD	DIGEST 178 SPK	229.7	1.27	253.5	0.21	0.7329	11.36	266.1	55.86	123.2	27.65	7.218	15.37	5.117	20.98
			% recovery	126%	108%	94%	102%	98%	101%	98%	104%	106%	99%	111%	102%	96%	97%
7/27/00	16:57	CW	DIGEST 211 SPK DIL	77.6	0.7826	403.4	0.0203	0.1086	6.385	88.32	12.34	37.19	4.926	1.22	4.756	1.473	6.463
7/27/00	17:01	CW	DIGEST 211 SPK	201.6	1.847	573.2	0.22	0.5909	16.54	231.7	59.3	116.4	29.3	6.735	14.94	6.278	24.97
			% recovery	124%	106%	113%	100%	96%	102%	96%	104%	106%	97%	110%	102%	96%	93%
7/27/00	18:12	CW	DIGEST 205 SPK DIL	348.5	1.204	178.7	0.187	0.8309	9.73	348.1	57.85	123.7	29.16	7.974	15.28	4.635	18.33
7/27/00	18:16	CW	DIGEST 205 SPK	475.9	2.31	320.3	0.3819	1.31	21.4	484.1	105	204.6	53.29	13.84	25.27	9.384	36.04
			% recovery	127%	111%	94%	97%	96%	117%	91%	105%	108%	97%	117%	100%	95%	89%
7/27/00	19:06	CW	DIGEST 212 SPK DIL	106.5	0.1133	28.38	0.0015	0.1418	0.2941	116.4	18.95	32.9	3.476	1.518	3.693	0.19	0.456
7/27/00	19:10	CW	DIGEST 212 SPK	228.3	1.224	171.5	0.2079	0.6244	9.945	263.5	64.7	111.5	27.78	7.106	13.76	5.145	20.22
			% recovery	122%	111%	95%	103%	97%	97%	98%	102%	105%	97%	112%	101%	99%	99%

EPA Method 200.7 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		*0.04*	*0.05*	*0.2*	*0.005*	*0.05*	*0.03*	*0.08*	*0.4*	*0.4*	*0.04*	*0.1*	*0.05*	*0.04*	*0.008*
		Amount Spike Added		*100*	*1*	*150*	*0.2*	*0.5*	*10*	*150*	*45*	*75*	*25*	*5*	*10*	*5*	*20*
8/16/00	12:27	CW	DIGEST 251 SPK DIL	75.11	2.644	16.58	0.0946	0.0771	12.71	122.5	22.65	23.66	34.61	2.398	4.113	24.24	27.92
8/16/00	12:31	CW	DIGEST 251 SPK	186.2	3.604	160	0.2849	0.5445	24.17	258.9	69.5	101.2	60.8	7.668	14.34	28.18	43.23
			% recovery	111%	96%	96%	95%	93%	115%	91%	104%	103%	105%	105%	102%	79%	77%
8/16/00	13:32	CW	DIGEST 276 SPK DIL	33.67	0.1137	13.06	0.0018	0.0505	3.603	63.21	10.4	14.66	1.17	1.67	2.072	0.1025	0.9332
8/16/00	13:36	CW	DIGEST 276 SPK	130.2	1.11	153.7	0.195	0.511	13.17	203.7	55.8	89.87	23.85	6.811	12.29	4.938	19.01
			% recovery	97%	100%	94%	97%	92%	96%	94%	101%	100%	91%	103%	102%	97%	90%
8/16/00	14:39	CW	DIGEST 361 SPK DIL	69.41	0.0269	21.36	0.0014	0.1088	0.072	91.8	15.74	27.67	1.333	1.842	2.91	0.0886	0.2028
8/16/00	14:43	CW	DIGEST 361 SPK	178.9	1.034	163.2	0.1937	0.5804	9.869	232.6	62.43	104.6	24.19	7.07	13.21	4.903	18.36
			% recovery	109%	101%	95%	96%	94%	98%	94%	104%	103%	91%	105%	103%	96%	91%
8/16/00	15:34	CW	DIGEST 372 SPK DIL	66.52	0.0591	20.96	0.001	0.082	0.0704	75.21	16.65	25.33	0.6771	1.572	2.882	0.0859	0.237
8/16/00	15:39	CW	DIGEST 372 SPK	178	1.073	162.3	0.1966	0.5536	10.07	217.4	64.05	103.8	23.89	6.902	13.32	4.961	18.51
			% recovery	111%	101%	94%	98%	94%	100%	95%	105%	105%	93%	107%	104%	98%	91%
9/11/00	12:01	CW	DIGEST 223 SPK DIL	101.6	0.1088	30.03	0.0072	0.1703	0.3699	123.3	18.8	40.34	2.701	1.562	4.857	0.174	0.5484
9/11/00	12:06	CW	DIGEST 223 SPK	216.7	1.134	170.1	0.203	0.6267	10.59	263.2	66.99	118.4	25.62	7.253	15.17	4.961	18.73
			% recovery	115%	103%	93%	98%	91%	102%	93%	107%	104%	92%	114%	103%	96%	91%
9/11/00	15:29	CW	DIGEST 246 SPK DIL	36.91	1.007	14.94	0.021	0.0486	4.898	91.8	13.74	13.31	2.134	1.46	3.079	0.9671	5.293
9/11/00	15:33	CW	DIGEST 246 SPK	133.2	2.012	150.6	0.2128	0.4952	14.67	228.8	59.88	88.62	24.1	6.826	13.08	5.686	22.85
			% recovery	96%	101%	90%	96%	89%	98%	91%	103%	100%	88%	107%	100%	94%	88%
9/11/00	13:12	CW	DIGEST 323 SPK DIL	108.8	0.0622	26.67	0.0048	0.11	0.1093	149	19.92	40.6	2.076	19.6	3.409	0.1027	0.2818
9/11/00	13:16	CW	DIGEST 323 SPK	225	1.043	169.9	0.1977	0.5736	10.15	289	67.73	118.7	25.16	25.75	13.51	4.843	18.38
			% recovery	116%	98%	95%	96%	93%	100%	93%	106%	104%	92%	123%	101%	95%	90%
9/11/00	16:32	CW	DIGEST 348 SPK DIL	84.22	0.3029	94.93	0.0235	0.1352	3.777	104.6	13.82	33.18	7.536	1.54	5.581	0.6212	4.835
9/11/00	16:36	CW	DIGEST 348 SPK	196.9	1.297	230.2	0.2148	0.5838	13.81	242.5	61.3	110.1	29.79	7.115	15.73	5.347	22.31
			% recovery	113%	99%	90%	96%	90%	100%	92%	106%	103%	89%	112%	101%	95%	87%

EPA Method 200.7 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		*0.04*	*0.05*	*0.2*	*0.005*	*0.05*	*0.03*	*0.08*	*0.4*	*0.4*	*0.04*	*0.1*	*0.05*	*0.04*	*0.008*
		Amount Spike Added		*100*	*1*	*150*	*0.2*	*0.5*	*10*	*150*	*45*	*75*	*25*	*5*	*10*	*5*	*20*
9/11/00	14:25	CW	DIGEST 357 SPK DIL	87.55	0.4741	49.6	0.0204	0.12	3.542	107.9	20.12	31.63	4.894	1.954	4.934	0.6274	3.355
9/11/00	14:28	CW	DIGEST 357 SPK	200.5	1.508	186.8	0.2161	0.5737	13.56	247.4	67.26	108.6	27.49	7.496	15.23	5.402	21.42
			% recovery	113%	103%	91%	98%	91%	100%	93%	105%	103%	90%	111%	103%	95%	90%
9/12/00	15:32	CW	DIGEST 243 SPK DIL	97.47	0.0416	27.77	0.0044	0.1468	0.1115	130	28.9	32.14	3.548	2.142	3.47	0.1131	0.2646
9/12/00	15:36	CW	DIGEST 243 SPK	207.1	1.034	171.2	0.2045	0.6103	9.798	268.9	72.81	107.4	25.93	7.193	13.51	4.943	18.51
			% recovery	110%	99%	96%	100%	93%	97%	93%	98%	100%	90%	101%	100%	97%	91%
9/12/00	16:38	CW	DIGEST 295 SPK DIL	113.8	0.0516	30.46	0.0039	0.0967	0.1252	108.3	22.39	38.08	2.609	1.867	3.21	0.1063	0.3215
9/12/00	16:42	CW	DIGEST 295 SPK	224.2	1.023	173.6	0.2028	0.5558	9.607	246.5	65.07	111.7	24.87	6.817	13.06	4.914	18.55
			% recovery	110%	97%	95%	99%	92%	95%	92%	95%	98%	89%	99%	99%	96%	91%
9/12/00	14:30	CW	DIGEST 324 SPK DIL	140.6	0.0652	29.22	0.0065	0.1514	0.1318	149.6	25.9	50.97	3.438	22.93	3	0.1334	0.3593
9/12/00	14:34	CW	DIGEST 324 SPK	250.3	1.059	176.7	0.2067	0.6197	9.987	289.4	68.58	125.9	26.38	27.08	13.09	4.994	18.96
			% recovery	110%	99%	98%	100%	94%	99%	93%	95%	100%	92%	83%	101%	97%	93%
9/12/00	13:05	CW	DIGEST 333 SPK DIL	53.8	0.5996	24.9	0.0256	0.0739	3.825	96.18	16.25	19.23	8.285	1.645	3.392	0.6643	5.941
9/12/00	13:09	CW	DIGEST 333 SPK	163	1.603	167.9	0.2255	0.5385	13.41	234.9	60.49	93.93	30.57	6.659	13.36	5.503	24.27
			% recovery	109%	100%	95%	100%	93%	96%	92%	98%	100%	89%	100%	100%	97%	92%
9/12/00	11:59	CW	DIGEST 350 SPK DIL	85.96	0.3751	108.8	0.0272	0.14	3.984	113.7	13.9	32.19	5.663	1.345	5.546	0.7133	4.91
9/12/00	12:03	CW	DIGEST 350 SPK	199.6	1.407	253.7	0.2326	0.6169	14.13	254.2	60.19	109.7	28.94	6.634	15.94	5.711	23.65
			% recovery	114%	103%	97%	103%	95%	101%	94%	103%	103%	93%	106%	104%	100%	94%
9/13/00	13:26	CW	DIGEST 292 SPK DIL	122	0.0353	41.25	0.0031	0.1226	0.1464	115.5	21.64	41.76	2.112	1.487	3.986	0.1166	0.3656
9/13/00	13:30	CW	DIGEST 292 SPK	231.5	1.001	177	0.1907	0.5687	9.764	249.3	66.47	116	24.24	6.697	13.78	4.754	17.98
			% recovery	110%	97%	91%	94%	89%	96%	89%	100%	99%	89%	104%	98%	93%	88%
9/13/00	11:45	CW	DIGEST 304 SPK DIL	62.25	0.4343	34.72	0.0137	0.077	3.098	85.77	18.83	23.02	3.151	2.373	3.497	0.5328	3.105
9/13/00	11:49	CW	DIGEST 304 SPK	173.2	1.452	175.1	0.2089	0.5429	12.94	225.4	65.12	99.91	25.89	7.682	13.68	5.37	21.54
			% recovery	111%	102%	94%	98%	93%	98%	93%	103%	103%	91%	106%	102%	97%	92%

EPA Method 200.7 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		*0.04*	*0.05*	*0.2*	*0.005*	*0.05*	*0.03*	*0.08*	*0.4*	*0.4*	*0.04*	*0.1*	*0.05*	*0.04*	*0.008*
		Amount Spike Added		*100*	*1*	*150*	*0.2*	*0.5*	*10*	*150*	*45*	*75*	*25*	*5*	*10*	*5*	*20*
9/13/00	15:06	CW	DIGEST 389 SPK DIL	35.75	0.0162	12.86	0.0011	0.0601	0.0467	55.62	7.802	15.96	0.4236	1.422	1.959	0.0426	0.1262
9/13/00	15:11	CW	DIGEST 389 SPK	133	0.9855	151	0.1933	0.5157	9.577	190.6	51.94	89.7	22.64	6.513	11.77	4.782	18.13
			% recovery	97%	97%	92%	96%	91%	95%	90%	98%	98%	89%	102%	98%	95%	90%
9/13/00	16:16	CW	DIGEST 393 SPK DIL	53.63	0.0705	165.3	0.0018	0.0584	0.1331	57.66	13.1	31.5	1.186	6.946	3.145	0.0528	0.1746
9/13/00	16:20	CW	DIGEST 393 SPK	165.5	1.066	301.5	0.1914	0.5074	9.866	192.8	58.55	107.5	23.47	12.3	13.04	4.761	17.9
			% recovery	112%	100%	91%	95%	90%	97%	90%	101%	101%	89%	107%	99%	94%	89%
9/14/00	11:27	CW	DIGEST 385 SPK DIL	34.86	2.631	7.404	0.0178	bpql	4.078	106.7	14.18	12.97	2.916	3.77	2.374	2.007	7.096
9/14/00	11:31	CW	DIGEST 385 SPK	135.4	3.689	155.4	0.2219	0.5326	13.98	247.7	61.08	90.37	26.42	8.934	12.82	6.978	26.02
			% recovery	101%	106%	99%	102%	N/A	99%	94%	104%	103%	94%	103%	104%	99%	95%
9/14/00	12:24	CW	DIGEST 387 SPK DIL	36.74	bpql	16.91	bpql	0.0935	0.0498	67.67	10.12	17.42	0.7024	2.051	2.766	0.0539	0.1514
9/14/00	12:29	CW	DIGEST 387 SPK	134.2	1.025	159	0.1988	0.5613	9.528	207.2	54.15	91.67	23.3	6.927	12.9	4.917	18.86
			% recovery	97%	N/A	95%	N/A	94%	95%	93%	98%	99%	90%	98%	101%	97%	94%
9/14/00	17:51	CW	DIGEST 440 SPK DIL	23.04	1.37	5.867	0.0112	bpql	2.03	65.61	10.78	7.31	0.8085	0.7598	2.295	1.313	3.54
9/14/00	17:55	CW	DIGEST 440 SPK	121.9	2.431	150.2	0.2113	0.4944	11.83	207.4	56.91	84.96	23.71	5.779	12.7	6.251	22.36
			% recovery	99%	106%	96%	100%	N/A	98%	95%	103%	104%	92%	100%	104%	99%	94%
9/14/00	16:54	CW	DIGEST 426 SPK DIL	93.18	bpql	37.59	bpql	0.1558	0.149	100.2	17.33	37.76	1.052	1.294	3.519	0.1067	0.3998
9/14/00	16:59	CW	DIGEST 426 SPK	207.1	1.078	182.3	0.2053	0.6296	10.15	243.4	63.69	116.8	24.45	6.39	14.11	5.1	19.43
			% recovery	114%	N/A	96%	N/A	95%	100%	95%	103%	105%	94%	102%	106%	100%	95%
9/14/00	15:51	CW	DIGEST 431 SPK DIL	112.6	bpql	33.84	bpql	0.2033	0.1405	117.6	16.84	40.5	1.551	1.884	3.039	0.1217	0.5831
9/14/00	15:55	CW	DIGEST 431 SPK	230	1.053	176.1	0.2015	0.6729	10.13	256.9	63.07	119.1	24.73	7.024	13.31	5.034	19.33
			% recovery	117%	N/A	95%	N/A	94%	100%	93%	103%	105%	93%	103%	103%	98%	94%
9/14/00	14:48	CW	DIGEST 446 SPK DIL	27.03	bpql	13.52	bpql	0.0514	0.3394	43.61	6.296	15.19	0.5495	1.237	2.423	0.0449	0.8468
9/14/00	14:52	CW	DIGEST 446 SPK	125.8	1.051	161	0.2079	0.5283	10.15	189.9	51.91	92.7	23.79	6.217	13.07	5.063	20.09
			% recovery	99%	N/A	98%	N/A	95%	98%	98%	101%	103%	93%	100%	106%	100%	96%

EPA Method 200.7 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		*0.04*	*0.05*	*0.2*	*0.005*	*0.05*	*0.03*	*0.08*	*0.4*	*0.4*	*0.04*	*0.1*	*0.05*	*0.04*	*0.008*
		Amount Spike Added		*100*	*1*	*150*	*0.2*	*0.5*	*10*	*150*	*45*	*75*	*25*	*5*	*10*	*5*	*20*
9/14/00	13:42	CW	DIGEST 455 SPK DIL	30.45	bpql	14.51	bpql	0.0583	0.0325	59.09	9.14	14.94	0.5383	1.488	2.857	0.0406	0.1143
9/14/00	13:46	CW	DIGEST 455 SPK	130.8	1.051	161.2	0.2061	0.5317	9.879	202.4	54.52	91.81	23.93	6.523	13.33	5.053	19.33
			% recovery	100%	N/A	98%	N/A	95%	98%	96%	101%	102%	94%	101%	105%	100%	96%
10/27/00	11:09	CW	DIGEST 459 SPK DIL	43.76	0.0243	15.62	0.0022	0.0623	0.0447	46.51	11.18	16.17	0.4624	1.571	2.24	0.0426	0.1239
10/27/00	11:12	CW	DIGEST 459 SPK	154.8	1.041	154.1	0.2073	0.52	9.788	185.2	59.68	94.04	23.34	7.382	12.55	4.795	18.24
			% recovery	111%	102%	92%	103%	92%	97%	92%	108%	104%	92%	116%	103%	95%	91%
10/27/00	12:29	CW	DIGEST 469 SPK DIL	104.4	0.0903	35.77	0.0031	0.0923	0.0915	98.46	29	40.06	2.266	9.086	3.16	0.0735	0.2592
10/27/00	12:34	CW	DIGEST 469 SPK	216	1.1	176.4	0.2071	0.5526	9.85	235.4	73.54	117.8	25.3	14.94	13.55	4.786	18.3
			% recovery	112%	101%	94%	102%	92%	98%	91%	99%	104%	92%	117%	104%	94%	90%
10/27/00	13:41	CW	DIGEST 479 SPK DIL	75.9	1.339	28.62	0.0415	0.0612	10.27	109	19.87	25.35	6.55	2.29	3.47	1.177	10.34
10/27/00	13:46	CW	DIGEST 479 SPK	187.9	2.381	169.8	0.2515	0.5201	21.94	246.4	66.96	105.9	29.84	8.332	14.2	6.018	27.76
			% recovery	112%	104%	94%	105%	92%	117%	92%	105%	107%	93%	121%	107%	97%	87%
10/27/00	14:27	CW	DIGEST 489 SPK DIL	87.13	0.1163	20.5	0.0062	0.0732	0.4587	76.49	26.29	30.25	2.631	8.121	2.786	0.1382	0.4171
10/27/00	14:31	CW	DIGEST 489 SPK	200.3	1.126	161.6	0.2121	0.5289	10.45	214.5	72.06	109.4	25.72	14.12	13.21	4.847	18.34
			% recovery	113%	101%	94%	103%	91%	100%	92%	102%	106%	92%	120%	104%	94%	90%
11/8/00	13:49	CW	DIGEST 544 SPK DIL	84.98	0.3432	34.44	0.0204	0.1629	9.869	121.7	13.79	33.48	1.238	1.123	4.496	1.797	5.591
11/8/00	13:53	CW	DIGEST 544 SPK	199.8	1.362	171.6	0.2243	0.6302	21.23	260.2	59.07	108.7	24.3	6.426	14.58	6.497	23.71
			% recovery	115%	102%	91%	102%	93%	114%	92%	101%	100%	92%	106%	101%	94%	91%
11/8/00	14:58	CW	DIGEST 539 SPK DIL	90.81	0.1207	90.01	0.0094	0.1402	0.9405	98.49	20.5	38.21	2.897	1.896	4.275	0.1583	2.574
11/8/00	15:02	CW	DIGEST 539 SPK	200.9	1.107	223.1	0.209	0.5816	10.7	235.5	66.15	112.3	25.05	7.19	14.39	4.774	20.02
			% recovery	110%	99%	89%	100%	88%	98%	91%	101%	99%	89%	106%	101%	92%	87%
11/8/00	15:49	TMC	DIGEST 546 SPK DIL	0.0106	0.0025	0.0416	-0.0003	0.0009	0.0015	0.0166	-0.0123	-0.0001	-0.0029	-0.0196	0.005	-0.0093	0.0016
11/8/00	15:54	CW	DIGEST 546 SPK	97.66	1.006	137.1	0.2063	0.4553	9.623	141.6	44.19	73.16	22.9	4.814	9.997	4.775	18.56
			% recovery	98%	100%	91%	103%	91%	96%	94%	98%	98%	92%	97%	100%	96%	93%

EPA Method 200.7 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		*0.04*	*0.05*	*0.2*	*0.005*	*0.05*	*0.03*	*0.08*	*0.4*	*0.4*	*0.04*	*0.1*	*0.05*	*0.04*	*0.008*
		Amount Spike Added		*100*	*1*	*150*	*0.2*	*0.5*	*10*	*150*	*45*	*75*	*25*	*5*	*10*	*5*	*20*
11/7/00	14:42	TMC	DIGEST 497 SPK DIL	102.4	0.1033	145.1	0.0043	0.1464	0.3191	107.2	15.36	39.45	2.313	1.486	4.586	0.131	0.3413
11/8/00	11:50	TMC	DIGEST 497 SPK	210.1	1.099	278.3	0.2025	0.5893	9.886	243.6	59.52	113.4	24.36	6.638	14.69	4.75	18.29
			% recovery	108%	100%	89%	99%	89%	96%	91%	98%	99%	88%	103%	101%	92%	90%
11/7/00	13:43	CW	DIGEST 501 SPK DIL	59.22	0.8041	23.47	0.0605	0.0806	5.711	115.9	14.12	21.65	12.22	1.857	3.544	0.8461	10.27
11/7/00	13:47	CW	DDIGEST 501 SPK	160.2	1.83	164.4	0.2664	0.5474	15.44	255.4	59.3	97.1	34.74	7.05	13.93	5.648	28.3
			% recovery	101%	103%	94%	103%	93%	97%	93%	100%	101%	90%	104%	104%	96%	90%
11/7/00	14:51	TMC	DIGEST 519 SPK DIL	48.76	0.0548	20.58	0.0019	0.0729	0.2351	95.36	10.84	18.21	0.6691	1.485	2.785	0.1035	0.2292
11/7/00	14:55	TMC	DIGEST 519 SPK	145.9	1.096	161.6	0.2091	0.5412	9.999	239.7	56.19	95.03	23.47	6.605	13.31	4.939	19.13
			% recovery	97%	104%	94%	104%	94%	98%	96%	101%	102%	91%	102%	105%	97%	95%
11/7/00	15:48	TMC	DIGEST 500 SPK DIL	134.5	0.9561	143.9	0.1873	0.5035	9.032	188.6	51.97	87.07	21.27	7.839	11.78	4.35	16.75
11/7/00	15:51	TMC	DIGEST 500 SPK	244.4	1.957	279.7	0.3784	0.9477	20.34	322.2	97.58	164.3	43.14	13.2	21.78	8.913	33.77
			% recovery	110%	100%	91%	96%	89%	113%	89%	101%	103%	87%	107%	100%	91%	85%
12/4/00	12:33	TMC	DIGEST 549 SPK DIL	46.52	0.0315	47.8	-0.0005	0.0601	0.0345	63.73	13.64	21.53	1.247	1.501	2.705	0.0399	0.1301
12/4/00	12:37	TMC	DIGEST 549 SPK	145.6	1.068	190.6	0.2095	0.5369	9.977	210.8	59.81	100.2	24.71	6.707	13.41	4.954	19.48
			% recovery	99%	104%	95%	105%	95%	99%	98%	103%	105%	94%	104%	107%	98%	97%

Note: bpql = below probable quantitative limit

EPA Method 200.7 Fortified Matrix Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		*0.04*	*0.05*	*0.2*	*0.005*	*0.05*	*0.03*	*0.08*	*0.4*	*0.4*	*0.04*	*0.1*	*0.05*	*0.04*	*0.008*
		Amount Spike Added		*100*	*1*	*150*	*0.2*	*0.5*	*10*	*150*	*45*	*75*	*25*	*5*	*10*	*5*	*20*
7/11/00	12:32	CW	CAL BLANK	-0.015	-0.0026	0.0089	0.0007	-0	-0.0015	-0.0029	0.1647	-0.0403	-0.0069	0.0093	-0.0048	-0.0107	0
7/11/00	15:34	CW	CAL BLANK_RQ	97.25	1.002	143.5	0.2074	0.47	9.784	146.1	44.62	74.74	23.99	4.723	10.47	4.875	19.05
			% spike recovery	97%	100%	96%	103%	94%	98%	97%	99%	100%	96%	94%	105%	98%	95%
7/21/00	9:23	TMC	CAL BLANK	-0.009	-0.0061	-0.018	0.0001	0.002	0.0009	0.0005	0.1289	0.0631	-0.0049	0.0113	-0.0001	-0.0052	0
7/21/00	9:27	TMC	CAL BLANK_RQ	99.72	1.028	149.4	0.2168	0.493	9.903	149.8	45.24	75.93	24.58	4.795	10.5	5.082	20.24
			% spike recovery	100%	103%	100%	108%	98%	99%	100%	100%	101%	98%	96%	105%	102%	101%
7/20/00	16:54	CW	CAL BLANK	-0.0159	0	0.0222	0.0003	-0	0.0017	0.0114	-0.0586	0.0054	-0.0037	0.0485	0.0079	0.009	-0.0006
7/20/00	16:59	CW	CAL BLANK_RQ	96.45	0.993	144.6	0.2108	0.468	9.812	145	45.03	75.81	23.93	4.735	10.44	4.929	19.12
			% spike recovery	96%	99%	96%	105%	94%	98%	97%	100%	101%	96%	94%	104%	98%	96%
7/27/00	17:05	CW	CAL BLANK	0.0241	0.0021	0.0275	-0.0005	0.002	0.0065	0.0103	-0.3228	-0.0162	-0.0008	-0.0952	-0.0049	0.003	-0.0004
7/27/00	17:10	CW	CAL BLANK_RQ	105	1.055	143.1	0.2054	0.482	9.769	149.1	43.75	75.9	24.65	4.726	9.944	4.912	19.85
			% spike recovery	105%	105%	95%	103%	96%	98%	99%	98%	101%	99%	96%	99%	98%	99%
7/27/00	17:59	CW	CAL BLANK	0.0193	-0.0035	-0.03	-0.0008	0.003	0.0026	-0.0011	-0.282	0.027	0.0052	-0.0449	-0.0061	0.001	-0.0003
7/27/00	18:03	CW	CAL BLANK_RQ	105.1	1.095	146.2	0.2085	0.488	9.434	151.1	43.53	76.33	24.51	4.888	9.933	5.036	20.23
			% spike recovery	105%	110%	97%	105%	97%	94%	101%	97%	102%	98%	99%	99%	101%	101%
8/16/00	15:46	CW	CAL BLANK	0	0.0034	0.0066	-0.0004	-0	0.0021	0.001	0.0395	0.0186	-0.0006	0.0183	-0.0031	0.0073	0.0003
8/16/00	15:50	CW	CAL BLANK_RQ	97.98	1.008	144.6	0.1977	0.473	9.777	145.2	45.6	76.47	23.37	5.121	10.38	4.941	18.64
			% spike recovery	98%	100%	96%	99%	95%	98%	97%	101%	102%	93%	102%	104%	99%	93%
9/11/00	16:40	CW	CAL BLANK	0.0231	0.0075	0.0527	0.0005	-0.01	-0.0035	0.0121	0.1192	-0.0102	0.0072	-0.0311	-0.0059	-0.021	0
9/11/00	16:44	CW	CAL BLANK_RQ	97.64	1.006	140.7	0.1986	0.453	9.826	142.9	45.72	75.17	23.09	5.135	10.09	4.84	18.54
			% spike recovery	98%	100%	94%	99%	92%	98%	95%	101%	100%	92%	103%	101%	97%	93%
9/12/00	16:22	CW	CAL BLANK	0.0229	0.0075	-0.0347	0.0001	-0	0.0011	0.0011	0.0918	-0.0229	-0.0049	0.0248	0.0024	0.0071	-0.0002
9/12/00	13:26	CW	CAL BLANK_RQ	94.37	0.9551	143.1	0.2001	0.458	9.379	140.7	42.73	72.79	22.69	4.877	9.815	4.843	18.34
			% spike recovery	94%	95%	95%	100%	92%	94%	94%	95%	97%	91%	97%	98%	97%	92%

EPA Method 200.7 Fortified Matrix Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		*0.04*	*0.05*	*0.2*	*0.005*	*0.05*	*0.03*	*0.08*	*0.4*	*0.4*	*0.04*	*0.1*	*0.05*	*0.04*	*0.008*
		Amount Spike Added		*100*	*1*	*150*	*0.2*	*0.5*	*10*	*150*	*45*	*75*	*25*	*5*	*10*	*5*	*20*
9/13/00	16:04	CW	CAL BLANK	0.0332	-0.0006	0.0598	0.0005	-0	-0.0019	0.0104	0.175	-0.0239	0.0026	-0.0208	0.0095	-0.0109	-0.0003
9/13/00	15:19	CW	CAL BLANK_RQ	96.71	0.9735	141.2	0.1956	0.457	9.539	139.4	43.79	73.67	22.65	5.006	9.829	4.825	18.44
			% spike recovery	97%	97%	94%	98%	92%	95%	93%	97%	98%	91%	101%	98%	97%	92%
9/14/00	12:32	CW	CAL BLANK	0.0094	0.0024	-0.0045	0	3E-04	0.0005	0.0007	0.0541	-0.0141	0.002	0.0195	0.0012	0.0087	0.0003
9/14/00	12:36	CW	CAL BLANK_RQ	93.27	0.9736	142.2	0.1967	0.464	9.279	140.7	42.4	72.61	22.43	4.681	10.01	4.834	18.76
			% spike recovery	93%	97%	95%	98%	93%	93%	94%	94%	97%	90%	93%	100%	97%	94%
10/27/00	12:38	CW	CAL BLANK	0.013	0.0041	-0.015	0.0012	-0.01	-0.0009	-0.0032	-0.0237	0.0405	-0.0007	-0.0382	0.0076	-0.0019	-0.0003
10/27/00	12:42	CW	CAL BLANK_RQ	101.6	1.058	147.3	0.2188	0.482	10.03	149	44.94	79.13	24.19	5.762	10.79	5.023	19.38
			% spike recovery	102%	105%	98%	109%	98%	100%	99%	100%	105%	97%	116%	108%	100%	97%
11/7/00	12:34	CW	CAL BLANK	0.004	0.0125	-0.0204	0.0009	-0	0.0019	-0.0062	0.1036	-0.0403	0.0027	0.0009	-0.0026	-0.001	0.0003
11/7/00	12:39	CW	CAL BLANK_RQ	95.15	1.008	141.2	0.2097	0.468	9.436	144.6	42.7	72.37	23.11	4.748	10.19	4.841	19.28
			% spike recovery	95%	100%	94%	104%	94%	94%	96%	95%	97%	92%	95%	102%	97%	96%
11/8/00	13:57	CW	CAL BLANK	0.017	0.0043	-0.0183	-0.0001	-0	-0.0002	0.0084	0.0484	-0.0001	-0.0036	-0.0151	0.002	0.0033	-0.0003
11/8/00	14:01	CW	CAL BLANK_RQ	97.65	1.013	143.5	0.2135	0.466	9.791	146.2	44.53	73.91	23.46	4.828	10.4	4.91	19.12
			% spike recovery	98%	101%	96%	107%	94%	98%	97%	99%	99%	94%	97%	104%	98%	96%
12/4/00	12:25	CW	CAL BLANK	0.0209	-0.0055	0.0022	0.0003	0.002	-0.0016	0.0151	0.1189	-0.0578	0.0034	0.008	-0.0021	-0.0122	0.0006
12/4/00	12:42	CW	CAL BLANK_RQ	96.14	1.02	143.8	0.21	0.481	9.746	147.8	44.96	76.76	23.51	4.733	10.55	4.911	19.52
			% spike recovery	96%	103%	96%	105%	96%	97%	99%	100%	102%	94%	95%	106%	98%	98%

APPENDIX A

A.5 pH and Metals Data

A.5.1 Surface Soils pH and Metals Data

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Surface Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
ESS-1	6.11	2.5	21	0.82	1.1	47	51	3.4	0.30	1.4	640	430	1,200	26	79
ESS-2	6.37	2.1	43	0.72	2	39	89	2.8	0.38	0.90	690	400	880	44	110
ESS-3	6.35	2.2	45	0.68	2.2	36	92	2.8	0.47	0.80	770	350	890	46	120
ESS-4	6.23	2.4	27	0.74	1.4	39	60	3.0	0.37	1.1	660	340	900	33	88
ESS-5	7.10	2.2	21	0.65	1.4	32	78	2.7	0.53	0.75	790	350	900	35	100
ESS-5 Field Dup	7.39	2.3	25	0.69	1.6	31	89	2.5	0.56	0.75	820	380	870	40	120
ESS-5 Split	-	2.2	22	0.63	1.6	31	80	2.4	0.54	0.73	800	380	820	35	110
ESS-6	5.93	2.2	25	0.65	1.6	37	81	2.7	0.41	0.89	590	310	1,100	40	120
ESS-7	6.06	2.0	32	0.77	1.7	36	110	2.8	0.37	1.0	660	470	1,200	39	120
ESS-8	6.57	2.3	30	0.54	1.3	32	62	2.5	0.47	0.77	640	280	720	30	87
ESS-9	6.51	2.2	31	0.64	1.8	34	84	2.7	0.45	0.84	650	390	830	35	99
ESS-10	7.18	2.1	34	1.5	1.4	34	67	2.7	0.32	0.95	510	370	900	30	88
SS-1	7.96	1.9	19	0.64	1.0	13	87	1.7	0.37	0.56	440	240	690	36	110
SS-2	7.83	2.1	45	0.99	3.1	13	400	1.7	0.34	0.66	980	1,300	580	74	970
SS-3	8.01	2.6	41	1.7	2.6	16	220	2.0	0.40	0.81	820	340	680	45	650
SS-4	7.78	1.9	30	0.48	1.6	13	130	1.5	0.32	0.49	750	290	460	35	360
SS-5	7.35	1.1	36	0.27	bpql	11	60	1.1	0.24	0.27	190	140	310	24	65
SS-6	7.66	2.7	37	0.61	3.5	16	260	2.0	0.52	0.67	1,000	380	480	43	1,100
SS-7	8.11	1.6	15	2.2	bpql	12	45	1.3	0.43	0.62	540	160	430	21	62
SS-8	7.01	2.6	23	0.60	1.4	13	100	1.9	0.52	0.65	780	270	550	32	350
SS-8 Field Dup	6.71	2.7	24	0.58	1.4	13	89	1.9	0.52	0.66	840	310	470	34	320
SS-9	8.00	3.2	23	0.77	1.1	14	87	2.2	0.48	0.85	620	420	530	29	270
SS-10	6.57	3.0	39	0.57	bpql	18	92	2.6	0.54	0.73	640	270	510	45	120
SS-11	7.88	2.6	23	0.62	bpql	15	50	1.9	0.55	0.72	550	140	480	25	80
SS-12	7.29	2.5	18	0.53	2.0	12	170	1.8	0.49	0.59	940	200	600	33	610
SS-13	7.88	1.1	22	2.3	bpql	11	45	1.2	0.26	0.38	340	170	560	17	52
SS-13 Split	-	1.1	24	2.2	bpql	11	46	1.2	0.25	0.37	300	150	550	18	52
SS-14	7.60	1.6	65	0.73	6.3	15	1,500	2.1	0.33	0.43	2,900	220	890	260	1,900
SS-15	7.23	1.9	30	0.39	2.3	15	230	1.6	0.50	0.55	550	300	520	51	480
SS-16	7.61	1.4	30	7.4	3	14	440	1.2	0.40	1.5	910	460	1,000	84	500
SS-17	6.85	2.2	36	0.46	4	15	520	1.7	0.46	0.48	1,500	240	610	67	840
SS-18	7.62	1.5	200	2.9	7	14	2,600	1.9	0.39	0.64	600	240	670	320	1,600
SS-19	7.44	1.7	220	0.84	12	20	1,700	2.8	0.40	0.56	1,700	610	920	230	2,500

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Surface Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
SS-20	6.66	1.1	320	0.40	6	17	1,100	3.0	0.28	0.38	1,300	320	690	280	1,300
SS-21	7.49	0.72	47	0.38	6	bpql	420	1.1	0.20	0.25	1,200	310	510	730	650
SS-22	7.16	1.3	270	0.54	6	20	1,100	2.3	0.36	0.45	1,200	310	750	270	1,200
SS-23	8.10	0.87	280	0.62	5	11	1,700	1.7	0.31	0.28	870	250	590	290	1,700
SS-24	7.64	1.6	90	1.1	3	26	990	2.1	0.38	0.71	600	350	810	160	570
SS-25	8.24	2.7	32	1.8	2	16	160	2.0	0.62	1.0	950	330	740	50	400
SS-26	8.03	2.7	46	2.1	2	16	530	2.1	0.53	0.87	1,200	310	670	87	470
SS-27	6.94	2.9	23	0.66	2	15	250	2.1	0.48	0.71	1,200	230	560	49	630
SS-28	7.99	2.9	34	1.1	bpql	17	100	2.2	0.57	0.89	640	290	640	38	120
SS-29	7.42	3.0	17	0.64	bpql	16	52	2.1	0.61	0.78	830	180	570	32	320
SS-30	6.98	2.1	250	0.94	5	15	1,400	2.3	0.49	0.64	560	210	1,100	300	1,200
SS-31	7.37	3.7	27	0.93	2	20	320	2.5	0.75	1.1	640	240	930	68	390
SS-32	8.08	3.9	22	1.0	2	19	150	2.4	0.81	1.2	500	590	950	49	320
SS-33	7.69	2.0	72	1.4	4	19	950	2.6	0.44	0.7	700	290	960	130	920
SS-34	8.00	1.2	71	0.54	2	19	450	1.9	0.30	0.42	760	380	590	93	550
SS-35	4.85	1.0	720	0.52	6	10	4,400	2.4	0.34	0.35	560	870	790	440	2,000
SS-35 Field Dup	4.95	0.89	780	0.55	bpql	10	2,900	2.4	0.35	0.33	640	1,000	720	460	2,100
SS-36	6.03	0.66	170	0.39	4	bpql	1,500	1.4	0.23	0.21	1,100	330	590	250	1,200
SS-37	7.57	1.9	150	1.0	7	29	1,000	2.8	0.39	0.70	1,600	540	910	170	1,300
SS-38	7.64	3.1	13	1.2	bpql	17	110	2.0	0.67	0.88	350	240	760	34	120
SS-39	6.91	3.2	24	0.69	2	16	230	2.1	0.63	0.88	610	240	760	56	370
SS-40	6.93	3.9	16	0.78	2	18	93	2.4	0.67	1.0	840	220	810	39	600
SS-40 Split	-	3.2	bpql	0.75	bpql	17	85	2.1	0.62	0.91	780	190	760	38	550
SS-41	7.57	3.0	22	0.76	1	16	150	2.0	0.57	0.86	800	330	820	44	270
SS-42	6.72	1.6	270	0.82	9	18	2,200	2.8	0.38	0.54	1,900	260	1,100	240	2,800
SS-43	7.72	4.1	34	1.0	bpql	20	93	2.5	0.86	1.2	450	860	810	37	190
SS-44	7.73	3.5	42	1.2	2	20	500	2.5	0.79	1.0	510	370	770	110	710
SS-45	7.56	3.1	18	0.67	bpql	18	46	2.2	0.65	0.79	410	200	650	33	180
SS-46	7.11	2.9	17	0.49	bpql	20	32	2.2	0.64	0.71	520	280	490	27	87
SS-47	7.48	2.5	27	0.67	bpql	19	100	2.0	0.61	0.71	500	210	670	44	130
SS-48	8.04	2.0	20	2.1	bpql	27	110	2.2	0.40	0.78	390	840	730	33	160
SS-49	7.78	1.9	35	5.5	2	19	290	1.8	0.44	0.89	630	670	730	53	500
SS-50	7.66	1.7	73	7.5	3	18	690	1.6	0.41	1.4	790	1,200	990	88	590

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Surface Soil Samples

SSoil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
SS-51	6.10	1.7	440	0.60	9	17	5,300	2.3	0.38	0.48	2,200	390	780	370	2,600
SS-52	7.55	1.9	220	1.1	4	21	1,700	2.3	0.36	0.61	700	420	850	270	1,200
SS-53	5.04	1.0	780	0.30	3	14	2,100	2.4	0.27	0.35	830	390	610	760	1,400
SS-54	7.33	1.0	74	0.44	4	19	520	2.0	0.26	0.36	1,500	350	590	96	870
SS-55	7.11	0.62	79	0.31	4	bpql	640	2.0	0.18	0.20	1,400	260	400	93	1,500
SS-56	6.80	1.9	510	0.94	7	23	5,400	2.7	0.35	0.63	910	340	890	490	1,600
SS-57	7.22	1.6	730	1.4	9	19	4,300	2.7	0.41	0.54	1,400	750	870	590	2,300
SS-57 Field Dup	7.40	1.6	710	1.4	bpql	19	4,800	2.6	0.37	0.56	1,000	660	860	580	2,200
SS-57 Split	-	1.8	680	1.5	11	20	4,400	2.6	0.40	0.60	1,500	750	880	570	2,900
SS-58	6.00	1.5	640	0.48	6.6	16	3,300	2.9	0.40	0.50	1,100	250	930	540	1,700
SS-59	6.59	1.2	510	0.47	7.2	12	3,500	2.5	0.37	0.48	1,300	450	760	440	2,100
SS-60	4.63	1.1	480	0.24	1.8	13	1,200	2.2	0.32	0.35	520	230	660	420	980
SS-61	6.61	2.1	310	1.7	8.8	19	8,400	3.2	0.45	0.65	1,000	260	920	740	2,200
SS-62	7.09	2.2	79	0.98	0.9	25	470	2.3	0.41	0.76	460	300	770	74	320
SS-63	5.20	1.6	190	0.32	3.2	19	3,100	2.3	0.37	0.56	920	380	740	380	1,200
SS-64	6.78	2.9	59	0.71	5.6	42	4,400	3.1	0.44	0.90	970	340	890	85	1,100
SS-65	6.81	2.1	77	0.78	4.2	41	2,200	2.9	0.31	0.76	290	260	1,000	410	1,300
SS-66	4.26	1.0	530	0.49	5.1	12	2,500	2.3	0.32	0.34	420	240	720	420	1,700
SS-67	7.45	2.3	540	0.71	4.5	37	4,300	3.2	0.38	0.78	830	270	980	390	1,300
SS-68	7.16	2.8	260	1.1	3.8	43	2,000	3.3	0.32	0.87	990	390	1,000	250	1,200
SS-69	7.09	2.9	78	0.97	3.5	39	1,100	3.0	0.39	0.93	1,200	450	930	140	950
SS-70	5.98	1.5	940	0.49	3.9	17	4,200	3.0	0.37	0.50	1,000	300	830	920	1,600
SS-71	4.46	0.75	340	0.13	2.8	8.1	1,300	1.8	0.25	0.23	320	210	520	320	1,100
SS-71 Split	4.34	0.81	340	0.13	2.6	8.8	1,300	1.8	0.29	0.24	340	230	530	330	1,100
SS-72	7.53	1.2	110	0.62	2.5	17	760	2.0	0.29	0.46	890	270	660	140	660
SS-73	7.24	2.0	290	0.94	4.4	25	2,000	2.5	0.48	0.77	860	370	1,100	290	1,200
SS-74	7.24	2.8	200	1.1	3.1	40	940	3.2	0.25	0.80	670	340	910	150	900
SS-75	7.67	2.1	44	1.6	0.9	30	440	2.3	0.30	0.74	610	330	810	77	310
SS-76	7.80	2.4	32	2.0	2	35	210	2.4	0.47	0.88	670	430	990	42	610
SS-77	4.44	0.88	310	0.43	2.8	10	2,100	1.9	0.23	0.33	250	480	550	280	1,400
SS-77 Field Dup	4.38	1.1	310	0.50	2.8	12	2,300	2.0	0.28	0.38	310	620	580	270	1,500
SS-78	6.19	1.5	280	0.43	12	21	1,900	2.7	0.35	0.48	1,400	340	760	250	3,200
SS-79	7.56	2.2	140	1.9	3.5	27	1,300	2.4	0.53	0.95	950	2,800	770	130	1,000

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Surface Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
SS-80	8.80	1.5	34	9.2	0.1	17	79	1.3	0.50	2.1	450	4,300	930	21	74
SS-81	7.17	2.6	110	0.97	11	54	650	3.2	0.30	0.87	1,600	360	1,300	140	1,700
SS-82	7.83	1.6	130	1.2	3.3	28	1,100	2.1	0.41	0.82	1,700	840	1,100	130	770
SS-83	8.11	2.3	42	2.5	1.5	53	280	2.6	0.20	0.96	660	370	1,100	63	360
SS-83 Field Dup	8.05	2.2	44	2.6	1.5	51	260	2.6	0.20	0.94	710	400	1,200	60	300
SS-84	7.80	2.1	40	4.3	5.3	40	130	2.3	0.20	0.84	1,300	450	1,200	47	1,500
SS-85	7.95	2.0	28	12	0.4	23	78	1.8	0.48	1.7	950	660	1,400	30	90
SS-86	7.81	2.2	52	4.4	0.5	30	90	2.5	0.37	0.94	400	470	1,100	37	130
SS-87	7.05	1.9	44	4.9	0.9	35	120	2.4	0.25	0.90	1,500	270	1,100	39	330
SS-88	7.42	2.0	17	4.3	0.8	27	88	1.8	0.28	0.63	320	230	1,000	33	150
SS-89	7.84	1.6	30	12	0.7	15	75	2.1	0.38	1.7	640	560	800	34	93
SS-91	6.05	2.5	58	0.72	1.1	42	120	3.1	0.43	0.96	800	330	1,000	41	160
SS-91 Split	6.07	2.5	53	0.77	0.7	41	100	3.3	0.39	1.1	810	330	1,000	43	150
SS-92	7.43	0.77	18	19	0.2	10	29	0.85	0.15	0.9	780	320	990	16	43
SS-93	7.96	2.4	23	2.9	0.1	46	54	2.9	0.33	1.3	640	270	1,100	29	77
SS-94	8.04	2.1	89	5.8	4	35	440	2.6	0.46	1.5	980	750	1,800	81	770
SS-95	8.49	2.3	17	1.3	bpql	52	66	3.5	0.24	1.5	630	420	1,300	28	77
SS-96	6.96	1.3	35	1.7	3.2	25	220	1.9	0.55	0.62	740	320	4,200	160	470
SS-97	7.97	2.1	13	1.6	bpql	45	54	2.5	0.40	0.98	430	780	1,100	37	85
SS-98	7.04	2.0	530	0.97	9.3	42	6,000	3.0	0.34	0.82	1,900	360	1,400	910	2,400
SS-98 Field Dup	7.01	2.0	470	0.96	8.2	44	5,600	3.2	0.34	0.83	1,800	410	1,300	810	2,200
SS-99	7.54	3.5	31	1.2	0.4	70	80	3.6	0.20	1.1	1,300	490	1,100	37	100
SS-100	6.68	1.6	300	0.67	5.2	28	2,200	2.9	0.31	0.55	1,100	310	880	260	1,100
SS-101	7.03	3.6	48	1.1	0.4	73	99	4.4	0.19	1.0	1,500	510	1,300	54	120
SS-102	6.99	3.1	74	1.0	0.7	65	110	3.3	0.26	1.0	810	400	1,300	97	170
SS-105	8.03	2.8	32	1.4	0	77	64	3.2	0.23	1.2	760	560	1,200	41	110
SS-106	7.43	2.9	28	0.93	0	73	57	3.3	0.20	1.1	1,200	390	1,100	38	88
SS-107	7.58	2.2	30	0.86	1	43	110	2.8	0.53	0.94	740	260	1,300	60	140
SS-108	7.42	1.7	170	9.3	4.2	22	1,400	2.0	0.27	0.81	1,100	270	1,000	320	1,400
SS-110	7.26	2.4	24	0.63	0.3	32	67	2.6	0.43	0.74	770	340	830	41	100
SS-111	7.65	2.4	16	0.59	bpql	33	36	2.6	0.42	0.77	690	320	710	28	100

Note: bpql = below probable quantitative limit

APPENDIX A

A.5 pH and Metals Data

A.5.2 Sediment Metals Data

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Irrigation Ditch Sediment

Soil Sample Name	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	8E-04	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
SED-1	2.9	27	0.90	4.9	18	400	2.4	0.63	0.92	1,200	240	970	78	1,100
SED-2	2.3	52	2.1	6.3	17	720	2.4	0.51	0.84	2,700	260	1,100	110	1,600
SED-3	2.5	75	1.7	7.4	22	820	2.8	0.49	0.87	2,200	270	1,100	140	1,500
SED-4	2.0	51	2.5	5.4	19	710	2.3	0.42	0.80	1,600	270	1,100	120	1,500
SED-5	2.0	52	1.9	5.4	36	830	2.6	0.31	0.87	970	280	1,300	140	1,500
SED-6	1.9	110	3.8	11	27	2,400	2.4	0.37	1.4	2,000	290	1,500	270	2,500
SED-6 Field Dup	2.3	49	2.5	7.9	34	840	2.6	0.43	1.4	1,400	310	1,500	110	1,700
SED-7a	1.8	65	2.1	5.1	30	830	2.3	0.30	0.73	1,700	320	1,200	130	1,100
SED-7b	2.0	61	1.8	4.6	35	790	2.5	0.32	0.79	1,500	320	1,300	140	1,000
SED-8	1.9	84	2.4	6.1	32	900	2.5	0.30	0.72	1,300	290	1,200	160	1,100
SED-9	2.2	130	1.6	7.3	32	1,500	3.0	0.34	0.76	1,200	250	1,300	280	2,000
SED-9 Split	2.4	140	1.6	7.3	32	1,600	3.1	0.36	0.80	1,300	270	1,300	280	2,100

Note: bpql = below probable quantitative limit

APPENDIX A

A.5 pH and Metals Data

A.5.3 Profile Soil pH and Metals Data

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Profile Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
SP1-a	7.76	2.3	32	1.9	bpql	35	38	2.4	0.43	0.88	530	310	970	24	78
SP1-b	7.77	0.86	370	0.26	7.7	bpql	3,600	1.8	0.33	0.25	1,300	150	630	420	2,500
SP1-c	7.89	2.1	100	1.0	12	27	2,100	2.8	0.45	0.72	770	290	1,100	320	2,500
SP2-a	7.96	2.0	43	7.0	bpql	21	47	1.8	0.42	0.98	560	320	980	16	56
SP2-b	7.84	1.7	89	6.3	5.2	23	1,100	1.9	0.44	1.2	1,100	390	1,500	99	540
SP2-c	7.10	1.4	70	1.5	8.4	18	1,500	1.9	0.31	0.59	680	330	1,400	240	1,400
SP3-a	8.82	2.4	13	0.59	bpql	25	24	3.3	0.45	0.91	460	4,300	760	23	62
SP3-b	8.60	3.3	13	0.64	1.3	31	30	3.3	0.59	1.1	750	5,200	660	25	79
SP3-c	8.41	2.7	16	2.8	bpql	29	38	2.6	0.53	1.1	550	4,400	850	22	72
SP3-d	8.03	2.3	100	2.8	3.6	26	680	2.5	0.54	1.0	720	3,000	910	96	600
BP1-a	6.48	1.2	78	1.9	6.8	15	760	1.6	0.55	0.59	1,000	230	2,800	150	1,100
BP1-b	7.85	1.5	260	0.62	11	22	3,600	2.4	0.74	0.57	890	670	1,000	220	2,200
BP1-c	7.65	2.1	320	0.63	4.7	25	4,200	3.0	0.88	0.69	520	580	1,000	260	1,400
BP1-d	7.30	0.74	120	1.6	6.2	bpql	10,000	1.2	0.66	0.37	120	930	660	130	1,200
BP1-e	7.68	1.0	550	0.36	4.1	bpql	990	2.5	0.59	0.30	330	620	770	500	1,300
BP1-e Split	7.67	0.91	540	0.37	4.8	10	930	2.4	0.54	0.29	330	580	770	500	1,400
BP1-f	7.06	1.8	880	0.67	5.3	15	6,200	2.9	0.67	0.63	1,200	540	1,100	870	2,300
BP1-g	7.60	2.4	45	1.4	18	35	2,700	2.5	0.77	0.88	3,000	570	1,100	30	3,000
BP1-h	7.81	2.6	bpql	0.63	1.0	34	38	2.3	0.67	0.78	380	510	730	21	210
BP1-i	8.00	2.6	bpql	0.63	bpql	35	29	2.7	0.70	0.81	360	490	700	22	77
BP1-j	7.90	2.2	11	0.62	1.2	33	26	2.9	0.64	0.72	800	460	780	26	60
BP1-k	7.88	1.9	bpql	0.63	bpql	40	25	2.0	0.48	0.77	150	480	760	18	55
BP2-a	5.91	1.5	160	0.68	12	25	910	2.5	0.41	0.60	1,000	350	960	170	2,400
BP2-b	5.05	0.80	230	0.33	4.6	10	1,100	2.0	0.30	0.30	480	310	690	210	1,200
BP2-c	4.35	0.73	740	0.20	4.7	bpql	780	2.5	0.34	0.28	370	450	630	460	1,500
BP2-d	4.36	1.2	1,100	0.26	3.7	16	1,700	2.9	0.35	0.45	690	560	730	770	1,300
BP2-d Split	4.33	1.1	1,300	0.25	4.1	14	1,700	3.0	0.34	0.45	710	520	730	850	1,500
BP2-e	4.61	1.8	660	0.95	4.9	23	5,400	2.7	0.42	0.70	1,200	420	920	1,300	1,800
BP2-f	5.74	1.8	12	1.3	2.6	24	4,000	2.3	0.42	0.80	490	460	810	47	600
BP2-g	6.18	2.6	bpql	1.5	4.5	48	38	2.9	0.30	0.97	570	360	850	36	1,600
BP2-h	5.30	1.2	bpql	0.39	bpql	19	14	1.4	0.25	0.47	110	370	570	15	58
BP2-i	4.30	1.5	bpql	0.43	bpql	19	14	1.6	0.37	0.54	160	530	690	17	50

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Profile Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
BP2-j	6.95	0.50	bpql	0.24	2.1	bpql	72	0.60	0.15	0.18	61	390	350	9.1	170
BP3-a	7.05	1.5	160	0.92	20	22	2,000	2.4	0.37	0.63	2,300	960	840	170	4,500
BP3-b	4.45	0.64	300	0.13	4.2	bpql	1,100	1.6	0.25	0.26	590	920	510	320	1,200
BP3-c	3.90	0.94	1,200	0.18	5.8	14	1,200	3.0	0.32	0.38	530	550	760	690	2,000
BP3-d	4.10	2.2	1,500	0.31	6.1	22	3,500	3.9	0.48	0.67	1,600	580	1,000	1,500	2,300
BP3-e	5.11	1.9	25	0.47	6.1	23	11,000	2.1	0.36	0.65	2,300	440	880	57	1,400
BP3-f	5.62	1.6	bpql	0.43	3.6	22	1,500	2.0	0.31	0.53	760	410	680	21	550
BP3-g	6.43	1.0	bpql	0.32	4.0	11	1,400	1.4	0.24	0.31	990	470	480	17	700
BP3-h	7.06	0.59	bpql	0.21	3.5	bpql	4,400	0.85	0.17	0.21	1,400	370	340	11	470
BP3-h Split	7.14	0.64	bpql	0.21	bpql	9	4,300	0.92	0.18	0.22	1,600	380	330	8	460
BP3-i	7.22	0.47	20	0.33	1.9	11	940	1.9	0.13	0.13	980	420	500	16	220
BP4-a	7.43	1.3	150	0.59	3.5	16	910	2.1	0.36	0.46	970	320	750	170	940
BP4-b	5.98	0.71	290	0.23	1.5	bpql	720	1.9	0.24	0.22	610	230	470	300	710
BP4-c	5.24	1.3	780	0.30	1.6	16	1,900	2.8	0.35	0.41	960	300	770	820	1,000
BP4-c Split	5.18	1.3	820	0.30	bpql	16	1,900	2.9	0.36	0.42	980	310	760	820	1,000
BP4-d	5.85	1.5	580	0.43	3.0	17	4,500	2.6	0.36	0.51	2,200	370	820	1,400	1,400
BP4-e	6.37	1.7	16	0.52	2.4	40	1,300	2.6	0.43	0.68	410	370	800	53	300
BP4-f	6.82	2.2	bpql	0.78	2.9	32	30	2.5	0.32	0.76	340	350	720	29	900
BP4-g	7.69	0.64	bpql	0.30	bpql	11	6.1	2.3	0.15	0.24	290	330	680	20	86
BP4-h	7.85	0.59	bpql	0.26	bpql	11	18	1.1	0.16	0.22	84	410	360	16	49
BP5-a	7.67	1.2	110	0.59	4.9	20	780	2.1	0.32	0.49	950	290	810	140	970
BP5-b	7.27	0.99	250	0.58	9.1	11	1,800	2.1	0.29	0.35	1,200	240	940	280	1,600
BP5-c	6.78	1.1	390	0.38	2.5	14	2,600	2.2	0.32	0.42	860	360	790	800	1,200
BP5-d	6.80	0.97	910	0.30	4.2	bpql	2,900	2.3	0.31	0.35	1,400	420	640	1,600	2,200
BP5-d Split	6.73	0.95	930	0.30	3.2	11	3,200	2.2	0.28	0.35	1,300	340	630	1,600	2,000
BP5-e	6.15	1.8	380	0.46	2.5	20	6,100	2.5	0.48	0.69	1,100	410	850	620	1,000
BP5-f	6.96	2.4	12	0.81	7.2	32	64	2.6	0.50	0.85	370	310	750	34	1,400
BP5-g	7.94	0.54	bpql	0.25	bpql	bpql	9.5	0.96	0.16	0.20	260	380	360	13	72
BP6-a	7.27	1.4	97	0.71	2.8	18	670	2.1	0.37	0.53	840	340	720	130	690
BP6-b	7.28	1.7	110	1.2	4.5	21	820	2.4	0.41	0.65	1,300	440	880	140	960
BP6-c	7.09	2.3	150	1.2	8.9	31	1,100	3.0	0.50	0.82	1,300	390	1,000	190	1,500
BP6-d	5.94	1.1	1,600	0.21	7.0	bpql	850	2.6	0.37	0.34	240	220	590	600	2,900

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Profile Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
BP6-e	4.64	1.0	1,400	0.17	4.0	10	1,200	3.8	0.34	0.36	200	160	700	960	1,700
BP6-e Split	4.58	1.2	1,400	0.19	bpql	11	1,200	3.7	0.43	0.38	210	200	730	1,000	1,800
BP6-f	5.91	1.3	920	0.35	11	13	13,000	3.6	0.36	0.47	550	200	900	770	3,900
BP6-g	6.51	1.4	1,200	0.41	10	14	15,000	3.7	0.37	0.50	680	280	950	1,300	3,400
BP6-h	6.80	2.0	bpql	0.69	bpql	23	30	2.3	0.44	0.74	240	280	750	37	130
BP6-i	7.03	1.8	bpql	0.62	bpql	23	19	2.0	0.46	0.72	200	390	670	20	70
BP7-a	6.73	1.5	140	0.78	7.8	20	1,100	2.5	0.43	0.57	1,400	460	970	180	1,300
BP7-b	6.92	1.3	230	0.56	12	16	1,700	2.7	0.34	0.45	2,900	350	880	230	2,100
BP7-c	7.34	1.1	210	0.40	4.1	14	1,500	2.2	0.31	0.35	1,100	380	710	220	1,200
BP7-d	7.29	0.94	860	0.36	4.6	12	810	3.2	0.31	0.35	580	270	690	580	1,700
BP7-d Split	7.33	1.0	840	0.36	4.7	13	750	3.1	0.34	0.35	560	350	670	560	1,700
BP7-e	7.34	0.76	26	0.29	bpql	12	800	1.4	0.23	0.33	260	370	460	25	210
BP7-f	7.61	0.59	bpql	0.28	2.1	11	140	1.2	0.16	0.26	740	390	470	bpql	260
BP7-g	7.60	0.56	12	0.35	2.2	13	28	1.4	0.16	0.26	800	320	880	11	280
BP8-a	8.27	0.67	bpql	0.34	bpql	18	12	1.7	0.17	0.35	2,300	350	620	9.2	27
BP8-b	7.84	1.6	bpql	0.52	bpql	25	17	2.0	0.32	0.65	360	320	680	17	46
BP8-c	8.40	1.3	bpql	0.45	bpql	19	13	1.7	0.28	0.50	250	420	590	16	37
BP8-c Split	8.43	1.2	bpql	0.42	bpql	18	13	1.6	0.26	0.47	250	380	560	14	35
BP8-d	8.44	2.1	bpql	0.70	bpql	24	24	2.2	0.37	0.79	550	500	780	24	65
BP8-e	8.31	2.3	11	1.1	bpql	30	29	2.4	0.38	0.90	540	560	850	28	87
BP8-f	6.77	0.89	460	0.30	3.0	bpql	830	1.9	0.35	0.26	310	450	630	330	1,200
BP8-g	7.13	1.2	97	0.58	4.9	17	680	1.9	0.33	0.44	1,100	320	760	120	990
BP9-a	7.73	0.53	bpql	0.28	bpql	13	bpql	1.6	0.15	0.19	110	310	490	9.1	31
BP9-a Field Dup	7.76	0.66	bpql	0.39	bpql	16	6.2	1.8	0.18	0.22	150	580	540	12	49
BP9-b	7.53	2.7	10	0.93	bpql	28	33	2.6	0.48	0.93	470	330	890	26	82
BP9-b Field Dup	7.60	2.7	bpql	1.1	bpql	26	40	2.5	0.48	0.91	460	360	1,100	20	85
BP9-c	7.78	2.6	bpql	0.66	bpql	22	27	2.3	0.46	0.84	530	370	690	22	67
BP9-c Field Dup	7.72	2.5	11	0.67	bpql	22	27	2.4	0.50	0.85	580	420	710	22	70
BP9-d	8.00	1.8	42	0.92	12	22	2,800	2.2	0.39	0.68	1,600	440	860	32	2,000
BP9-d Field Dup	7.98	1.8	51	0.74	9.9	20	4,500	2.2	0.39	0.70	1,600	410	860	34	2,100
BP9-e	8.26	1.1	870	0.55	4.1	15	2,000	3.1	0.34	0.45	780	310	910	660	1,600
BP9-e Field Dup	8.27	1.2	830	0.56	4.7	16	2,000	3.0	0.38	0.47	870	380	910	640	1,800

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Profile Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
BP9-f	8.25	1.4	370	0.62	10	17	2,300	2.6	0.42	0.48	1,100	500	880	330	2,100
BP9-f Field Dup	8.16	1.3	390	0.61	12	17	2,400	2.6	0.39	0.48	1,200	410	900	330	2,200
BP9-g	7.44	1.4	99	0.78	3.1	18	700	2.0	0.42	0.52	710	530	810	120	710
BP9-g Field Dup	7.45	1.4	95	0.74	3.0	17	690	2.0	0.42	0.51	630	490	840	120	710
BP10-a	8.59	0.79	bpql	0.65	bpql	37	10	1.6	0.21	0.37	310	300	510	13	29
BP10-b	8.44	1.5	bpql	0.44	bpql	22	13	1.9	0.33	0.54	140	260	720	18	39
BP10-c	8.40	2.0	bpql	0.54	bpql	30	17	2.3	0.46	0.79	150	320	730	21	51
BP10-d	8.65	1.9	bpql	0.62	bpql	21	17	2.1	0.45	0.75	750	490	660	19	48
BP10-d Split	8.65	1.9	bpql	0.62	bpql	21	16	2.1	0.45	0.75	770	500	640	20	47
BP10-e	8.68	1.8	bpql	11	bpql	18	17	1.5	0.50	2.1	400	740	840	15	47
BP10-f	8.26	1.5	14	12	bpql	16	24	1.2	0.50	2.9	360	1,700	910	14	49
BP10-g	8.17	1.5	69	9.4	1.5	16	260	1.4	0.53	2.8	580	1,500	1,100	55	280
BP11-a	7.94	0.39	bpql	0.17	bpql	bpql	bpql	0.40	0.13	0.13	54	340	260	bpql	14
BP11-b	7.87	0.83	bpql	0.25	bpql	bpql	9.4	0.72	0.25	0.28	78	510	300	bpql	24
BP11-c	7.21	2.6	bpql	0.74	bpql	59	38	2.4	0.30	0.84	500	300	870	21	63
BP11-d	6.87	3.6	16	0.93	1.8	69	65	3.5	0.36	1.0	1,300	280	1,000	30	110
BP11-e	6.85	2.4	290	1.0	8.5	44	2,200	3.0	0.41	0.81	1,200	280	1,600	400	1,500
BP11-f	7.06	1.7	200	0.72	6.9	24	1,200	2.5	0.36	0.58	1,500	240	1,300	230	1,400
BP11-g	7.30	1.9	110	1.1	4.8	25	800	2.5	0.45	0.71	1,100	410	1,200	140	770
BP11-h	7.95	1.2	67	0.59	2.1	20	520	2.0	0.31	0.46	690	330	750	98	500
BP12-a	7.74	0.66	67	0.26	1.1	11	460	1.7	0.19	0.22	220	310	560	77	300
BP12-b	7.81	1.7	260	0.71	4.9	28	2,300	2.9	0.40	0.63	660	330	920	240	2,100
BP12-c	8.32	1.3	150	0.49	6.1	19	1,300	2.7	0.31	0.43	1,500	410	830	170	2,100
BP12-d	8.48	1.3	100	0.46	5.9	18	770	2.5	0.31	0.43	1,800	340	760	120	1,800
BP12-e	7.84	1.0	84	0.44	9.7	20	580	2.4	0.26	0.39	2,000	470	700	110	1,100
BP12-f	7.20	1.7	69	0.72	3.6	38	330	2.8	0.33	0.67	800	400	940	93	460
BP13-a	8.37	0.66	bpql	0.29	bpql	13	28	1.2	0.17	0.27	97	390	430	12	130
BP13-b	8.60	0.80	16	0.31	bpql	11	10	1.3	0.22	0.28	320	630	400	11	120
BP13-c	8.22	1.7	17	0.55	1.5	21	63	1.8	0.33	0.59	500	320	590	18	290
BP13-d	7.38	1.4	17	0.86	18	15	4,300	1.7	0.36	0.57	1,400	390	710	19	4,000
BP13-e	6.90	0.9	510	0.32	2.7	bpql	740	2.3	0.33	0.31	540	270	630	440	1,100
BP13-f	7.33	1.2	130	0.55	6.0	17	850	2.1	0.36	0.42	1,800	360	760	150	1,300

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Profile Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
BP14-a	8.52	0.73	bpql	0.31	bpql	15	7.1	1.0	0.20	0.29	66	520	450	13	23
BP14-b	7.96	1.5	bpql	0.47	bpql	24	16	2.1	0.36	0.63	290	410	670	18	44
BP14-c	8.22	2.4	13	0.75	bpql	37	33	2.5	0.42	0.89	450	690	720	29	75
BP14-d	8.65	2.1	16	1.8	bpql	23	32	2.0	0.49	0.84	490	810	710	24	120
BP14-d Split	8.66	2.2	20	1.8	bpql	23	34	2.1	0.52	0.89	540	860	740	22	140
BP14-e	7.49	1.0	500	0.46	7.8	bpql	1,100	2.1	0.36	0.31	1,700	900	680	490	2,400
BP14-f	7.41	1.2	330	0.50	7.9	14	1,100	2.4	0.39	0.49	1,000	1,000	840	300	2,100
BP14-g	7.30	1.5	110	0.75	3.7	19	830	2.2	0.46	0.55	890	680	830	140	900
BP15-a	7.12	1.5	13	0.46	bpql	17	16	1.7	0.36	0.56	150	340	630	17	52
BP15-b	6.96	1.7	bpql	0.56	3.8	22	450	2.0	0.31	0.62	810	330	690	21	820
BP15-c	6.91	1.6	56	0.54	bpql	20	2,100	2.3	0.40	0.67	400	310	830	130	470
BP15-d	5.04	0.91	940	0.25	3.4	11	660	2.9	0.31	0.34	490	270	700	600	1,300
BP15-d Split	5.08	0.90	860	0.23	3.4	11	570	2.8	0.29	0.32	490	260	640	580	1,300
BP15-e	4.71	0.74	470	0.16	2.2	bpql	510	1.9	0.25	0.27	390	160	550	450	840
BP15-f	6.72	1.5	290	0.71	8.4	17	1,600	2.5	0.39	0.49	1,600	310	900	280	1,600
CP10-a	7.88	1.6	810	0.99	13	15	5,300	2.8	0.45	0.54	1,700	290	1,000	630	3,600
CP10-b	8.27	2.2	23	3.3	bpql	34	71	2.4	0.34	0.87	510	330	1,000	31	77
CP10-c	7.83	2.2	bpql	0.80	bpql	30	26	2.4	0.35	0.83	420	360	800	19	53
CP10-d	7.82	2.2	bpql	0.64	bpql	26	20	2.7	0.39	0.82	950	340	730	20	56
CP10-e	7.78	2.4	13	0.71	1.3	26	24	3.9	0.41	0.85	500	350	690	25	58
CP10-f	7.02	0.96	bpql	0.34	bpql	13	10	1.1	0.24	0.36	100	370	510	9.3	26
CP11-a	6.18	1.5	470	0.40	4.8	14	2,700	2.4	0.39	0.52	1,200	440	740	450	1,400
CP11-b	6.29	1.8	480	0.71	14	22	2,900	3.4	0.39	0.63	2,200	730	1,100	490	2,700
CP11-c	6.93	2.3	30	0.85	1.5	40	150	2.6	0.35	0.91	650	370	910	37	330
CP11-d	7.21	1.3	bpql	0.40	bpql	17	15	1.4	0.19	0.44	210	230	450	15	44
CP11-e	7.29	0.45	15	0.18	bpql	bpql	bpql	1.2	0.14	0.17	91	290	420	8.9	15
CP12-a	5.08	1.1	380	0.99	9.6	16	2,900	2.0	0.43	0.47	1,000	760	990	290	1,900
CP12-b	4.28	0.91	410	0.17	3.4	bpql	1,000	1.8	0.40	0.28	300	270	640	370	1,100
CP12-c	4.09	1.3	1,000	0.27	4.2	16	1,000	3.3	0.41	0.49	370	300	840	520	1,400
CP12-d	5.10	2.5	120	0.79	3.1	52	5,300	2.9	0.33	0.87	770	270	1,100	220	520
CP12-d Split	5.18	3.2	110	0.76	3.2	55	5,400	2.9	0.38	0.94	680	340	1,100	180	470
CP12-e	7.70	1.8	bpql	0.59	bpql	27	22	1.9	0.39	0.70	170	230	740	15	48

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Profile Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
CP13-a	6.52	3.1	120	1.0	3.5	54	170	3.6	0.20	0.91	820	590	1,800	79	200
CP13-b	7.76	3.0	38	0.96	bpql	66	70	4.6	0.14	0.93	950	380	1,600	36	88
CP13-c	7.10	3.2	12	0.81	bpql	74	49	3.2	0.17	0.92	480	330	880	32	81
CP13-d	5.70	2.7	bpql	0.76	bpql	76	41	2.6	0.19	1.0	290	340	1,000	22	68
CP14-a	7.01	1.9	370	2.2	9.0	18	980	2.4	0.47	0.67	1,800	560	1,400	140	2,300
CP14-b	7.11	1.1	24	0.39	bpql	13	29	1.3	0.31	0.43	180	330	490	17	43
CP14-c	7.12	0.68	12	0.29	bpql	bpql	7.6	0.93	0.22	0.27	93	300	400	10	25
CP14-d	7.36	0.80	bpql	0.30	bpql	bpql	bpql	0.77	0.28	0.24	78	990	390	bpql	28
CP14-d Split	7.29	0.46	bpql	0.19	bpql	bpql	bpql	0.55	0.19	0.14	51	540	280	bpql	19
CP14-e	8.31	0.48	bpql	0.17	bpql	bpql	bpql	0.65	0.16	0.18	60	300	270	bpql	16
CP15-a	7.66	1.6	48	0.82	5.1	14	780	1.9	0.31	0.66	960	350	870	110	2,800
CP15-b	8.32	1.5	21	1.7	1.1	13	260	1.4	0.40	0.94	560	320	530	58	100
CP15-c	8.40	2.0	11	2.8	bpql	14	15	1.7	0.47	0.94	420	290	670	18	52
CP15-c Split	8.44	2.0	11	2.9	bpql	15	17	1.7	0.48	1.0	430	320	720	16	51
CP15-d	8.60	1.3	bpql	3.1	bpql	11	12	1.3	0.34	0.63	380	230	730	12	35
CP16-a	7.71	2.0	bpql	0.60	bpql	21	36	2.1	0.41	0.77	320	350	680	19	66
CP16-b	7.57	1.3	bpql	0.42	bpql	15	14	1.5	0.36	0.52	190	310	600	15	42
CP16-c	7.35	0.79	bpql	0.33	bpql	14	8.5	1.3	0.20	0.35	87	470	560	11	24
CP17-a	7.84	2.0	140	0.94	8.4	29	970	2.6	0.45	0.75	1,500	840	920	160	1,200
CP17-b	7.74	1.3	180	0.53	14	18	1,300	2.6	0.32	0.48	2,700	410	800	190	2,300
CP17-c	7.75	1.9	210	0.60	8.2	23	1,700	3.3	0.45	0.60	1,500	390	1,100	230	2,900
CP17-d	7.39	0.70	190	0.28	4.7	bpql	4,000	2.4	0.23	0.26	1,000	300	470	270	1,400
CP17-e	7.35	0.79	bpql	0.29	1.7	19	1,400	2.1	0.26	0.43	990	460	550	150	360
CP18-a	8.11	1.9	25	0.43	1.4	15	97	1.6	0.56	0.65	570	1,700	580	29	89
CP18-b	8.82	2.3	21	0.79	bpql	20	21	2.2	0.67	0.90	500	2,100	710	18	56
CP18-b Split	-	2.2	22	0.82	bpql	20	bpql	2.1	0.63	0.84	500	1,800	710	19	56
CP18-c	8.68	1.0	bpql	1.0	bpql	14	8.0	1.4	0.29	0.46	270	310	590	11	28
CP18-d	8.65	0.51	bpql	0.29	bpql	10	bpql	0.88	0.15	0.22	760	290	460	bpql	16
CP18-e	8.54	1.2	12	0.81	bpql	16	12	1.8	0.30	0.47	1,100	320	620	12	30
CP18-f	8.46	0.54	17	0.33	bpql	11	8.2	1.6	0.15	0.25	2000	310	490	9.2	18
CP19-a	6.82	3.1	30	0.80	2.1	16	110	2.3	0.65	0.90	820	220	730	44	310
CP19-b	7.80	3.0	19	1.6	bpql	16	48	2.3	0.61	0.97	590	260	770	30	89

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Profile Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
CP19-b Split	-	3.0	19	1.6	bpql	14	49	2.2	0.61	0.96	570	270	780	24	93
CP19-c	8.20	2.1	bpql	1.3	bpql	11	16	1.8	0.42	0.79	540	360	810	21	49
CP20-a	8.27	1.7	200	2.7	7.9	19	1,400	2.0	0.49	0.99	1,100	1,400	1,000	200	1,100
CP20-b	8.13	1.1	13	0.46	bpql	16	53	2.1	0.25	0.41	140	330	630	21	50
CP20-c	8.35	0.76	bpql	0.34	bpql	16	6.1	1.1	0.20	0.30	110	400	580	9.4	25
CP20-c Split	-	0.71	bpql	0.34	bpql	15	bpql	1.1	0.19	0.30	100	380	590	bpql	24
CP20-d	8.43	0.93	bpql	0.42	bpql	14	9.2	1.7	0.24	0.43	170	580	630	13	30
CP21-a	6.83	1.4	690	0.54	7.1	13	3,700	2.8	0.43	0.49	1,100	350	1,000	620	1,900
CP21-b	7.69	1.5	47	1.2	2.5	19	260	1.9	0.39	0.61	440	450	760	28	570
CP21-c	7.96	1.5	23	0.56	bpql	19	64	1.9	0.34	0.57	310	420	710	22	74
CP21-d	8.03	0.55	bpql	0.23	bpql	bpql	bpql	1.1	0.20	0.24	270	390	370	bpql	20
CP21-e	8.00	0.49	bpql	0.24	bpql	bpql	7.4	1.3	0.17	0.15	540	490	500	10	21
C1-a	6.06	0.62	bpql	0.34	4.7	10	140	1.5	0.18	0.19	170	610	430	13	260
C1-a Split	5.83	0.57	bpql	0.28	7.1	10	160	1.2	0.16	0.20	210	380	440	11	330
C1-b	6.96	1.7	19	0.49	4.0	20	6,500	2.1	0.32	0.69	530	650	710	34	740
C1-c	4.73	1.5	850	0.28	3.4	18	3,000	2.7	0.41	0.54	1,100	1,300	830	960	1,400
C1-d	4.44	0.75	570	0.16	3.9	bpql	900	2.3	0.30	0.28	630	830	520	440	1,500
C1-e	5.42	1.5	270	2.3	8.4	14	7,400	2.0	0.58	0.51	670	4,300	900	250	1,700
C2-a	7.67	0.83	bpql	0.37	bpql	22	11	1.5	0.23	0.38	160	460	600	14	33
C2-b	7.87	0.70	bpql	0.32	bpql	bpql	12	1.2	0.20	0.27	150	590	470	8.6	26
C2-c	4.16	0.79	bpql	0.28	bpql	13	10	1.2	0.17	0.36	94	310	420	11	27
C3-a	7.87	1.5	bpql	0.45	bpql	17	14	1.6	0.35	0.56	130	580	600	15	44
C3-b	8.16	1.4	bpql	0.53	bpql	17	16	1.8	0.27	0.65	250	710	740	18	49
C3-c	8.65	1.3	10	1.2	bpql	15	13	1.7	0.27	0.59	260	1200	650	14	37
C3-d	8.43	1.2	16	3.6	bpql	11	29	1.3	0.29	0.69	260	1,500	690	13	38
C3-e	7.79	1.6	230	1.8	6.7	17	1,900	2.2	0.53	0.82	1,100	1,700	1,100	240	1,300
C4-a	7.79	0.60	bpql	0.30	bpql	11	8.2	1.5	0.22	0.22	810	430	420	9.2	18
C5-a	7.70	0.68	bpql	0.34	bpql	15	9.9	1.7	0.19	0.23	250	650	500	12	19
C5-b	7.65	0.55	bpql	0.25	bpql	bpql	20	0.89	0.16	0.18	190	400	400	bpql	110
C5-c	7.04	1.0	37	0.36	2.7	13	660	1.2	0.27	0.33	340	320	520	17	490
C5-c Split	7.16	1.1	36	0.39	2.8	12	580	1.3	0.35	0.33	330	630	510	17	450
C5-d	5.63	1.1	340	0.30	2.2	12	1,500	2.0	0.33	0.38	800	430	600	360	930

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Profile Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
C5-e	5.47	1.2	350	0.30	4.3	12	2,300	2.1	0.40	0.38	630	450	740	290	1,200
C6-a	7.48	0.49	bpql	0.21	bpql	bpql	bpql	0.88	0.17	0.17	270	430	330	bpql	90
C7-a	4.56	1.3	800	0.26	4.3	17	2,000	2.4	0.37	0.41	1,100	560	710	1,100	1,600
C7-a Split	4.54	1.2	780	0.24	4.7	15	2,100	2.4	0.37	0.40	1,200	480	720	1,100	1,600
C7-b	5.15	2.2	73	0.45	5.4	23	4,500	2.6	0.49	0.75	1,800	460	930	950	1,600
C7-c	6.62	2.1	17	0.57	4.6	23	3,800	2.7	0.51	0.81	660	370	1,000	83	630
C7-d	7.31	0.96	bpql	0.32	2.8	14	1,700	1.2	0.26	0.36	440	280	560	19	280
C7-e	7.23	0.51	bpql	0.16	bpql	bpql	840	0.81	0.17	0.28	350	300	320	8.4	89
C8-a	7.74	0.37	12	0.17	bpql	bpql	170	0.81	0.13	0.13	170	330	310	bpql	66
C9-a	4.72	1.5	1,600	0.29	4.4	16	2,900	3.5	0.42	0.50	1,700	260	1,100	1,600	2,000
C9-b	5.59	2.1	86	0.70	8.1	28	5,700	2.6	0.45	0.75	1,100	270	930	68	1,200
C9-c	6.85	1.9	bpql	0.70	5.0	24	34	2.2	0.42	0.69	360	280	800	21	2,000
C9-d	7.34	0.47	bpql	0.23	bpql	bpql	74	0.67	0.15	0.16	110	390	440	bpql	140
C9-e	7.38	0.65	bpql	0.25	bpql	bpql	17	1.0	0.16	0.24	71	240	460	bpql	81
C10-a	8.22	0.61	bpql	0.26	bpql	12	7.7	0.83	0.20	0.32	83	530	420	bpql	22
C10-a Split	8.15	0.57	bpql	0.23	bpql	12	8.0	0.76	0.21	0.24	73	460	450	bpql	21
C10-b	5.11	0.68	bpql	0.23	bpql	bpql	14	0.72	0.20	0.25	80	330	300	bpql	31
C10-c	6.64	2.1	11	0.81	bpql	34	33	2.2	0.38	0.83	230	280	760	23	87
C11-a	7.55	2.1	77	1.7	2.3	42	320	2.3	0.50	1.0	670	1,200	1,300	77	260
C11-b	8.13	3.0	21	1.6	bpql	71	52	3.0	0.33	1.2	310	1,000	1,100	29	79
C11-c	8.20	2.8	bpql	0.86	bpql	65	39	2.8	0.29	1.0	320	650	950	25	67
C11-d	8.12	2.5	bpql	0.74	bpql	36	30	2.6	0.38	0.91	340	430	660	26	69
C11-e	7.56	1.4	bpql	0.46	bpql	21	14	1.6	0.29	0.51	190	300	640	14	39
C11-e Split	7.50	1.5	bpql	0.48	bpql	22	15	1.7	0.31	0.53	200	360	660	16	42
C12-a	7.67	0.88	bpql	0.36	bpql	19	11	1.5	0.17	0.45	130	340	640	11	30
C12-b	6.24	0.98	bpql	0.29	bpql	30	11	1.5	0.16	0.88	130	260	600	10	28
C13-a	4.53	1.3	360	3.8	8.2	17	5,700	2.3	0.37	0.50	610	540	920	290	1,900
C13-b	4.16	0.65	280	0.15	3.4	bpql	660	1.6	0.30	0.21	280	240	540	270	1,100
C13-c	4.08	0.51	300	0.13	2.3	bpql	450	1.4	0.24	0.16	180	170	500	290	780
C13-d	4.34	1.2	1,200	0.28	4.9	15	1,700	3.2	0.35	0.42	700	330	810	840	1,800
C13-e	6.20	2.8	11	0.77	9.9	62	9,500	2.8	0.30	0.97	2,900	270	980	27	1,900
C13-e Split	6.16	2.5	bpql	0.75	9.5	59	8,300	2.7	0.28	0.91	2,700	250	980	25	1,800

EPA Method 200.7 Cation Analysis by ICAP-ES and Soil pH – Profile Soil Samples

Soil Sample Name	pH	Al (wt. %)	As (ppm)	Ca (wt. %)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit		0.0008	10	0.004	1	10	6	0.0016	0.008	0.008	8	20	10	8	1
C13-f	6.09	1.5	bpql	0.54	bpql	36	55	1.8	0.22	0.61	180	280	750	16	390
C14-a	6.12	0.60	bpql	0.30	1.0	11	77	1.0	0.14	0.34	120	260	550	bpql	190
C14-b	6.74	1.0	10	0.43	bpql	13	61	2.0	0.18	0.62	150	330	930	10	150
C15-a	7.62	1.5	150	1.9	5.8	20	1,400	2.1	0.37	0.67	760	320	990	190	1,200
C15-b	7.96	1.5	120	1.0	2.9	21	800	1.9	0.36	0.63	500	260	750	92	540
C15-c	7.51	1.4	33	0.50	bpql	19	22	1.8	0.36	0.61	540	280	600	19	49
C15-d	7.92	0.47	13	0.19	bpql	bpql	8.1	0.72	0.14	0.18	170	290	300	bpql	16
C15-e	7.84	0.52	24	0.20	bpql	bpql	10	0.75	0.16	0.23	320	160	330	bpql	20
C15-f	7.83	0.47	bpql	0.21	bpql	bpql	8.0	0.84	0.14	0.18	69	280	350	bpql	17
C16-a	8.30	0.68	bpql	0.33	bpql	13	7.3	1.3	0.20	0.33	120	330	650	10	26
C17-a	6.57	1.3	310	0.48	9.4	15	1,900	2.3	0.36	0.48	1,300	460	770	280	2,200
C17-b	5.93	1.7	300	0.64	9.2	13	2,300	2.4	0.45	0.57	1,500	520	770	260	2,300
C17-c	6.06	0.53	180	0.32	2.6	bpql	1,200	2.0	0.19	0.15	1,200	310	380	210	1,200
C17-c Split	5.80	0.49	180	0.33	2.7	bpql	1,200	2.1	0.17	0.15	1,200	210	400	220	1,300
C17-d	5.22	0.52	240	0.21	2.0	bpql	730	1.9	0.19	0.17	840	320	400	280	890
C17-e	6.45	0.56	bpql	0.26	bpql	bpql	430	1.0	0.18	0.20	550	600	400	13	140
C18-a	5.97	0.69	110	0.39	1.6	bpql	750	1.9	0.24	0.17	1,100	660	350	400	950

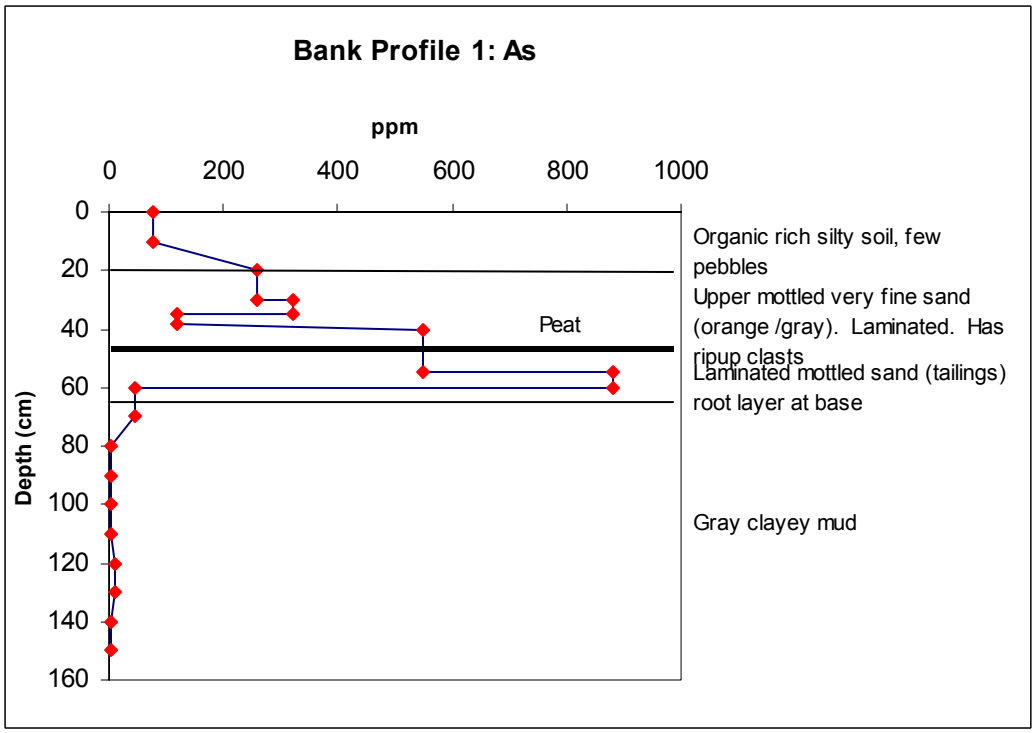
Note: bpql = below probable quantitative limit

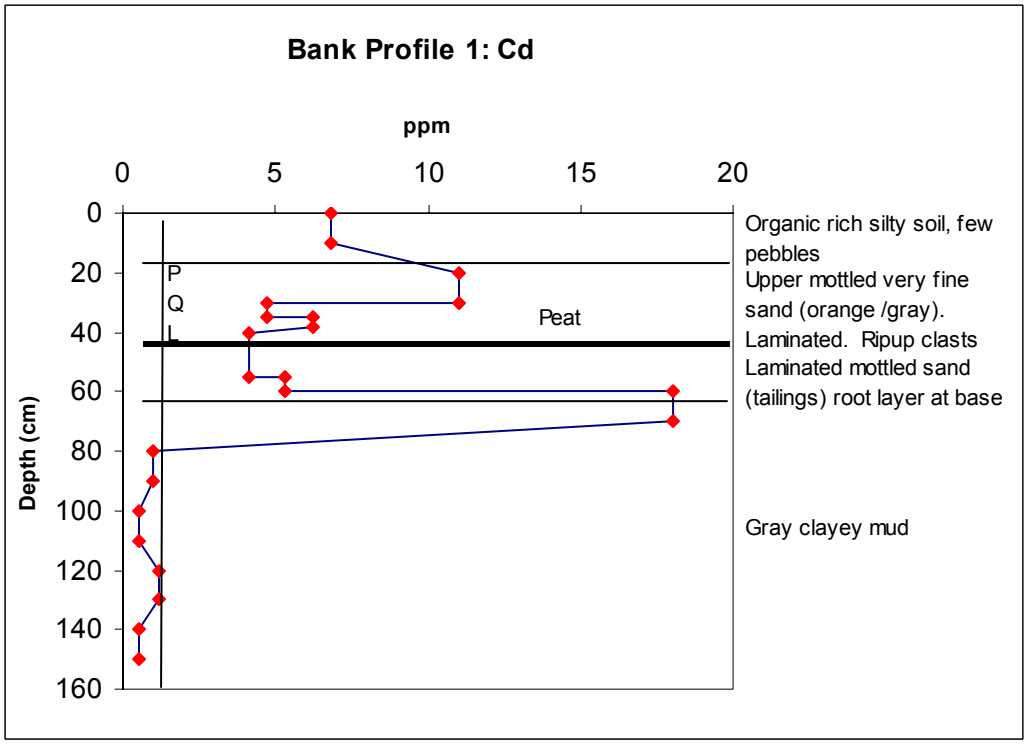
APPENDIX A

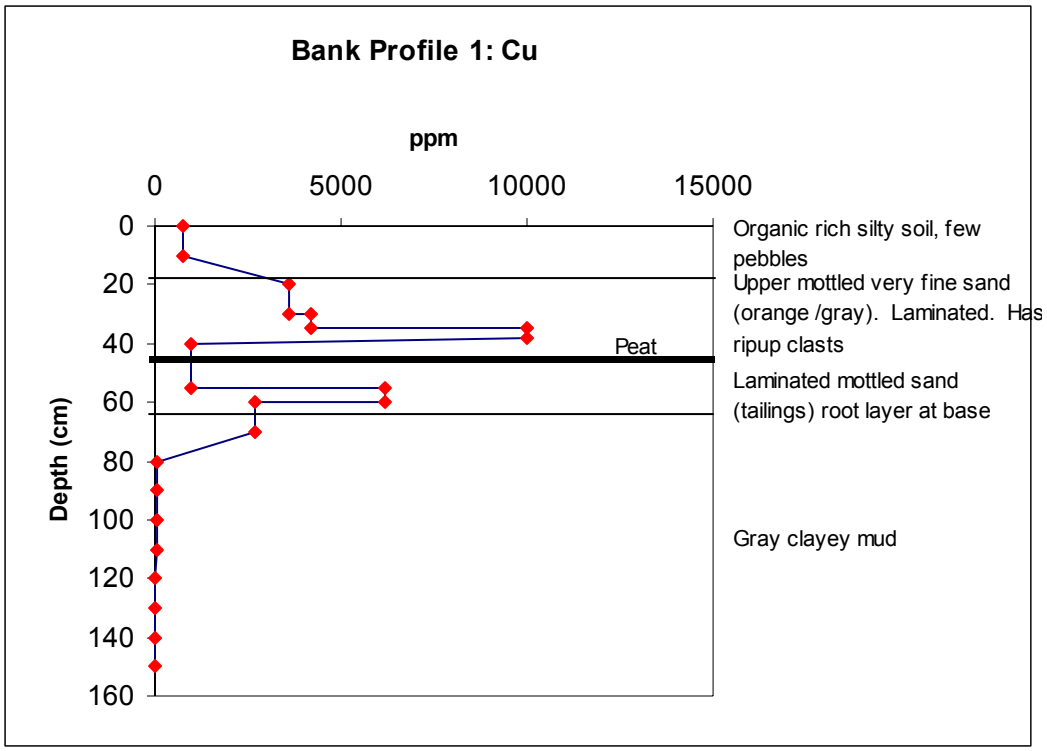
A.5 pH and Metals Data

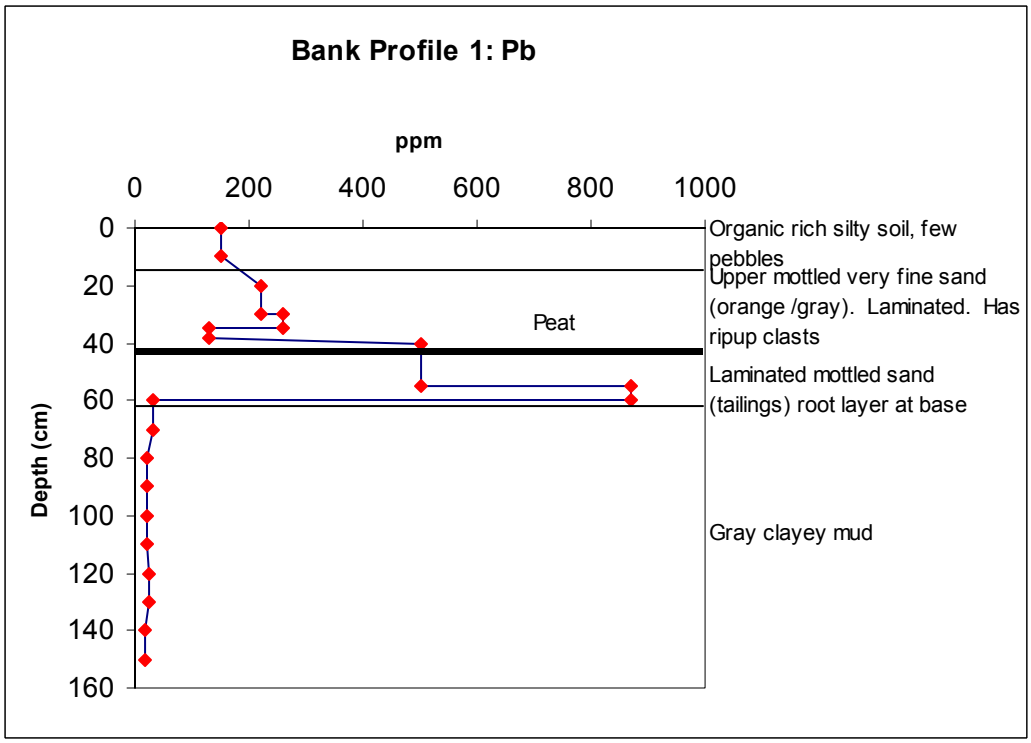
A.5.4 Profile Plots

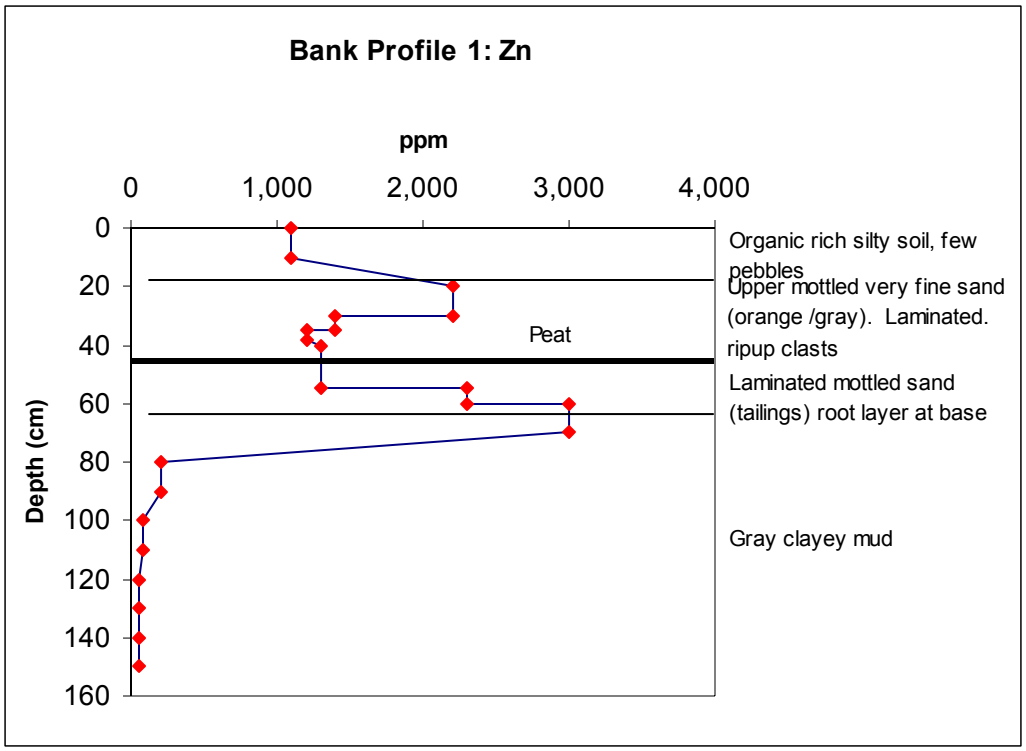
The following charts show the vertical distribution of concentrations (As, Cd, Cu , Pb and Zn) for soil samples collected from bank profile sites (BP), core profiles (CP) and soil pits (SP). The concentration data are plotted twice, once at the top of the sample interval and once at the base of the sample interval. Horizontal lines drawn on the plots represent different stratigraphic units described in the field or from the cores. Short descriptions of the units are listed to the right of the plots. Detailed descriptions are on the Stratigraphic sheets used when mapping and sampling. These sheets will be returned to GKR at the end of the project. All depths are listed in cm and each plot is scaled to the maximum depth described or sampled.

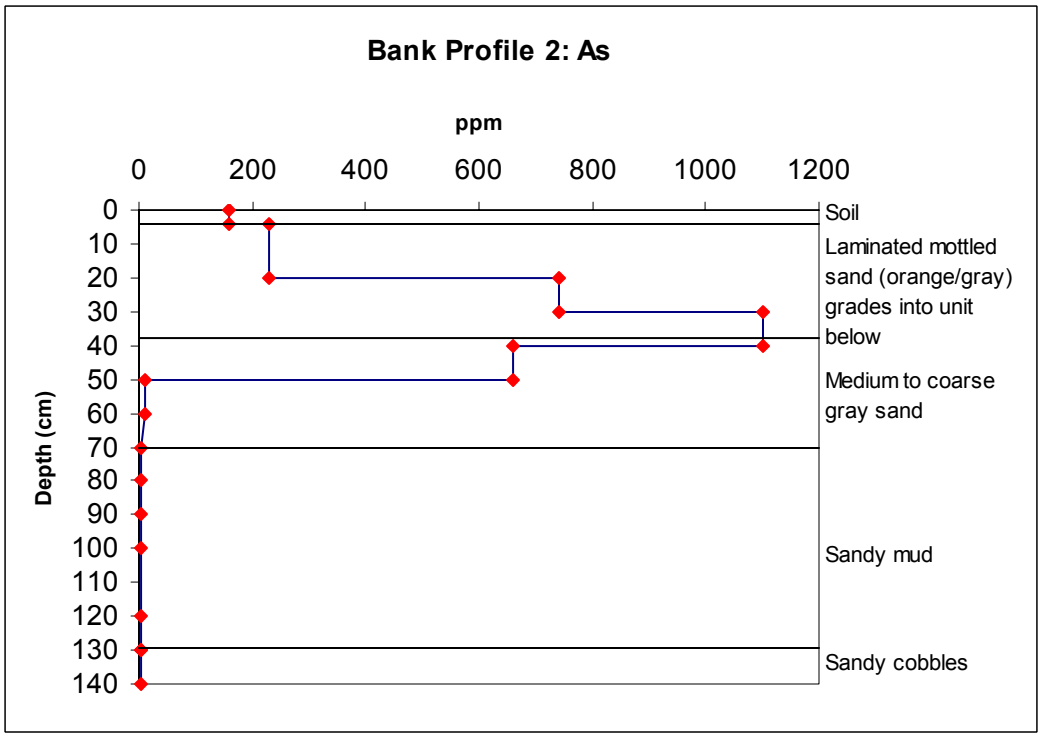

Bank Profile 1: As
ppm
0
200
400
600
800
1000
Depth (cm)
0
20
40
60
80
100
120
140
160
Peat
Organic rich silty soil, few pebbles
Upper mottled very fine sand (orange /gray). Laminated. Has ripup clasts
Laminated mottled sand (tailings) root layer at base
Gray clayey mud

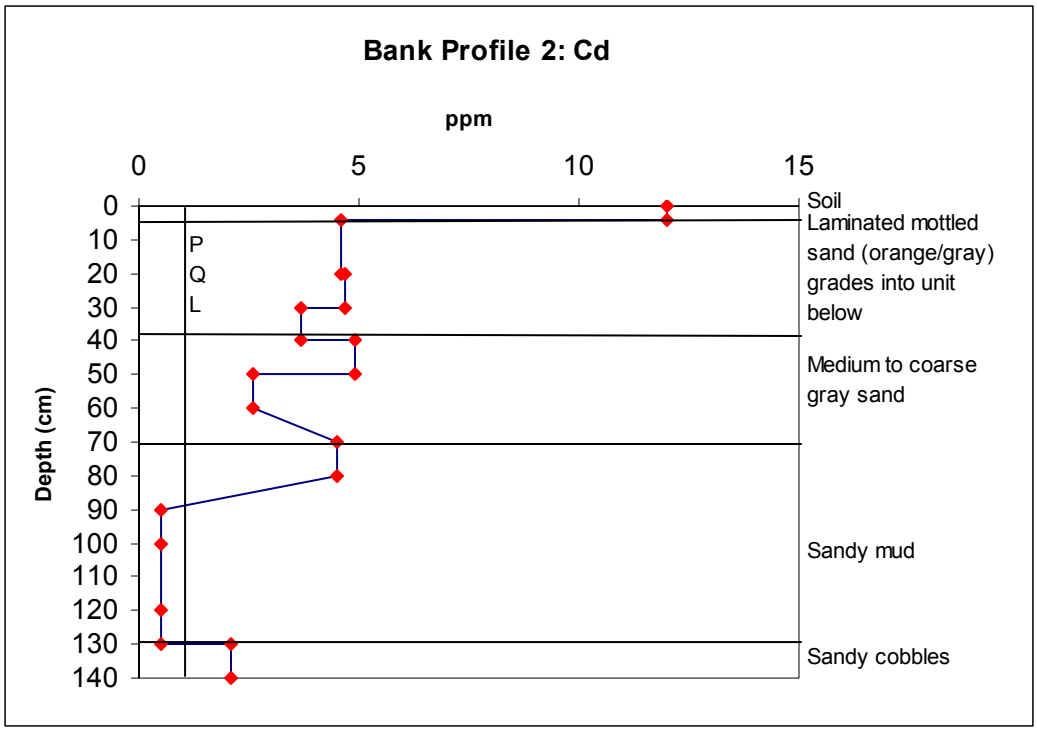

Bank Profile 1: Cd
ppm
0
5
10
15
20
Depth (cm)
0
20
40
60
80
100
120
140
160
P
Q
L
Peat
Organic rich silty soil, few pebbles
Upper mottled very fine sand (orange /gray). Laminated. Ripup clasts
Laminated mottled sand (tailings) root layer at base
Gray clayey mud

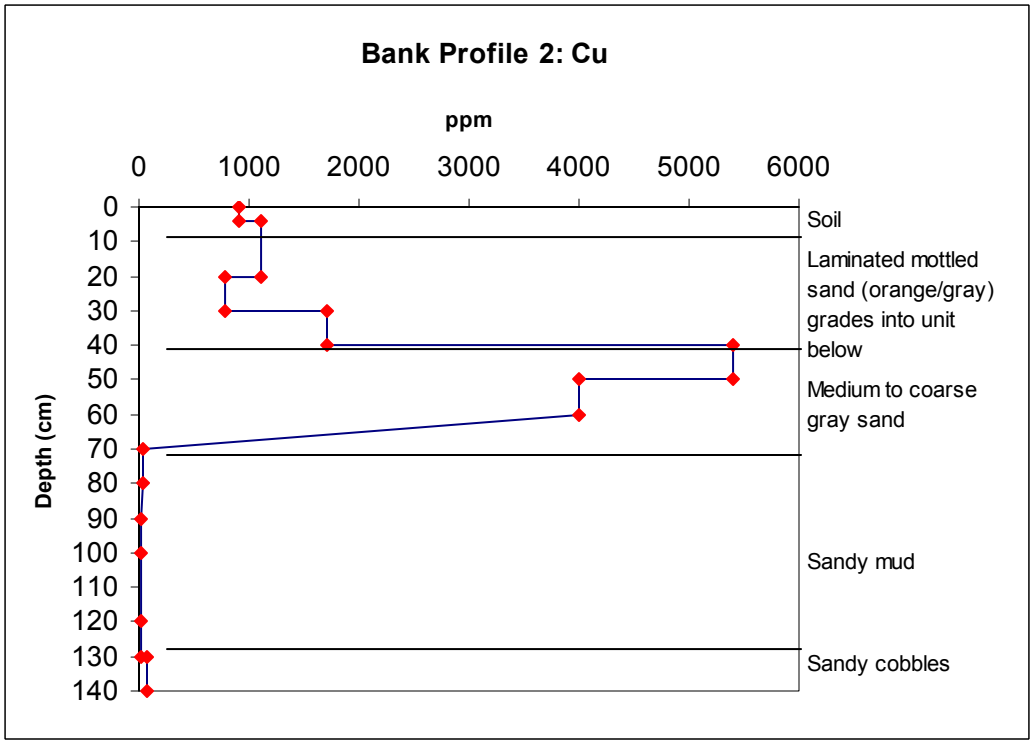

Bank Profile 1: Cu
ppm
0
5000
10000
15000
Depth (cm)
0
20
40
60
80
100
120
140
160
Peat
Organic rich silty soil, few pebbles
Upper mottled very fine sand (orange /gray). Laminated. Has ripup clasts
Laminated mottled sand (tailings) root layer at base
Gray clayey mud

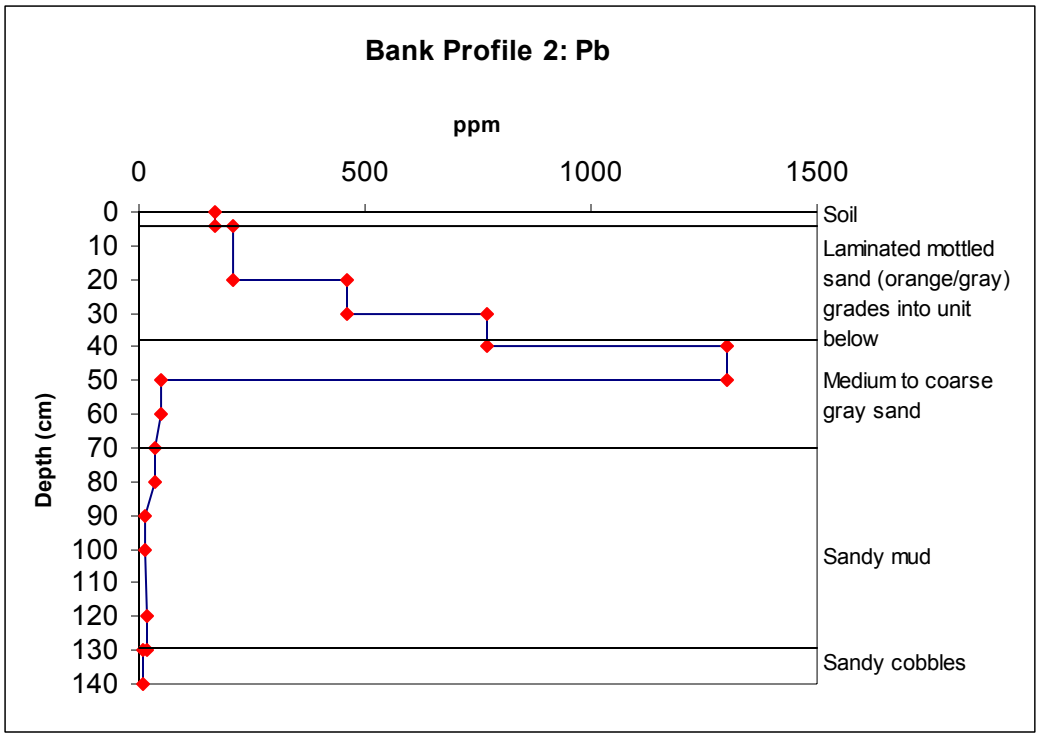

Bank Profile 1: Pb
ppm
0
200
400
600
800
1000
Depth (cm)
0
20
40
60
80
100
120
140
160
Peat
Organic rich silty soil, few pebbles
Upper mottled very fine sand (orange /gray). Laminated. Has ripup clasts
Laminated mottled sand (tailings) root layer at base
Gray clayey mud

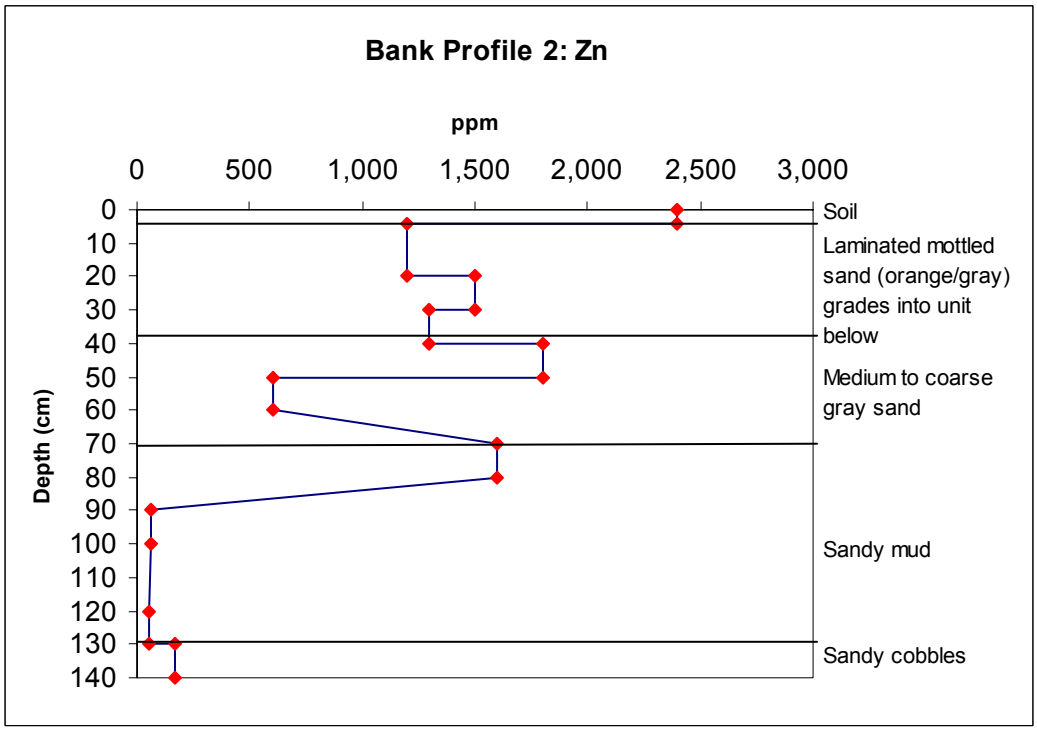

Bank Profile 1: Zn
ppm
0
1,000
2,000
3,000
4,000
Depth (cm)
0
20
40
60
80
100
120
140
160
Peat
Organic rich silty soil, few pebbles
Upper mottled very fine sand (orange /gray). Laminated. ripup clasts
Laminated mottled sand (tailings) root layer at base
Gray clayey mud

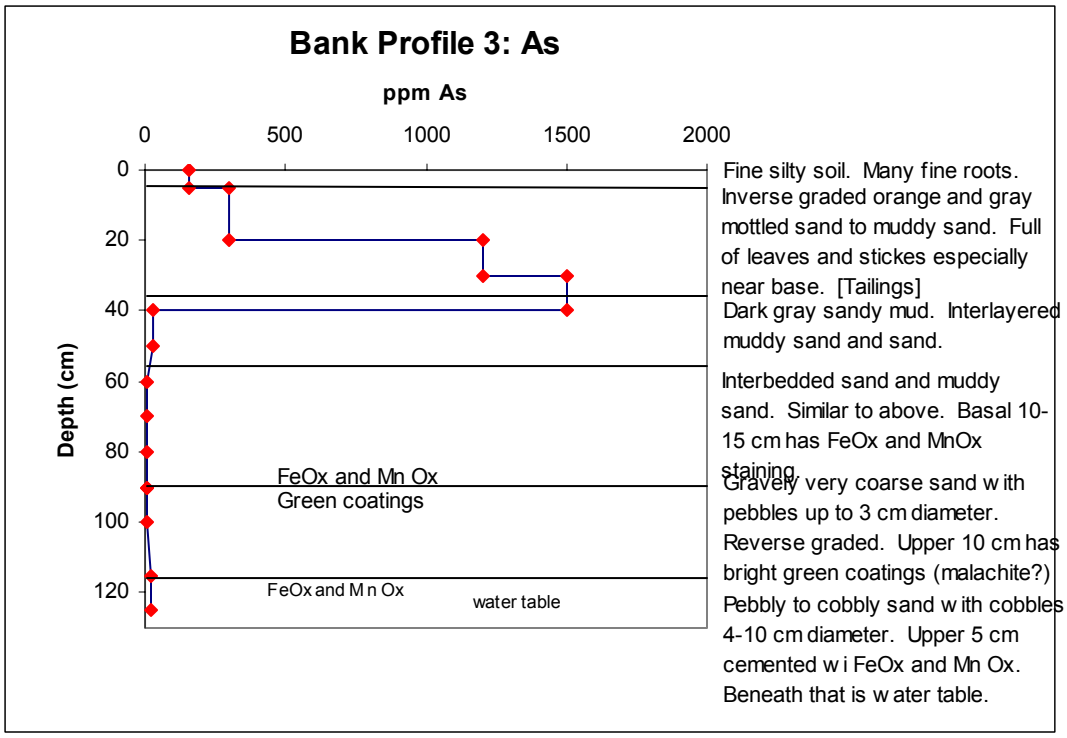

Bank Profile 2: As
ppm
0
200
400
600
800
1000
1200
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Soil
Laminated mottled sand (orange/gray) grades into unit below
Medium to coarse gray sand
Sandy mud
Sandy cobbles

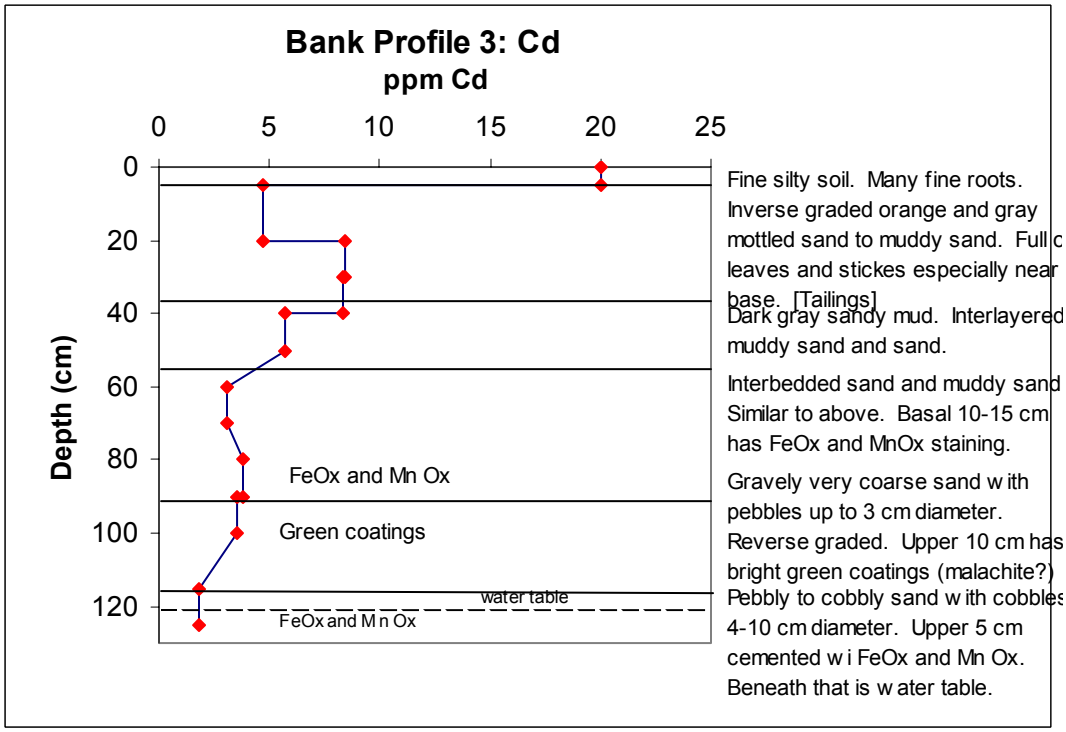

Bank Profile 2: Cd
ppm
0
5
10
15
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
P
Q
L
Soil
Laminated mottled sand (orange/gray) grades into unit below
Medium to coarse gray sand
Sandy mud
Sandy cobbles

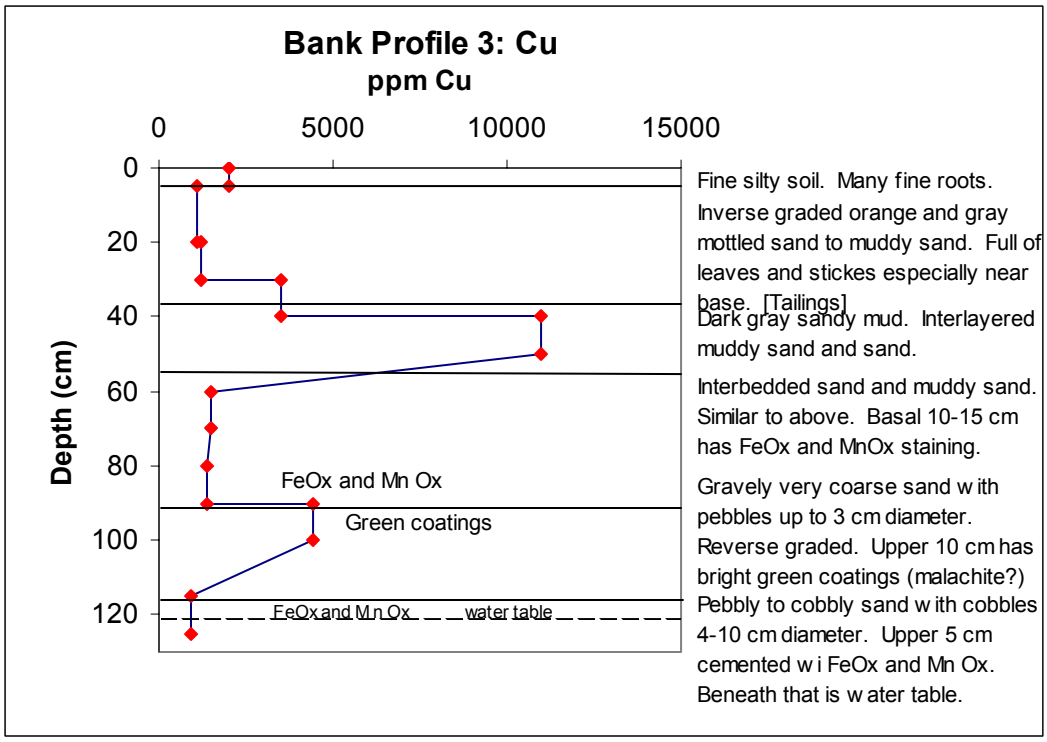

Bank Profile 2: Cu
ppm
0
1000
2000
3000
4000
5000
6000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Soil
Laminated mottled sand (orange/gray) grades into unit below
Medium to coarse gray sand
Sandy mud
Sandy cobbles

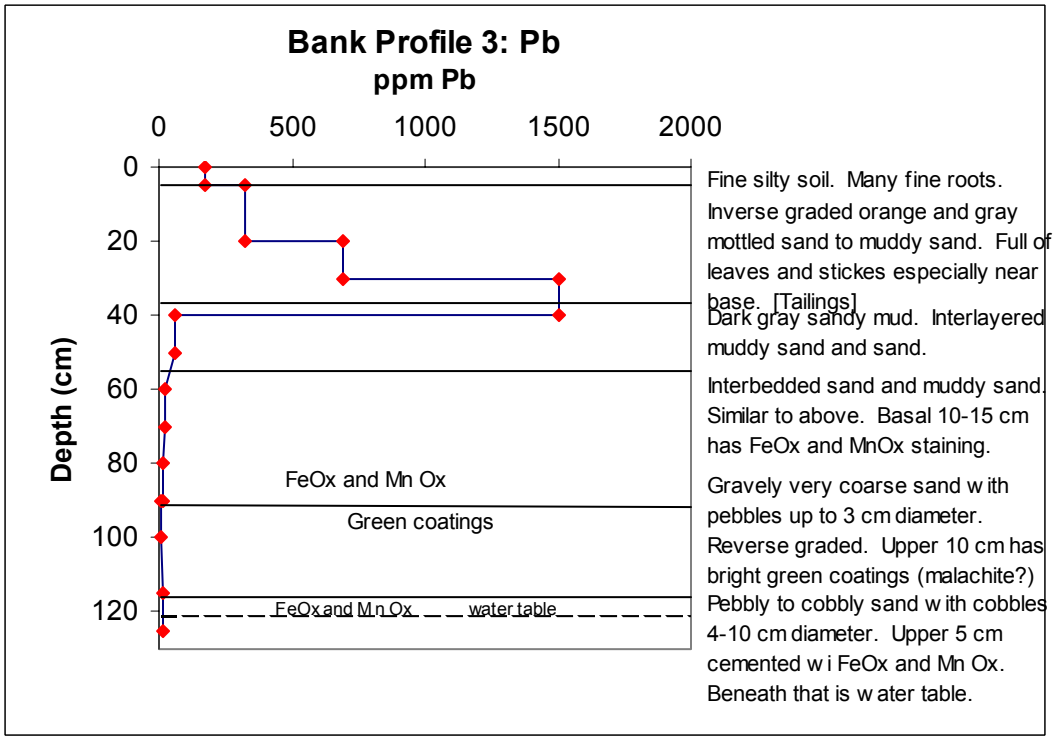

Bank Profile 2: Pb
ppm
0
500
1000
1500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Soil
Laminated mottled sand (orange/gray) grades into unit below
Medium to coarse gray sand
Sandy mud
Sandy cobbles

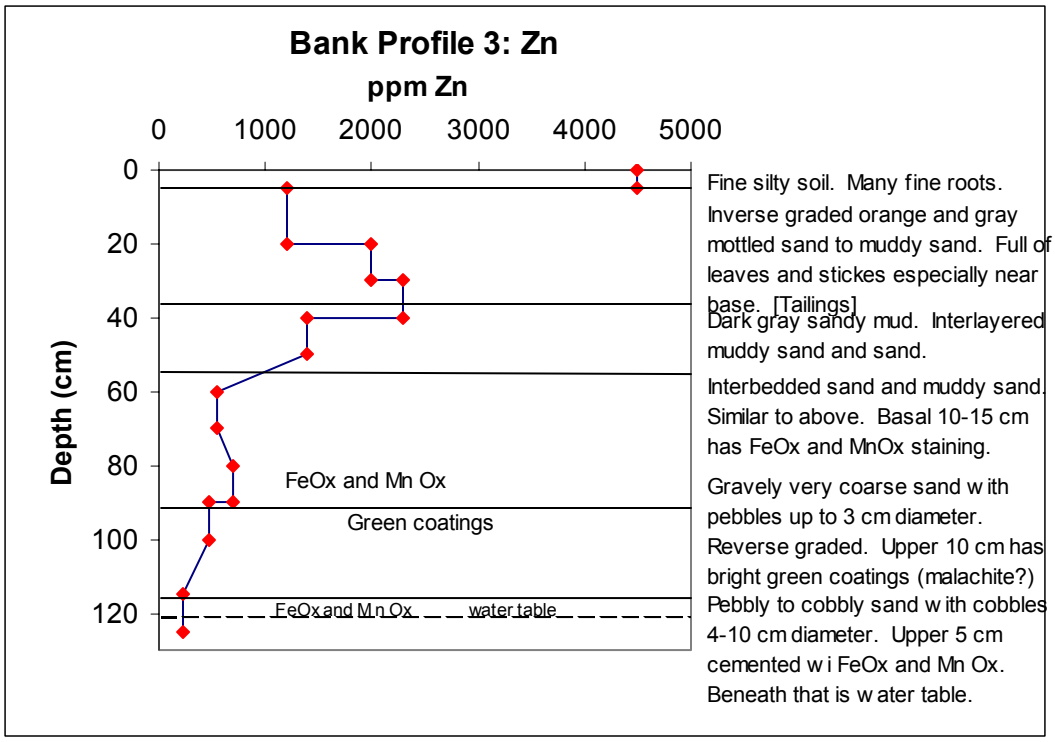

Bank Profile 2: Zn
ppm
0
500
1,000
1,500
2,000
2,500
3,000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Soil
Laminated mottled sand (orange/gray) grades into unit below
Medium to coarse gray sand
Sandy mud
Sandy cobbles

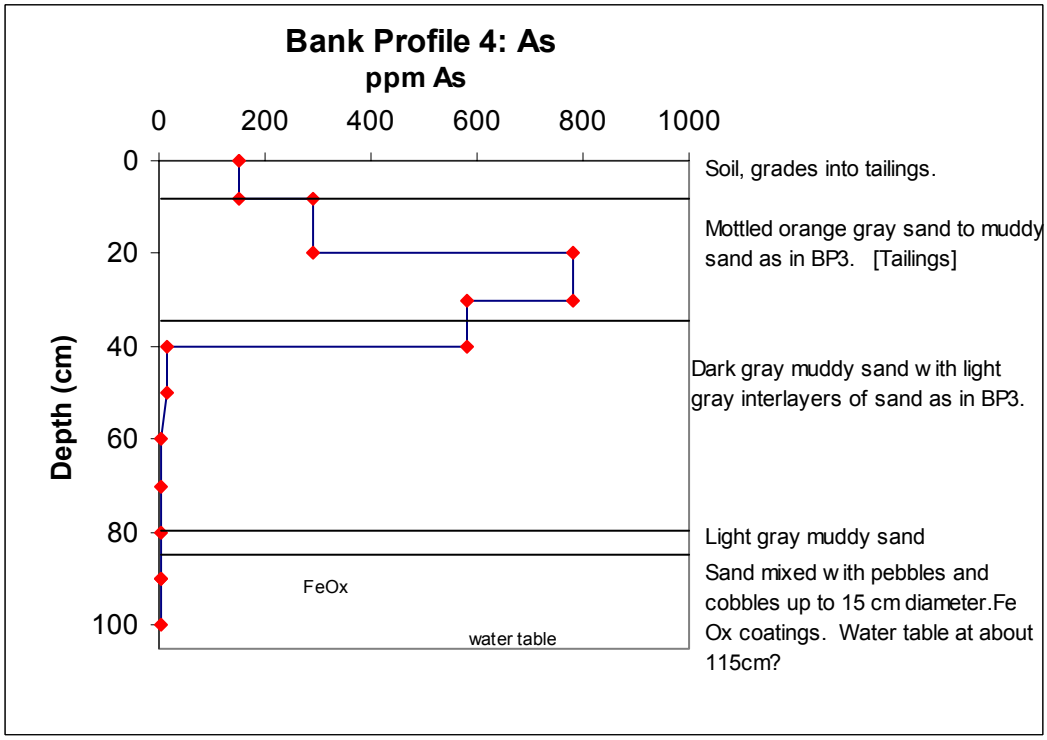

Bank Profile 3: As
ppm As
0
500
1000
1500
2000
Depth (cm)
0
20
40
60
80
100
120
FeOx and Mn Ox
Green coatings
FeOx and Mn Ox
water table
Fine silty soil. Many fine roots.
Inverse graded orange and gray mottled sand to muddy sand. Full of leaves and stickes especially near base. [Tailings]
Dark gray sandy mud. Interlayered muddy sand and sand.
Interbedded sand and muddy sand. Similar to above. Basal 10-15 cm has FeOx and MnOx staining.
Gravely very coarse sand with pebbles up to 3 cm diameter. Reverse graded. Upper 10 cm has bright green coatings (malachite?)
Pebbly to cobbly sand with cobbles 4-10 cm diameter. Upper 5 cm cemented wi FeOx and Mn Ox. Beneath that is water table.

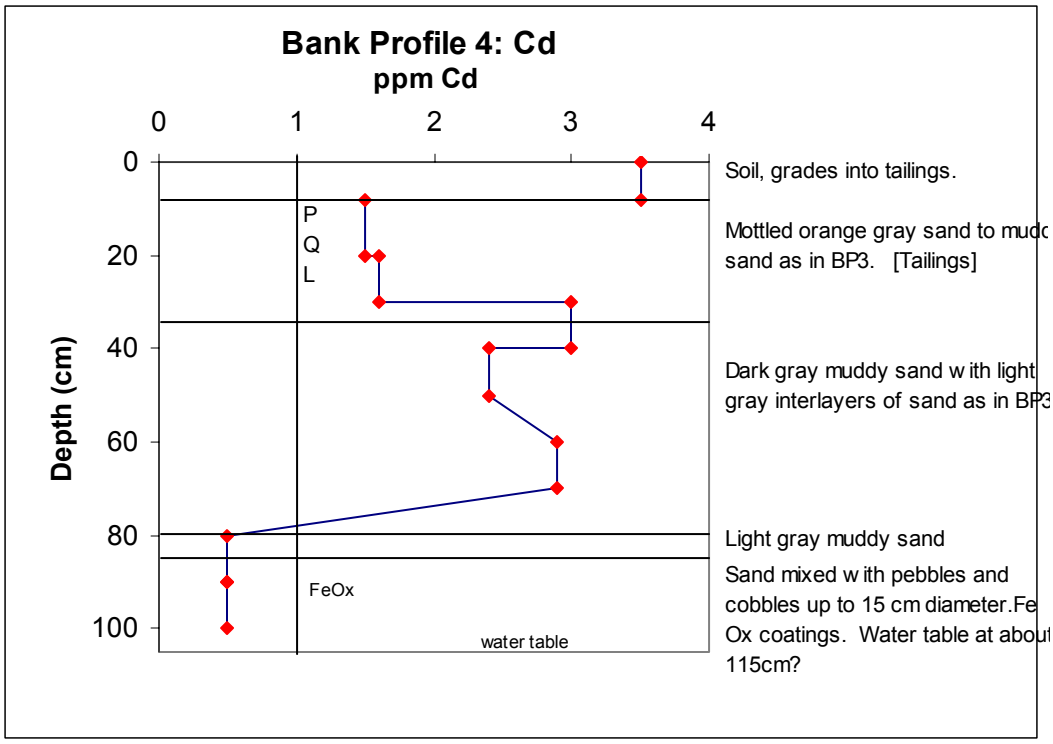

Bank Profile 3: Cd
ppm Cd
0
5
10
15
20
25
Depth (cm)
0
20
40
60
80
100
120
FeOx and Mn Ox
Green coatings
water table
FeOx and Mn Ox
Fine silty soil. Many fine roots.
Inverse graded orange and gray mottled sand to muddy sand. Full of leaves and stickes especially near base. [Tailings]
Dark gray sandy mud. Interlayered muddy sand and sand.
Interbedded sand and muddy sand Similar to above. Basal 10-15 cm has FeOx and MnOx staining.
Gravely very coarse sand with pebbles up to 3 cm diameter. Reverse graded. Upper 10 cm has bright green coatings (malachite?)
Pebbly to cobbly sand with cobbles 4-10 cm diameter. Upper 5 cm cemented wi FeOx and Mn Ox. Beneath that is water table.

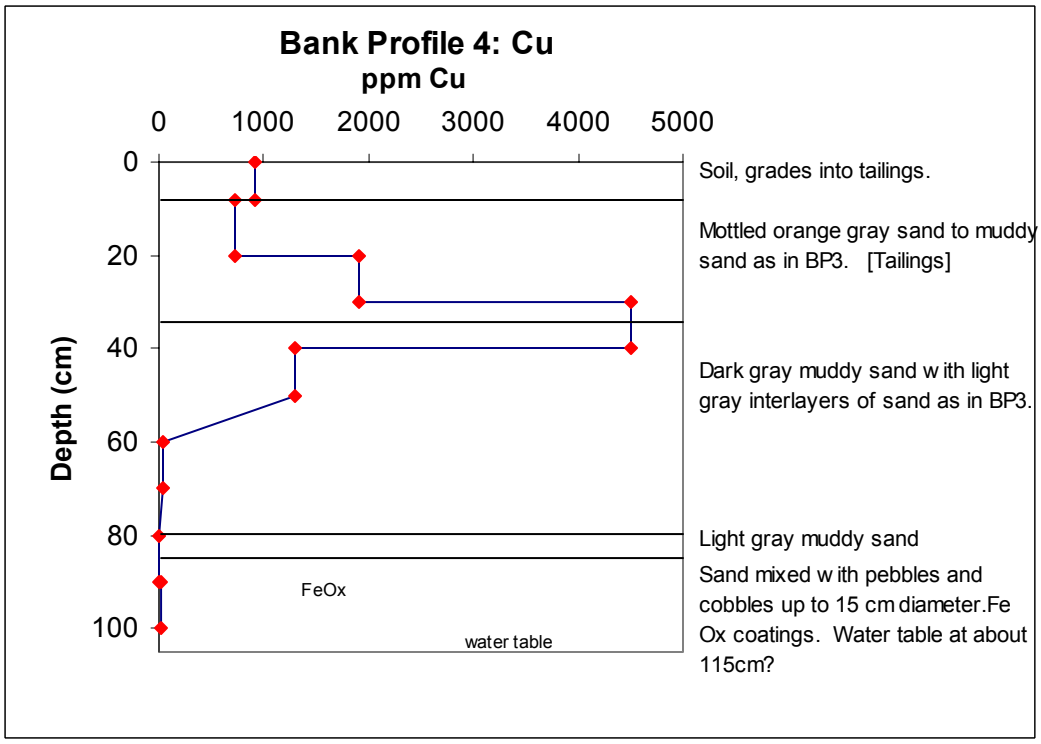

Bank Profile 3: Cu
ppm Cu
0
5000
10000
15000
Depth (cm)
0
20
40
60
80
100
120
FeOx and Mn Ox
Green coatings
FeOx and Mn Ox
water table
Fine silty soil. Many fine roots. Inverse graded orange and gray mottled sand to muddy sand. Full of leaves and stickes especially near base. [Tailings]
Dark gray sandy mud. Interlayered muddy sand and sand.
Interbedded sand and muddy sand. Similar to above. Basal 10-15 cm has FeOx and MnOx staining.
Gravely very coarse sand w ith pebbles up to 3 cm diameter. Reverse graded. Upper 10 cm has bright green coatings (malachite?)
Pebbly to cobbly sand w ith cobbles 4-10 cm diameter. Upper 5 cm cemented w i FeOx and Mn Ox. Beneath that is w ater table.

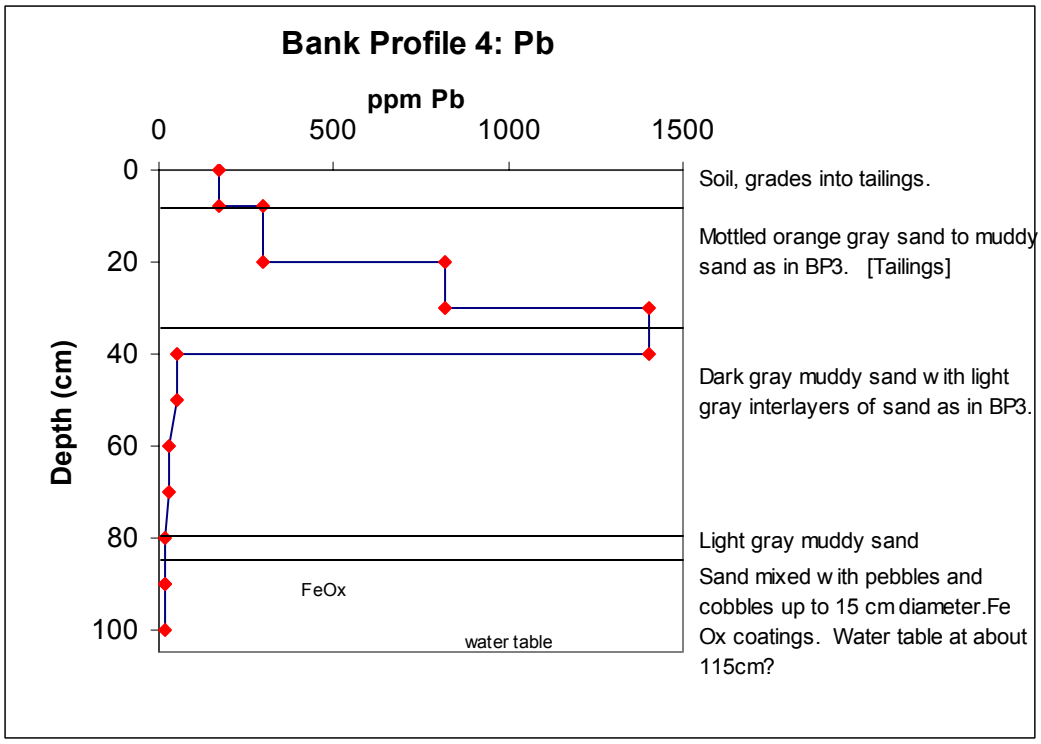

Bank Profile 3: Pb
ppm Pb
0
500
1000
1500
2000
Depth (cm)
0
20
40
60
80
100
120
FeOx and Mn Ox
Green coatings
FeOx and Mn Ox
water table
Fine silty soil. Many fine roots. Inverse graded orange and gray mottled sand to muddy sand. Full of leaves and stickes especially near base. [Tailings]
Dark gray sandy mud. Interlayered muddy sand and sand.
Interbedded sand and muddy sand. Similar to above. Basal 10-15 cm has FeOx and MnOx staining.
Gravely very coarse sand w ith pebbles up to 3 cm diameter. Reverse graded. Upper 10 cm has bright green coatings (malachite?)
Pebbly to cobbly sand w ith cobbles 4-10 cm diameter. Upper 5 cm cemented w i FeOx and Mn Ox. Beneath that is w ater table.

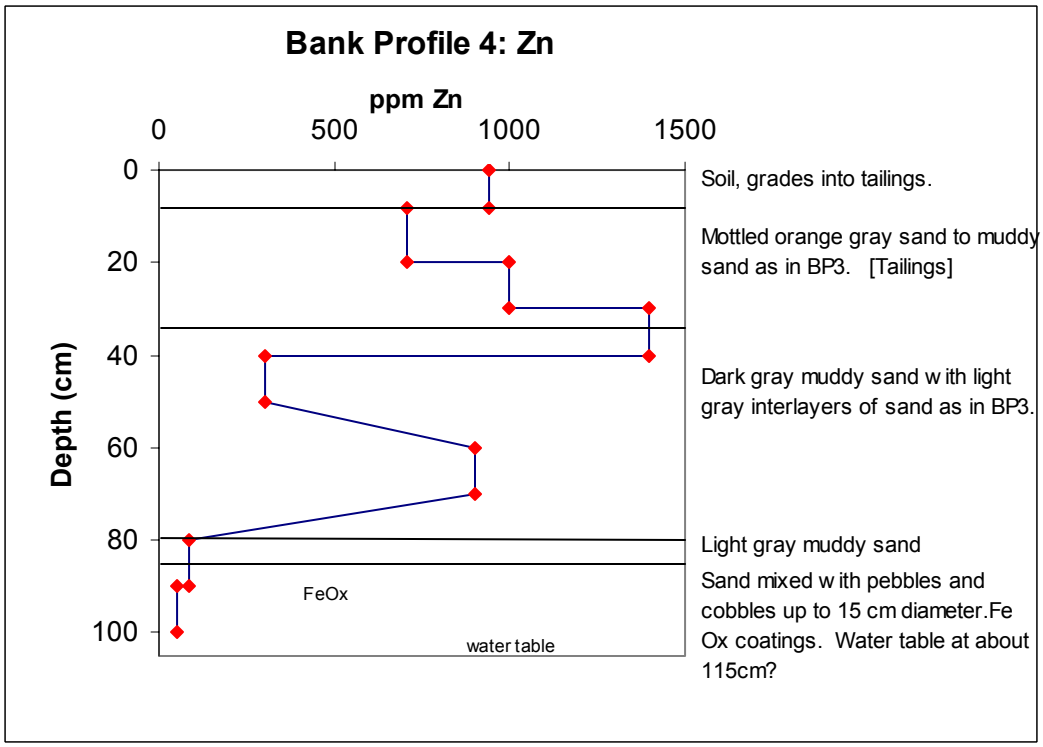

Bank Profile 3: Zn
ppm Zn
0
1000
2000
3000
4000
5000
Depth (cm)
0
20
40
60
80
100
120
FeOx and Mn Ox
Green coatings
FeOx and Mn Ox
water table
Fine silty soil. Many fine roots.
Inverse graded orange and gray mottled sand to muddy sand. Full of leaves and stickes especially near base. [Tailings]
Dark gray sandy mud. Interlayered muddy sand and sand.
Interbedded sand and muddy sand. Similar to above. Basal 10-15 cm has FeOx and MnOx staining.
Gravely very coarse sand w ith pebbles up to 3 cm diameter. Reverse graded. Upper 10 cm has bright green coatings (malachite?)
Pebbly to cobbly sand w ith cobbles 4-10 cm diameter. Upper 5 cm cemented w i FeOx and Mn Ox. Beneath that is w ater table.

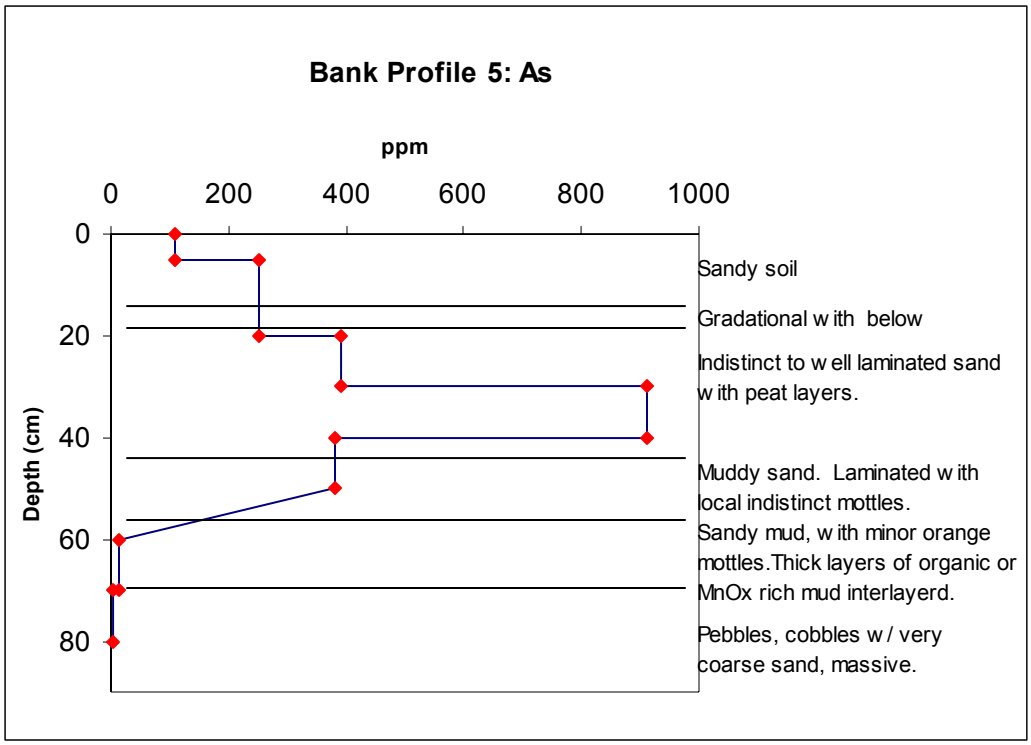

Bank Profile 4: As
ppm As
0
200
400
600
800
1000
Depth (cm)
0
20
40
60
80
100
FeOx
water table
Soil, grades into tailings.
Mottled orange gray sand to muddy sand as in BP3. [Tailings]
Dark gray muddy sand w ith light gray interlayers of sand as in BP3.
Light gray muddy sand
Sand mixed w ith pebbles and cobbles up to 15 cm diameter.Fe Ox coatings. Water table at about 115cm?

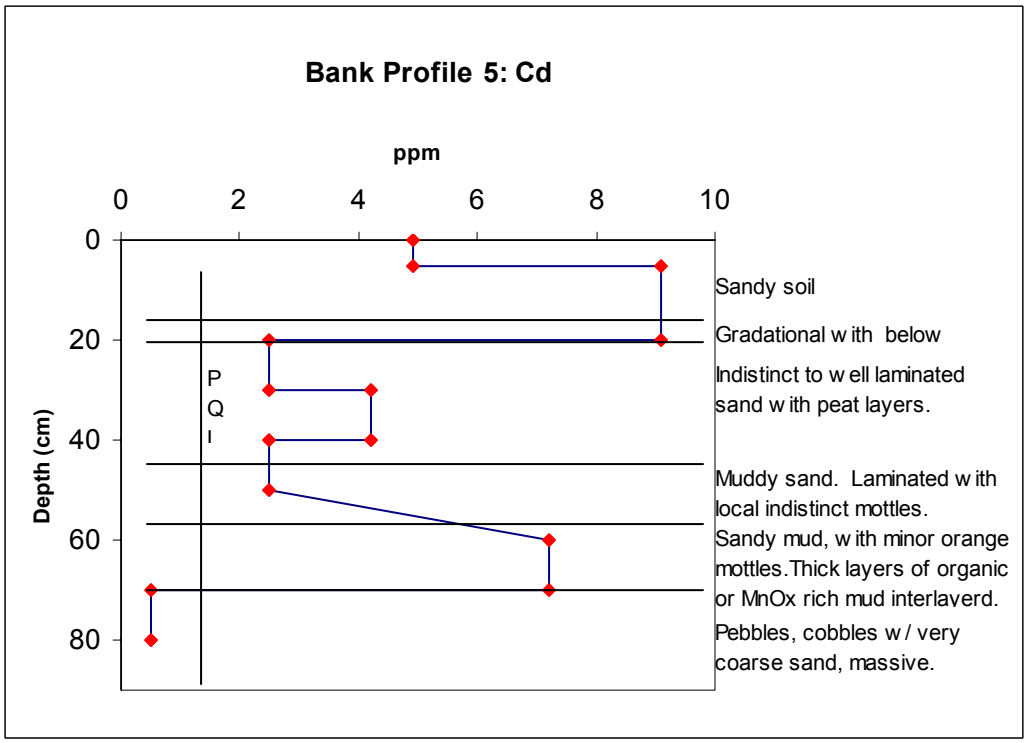

Bank Profile 4: Cd
ppm Cd
0
1
2
3
4
0
20
40
60
80
100
Depth (cm)
P
Q
L
FeOx
water table
Soil, grades into tailings.
Mottled orange gray sand to mudd
sand as in BP3. [Tailings]
Dark gray muddy sand with light
gray interlayers of sand as in BP3
Light gray muddy sand
Sand mixed with pebbles and
cobbles up to 15 cm diameter.Fe
Ox coatings. Water table at about
115cm?

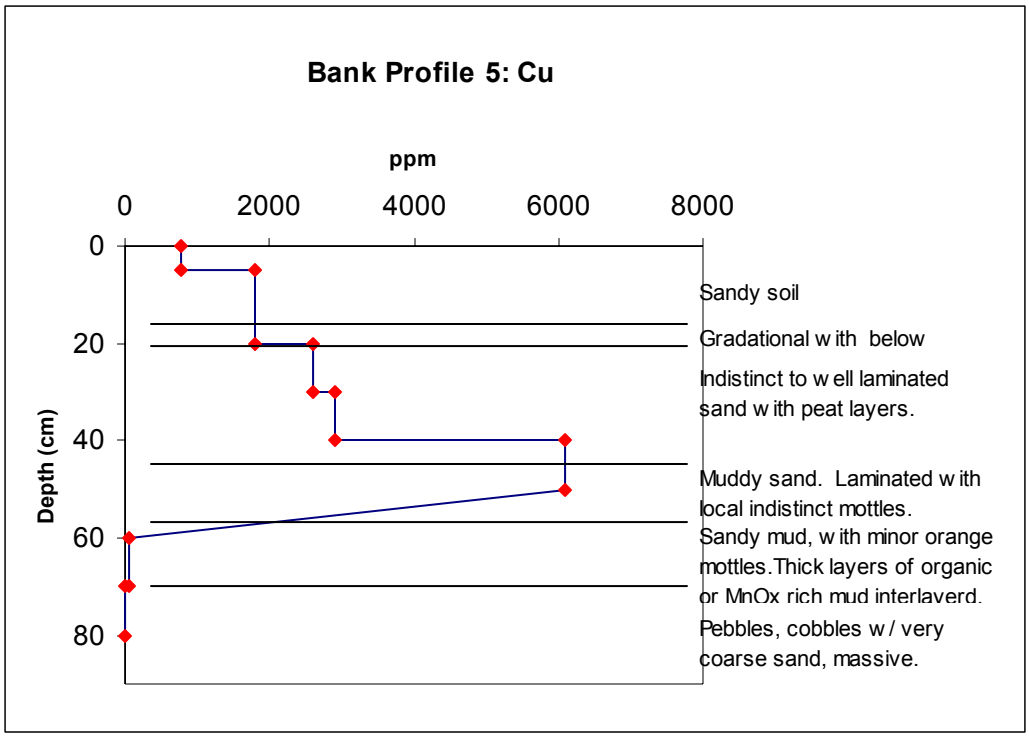

Bank Profile 4: Cu
ppm Cu
0
1000
2000
3000
4000
5000
0
20
40
60
80
100
Depth (cm)
FeOx
water table
Soil, grades into tailings.
Mottled orange gray sand to muddy
sand as in BP3. [Tailings]
Dark gray muddy sand with light
gray interlayers of sand as in BP3.
Light gray muddy sand
Sand mixed with pebbles and
cobbles up to 15 cm diameter.Fe
Ox coatings. Water table at about
115cm?

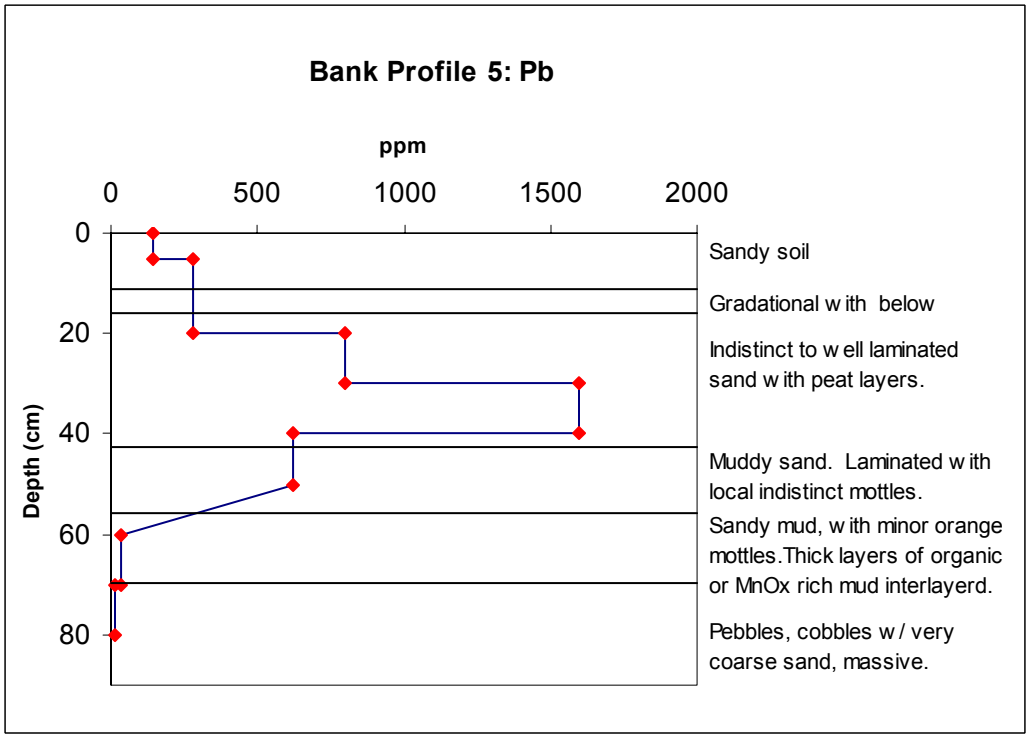

Bank Profile 4: Pb
ppm Pb
0
500
1000
1500
Depth (cm)
0
20
40
60
80
100
FeOx
water table
Soil, grades into tailings.
Mottled orange gray sand to muddy sand as in BP3. [Tailings]
Dark gray muddy sand with light gray interlayers of sand as in BP3.
Light gray muddy sand
Sand mixed with pebbles and cobbles up to 15 cm diameter.Fe Ox coatings. Water table at about 115cm?

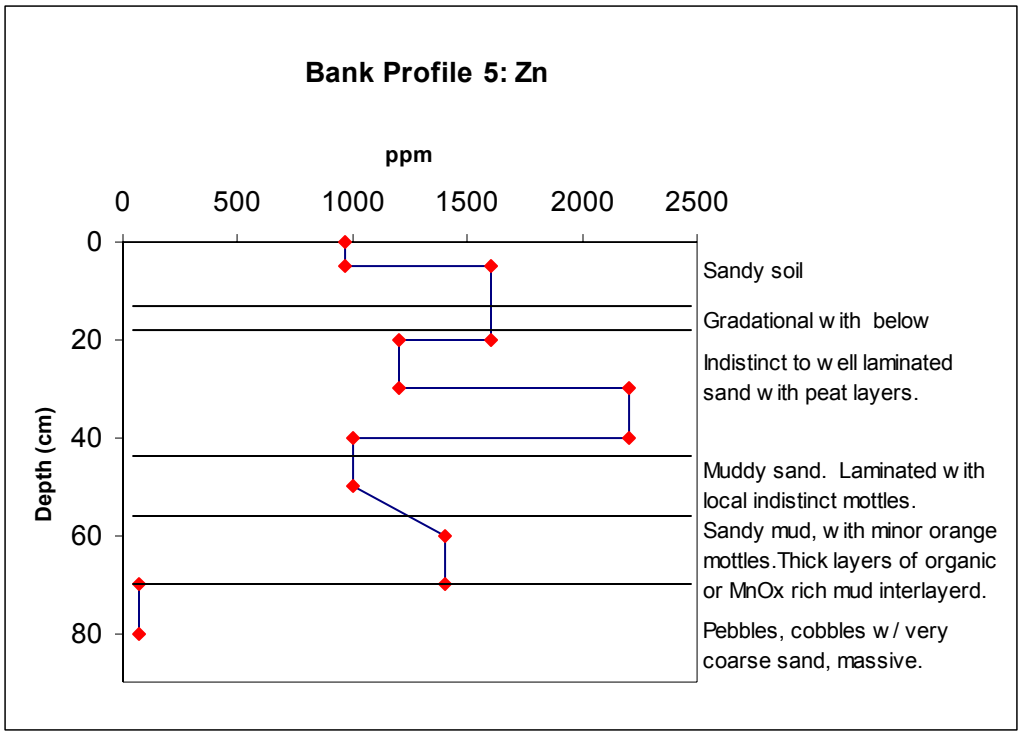

Bank Profile 4: Zn
ppm Zn
0
500
1000
1500
Depth (cm)
0
20
40
60
80
100
FeOx
water table
Soil, grades into tailings.
Mottled orange gray sand to muddy sand as in BP3. [Tailings]
Dark gray muddy sand with light gray interlayers of sand as in BP3.
Light gray muddy sand
Sand mixed with pebbles and cobbles up to 15 cm diameter.Fe Ox coatings. Water table at about 115cm?

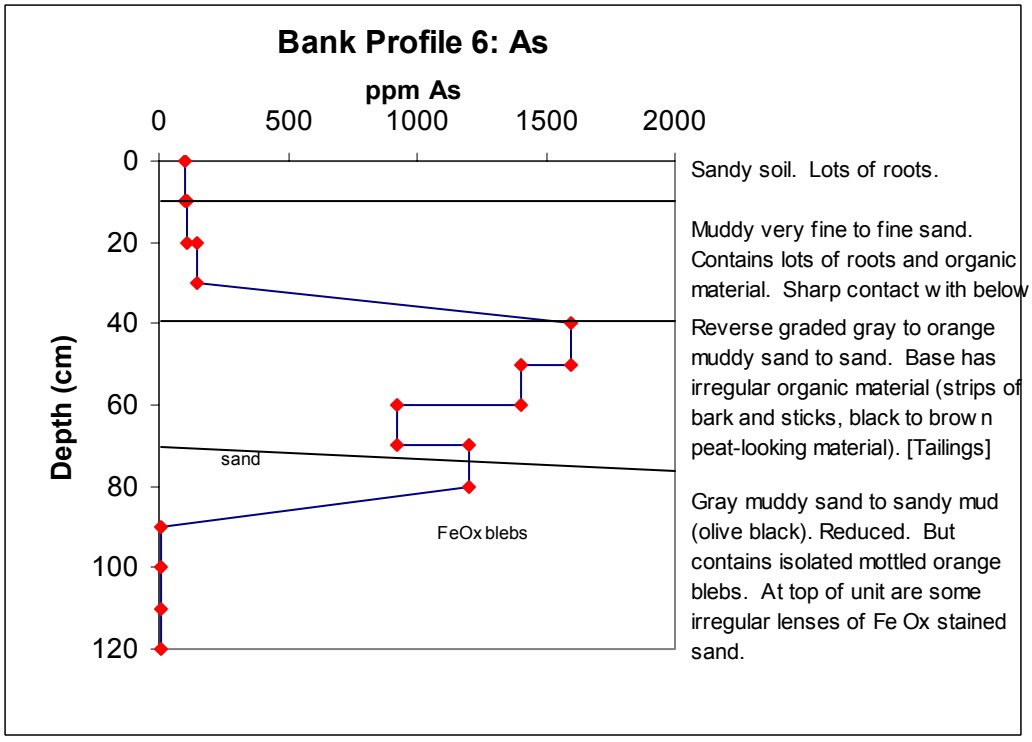

Bank Profile 5: As
ppm
0
200
400
600
800
1000
0
20
40
60
80
Depth (cm)
Sandy soil
Gradational w ith below
Indistinct to w ell laminated sand w ith peat layers.
Muddy sand. Laminated w ith local indistinct mottles.
Sandy mud, w ith minor orange mottles.Thick layers of organic or MnOx rich mud interlayerd.
Pebbles, cobbles w / very coarse sand, massive.

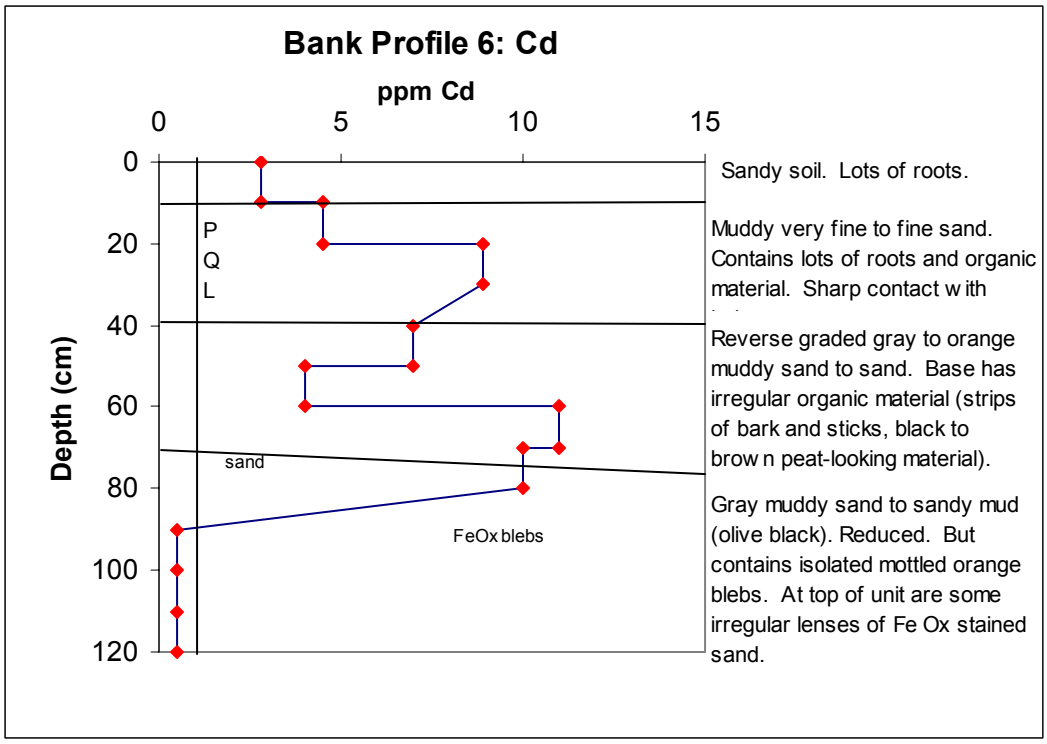

Bank Profile 5: Cd
ppm
0
2
4
6
8
10
0
20
40
60
80
Depth (cm)
P
Q
I
Sandy soil
Gradational w ith below
Indistinct to w ell laminated sand w ith peat layers.
Muddy sand. Laminated w ith local indistinct mottles.
Sandy mud, w ith minor orange mottles.Thick layers of organic or MnOx rich mud interlaverd.
Pebbles, cobbles w / very coarse sand, massive.

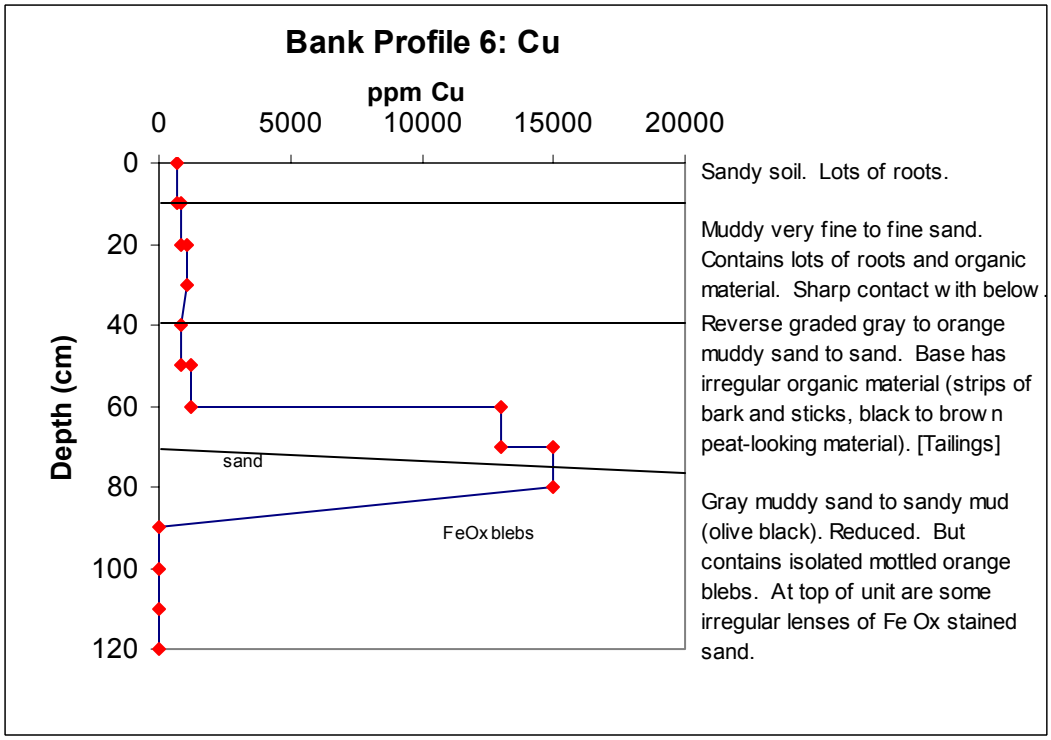

Bank Profile 5: Cu
ppm
0
2000
4000
6000
8000
0
20
40
60
80
Depth (cm)
Sandy soil
Gradational w ith below
Indistinct to w ell laminated sand w ith peat layers.
Muddy sand. Laminated w ith local indistinct mottles.
Sandy mud, w ith minor orange mottles.Thick layers of organic or MnOx rich mud interlaverd.
Pebbles, cobbles w / very coarse sand, massive.

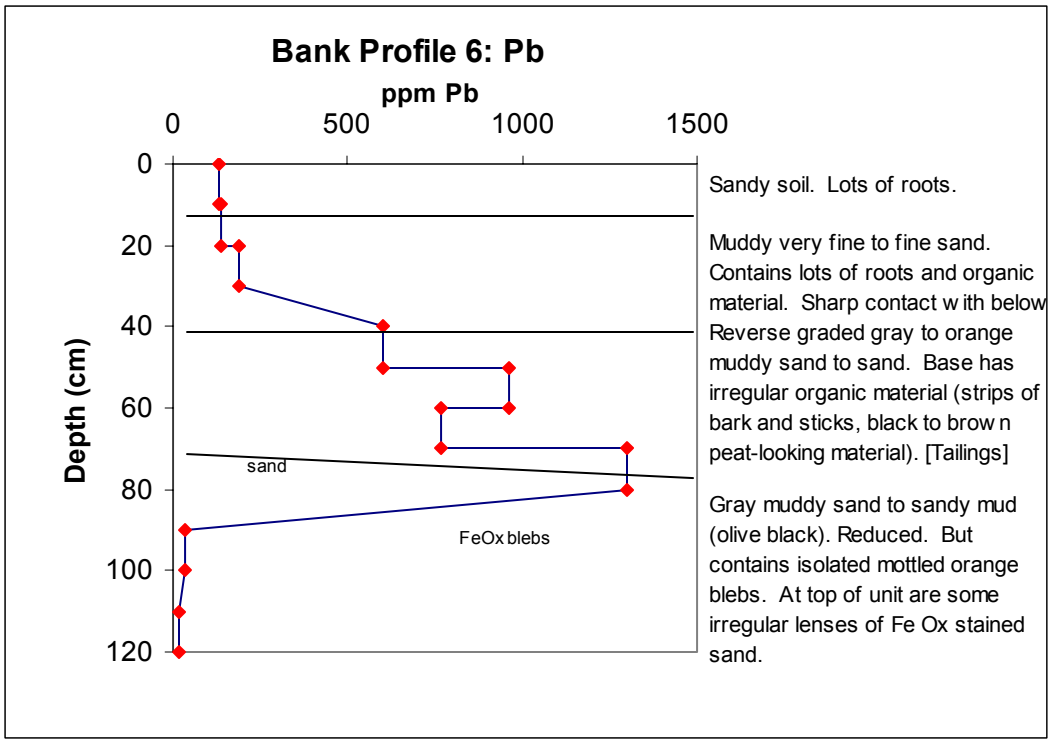

Bank Profile 5: Pb
ppm
0
500
1000
1500
2000
0
20
40
60
80
Depth (cm)
Sandy soil
Gradational w ith below
Indistinct to w ell laminated sand w ith peat layers.
Muddy sand. Laminated w ith local indistinct mottles.
Sandy mud, w ith minor orange mottles.Thick layers of organic or MnOx rich mud interlayerd.
Pebbles, cobbles w / very coarse sand, massive.

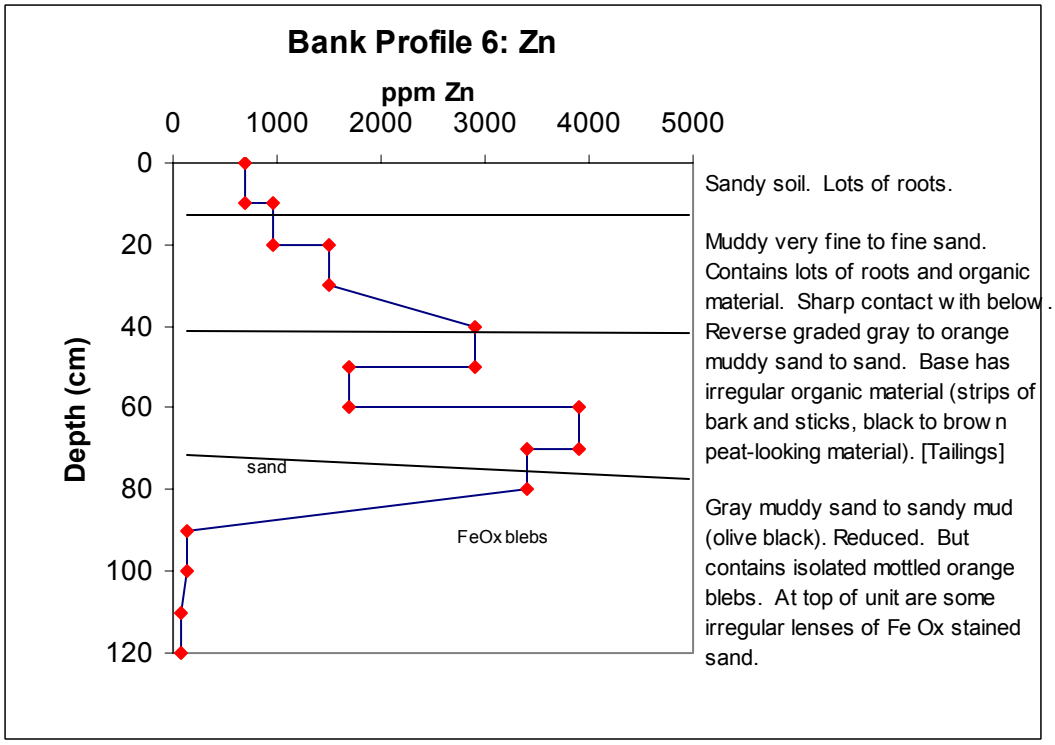

Bank Profile 5: Zn
ppm
0
500
1000
1500
2000
2500
Depth (cm)
0
20
40
60
80
Sandy soil
Gradational w ith below
Indistinct to w ell laminated sand w ith peat layers.
Muddy sand. Laminated w ith local indistinct mottles.
Sandy mud, w ith minor orange mottles.Thick layers of organic or MnOx rich mud interlayerd.
Pebbles, cobbles w / very coarse sand, massive.

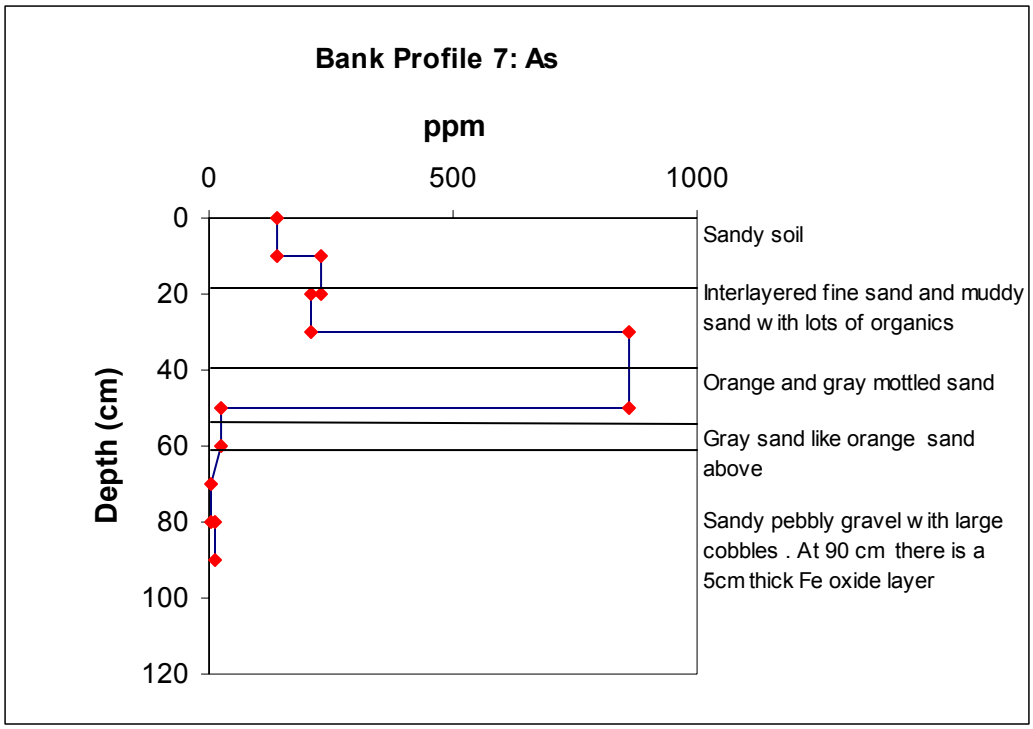

Bank Profile 6: As
ppm As
0
500
1000
1500
2000
Depth (cm)
0
20
40
60
80
100
120
sand
FeOx blebs
Sandy soil. Lots of roots.
Muddy very fine to fine sand. Contains lots of roots and organic material. Sharp contact w ith below
Reverse graded gray to orange muddy sand to sand. Base has irregular organic material (strips of bark and sticks, black to brow n peat-looking material). [Tailings]
Gray muddy sand to sandy mud (olive black). Reduced. But contains isolated mottled orange blebs. At top of unit are some irregular lenses of Fe Ox stained sand.

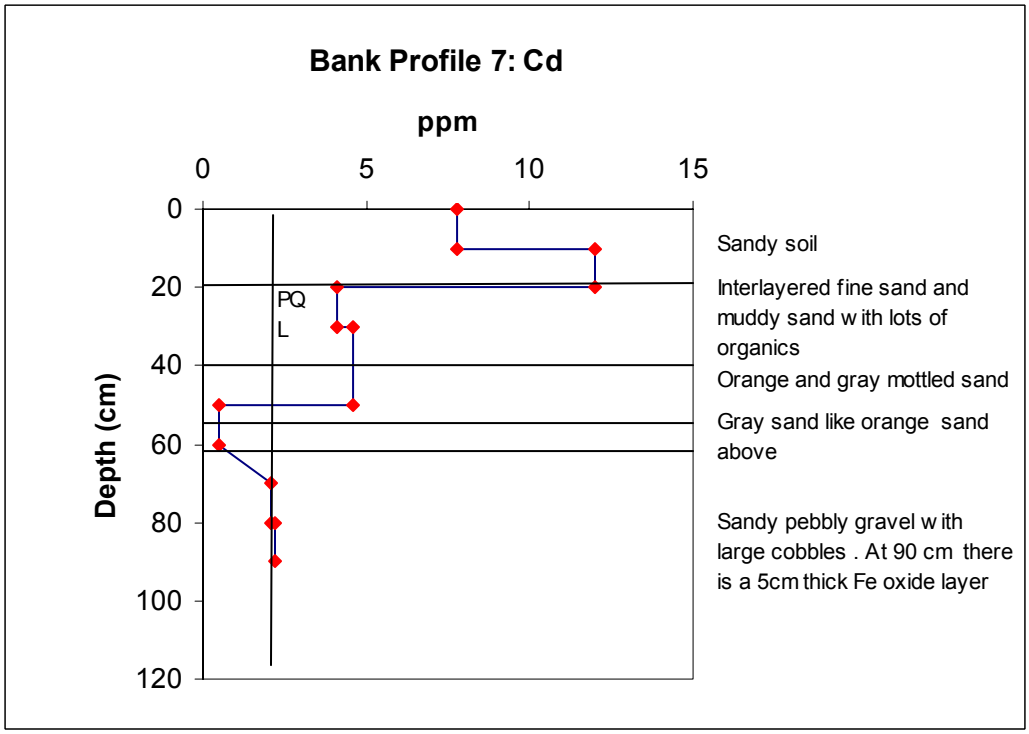

Bank Profile 6: Cd
ppm Cd
0
5
10
15
Depth (cm)
0
20
40
60
80
100
120
P
Q
L
sand
FeOx blebs
Sandy soil. Lots of roots.
Muddy very fine to fine sand. Contains lots of roots and organic material. Sharp contact w ith
Reverse graded gray to orange muddy sand to sand. Base has irregular organic material (strips of bark and sticks, black to brow n peat-looking material).
Gray muddy sand to sandy mud (olive black). Reduced. But contains isolated mottled orange blebs. At top of unit are some irregular lenses of Fe Ox stained sand.

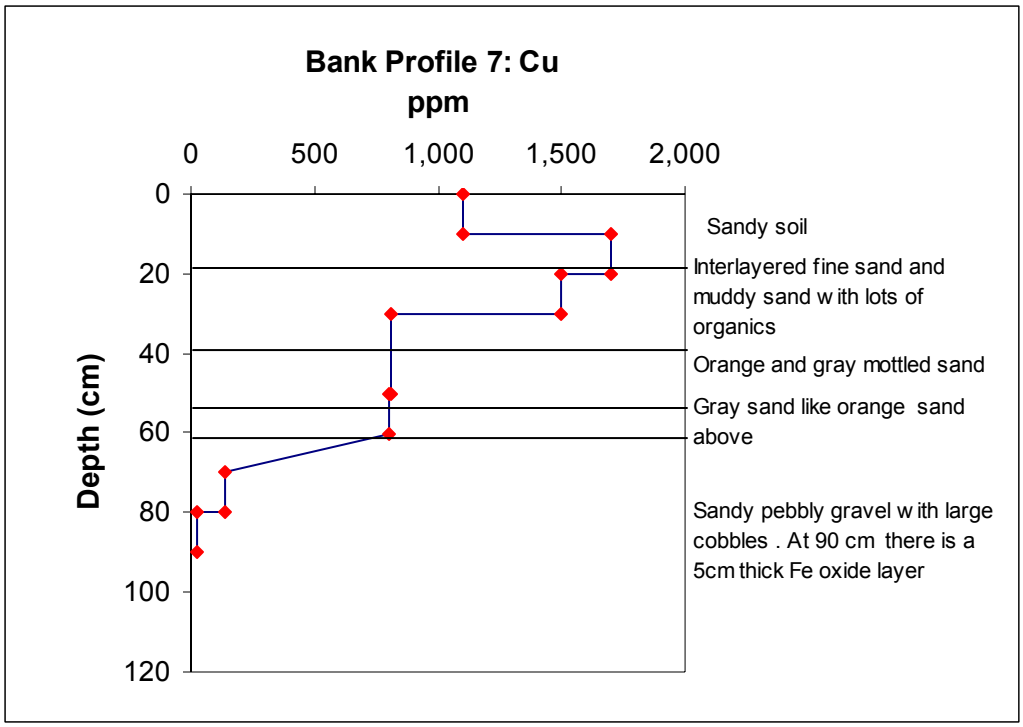

Bank Profile 6: Cu
ppm Cu
0
5000
10000
15000
20000
Depth (cm)
0
20
40
60
80
100
120
sand
FeOx blebs
Sandy soil. Lots of roots.
Muddy very fine to fine sand. Contains lots of roots and organic material. Sharp contact w ith below
Reverse graded gray to orange muddy sand to sand. Base has irregular organic material (strips of bark and sticks, black to brow n peat-looking material). [Tailings]
Gray muddy sand to sandy mud (olive black). Reduced. But contains isolated mottled orange blebs. At top of unit are some irregular lenses of Fe Ox stained sand.

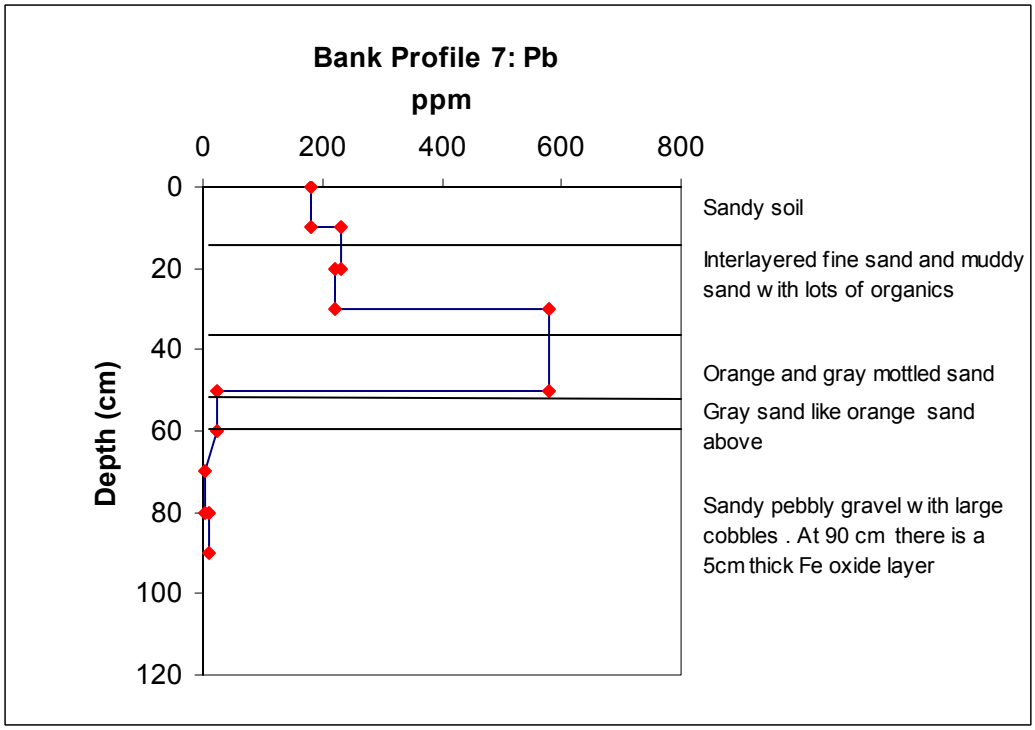

Bank Profile 6: Pb
ppm Pb
0
500
1000
1500
0
20
40
60
80
100
120
Depth (cm)
sand
FeOx blebs
Sandy soil. Lots of roots.
Muddy very fine to fine sand. Contains lots of roots and organic material. Sharp contact w ith below. Reverse graded gray to orange muddy sand to sand. Base has irregular organic material (strips of bark and sticks, black to brow n peat-looking material). [Tailings]
Gray muddy sand to sandy mud (olive black). Reduced. But contains isolated mottled orange blebs. At top of unit are some irregular lenses of Fe Ox stained sand.

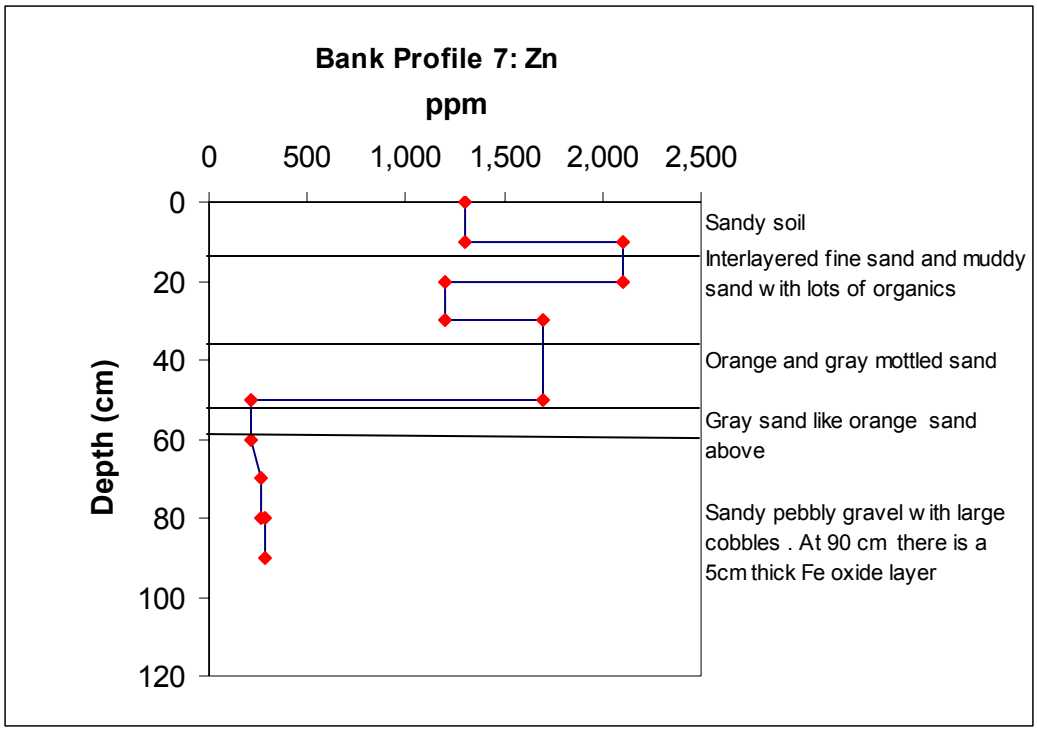

Bank Profile 6: Zn
ppm Zn
0
1000
2000
3000
4000
5000
0
20
40
60
80
100
120
Depth (cm)
sand
FeOx blebs
Sandy soil. Lots of roots.
Muddy very fine to fine sand. Contains lots of roots and organic material. Sharp contact w ith below. Reverse graded gray to orange muddy sand to sand. Base has irregular organic material (strips of bark and sticks, black to brow n peat-looking material). [Tailings]
Gray muddy sand to sandy mud (olive black). Reduced. But contains isolated mottled orange blebs. At top of unit are some irregular lenses of Fe Ox stained sand.

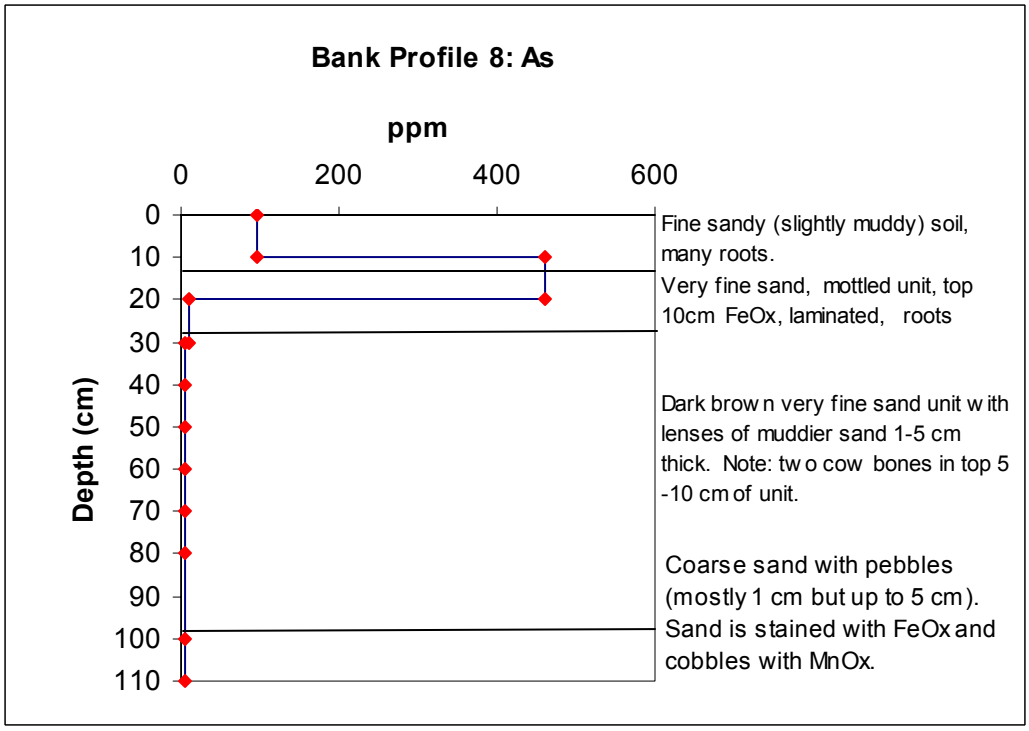

Bank Profile 7: As
ppm
0
500
1000
0
20
40
60
80
100
120
Depth (cm)
Sandy soil
Interlayered fine sand and muddy sand w ith lots of organics
Orange and gray mottled sand
Gray sand like orange sand above
Sandy pebbly gravel w ith large cobbles . At 90 cm there is a 5cm thick Fe oxide layer

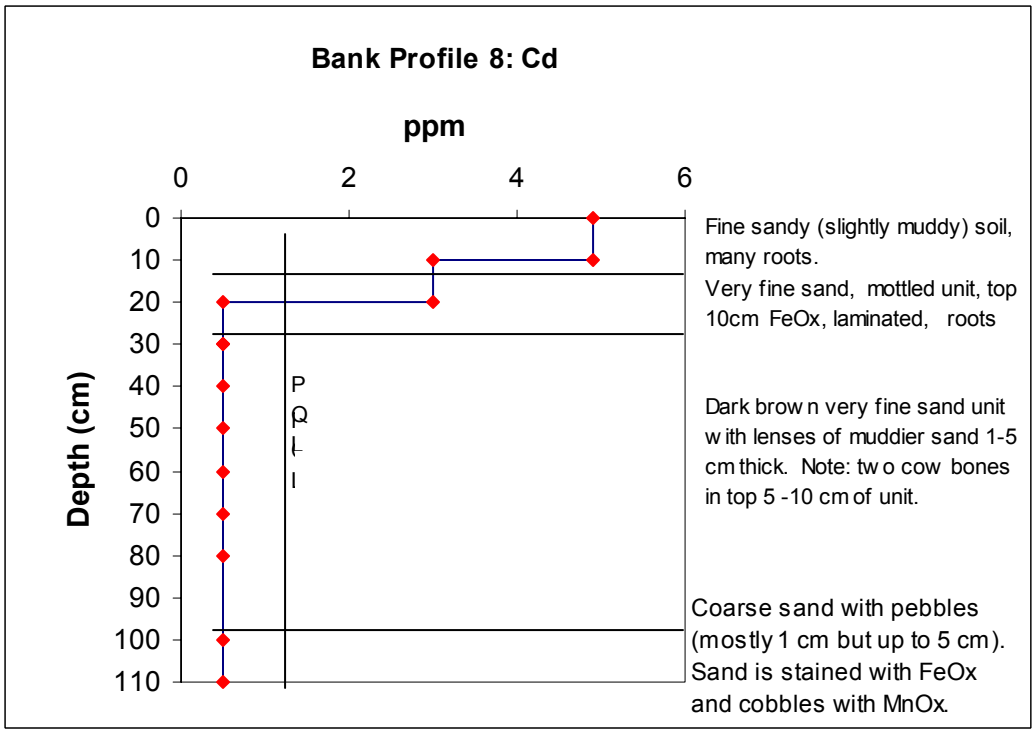

Bank Profile 7: Cd
ppm
0
5
10
15
0
20
40
60
80
100
120
Depth (cm)
PQ
L
Sandy soil
Interlayered fine sand and muddy sand w ith lots of organics
Orange and gray mottled sand
Gray sand like orange sand above
Sandy pebbly gravel w ith large cobbles . At 90 cm there is a 5cm thick Fe oxide layer

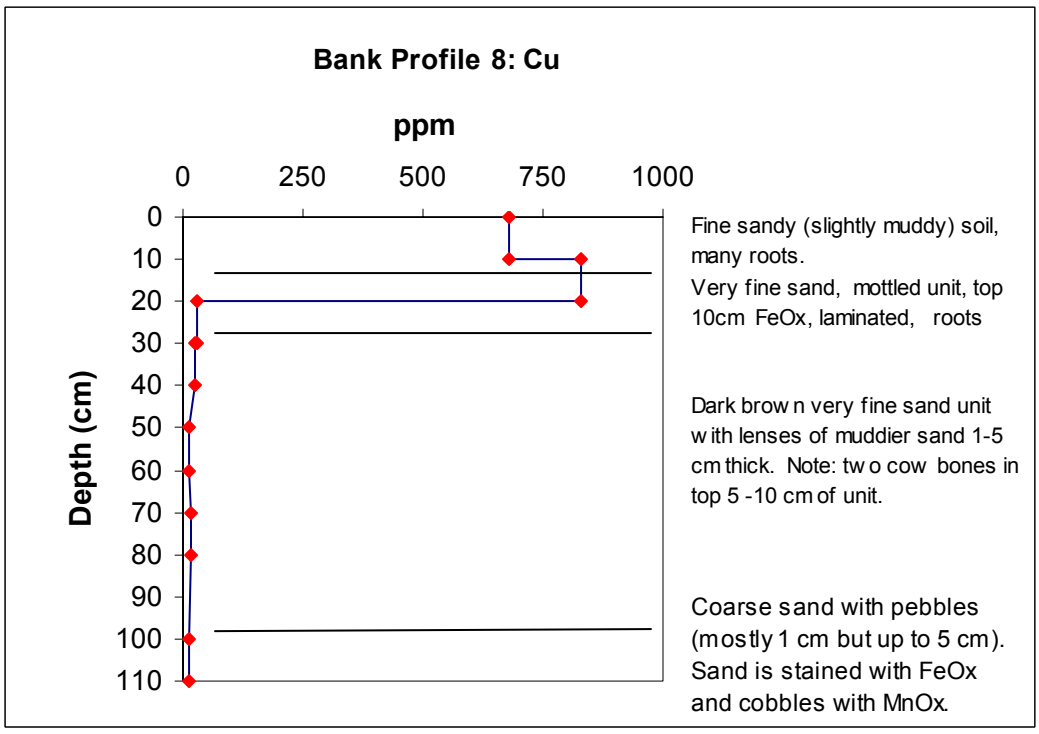

Bank Profile 7: Cu
ppm
0
500
1,000
1,500
2,000
0
20
40
60
80
100
120
Depth (cm)
Sandy soil
Interlayered fine sand and muddy sand with lots of organics
Orange and gray mottled sand
Gray sand like orange sand above
Sandy pebbly gravel with large cobbles . At 90 cm there is a 5cm thick Fe oxide layer

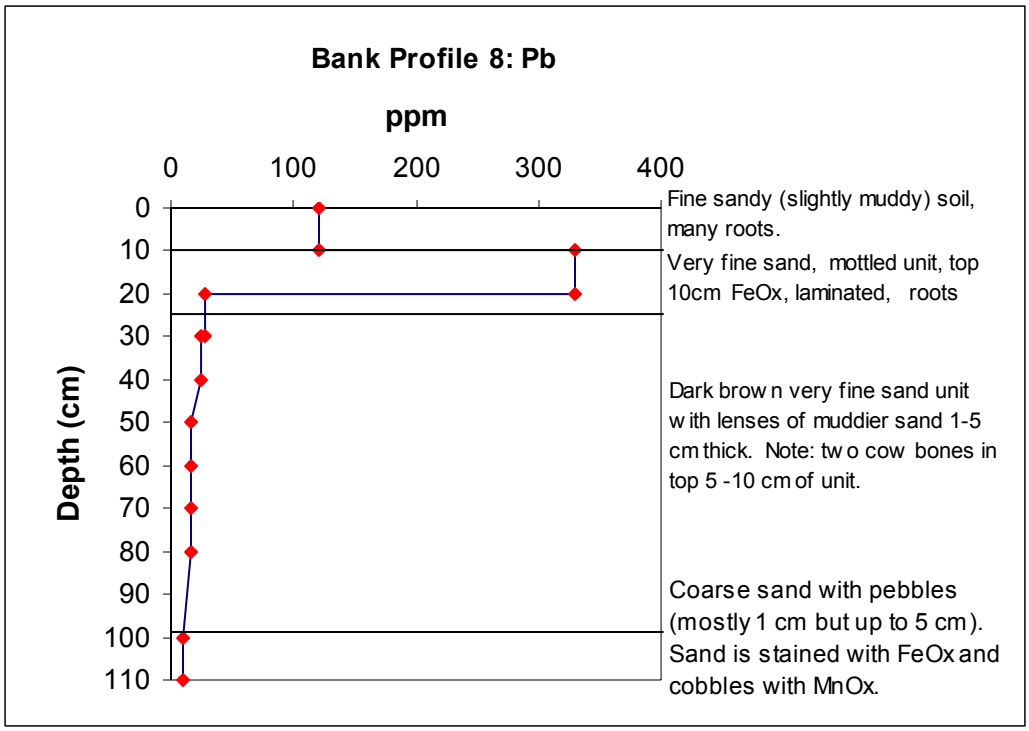

Bank Profile 7: Pb
ppm
0
200
400
600
800
0
20
40
60
80
100
120
Depth (cm)
Sandy soil
Interlayered fine sand and muddy sand with lots of organics
Orange and gray mottled sand
Gray sand like orange sand above
Sandy pebbly gravel with large cobbles . At 90 cm there is a 5cm thick Fe oxide layer

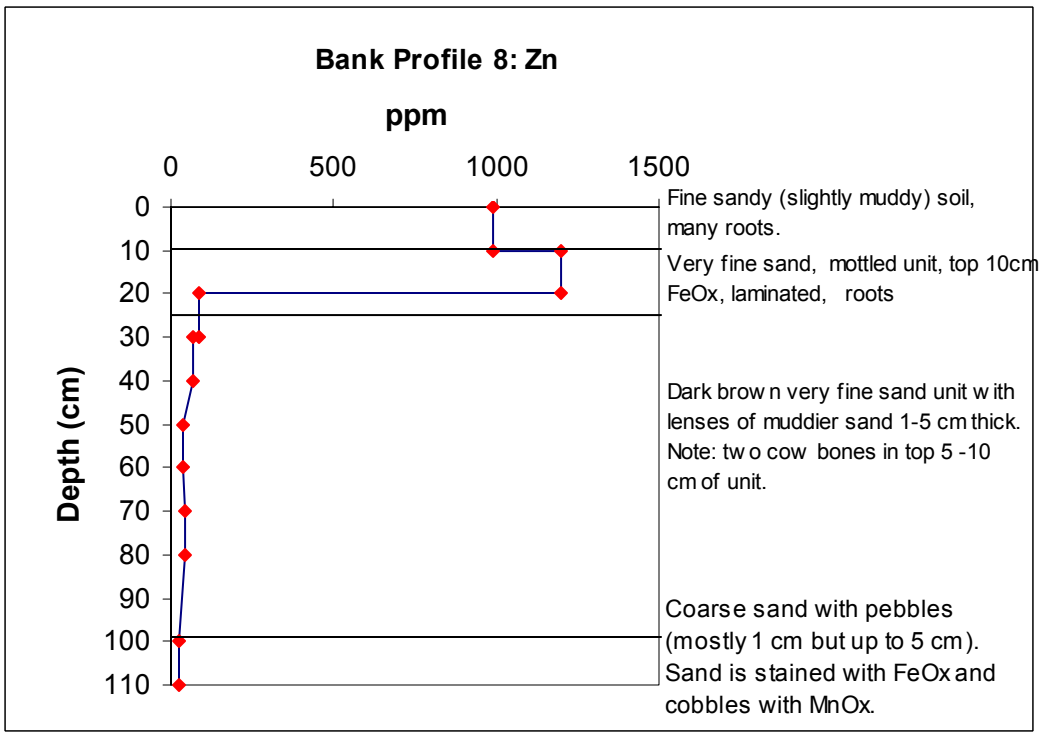

Bank Profile 7: Zn
ppm
0
500
1,000
1,500
2,000
2,500
Depth (cm)
0
20
40
60
80
100
120
Sandy soil
Interlayered fine sand and muddy sand with lots of organics
Orange and gray mottled sand
Gray sand like orange sand above
Sandy pebbly gravel with large cobbles . At 90 cm there is a 5cm thick Fe oxide layer

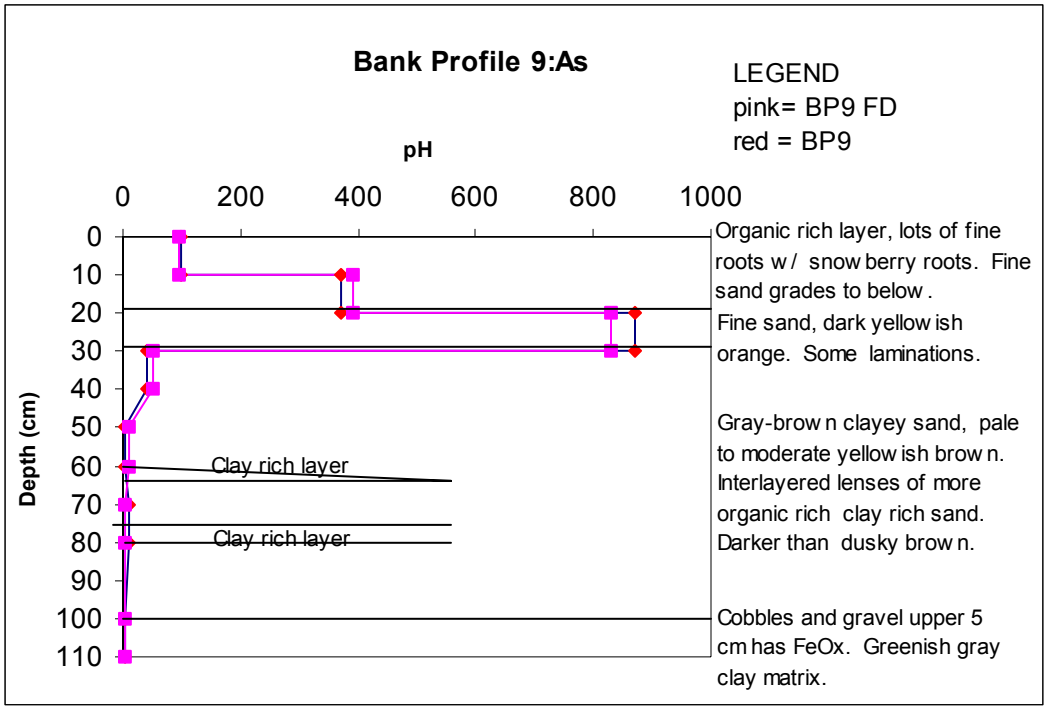

Bank Profile 8: As
ppm
0
200
400
600
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
Fine sandy (slightly muddy) soil, many roots.
Very fine sand, mottled unit, top 10cm FeOx, laminated, roots
Dark brown very fine sand unit with lenses of muddier sand 1-5 cm thick. Note: two cow bones in top 5 -10 cm of unit.
Coarse sand with pebbles (mostly 1 cm but up to 5 cm). Sand is stained with FeOx and cobbles with MnOx.

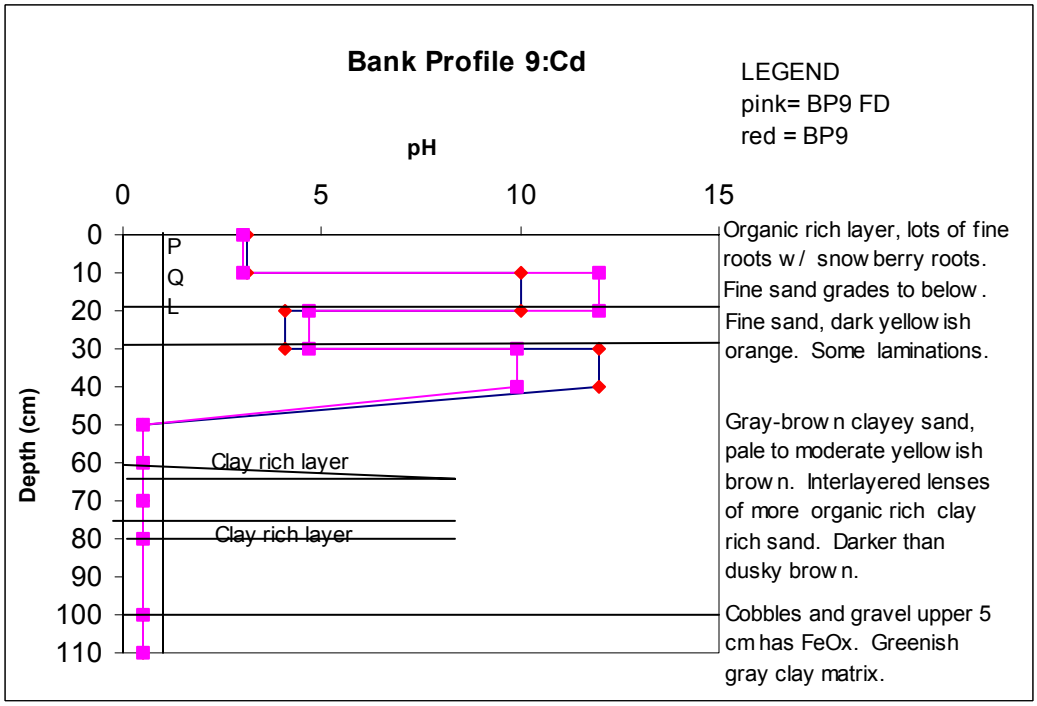

Bank Profile 8: Cd
ppm
0
2
4
6
0
10
20
30
40
50
60
70
80
90
100
110
Depth (cm)
PQL
Fine sandy (slightly muddy) soil, many roots.
Very fine sand, mottled unit, top 10cm FeOx, laminated, roots
Dark brown very fine sand unit with lenses of muddier sand 1-5 cm thick. Note: two cow bones in top 5 -10 cm of unit.
Coarse sand with pebbles (mostly 1 cm but up to 5 cm). Sand is stained with FeOx and cobbles with MnOx.

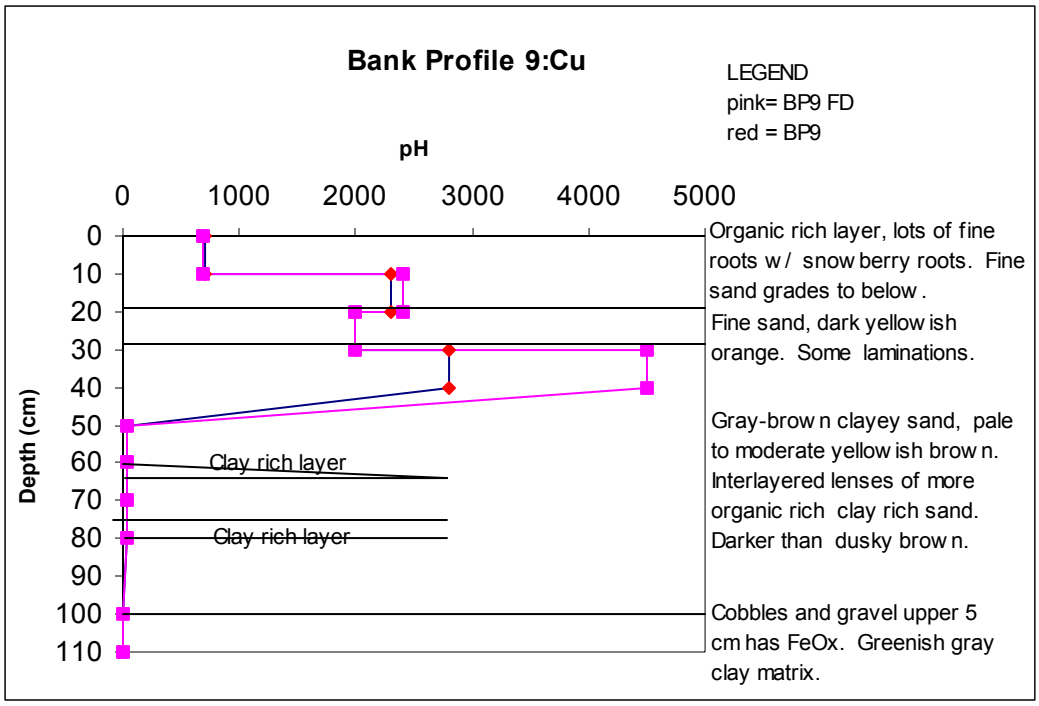

Bank Profile 8: Cu
ppm
0
250
500
750
1000
0
10
20
30
40
50
60
70
80
90
100
110
Depth (cm)
Fine sandy (slightly muddy) soil, many roots.
Very fine sand, mottled unit, top 10cm FeOx, laminated, roots
Dark brown very fine sand unit with lenses of muddier sand 1-5 cm thick. Note: two cow bones in top 5 -10 cm of unit.
Coarse sand with pebbles (mostly 1 cm but up to 5 cm). Sand is stained with FeOx and cobbles with MnOx.

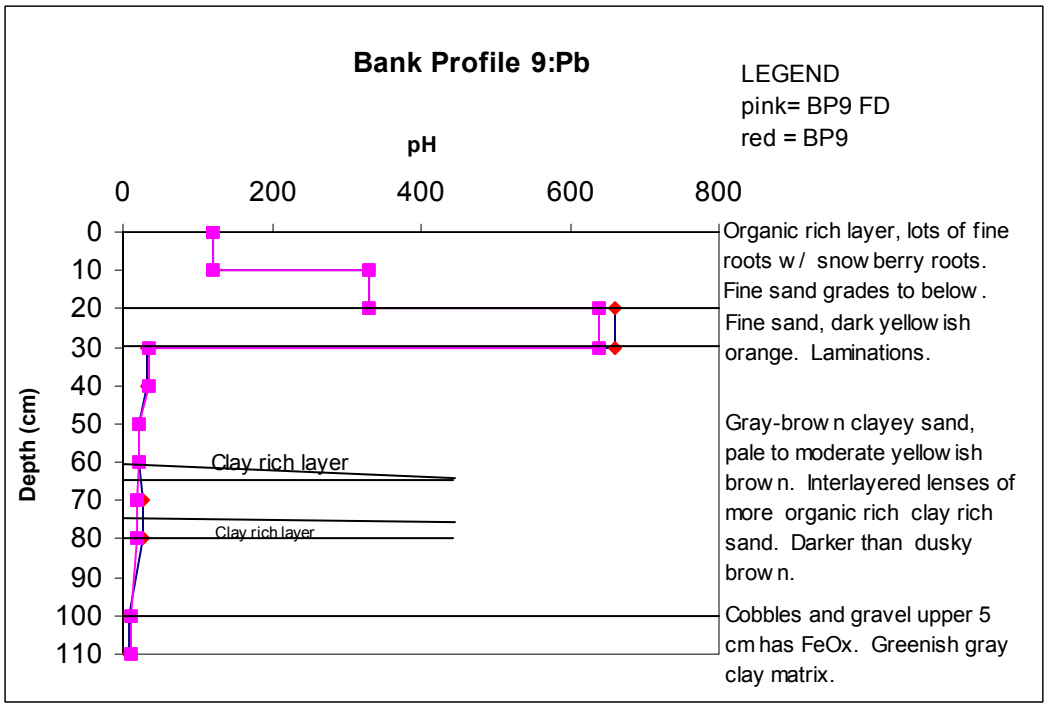

Bank Profile 8: Pb
ppm
0
100
200
300
400
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
Fine sandy (slightly muddy) soil, many roots.
Very fine sand, mottled unit, top 10cm FeOx, laminated, roots
Dark brown very fine sand unit with lenses of muddier sand 1-5 cm thick. Note: two cow bones in top 5 -10 cm of unit.
Coarse sand with pebbles (mostly 1 cm but up to 5 cm). Sand is stained with FeOx and cobbles with MnOx.

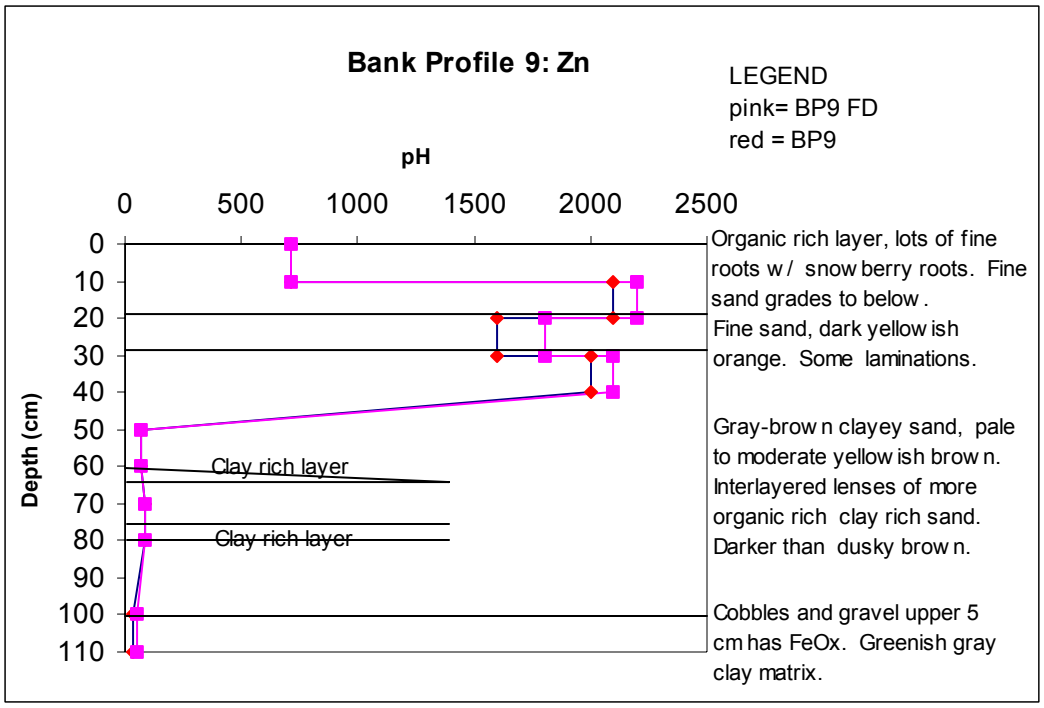

Bank Profile 8: Zn
ppm
0
500
1000
1500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
Fine sandy (slightly muddy) soil, many roots.
Very fine sand, mottled unit, top 10cm FeOx, laminated, roots
Dark brown very fine sand unit with lenses of muddier sand 1-5 cm thick. Note: two cow bones in top 5 -10 cm of unit.
Coarse sand with pebbles (mostly 1 cm but up to 5 cm). Sand is stained with FeOx and cobbles with MnOx.

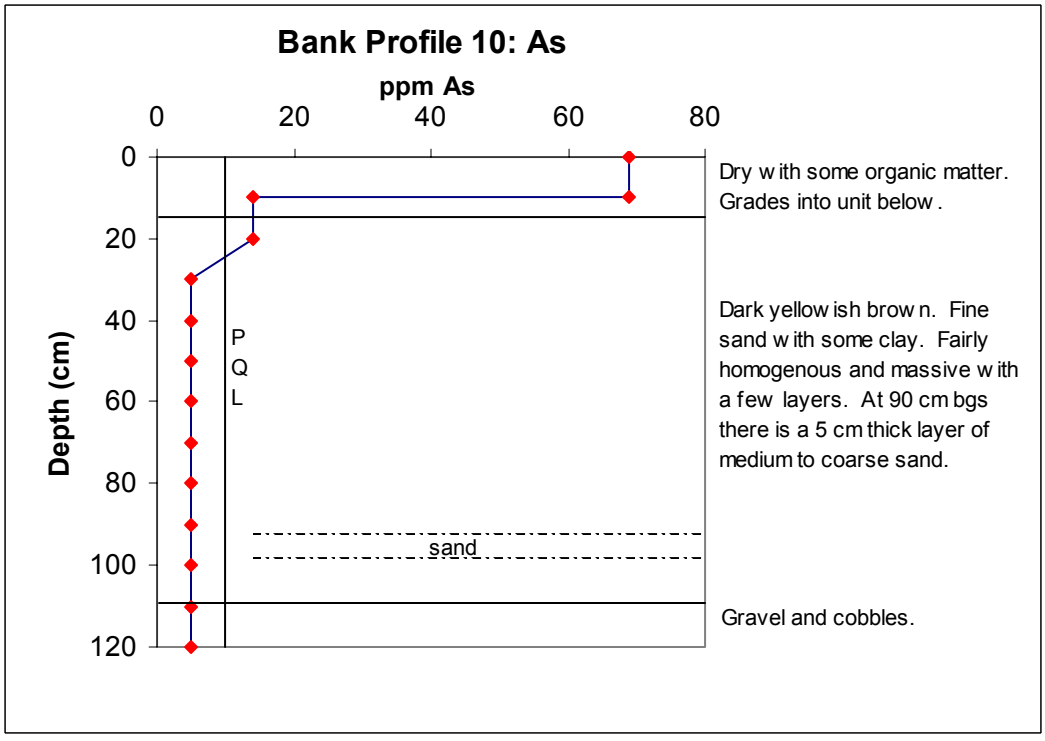

Bank Profile 9:As
LEGEND
pink= BP9 FD
red = BP9
pH
0
200
400
600
800
1000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
Clay rich layer
Clay rich layer
Organic rich layer, lots of fine roots w/ snow berry roots. Fine sand grades to below.
Fine sand, dark yellowish orange. Some laminations.
Gray-brown clayey sand, pale to moderate yellowish brown. Interlayered lenses of more organic rich clay rich sand. Darker than dusky brown.
Cobbles and gravel upper 5 cm has FeOx. Greenish gray clay matrix.

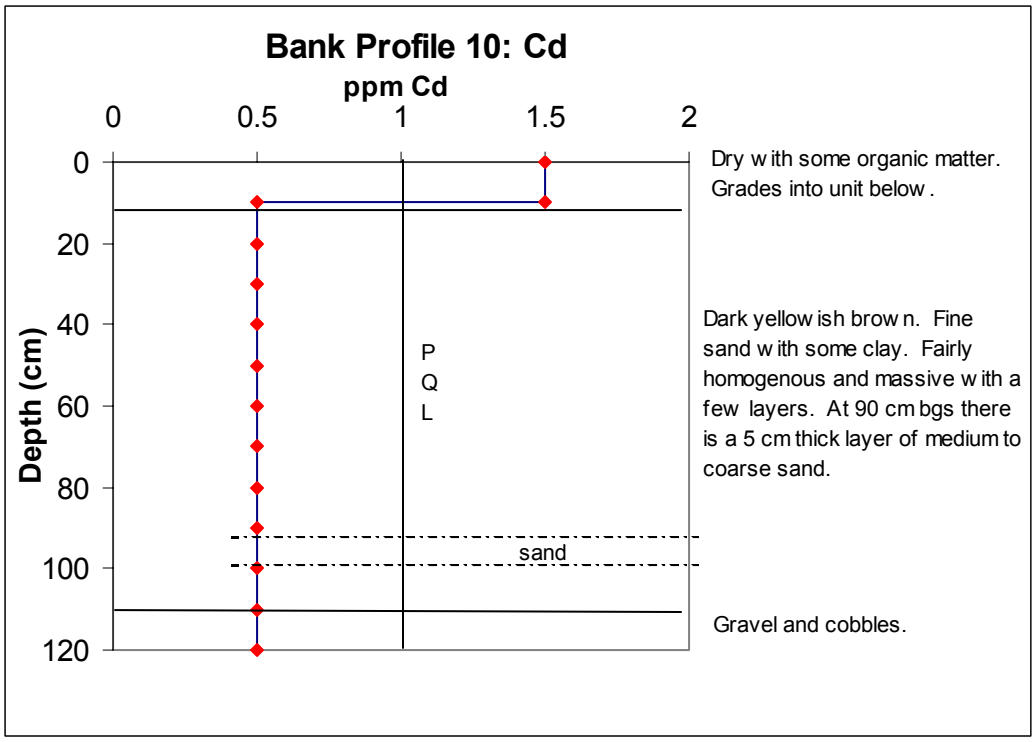

Bank Profile 9:Cd
LEGEND
pink= BP9 FD
red = BP9
pH
0
5
10
15
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
P
Q
L
Clay rich layer
Clay rich layer
Organic rich layer, lots of fine roots w/ snow berry roots. Fine sand grades to below.
Fine sand, dark yellowish orange. Some laminations.
Gray-brown clayey sand, pale to moderate yellowish brown. Interlayered lenses of more organic rich clay rich sand. Darker than dusky brown.
Cobbles and gravel upper 5 cm has FeOx. Greenish gray clay matrix.

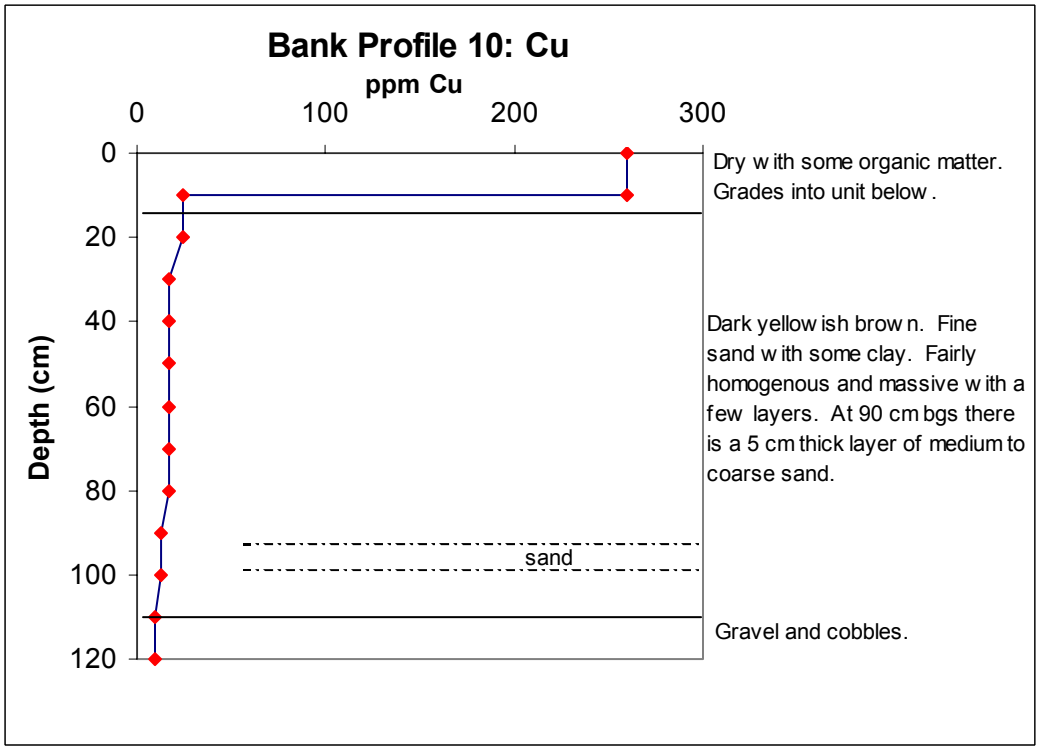

Bank Profile 9:Cu
LEGEND
pink= BP9 FD
red = BP9
pH
0
1000
2000
3000
4000
5000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
Clay rich layer
Clay rich layer
Organic rich layer, lots of fine roots w / snow berry roots. Fine sand grades to below .
Fine sand, dark yellow ish orange. Some laminations.
Gray-brow n clayey sand, pale to moderate yellow ish brow n. Interlayered lenses of more organic rich clay rich sand. Darker than dusky brow n.
Cobbles and gravel upper 5 cm has FeOx. Greenish gray clay matrix.

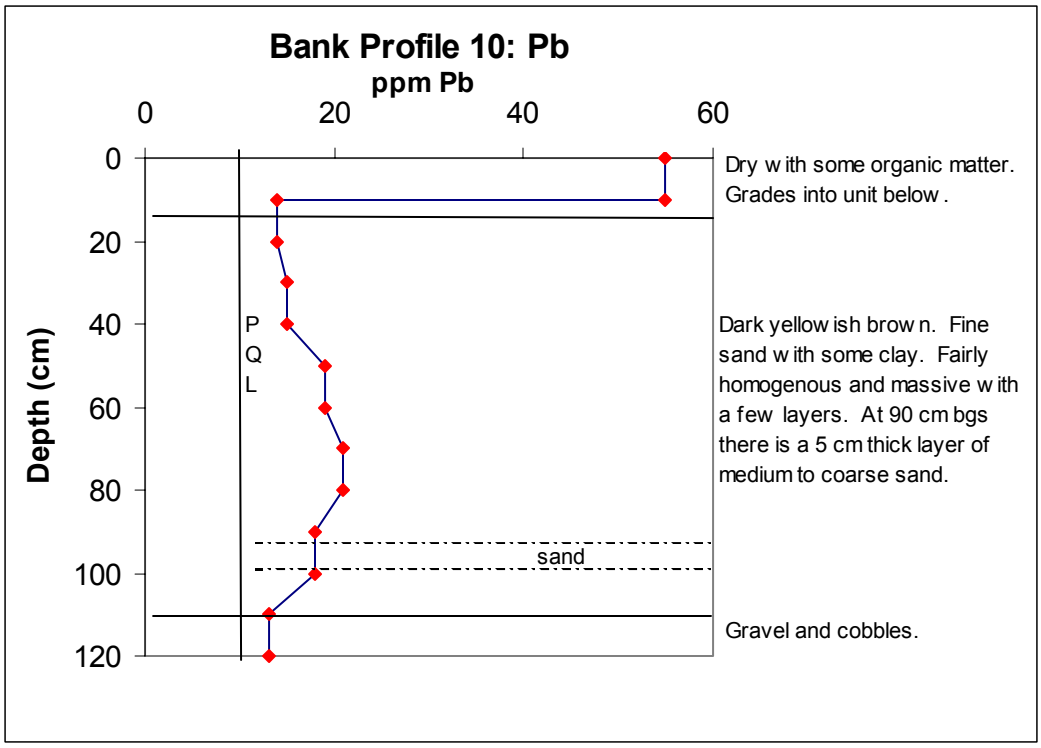

Bank Profile 9:Pb
LEGEND
pink= BP9 FD
red = BP9
pH
0
200
400
600
800
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
Clay rich layer
Clay rich layer
Organic rich layer, lots of fine roots w / snow berry roots. Fine sand grades to below .
Fine sand, dark yellow ish orange. Laminations.
Gray-brow n clayey sand, pale to moderate yellow ish brow n. Interlayered lenses of more organic rich clay rich sand. Darker than dusky brow n.
Cobbles and gravel upper 5 cm has FeOx. Greenish gray clay matrix.

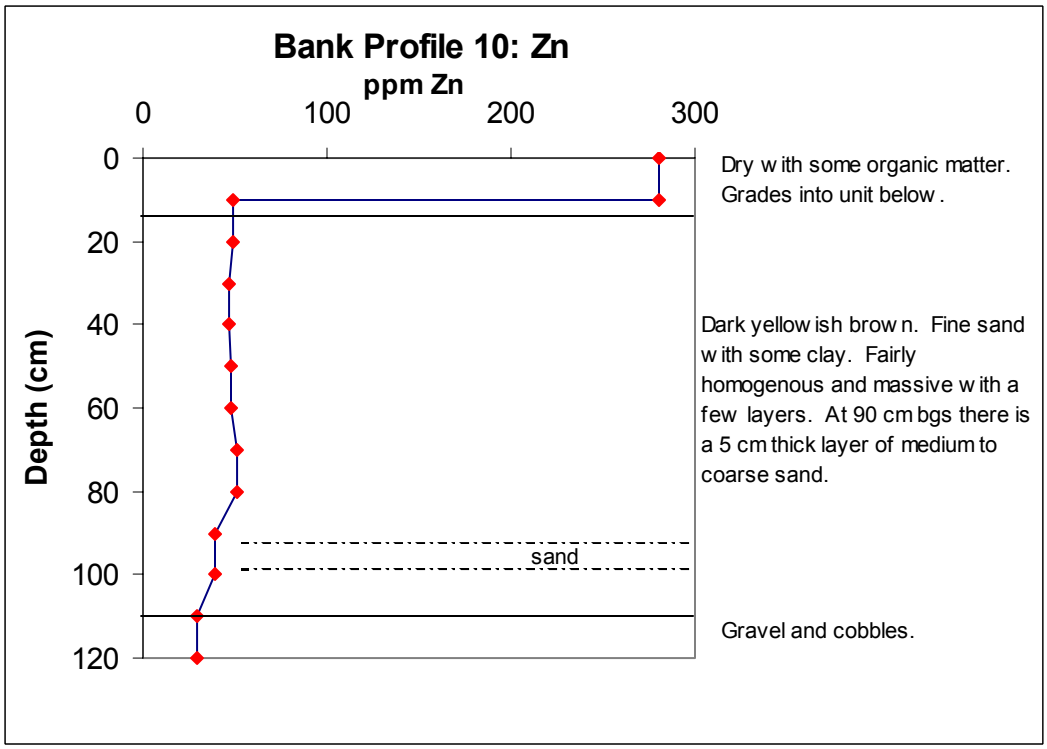

Bank Profile 9: Zn
LEGEND
pink= BP9 FD
red = BP9
pH
0
500
1000
1500
2000
2500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
Clay rich layer
Clay rich layer
Organic rich layer, lots of fine roots w / snow berry roots. Fine sand grades to below .
Fine sand, dark yellow ish orange. Some laminations.
Gray-brow n clayey sand, pale to moderate yellow ish brow n. Interlayered lenses of more organic rich clay rich sand. Darker than dusky brow n.
Cobbles and gravel upper 5 cm has FeOx. Greenish gray clay matrix.

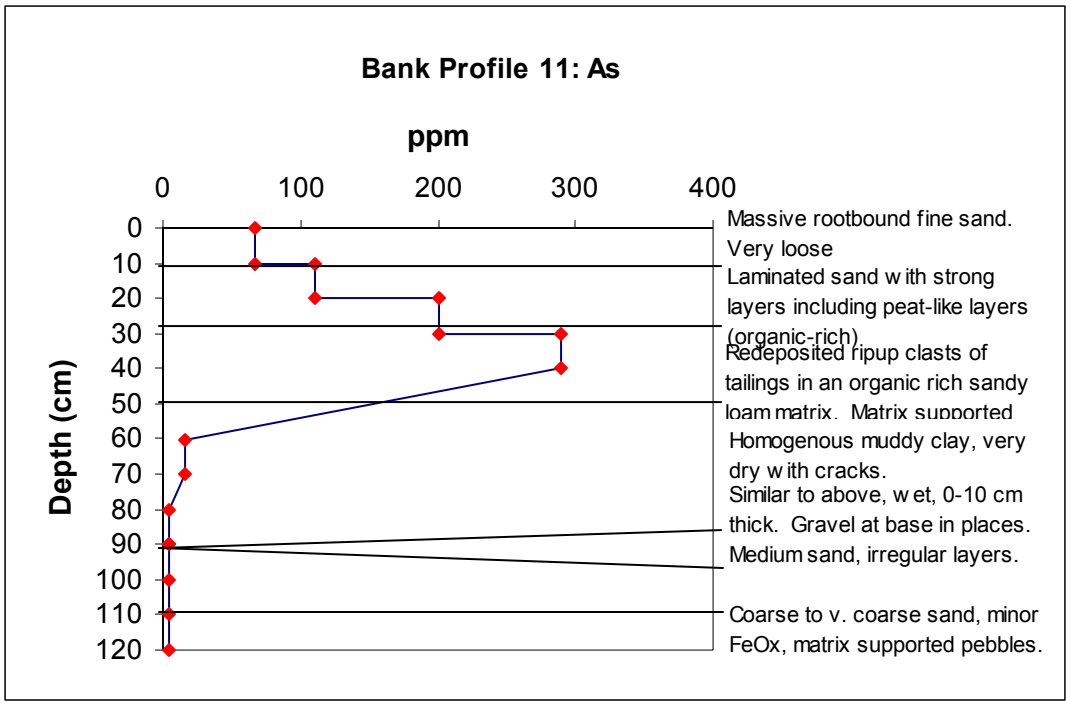

Bank Profile 10: As
ppm As
0
20
40
60
80
Depth (cm)
0
20
40
60
80
100
120
P
Q
L
sand
Dry w ith some organic matter. Grades into unit below .
Dark yellow ish brow n. Fine sand w ith some clay. Fairly homogenous and massive w ith a few layers. At 90 cm bgs there is a 5 cm thick layer of medium to coarse sand.
Gravel and cobbles.

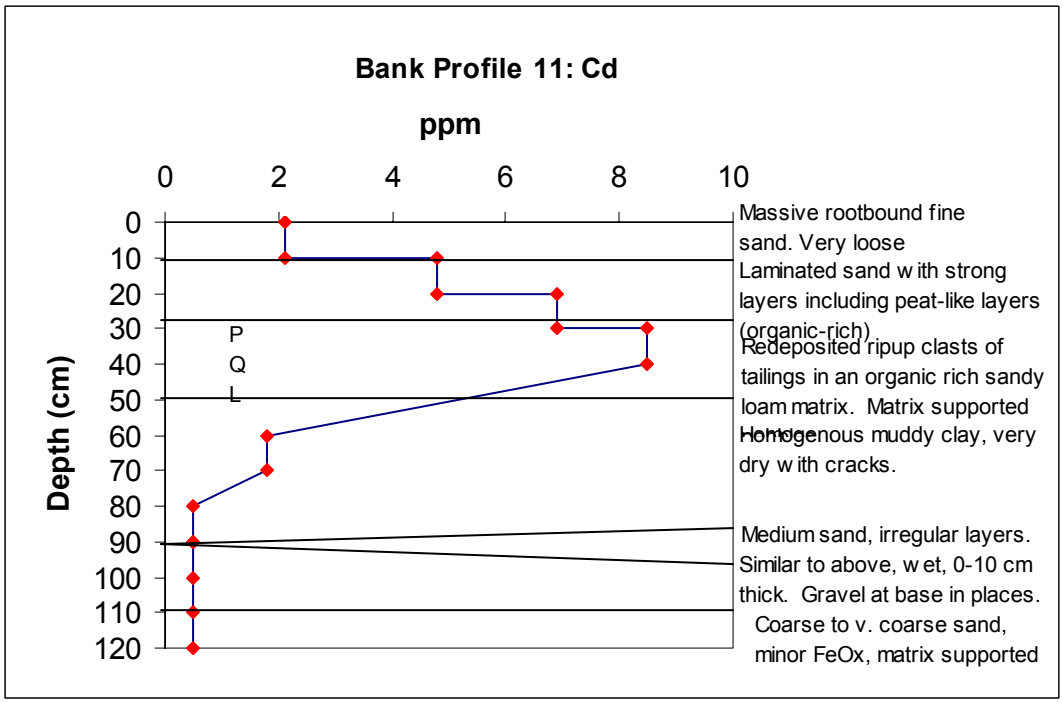

Bank Profile 10: Cd
ppm Cd
0
0.5
1
1.5
2
Depth (cm)
0
20
40
60
80
100
120
P
Q
L
sand
Dry with some organic matter. Grades into unit below.
Dark yellowish brown. Fine sand with some clay. Fairly homogenous and massive with a few layers. At 90 cm bgs there is a 5 cm thick layer of medium to coarse sand.
Gravel and cobbles.

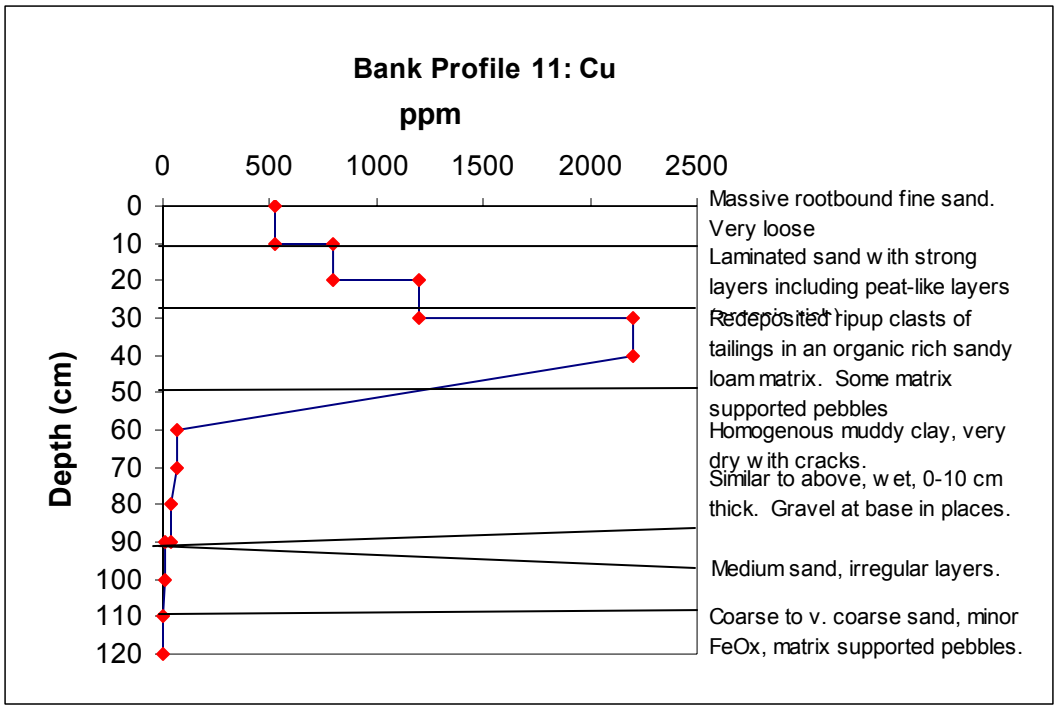

Bank Profile 10: Cu
ppm Cu
0
100
200
300
Depth (cm)
0
20
40
60
80
100
120
sand
Dry with some organic matter. Grades into unit below.
Dark yellowish brown. Fine sand with some clay. Fairly homogenous and massive with a few layers. At 90 cm bgs there is a 5 cm thick layer of medium to coarse sand.
Gravel and cobbles.

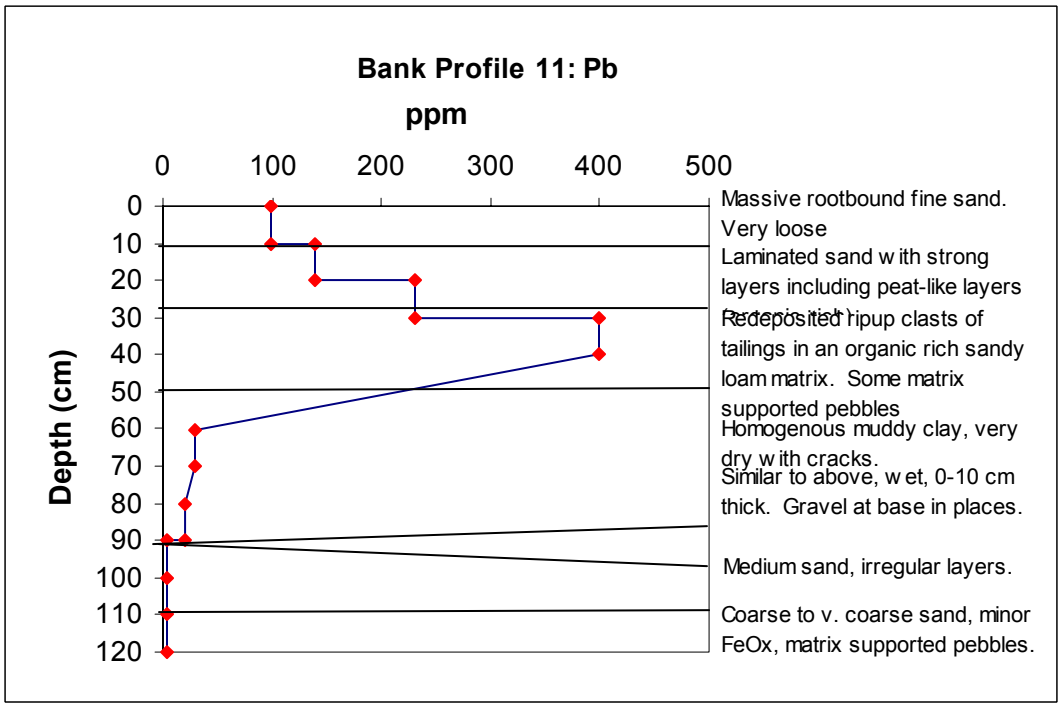

Bank Profile 10: Pb
ppm Pb
0
20
40
60
Depth (cm)
0
20
40
60
80
100
120
P
Q
L
sand
Dry with some organic matter. Grades into unit below.
Dark yellowish brown. Fine sand with some clay. Fairly homogenous and massive with a few layers. At 90 cm bgs there is a 5 cm thick layer of medium to coarse sand.
Gravel and cobbles.

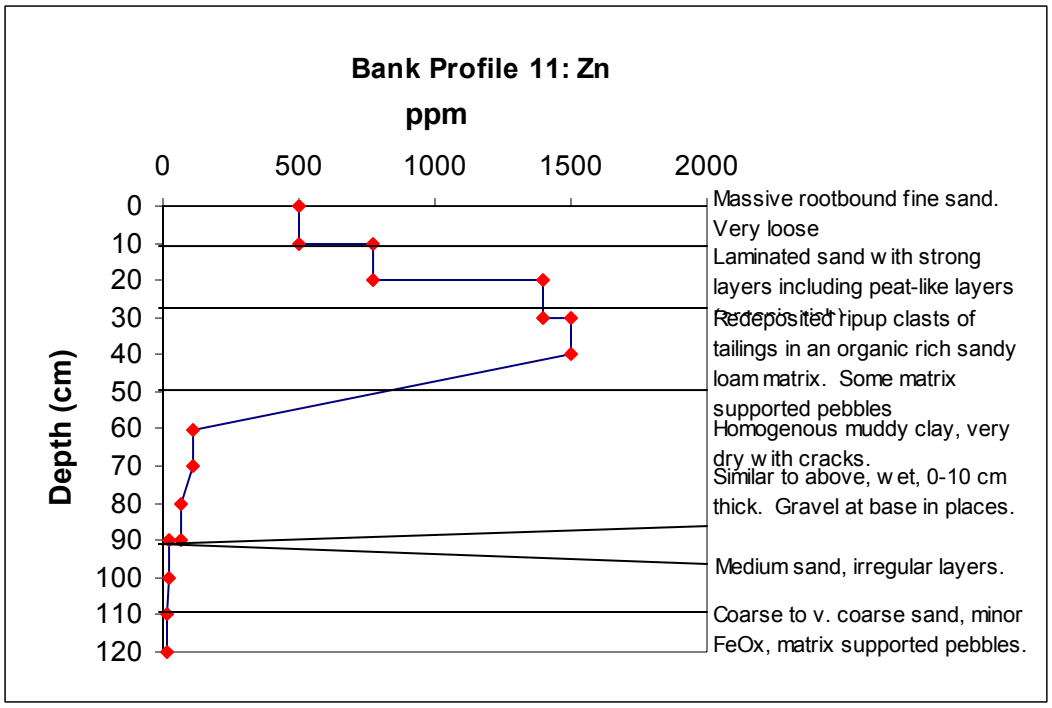

Bank Profile 10: Zn
ppm Zn
0
100
200
300
Depth (cm)
0
20
40
60
80
100
120
sand
Dry with some organic matter. Grades into unit below.
Dark yellowish brown. Fine sand with some clay. Fairly homogenous and massive with a few layers. At 90 cm bgs there is a 5 cm thick layer of medium to coarse sand.
Gravel and cobbles.

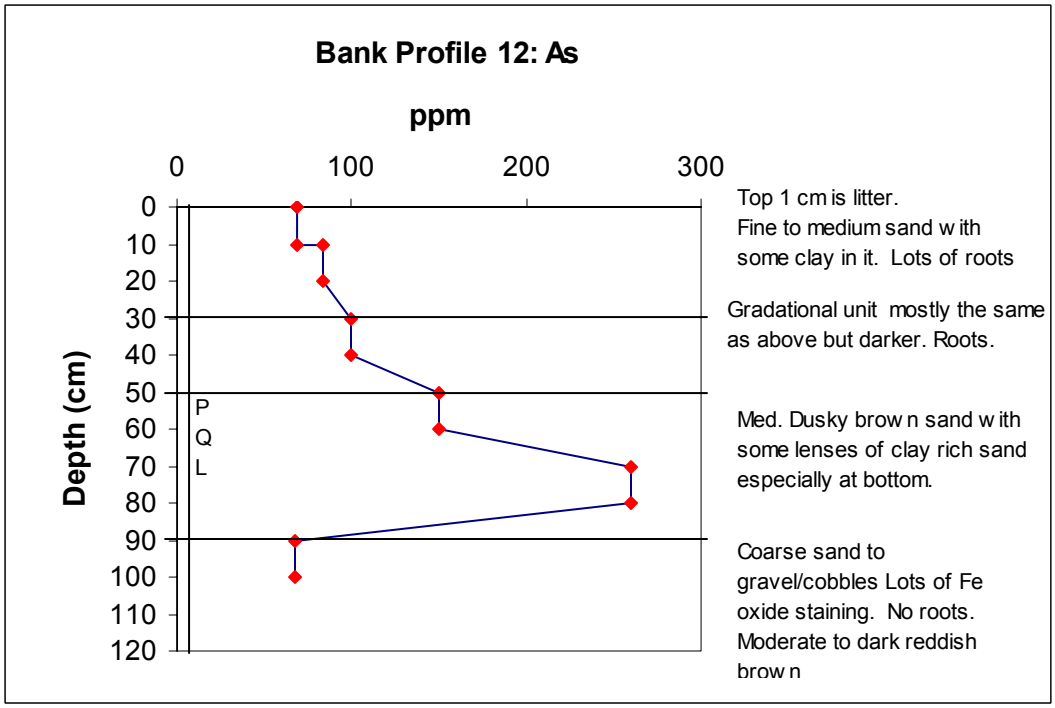

Bank Profile 11: As
ppm
0
100
200
300
400
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
Massive rootbound fine sand. Very loose
Laminated sand with strong layers including peat-like layers (organic-rich)
Redeposited ripup clasts of tailings in an organic rich sandy loam matrix. Matrix supported
Homogenous muddy clay, very dry with cracks.
Similar to above, wet, 0-10 cm thick. Gravel at base in places.
Medium sand, irregular layers.
Coarse to v. coarse sand, minor FeOx, matrix supported pebbles.

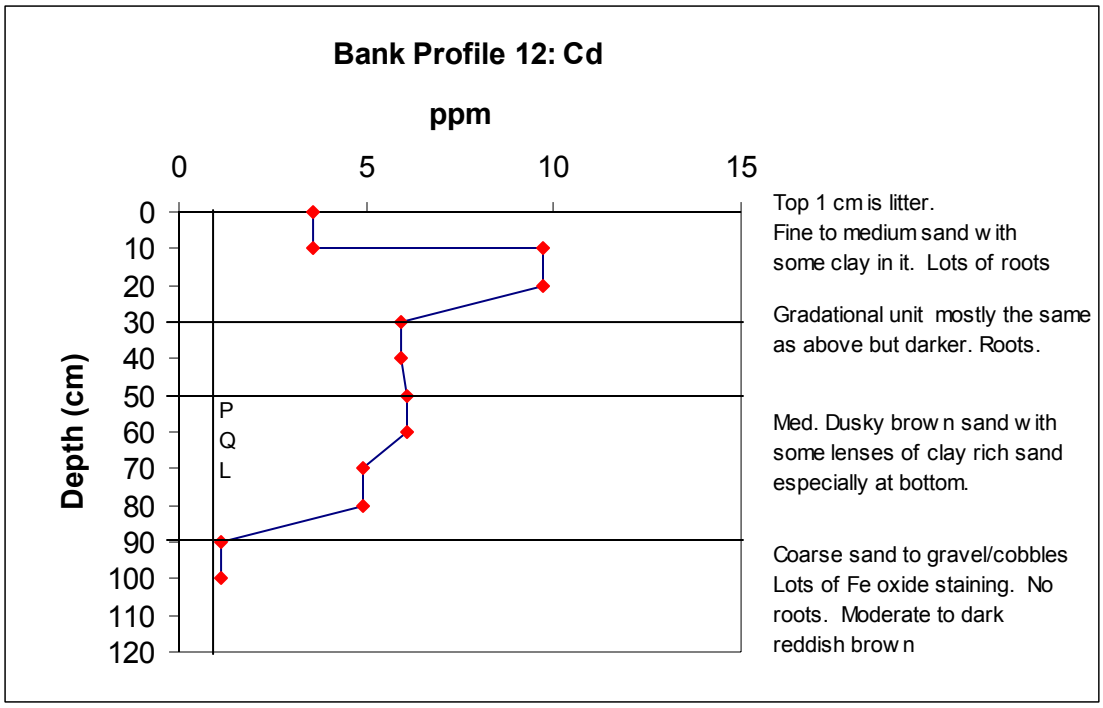

Bank Profile 11: Cd
ppm
0
2
4
6
8
10
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
P
Q
L
Massive rootbound fine sand. Very loose
Laminated sand with strong layers including peat-like layers (organic-rich)
Redeposited ripup clasts of tailings in an organic rich sandy loam matrix. Matrix supported
Homogenous muddy clay, very dry with cracks.
Medium sand, irregular layers.
Similar to above, wet, 0-10 cm thick. Gravel at base in places.
Coarse to v. coarse sand, minor FeOx, matrix supported

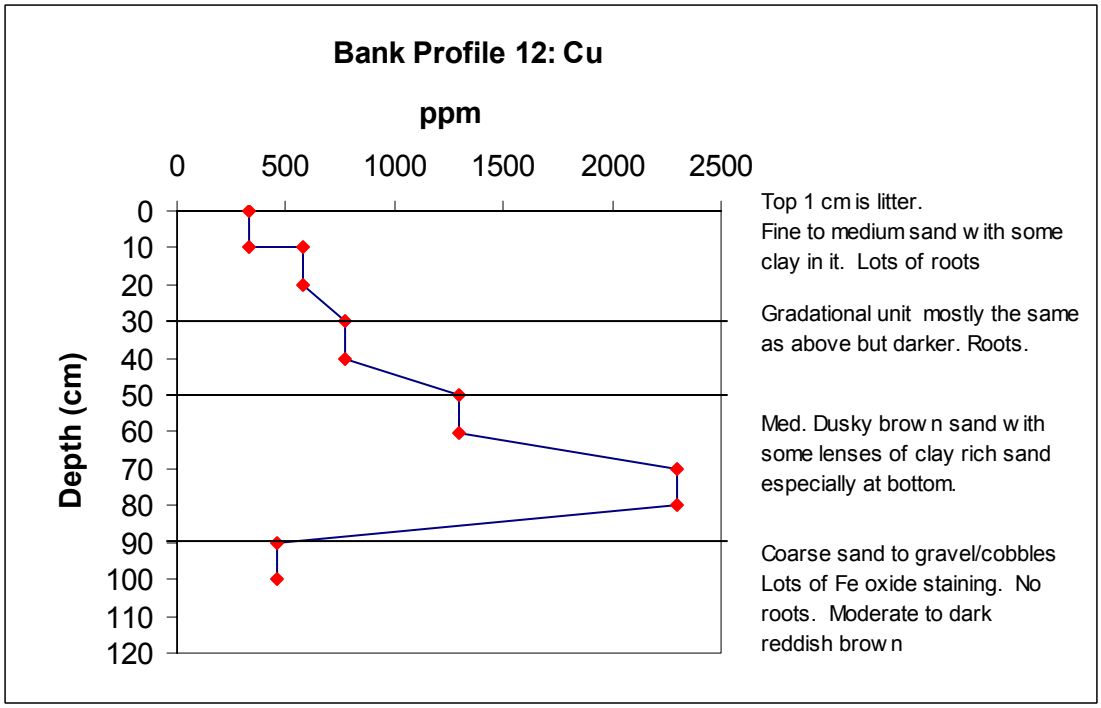

Bank Profile 11: Cu
ppm
0
500
1000
1500
2000
2500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
Massive rootbound fine sand. Very loose
Laminated sand with strong layers including peat-like layers
Redeposited ripup clasts of tailings in an organic rich sandy loam matrix. Some matrix supported pebbles
Homogenous muddy clay, very dry with cracks.
Similar to above, wet, 0-10 cm thick. Gravel at base in places.
Medium sand, irregular layers.
Coarse to v. coarse sand, minor FeOx, matrix supported pebbles.

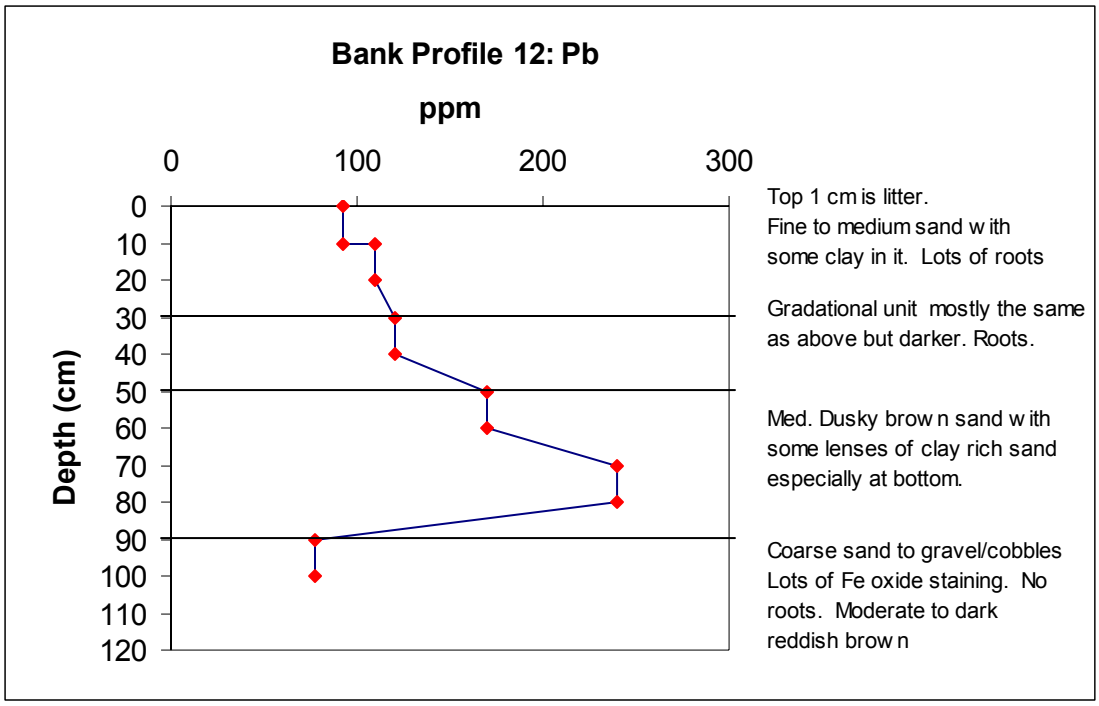

Bank Profile 11: Pb
ppm
0
100
200
300
400
500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
Massive rootbound fine sand. Very loose
Laminated sand with strong layers including peat-like layers
Redeposited ripup clasts of tailings in an organic rich sandy loam matrix. Some matrix supported pebbles
Homogenous muddy clay, very dry with cracks.
Similar to above, wet, 0-10 cm thick. Gravel at base in places.
Medium sand, irregular layers.
Coarse to v. coarse sand, minor FeOx, matrix supported pebbles.

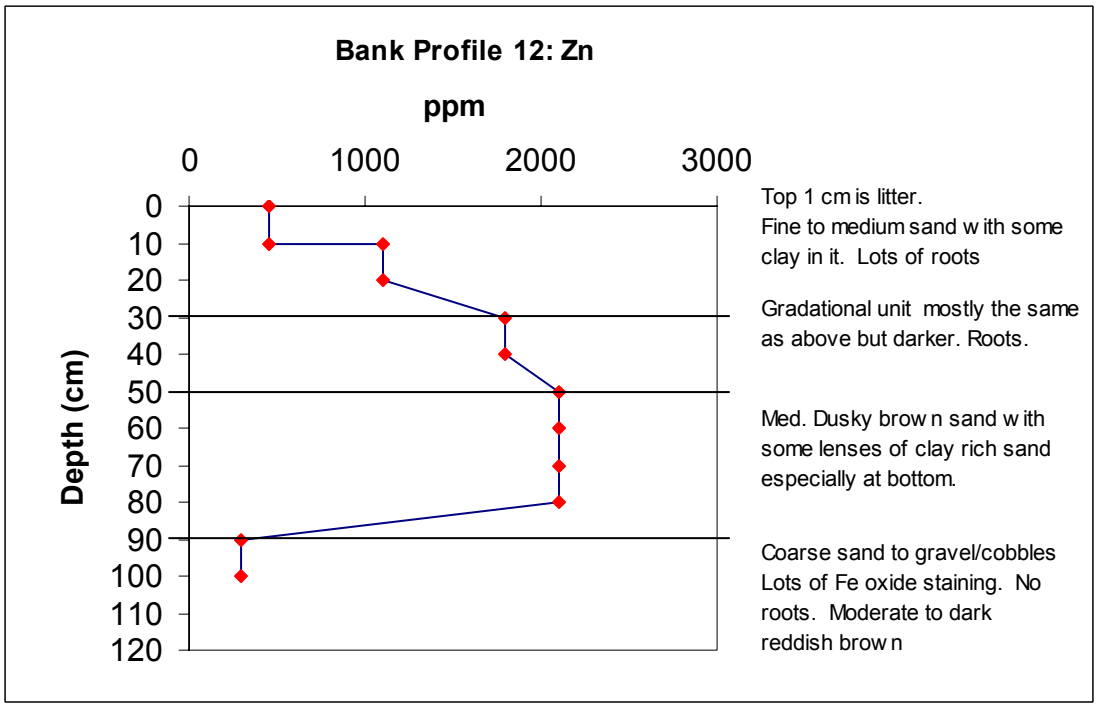

Bank Profile 11: Zn
ppm
0
500
1000
1500
2000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
Massive rootbound fine sand. Very loose
Laminated sand with strong layers including peat-like layers
Redeposited ripup clasts of tailings in an organic rich sandy loam matrix. Some matrix supported pebbles
Homogenous muddy clay, very dry with cracks.
Similar to above, wet, 0-10 cm thick. Gravel at base in places.
Medium sand, irregular layers.
Coarse to v. coarse sand, minor FeOx, matrix supported pebbles.

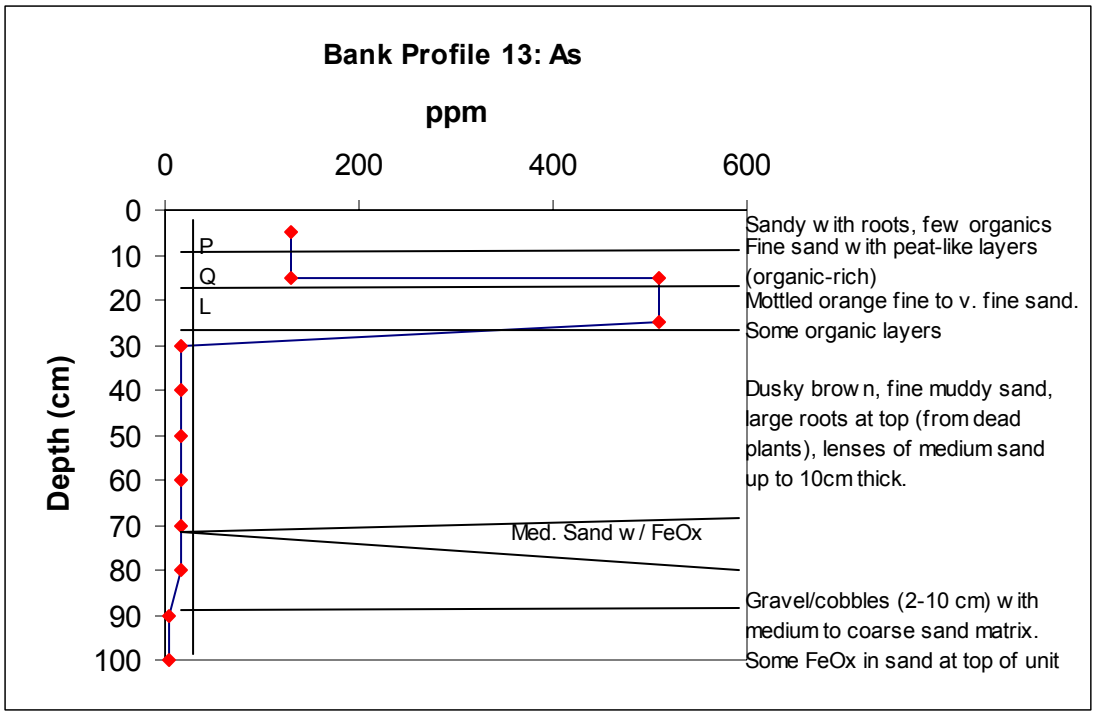

Bank Profile 12: As
ppm
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100
200
300
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
P
Q
L
Top 1 cm is litter. Fine to medium sand with some clay in it. Lots of roots
Gradational unit mostly the same as above but darker. Roots.
Med. Dusky brown sand with some lenses of clay rich sand especially at bottom.
Coarse sand to gravel/cobbles Lots of Fe oxide staining. No roots. Moderate to dark reddish brown

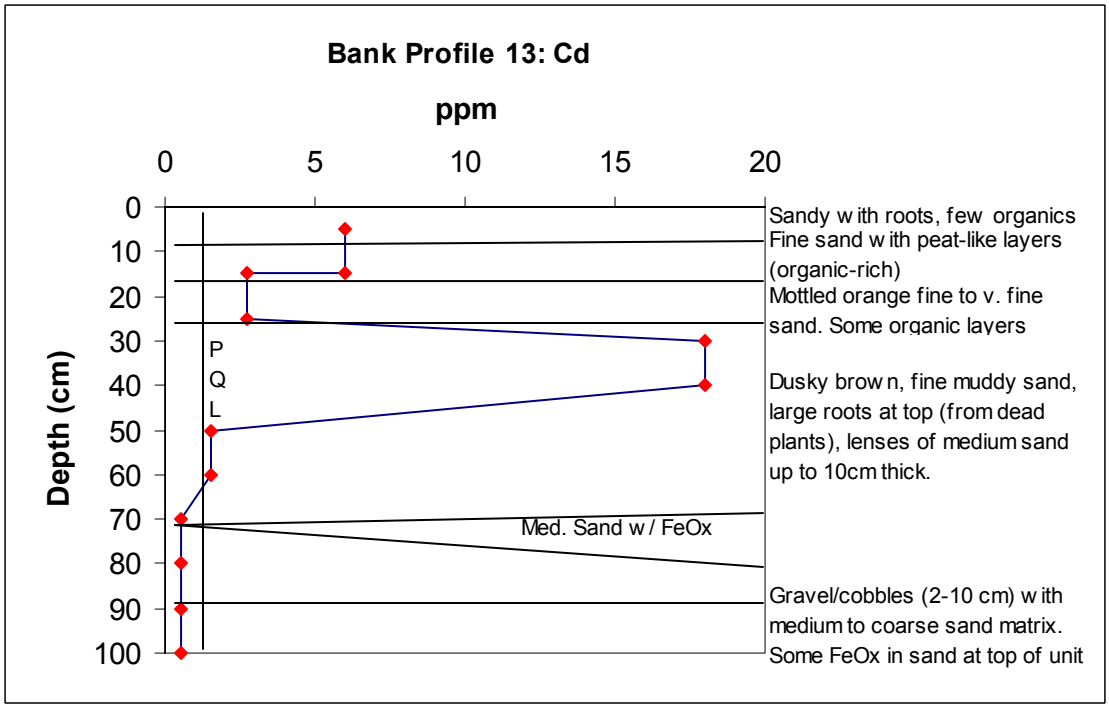

Bank Profile 12: Cd
ppm
0
5
10
15
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
P
Q
L
Top 1 cm is litter.
Fine to medium sand with some clay in it. Lots of roots
Gradational unit mostly the same as above but darker. Roots.
Med. Dusky brown sand with some lenses of clay rich sand especially at bottom.
Coarse sand to gravel/cobbles Lots of Fe oxide staining. No roots. Moderate to dark reddish brown

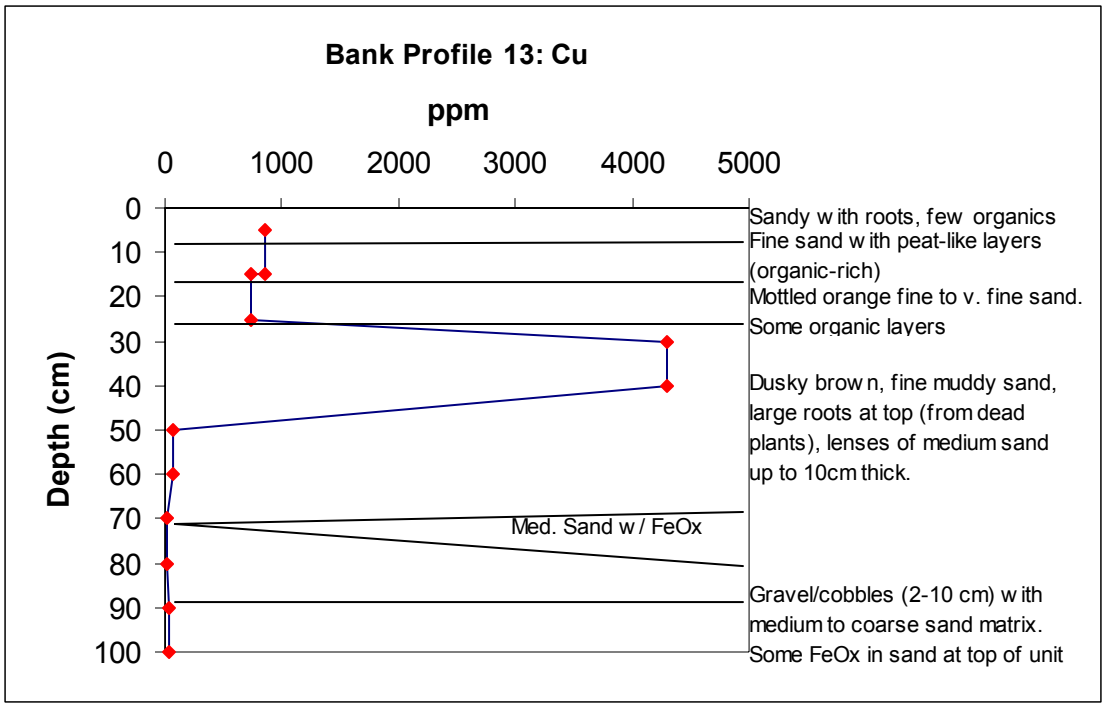

Bank Profile 12: Cu
ppm
0
500
1000
1500
2000
2500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
Top 1 cm is litter.
Fine to medium sand with some clay in it. Lots of roots
Gradational unit mostly the same as above but darker. Roots.
Med. Dusky brown sand with some lenses of clay rich sand especially at bottom.
Coarse sand to gravel/cobbles Lots of Fe oxide staining. No roots. Moderate to dark reddish brown

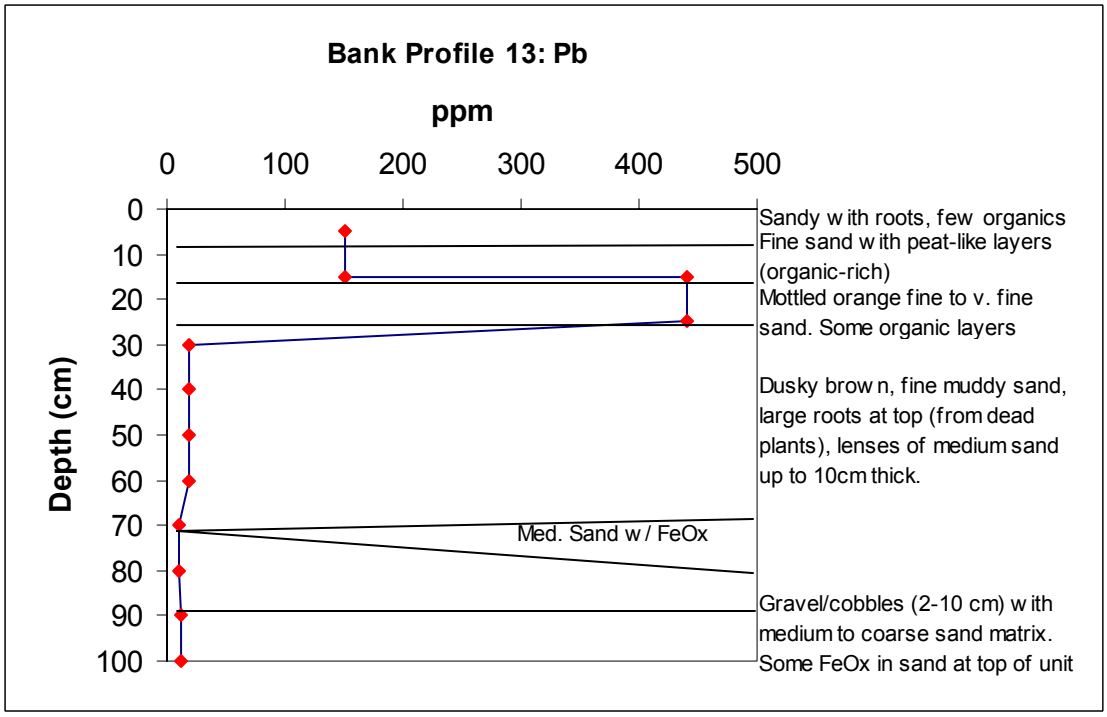

Bank Profile 12: Pb
ppm
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100
200
300
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
Top 1 cm is litter.
Fine to medium sand with some clay in it. Lots of roots
Gradational unit mostly the same as above but darker. Roots.
Med. Dusky brown sand with some lenses of clay rich sand especially at bottom.
Coarse sand to gravel/cobbles Lots of Fe oxide staining. No roots. Moderate to dark reddish brown

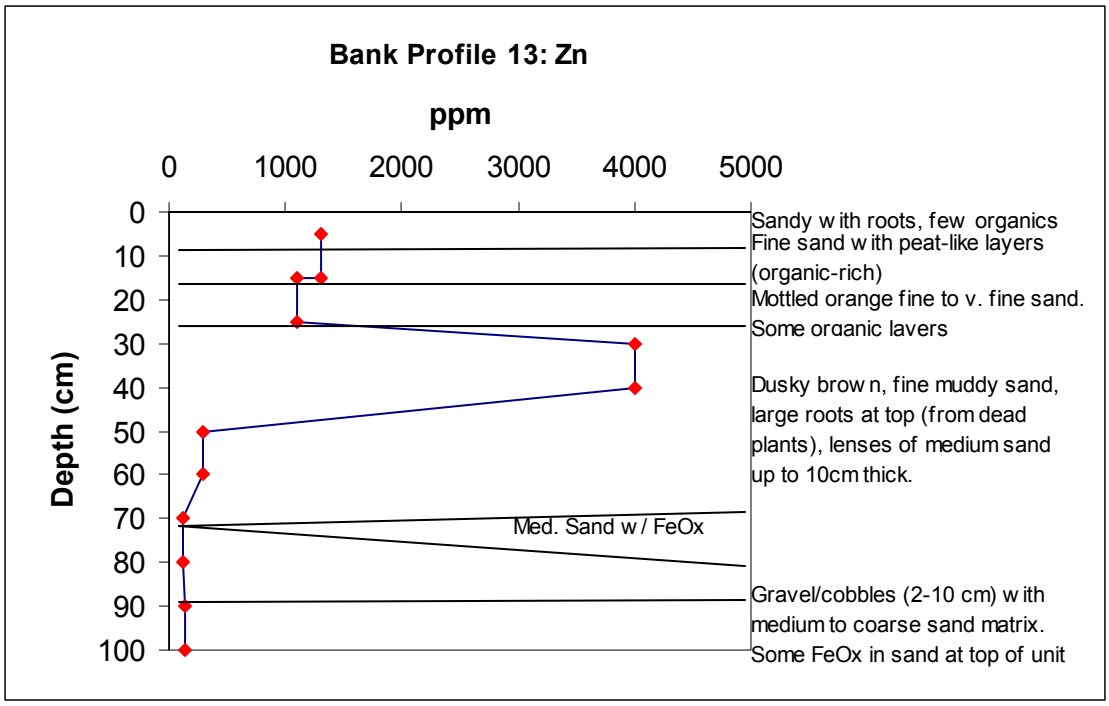

Bank Profile 12: Zn
ppm
0
1000
2000
3000
Depth (cm)
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10
20
30
40
50
60
70
80
90
100
110
120
Top 1 cm is litter.
Fine to medium sand with some clay in it. Lots of roots
Gradational unit mostly the same as above but darker. Roots.
Med. Dusky brown sand with some lenses of clay rich sand especially at bottom.
Coarse sand to gravel/cobbles Lots of Fe oxide staining. No roots. Moderate to dark reddish brown

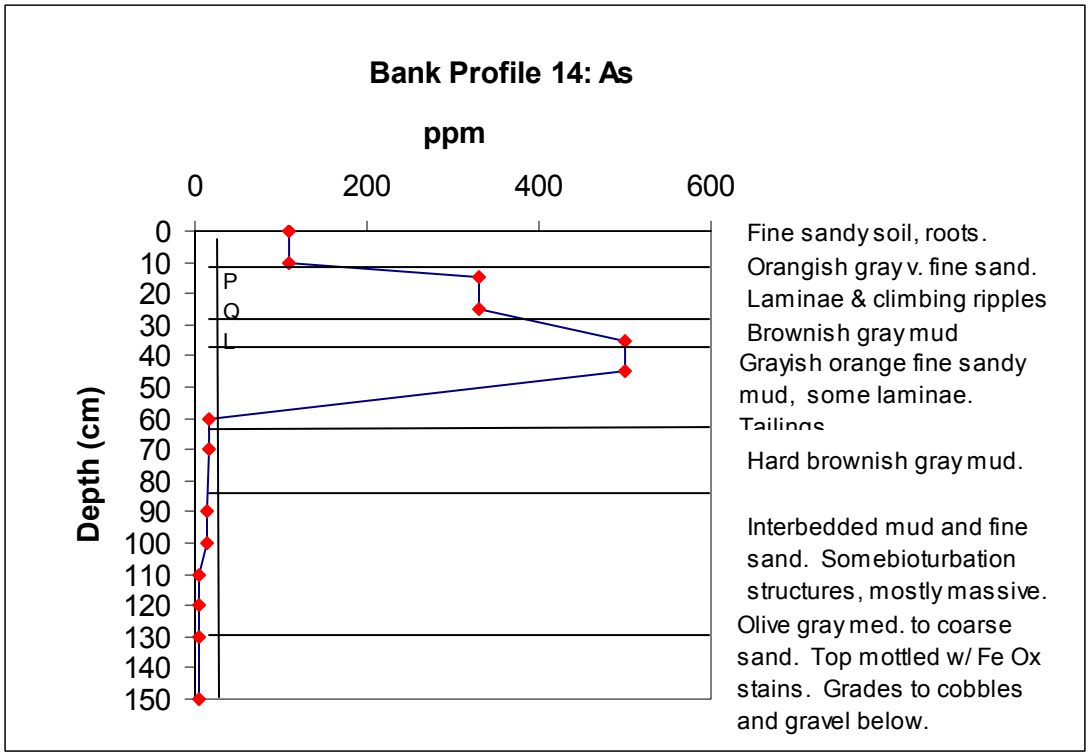

Bank Profile 13: As
ppm
0
200
400
600
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
P
Q
L
Sandy with roots, few organics
Fine sand with peat-like layers (organic-rich)
Mottled orange fine to v. fine sand. Some organic layers
Dusky brown, fine muddy sand, large roots at top (from dead plants), lenses of medium sand up to 10cm thick.
Med. Sand w / FeOx
Gravel/cobbles (2-10 cm) with medium to coarse sand matrix. Some FeOx in sand at top of unit

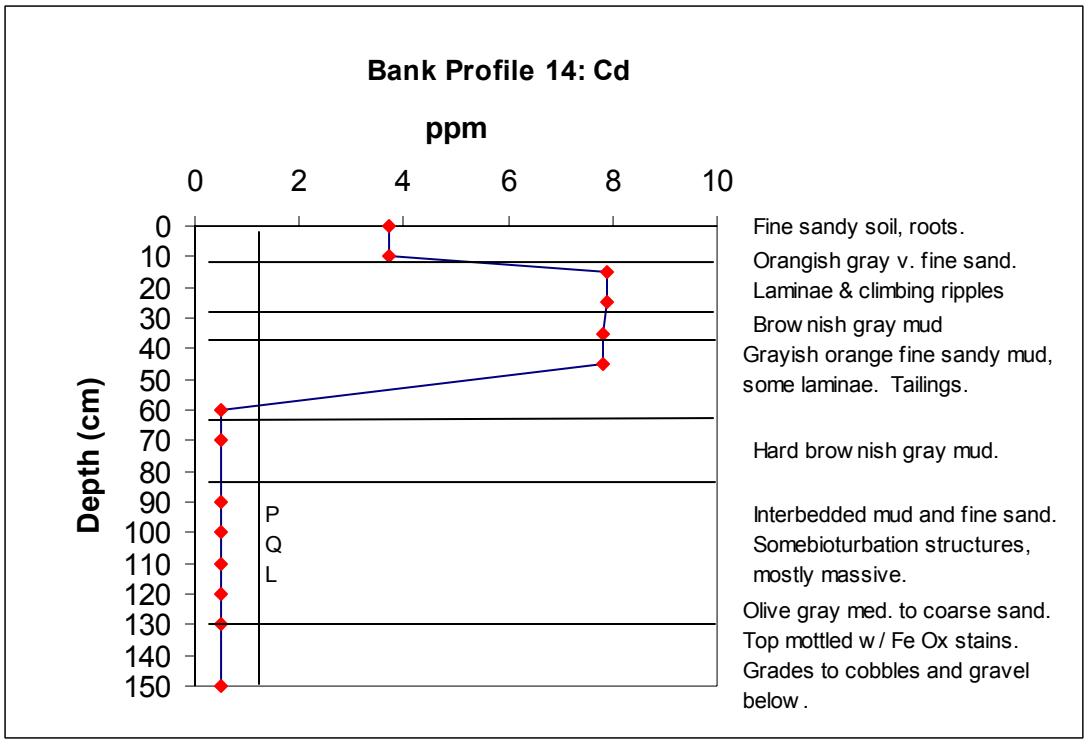

Bank Profile 13: Cd
ppm
0
5
10
15
20
Depth (cm)
0
10
20
30
40
50
60
70
80
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100
P
Q
L
Sandy with roots, few organics
Fine sand with peat-like layers (organic-rich)
Mottled orange fine to v. fine sand. Some organic layers
Dusky brown, fine muddy sand, large roots at top (from dead plants), lenses of medium sand up to 10cm thick.
Med. Sand w / FeOx
Gravel/cobbles (2-10 cm) with medium to coarse sand matrix. Some FeOx in sand at top of unit

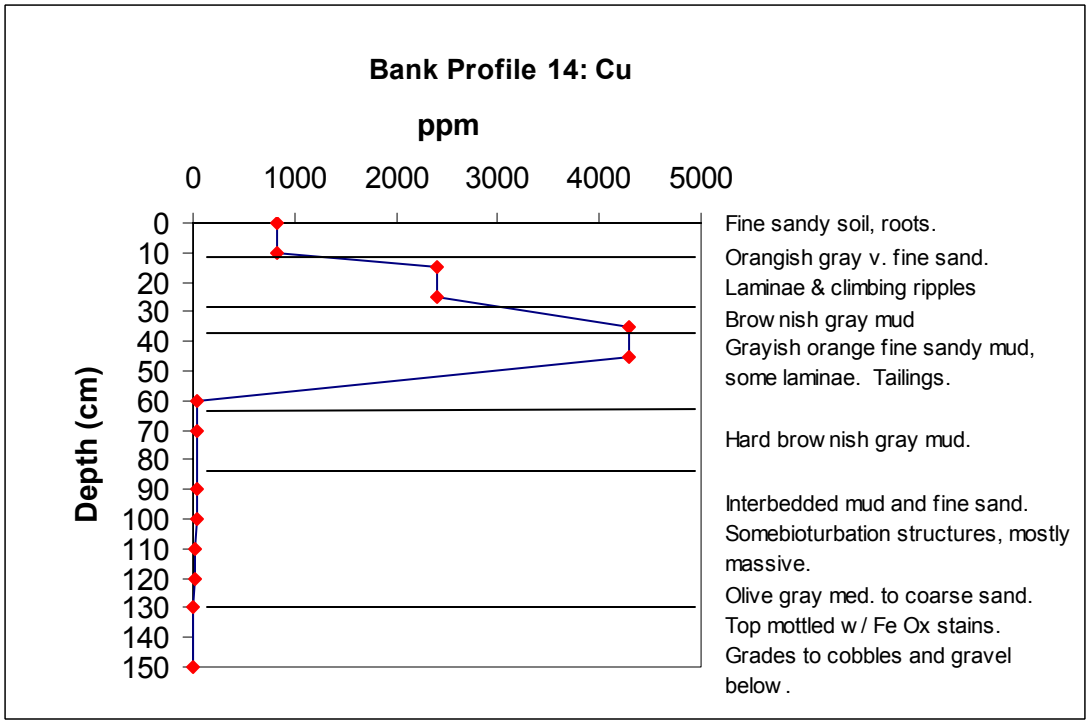

Bank Profile 13: Cu
ppm
0
1000
2000
3000
4000
5000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
Sandy with roots, few organics
Fine sand with peat-like layers (organic-rich)
Mottled orange fine to v. fine sand. Some organic layers
Dusky brown, fine muddy sand, large roots at top (from dead plants), lenses of medium sand up to 10cm thick.
Med. Sand w / FeOx
Gravel/cobbles (2-10 cm) with medium to coarse sand matrix. Some FeOx in sand at top of unit

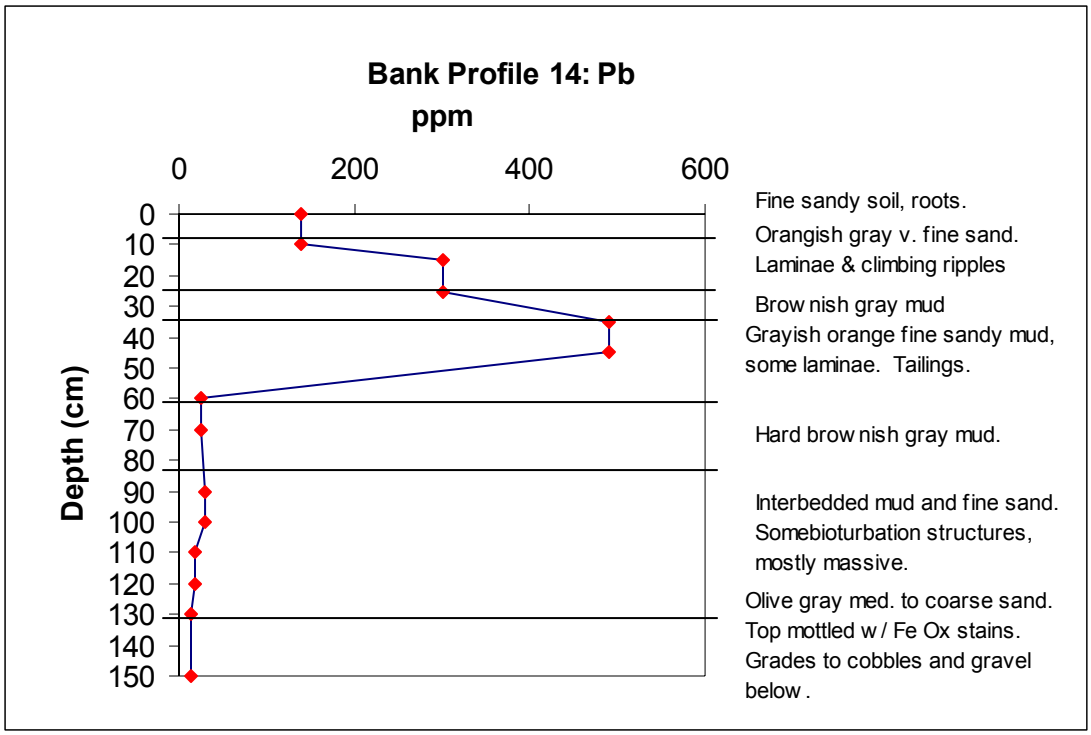

Bank Profile 13: Pb
ppm
0
100
200
300
400
500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
Sandy with roots, few organics
Fine sand with peat-like layers (organic-rich)
Mottled orange fine to v. fine sand. Some organic layers
Dusky brown, fine muddy sand, large roots at top (from dead plants), lenses of medium sand up to 10cm thick.
Med. Sand w / FeOx
Gravel/cobbles (2-10 cm) with medium to coarse sand matrix. Some FeOx in sand at top of unit

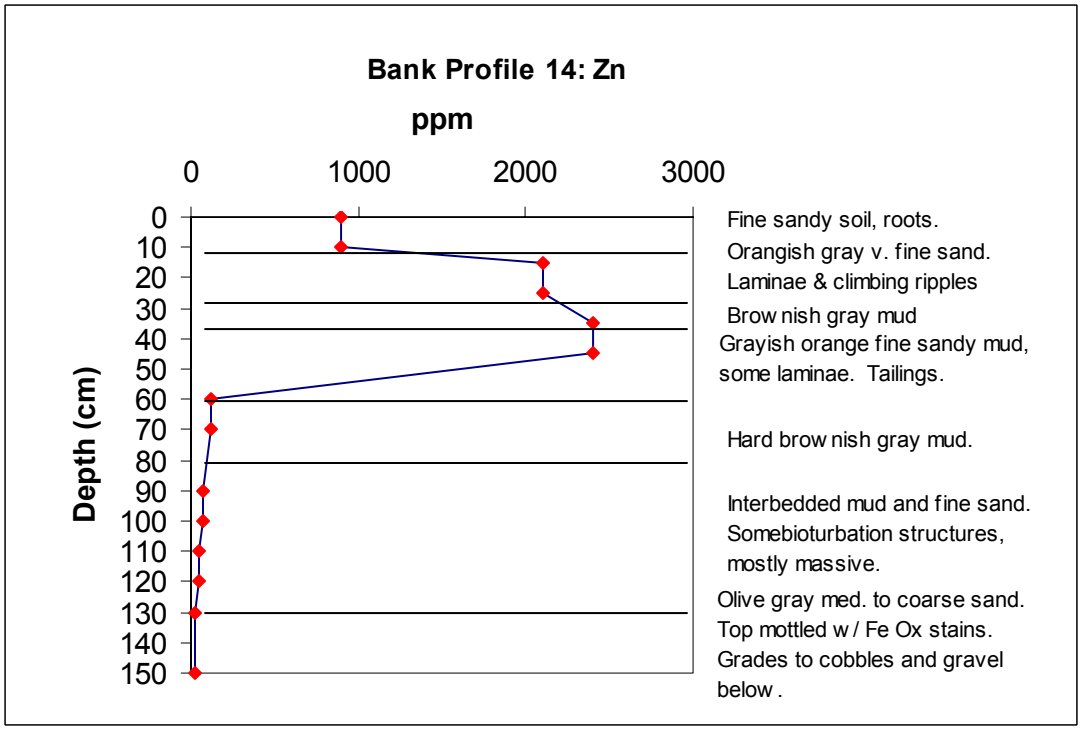

Bank Profile 13: Zn
ppm
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1000
2000
3000
4000
5000
Depth (cm)
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10
20
30
40
50
60
70
80
90
100
Sandy with roots, few organics
Fine sand with peat-like layers (organic-rich)
Mottled orange fine to v. fine sand. Some organic layers
Dusky brown, fine muddy sand, large roots at top (from dead plants), lenses of medium sand up to 10cm thick.
Med. Sand w / FeOx
Gravel/cobbles (2-10 cm) with medium to coarse sand matrix. Some FeOx in sand at top of unit

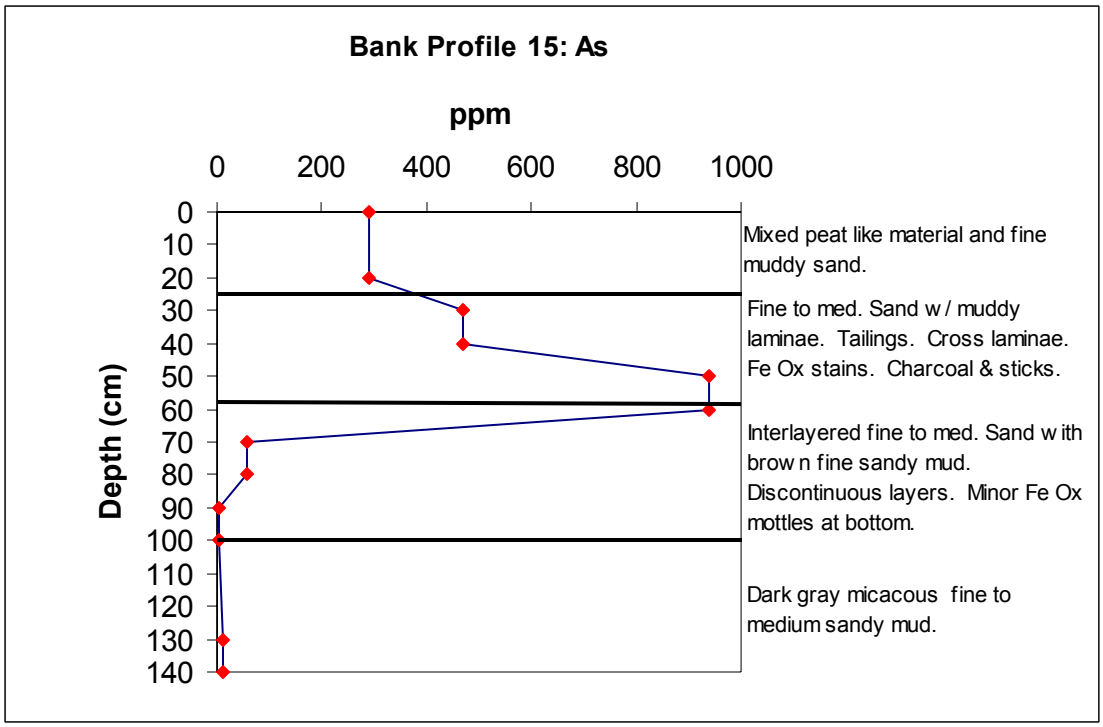

Bank Profile 14: As
ppm
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200
400
600
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
P
Q
L
Fine sandy soil, roots.
Orangish gray v. fine sand. Laminae & climbing ripples
Brownish gray mud
Grayish orange fine sandy mud, some laminae.
Tailings
Hard brownish gray mud.
Interbedded mud and fine sand. Somebioturbation structures, mostly massive.
Olive gray med. to coarse sand. Top mottled w/ Fe Ox stains. Grades to cobbles and gravel below.

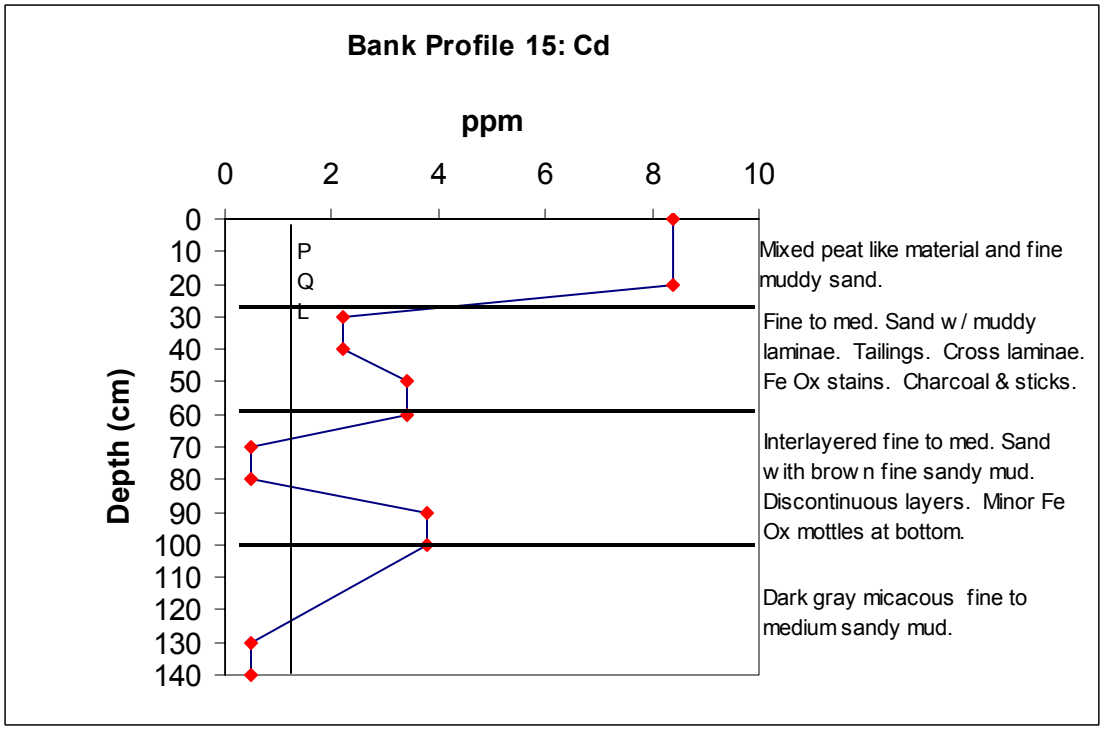

Bank Profile 14: Cd
ppm
0
2
4
6
8
10
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
P
Q
L
Fine sandy soil, roots.
Orangish gray v. fine sand.
Laminae & climbing ripples
Brownish gray mud
Grayish orange fine sandy mud, some laminae. Tailings.
Hard brownish gray mud.
Interbedded mud and fine sand. Somebioturbation structures, mostly massive.
Olive gray med. to coarse sand. Top mottled w / Fe Ox stains. Grades to cobbles and gravel below .

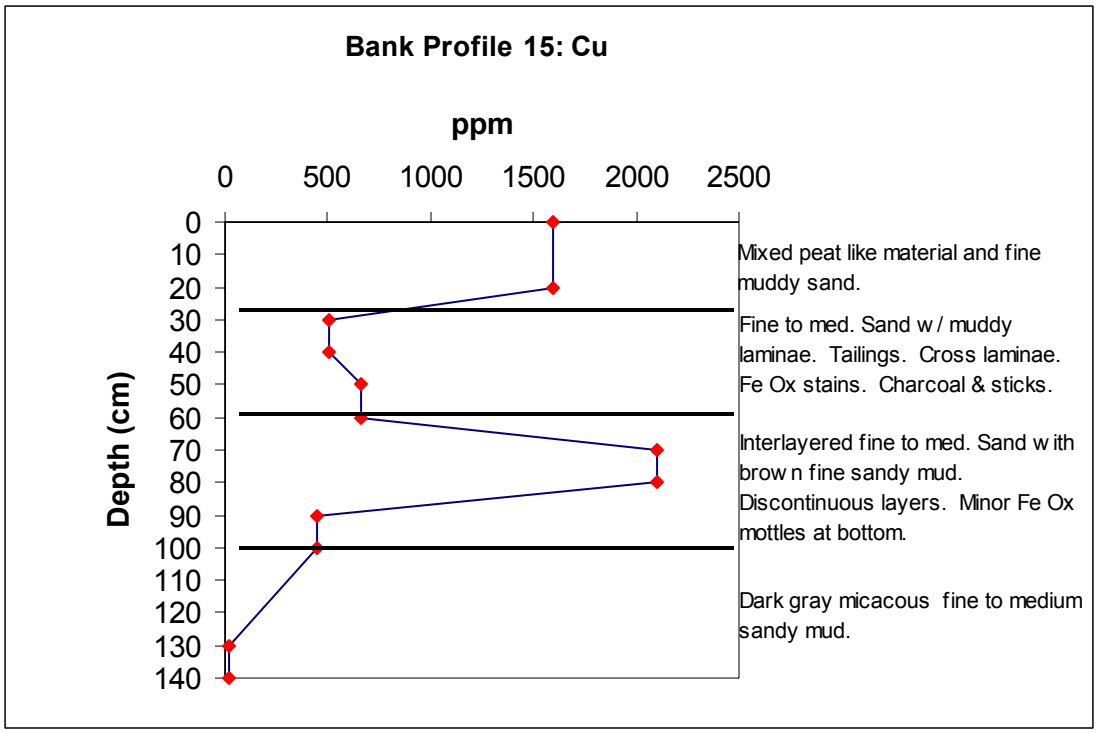

Bank Profile 14: Cu
ppm
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1000
2000
3000
4000
5000
Depth (cm)
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10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Fine sandy soil, roots.
Orangish gray v. fine sand.
Laminae & climbing ripples
Brownish gray mud
Grayish orange fine sandy mud, some laminae. Tailings.
Hard brownish gray mud.
Interbedded mud and fine sand. Somebioturbation structures, mostly massive.
Olive gray med. to coarse sand. Top mottled w / Fe Ox stains. Grades to cobbles and gravel below .

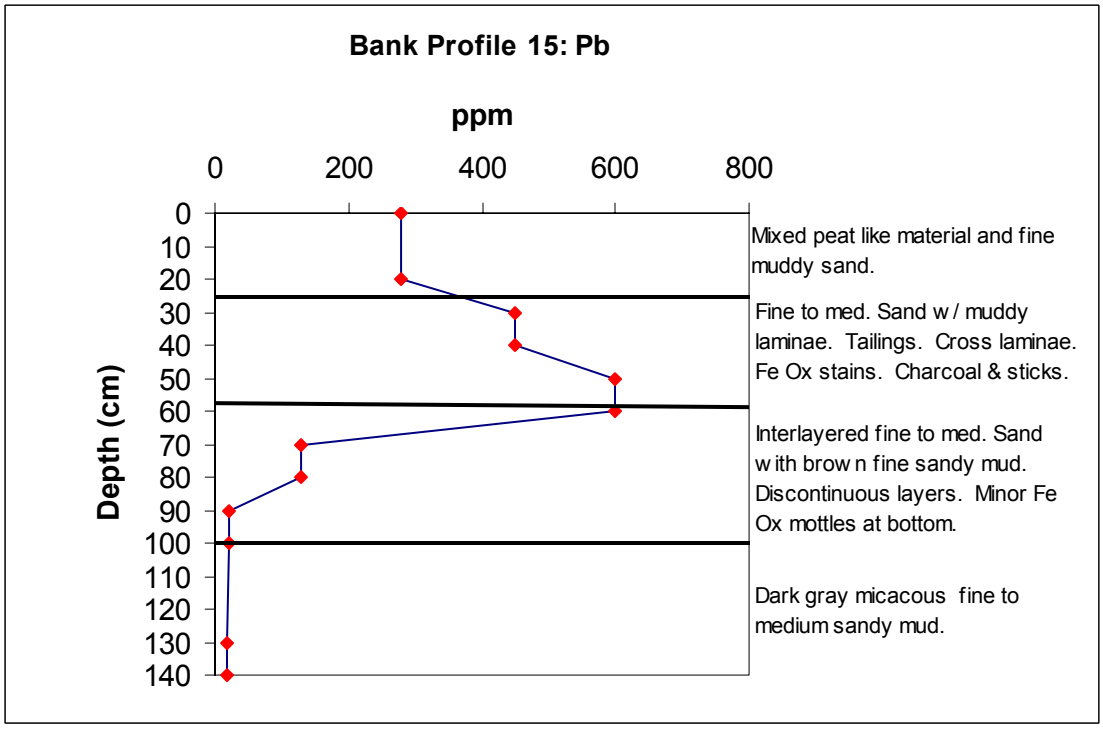

Bank Profile 14: Pb
ppm
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200
400
600
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Fine sandy soil, roots.
Orangish gray v. fine sand.
Laminae & climbing ripples
Brow nish gray mud
Grayish orange fine sandy mud,
some laminae. Tailings.
Hard brow nish gray mud.
Interbedded mud and fine sand.
Somebioturbation structures,
mostly massive.
Olive gray med. to coarse sand.
Top mottled w / Fe Ox stains.
Grades to cobbles and gravel
below .

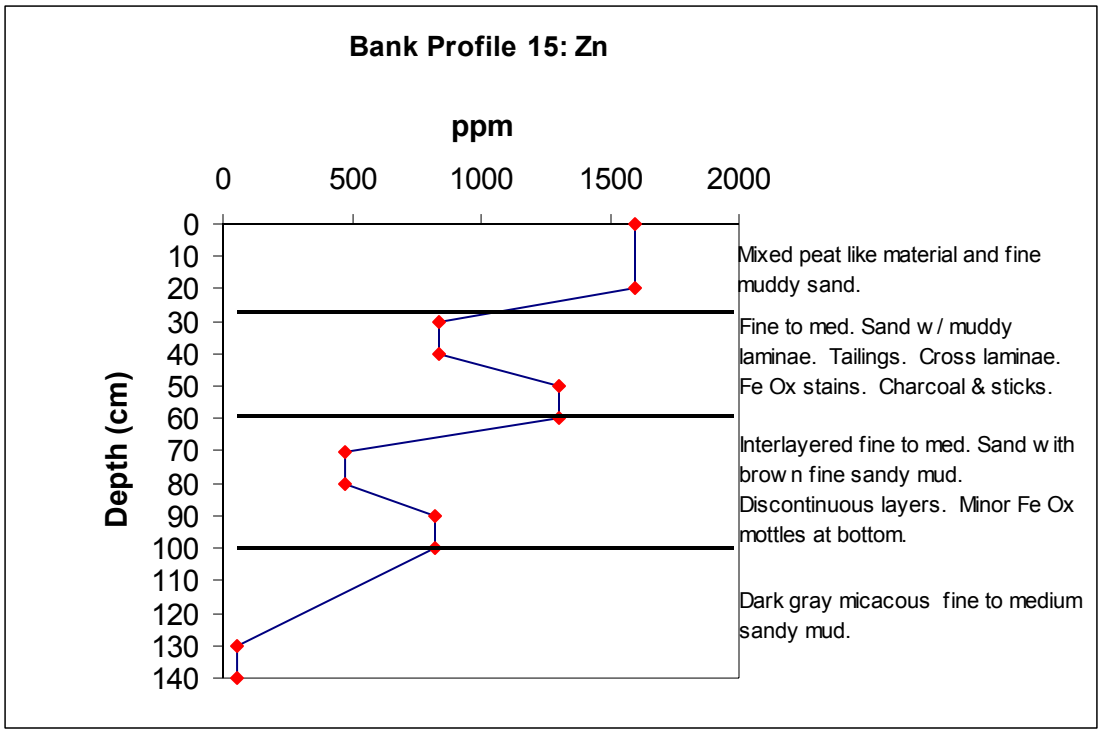

Bank Profile 14: Zn
ppm
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1000
2000
3000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Fine sandy soil, roots.
Orangish gray v. fine sand.
Laminae & climbing ripples
Brow nish gray mud
Grayish orange fine sandy mud,
some laminae. Tailings.
Hard brow nish gray mud.
Interbedded mud and fine sand.
Somebioturbation structures,
mostly massive.
Olive gray med. to coarse sand.
Top mottled w / Fe Ox stains.
Grades to cobbles and gravel
below .

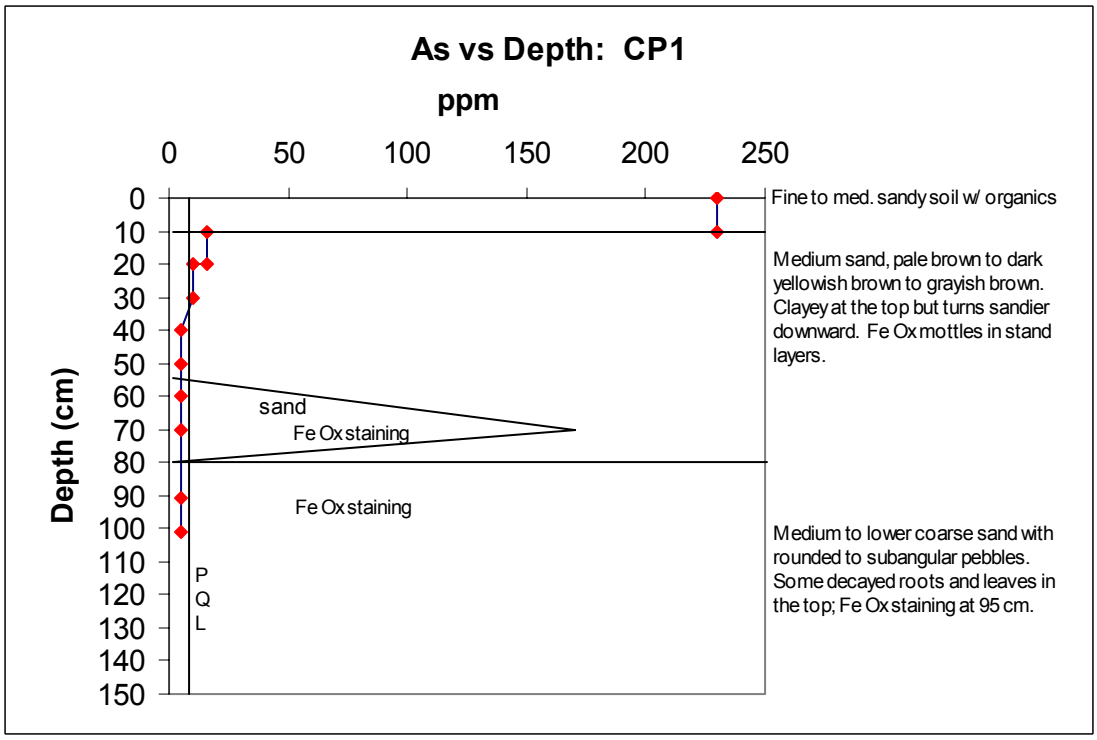

Bank Profile 15: As
ppm
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200
400
600
800
1000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Mixed peat like material and fine muddy sand.
Fine to med. Sand w / muddy laminae. Tailings. Cross laminae. Fe Ox stains. Charcoal & sticks.
Interlayered fine to med. Sand w ith brow n fine sandy mud. Discontinuous layers. Minor Fe Ox mottles at bottom.
Dark gray micacous fine to medium sandy mud.

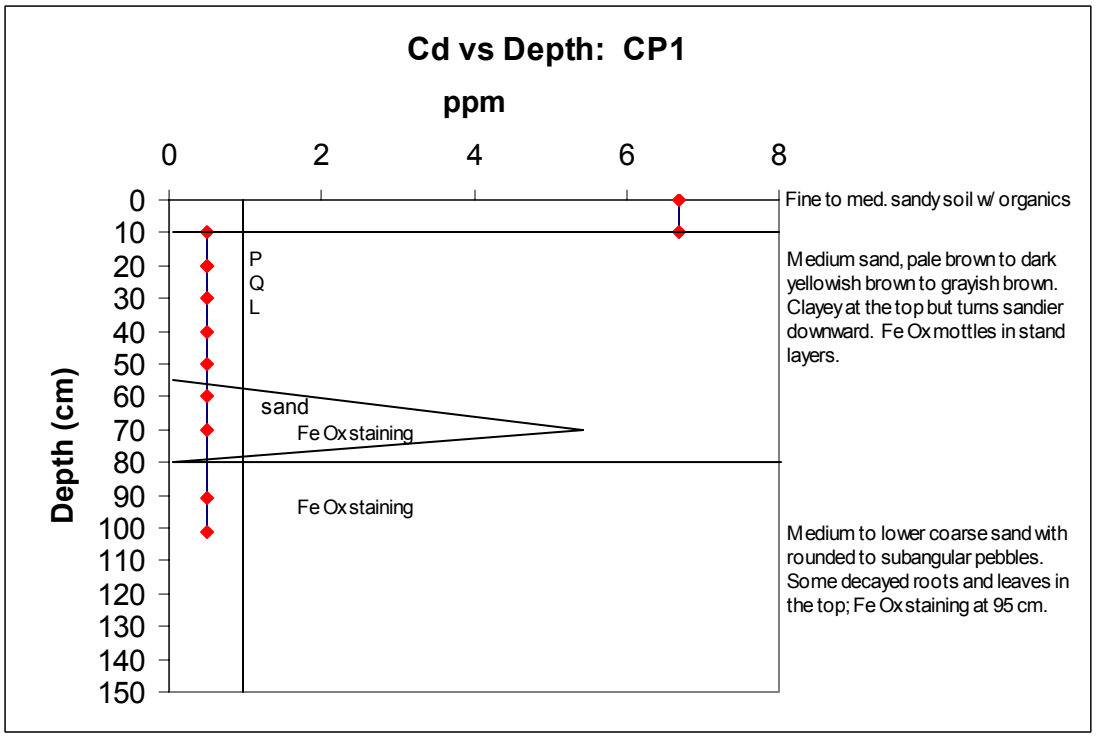

Bank Profile 15: Cd
ppm
0
2
4
6
8
10
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
P
Q
L
Mixed peat like material and fine muddy sand.
Fine to med. Sand w / muddy laminae. Tailings. Cross laminae. Fe Ox stains. Charcoal & sticks.
Interlayered fine to med. Sand w ith brow n fine sandy mud. Discontinuous layers. Minor Fe Ox mottles at bottom.
Dark gray micacous fine to medium sandy mud.

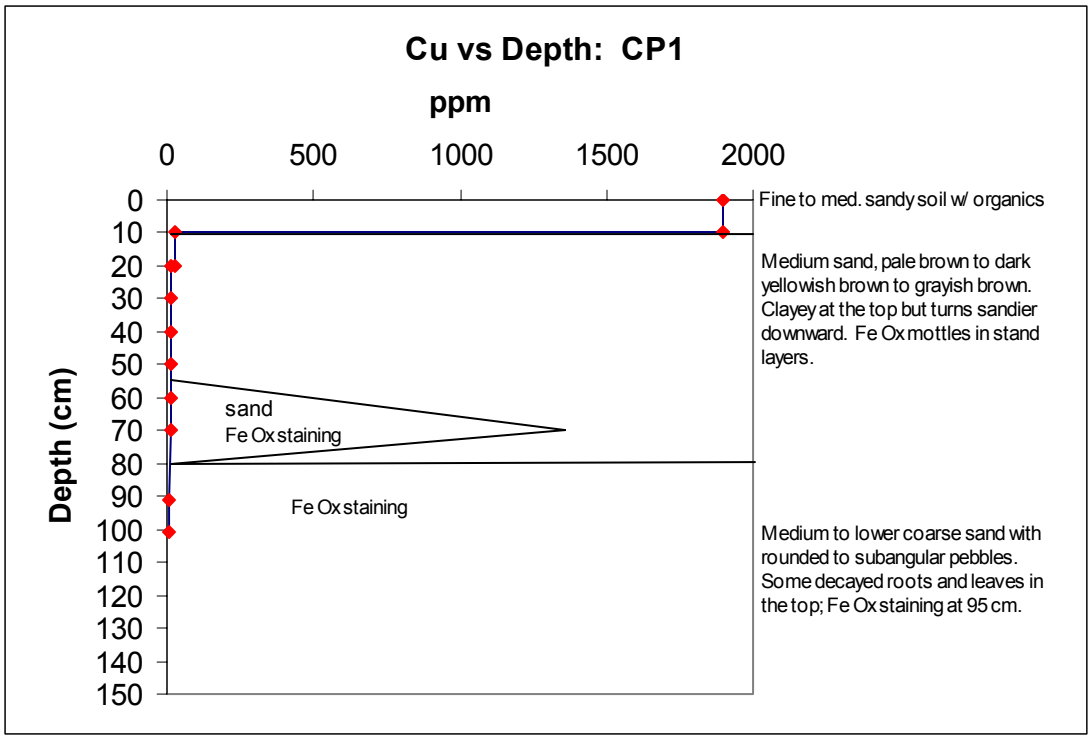

Bank Profile 15: Cu
ppm
0
500
1000
1500
2000
2500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Mixed peat like material and fine muddy sand.
Fine to med. Sand w / muddy laminae. Tailings. Cross laminae. Fe Ox stains. Charcoal & sticks.
Interlayered fine to med. Sand w ith brow n fine sandy mud. Discontinuous layers. Minor Fe Ox mottles at bottom.
Dark gray micacous fine to medium sandy mud.

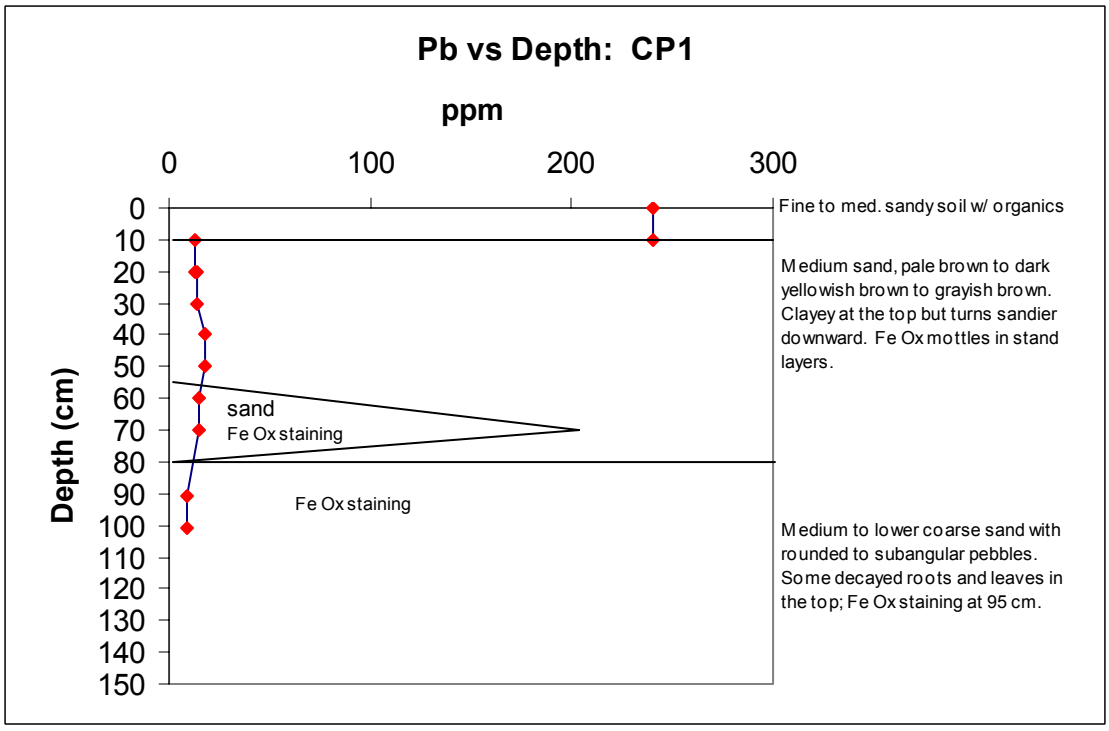

Bank Profile 15: Pb
ppm
0
200
400
600
800
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Mixed peat like material and fine muddy sand.
Fine to med. Sand w / muddy laminae. Tailings. Cross laminae. Fe Ox stains. Charcoal & sticks.
Interlayered fine to med. Sand w ith brow n fine sandy mud. Discontinuous layers. Minor Fe Ox mottles at bottom.
Dark gray micacous fine to medium sandy mud.

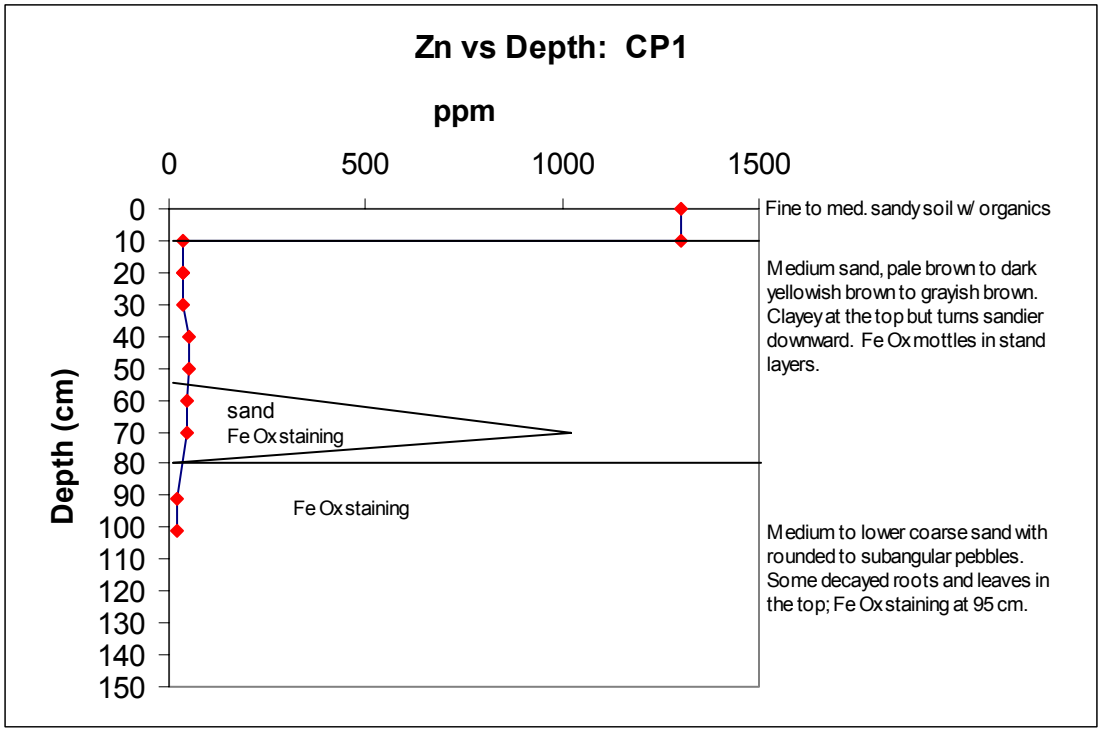

Bank Profile 15: Zn
ppm
0
500
1000
1500
2000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Mixed peat like material and fine muddy sand.
Fine to med. Sand w / muddy laminae. Tailings. Cross laminae. Fe Ox stains. Charcoal & sticks.
Interlayered fine to med. Sand w ith brow n fine sandy mud. Discontinuous layers. Minor Fe Ox mottles at bottom.
Dark gray micacous fine to medium sandy mud.

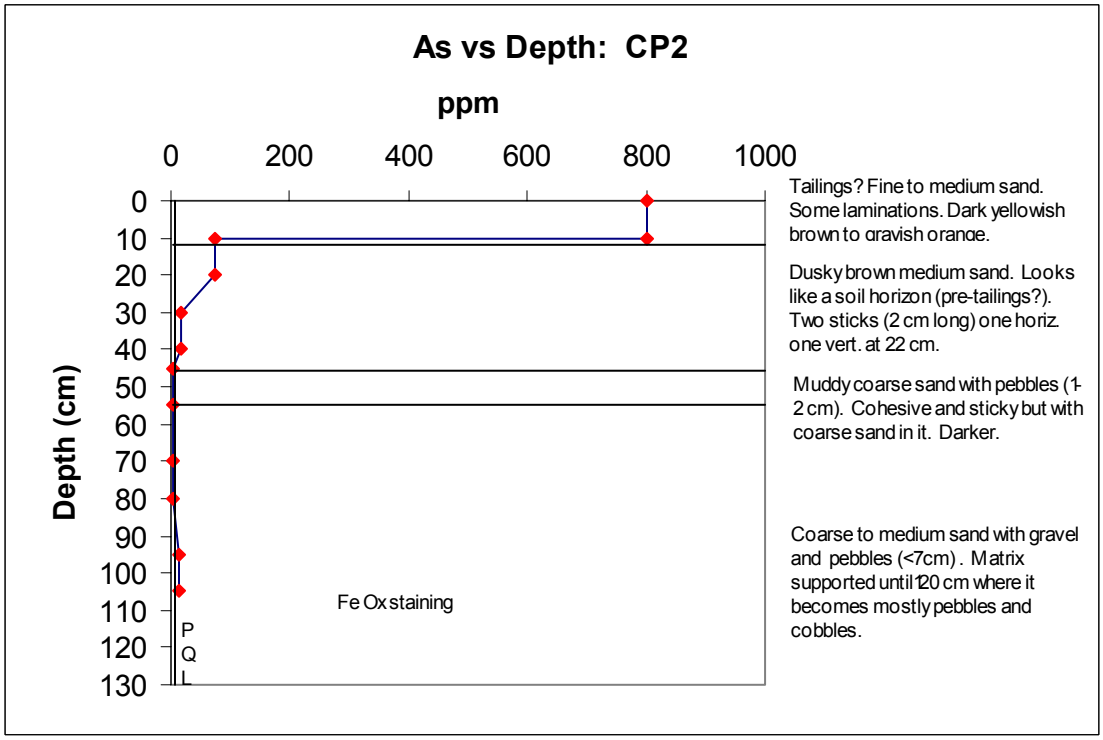

As vs Depth: CP1
ppm
0
50
100
150
200
250
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
sand
Fe Ox staining
Fe Ox staining
P
Q
L
Fine to med. sandy soil w/ organics
Medium sand, pale brown to dark yellowish brown to grayish brown. Clayey at the top but turns sandier downward. Fe Ox mottles in stand layers.
Medium to lower coarse sand with rounded to subangular pebbles. Some decayed roots and leaves in the top; Fe Ox staining at 95 cm.

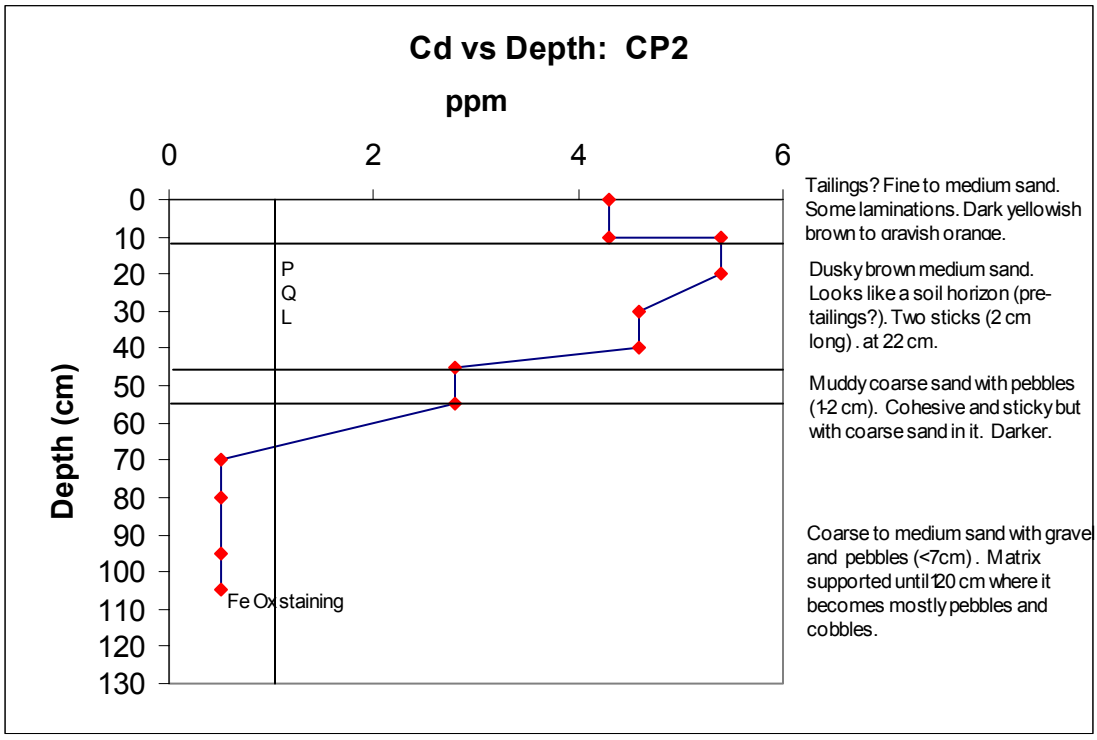

Cd vs Depth: CP1
ppm
0
2
4
6
8
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
P
Q
L
sand
Fe Ox staining
Fe Ox staining
Fine to med. sandy soil w/ organics
Medium sand, pale brown to dark yellowish brown to grayish brown. Clayey at the top but turns sandier downward. Fe Ox mottles in stand layers.
Medium to lower coarse sand with rounded to subangular pebbles. Some decayed roots and leaves in the top; Fe Ox staining at 95 cm.

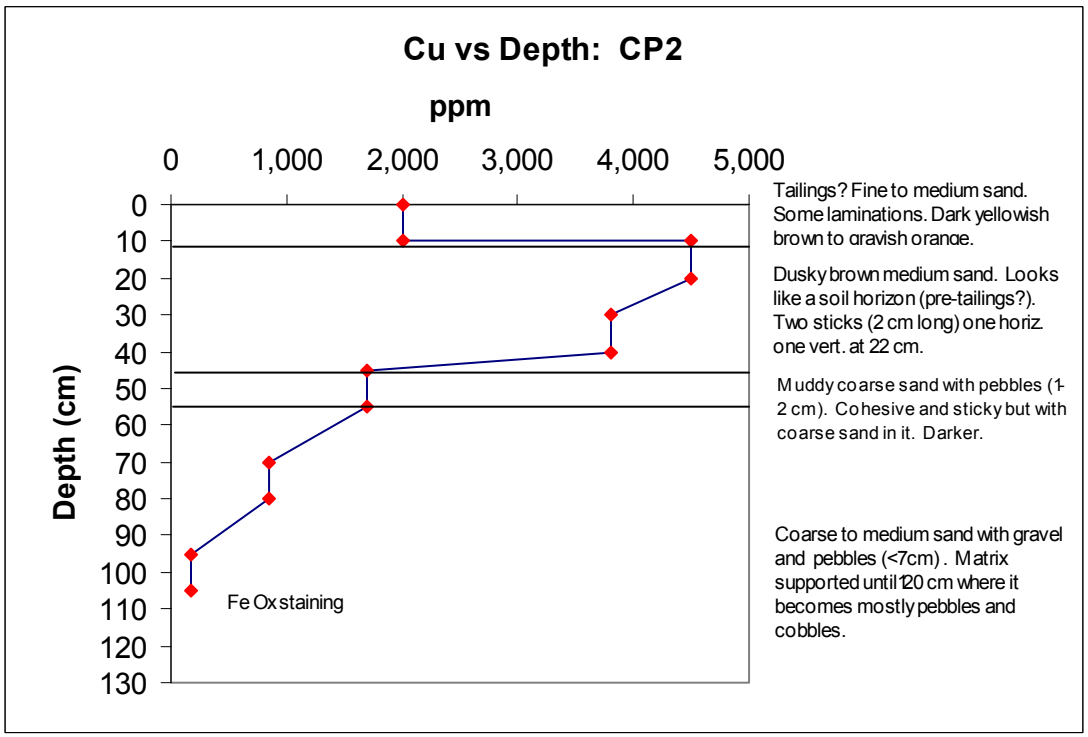

Cu vs Depth: CP1
ppm
0
500
1000
1500
2000
Depth (cm)
0
10
20
30
40
50
60
70
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90
100
110
120
130
140
150
sand
Fe Ox staining
Fe Ox staining
Fine to med. sandy soil w/ organics
Medium sand, pale brown to dark yellowish brown to grayish brown. Clayey at the top but turns sandier downward. Fe Ox mottles in stand layers.
Medium to lower coarse sand with rounded to subangular pebbles. Some decayed roots and leaves in the top; Fe Ox staining at 95 cm.

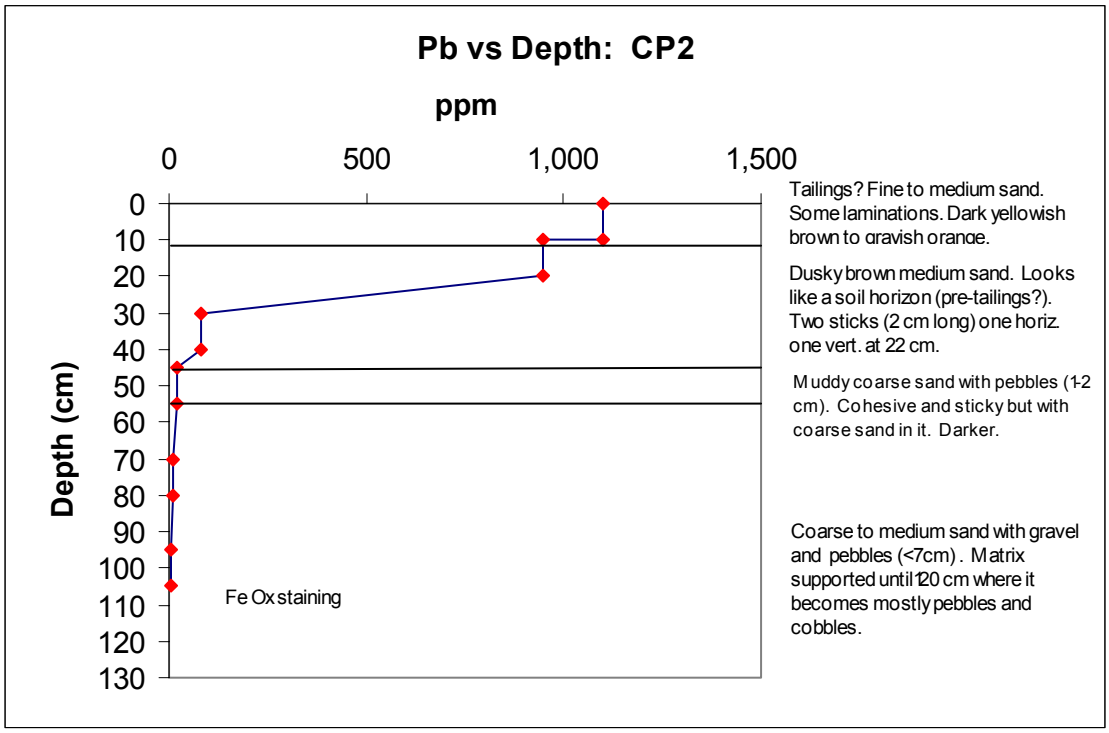

Pb vs Depth: CP1
ppm
0
100
200
300
Depth (cm)
0
10
20
30
40
50
60
70
80
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100
110
120
130
140
150
sand
Fe Ox staining
Fe Ox staining
Fine to med. sandy soil w/ organics
Medium sand, pale brown to dark yellowish brown to grayish brown. Clayey at the top but turns sandier downward. Fe Ox mottles in stand layers.
Medium to lower coarse sand with rounded to subangular pebbles. Some decayed roots and leaves in the top; Fe Ox staining at 95 cm.

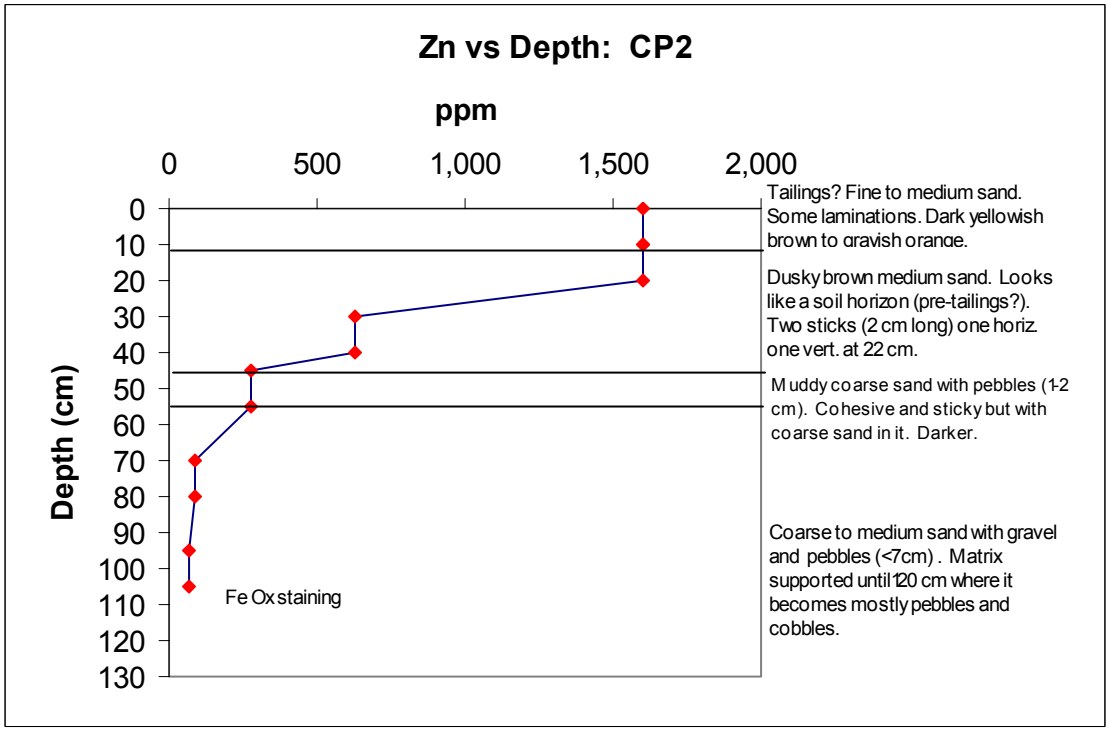

Zn vs Depth: CP1
ppm
0
500
1000
1500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
sand
Fe Ox staining
Fe Ox staining
Fine to med. sandy soil w/ organics
Medium sand, pale brown to dark yellowish brown to grayish brown. Clayey at the top but turns sandier downward. Fe Ox mottles in stand layers.
Medium to lower coarse sand with rounded to subangular pebbles. Some decayed roots and leaves in the top; Fe Ox staining at 95 cm.

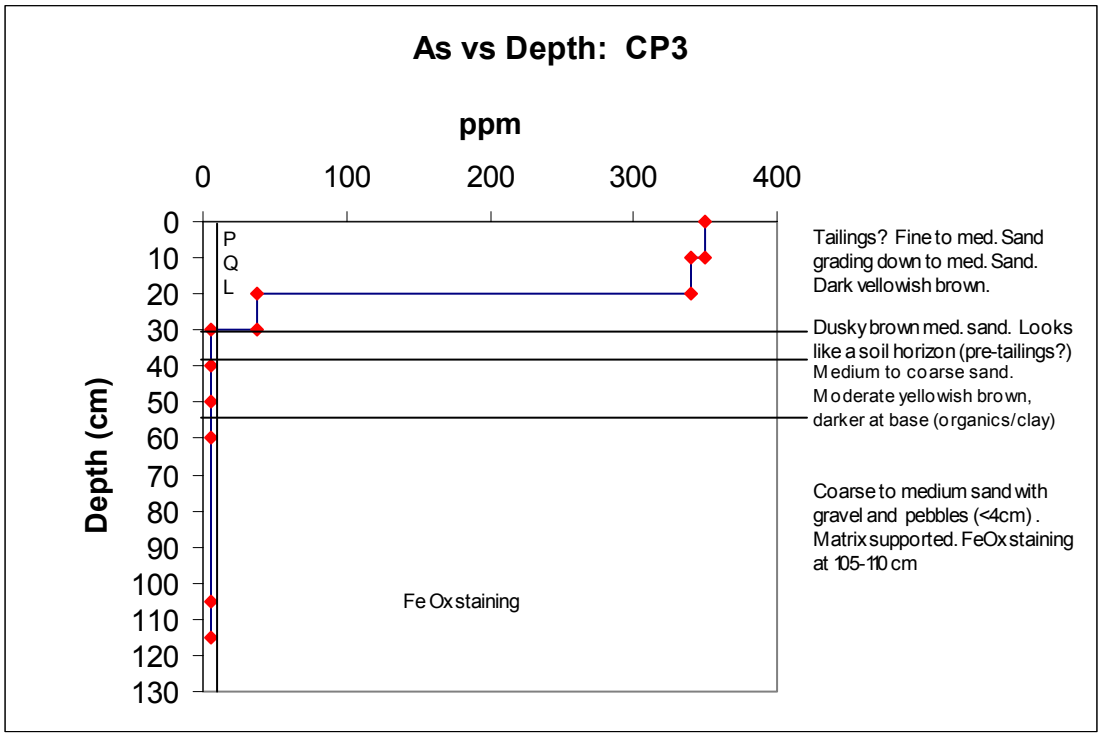

As vs Depth: CP2
ppm
0
200
400
600
800
1000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
Fe Ox staining
P
Q
L
Tailings? Fine to medium sand. Some laminations. Dark yellowish brown to gravish orange.
Dusky brown medium sand. Looks like a soil horizon (pre-tailings?). Two sticks (2 cm long) one horiz. one vert. at 22 cm.
Muddy coarse sand with pebbles (1-2 cm). Cohesive and sticky but with coarse sand in it. Darker.
Coarse to medium sand with gravel and pebbles (<7cm). Matrix supported until 120 cm where it becomes mostly pebbles and cobbles.

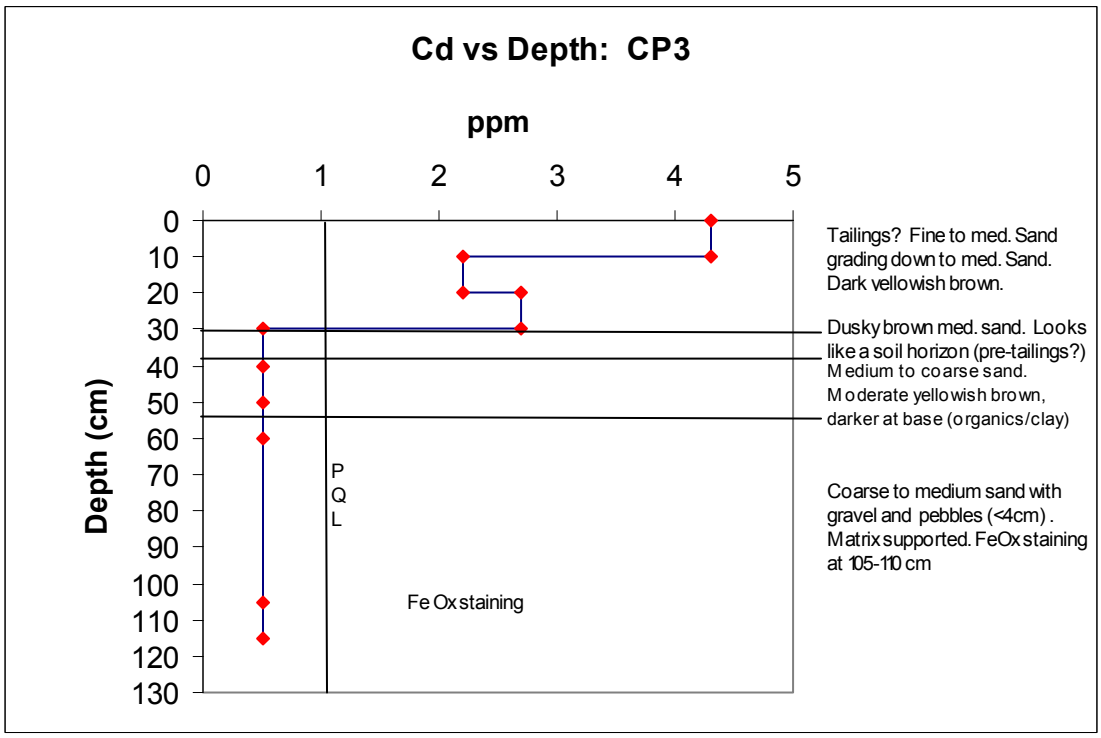

Cd vs Depth: CP2
ppm
0
2
4
6
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
P
Q
L
Fe Ox staining
Tailings? Fine to medium sand. Some laminations. Dark yellowish brown to oravish orange.
Dusky brown medium sand. Looks like a soil horizon (pre-tailings?). Two sticks (2 cm long) . at 22 cm.
Muddy coarse sand with pebbles (1-2 cm). Cohesive and sticky but with coarse sand in it. Darker.
Coarse to medium sand with gravel and pebbles (<7cm) . Matrix supported until 120 cm where it becomes mostly pebbles and cobbles.

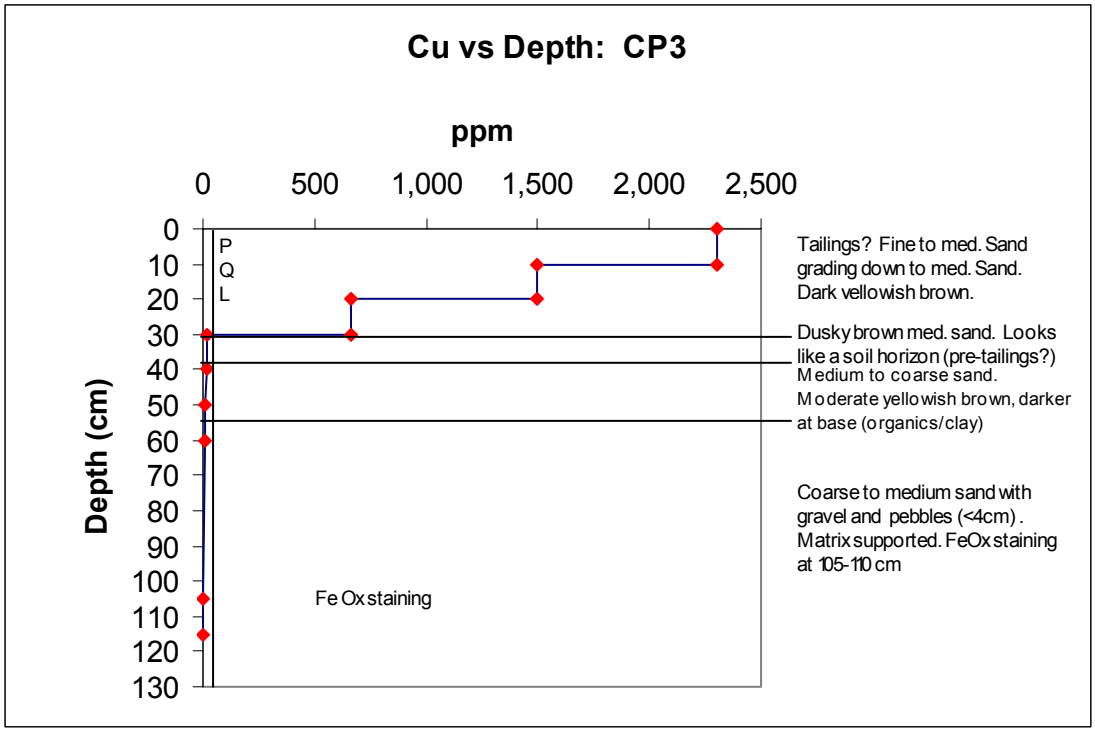

Cu vs Depth: CP2
ppm
0
1,000
2,000
3,000
4,000
5,000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
Fe Ox staining
Tailings? Fine to medium sand. Some laminations. Dark yellowish brown to oravish orange.
Dusky brown medium sand. Looks like a soil horizon (pre-tailings?). Two sticks (2 cm long) one horiz. one vert. at 22 cm.
Muddy coarse sand with pebbles (1-2 cm). Cohesive and sticky but with coarse sand in it. Darker.
Coarse to medium sand with gravel and pebbles (<7cm) . Matrix supported until 120 cm where it becomes mostly pebbles and cobbles.

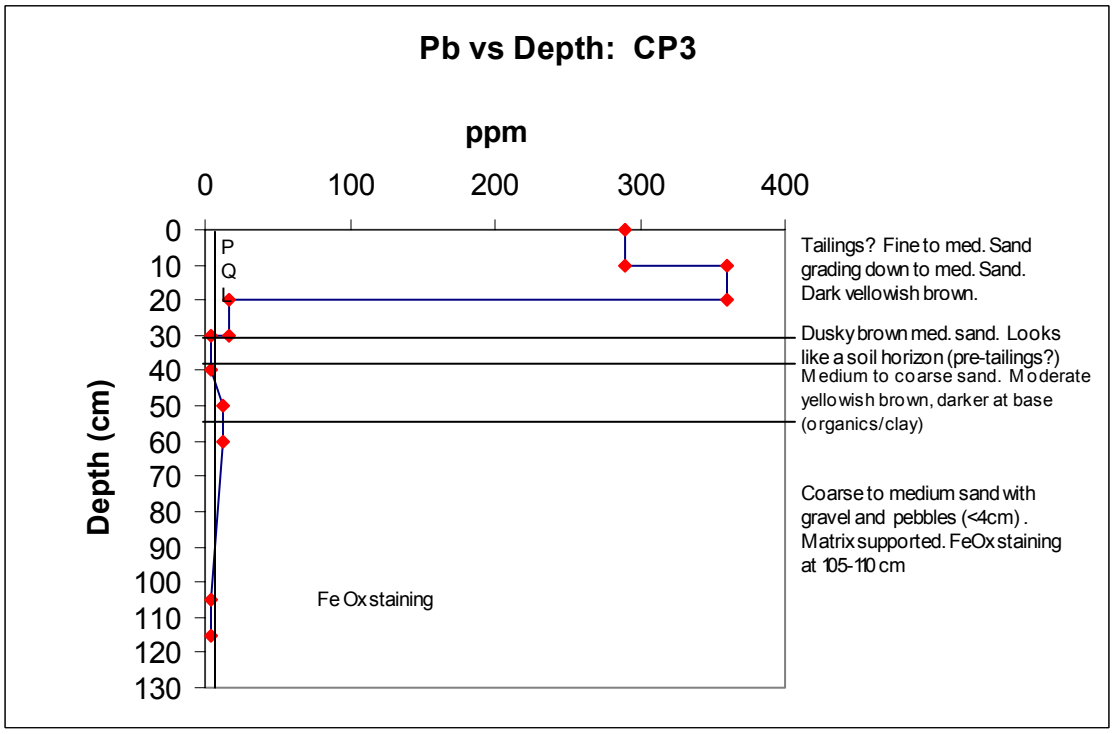

Pb vs Depth: CP2
ppm
0
500
1,000
1,500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
Fe Ox staining
Tailings? Fine to medium sand. Some laminations. Dark yellowish brown to oravish orange.
Dusky brown medium sand. Looks like a soil horizon (pre-tailings?). Two sticks (2 cm long) one horiz. one vert. at 22 cm.
Muddy coarse sand with pebbles (1-2 cm). Cohesive and sticky but with coarse sand in it. Darker.
Coarse to medium sand with gravel and pebbles (<7cm). Matrix supported until 120 cm where it becomes mostly pebbles and cobbles.

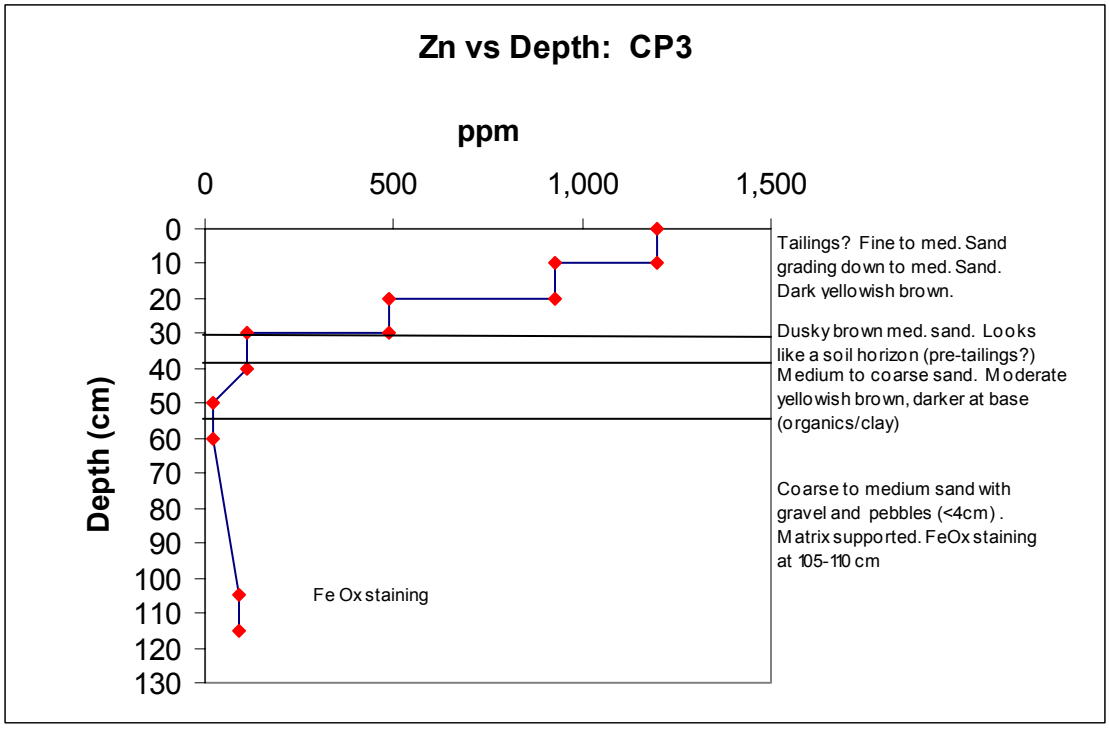

Zn vs Depth: CP2
ppm
0
500
1,000
1,500
2,000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
Fe Ox staining
Tailings? Fine to medium sand. Some laminations. Dark yellowish brown to oravish orange.
Dusky brown medium sand. Looks like a soil horizon (pre-tailings?). Two sticks (2 cm long) one horiz. one vert. at 22 cm.
Muddy coarse sand with pebbles (1-2 cm). Cohesive and sticky but with coarse sand in it. Darker.
Coarse to medium sand with gravel and pebbles (<7cm). Matrix supported until 120 cm where it becomes mostly pebbles and cobbles.

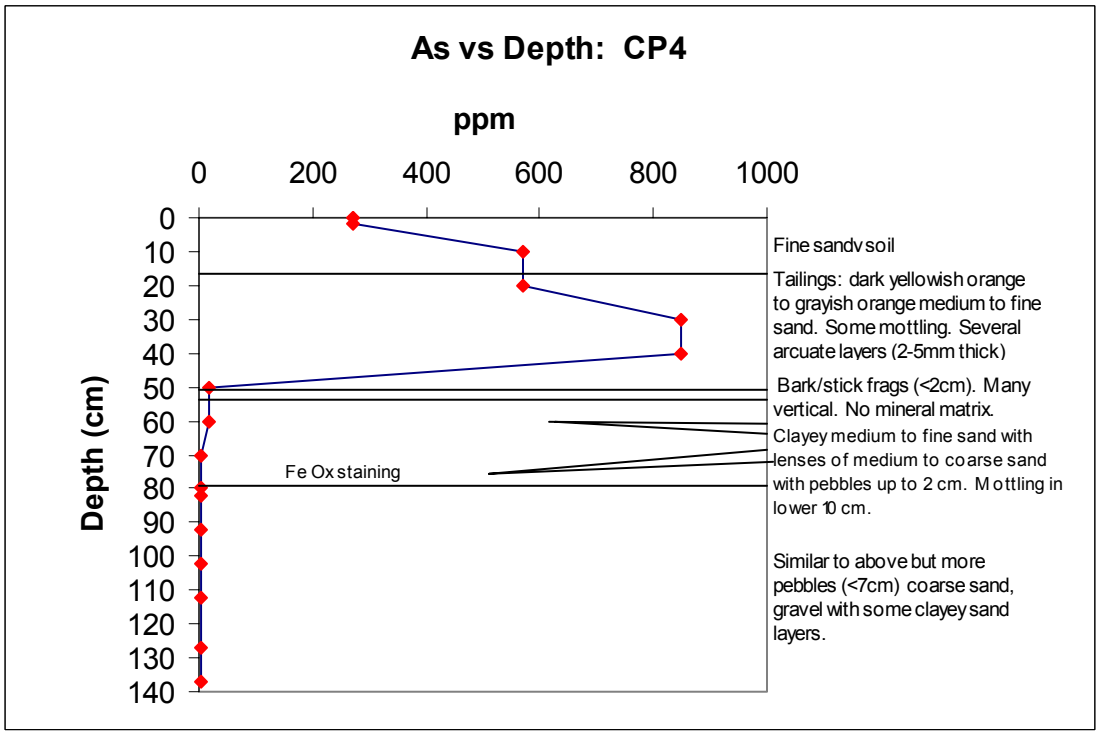

As vs Depth: CP3
ppm
0
100
200
300
400
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
P
Q
L
Fe Ox staining
Tailings? Fine to med. Sand grading down to med. Sand. Dark yellowish brown.
Dusky brown med. sand. Looks like a soil horizon (pre-tailings?)
Medium to coarse sand. Moderate yellowish brown, darker at base (organics/clay)
Coarse to medium sand with gravel and pebbles (<4cm). Matrix supported. FeOx staining at 105-110 cm

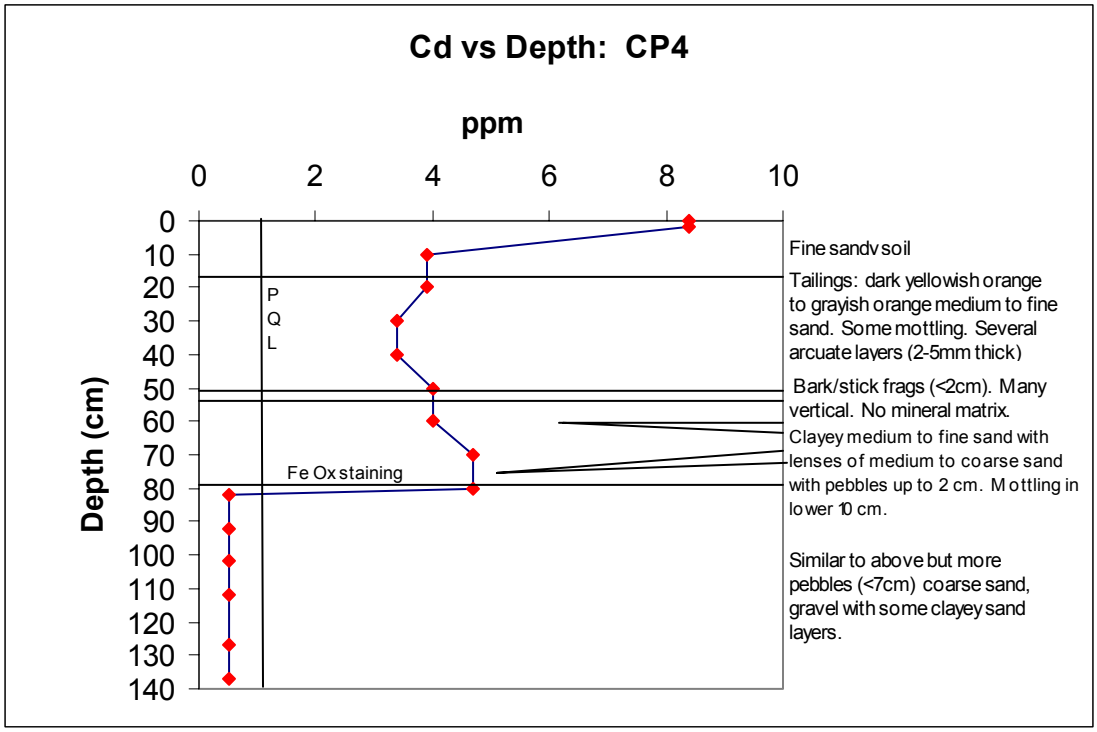

Cd vs Depth: CP3
ppm
0
1
2
3
4
5
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
P
Q
L
Fe Ox staining
Tailings? Fine to med. Sand grading down to med. Sand. Dark yellowish brown.
Dusky brown med. sand. Looks like a soil horizon (pre-tailings?)
Medium to coarse sand. Moderate yellowish brown, darker at base (organics/clay)
Coarse to medium sand with gravel and pebbles (<4cm). Matrix supported. FeOx staining at 105-110 cm

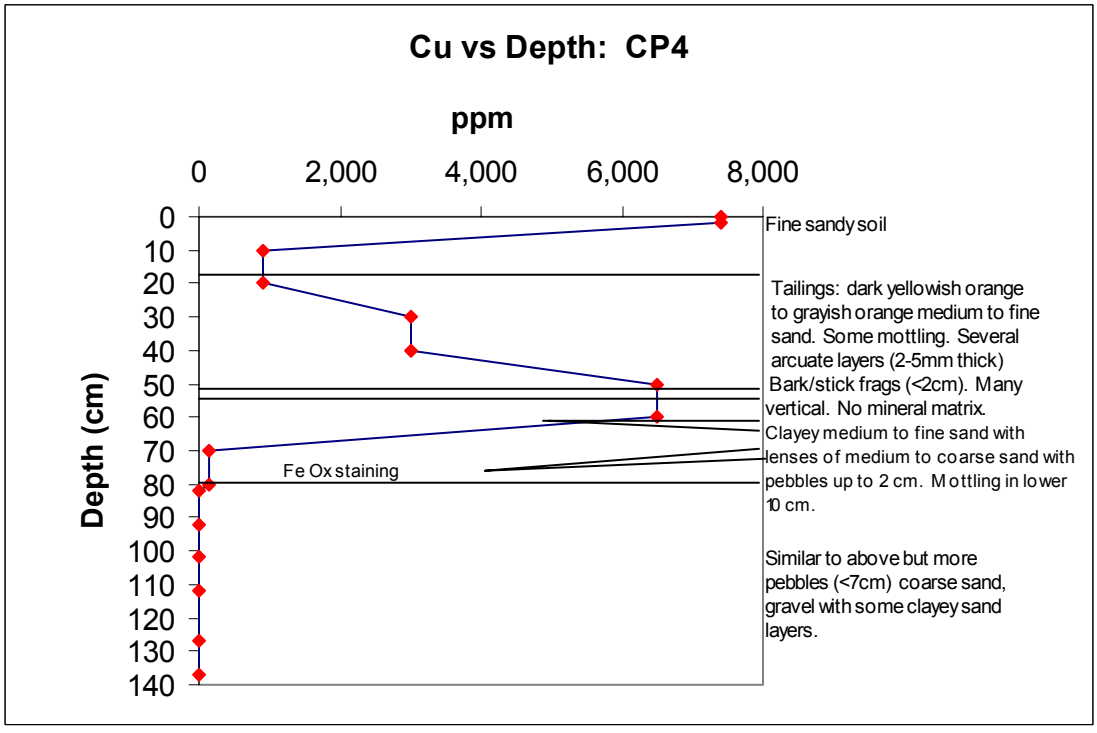

Cu vs Depth: CP3
ppm
0
500
1,000
1,500
2,000
2,500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
P
Q
L
Fe Ox staining
Tailings? Fine to med. Sand grading down to med. Sand. Dark yellowish brown.
Dusky brown med. sand. Looks like a soil horizon (pre-tailings?)
Medium to coarse sand. Moderate yellowish brown, darker at base (organics/clay)
Coarse to medium sand with gravel and pebbles (<4cm). Matrix supported. FeOx staining at 105-110 cm

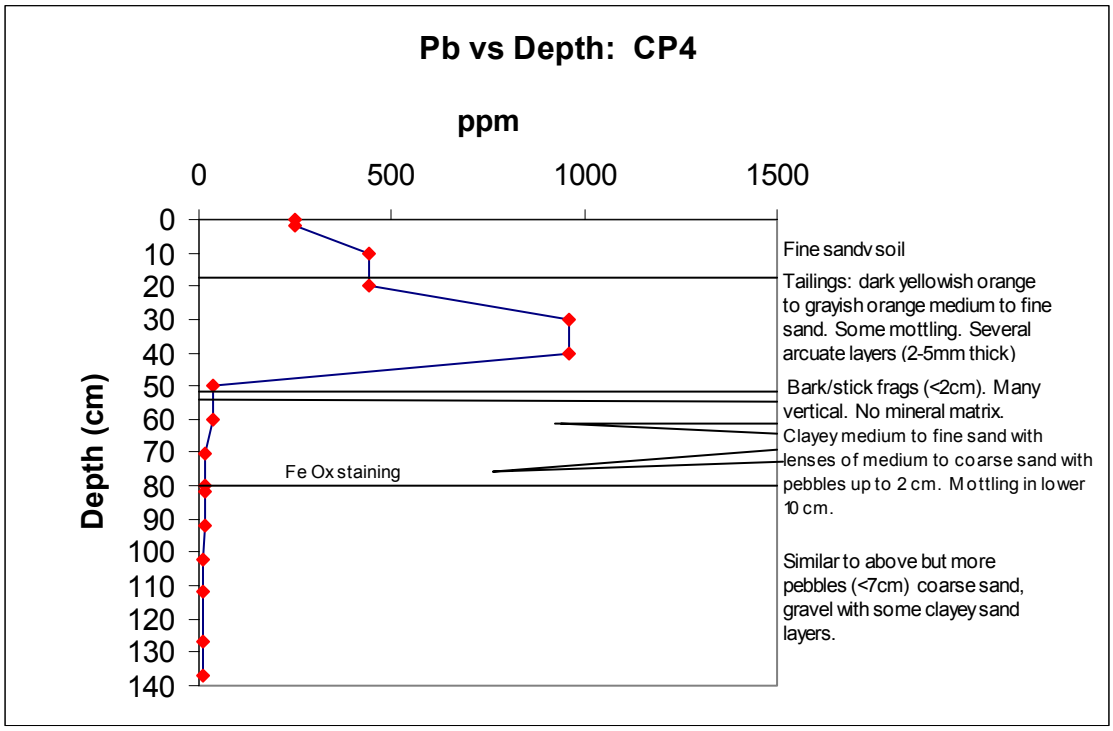

Pb vs Depth: CP3
ppm
0
100
200
300
400
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
P
Q
L
Fe Ox staining
Tailings? Fine to med. Sand grading down to med. Sand. Dark yellowish brown.
Dusky brown med. sand. Looks like a soil horizon (pre-tailings?)
Medium to coarse sand. Moderate yellowish brown, darker at base (organics/clay)
Coarse to medium sand with gravel and pebbles (<4cm). Matrix supported. FeOx staining at 105-110 cm

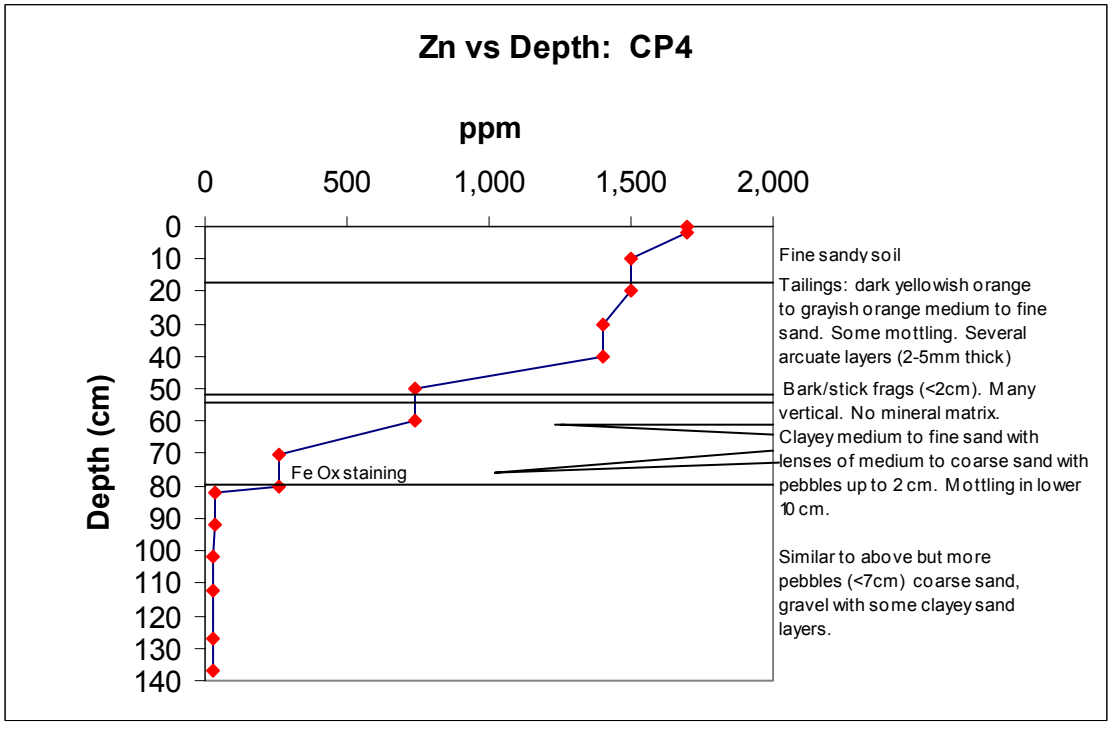

Zn vs Depth: CP3
ppm
0
500
1,000
1,500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
Fe Ox staining
Tailings? Fine to med. Sand grading down to med. Sand. Dark yellowish brown.
Dusky brown med. sand. Looks like a soil horizon (pre-tailings?)
Medium to coarse sand. Moderate yellowish brown, darker at base (organics/clay)
Coarse to medium sand with gravel and pebbles (<4cm). Matrix supported. FeOx staining at 105-110 cm

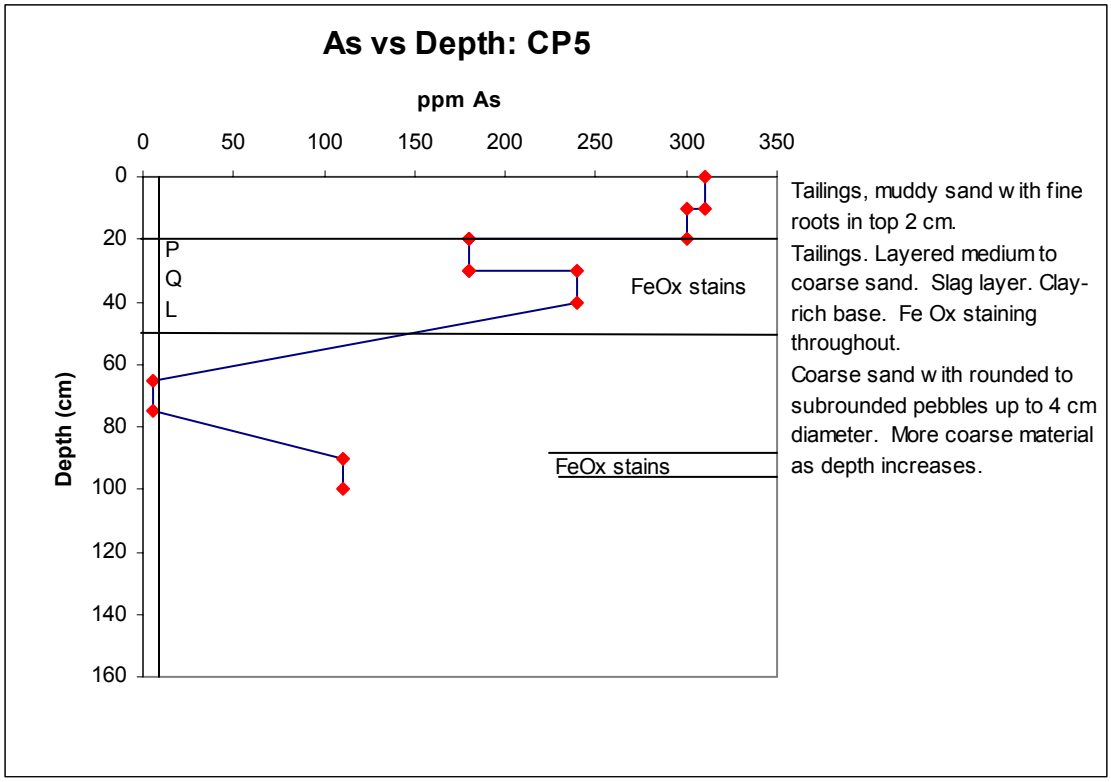

As vs Depth: CP4
ppm
0
200
400
600
800
1000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Fe Ox staining
Fine sandy soil
Tailings: dark yellowish orange to grayish orange medium to fine sand. Some mottling. Several arcuate layers (2-5mm thick)
Bark/stick frags (<2cm). Many vertical. No mineral matrix.
Clayey medium to fine sand with lenses of medium to coarse sand with pebbles up to 2 cm. Mottling in lower 10 cm.
Similar to above but more pebbles (<7cm) coarse sand, gravel with some clayey sand layers.

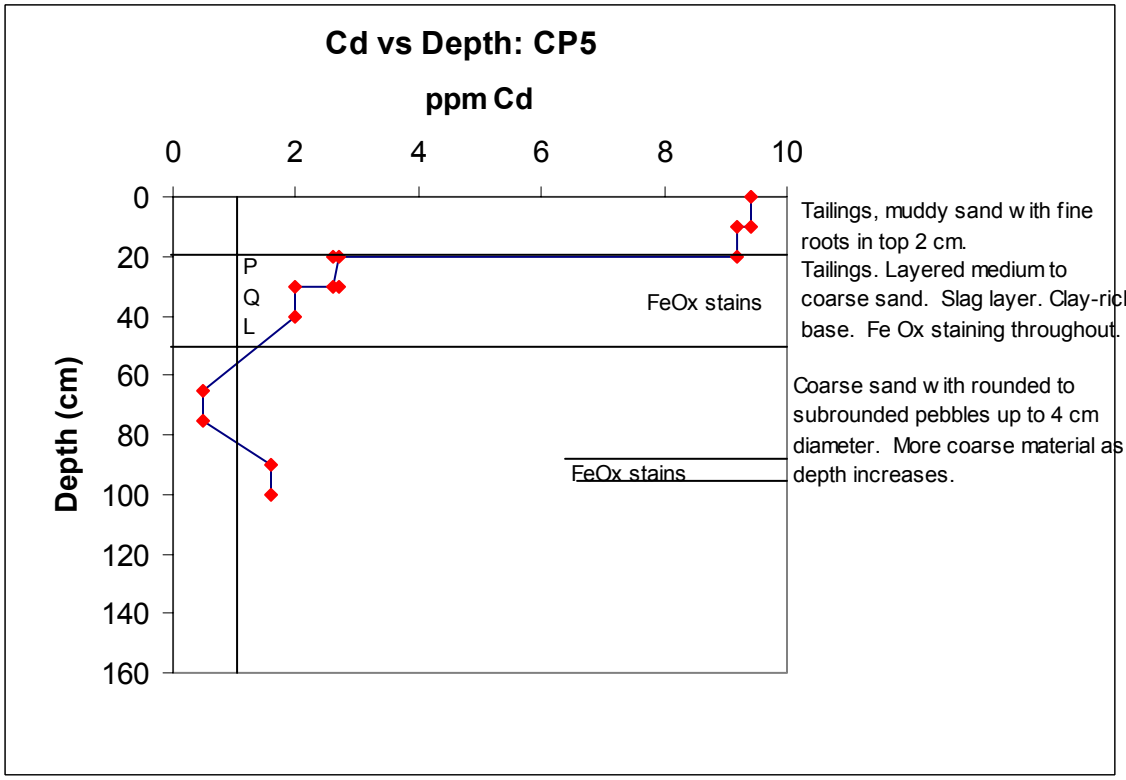

Cd vs Depth: CP4
ppm
0
2
4
6
8
10
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
P
Q
L
Fe Ox staining
Fine sandy soil
Tailings: dark yellowish orange to grayish orange medium to fine sand. Some mottling. Several arcuate layers (2-5mm thick)
Bark/stick frags (<2cm). Many vertical. No mineral matrix.
Clayey medium to fine sand with lenses of medium to coarse sand with pebbles up to 2 cm. Mottling in lower 10 cm.
Similar to above but more pebbles (<7cm) coarse sand, gravel with some clayey sand layers.

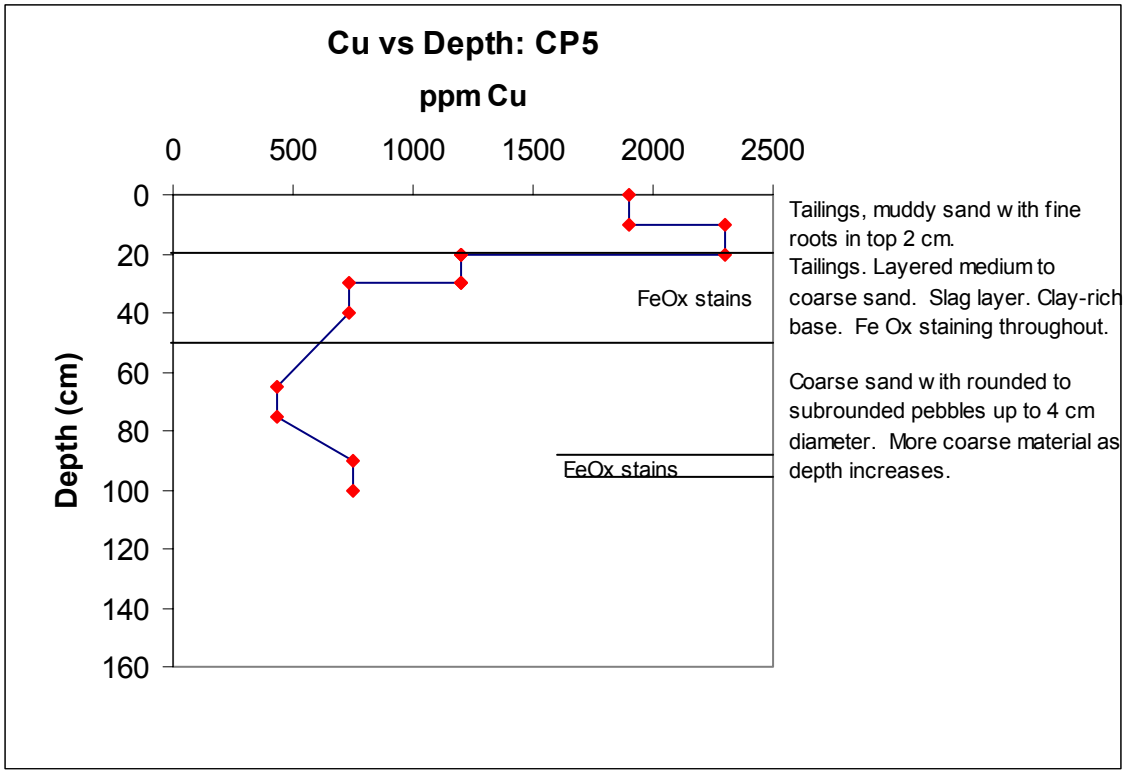

Cu vs Depth: CP4
ppm
0
2,000
4,000
6,000
8,000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Fe Ox staining
Fine sandy soil
Tailings: dark yellowish orange to grayish orange medium to fine sand. Some mottling. Several arcuate layers (2-5mm thick)
Bark/stick frags (<2cm). Many vertical. No mineral matrix.
Clayey medium to fine sand with lenses of medium to coarse sand with pebbles up to 2 cm. Mottling in lower 10 cm.
Similar to above but more pebbles (<7cm) coarse sand, gravel with some clayey sand layers.

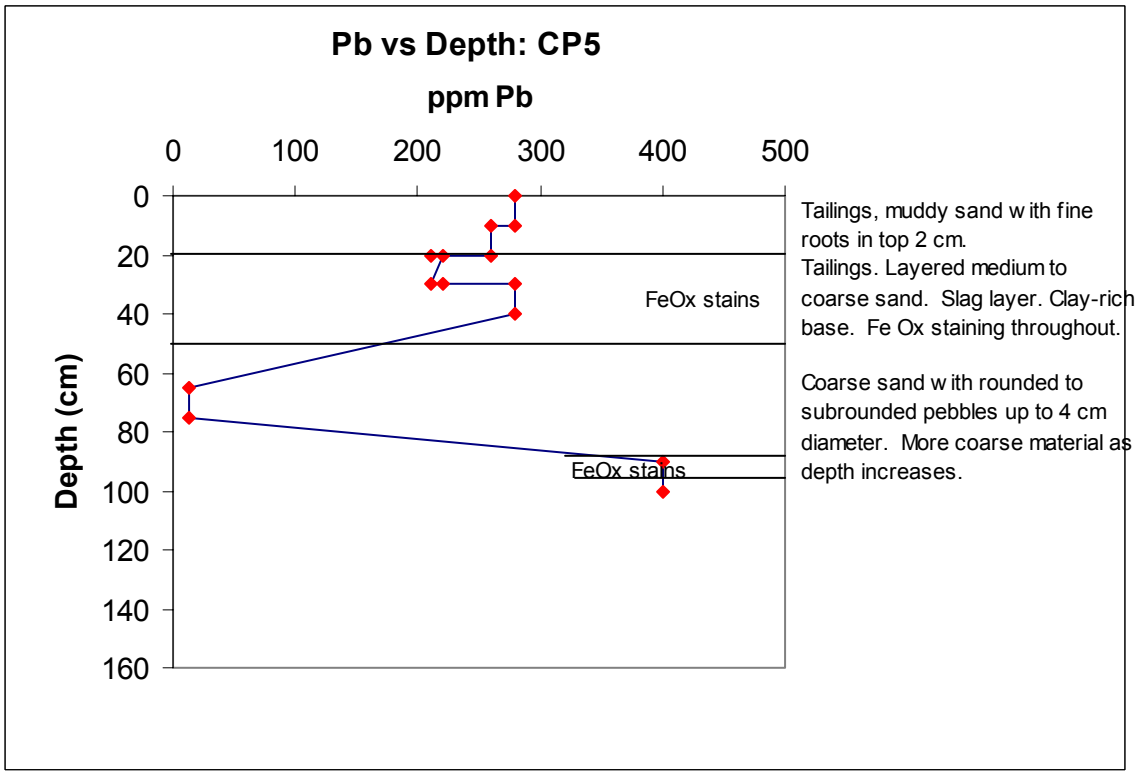

Pb vs Depth: CP4
ppm
0
500
1000
1500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Fe Ox staining
Fine sandy soil
Tailings: dark yellowish orange to grayish orange medium to fine sand. Some mottling. Several arcuate layers (2-5mm thick)
Bark/stick frags (<2cm). Many vertical. No mineral matrix.
Clayey medium to fine sand with lenses of medium to coarse sand with pebbles up to 2 cm. Mottling in lower 10 cm.
Similar to above but more pebbles (<7cm) coarse sand, gravel with some clayey sand layers.

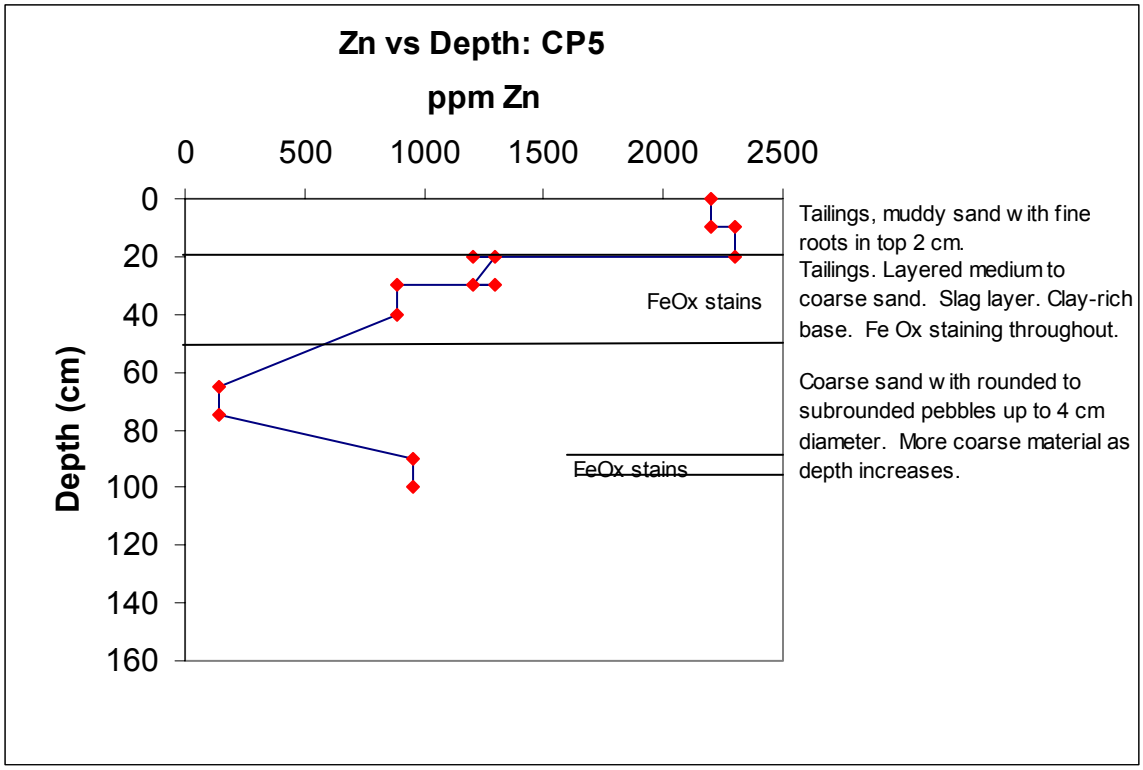

Zn vs Depth: CP4
ppm
0
500
1,000
1,500
2,000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Fe Ox staining
Fine sandy soil
Tailings: dark yellowish orange to grayish orange medium to fine sand. Some mottling. Several arcuate layers (2-5mm thick)
Bark/stick frags (<2cm). Many vertical. No mineral matrix.
Clayey medium to fine sand with lenses of medium to coarse sand with pebbles up to 2 cm. Mottling in lower 10 cm.
Similar to above but more pebbles (<7cm) coarse sand, gravel with some clayey sand layers.

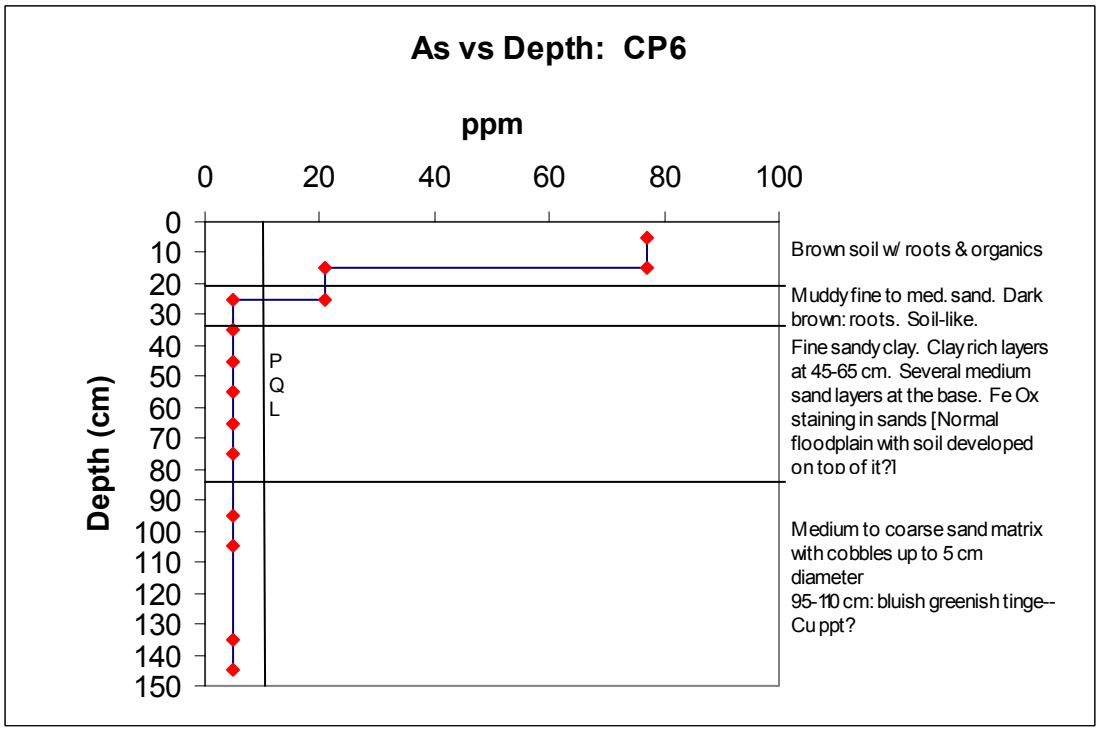

As vs Depth: CP5
ppm As
0
50
100
150
200
250
300
350
Depth (cm)
0
20
40
60
80
100
120
140
160
P
Q
L
FeOx stains
FeOx stains
Tailings, muddy sand with fine roots in top 2 cm.
Tailings. Layered medium to coarse sand. Slag layer. Clay-rich base. Fe Ox staining throughout.
Coarse sand with rounded to subrounded pebbles up to 4 cm diameter. More coarse material as depth increases.

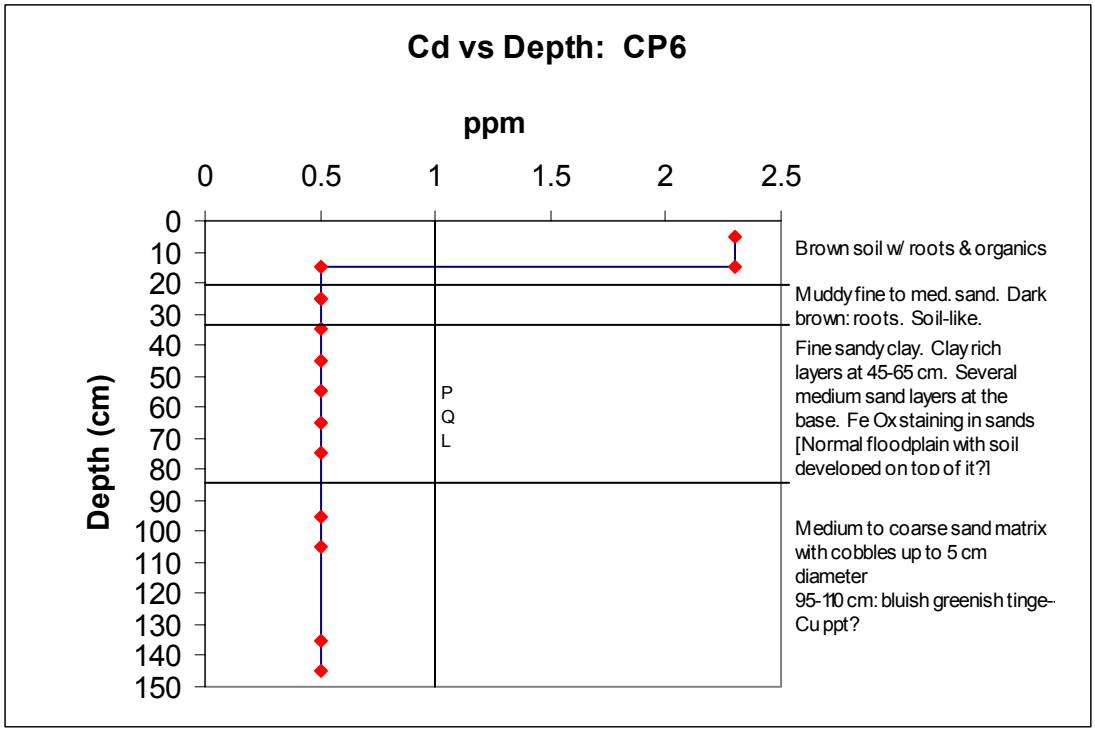

Cd vs Depth: CP5
ppm Cd
0
2
4
6
8
10
Depth (cm)
0
20
40
60
80
100
120
140
160
P
Q
L
FeOx stains
FeOx stains
Tailings, muddy sand with fine roots in top 2 cm.
Tailings. Layered medium to coarse sand. Slag layer. Clay-rich base. Fe Ox staining throughout.
Coarse sand with rounded to subrounded pebbles up to 4 cm diameter. More coarse material as depth increases.

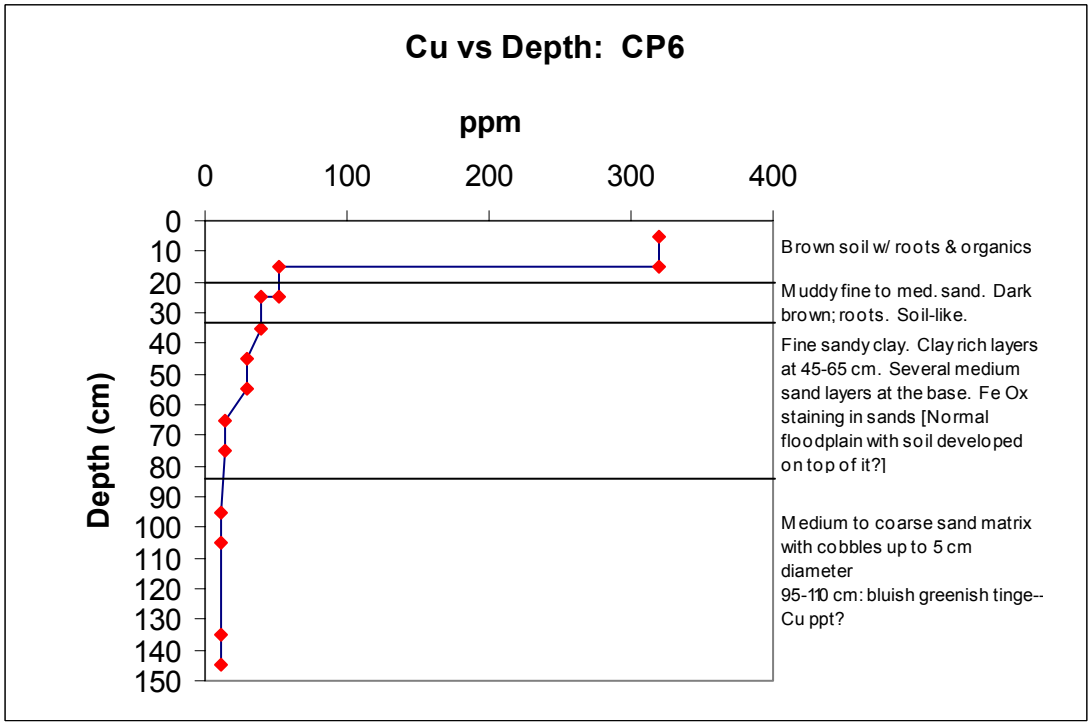

Cu vs Depth: CP5
ppm Cu
0
500
1000
1500
2000
2500
Depth (cm)
0
20
40
60
80
100
120
140
160
FeOx stains
FeOx stains
Tailings, muddy sand with fine roots in top 2 cm.
Tailings. Layered medium to coarse sand. Slag layer. Clay-rich base. Fe Ox staining throughout.
Coarse sand with rounded to subrounded pebbles up to 4 cm diameter. More coarse material as depth increases.

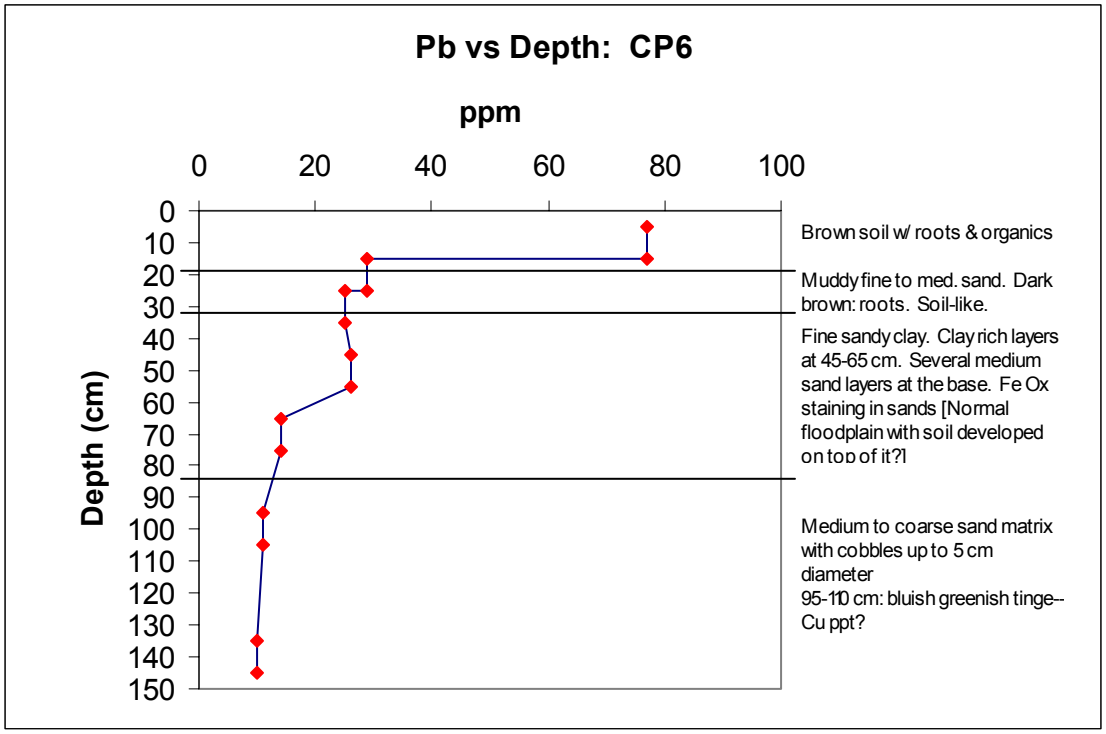

Pb vs Depth: CP5
ppm Pb
0
100
200
300
400
500
Depth (cm)
0
20
40
60
80
100
120
140
160
FeOx stains
FeOx stains
Tailings, muddy sand with fine roots in top 2 cm.
Tailings. Layered medium to coarse sand. Slag layer. Clay-rich base. Fe Ox staining throughout.
Coarse sand with rounded to subrounded pebbles up to 4 cm diameter. More coarse material as depth increases.

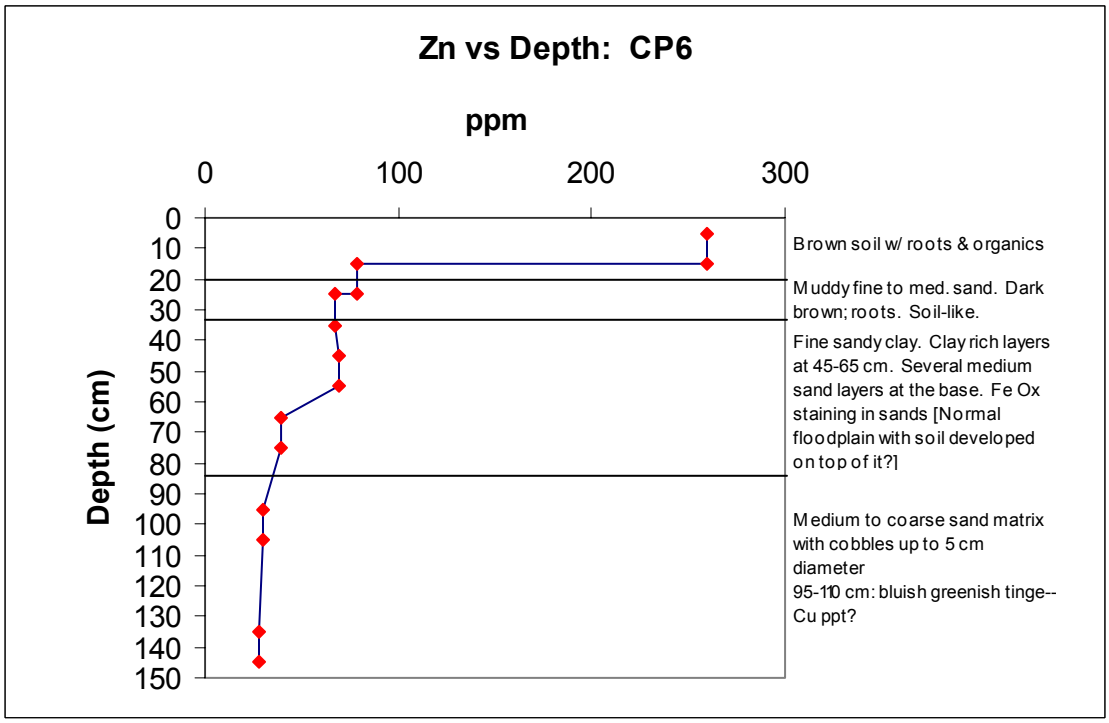

Zn vs Depth: CP5
ppm Zn
0
500
1000
1500
2000
2500
Depth (cm)
0
20
40
60
80
100
120
140
160
FeOx stains
FeOx stains
Tailings, muddy sand with fine roots in top 2 cm.
Tailings. Layered medium to coarse sand. Slag layer. Clay-rich base. Fe Ox staining throughout.
Coarse sand with rounded to subrounded pebbles up to 4 cm diameter. More coarse material as depth increases.

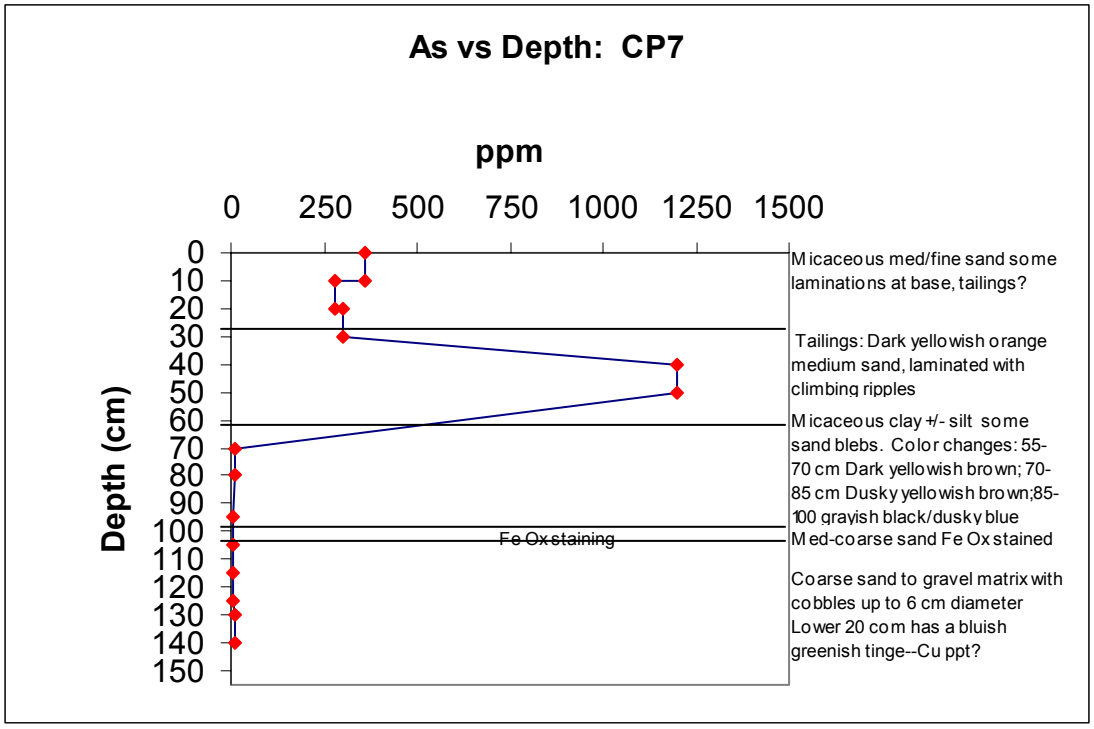

As vs Depth: CP6
ppm
0
20
40
60
80
100
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
P
Q
L
Brown soil w/ roots & organics
Muddy fine to med. sand. Dark brown: roots. Soil-like.
Fine sandy clay. Clay rich layers at 45-65 cm. Several medium sand layers at the base. Fe Ox staining in sands [Normal floodplain with soil developed on top of it?]
Medium to coarse sand matrix with cobbles up to 5 cm diameter
95-110 cm: bluish greenish tinge--Cu ppt?

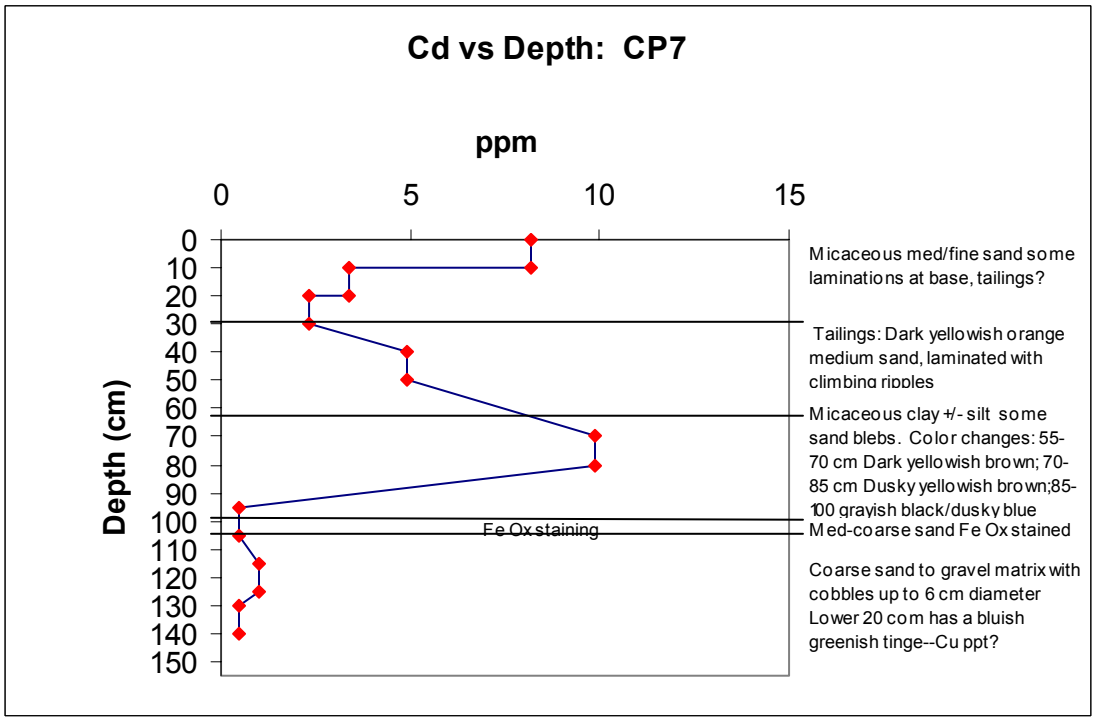

Cd vs Depth: CP6
ppm
0
0.5
1
1.5
2
2.5
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
P
Q
L
Brown soil w/ roots & organics
Muddy fine to med. sand. Dark brown: roots. Soil-like.
Fine sandy clay. Clay rich layers at 45-65 cm. Several medium sand layers at the base. Fe Ox staining in sands [Normal floodplain with soil developed on top of it?]
Medium to coarse sand matrix with cobbles up to 5 cm diameter
95-110 cm: bluish greenish tinge-- Cu ppt?

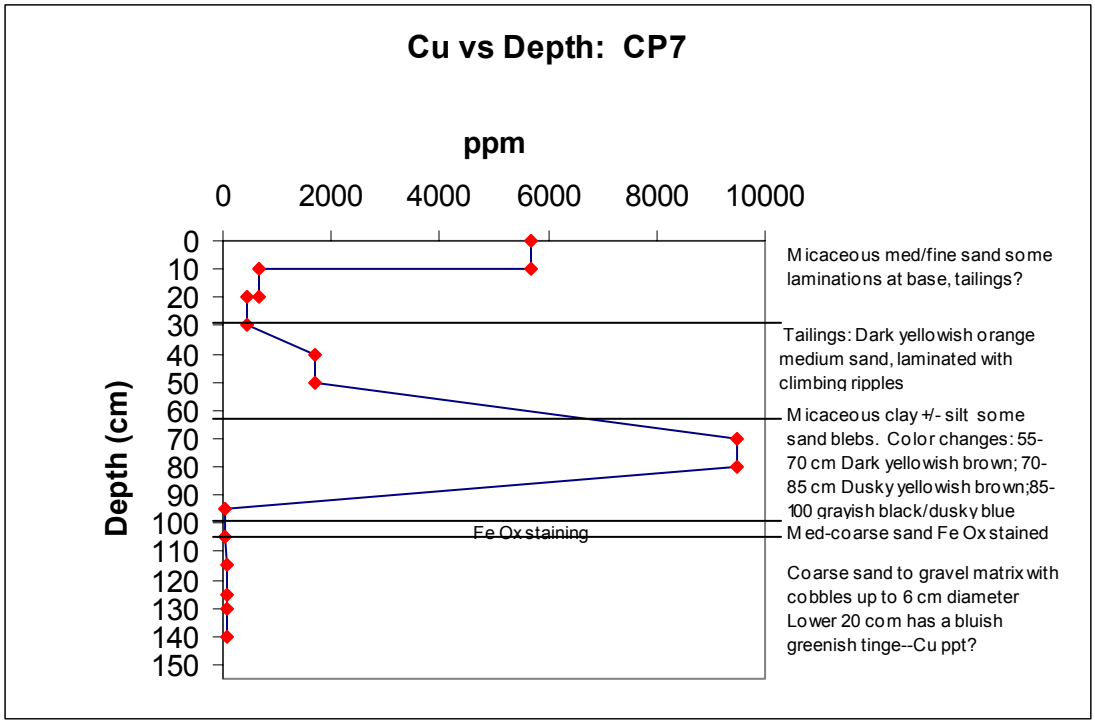

Cu vs Depth: CP6
ppm
0
100
200
300
400
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Brown soil w/ roots & organics
Muddy fine to med. sand. Dark brown; roots. Soil-like.
Fine sandy clay. Clay rich layers at 45-65 cm. Several medium sand layers at the base. Fe Ox staining in sands [Normal floodplain with soil developed on top of it?]
Medium to coarse sand matrix with cobbles up to 5 cm diameter
95-110 cm: bluish greenish tinge-- Cu ppt?

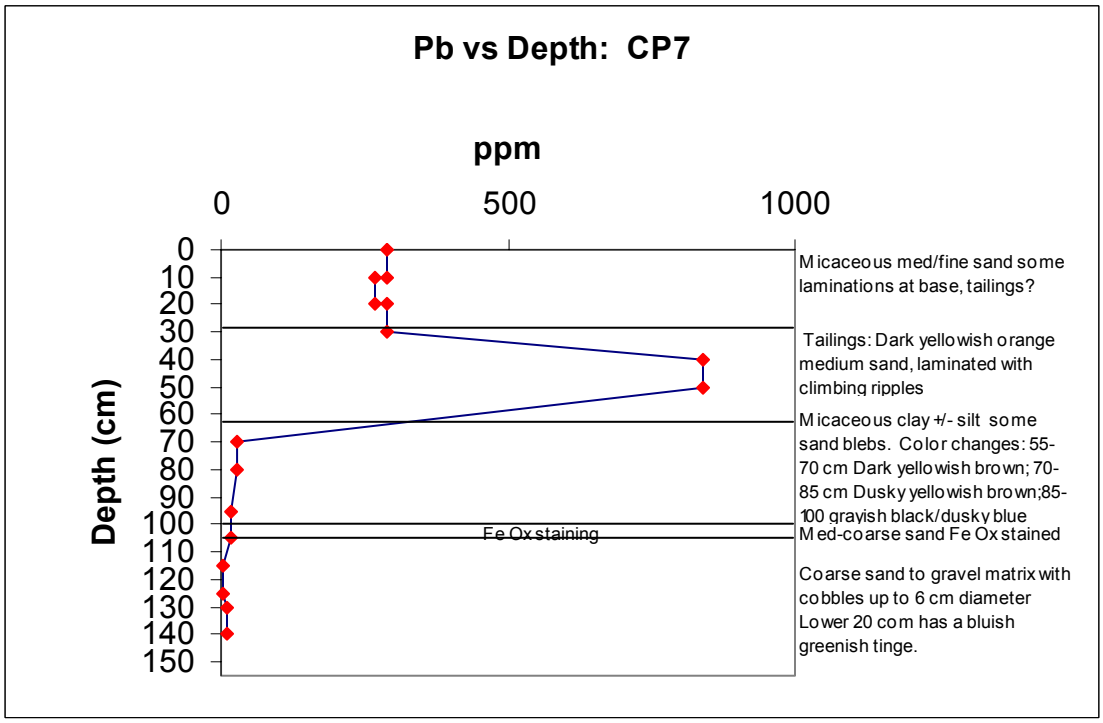

Pb vs Depth: CP6
ppm
0
20
40
60
80
100
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Brown soil w/ roots & organics
Muddy fine to med. sand. Dark brown: roots. Soil-like.
Fine sandy clay. Clay rich layers at 45-65 cm. Several medium sand layers at the base. Fe Ox staining in sands [Normal floodplain with soil developed on top of it?]
Medium to coarse sand matrix with cobbles up to 5 cm diameter
95-110 cm: bluish greenish tinge--Cu ppt?

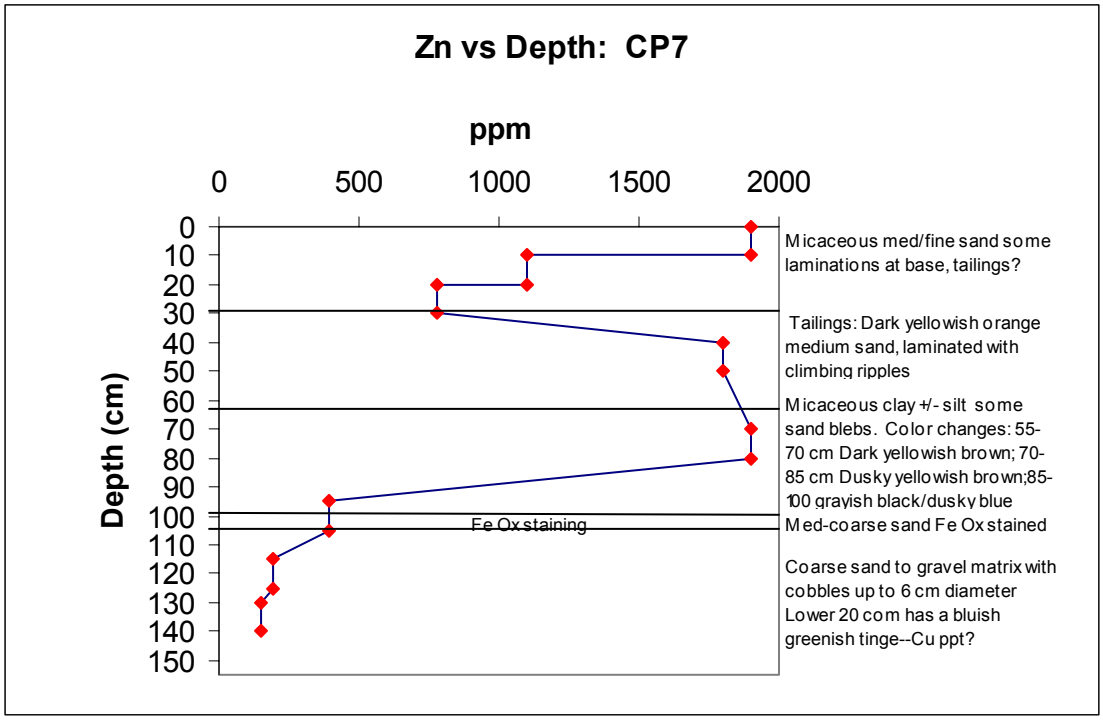

Zn vs Depth: CP6
ppm
0
100
200
300
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Brown soil w/ roots & organics
Muddy fine to med. sand. Dark brown; roots. Soil-like.
Fine sandy clay. Clay rich layers at 45-65 cm. Several medium sand layers at the base. Fe Ox staining in sands [Normal floodplain with soil developed on top of it?]
Medium to coarse sand matrix with cobbles up to 5 cm diameter
95-110 cm: bluish greenish tinge--Cu ppt?

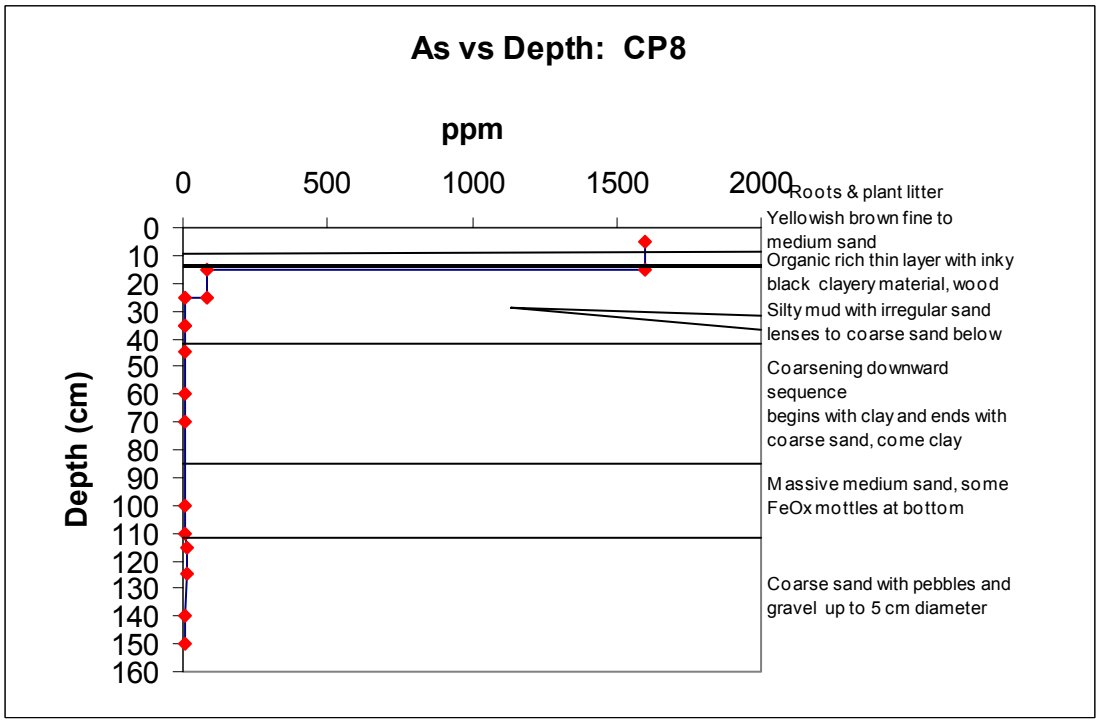

As vs Depth: CP7
ppm
0
250
500
750
1000
1250
1500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Micaceous med/fine sand some laminations at base, tailings?
Tailings: Dark yellowish orange medium sand, laminated with climbing ripples
Micaceous clay +/- silt some sand blebs. Color changes: 55-70 cm Dark yellowish brown; 70-85 cm Dusky yellowish brown;85-100 grayish black/dusky blue
Fe Ox staining
Med-coarse sand Fe Ox stained
Coarse sand to gravel matrix with cobbles up to 6 cm diameter Lower 20 com has a bluish greenish tinge--Cu ppt?

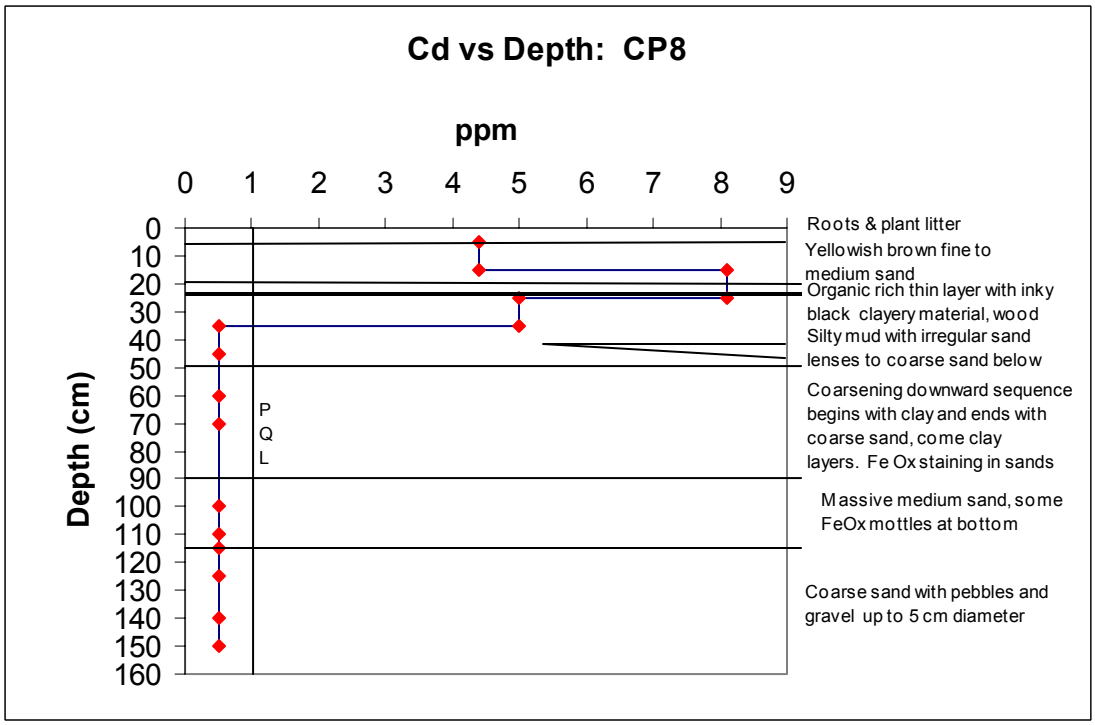

Cd vs Depth: CP7
ppm
0
5
10
15
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Micaceous med/fine sand some laminations at base, tailings?
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Micaceous clay +/- silt some sand blebs. Color changes: 55-70 cm Dark yellowish brown; 70-85 cm Dusky yellowish brown;85-100 grayish black/dusky blue
Fe Ox staining
Med-coarse sand Fe Ox stained
Coarse sand to gravel matrix with cobbles up to 6 cm diameter Lower 20 com has a bluish greenish tinge--Cu ppt?

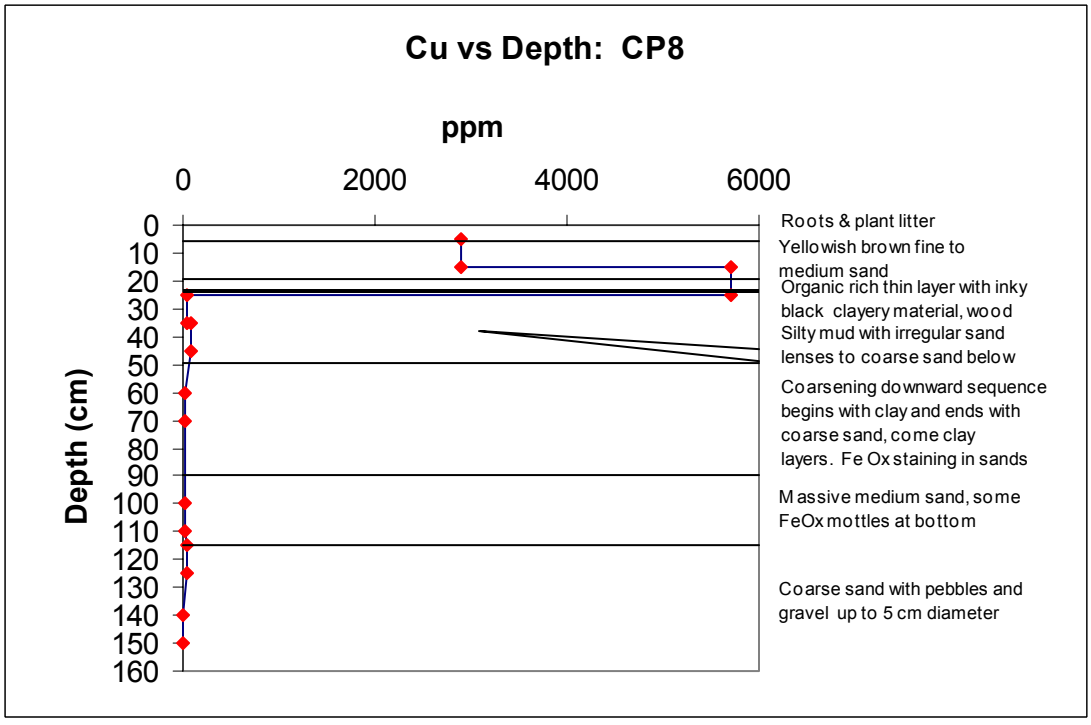

Cu vs Depth: CP7
ppm
0
2000
4000
6000
8000
10000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Micaceous med/fine sand some laminations at base, tailings?
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Fe Ox staining
Med-coarse sand Fe Ox stained
Coarse sand to gravel matrix with cobbles up to 6 cm diameter Lower 20 com has a bluish greenish tinge--Cu ppt?

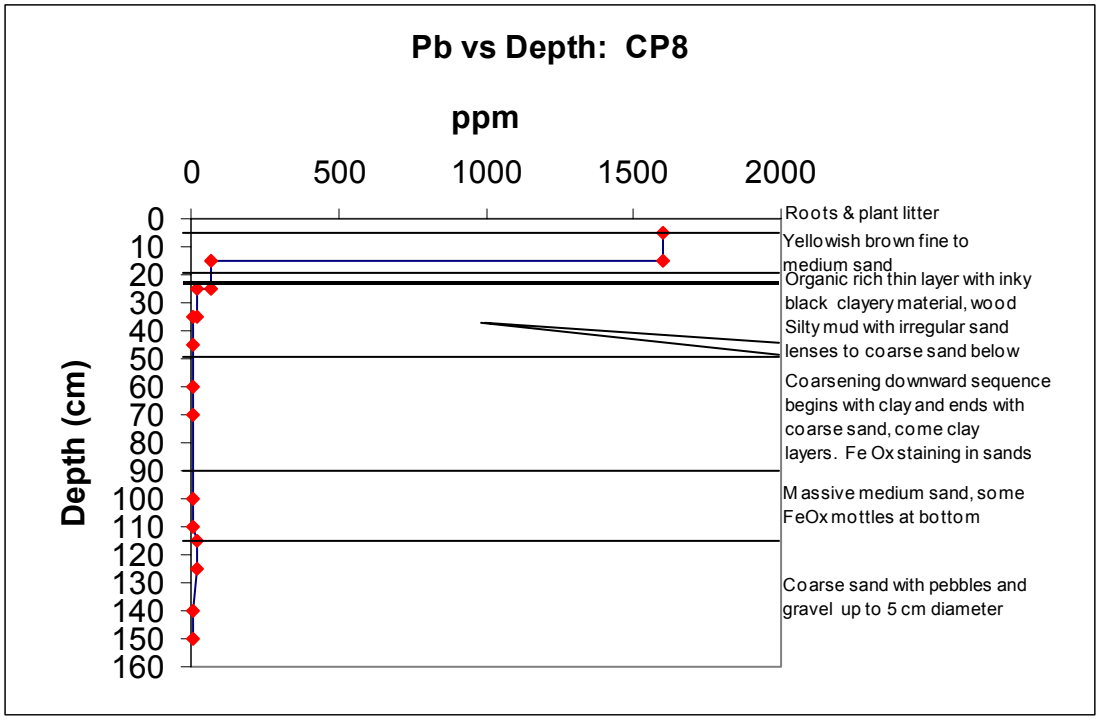

Pb vs Depth: CP7
ppm
0
500
1000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Micaceous med/fine sand some laminations at base, tailings?
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Fe Ox staining
Med-coarse sand Fe Ox stained
Coarse sand to gravel matrix with cobbles up to 6 cm diameter Lower 20 com has a bluish greenish tinge.

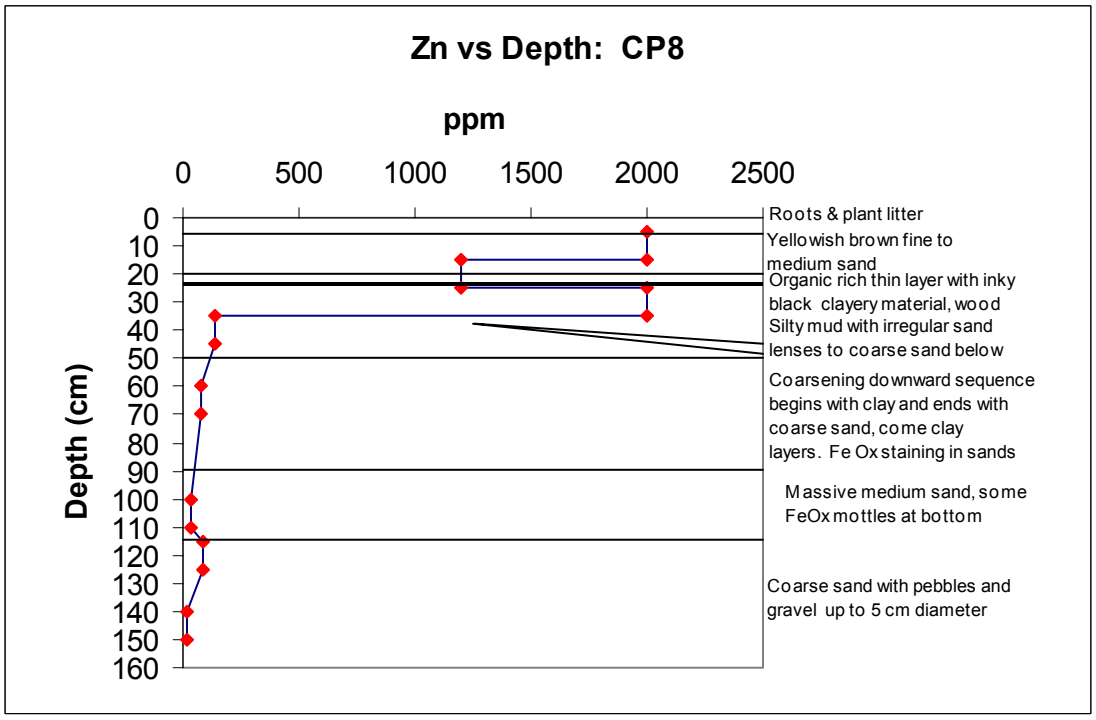

Zn vs Depth: CP7
ppm
0
500
1000
1500
2000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Micaceous med/fine sand some laminations at base, tailings?
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Med-coarse sand Fe Ox stained
Coarse sand to gravel matrix with cobbles up to 6 cm diameter Lower 20 com has a bluish greenish tinge--Cu ppt?

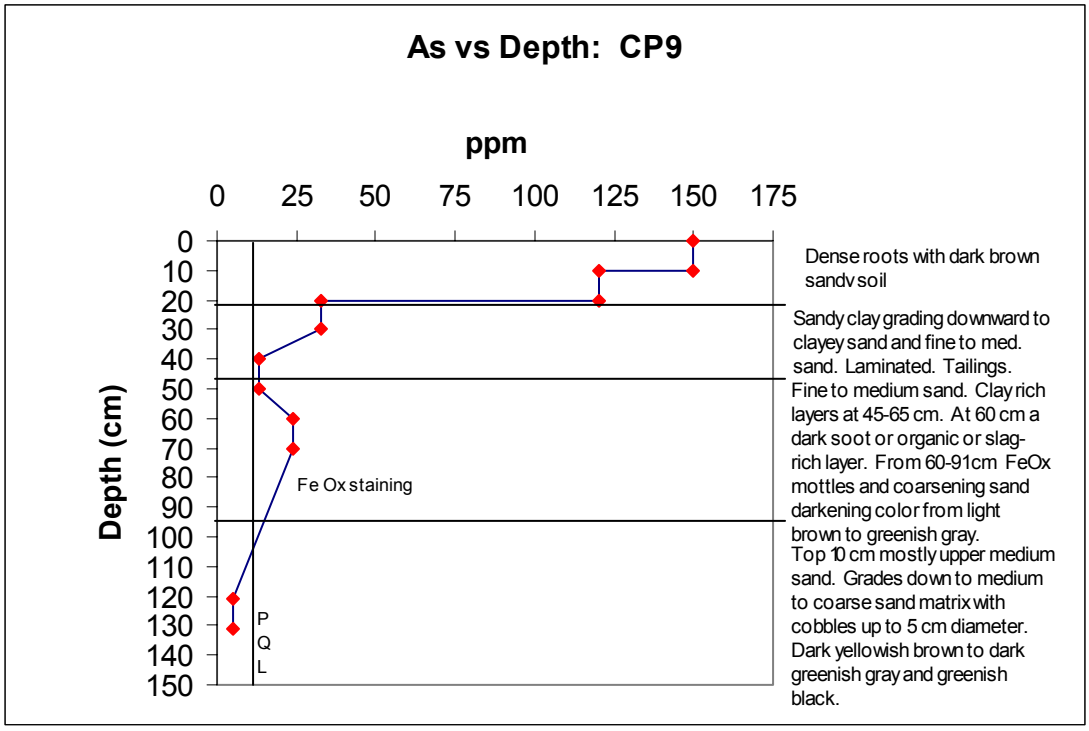

As vs Depth: CP8
ppm
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500
1000
1500
2000
Depth (cm)
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10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
Roots & plant litter
Yellowish brown fine to medium sand
Organic rich thin layer with inky black clayery material, wood
Silty mud with irregular sand lenses to coarse sand below
Coarsening downward sequence
begins with clay and ends with coarse sand, come clay
Massive medium sand, some FeOx mottles at bottom
Coarse sand with pebbles and gravel up to 5 cm diameter

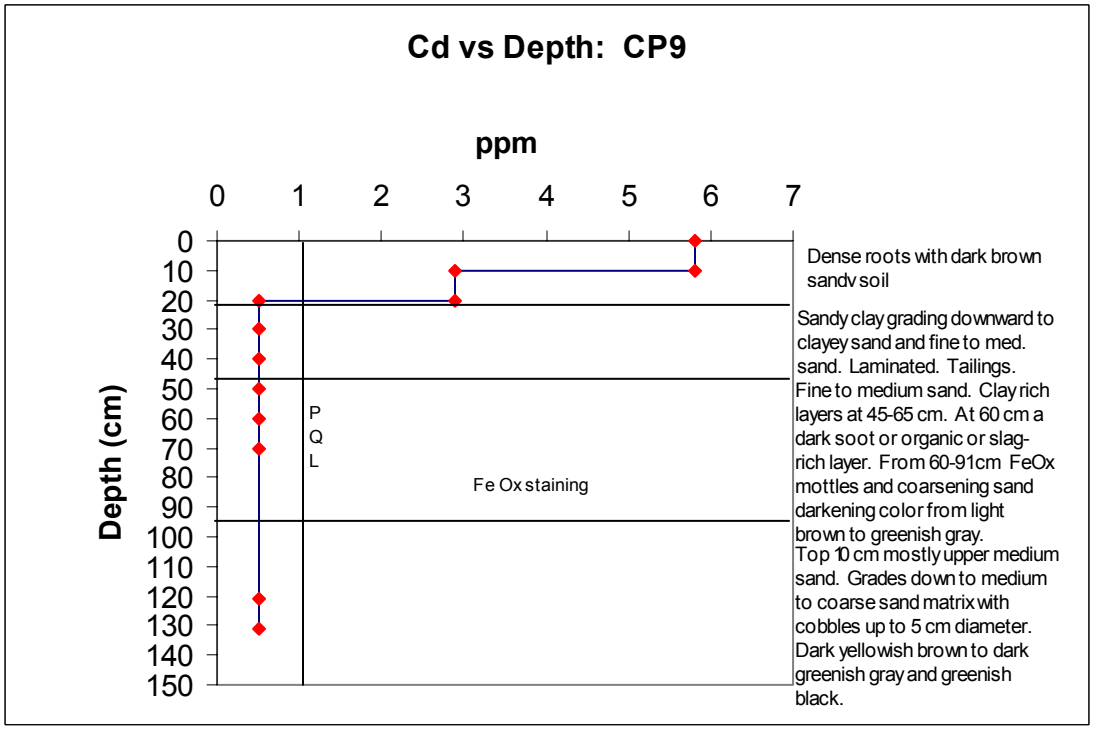

Cd vs Depth: CP8
ppm
0 1 2 3 4 5 6 7 8 9
Depth (cm)
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
P
Q
L
Roots & plant litter
Yellowish brown fine to medium sand
Organic rich thin layer with inky black clayery material, wood
Silty mud with irregular sand lenses to coarse sand below
Coarsening downward sequence begins with clay and ends with coarse sand, come clay layers. Fe Ox staining in sands
Massive medium sand, some FeOx mottles at bottom
Coarse sand with pebbles and gravel up to 5 cm diameter

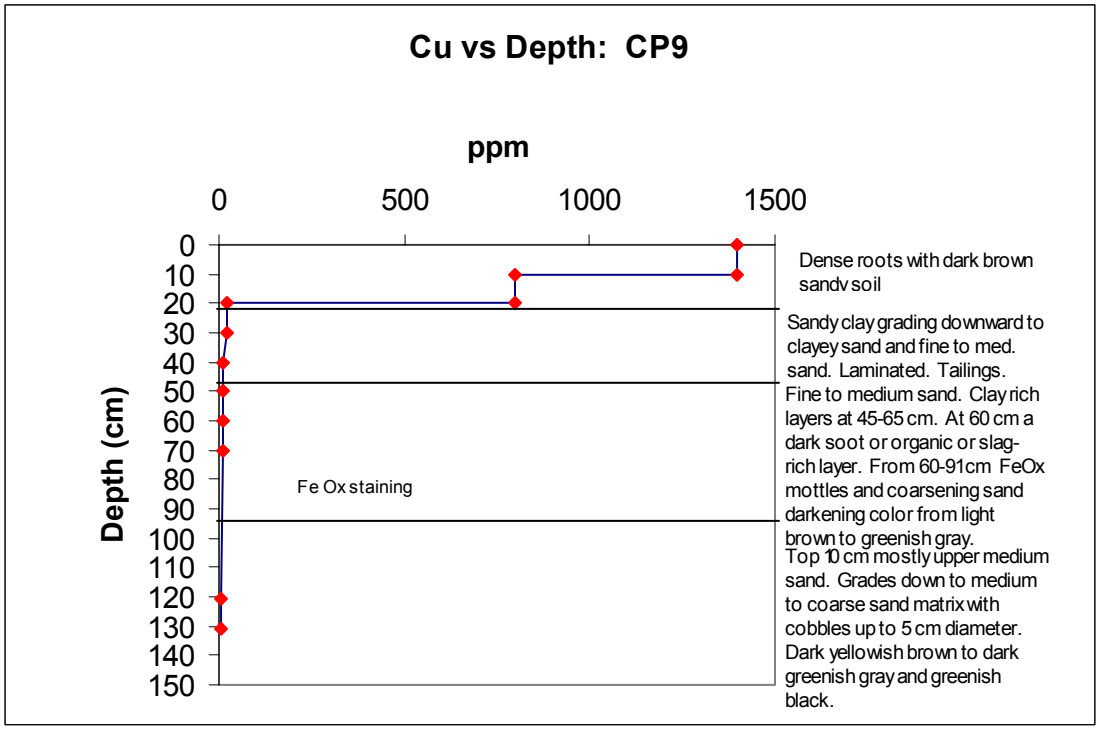

Cu vs Depth: CP8
ppm
0 2000 4000 6000
Depth (cm)
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
Roots & plant litter
Yellowish brown fine to medium sand
Organic rich thin layer with inky black clayery material, wood
Silty mud with irregular sand lenses to coarse sand below
Coarsening downward sequence begins with clay and ends with coarse sand, come clay layers. Fe Ox staining in sands
Massive medium sand, some FeOx mottles at bottom
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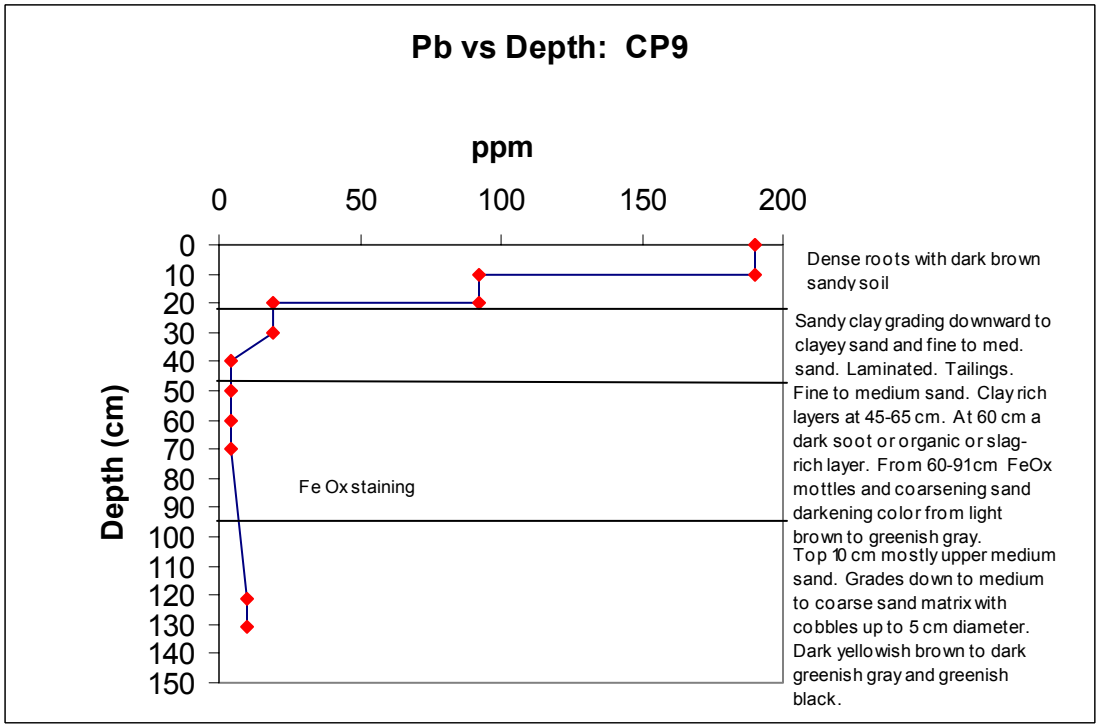

Pb vs Depth: CP8
ppm
0
500
1000
1500
2000
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
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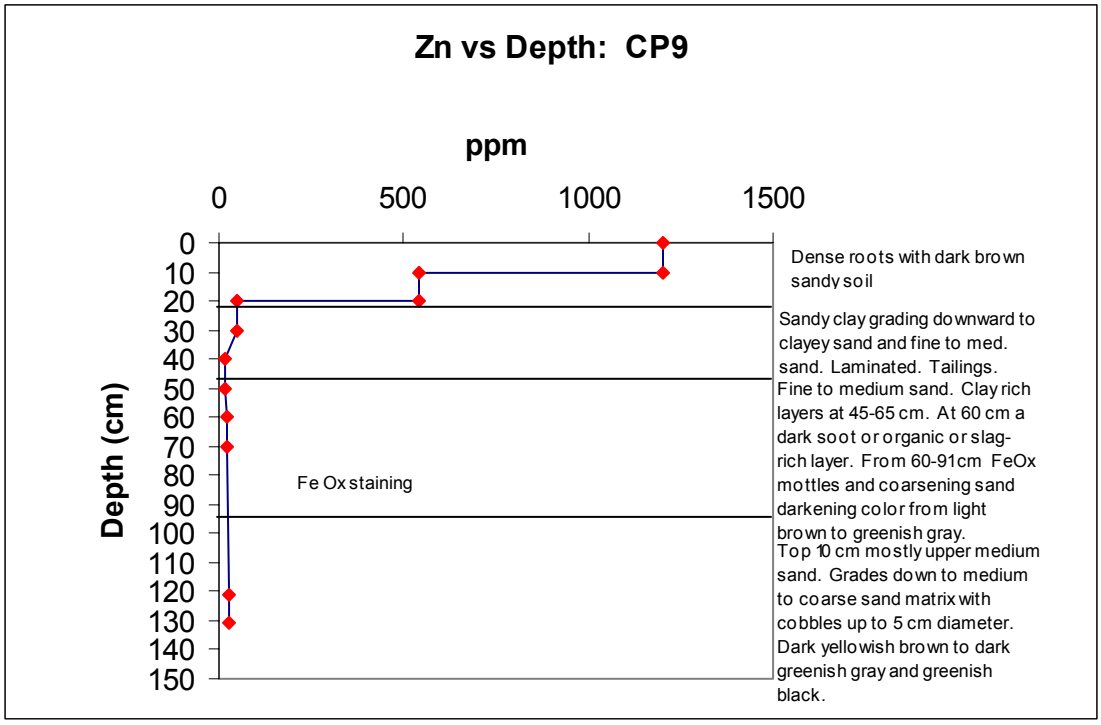

Zn vs Depth: CP8
ppm
0
500
1000
1500
2000
2500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
Roots & plant litter
Yellowish brown fine to medium sand
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Coarsening downward sequence begins with clay and ends with coarse sand, come clay layers. Fe Ox staining in sands
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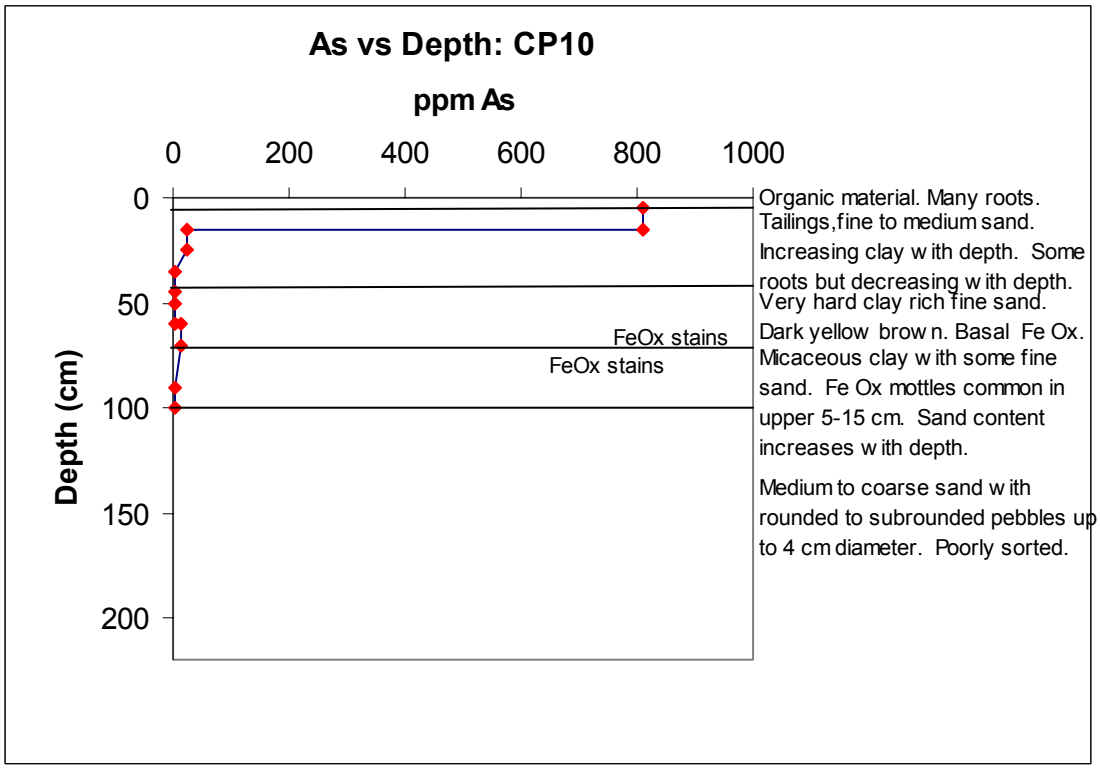

As vs Depth: CP9
ppm
0 25 50 75 100 125 150 175
Depth (cm)
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
Fe Ox staining
P
Q
L
Dense roots with dark brown sandy soil
Sandy clay grading downward to clayey sand and fine to med. sand. Laminated. Tailings. Fine to medium sand. Clay rich layers at 45-65 cm. At 60 cm a dark soot or organic or slag-rich layer. From 60-91cm FeOx mottles and coarsening sand darkening color from light brown to greenish gray.
Top 10 cm mostly upper medium sand. Grades down to medium to coarse sand matrix with cobbles up to 5 cm diameter. Dark yellowish brown to dark greenish gray and greenish black.

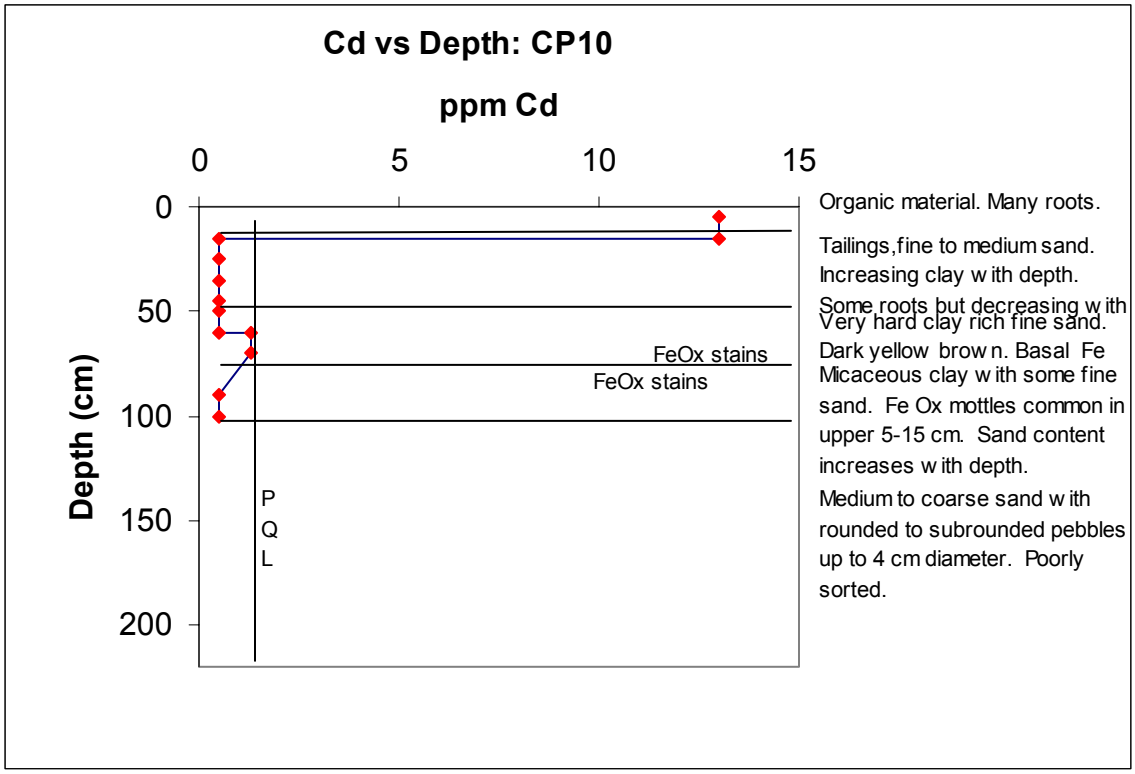

Cd vs Depth: CP9
ppm
0 1 2 3 4 5 6 7
Depth (cm)
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
P
Q
L
Fe Ox staining
Dense roots with dark brown sandy soil
Sandy clay grading downward to clayey sand and fine to med. sand. Laminated. Tailings. Fine to medium sand. Clay rich layers at 45-65 cm. At 60 cm a dark soot or organic or slag-rich layer. From 60-91cm FeOx mottles and coarsening sand darkening color from light brown to greenish gray.
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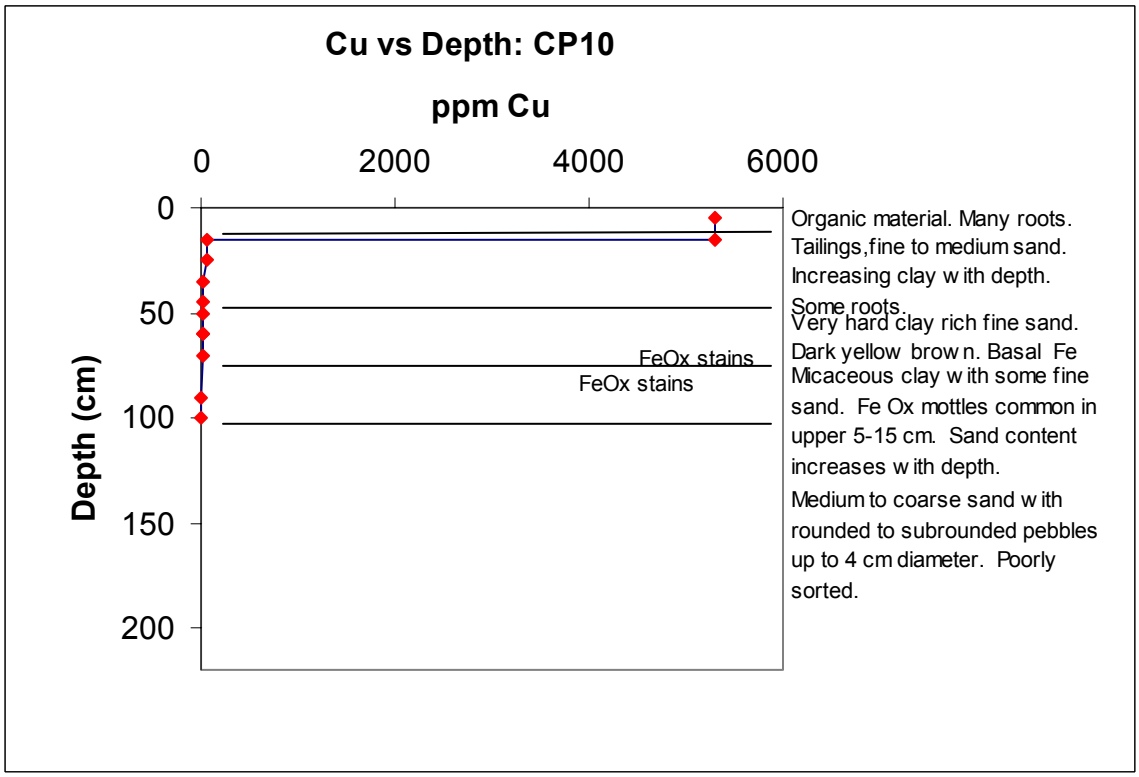

Cu vs Depth: CP9
ppm
0
500
1000
1500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Fe Ox staining
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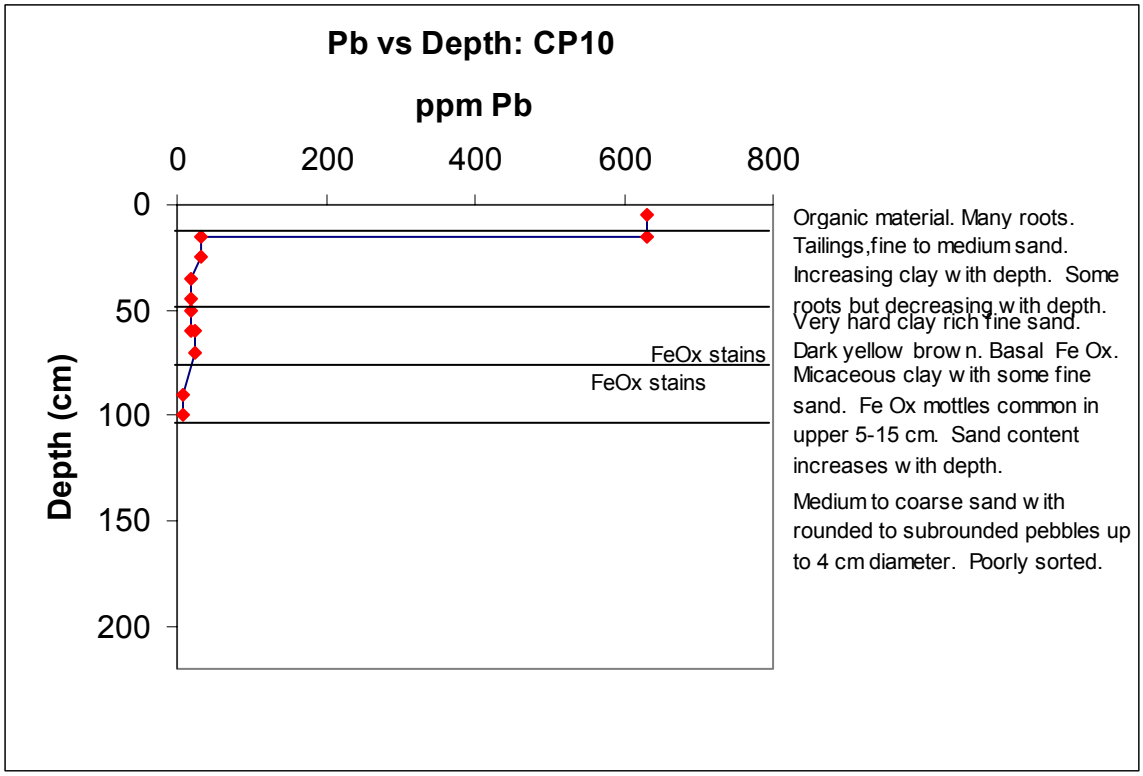

Pb vs Depth: CP9
ppm
0
50
100
150
200
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Fe Ox staining
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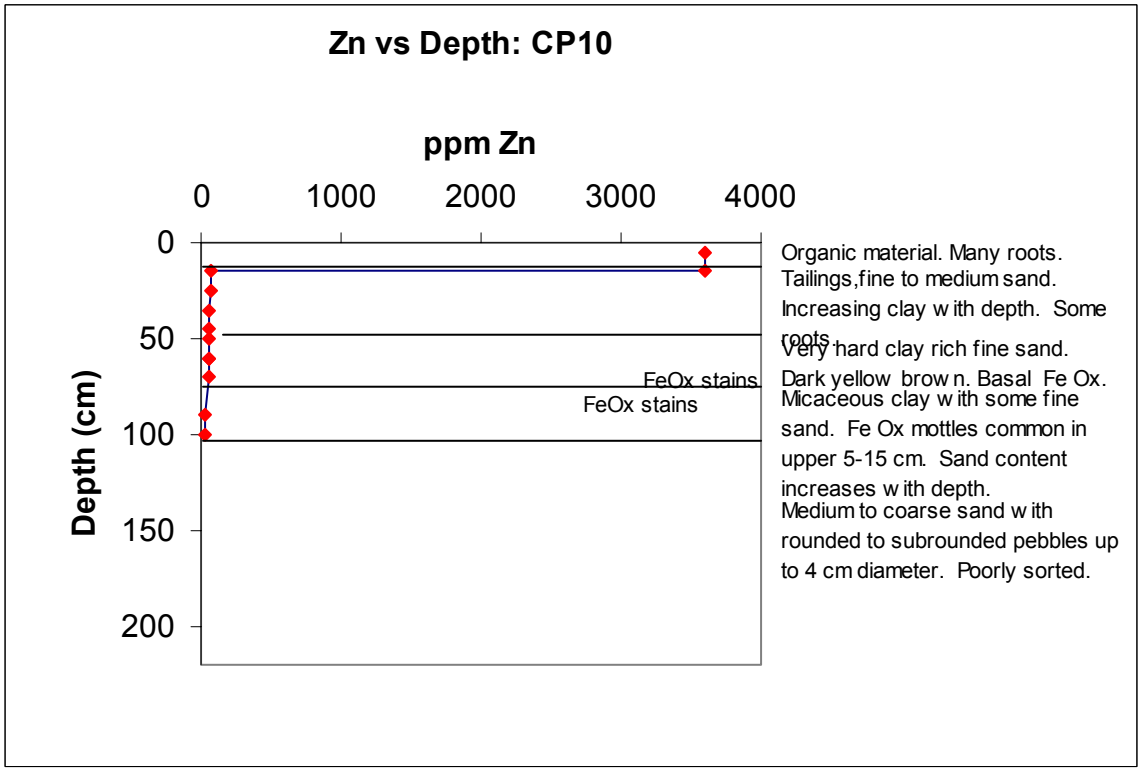

Zn vs Depth: CP9
ppm
0
500
1000
1500
Depth (cm)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Fe Ox staining
Dense roots with dark brown sandy soil
Sandy clay grading downward to clayey sand and fine to med. sand. Laminated. Tailings.
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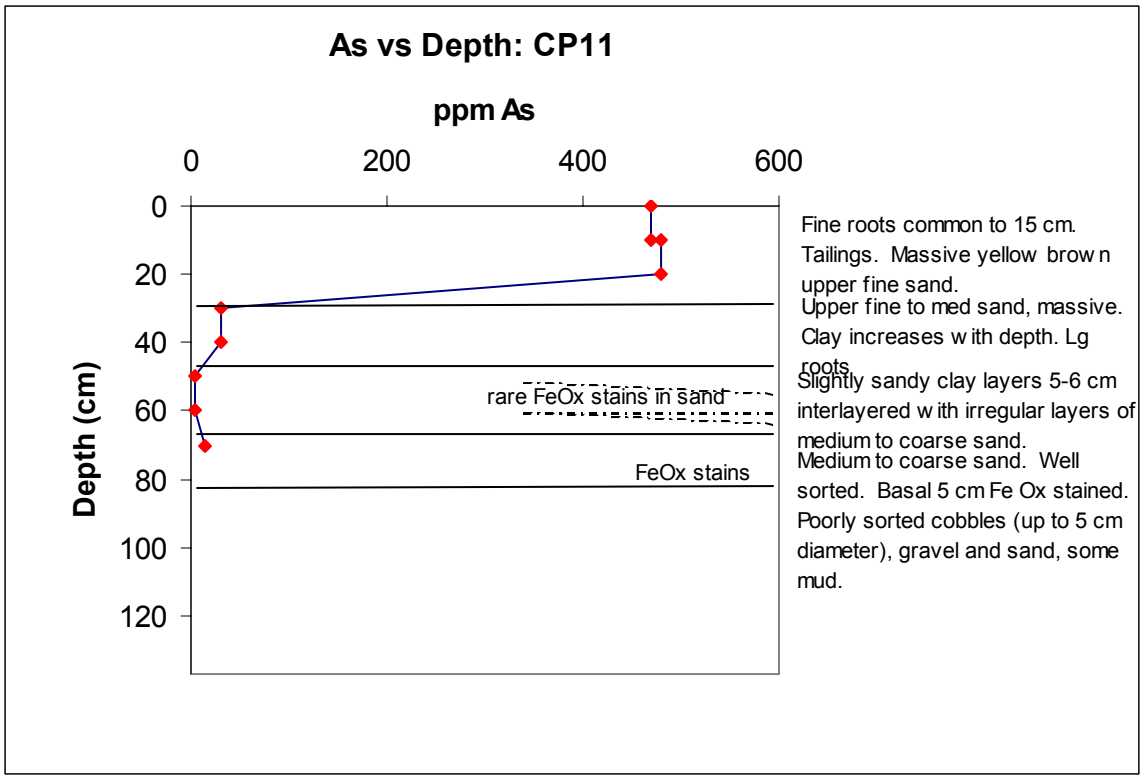

As vs Depth: CP10
ppm As
0
200
400
600
800
1000
Depth (cm)
0
50
100
150
200
FeOx stains
FeOx stains
Organic material. Many roots. Tailings,fine to medium sand.
Increasing clay with depth. Some roots but decreasing with depth.
Very hard clay rich fine sand. Dark yellow brown. Basal Fe Ox.
Micaceous clay with some fine sand. Fe Ox mottles common in upper 5-15 cm. Sand content increases with depth.
Medium to coarse sand with rounded to subrounded pebbles up to 4 cm diameter. Poorly sorted.

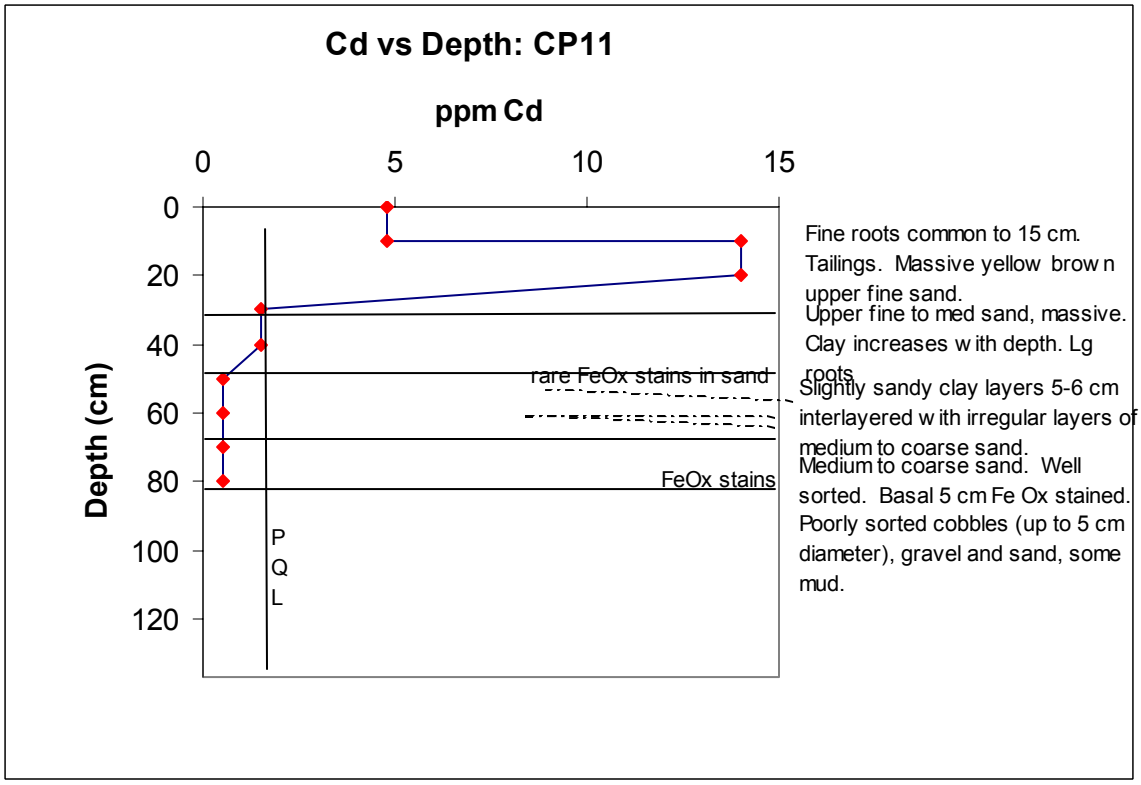

Cd vs Depth: CP10
ppm Cd
0
5
10
15
0
50
100
150
200
Depth (cm)
FeOx stains
FeOx stains
P
Q
L
Organic material. Many roots.
Tailings,fine to medium sand. Increasing clay with depth.
Some roots but decreasing with
Very hard clay rich fine sand. Dark yellow brown. Basal Fe Micaceous clay with some fine sand. Fe Ox mottles common in upper 5-15 cm. Sand content increases with depth.
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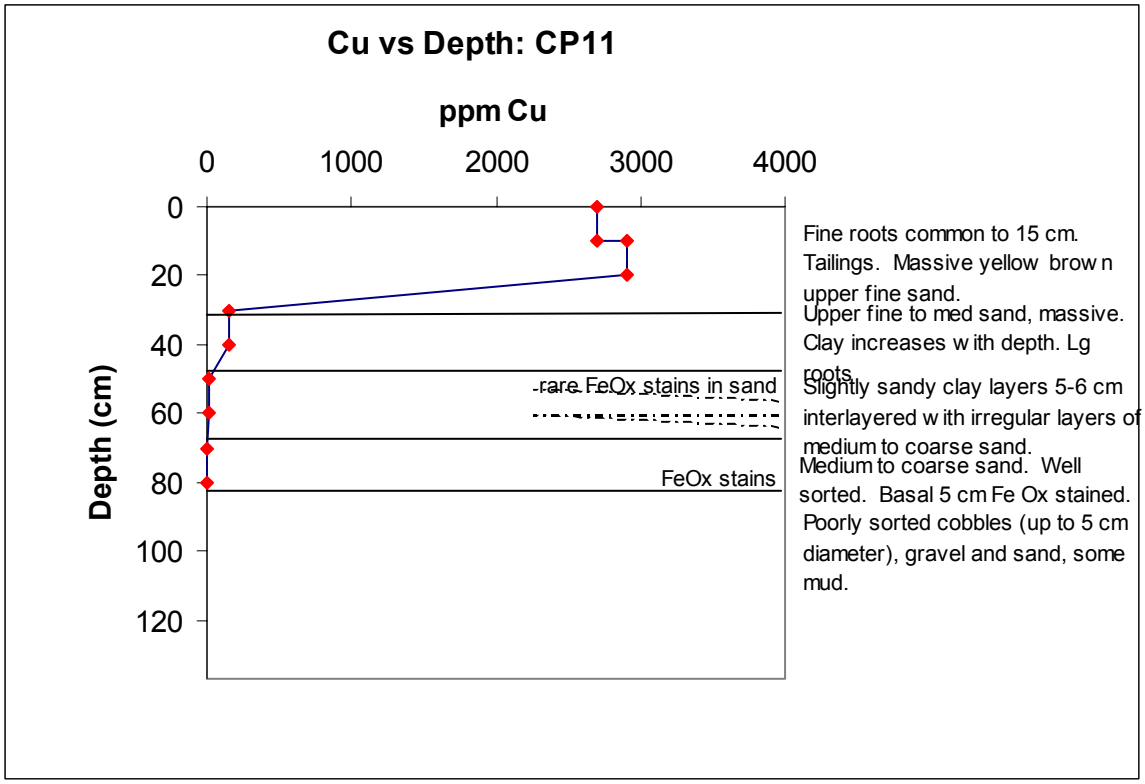

Cu vs Depth: CP10
ppm Cu
0
2000
4000
6000
0
50
100
150
200
Depth (cm)
FeOx stains
FeOx stains
Organic material. Many roots.
Tailings,fine to medium sand. Increasing clay with depth.
Some roots.
Very hard clay rich fine sand. Dark yellow brown. Basal Fe Micaceous clay with some fine sand. Fe Ox mottles common in upper 5-15 cm. Sand content increases with depth.
Medium to coarse sand with rounded to subrounded pebbles up to 4 cm diameter. Poorly sorted.

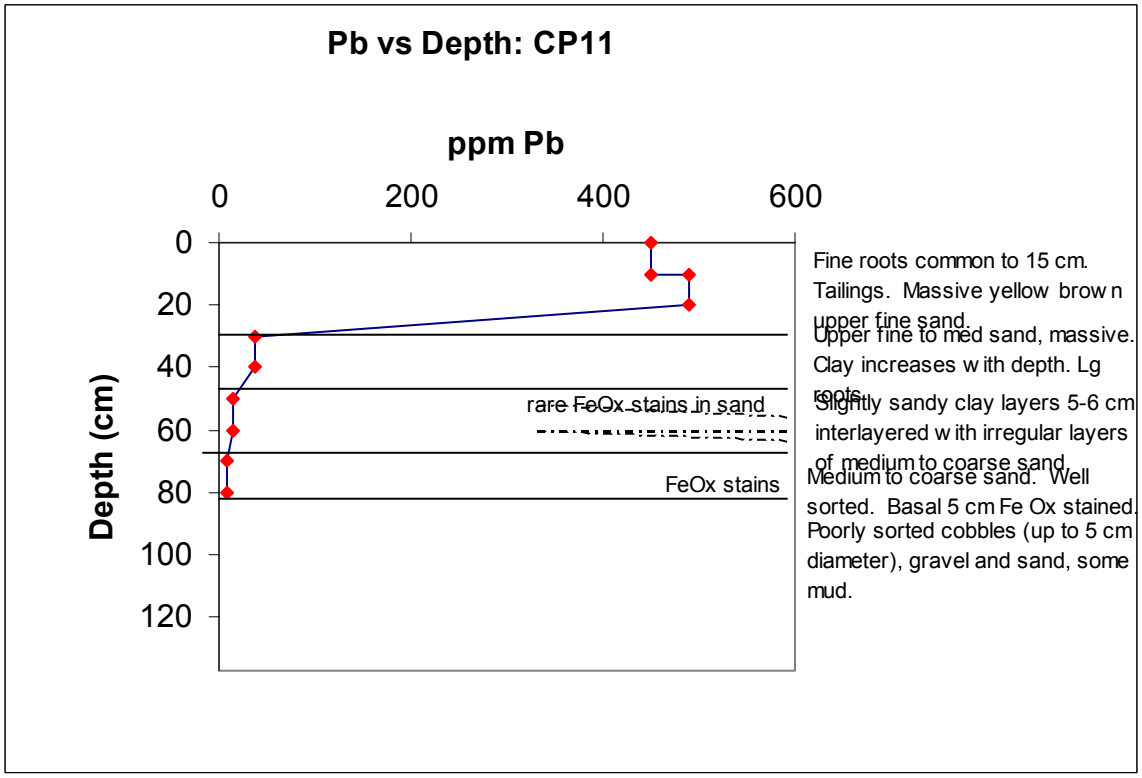

Pb vs Depth: CP10
ppm Pb
0
200
400
600
800
Depth (cm)
0
50
100
150
200
FeOx stains
FeOx stains
Organic material. Many roots. Tailings,fine to medium sand. Increasing clay with depth. Some roots but decreasing with depth.
Very hard clay rich fine sand. Dark yellow brown. Basal Fe Ox.
Micaceous clay with some fine sand. Fe Ox mottles common in upper 5-15 cm. Sand content increases with depth.
Medium to coarse sand with rounded to subrounded pebbles up to 4 cm diameter. Poorly sorted.

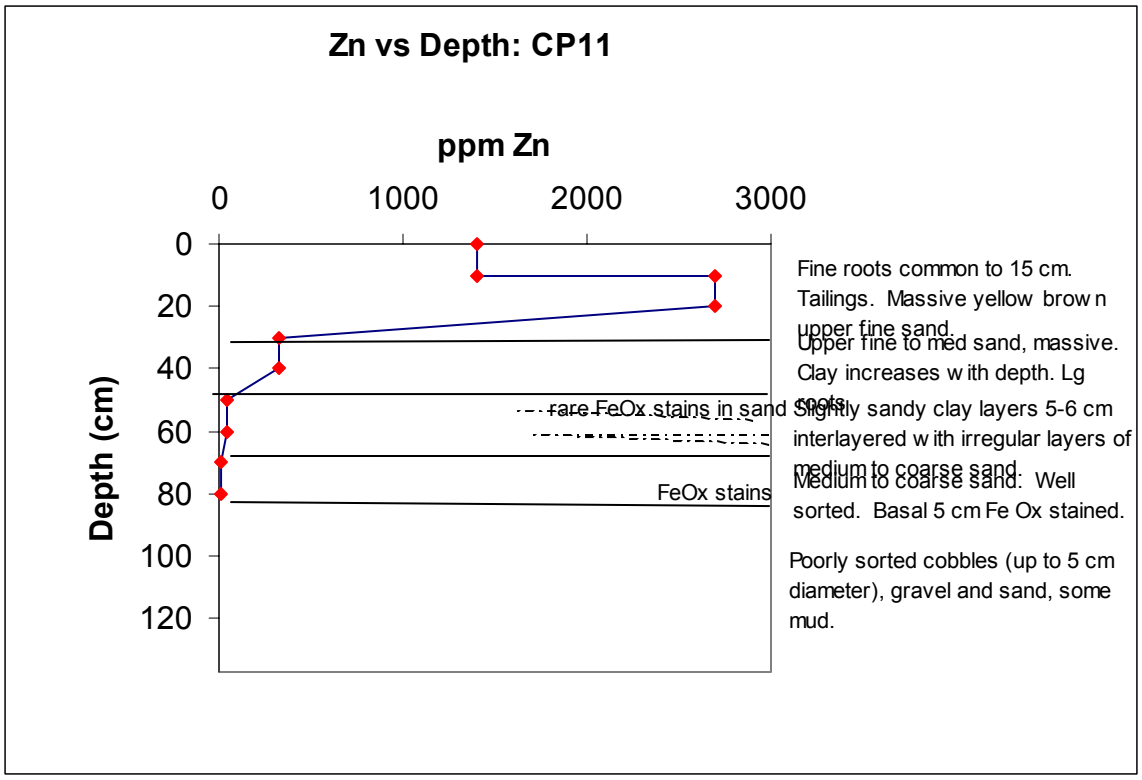

Zn vs Depth: CP10
ppm Zn
0
1000
2000
3000
4000
Depth (cm)
0
50
100
150
200
FeOx stains
FeOx stains
Organic material. Many roots. Tailings,fine to medium sand. Increasing clay with depth. Some roots.
Very hard clay rich fine sand. Dark yellow brown. Basal Fe Ox.
Micaceous clay with some fine sand. Fe Ox mottles common in upper 5-15 cm. Sand content increases with depth.
Medium to coarse sand with rounded to subrounded pebbles up to 4 cm diameter. Poorly sorted.

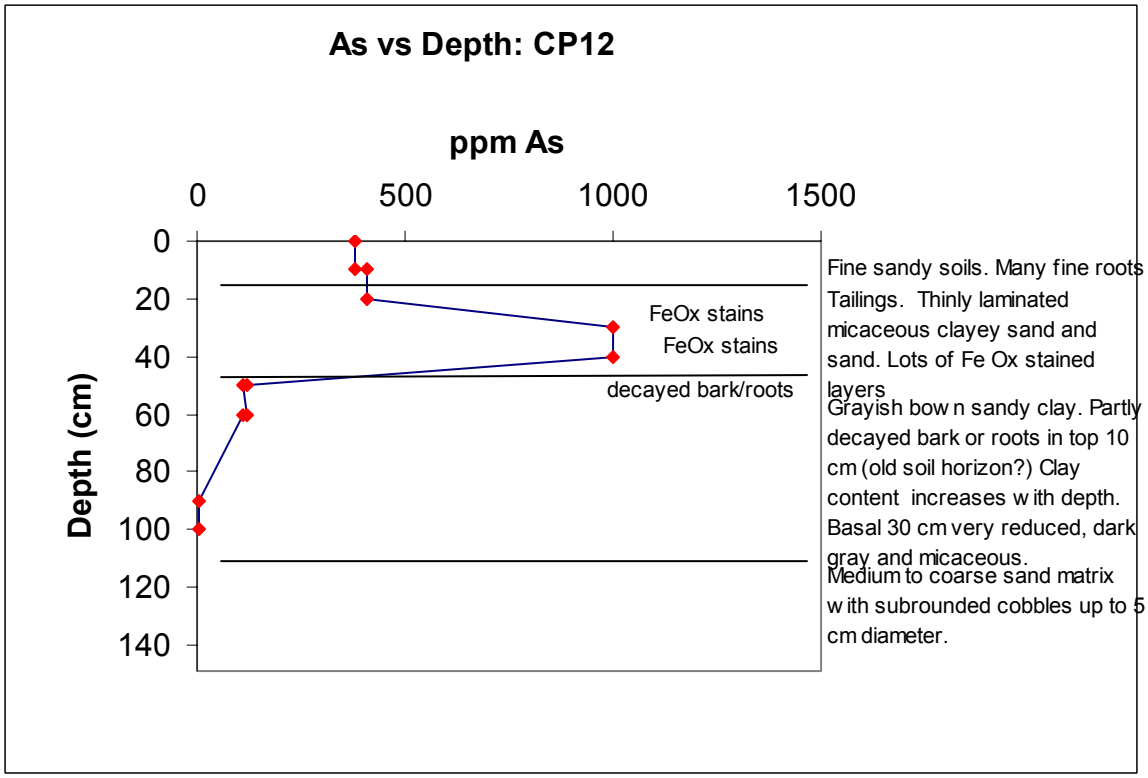

As vs Depth: CP11
ppm As
0
200
400
600
Depth (cm)
0
20
40
60
80
100
120
rare FeOx stains in sand
FeOx stains
Fine roots common to 15 cm. Tailings. Massive yellow brown upper fine sand.
Upper fine to med sand, massive. Clay increases with depth. Lg roots.
Slightly sandy clay layers 5-6 cm interlayered with irregular layers of medium to coarse sand.
Medium to coarse sand. Well sorted. Basal 5 cm Fe Ox stained.
Poorly sorted cobbles (up to 5 cm diameter), gravel and sand, some mud.

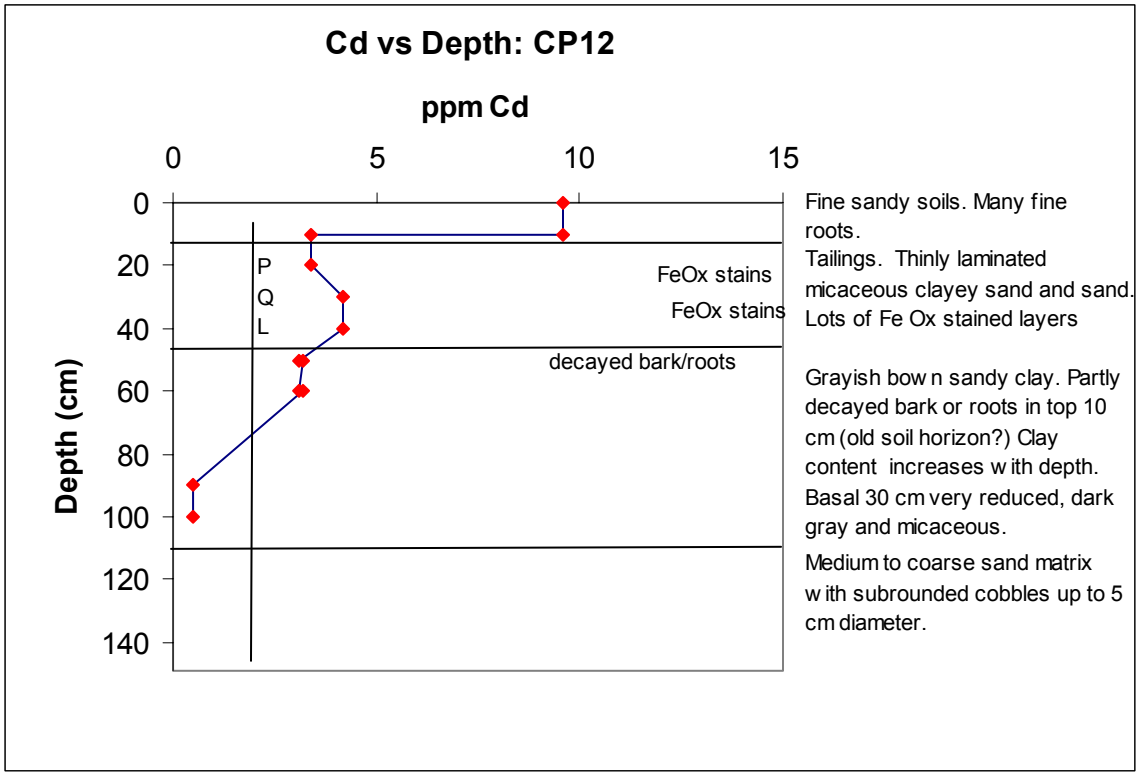

Cd vs Depth: CP11
ppm Cd
0
5
10
15
Depth (cm)
0
20
40
60
80
100
120
P
Q
L
rare FeOx stains in sand
FeOx stains
Fine roots common to 15 cm. Tailings. Massive yellow brown upper fine sand.
Upper fine to med sand, massive. Clay increases with depth. Lg roots.
Slightly sandy clay layers 5-6 cm interlayered with irregular layers of medium to coarse sand.
Medium to coarse sand. Well sorted. Basal 5 cm Fe Ox stained.
Poorly sorted cobbles (up to 5 cm diameter), gravel and sand, some mud.

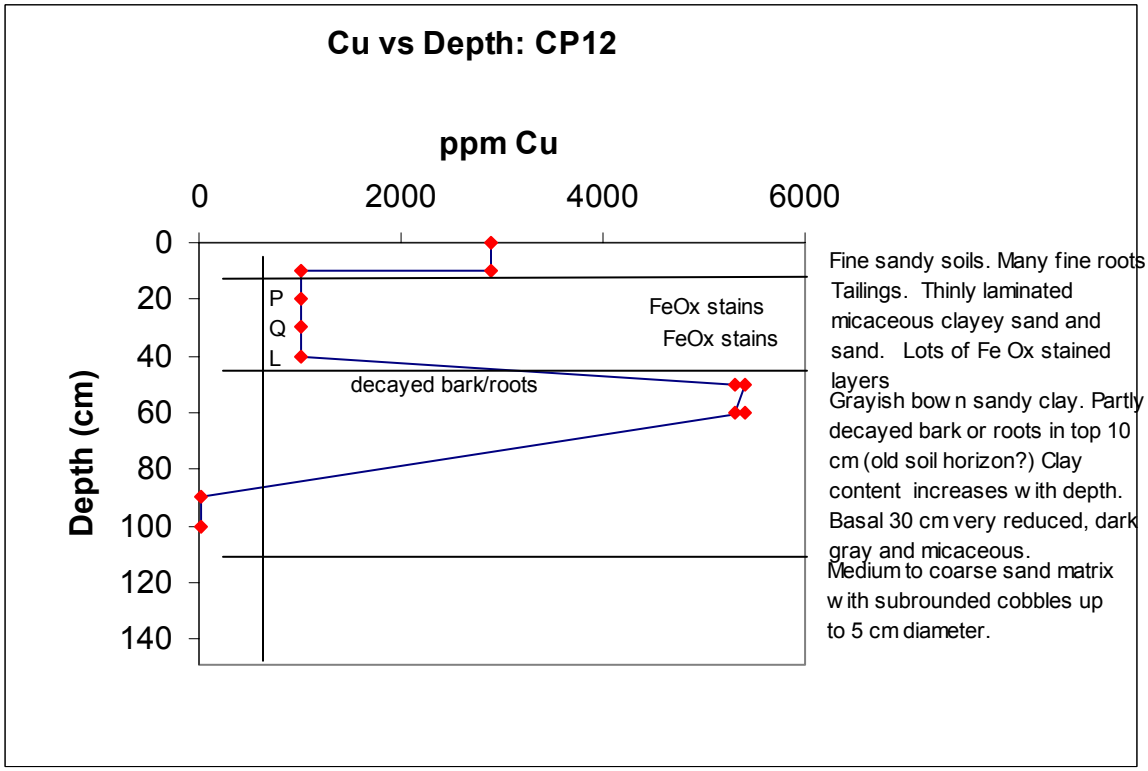

Cu vs Depth: CP11
ppm Cu
0
1000
2000
3000
4000
Depth (cm)
0
20
40
60
80
100
120
rare FeOx stains in sand
FeOx stains
Fine roots common to 15 cm. Tailings. Massive yellow brown upper fine sand.
Upper fine to med sand, massive. Clay increases with depth. Lg roots.
Slightly sandy clay layers 5-6 cm interlayered with irregular layers of medium to coarse sand.
Medium to coarse sand. Well sorted. Basal 5 cm Fe Ox stained.
Poorly sorted cobbles (up to 5 cm diameter), gravel and sand, some mud.

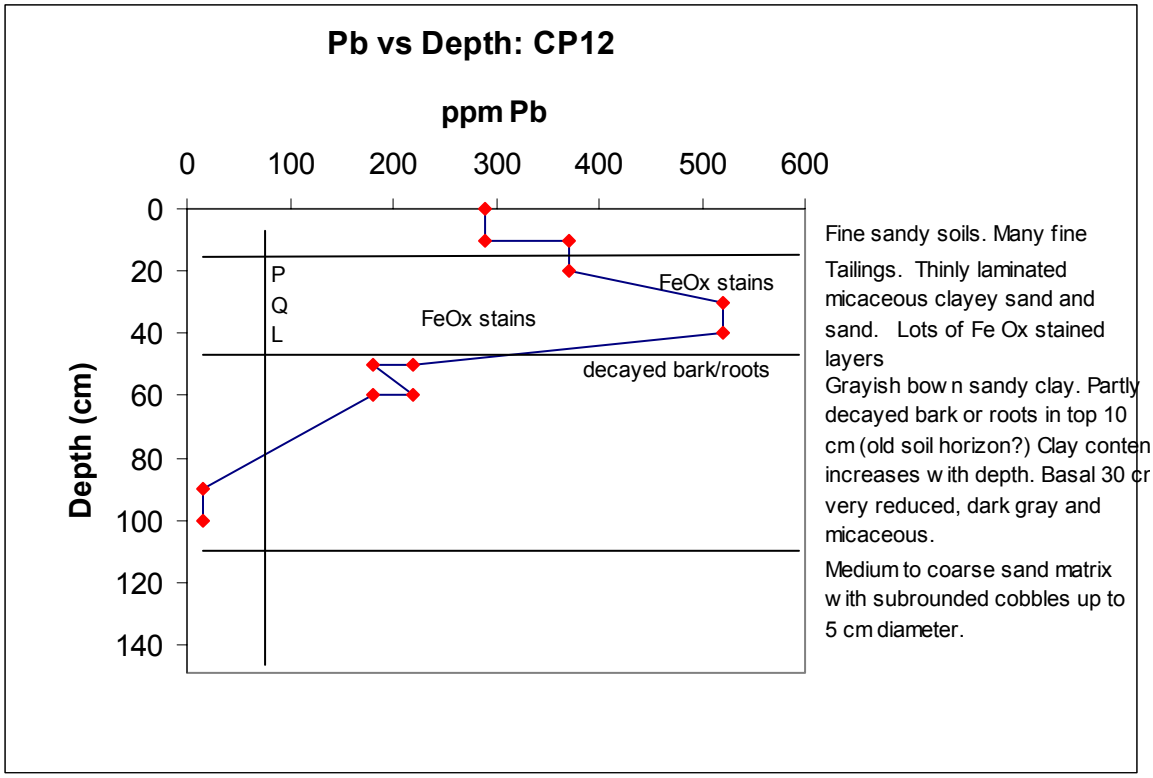

Pb vs Depth: CP11
ppm Pb
0
200
400
600
Depth (cm)
0
20
40
60
80
100
120
rare FeOx stains in sand
FeOx stains
Fine roots common to 15 cm. Tailings. Massive yellow brown upper fine sand.
Upper fine to med sand, massive. Clay increases with depth. Lg roots.
Slightly sandy clay layers 5-6 cm interlayered with irregular layers of medium to coarse sand.
Medium to coarse sand. Well sorted. Basal 5 cm Fe Ox stained.
Poorly sorted cobbles (up to 5 cm diameter), gravel and sand, some mud.

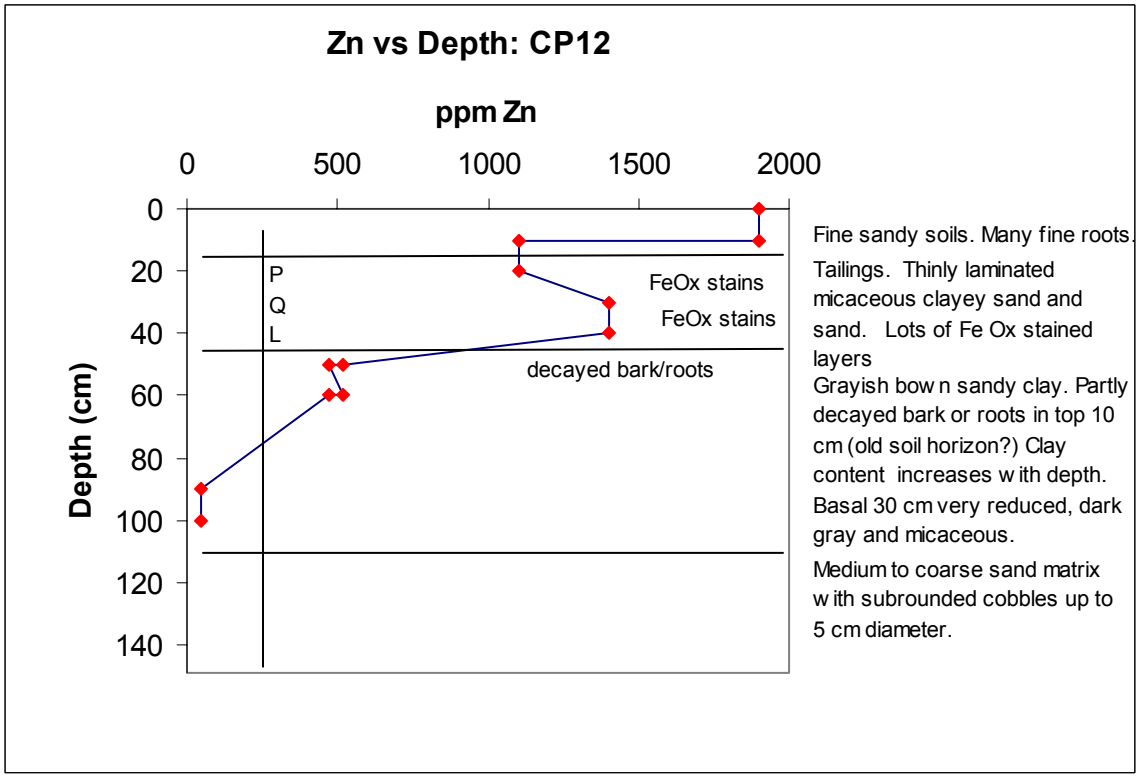

Zn vs Depth: CP11
ppm Zn
0
1000
2000
3000
Depth (cm)
0
20
40
60
80
100
120
rare FeOx stains in sand
FeOx stains
Fine roots common to 15 cm. Tailings. Massive yellow brown upper fine sand.
Upper fine to med sand, massive. Clay increases with depth. Lg roots.
Slightly sandy clay layers 5-6 cm interlayered with irregular layers of medium to coarse sand.
Medium to coarse sand. Well sorted. Basal 5 cm Fe Ox stained.
Poorly sorted cobbles (up to 5 cm diameter), gravel and sand, some mud.

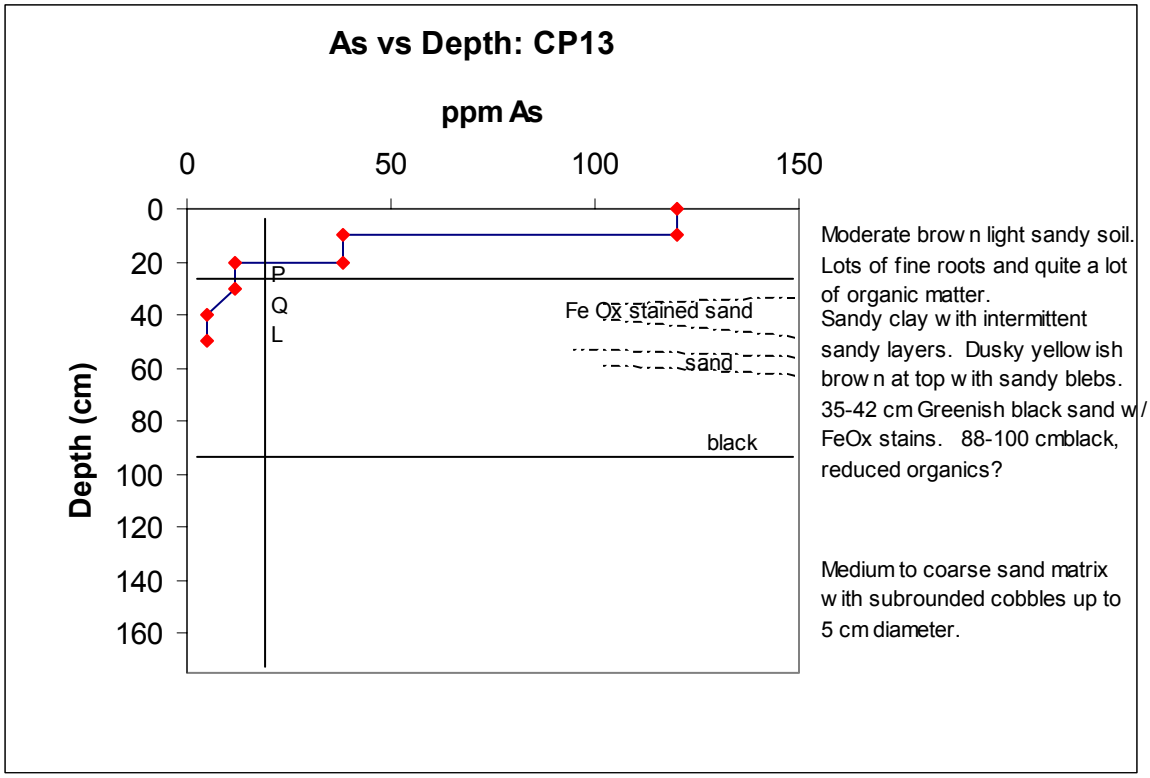

As vs Depth: CP12
ppm As
0
500
1000
1500
Depth (cm)
0
20
40
60
80
100
120
140
FeOx stains
FeOx stains
decayed bark/roots
Fine sandy soils. Many fine roots Tailings. Thinly laminated micaceous clayey sand and sand. Lots of Fe Ox stained layers
Grayish brown sandy clay. Partly decayed bark or roots in top 10 cm (old soil horizon?) Clay content increases with depth. Basal 30 cm very reduced, dark gray and micaceous.
Medium to coarse sand matrix with subrounded cobbles up to 5 cm diameter.

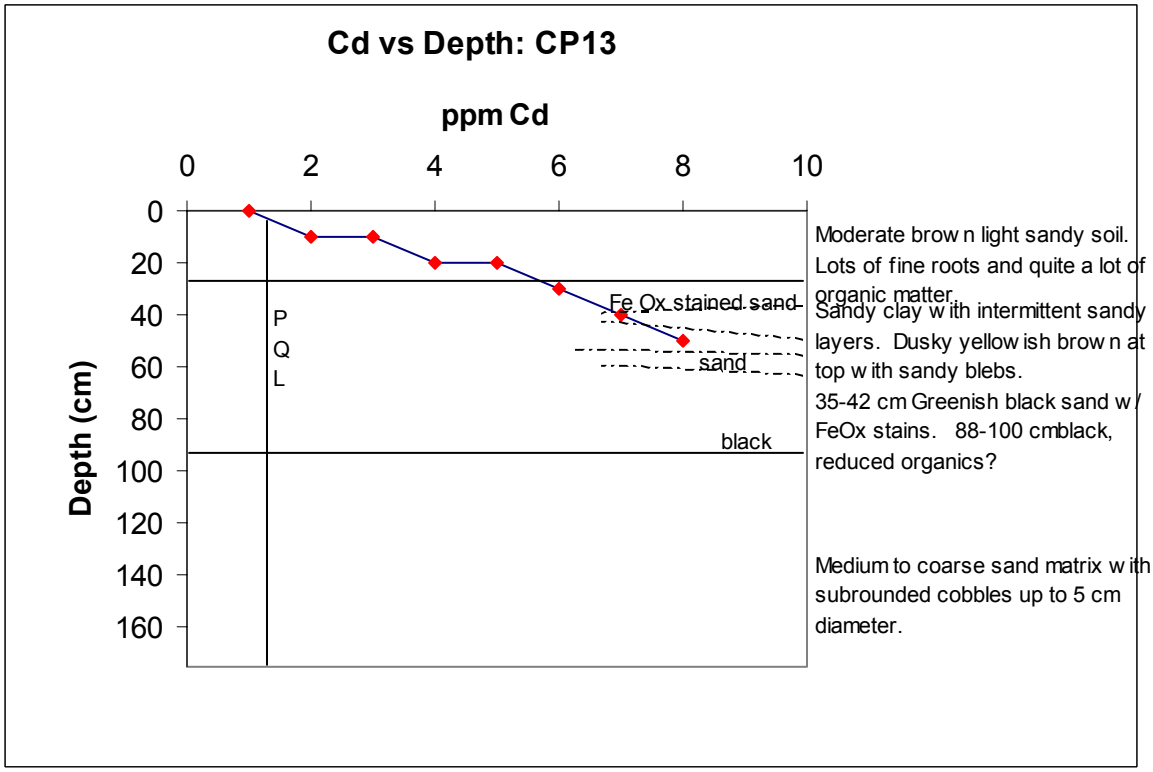

Cd vs Depth: CP12
ppm Cd
0
5
10
15
0
20
40
60
80
100
120
140
Depth (cm)
P
Q
L
FeOx stains
FeOx stains
decayed bark/roots
Fine sandy soils. Many fine roots.
Tailings. Thinly laminated micaceous clayey sand and sand. Lots of Fe Ox stained layers
Grayish bow n sandy clay. Partly decayed bark or roots in top 10 cm (old soil horizon?) Clay content increases w ith depth. Basal 30 cm very reduced, dark gray and micaceous.
Medium to coarse sand matrix w ith subrounded cobbles up to 5 cm diameter.

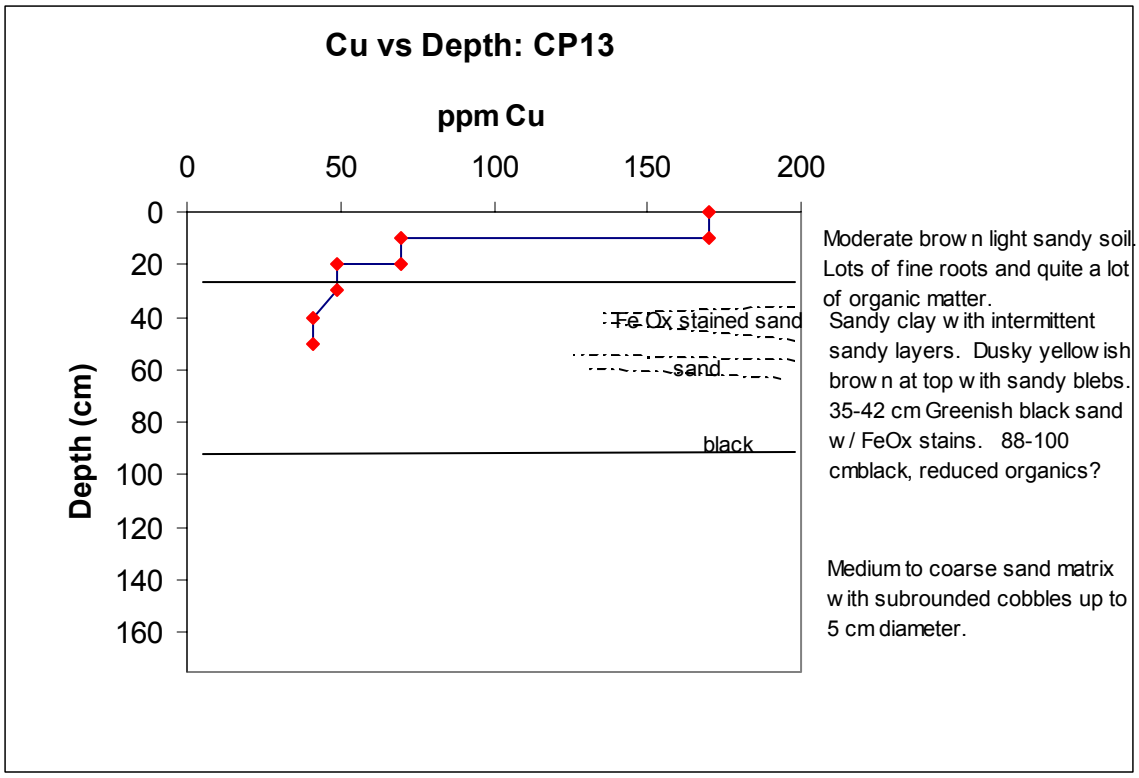

Cu vs Depth: CP12
ppm Cu
0
2000
4000
6000
0
20
40
60
80
100
120
140
Depth (cm)
P
Q
L
FeOx stains
FeOx stains
decayed bark/roots
Fine sandy soils. Many fine roots
Tailings. Thinly laminated micaceous clayey sand and sand. Lots of Fe Ox stained layers
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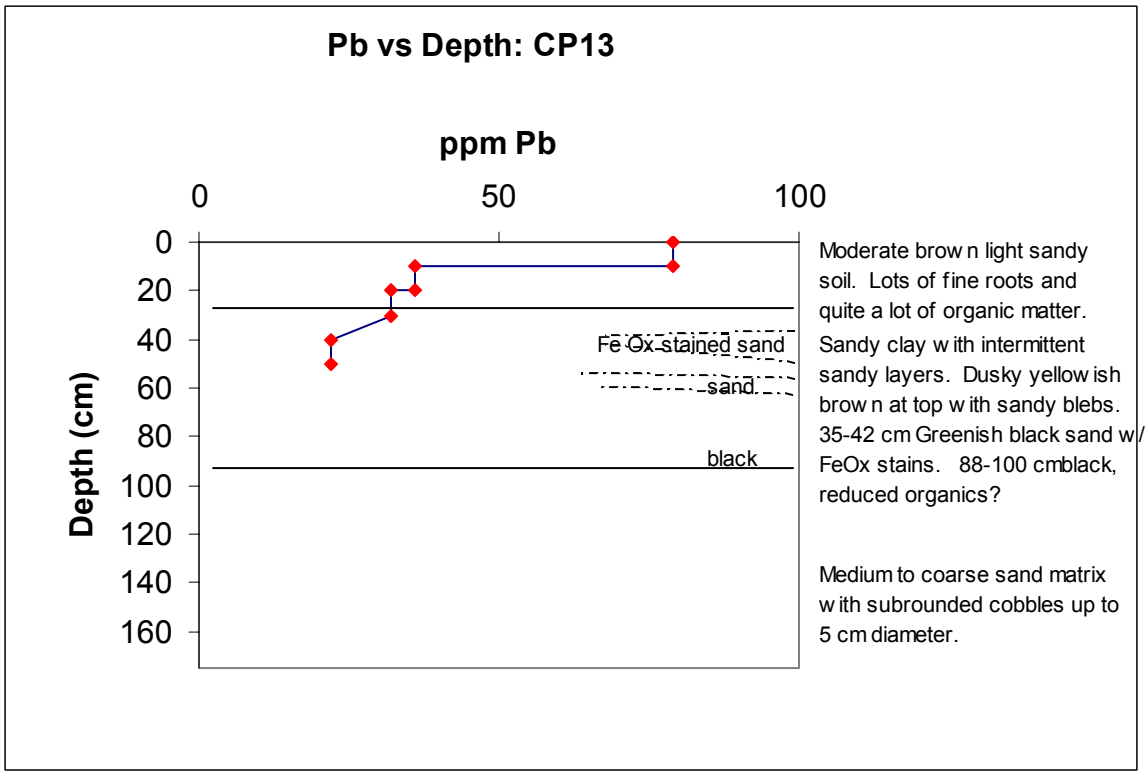

Pb vs Depth: CP12
ppm Pb
0
100
200
300
400
500
600
Depth (cm)
0
20
40
60
80
100
120
140
P
Q
L
FeOx stains
FeOx stains
decayed bark/roots
Fine sandy soils. Many fine
Tailings. Thinly laminated micaceous clayey sand and sand. Lots of Fe Ox stained layers
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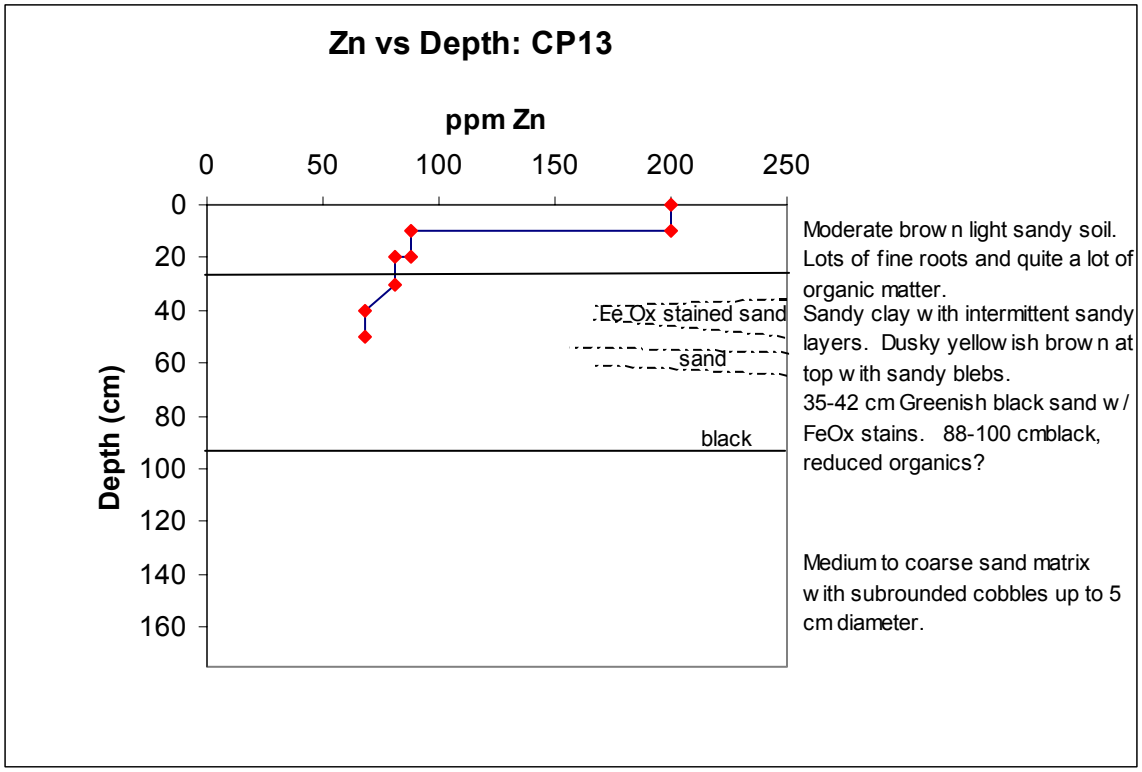

Zn vs Depth: CP12
ppm Zn
0
500
1000
1500
2000
Depth (cm)
0
20
40
60
80
100
120
140
P
Q
L
FeOx stains
FeOx stains
decayed bark/roots
Fine sandy soils. Many fine roots.
Tailings. Thinly laminated micaceous clayey sand and sand. Lots of Fe Ox stained layers
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Medium to coarse sand matrix w ith subrounded cobbles up to 5 cm diameter.

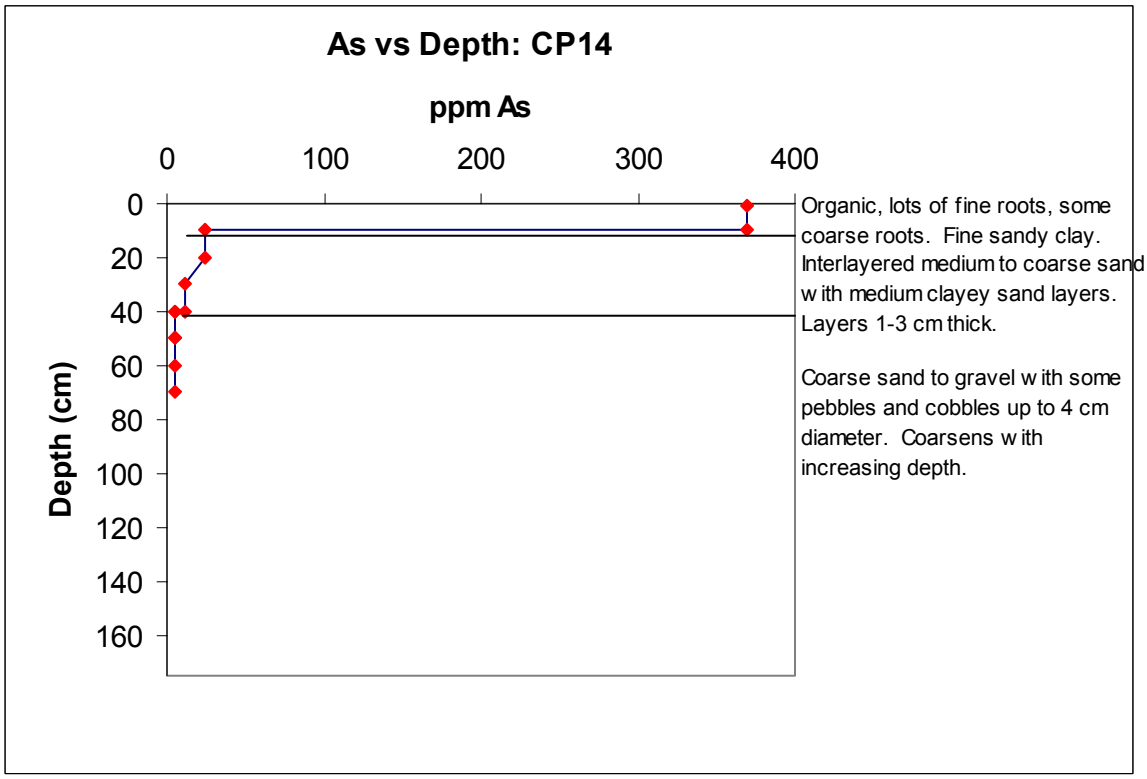

As vs Depth: CP13
ppm As
0
50
100
150
Depth (cm)
0
20
40
60
80
100
120
140
160
P
Q
L
Fe Ox stained sand
sand
black
Moderate brown light sandy soil. Lots of fine roots and quite a lot of organic matter.
Sandy clay with intermittent sandy layers. Dusky yellowish brown at top with sandy blebs.
35-42 cm Greenish black sand w/ FeOx stains. 88-100 cmblack, reduced organics?
Medium to coarse sand matrix with subrounded cobbles up to 5 cm diameter.

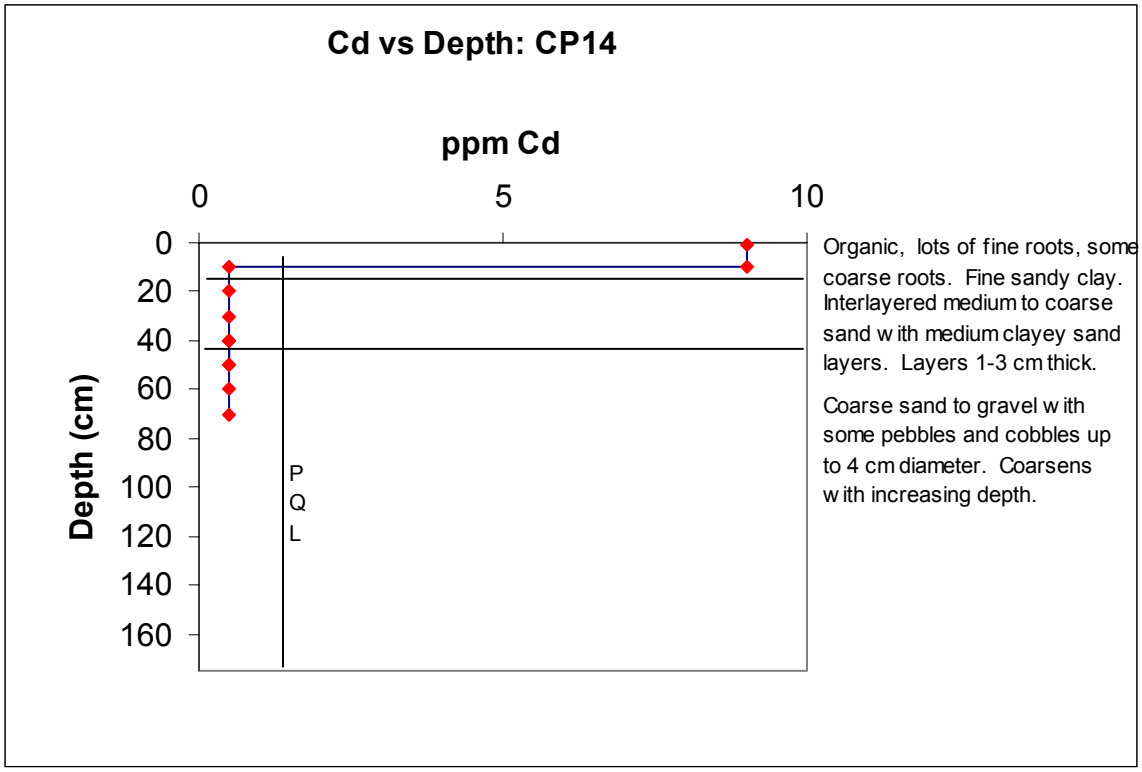

Cd vs Depth: CP13
ppm Cd
0
2
4
6
8
10
Depth (cm)
0
20
40
60
80
100
120
140
160
P
Q
L
Fe Ox stained sand
sand
black
Moderate brown light sandy soil. Lots of fine roots and quite a lot of organic matter.
Sandy clay with intermittent sandy layers. Dusky yellowish brown at top with sandy blebs.
35-42 cm Greenish black sand w/ FeOx stains. 88-100 cmblack, reduced organics?
Medium to coarse sand matrix with subrounded cobbles up to 5 cm diameter.

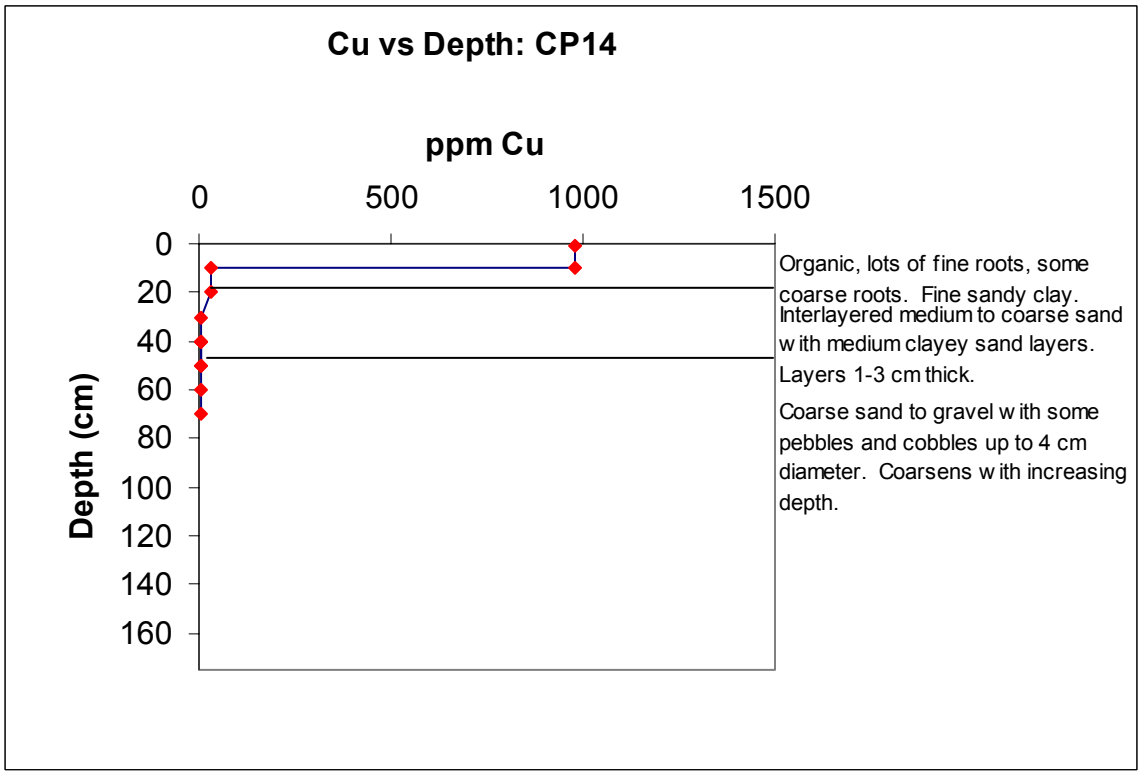

Cu vs Depth: CP13
ppm Cu
0
50
100
150
200
Depth (cm)
0
20
40
60
80
100
120
140
160
Fe Ox stained sand
sand
black
Moderate brown light sandy soil. Lots of fine roots and quite a lot of organic matter.
Sandy clay with intermittent sandy layers. Dusky yellowish brown at top with sandy blebs. 35-42 cm Greenish black sand w/ FeOx stains. 88-100 cmblack, reduced organics?
Medium to coarse sand matrix with subrounded cobbles up to 5 cm diameter.

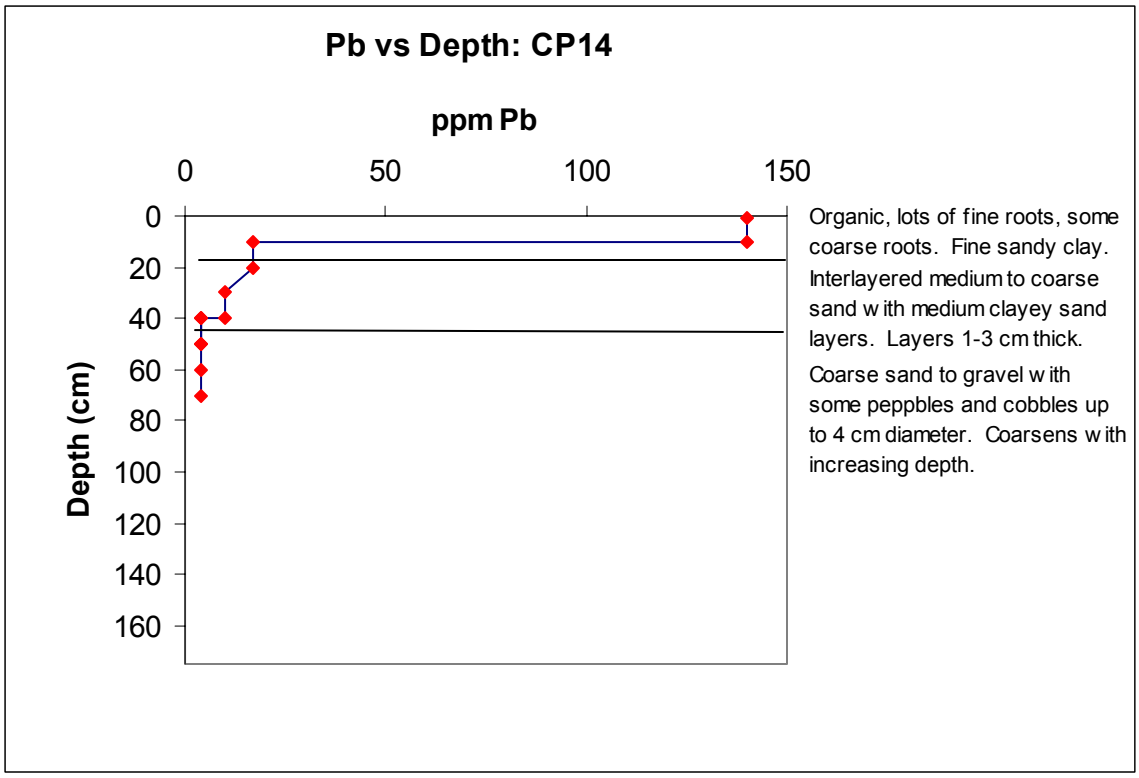

Pb vs Depth: CP13
ppm Pb
0
50
100
Depth (cm)
0
20
40
60
80
100
120
140
160
Fe Ox stained sand
sand
black
Moderate brown light sandy soil. Lots of fine roots and quite a lot of organic matter.
Sandy clay with intermittent sandy layers. Dusky yellowish brown at top with sandy blebs. 35-42 cm Greenish black sand w/ FeOx stains. 88-100 cmblack, reduced organics?
Medium to coarse sand matrix with subrounded cobbles up to 5 cm diameter.

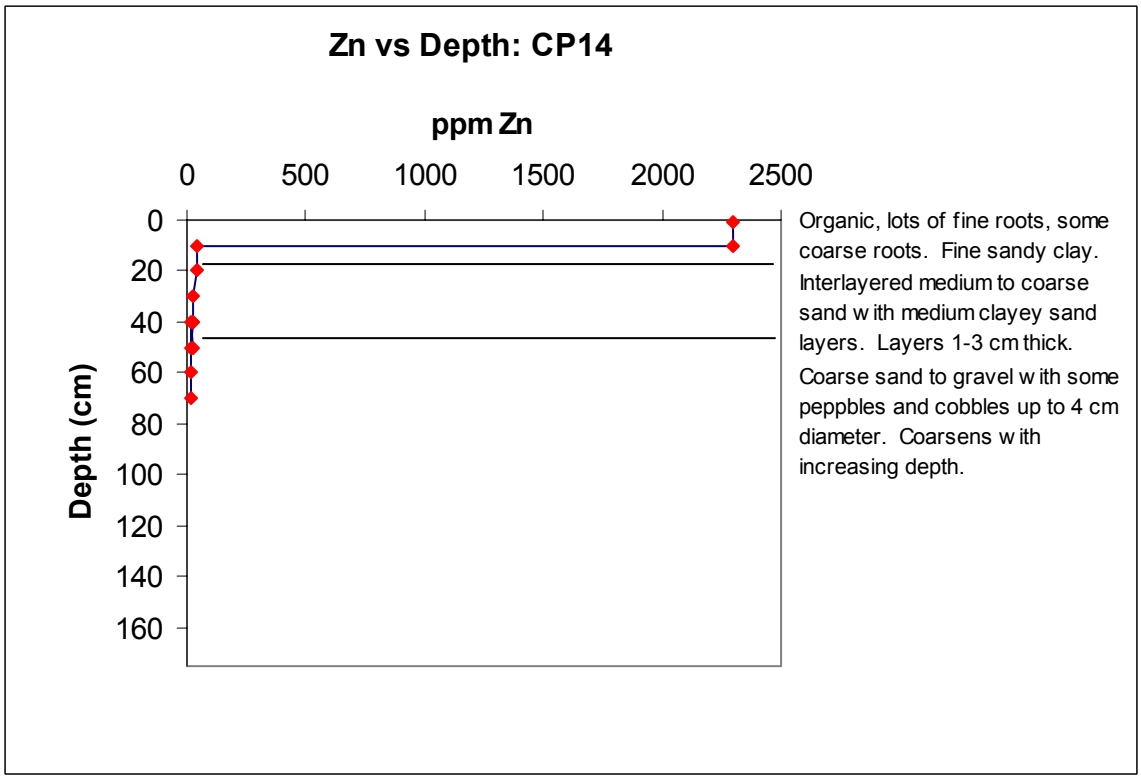

Zn vs Depth: CP13
ppm Zn
0
50
100
150
200
250
Depth (cm)
0
20
40
60
80
100
120
140
160
Fe Ox stained sand
sand
black
Moderate brown light sandy soil. Lots of fine roots and quite a lot of organic matter.
Sandy clay with intermittent sandy layers. Dusky yellowish brown at top with sandy blebs.
35-42 cm Greenish black sand w/ FeOx stains. 88-100 cmblack, reduced organics?
Medium to coarse sand matrix with subrounded cobbles up to 5 cm diameter.

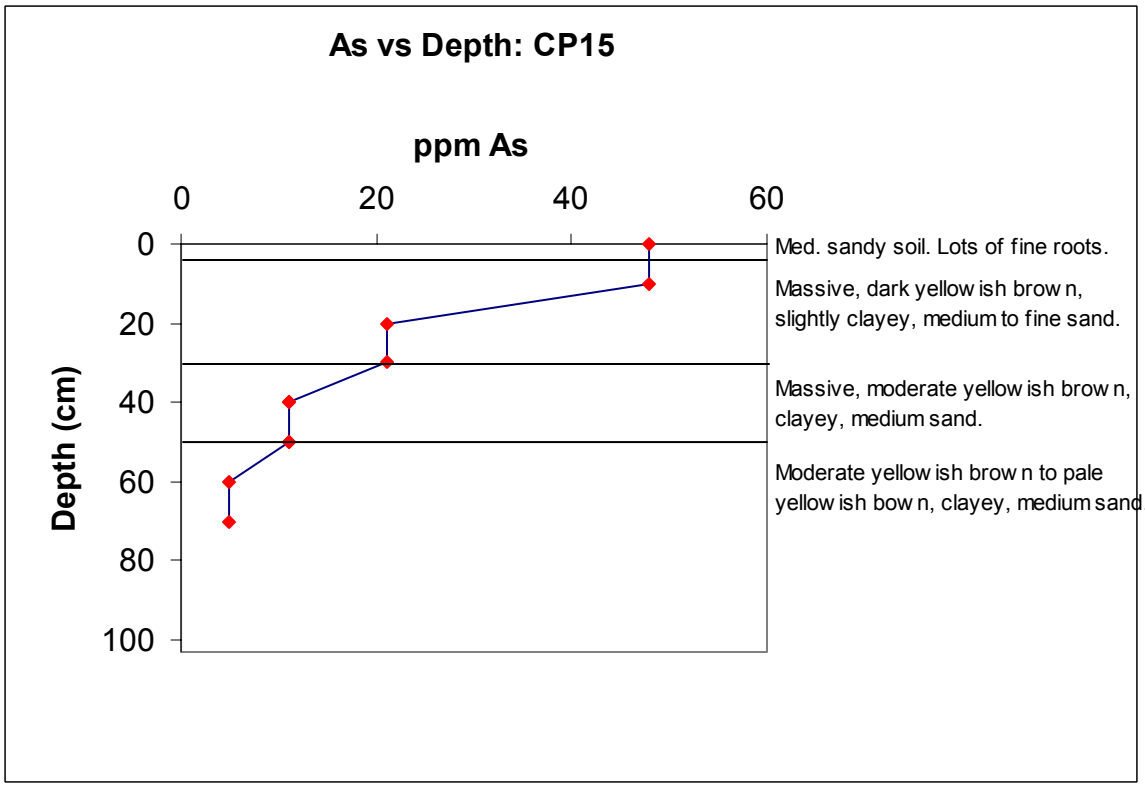

As vs Depth: CP14
ppm As
0
100
200
300
400
Depth (cm)
0
20
40
60
80
100
120
140
160
Organic, lots of fine roots, some coarse roots. Fine sandy clay.
Interlayered medium to coarse sand with medium clayey sand layers. Layers 1-3 cm thick.
Coarse sand to gravel with some pebbles and cobbles up to 4 cm diameter. Coarsens with increasing depth.

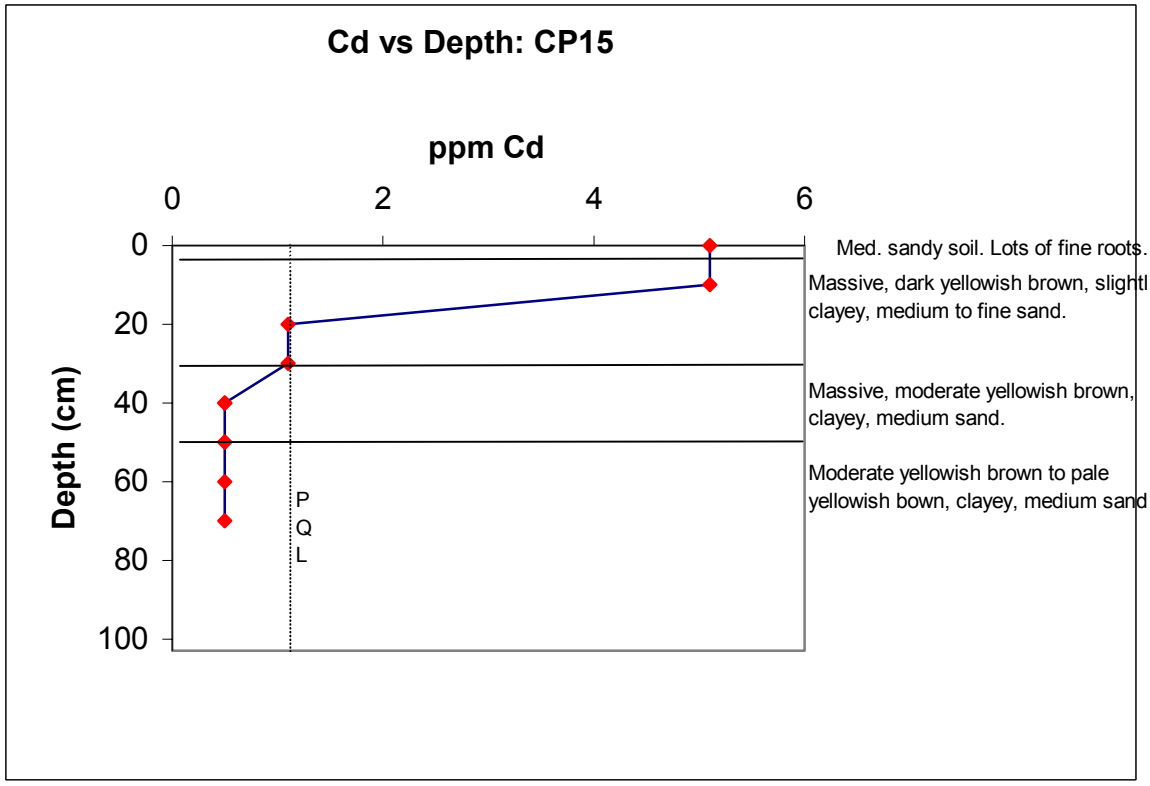

Cd vs Depth: CP14
ppm Cd
0
5
10
Depth (cm)
0
20
40
60
80
100
120
140
160
PQL
Organic, lots of fine roots, some coarse roots. Fine sandy clay. Interlayered medium to coarse sand with medium clayey sand layers. Layers 1-3 cm thick.
Coarse sand to gravel with some pebbles and cobbles up to 4 cm diameter. Coarsens with increasing depth.

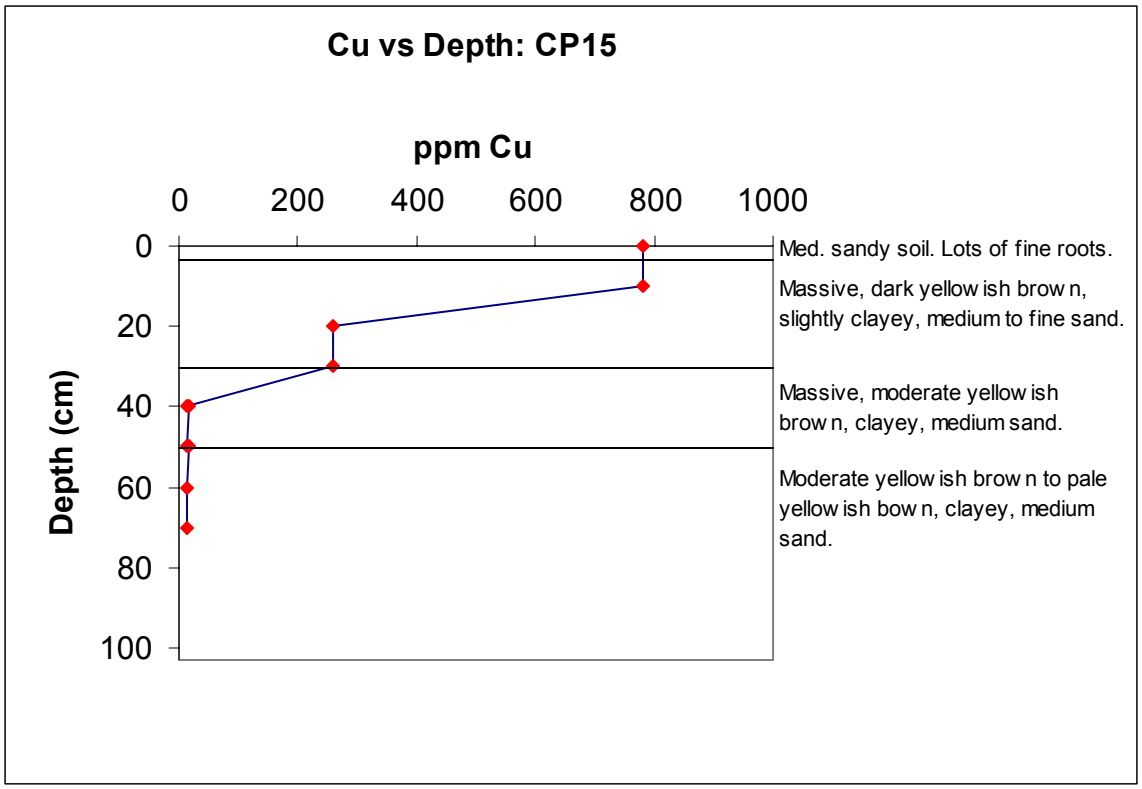

Cu vs Depth: CP14
ppm Cu
0
500
1000
1500
Depth (cm)
0
20
40
60
80
100
120
140
160
Organic, lots of fine roots, some coarse roots. Fine sandy clay. Interlayered medium to coarse sand with medium clayey sand layers. Layers 1-3 cm thick.
Coarse sand to gravel with some pebbles and cobbles up to 4 cm diameter. Coarsens with increasing depth.

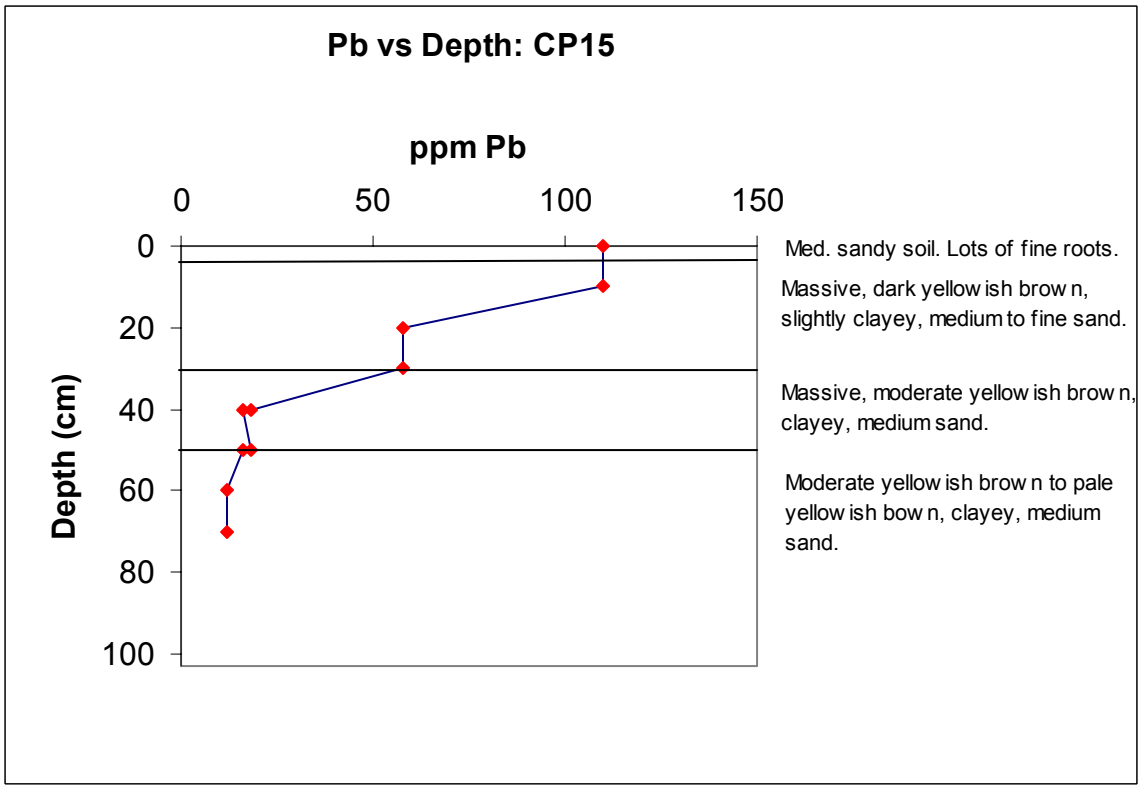

Pb vs Depth: CP14
ppm Pb
0
50
100
150
Depth (cm)
0
20
40
60
80
100
120
140
160
Organic, lots of fine roots, some coarse roots. Fine sandy clay.
Interlayered medium to coarse sand with medium clayey sand layers. Layers 1-3 cm thick.
Coarse sand to gravel with some peppbles and cobbles up to 4 cm diameter. Coarsens with increasing depth.

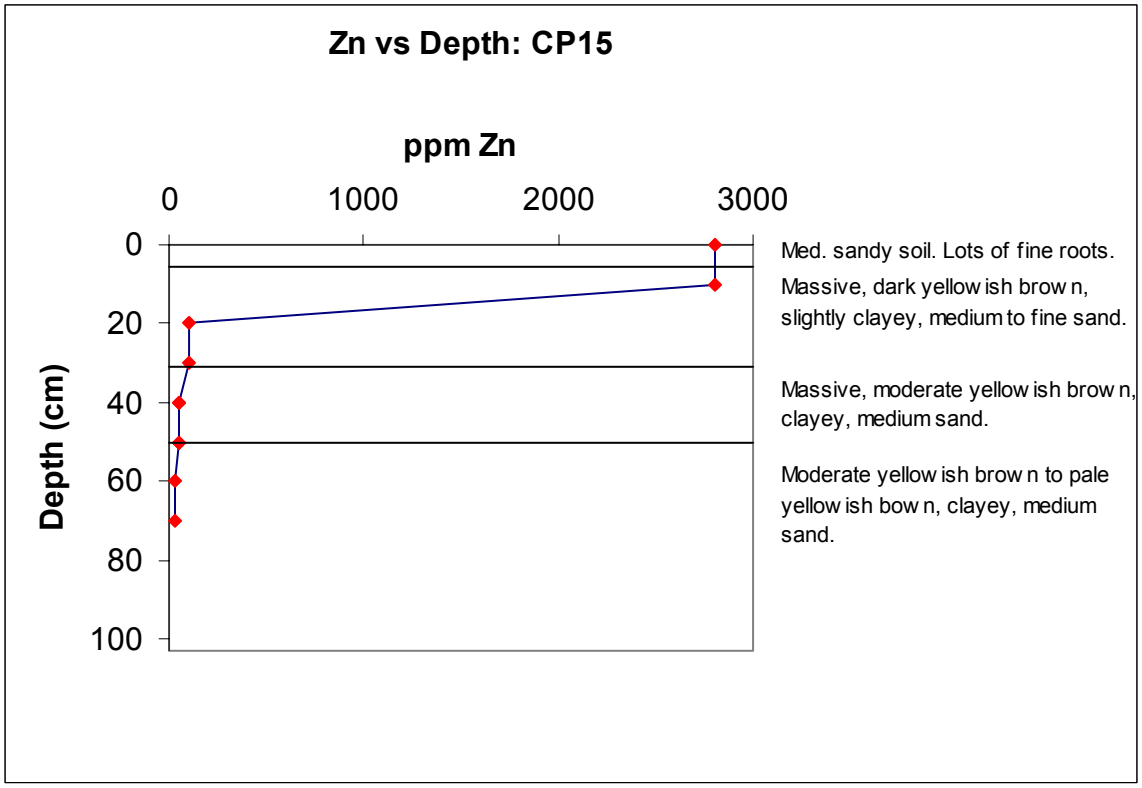

Zn vs Depth: CP14
ppm Zn
0
500
1000
1500
2000
2500
Depth (cm)
0
20
40
60
80
100
120
140
160
Organic, lots of fine roots, some coarse roots. Fine sandy clay.
Interlayered medium to coarse sand with medium clayey sand layers. Layers 1-3 cm thick.
Coarse sand to gravel with some peppbles and cobbles up to 4 cm diameter. Coarsens with increasing depth.


As vs Depth: CP15
ppm As
0
20
40
60
Depth (cm)
0
20
40
60
80
100
Med. sandy soil. Lots of fine roots.
Massive, dark yellow ish brow n, slightly clayey, medium to fine sand.
Massive, moderate yellow ish brow n, clayey, medium sand.
Moderate yellow ish brow n to pale yellow ish bow n, clayey, medium sand.

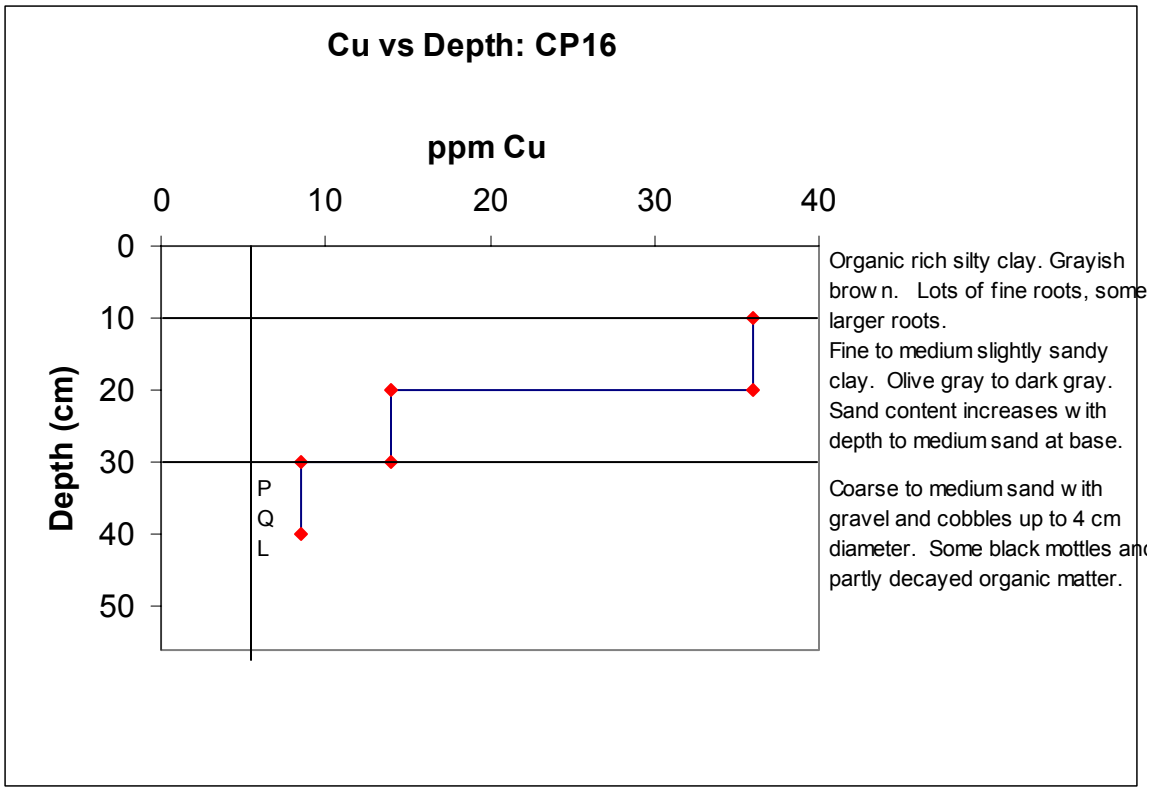

Cd vs Depth: CP15
ppm Cd
0
2
4
6
Depth (cm)
0
20
40
60
80
100
P
Q
L
Med. sandy soil. Lots of fine roots.
Massive, dark yellowish brown, slightl clayey, medium to fine sand.
Massive, moderate yellowish brown, clayey, medium sand.
Moderate yellowish brown to pale yellowish bown, clayey, medium sand

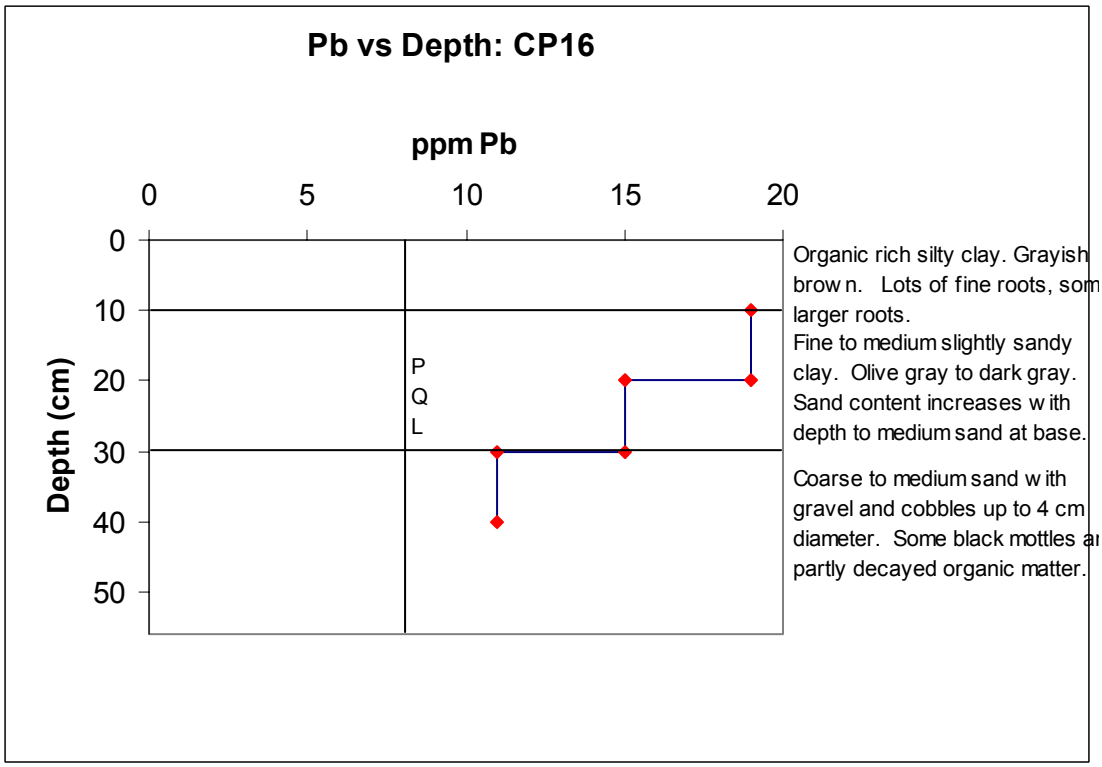

Cu vs Depth: CP15
ppm Cu
0
200
400
600
800
1000
Depth (cm)
0
20
40
60
80
100
Med. sandy soil. Lots of fine roots.
Massive, dark yellowish brown, slightly clayey, medium to fine sand.
Massive, moderate yellowish brown, clayey, medium sand.
Moderate yellowish brown to pale yellowish bown, clayey, medium sand.

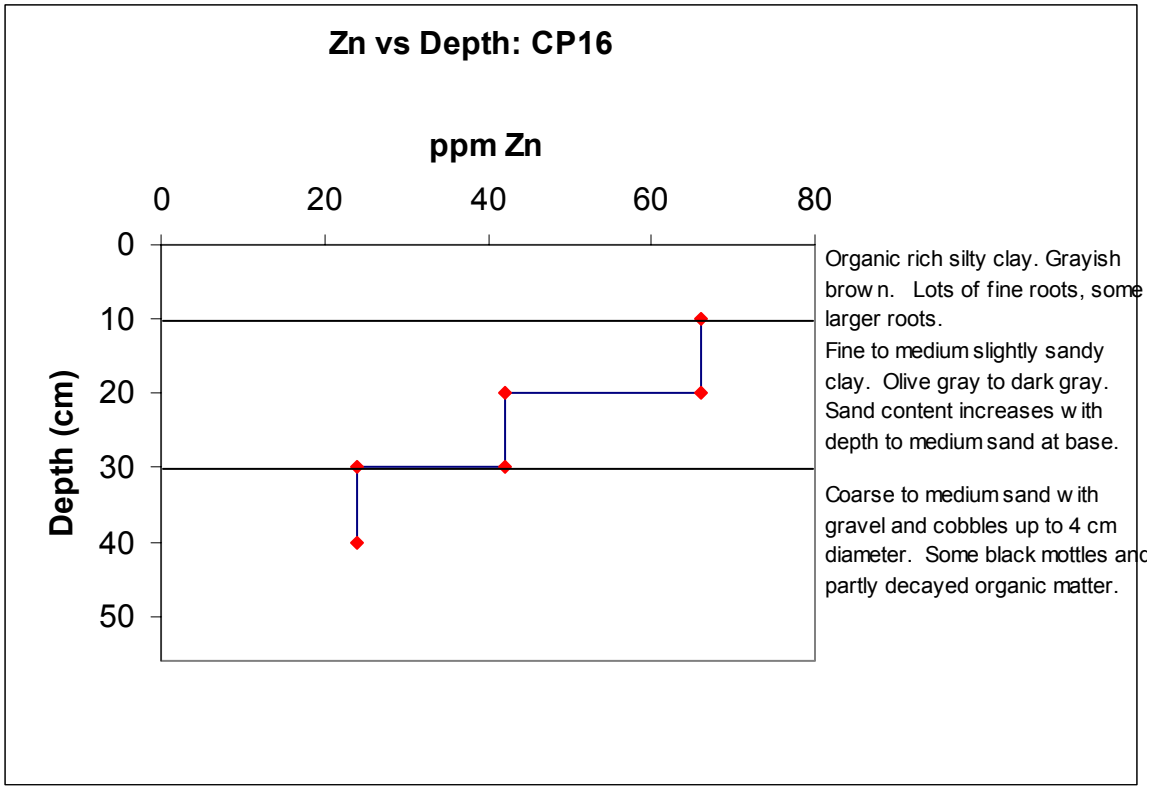

Pb vs Depth: CP15
ppm Pb
0
50
100
150
Depth (cm)
0
20
40
60
80
100
Med. sandy soil. Lots of fine roots.
Massive, dark yellowish brown, slightly clayey, medium to fine sand.
Massive, moderate yellowish brown, clayey, medium sand.
Moderate yellowish brown to pale yellowish bown, clayey, medium sand.

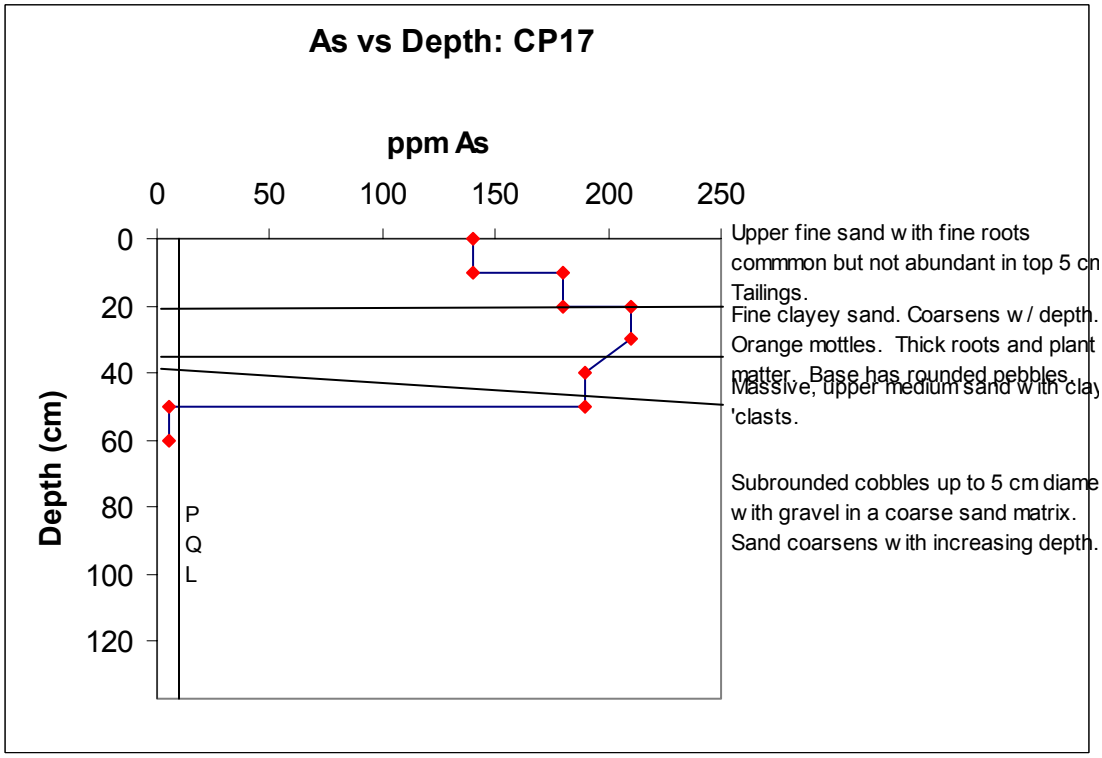


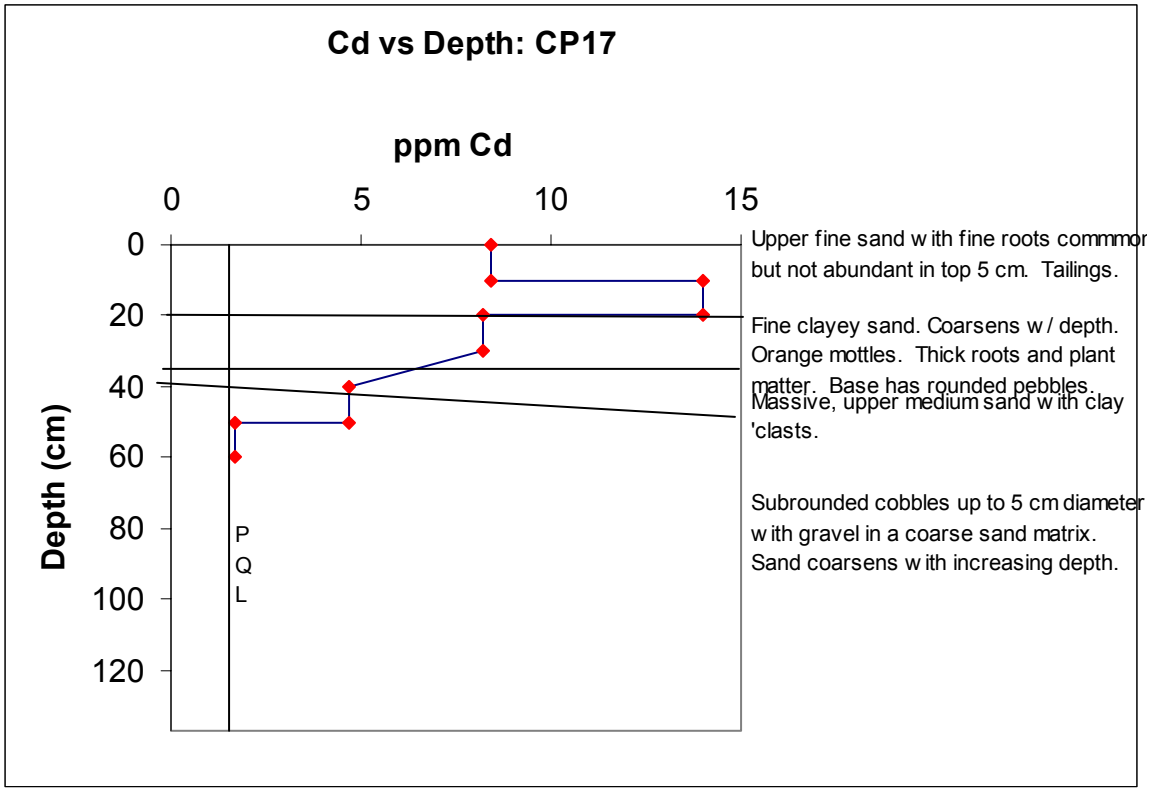
Note: Both arsenic and cadmium had no values above the PQL for CP16. No plots made.

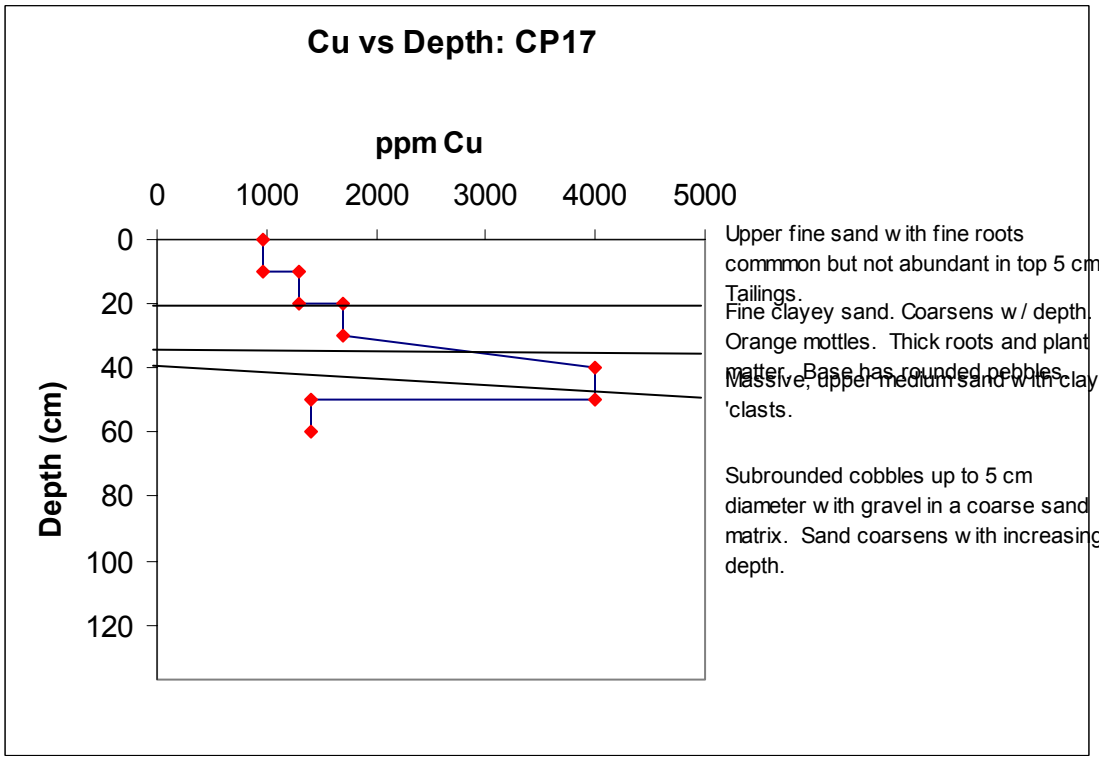

Cu vs Depth: CP16
ppm Cu
0
10
20
30
40
Depth (cm)
0
10
20
30
40
50
P
Q
L
Organic rich silty clay. Grayish brown. Lots of fine roots, some larger roots.
Fine to medium slightly sandy clay. Olive gray to dark gray. Sand content increases with depth to medium sand at base.
Coarse to medium sand with gravel and cobbles up to 4 cm diameter. Some black mottles and partly decayed organic matter.

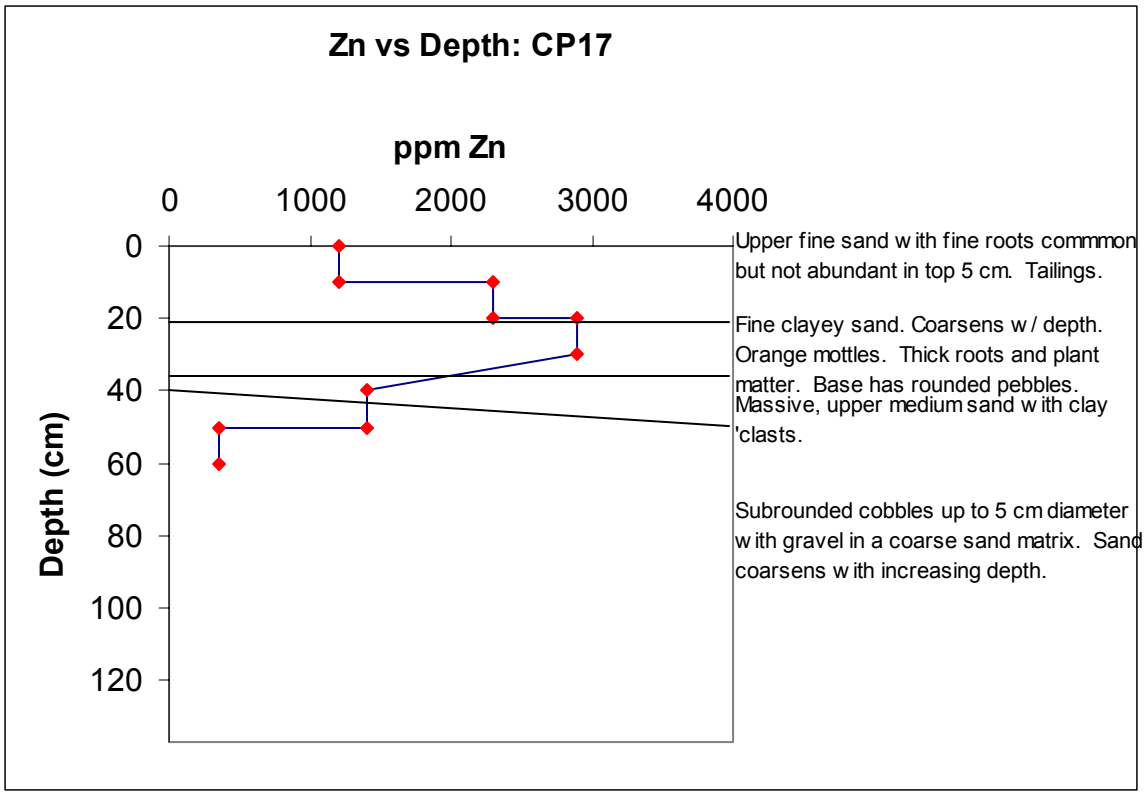

Pb vs Depth: CP16
ppm Pb
0
5
10
15
20
Depth (cm)
0
10
20
30
40
50
P
Q
L
Organic rich silty clay. Grayish brown. Lots of fine roots, some larger roots.
Fine to medium slightly sandy clay. Olive gray to dark gray. Sand content increases with depth to medium sand at base.
Coarse to medium sand with gravel and cobbles up to 4 cm diameter. Some black mottles and partly decayed organic matter.

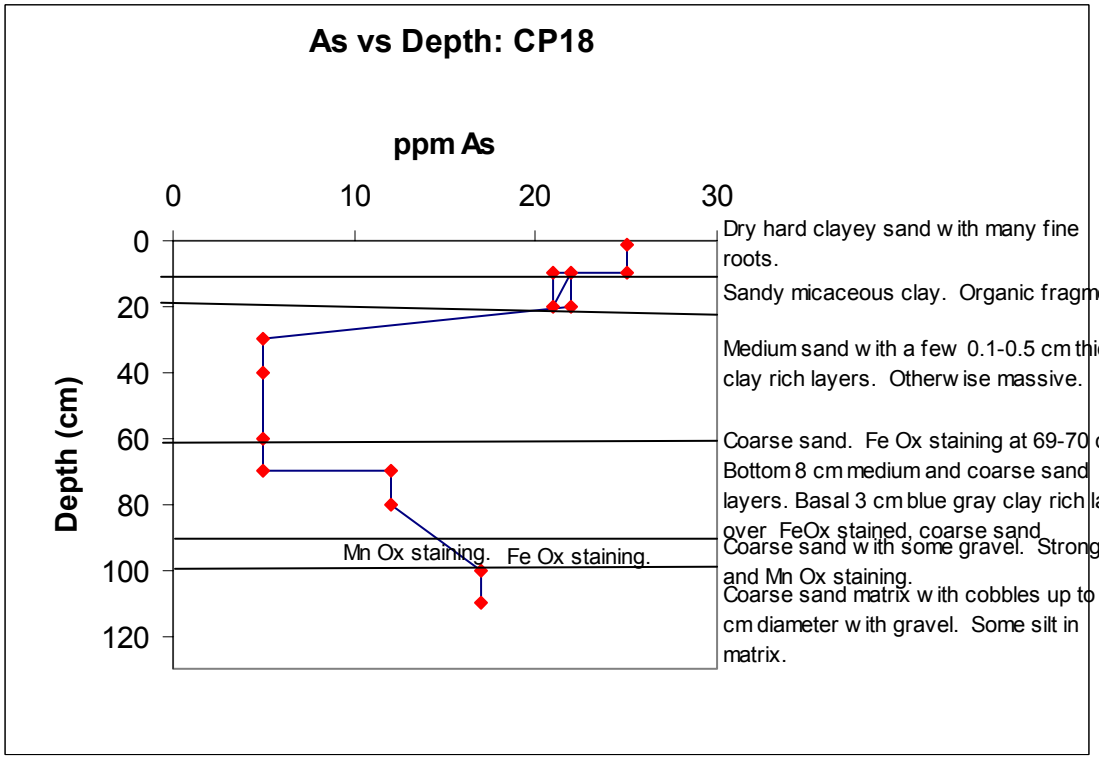

Zn vs Depth: CP16
ppm Zn
0
20
40
60
80
Depth (cm)
0
10
20
30
40
50
Organic rich silty clay. Grayish brown. Lots of fine roots, some larger roots.
Fine to medium slightly sandy clay. Olive gray to dark gray. Sand content increases with depth to medium sand at base.
Coarse to medium sand with gravel and cobbles up to 4 cm diameter. Some black mottles and partly decayed organic matter.

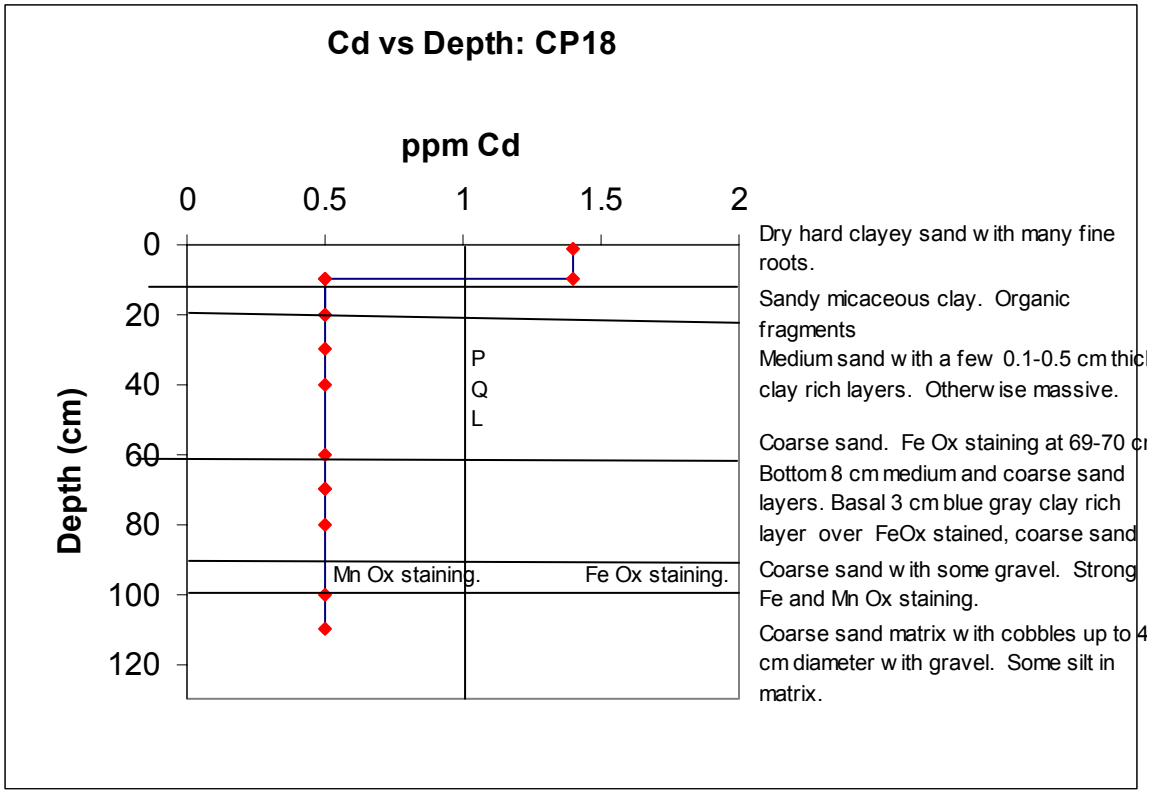

As vs Depth: CP17
ppm As
0
50
100
150
200
250
Depth (cm)
0
20
40
60
80
100
120
P
Q
L
Upper fine sand with fine roots commmon but not abundant in top 5 cm Tailings.
Fine clayey sand. Coarsens w / depth. Orange mottles. Thick roots and plant matter. Base has rounded pebbles.
Massive, upper medium sand with clay 'clasts.
Subrounded cobbles up to 5 cm diame with gravel in a coarse sand matrix. Sand coarsens with increasing depth.

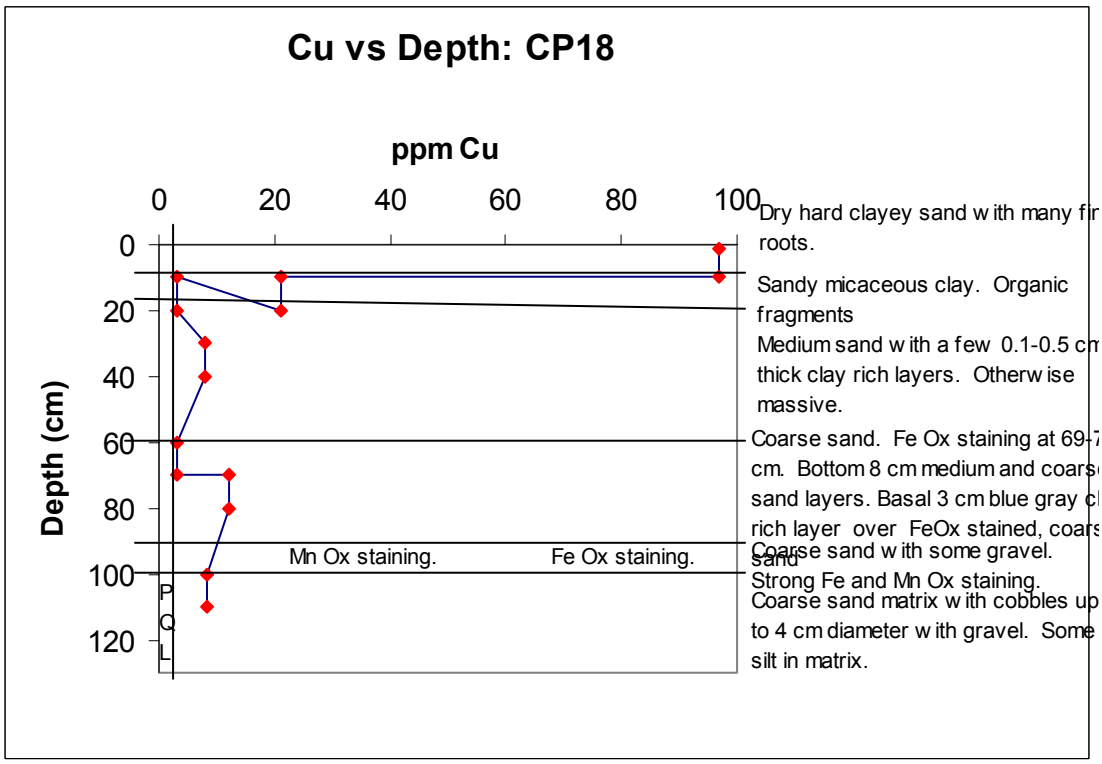

Cd vs Depth: CP17
ppm Cd
0
5
10
15
Depth (cm)
0
20
40
60
80
100
120
P
Q
L
Upper fine sand with fine roots commmon but not abundant in top 5 cm. Tailings.
Fine clayey sand. Coarsens w / depth. Orange mottles. Thick roots and plant matter. Base has rounded pebbles.
Massive, upper medium sand with clay 'clasts.
Subrounded cobbles up to 5 cm diameter with gravel in a coarse sand matrix. Sand coarsens with increasing depth.

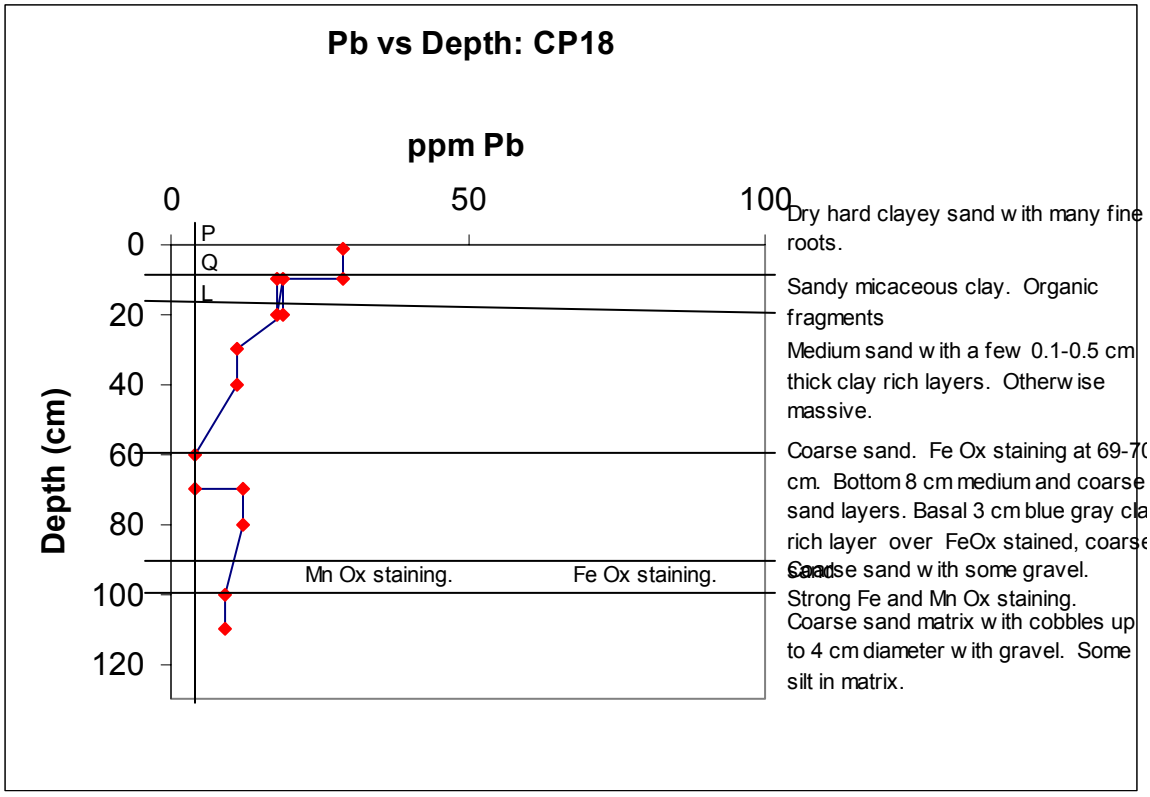

Cu vs Depth: CP17
ppm Cu
0
1000
2000
3000
4000
5000
Depth (cm)
0
20
40
60
80
100
120
Upper fine sand with fine roots commmon but not abundant in top 5 cm Tailings.
Fine clayey sand. Coarsens w / depth. Orange mottles. Thick roots and plant matter. Base has rounded pebbles.
Massive, upper medium sand with clay 'clasts.
Subrounded cobbles up to 5 cm diameter with gravel in a coarse sand matrix. Sand coarsens with increasing depth.

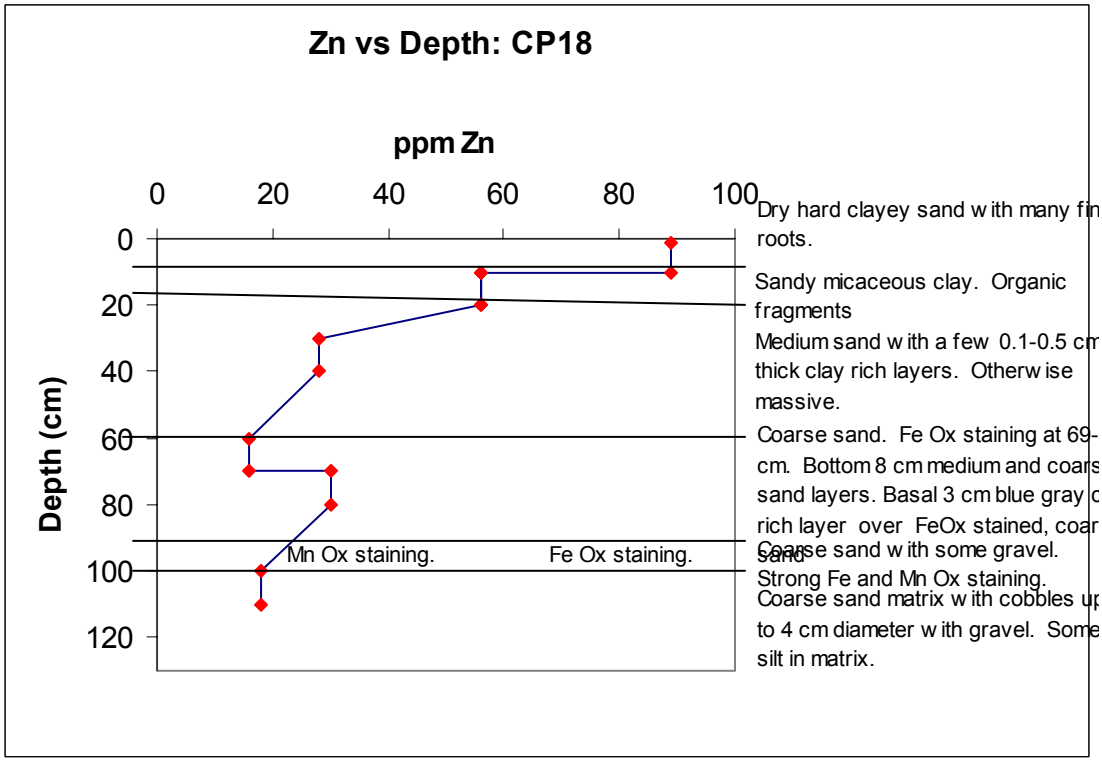

Zn vs Depth: CP17
ppm Zn
0
1000
2000
3000
4000
Depth (cm)
0
20
40
60
80
100
120
Upper fine sand with fine roots commmon but not abundant in top 5 cm. Tailings.
Fine clayey sand. Coarsens w / depth. Orange mottles. Thick roots and plant matter. Base has rounded pebbles.
Massive, upper medium sand with clay 'clasts.
Subrounded cobbles up to 5 cm diameter with gravel in a coarse sand matrix. Sand coarsens with increasing depth.

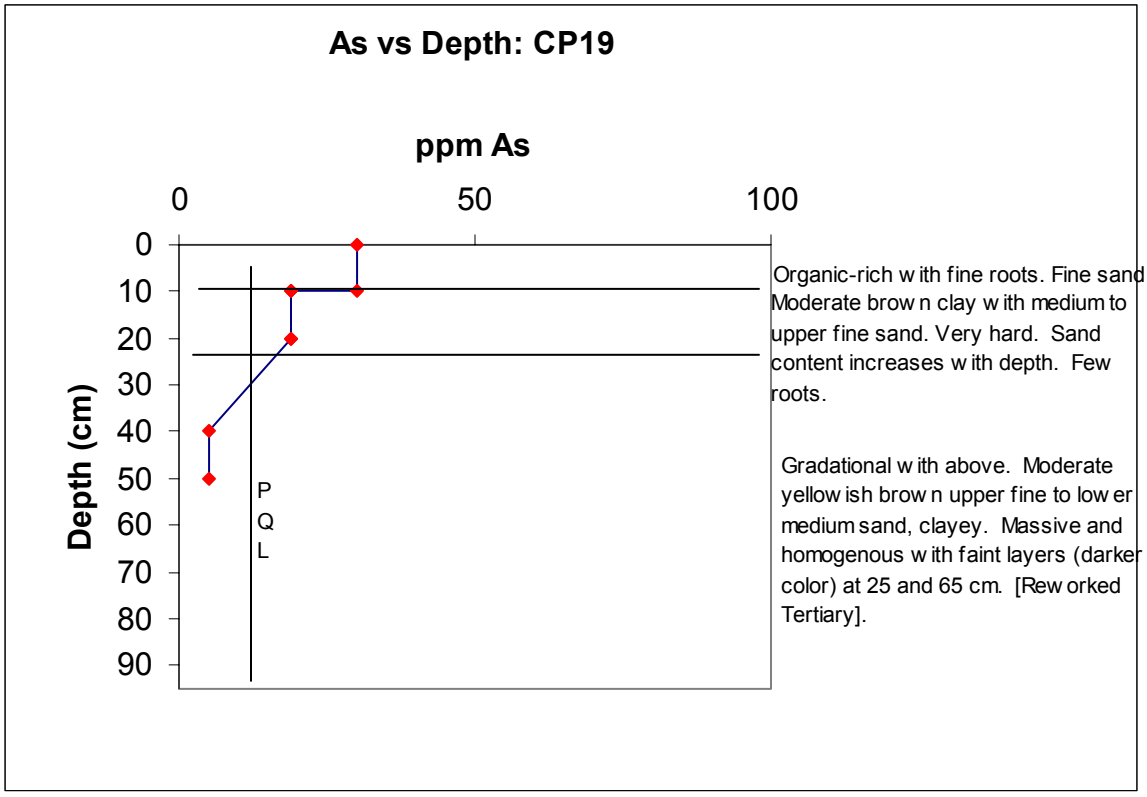

As vs Depth: CP18
ppm As
0
10
20
30
Depth (cm)
0
20
40
60
80
100
120
Mn Ox staining.
Fe Ox staining.
Dry hard clayey sand with many fine roots.
Sandy micaceous clay. Organic fragm
Medium sand with a few 0.1-0.5 cm thi clay rich layers. Otherwise massive.
Coarse sand. Fe Ox staining at 69-70 Bottom 8 cm medium and coarse sand layers. Basal 3 cm blue gray clay rich la over FeOx stained, coarse sand.
Coarse sand with some gravel. Strong and Mn Ox staining.
Coarse sand matrix with cobbles up to cm diameter with gravel. Some silt in matrix.

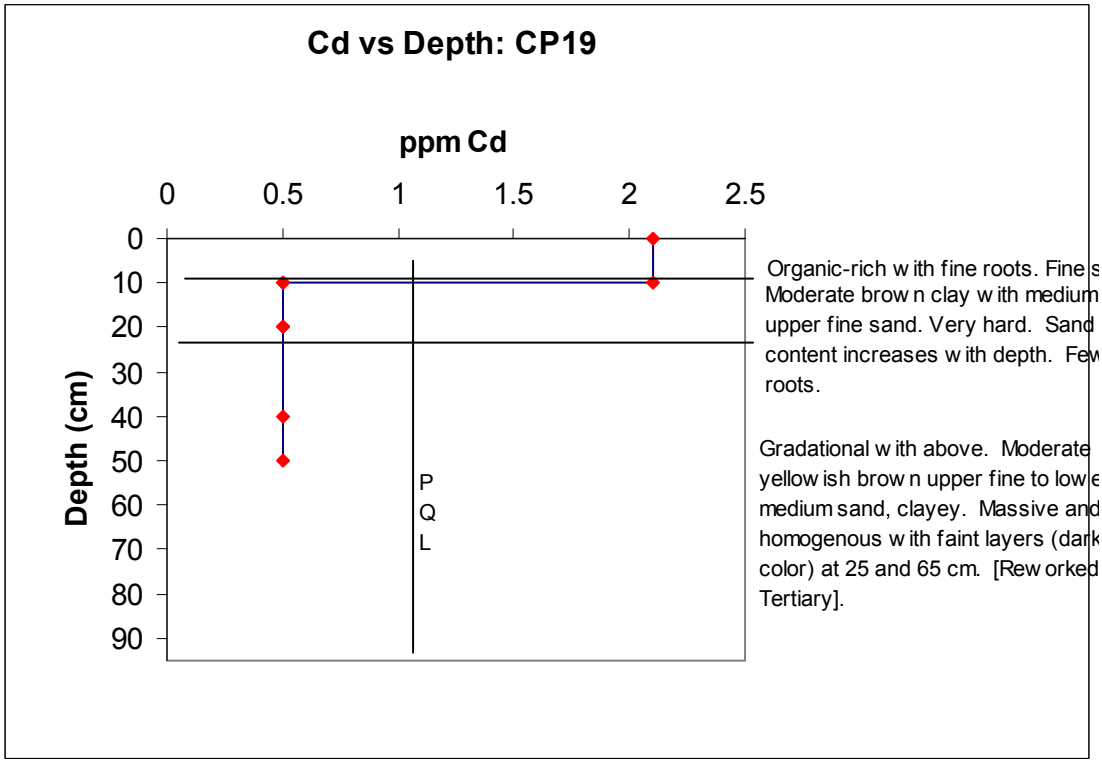

Cd vs Depth: CP18
ppm Cd
0
0.5
1
1.5
2
Depth (cm)
0
20
40
60
80
100
120
P
Q
L
Mn Ox staining.
Fe Ox staining.
Dry hard clayey sand with many fine roots.
Sandy micaceous clay. Organic fragments
Medium sand with a few 0.1-0.5 cm thic
clay rich layers. Otherwise massive.
Coarse sand. Fe Ox staining at 69-70 c
Bottom 8 cm medium and coarse sand layers. Basal 3 cm blue gray clay rich layer over FeOx stained, coarse sand
Coarse sand with some gravel. Strong Fe and Mn Ox staining.
Coarse sand matrix with cobbles up to 4 cm diameter with gravel. Some silt in matrix.

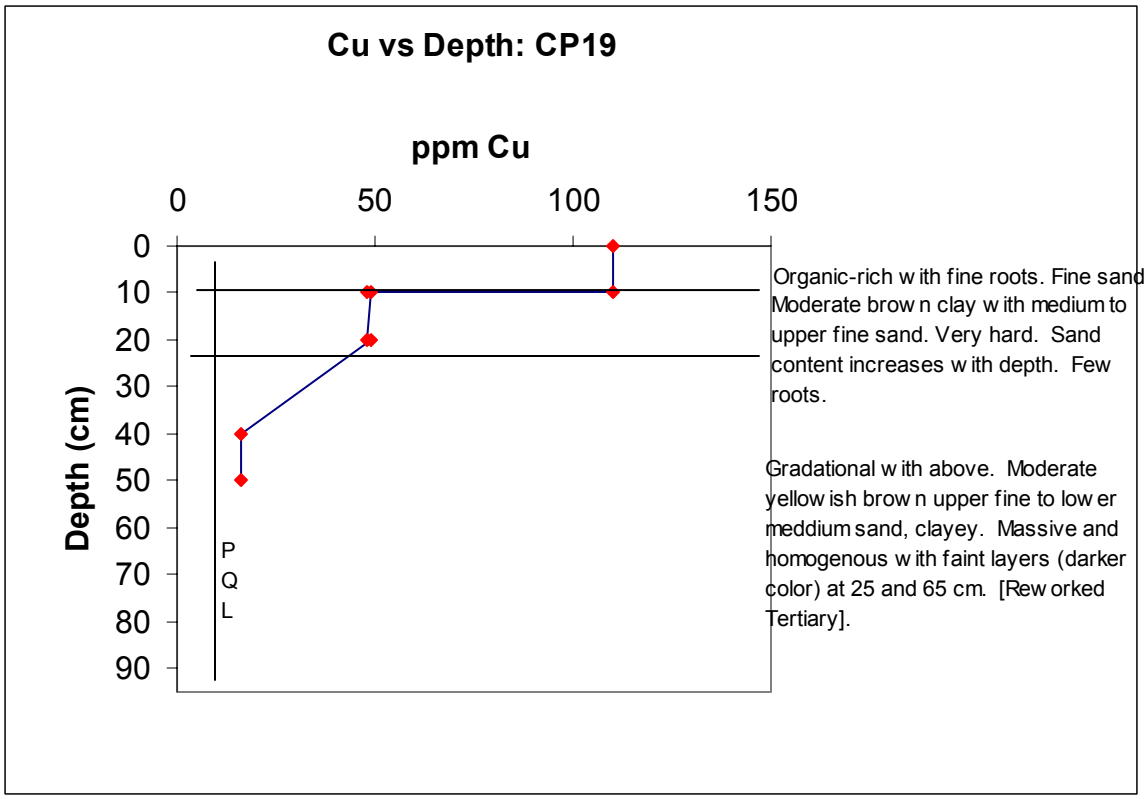

Cu vs Depth: CP18
ppm Cu
0
20
40
60
80
100
Depth (cm)
0
20
40
60
80
100
120
P
Q
L
Mn Ox staining.
Fe Ox staining.
Dry hard clayey sand with many fir roots.
Sandy micaceous clay. Organic fragments
Medium sand with a few 0.1-0.5 cm thick clay rich layers. Otherwise massive.
Coarse sand. Fe Ox staining at 69-7 cm. Bottom 8 cm medium and coars sand layers. Basal 3 cm blue gray cl rich layer over FeOx stained, coars sand
Coarse sand with some gravel. Strong Fe and Mn Ox staining.
Coarse sand matrix with cobbles up to 4 cm diameter with gravel. Some silt in matrix.

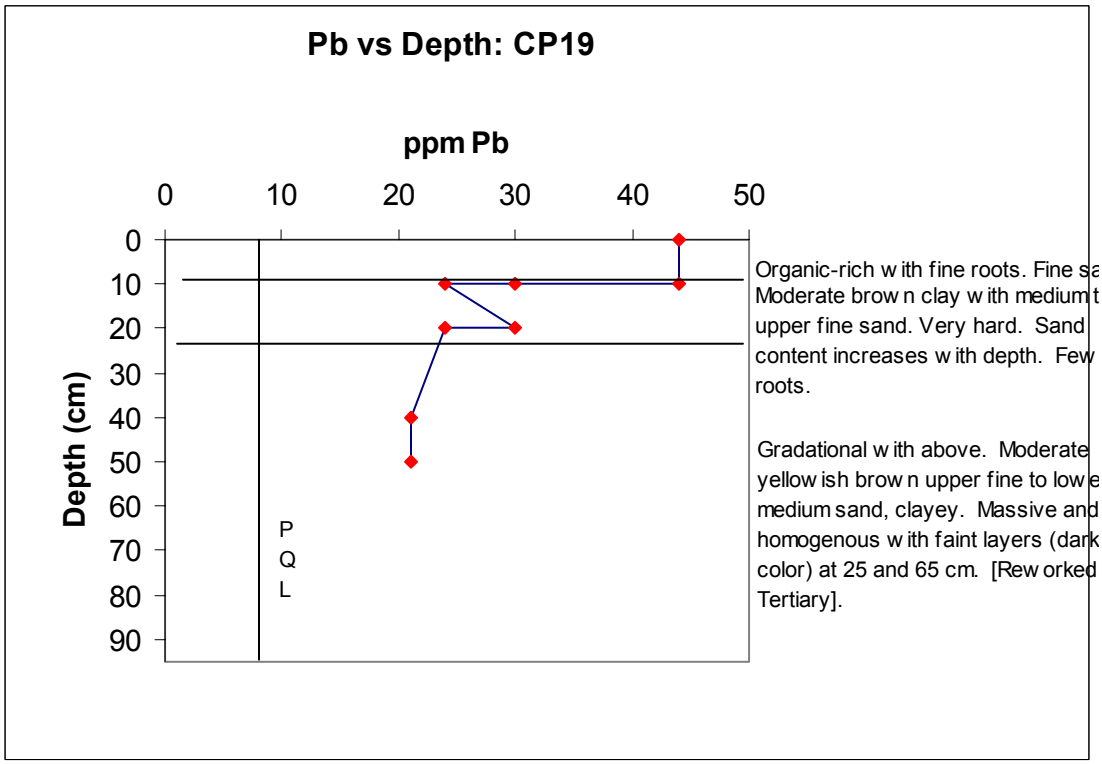

Pb vs Depth: CP18
ppm Pb
0
50
100
Depth (cm)
0
20
40
60
80
100
120
P
Q
L
Mn Ox staining.
Fe Ox staining.
Dry hard clayey sand with many fine roots.
Sandy micaceous clay. Organic fragments
Medium sand with a few 0.1-0.5 cm thick clay rich layers. Otherwise massive.
Coarse sand. Fe Ox staining at 69-7
cm. Bottom 8 cm medium and coarse sand layers. Basal 3 cm blue gray cla
rich layer over FeOx stained, coarse
sand
Coarse sand with some gravel.
Strong Fe and Mn Ox staining.
Coarse sand matrix with cobbles up to 4 cm diameter with gravel. Some silt in matrix.

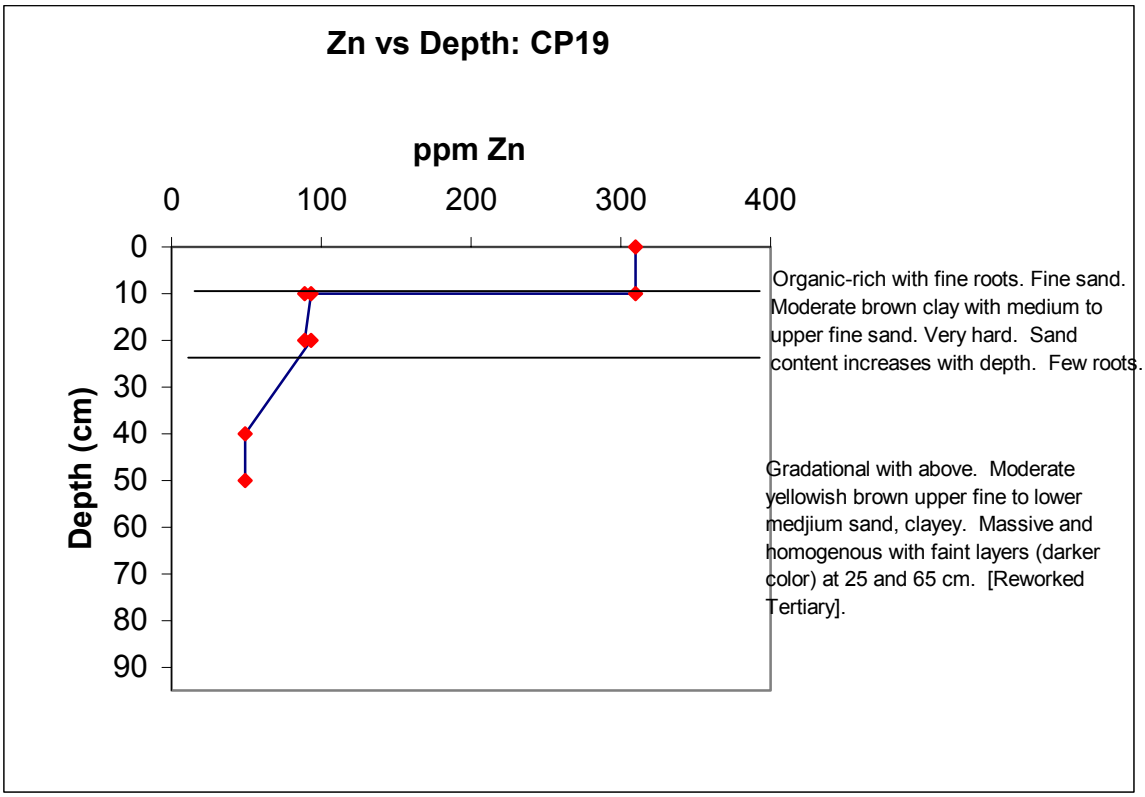

Zn vs Depth: CP18
ppm Zn
0
20
40
60
80
100
Depth (cm)
0
20
40
60
80
100
120
Mn Ox staining.
Fe Ox staining.
Dry hard clayey sand with many fin
roots.
Sandy micaceous clay. Organic fragments
Medium sand with a few 0.1-0.5 cm
thick clay rich layers. Otherwise massive.
Coarse sand. Fe Ox staining at 69-
cm. Bottom 8 cm medium and coars
sand layers. Basal 3 cm blue gray c
rich layer over FeOx stained, coar
sand
Coarse sand with some gravel.
Strong Fe and Mn Ox staining.
Coarse sand matrix with cobbles up
to 4 cm diameter with gravel. Some
silt in matrix.

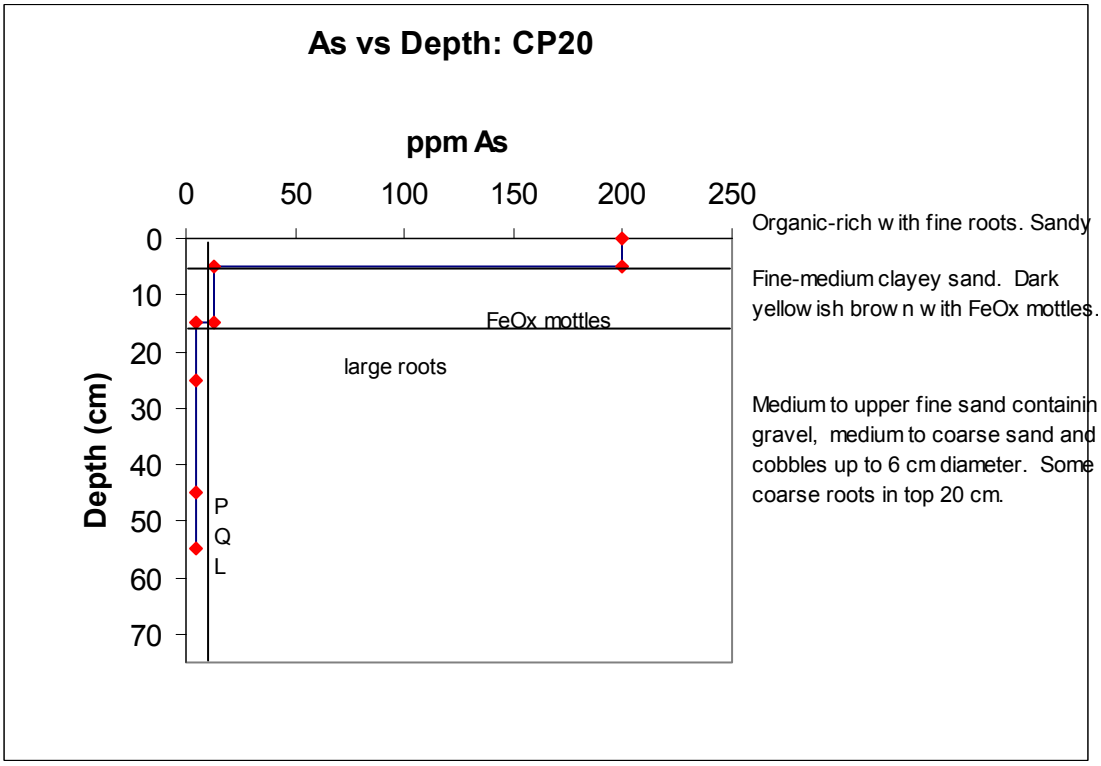

As vs Depth: CP19
ppm As
0
50
100
Depth (cm)
0
10
20
30
40
50
60
70
80
90
P
Q
L
Organic-rich with fine roots. Fine sand
Moderate brown clay with medium to
upper fine sand. Very hard. Sand
content increases with depth. Few
roots.
Gradational with above. Moderate
yellowish brown upper fine to lower
medium sand, clayey. Massive and
homogenous with faint layers (darker
color) at 25 and 65 cm. [Reworked
Tertiary].

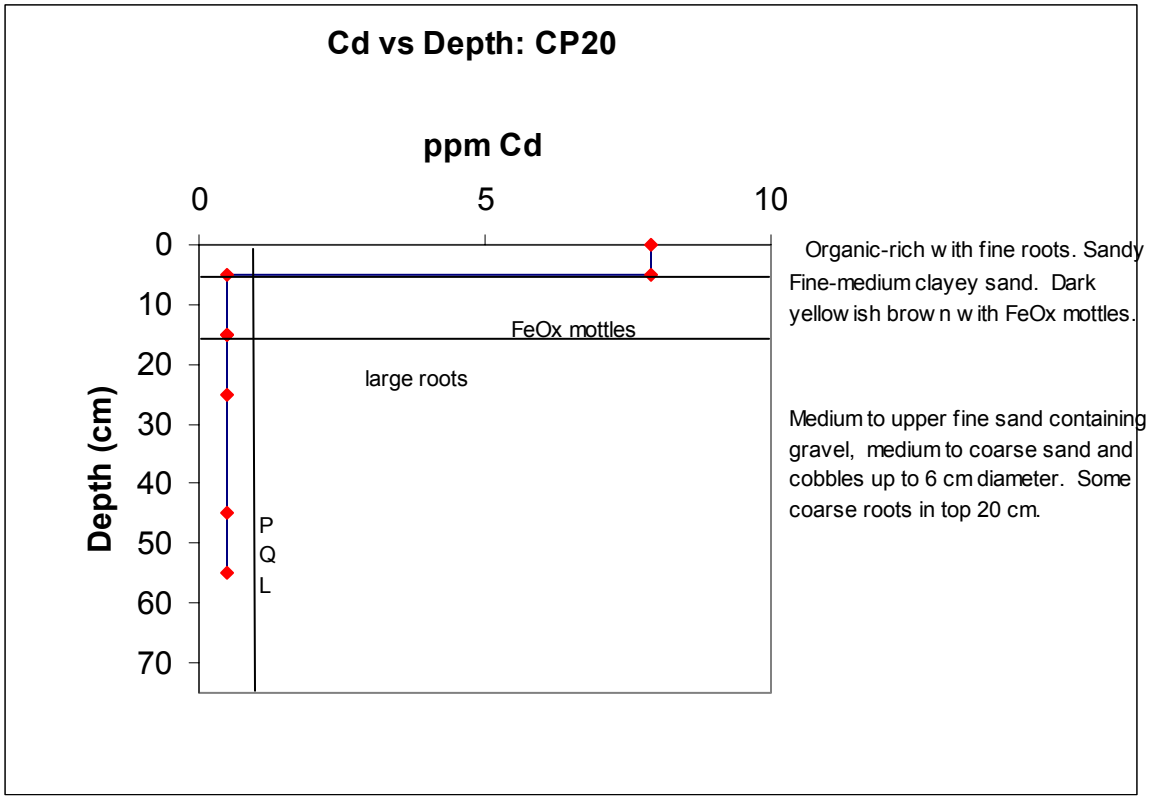

Cd vs Depth: CP19
ppm Cd
0
0.5
1
1.5
2
2.5
Depth (cm)
0
10
20
30
40
50
60
70
80
90
P
Q
L
Organic-rich with fine roots. Fine s
Moderate brown clay with medium
upper fine sand. Very hard. Sand
content increases with depth. Few
roots.
Gradational with above. Moderate
yellowish brown upper fine to low
medium sand, clayey. Massive and
homogenous with faint layers (dark
color) at 25 and 65 cm. [Reworked
Tertiary].

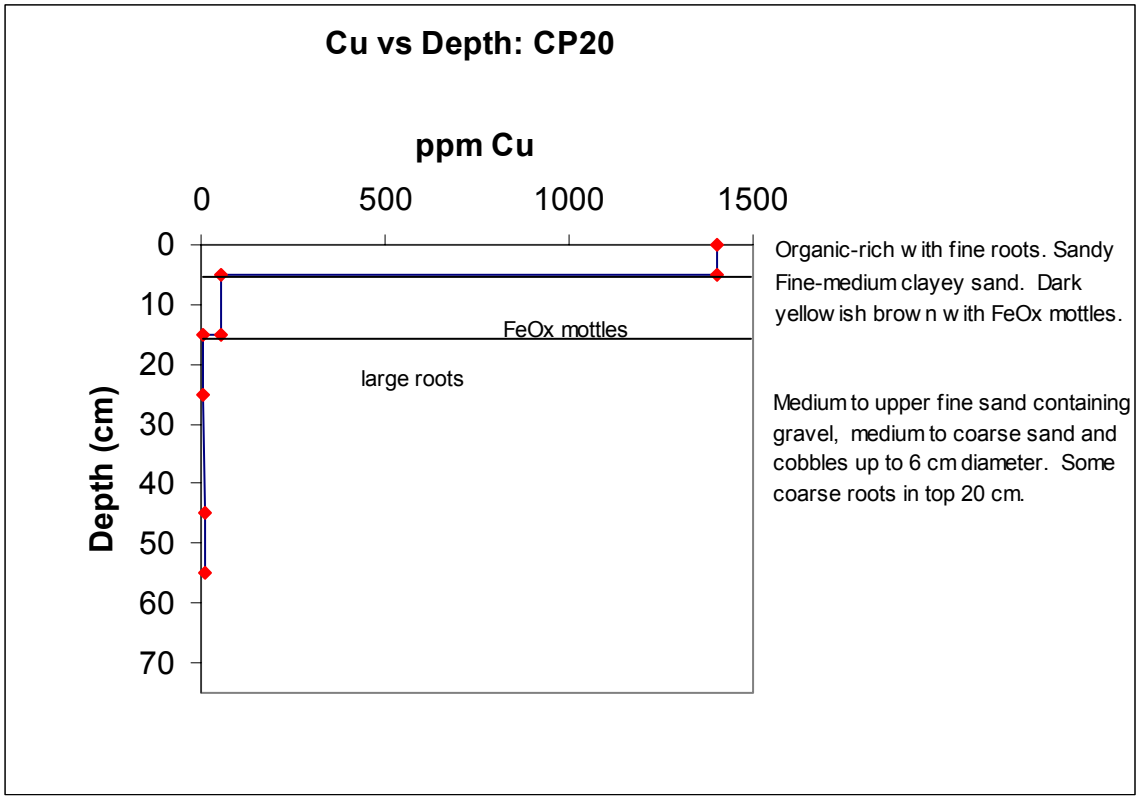

Cu vs Depth: CP19
ppm Cu
0
50
100
150
0
10
20
30
40
50
60
70
80
90
Depth (cm)
P
Q
L
Organic-rich with fine roots. Fine sand
Moderate brown clay with medium to
upper fine sand. Very hard. Sand
content increases with depth. Few
roots.
Gradational with above. Moderate
yellowish brown upper fine to lower
meddium sand, clayey. Massive and
homogenous with faint layers (darker
color) at 25 and 65 cm. [Reworked
Tertiary].

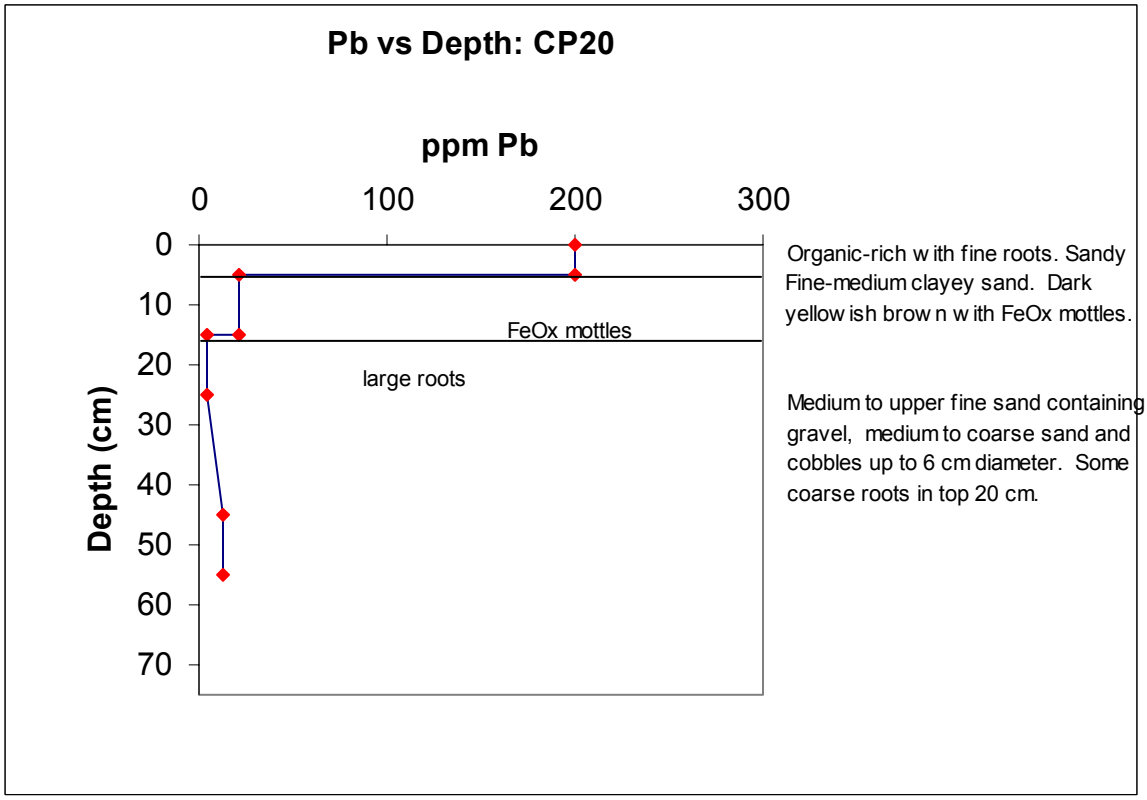

Pb vs Depth: CP19
ppm Pb
0
10
20
30
40
50
0
10
20
30
40
50
60
70
80
90
Depth (cm)
P
Q
L
Organic-rich with fine roots. Fine sa
Moderate brown clay with medium t
upper fine sand. Very hard. Sand
content increases with depth. Few
roots.
Gradational with above. Moderate
yellowish brown upper fine to lowe
medium sand, clayey. Massive and
homogenous with faint layers (dark
color) at 25 and 65 cm. [Reworked
Tertiary].

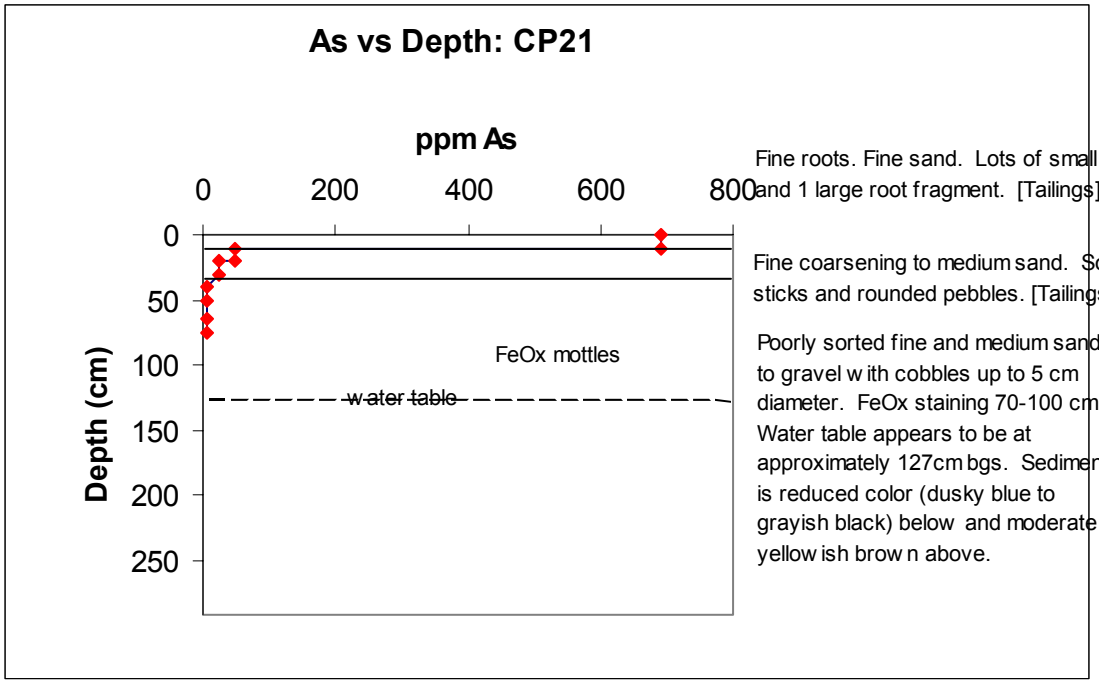

Zn vs Depth: CP19
ppm Zn
0
100
200
300
400
Depth (cm)
0
10
20
30
40
50
60
70
80
90
Organic-rich with fine roots. Fine sand. Moderate brown clay with medium to upper fine sand. Very hard. Sand content increases with depth. Few roots.
Gradational with above. Moderate yellowish brown upper fine to lower medjium sand, clayey. Massive and homogenous with faint layers (darker color) at 25 and 65 cm. [Reworked Tertiary].

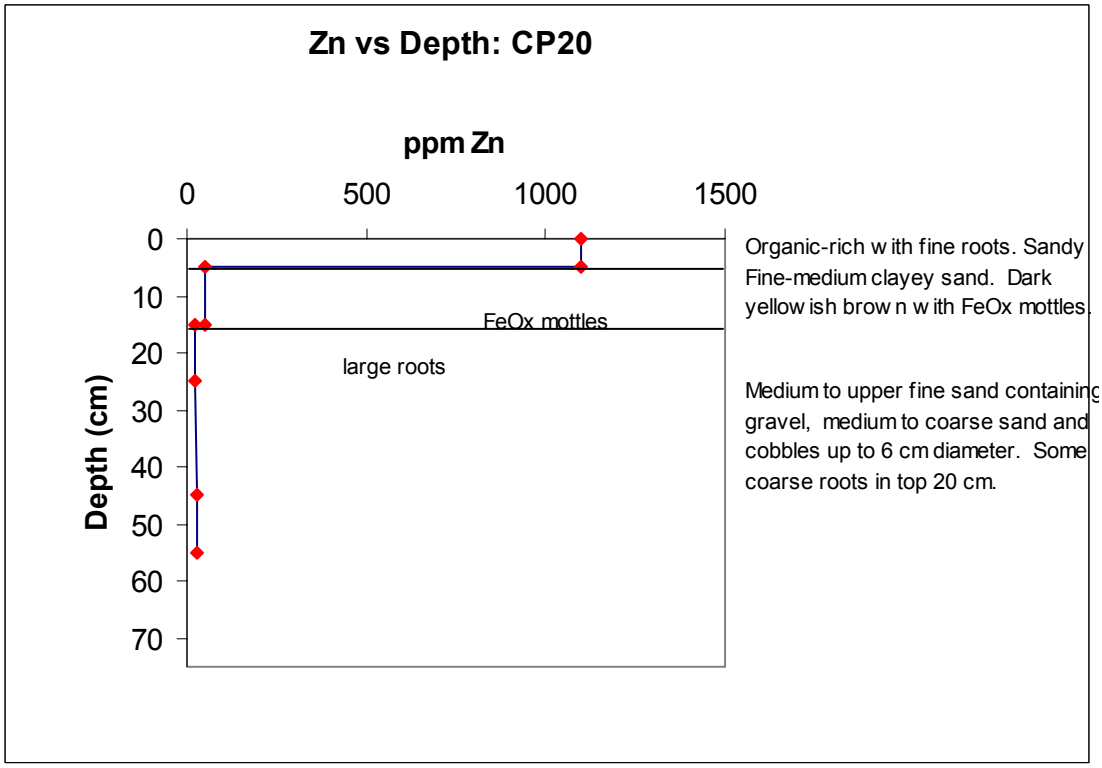

As vs Depth: CP20
ppm As
0
50
100
150
200
250
Depth (cm)
0
10
20
30
40
50
60
70
Organic-rich w ith fine roots. Sandy
Fine-medium clayey sand. Dark yellow ish brow n w ith FeOx mottles.
FeOx mottles
large roots
Medium to upper fine sand containin gravel, medium to coarse sand and cobbles up to 6 cm diameter. Some coarse roots in top 20 cm.
P
Q
L

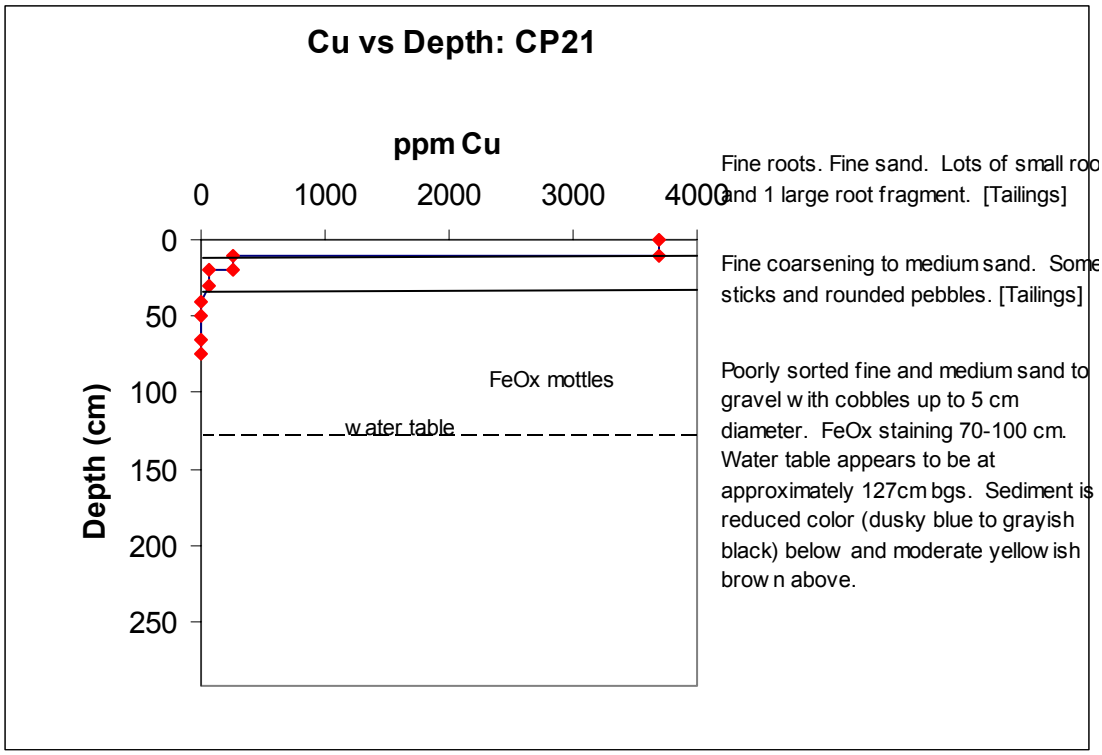

Cd vs Depth: CP20
ppm Cd
0
5
10
Depth (cm)
0
10
20
30
40
50
60
70
FeOx mottles
large roots
P
Q
L
Organic-rich w ith fine roots. Sandy Fine-medium clayey sand. Dark yellow ish brow n w ith FeOx mottles.
Medium to upper fine sand containing gravel, medium to coarse sand and cobbles up to 6 cm diameter. Some coarse roots in top 20 cm.

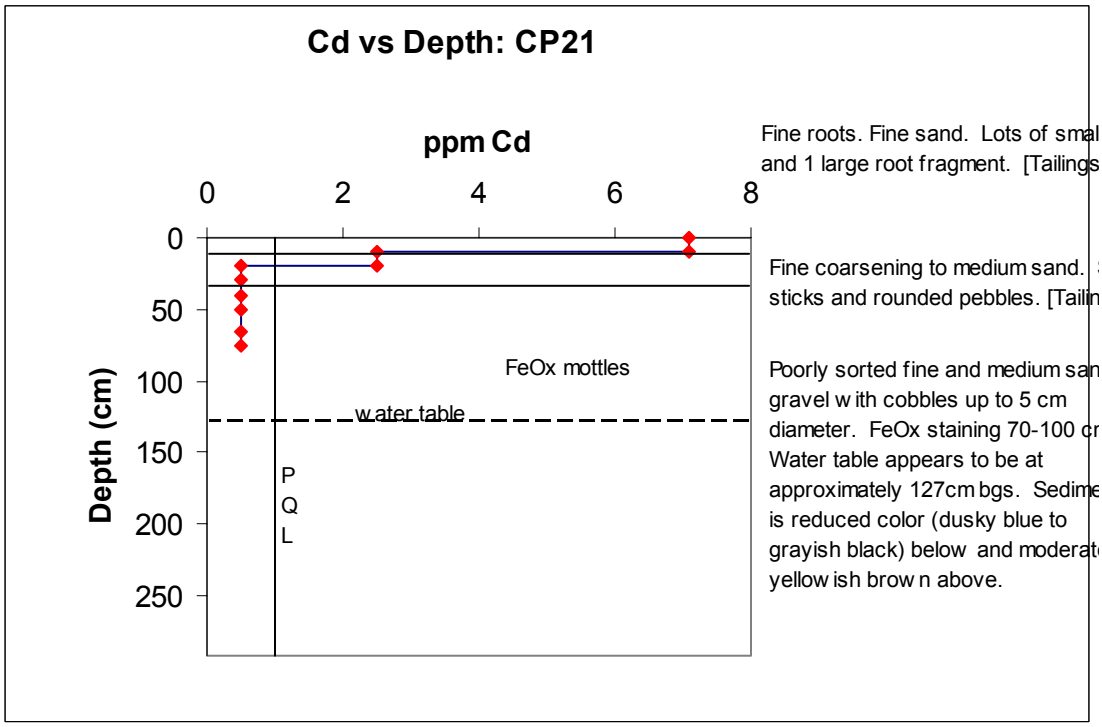

Cu vs Depth: CP20
ppm Cu
0
500
1000
1500
Depth (cm)
0
10
20
30
40
50
60
70
FeOx mottles
large roots
Organic-rich with fine roots. Sandy Fine-medium clayey sand. Dark yellowish brown with FeOx mottles.
Medium to upper fine sand containing gravel, medium to coarse sand and cobbles up to 6 cm diameter. Some coarse roots in top 20 cm.

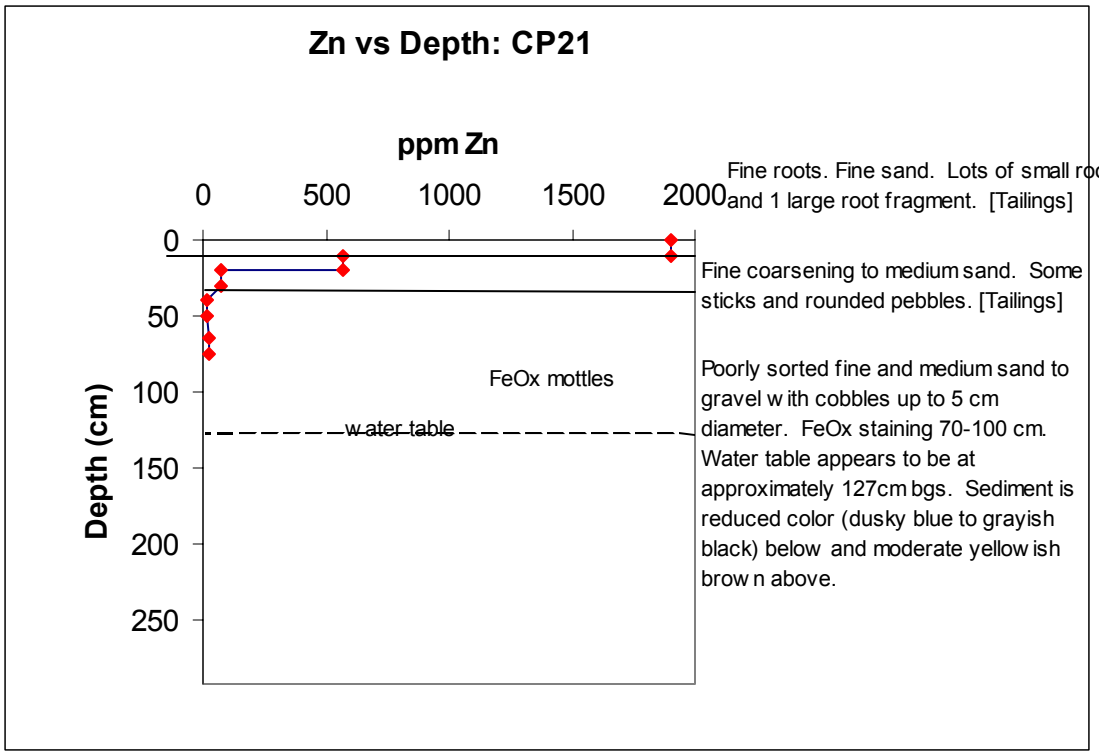

Pb vs Depth: CP20
ppm Pb
0
100
200
300
Depth (cm)
0
10
20
30
40
50
60
70
FeOx mottles
large roots
Organic-rich with fine roots. Sandy Fine-medium clayey sand. Dark yellowish brown with FeOx mottles.
Medium to upper fine sand containing gravel, medium to coarse sand and cobbles up to 6 cm diameter. Some coarse roots in top 20 cm.

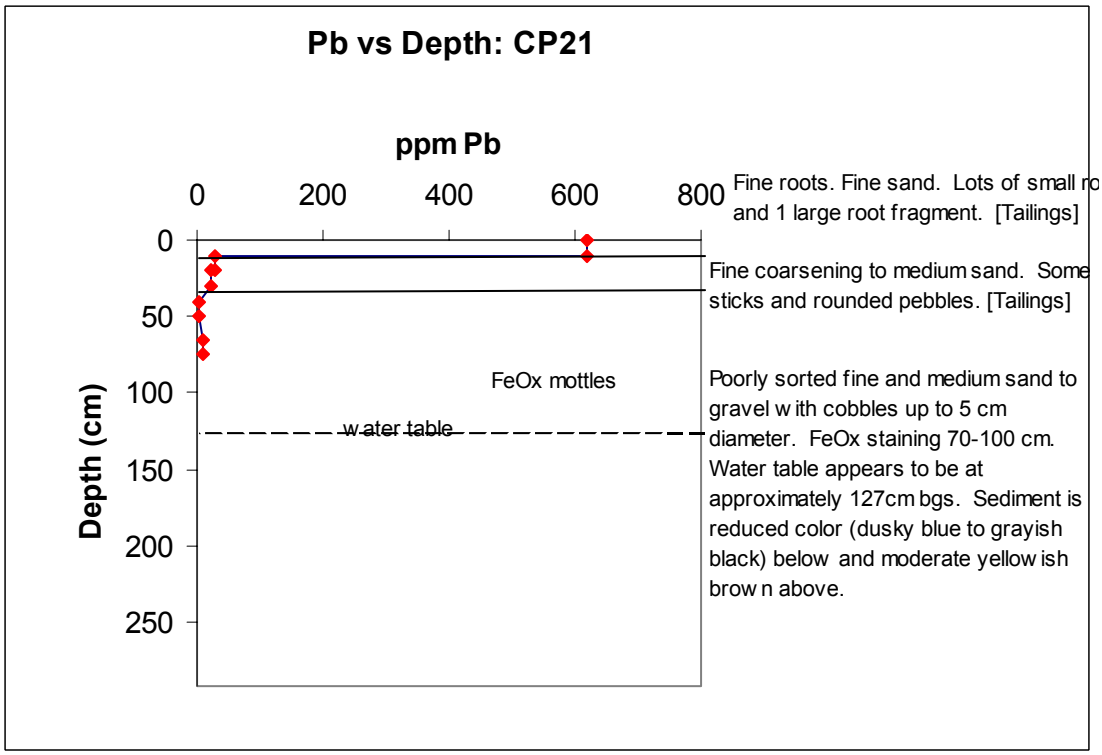

As vs Depth: CP21
ppm As
0
200
400
600
800
Depth (cm)
0
50
100
150
200
250
FeOx mottles
water table
Fine roots. Fine sand. Lots of small and 1 large root fragment. [Tailings]
Fine coarsening to medium sand. Sc sticks and rounded pebbles. [Tailings
Poorly sorted fine and medium sand to gravel with cobbles up to 5 cm diameter. FeOx staining 70-100 cm Water table appears to be at approximately 127cm bgs. Sedimer is reduced color (dusky blue to grayish black) below and moderate yellowish brown above.

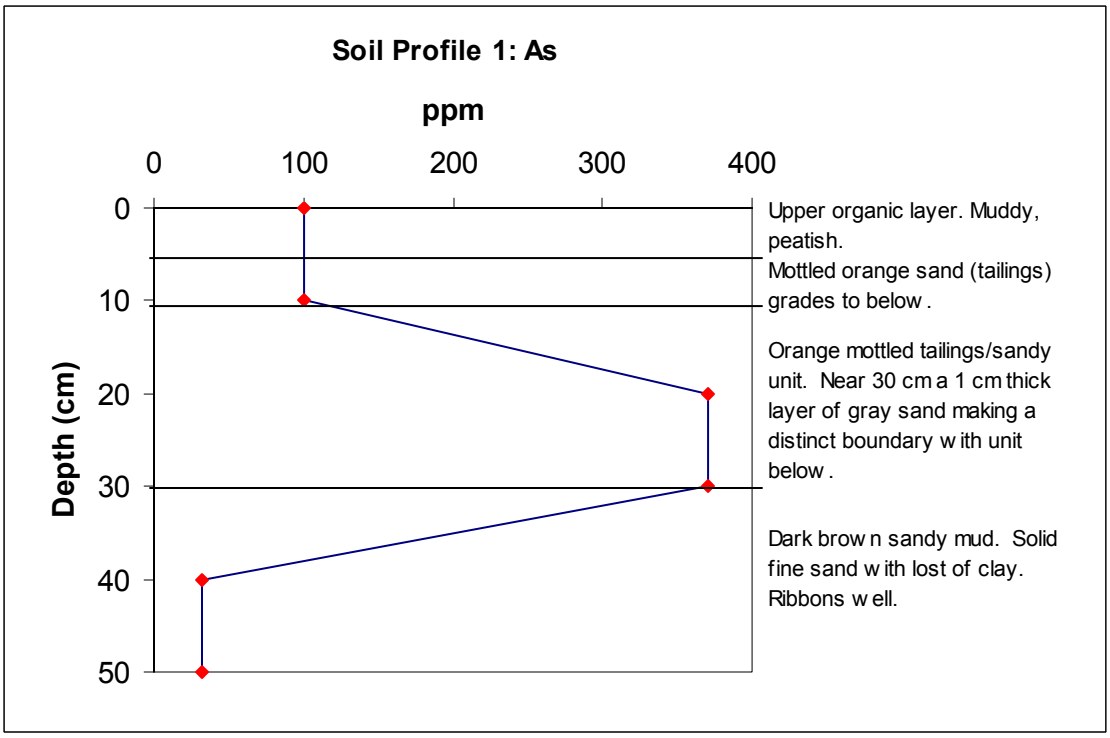

Zn vs Depth: CP20
ppm Zn
0
500
1000
1500
Depth (cm)
0
10
20
30
40
50
60
70
FeOx mottles
large roots
Organic-rich with fine roots. Sandy Fine-medium clayey sand. Dark yellowish brown with FeOx mottles.
Medium to upper fine sand containing gravel, medium to coarse sand and cobbles up to 6 cm diameter. Some coarse roots in top 20 cm.

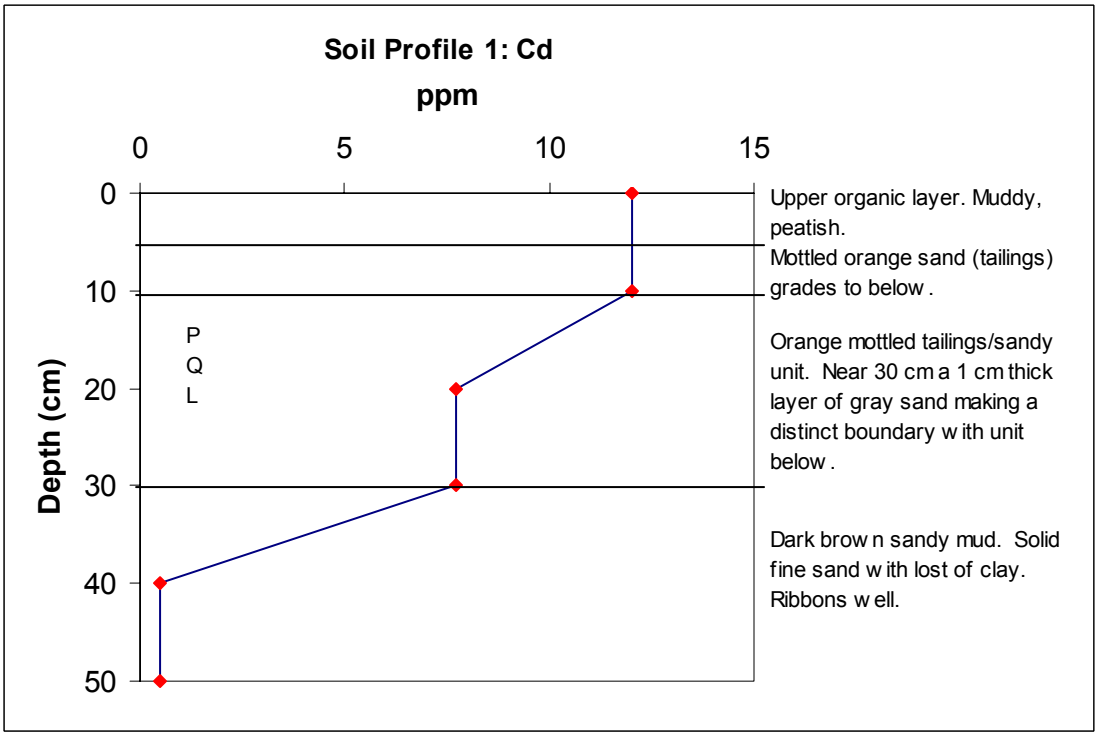

Cu vs Depth: CP21
ppm Cu
0
1000
2000
3000
4000
Depth (cm)
0
50
100
150
200
250
FeOx mottles
water table
Fine roots. Fine sand. Lots of small roo
and 1 large root fragment. [Tailings]
Fine coarsening to medium sand. Some
sticks and rounded pebbles. [Tailings]
Poorly sorted fine and medium sand to
gravel with cobbles up to 5 cm
diameter. FeOx staining 70-100 cm.
Water table appears to be at
approximately 127cm bgs. Sediment is
reduced color (dusky blue to grayish
black) below and moderate yellowish
brown above.

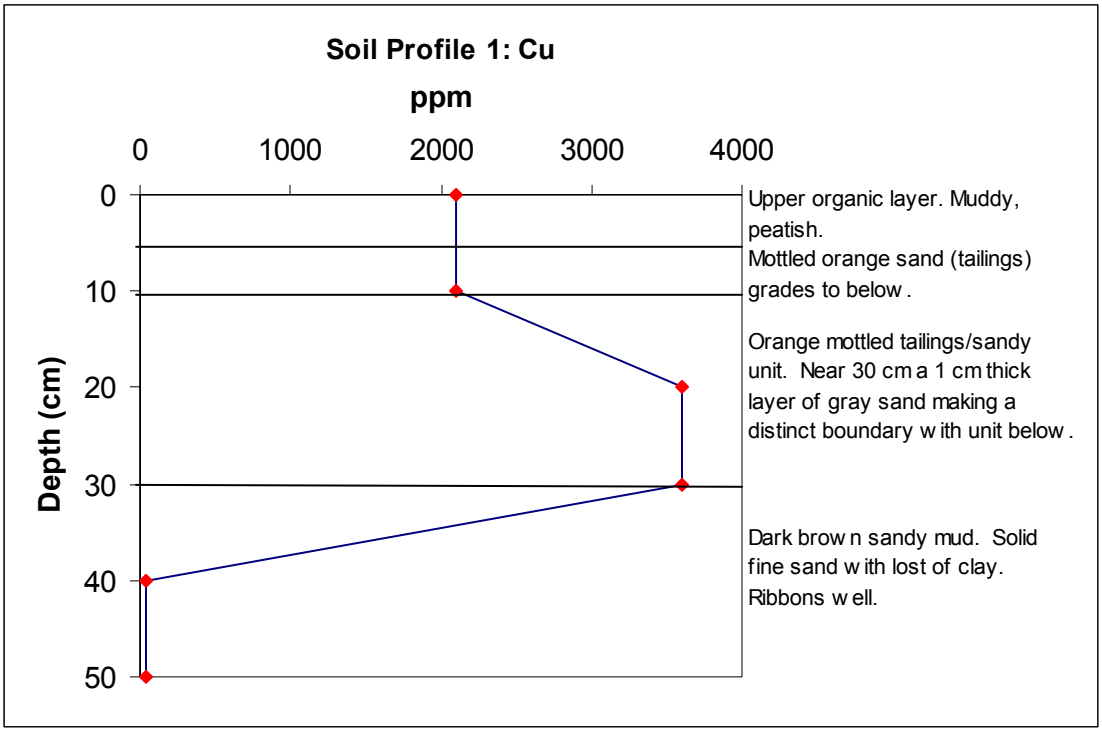

Cd vs Depth: CP21
ppm Cd
0
2
4
6
8
Depth (cm)
0
50
100
150
200
250
FeOx mottles
water table
P
Q
L
Fine roots. Fine sand. Lots of smal
and 1 large root fragment. [Tailings
Fine coarsening to medium sand.
sticks and rounded pebbles. [Tailin
Poorly sorted fine and medium san
gravel with cobbles up to 5 cm
diameter. FeOx staining 70-100 cr
Water table appears to be at
approximately 127cm bgs. Sedime
is reduced color (dusky blue to
grayish black) below and moderat
yellowish brown above.

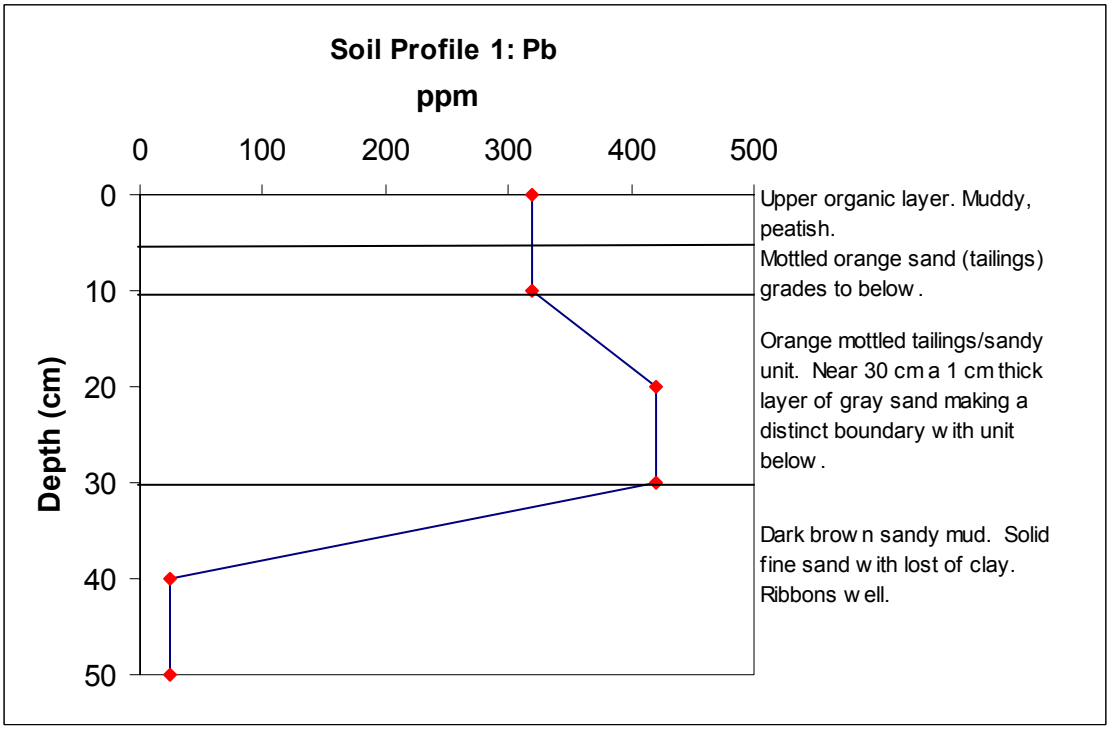

Zn vs Depth: CP21
ppm Zn
0
500
1000
1500
2000
Depth (cm)
0
50
100
150
200
250
FeOx mottles
water table
Fine roots. Fine sand. Lots of small ro
and 1 large root fragment. [Tailings]
Fine coarsening to medium sand. Some
sticks and rounded pebbles. [Tailings]
Poorly sorted fine and medium sand to
gravel with cobbles up to 5 cm
diameter. FeOx staining 70-100 cm.
Water table appears to be at
approximately 127cm bgs. Sediment is
reduced color (dusky blue to grayish
black) below and moderate yellowish
brown above.

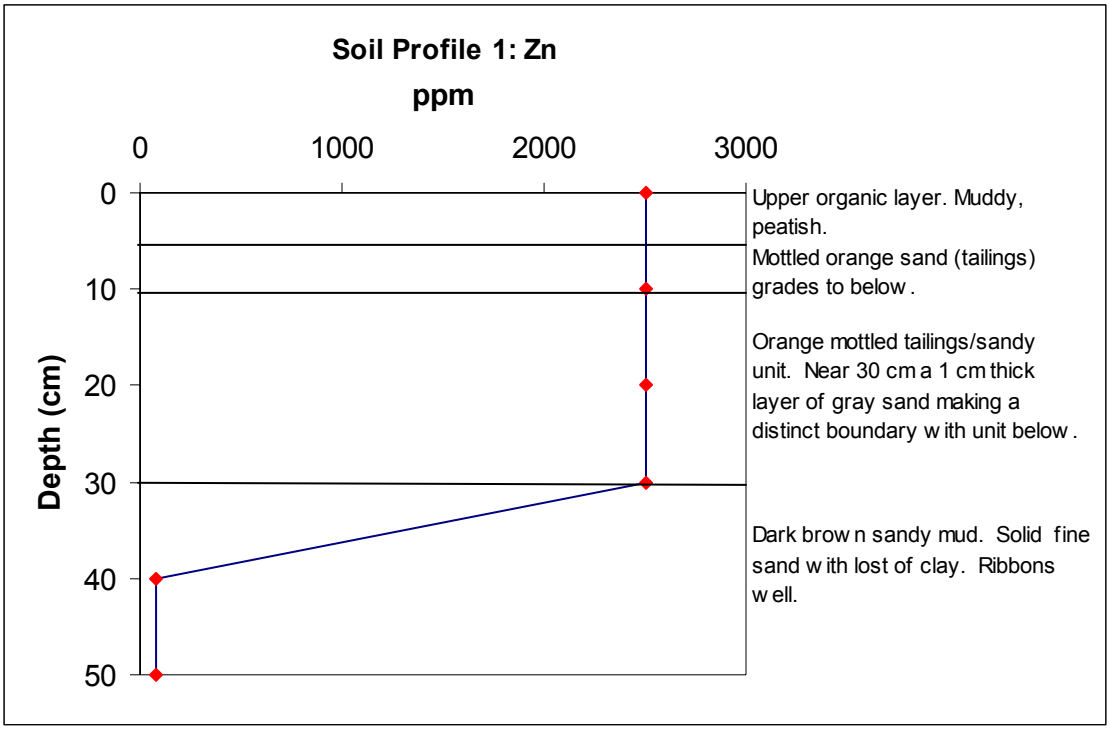

Pb vs Depth: CP21
ppm Pb
0
200
400
600
800
Depth (cm)
0
50
100
150
200
250
FeOx mottles
water table
Fine roots. Fine sand. Lots of small ro
and 1 large root fragment. [Tailings]
Fine coarsening to medium sand. Some
sticks and rounded pebbles. [Tailings]
Poorly sorted fine and medium sand to
gravel with cobbles up to 5 cm
diameter. FeOx staining 70-100 cm.
Water table appears to be at
approximately 127cm bgs. Sediment is
reduced color (dusky blue to grayish
black) below and moderate yellowish
brown above.

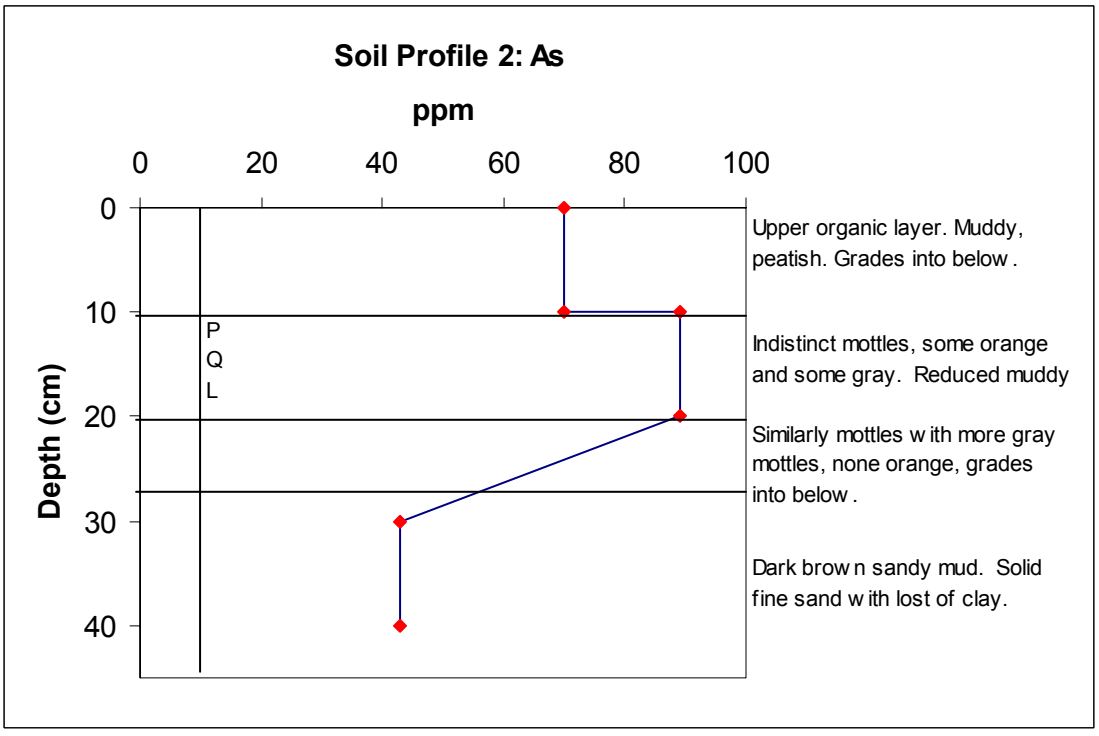

Soil Profile 1: As
ppm
0
100
200
300
400
0
10
20
30
40
50
Depth (cm)
Upper organic layer. Muddy, peatish.
Mottled orange sand (tailings) grades to below .
Orange mottled tailings/sandy unit. Near 30 cm a 1 cm thick layer of gray sand making a distinct boundary w ith unit below .
Dark brow n sandy mud. Solid fine sand w ith lost of clay. Ribbons w ell.

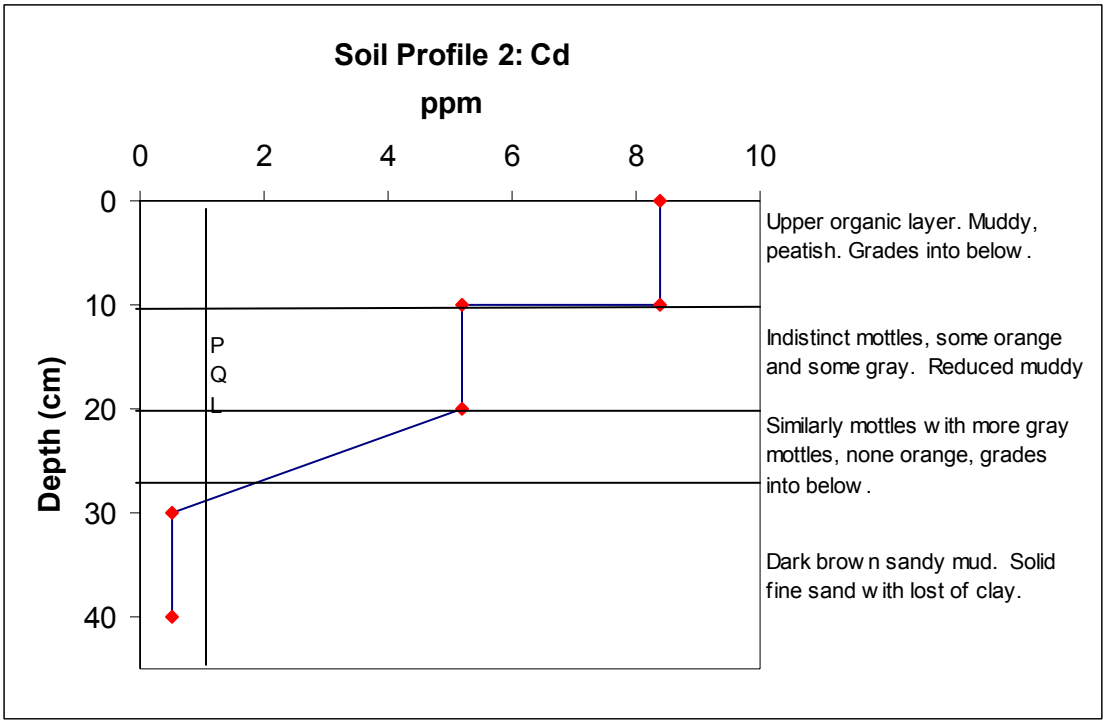

Soil Profile 1: Cd
ppm
0
5
10
15
0
10
20
30
40
50
Depth (cm)
P
Q
L
Upper organic layer. Muddy, peatish.
Mottled orange sand (tailings) grades to below .
Orange mottled tailings/sandy unit. Near 30 cm a 1 cm thick layer of gray sand making a distinct boundary w ith unit below .
Dark brow n sandy mud. Solid fine sand w ith lost of clay. Ribbons w ell.

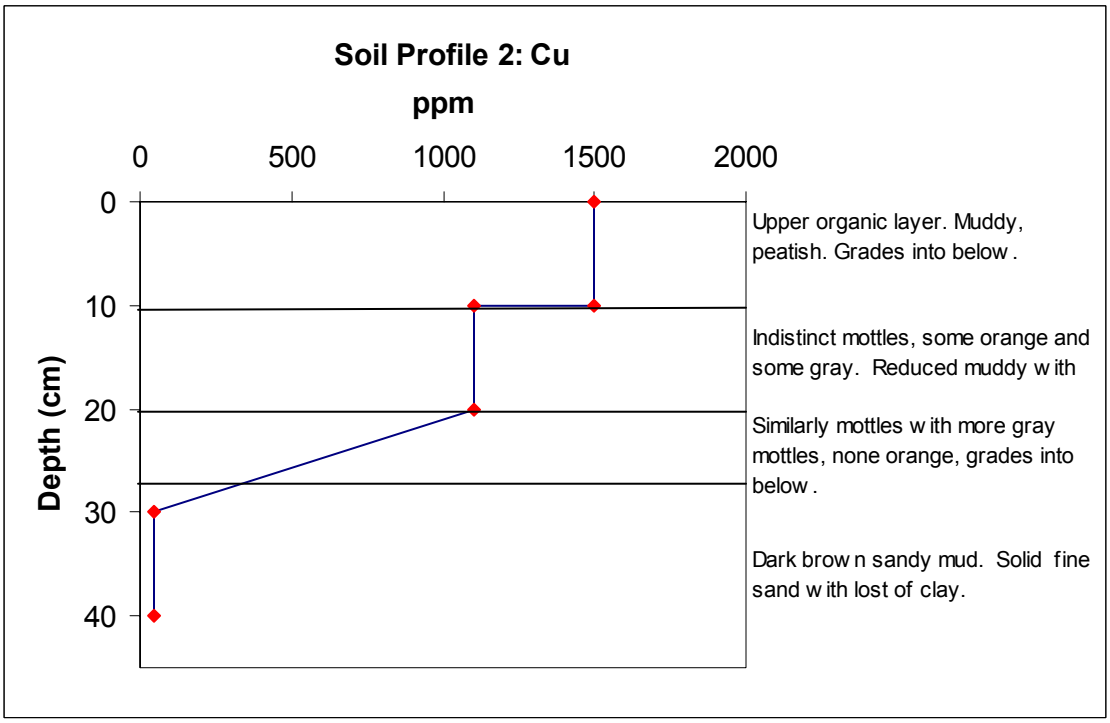

Soil Profile 1: Cu
ppm
0
1000
2000
3000
4000
Depth (cm)
0
10
20
30
40
50
Upper organic layer. Muddy, peatish.
Mottled orange sand (tailings) grades to below.
Orange mottled tailings/sandy unit. Near 30 cm a 1 cm thick layer of gray sand making a distinct boundary with unit below.
Dark brown sandy mud. Solid fine sand with lost of clay. Ribbons well.

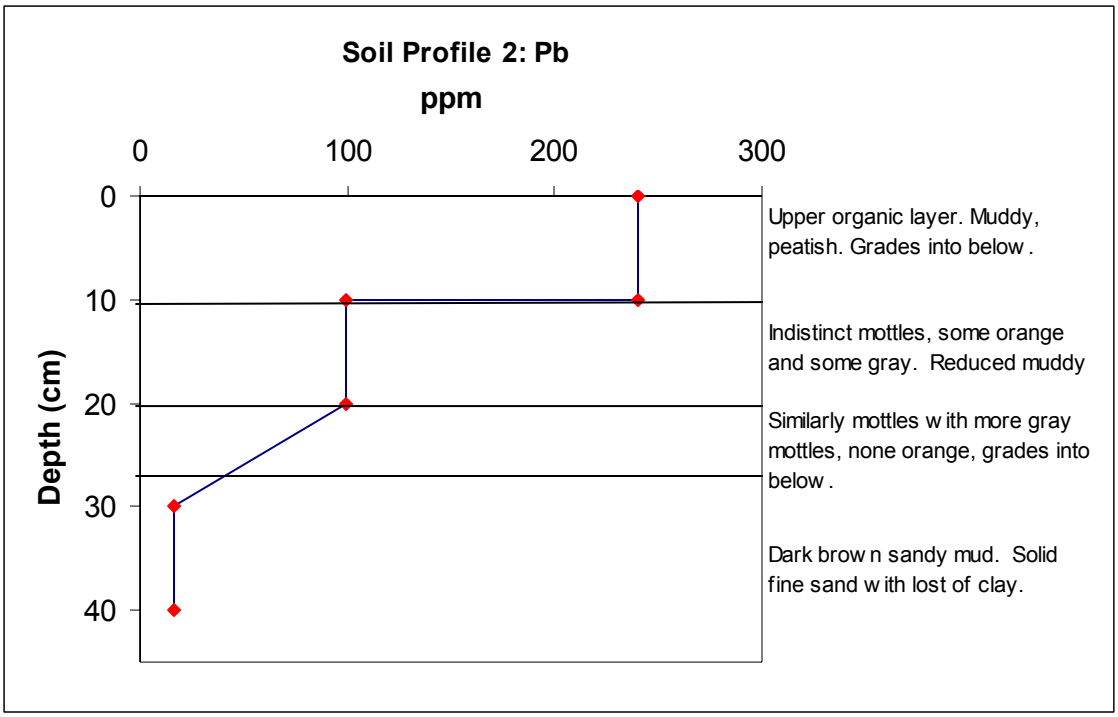

Soil Profile 1: Pb
ppm
0
100
200
300
400
500
Depth (cm)
0
10
20
30
40
50
Upper organic layer. Muddy, peatish.
Mottled orange sand (tailings) grades to below.
Orange mottled tailings/sandy unit. Near 30 cm a 1 cm thick layer of gray sand making a distinct boundary with unit below.
Dark brown sandy mud. Solid fine sand with lost of clay. Ribbons well.

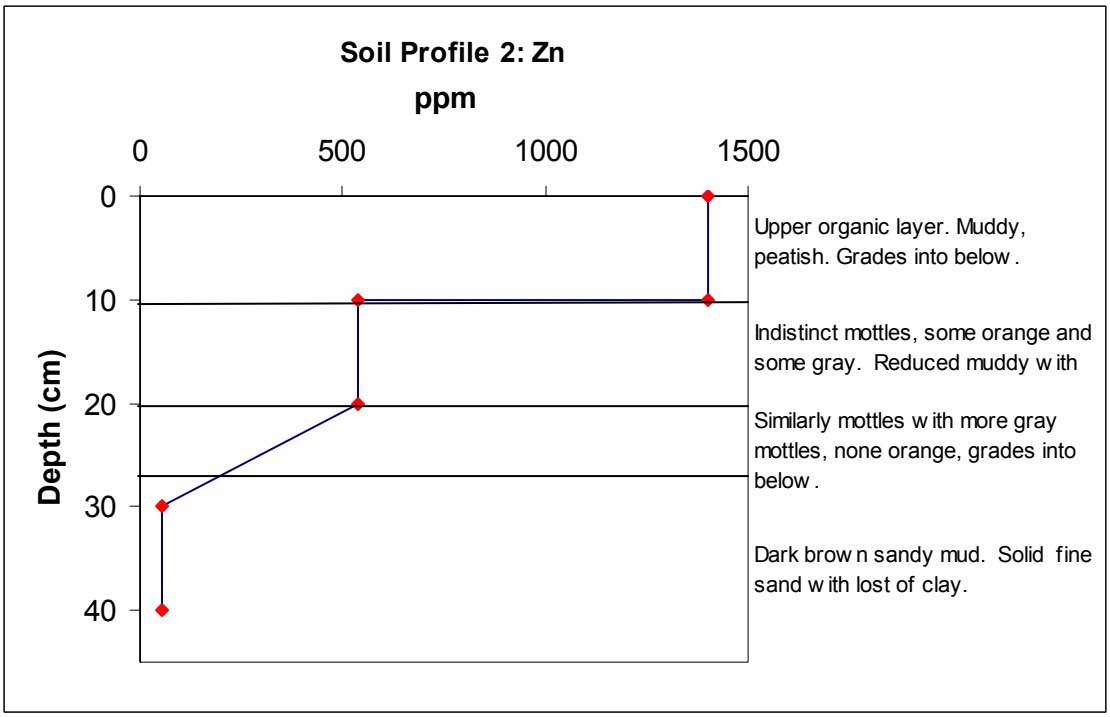

Soil Profile 1: Zn
ppm
0
1000
2000
3000
0
10
20
30
40
50
Depth (cm)
Upper organic layer. Muddy, peatish.
Mottled orange sand (tailings) grades to below.
Orange mottled tailings/sandy unit. Near 30 cm a 1 cm thick layer of gray sand making a distinct boundary with unit below.
Dark brown sandy mud. Solid fine sand with lost of clay. Ribbons well.

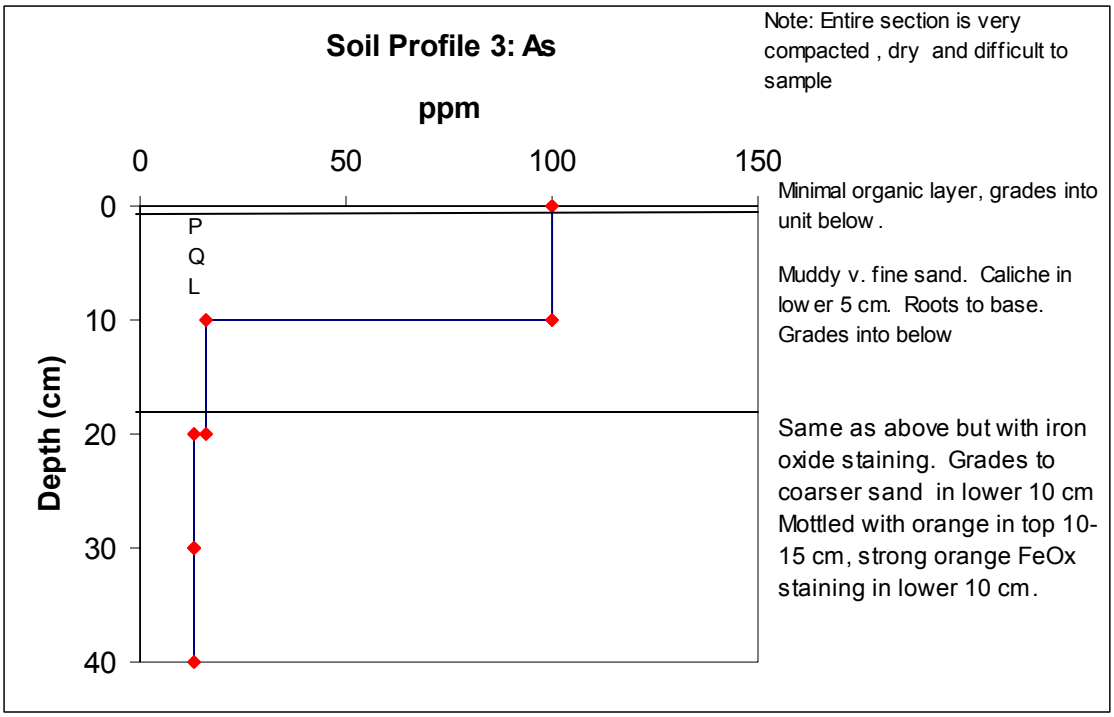

Soil Profile 2: As
ppm
0
20
40
60
80
100
0
10
20
30
40
Depth (cm)
P
Q
L
Upper organic layer. Muddy, peatish. Grades into below.
Indistinct mottles, some orange and some gray. Reduced muddy
Similarly mottles with more gray mottles, none orange, grades into below.
Dark brown sandy mud. Solid fine sand with lost of clay.

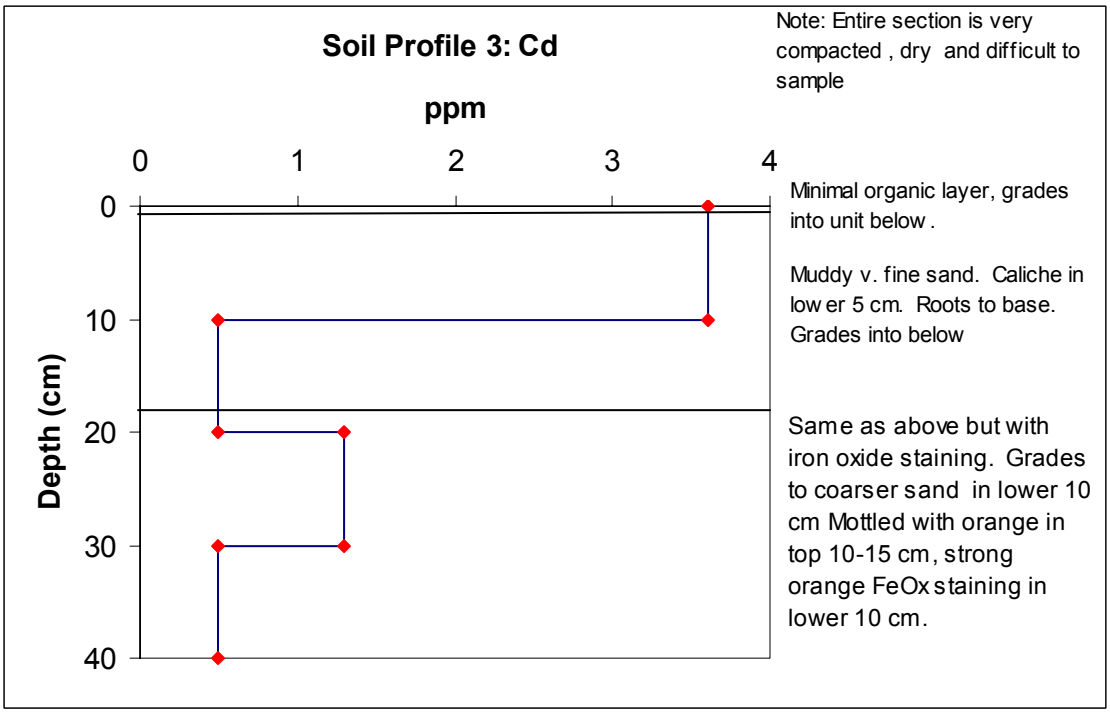

Soil Profile 2: Cd
ppm
0
2
4
6
8
10
0
10
20
30
40
Depth (cm)
P
Q
L
Upper organic layer. Muddy, peatish. Grades into below .
Indistinct mottles, some orange and some gray. Reduced muddy
Similarly mottles w ith more gray mottles, none orange, grades into below .
Dark brow n sandy mud. Solid fine sand w ith lost of clay.

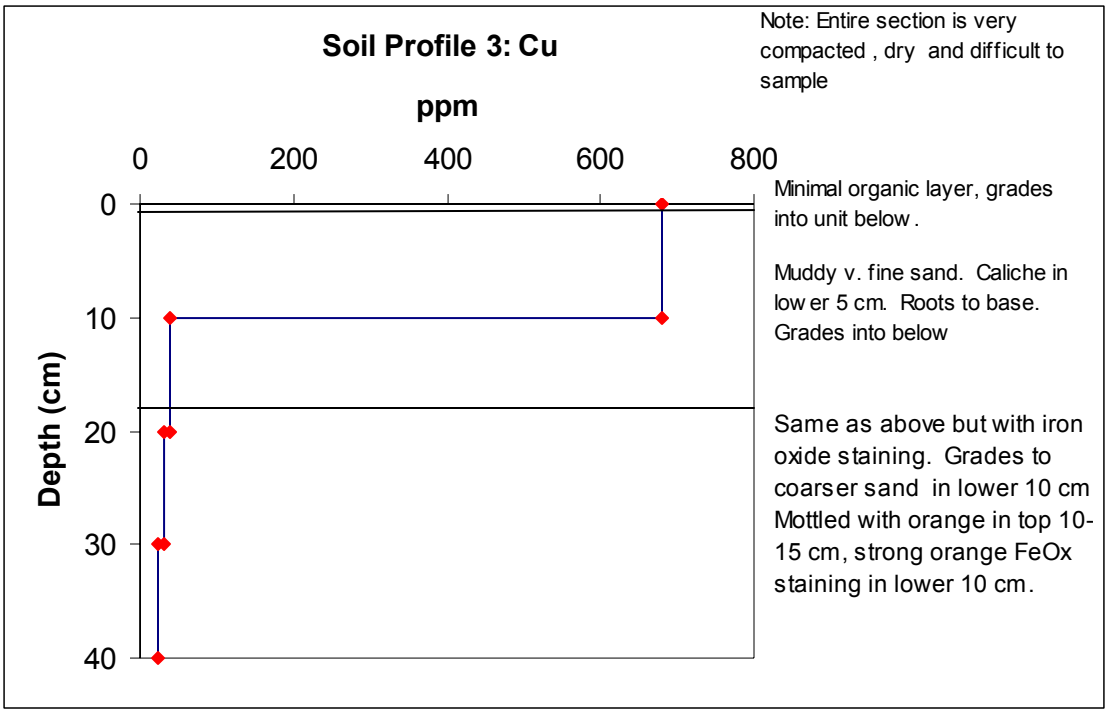

Soil Profile 2: Cu
ppm
0
500
1000
1500
2000
0
10
20
30
40
Depth (cm)
Upper organic layer. Muddy, peatish. Grades into below .
Indistinct mottles, some orange and some gray. Reduced muddy w ith
Similarly mottles w ith more gray mottles, none orange, grades into below .
Dark brow n sandy mud. Solid fine sand w ith lost of clay.

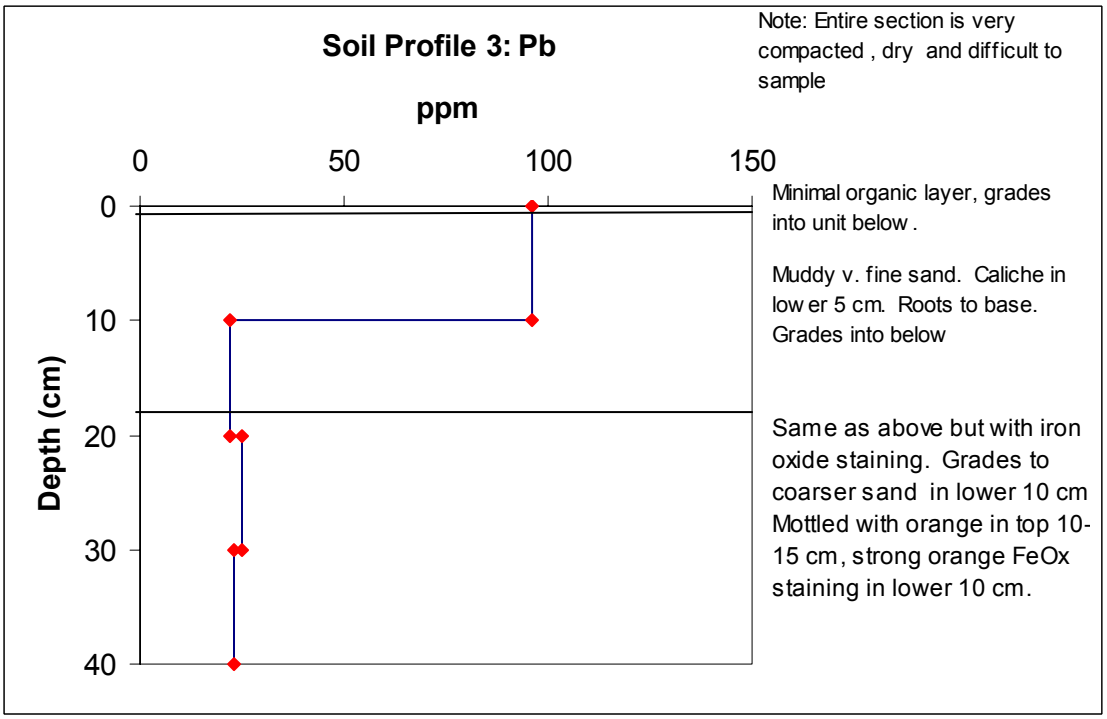

Soil Profile 2: Pb
ppm
0
100
200
300
0
10
20
30
40
Depth (cm)
Upper organic layer. Muddy, peatish. Grades into below .
Indistinct mottles, some orange and some gray. Reduced muddy
Similarly mottles w ith more gray mottles, none orange, grades into below .
Dark brow n sandy mud. Solid fine sand w ith lost of clay.

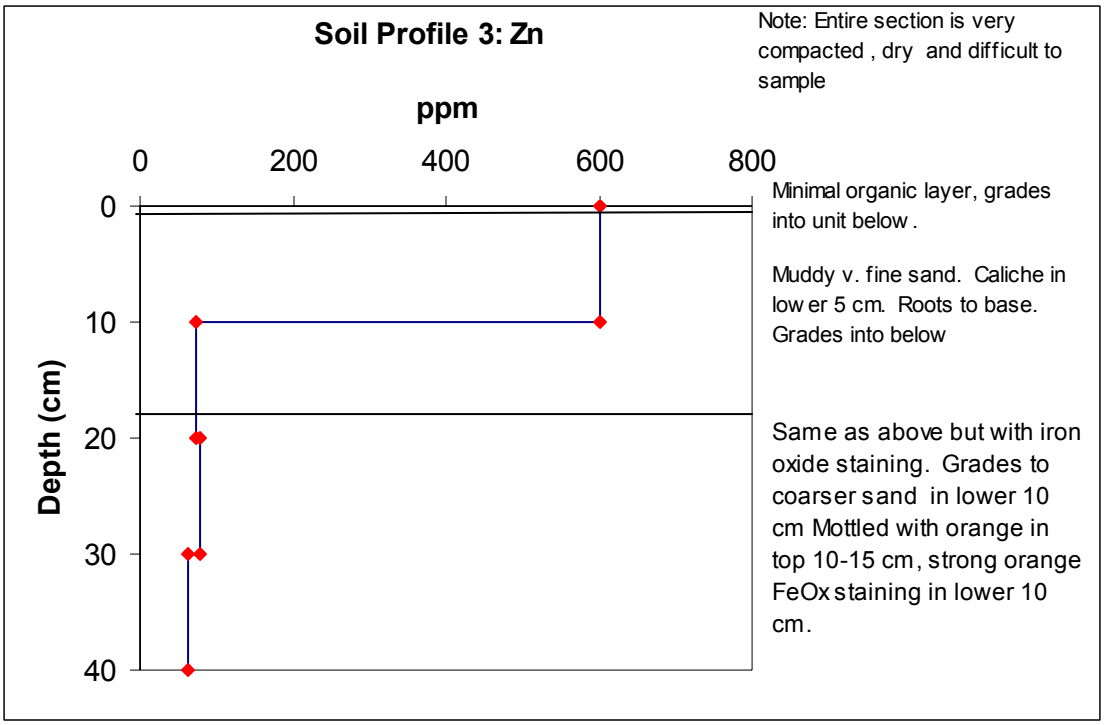

Soil Profile 2: Zn
ppm
0
500
1000
1500
0
10
20
30
40
Depth (cm)
Upper organic layer. Muddy, peatish. Grades into below .
Indistinct mottles, some orange and some gray. Reduced muddy w ith
Similarly mottles w ith more gray mottles, none orange, grades into below .
Dark brow n sandy mud. Solid fine sand w ith lost of clay.


Soil Profile 3: As
ppm
0
50
100
150
0
10
20
30
40
Depth (cm)
P
Q
L
Note: Entire section is very compacted , dry and difficult to sample
Minimal organic layer, grades into unit below .
Muddy v. fine sand. Caliche in low er 5 cm. Roots to base. Grades into below
Same as above but with iron oxide staining. Grades to coarser sand in lower 10 cm Mottled with orange in top 10-15 cm, strong orange FeOx staining in lower 10 cm.


Soil Profile 3: Cd
ppm
0
1
2
3
4
0
10
20
30
40
Depth (cm)
Note: Entire section is very compacted , dry and difficult to sample
Minimal organic layer, grades into unit below .
Muddy v. fine sand. Caliche in low er 5 cm. Roots to base. Grades into below
Same as above but with iron oxide staining. Grades to coarser sand in lower 10 cm Mottled with orange in top 10-15 cm, strong orange FeOx staining in lower 10 cm.


Soil Profile 3: Cu
ppm
0
200
400
600
800
Depth (cm)
0
10
20
30
40
Note: Entire section is very compacted , dry and difficult to sample
Minimal organic layer, grades into unit below .
Muddy v. fine sand. Caliche in low er 5 cm. Roots to base. Grades into below
Same as above but with iron oxide staining. Grades to coarser sand in lower 10 cm Mottled with orange in top 10-15 cm, strong orange FeOx staining in lower 10 cm.


Soil Profile 3: Pb
ppm
0
50
100
150
Depth (cm)
0
10
20
30
40
Note: Entire section is very compacted , dry and difficult to sample
Minimal organic layer, grades into unit below .
Muddy v. fine sand. Caliche in low er 5 cm. Roots to base. Grades into below
Same as above but with iron oxide staining. Grades to coarser sand in lower 10 cm Mottled with orange in top 10-15 cm, strong orange FeOx staining in lower 10 cm.


Soil Profile 3: Zn
ppm
0
200
400
600
800
Depth (cm)
0
10
20
30
40
Note: Entire section is very compacted , dry and difficult to sample
Minimal organic layer, grades into unit below .
Muddy v. fine sand. Caliche in low er 5 cm. Roots to base. Grades into below
Same as above but with iron oxide staining. Grades to coarser sand in lower 10 cm Mottled with orange in top 10-15 cm, strong orange FeOx staining in lower 10 cm.

APPENDIX A

A.5 pH and Metals Data

A.5.5 Baseline Calculations

Samples used for baseline calculations are listed here. Samples are listed for each element separately because the depth to baseline values appeared to vary depending on the mobility of the element. Site s are listed along with the individual samples used from a given site.

Samples used to calculate baseline

Arsenic					
Site	Sample	Site	Sample	Site	Sample
BP1	BP1-h	BP6	BP6-l	CP11	CP11-c
BP1	BP1-l	BP10	BP10-a	CP11	CP11-d
BP1	BP1-j	BP10	BP10-b	CP11	CP11-e
BP1	BP1-k	BP10	BP10-c	CP13	CP13-b
BP2	BP2-f	BP10	BP10-d	CP13	CP13-d
BP2	BP2-g	BP10	BP10-e	CP14	CP14-b
BP2	BP2-h	BP10	BP10-f	CP14	CP14-c
BP2	BP2-i	CP1	C3-a	CP14	CP14-d
BP2	BP2-j	CP1	C3-b	CP14	CP14-e
BP5	BP5-f	CP1	C3-c	CP15	CP15-b
BP5	BP5-g	CP1	C3-d	CP15	CP15-c
BP7	BP7-e	CP1	C4-a	CP15	CP15-d
BP7	BP7-f	CP2	C7-c	CP16	CP16-a
BP7	BP7-g	CP2	C7-d	CP16	CP16-b
BP8	BP8-a	CP2	C7-e	CP16	CP16-c
BP8	BP8-b	CP2	C8-a	CP18	CP18-a
BP8	BP8-c	CP3	C5-a	CP18	CP18-b
BP8	BP8-d	CP3	C5-a	CP18	CP18-e
BP8	BP8-e	CP3	C5-b	CP19	CP19-a
BP9	BP9-a	CP3	C6-a	CP19	CP19-b
BP9	BP9-b	CP4	C1-a	CP19	CP19-c
BP9	BP9-c	CP4	C1-b	CP20	CP20-b
BP11	BP11-a	CP4	C2-a	CP20	CP20-d
BP11	BP11-b	CP4	C2-b	CP21	CP21-c
BP11	BP11-c	CP4	C2-c	CP21	CP21-d
BP11	BP11-d	CP6	C11-b	CP21	CP21-e
BP13	BP13-a	CP6	C11-c		
BP13	BP13-b	CP6	C11-d		
BP13	BP13-c	CP6	C11-e		
BP13	BP13-d	CP6	C12-a		
BP14	BP14-a	CP6	C12-b		
BP14	BP14-b	CP7	C13-e		
BP14	BP14-c	CP7	C13-f		
BP14	BP14-d	CP7	C14-a		
BP15	BP15-a	CP7	C14-b		
BP15	BP15-b	CP8	C10-b		
SP3	SP3-a	CP8	C10-c		
SP3	SP3-b	CP8	C9-c		
SP3	SP3-c	CP8	C9-d		
BP3	BP3-e	CP8	C9-e		
BP3	BP3-f	CP9	C15-c		
BP3	BP3-g	CP9	C15-d		
BP3	BP3-h	CP9	C15-e		
BP3	BP3-l	CP9	C16-a		
BP4	BP4-e	CP10	CP10-b		
BP4	BP4-f	CP10	CP10-c		
BP4	BP4-g	CP10	CP10-d		
BP4	BP4-h	CP10	CP10-e		
BP6	BP6-h	CP10	CP10-f		

Cadmium			
Site	Sample	Site	Sample
BP1	BP1-h	CP6	C11-c
BP1	BP1-l	CP6	C11-d
BP1	BP1-j	CP6	C11-e
BP1	BP1-k	CP6	C12-a
BP8	BP8-a	CP6	C12-b
BP8	BP8-b	CP7	C13-f
BP8	BP8-c	CP7	C14-a
BP8	BP8-d	CP7	C14-b
BP8	BP8-e	CP8	C10-a
BP9	BP9-a	CP8	C10-b
BP9	BP9-b	CP8	C10-c
BP9	BP9-c	CP8	C9-d
BP11	BP11-a	CP8	C9-e
BP11	BP11-b	CP9	C15-c
BP11	BP11-c	CP9	C15-d
BP13	BP13-a	CP9	C15-e
BP13	BP13-b	CP9	C16-a
BP14	BP14-a	CP10	CP10-b
BP14	BP14-b	CP10	CP10-c
BP14	BP14-c	CP10	CP10-d
BP14	BP14-d	CP10	CP10-e
SP1	SP1-a	CP10	CP10-f
SP2	SP2-a	CP11	CP11-d
SP3	SP3-a	CP11	CP11-e
BP4	BP4-g	CP13	CP13-b
BP4	BP4-h	CP13	CP13-d
BP6	BP6-h	CP14	CP14-b
BP6	BP6-l	CP14	CP14-c
BP10	BP10-a	CP14	CP14-d
BP10	BP10-b	CP14	CP14-e
BP10	BP10-c	CP15	CP15-c
BP10	BP10-d	CP15	CP15-d
BP10	BP10-e	CP16	CP16-a
BP10	BP10-f	CP16	CP16-b
CP1	C3-a	CP16	CP16-c
CP1	C3-b	CP18	CP18-b
CP1	C3-c	CP18	CP18-e
CP1	C3-d	CP19	CP19-b
CP1	C4-a	CP19	CP19-c
CP2	C7-e	CP20	CP20-b
CP2	C8-a	CP20	CP20-c
CP3	C5-a	CP20	CP20-d
CP3	C5-a	CP21	CP21-c
CP3	C5-b	CP21	CP21-d
CP3	C6-a	CP21	CP21-e
CP4	C2-a		
CP4	C2-b		
CP4	C2-c		
CP6	C11-b		

Copper			
Site	Sample	Site	Sample
BP1	BP1-h	CP6	C11-b
BP1	BP1-l	CP6	C11-c
BP1	BP1-j	CP6	C11-d
BP1	BP1-k	CP6	C11-e
BP2	BP2-g	CP6	C12-a
BP2	BP2-h	CP6	C12-b
BP2	BP2-i	CP7	C13-f
BP2	BP2-j	CP7	C14-a
BP8	BP8-a	CP7	C14-b
BP8	BP8-b	CP8	C10-a SPLIT
BP8	BP8-c	CP8	C10-b
BP9	BP9-a	CP8	C10-c
BP9	BP9-b	CP8	C9-c
BP9	BP9-c	CP8	C9-d
BP11	BP11-a	CP8	C9-e
BP11	BP11-b	CP9	C15-c
BP13	BP13-a	CP9	C15-d
BP13	BP13-b	CP9	C15-e
BP13	BP13-c	CP9	C16-a
BP14	BP14-a	CP10	CP10-c
BP14	BP14-b	CP10	CP10-d
BP14	BP14-c	CP10	CP10-e
BP14	BP14-d	CP10	CP10-f
SP3	SP3-a	CP11	CP11-d
SP3	SP3-b	CP11	CP11-e
SP3	SP3-c	CP13	CP13-b
BP4	BP4-f	CP13	CP13-d
BP4	BP4-g	CP14	CP14-b
BP4	BP4-h	CP14	CP14-c
BP6	BP6-h	CP14	CP14-d
BP6	BP6-l	CP14	CP14-e
BP10	BP10-a	CP15	CP15-c
BP10	BP10-b	CP15	CP15-d
BP10	BP10-c	CP16	CP16-a
BP10	BP10-d	CP16	CP16-b
BP10	BP10-e	CP16	CP16-c
BP10	BP10-f	CP18	CP18-b
CP1	C3-a	CP18	CP18-e
CP1	C3-b	CP19	CP19-b
CP1	C3-c	CP19	CP19-c
CP1	C3-d	CP20	CP20-b
CP1	C4-a	CP20	CP20-c SPLIT
CP3	C5-a	CP20	CP20-d
CP3	C5-a	CP21	CP21-c
CP3	C5-b	CP21	CP21-d
CP3	C6-a	CP21	CP21-e
CP4	C2-a		
CP4	C2-b		
CP4	C2-c		

Lead					
Site	Sample	Site	Sample	Site	Sample
BP1	BP1-g	CP1	C4-a	CP15	CP15-d
BP1	BP1-h	CP2	C7-d	CP16	CP16-a
BP1	BP1-l	CP2	C7-e	CP16	CP16-b
BP1	BP1-j	CP2	C8-a	CP16	CP16-c
BP1	BP1-k	CP3	C5-a	CP18	CP18-a
BP2	BP2-h	CP3	C5-a	CP18	CP18-b
BP2	BP2-i	CP3	C5-b	CP18	CP18-e
BP2	BP2-j	CP3	C5-c	CP19	CP19-b
BP5	BP5-f	CP3	C6-a	CP19	CP19-c
BP5	BP5-g	CP4	C1-a	CP20	CP20-b
BP7	BP7-f	CP4	C1-b	CP20	CP20-c SPLIT
BP7	BP7-g	CP4	C2-a	CP20	CP20-d
BP8	BP8-a	CP4	C2-b	CP21	CP21-b
BP8	BP8-b	CP4	C2-c	CP21	CP21-c
BP8	BP8-c	CP6	C11-b	CP21	CP21-d
BP9	BP9-a	CP6	C11-c	CP21	CP21-e
BP9	BP9-b	CP6	C11-d		
BP9	BP9-c	CP6	C11-e		
BP11	BP11-a	CP6	C12-a		
BP11	BP11-b	CP6	C12-b		
BP13	BP13-a	CP7	C13-e		
BP13	BP13-b	CP7	C13-f		
BP13	BP13-c	CP7	C14-a		
BP13	BP13-d	CP7	C14-b		
BP14	BP14-a	CP8	C10-a SPLIT		
BP14	BP14-b	CP8	C10-b		
BP14	BP14-c	CP8	C10-c		
BP14	BP14-d	CP8	C9-c		
BP15	BP15-a	CP8	C9-d		
BP15	BP15-b	CP8	C9-e		
SP3	SP3-a	CP9	C15-c		
SP3	SP3-b	CP9	C15-d		
SP3	SP3-c	CP9	C15-e		
BP3	BP3-f	CP9	C16-a		
BP3	BP3-g	CP10	CP10-b		
BP3	BP3-h	CP10	CP10-c		
BP3	BP3-l	CP10	CP10-d		
BP6	BP6-h	CP10	CP10-e		
BP6	BP6-l	CP10	CP10-f		
BP10	BP10-a	CP11	CP11-c		
BP10	BP10-b	CP11	CP11-d		
BP10	BP10-c	CP11	CP11-e		
BP10	BP10-d	CP13	CP13-b		
BP10	BP10-e	CP13	CP13-d		
BP10	BP10-f	CP14	CP14-b		
CP1	C3-a	CP14	CP14-c		
CP1	C3-b	CP14	CP14-d		
CP1	C3-c	CP14	CP14-e		
CP1	C3-d	CP15	CP15-c		

Zinc			
Site	Sample	Site	Sample
BP1	BP1-l	CP6	C12-a
BP1	BP1-j	CP6	C12-b
BP1	BP1-k	CP8	C10-a SPLIT
BP8	BP8-a	CP8	C10-b
BP8	BP8-b	CP8	C10-c
BP8	BP8-c	CP8	C9-d
BP8	BP8-d	CP8	C9-e
BP8	BP8-e	CP9	C15-c
BP9	BP9-a	CP9	C15-d
BP9	BP9-b	CP9	C15-e
BP9	BP9-c	CP9	C16-a
BP11	BP11-a	CP10	CP10-b
BP11	BP11-b	CP10	CP10-c
BP11	BP11-c	CP10	CP10-d
BP13	BP13-a	CP10	CP10-e
BP13	BP13-b	CP10	CP10-f
BP14	BP14-a	CP11	CP11-d
BP14	BP14-b	CP11	CP11-e
BP14	BP14-c	CP13	CP13-b
BP14	BP14-d	CP13	CP13-d
SP3	SP3-a	CP14	CP14-b
SP3	SP3-b	CP14	CP14-c
SP3	SP3-c	CP14	CP14-d
BP6	BP6-h	CP14	CP14-e
BP6	BP6-l	CP15	CP15-b
BP10	BP10-a	CP15	CP15-c
BP10	BP10-b	CP15	CP15-d
BP10	BP10-c	CP16	CP16-a
BP10	BP10-d	CP16	CP16-b
BP10	BP10-e	CP16	CP16-c
BP10	BP10-f	CP18	CP18-b
CP1	C3-a	CP18	CP18-e
CP1	C3-b	CP19	CP19-b
CP1	C3-c	CP19	CP19-c
CP1	C3-d	CP20	CP20-b
CP1	C4-a	CP20	CP20-c SPLIT
CP2	C7-e	CP20	CP20-d
CP2	C8-a	CP21	CP21-d
CP3	C5-a	CP21	CP21-e
CP3	C5-a		
CP3	C5-b		
CP3	C6-a		
CP4	C2-a		
CP4	C2-b		
CP4	C2-c		
CP6	C11-b		
CP6	C11-c		
CP6	C11-d		
CP6	C11-e		

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APPENDIX B

APPENDIX B – Water Resources

B.1 Field Instrumentation Installation Information and Diagrams

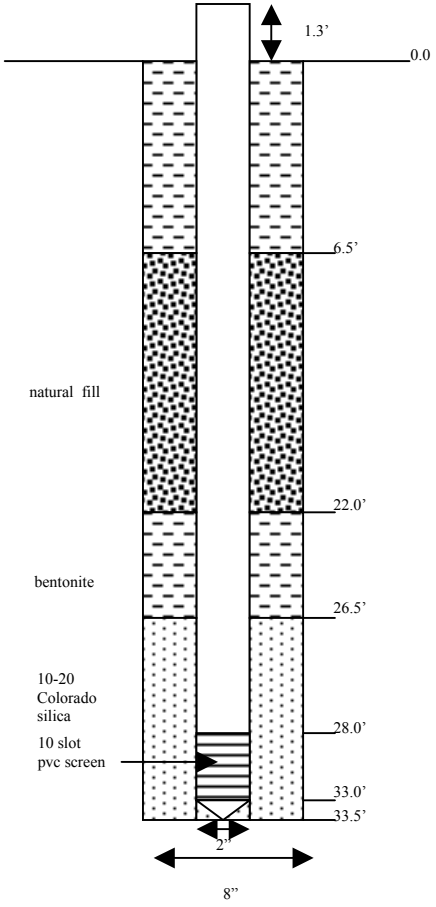
Tables contain information pertaining to the installation of monitoring wells, multi-level piezometers, tensiometers and lysimeters.

Monitoring Well Installation Information

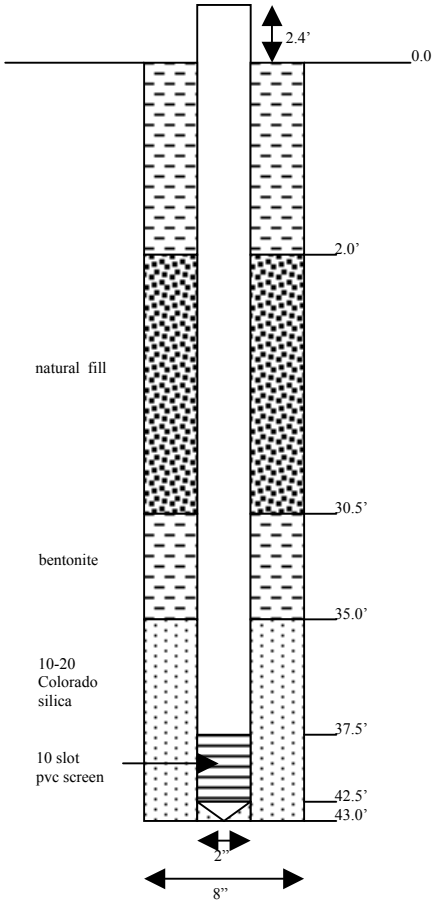
Instrument ID	Instrument	Installation Date	Well depth/port depth (ft)	Top of casing above surface (ft)	Purge Volume
MW-1	monitoring well	8/26/97	28.70	3.00	0.163gal/ft
MW-2	monitoring well	8/26/97	18.02	0.00	0.163gal/ft
MW-3	monitoring well	Aug-97	14.55	2.00	0.163gal/ft
MW-4	monitoring well	Aug-97	16.83	3.00	0.163gal/ft
MW-5	monitoring well	Aug-97	16.22	3.00	0.163gal/ft
Stock well	stock well	previous	UNK	UNK	----------
GKW-1	monitoring well	5/22/00	33.50	1.30	0.163gal/ft
GKW-2	monitoring well	5/22/00	43.00	2.40	0.163gal/ft
GKW-3	monitoring well	5/22/00	12.50	2.40	0.163gal/ft
GKW-4	monitoring well	5/23/00	33.50	1.50	0.163gal/ft
GKW-5	monitoring well	5/23/00	19.00	2.00	0.163gal/ft
GKW-6	monitoring well	5/23/00	34.00	1.50	0.163gal/ft
GKW-7	monitoring well	5/24/00	14.00	1.00	0.163gal/ft
GKW-8	monitoring well	5/24/00	14.50	2.20	0.163gal/ft
GKW-9	monitoring well	5/24/00	10.00	1.70	0.163gal/ft
GKW-10	monitoring well	5/23/00	19.00	1.50	0.163gal/ft
GKW-11	monitoring well	5/24/00	24.00	0.92	0.163gal/ft

Monitoring Well Diagrams

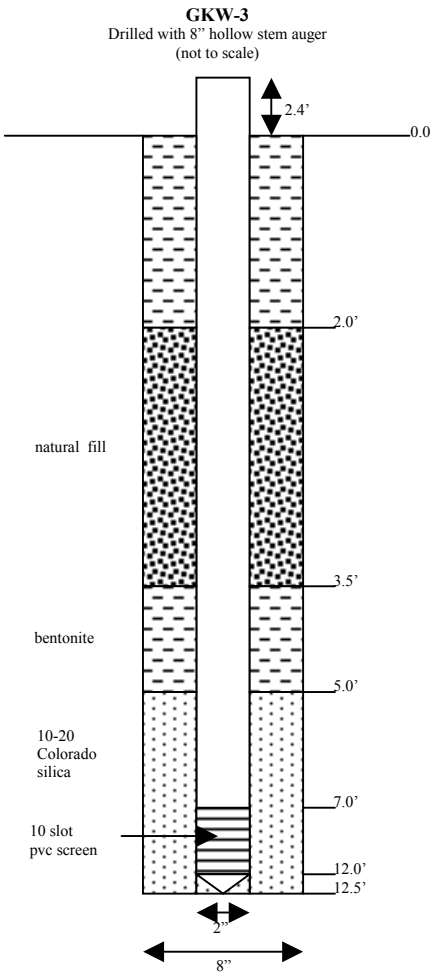
GKW-1
Drilled with 8" hollow stem auger
(not to scale)

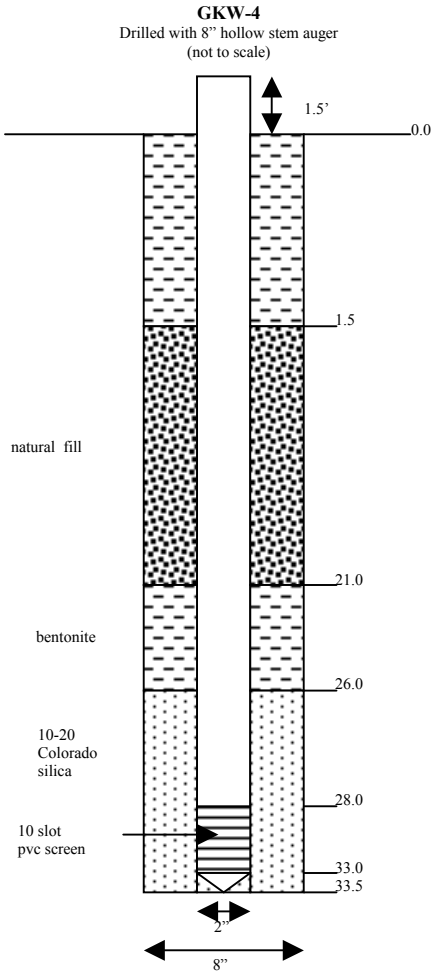


GKW-2
Drilled with 8" hollow stem auger
(not to scale)

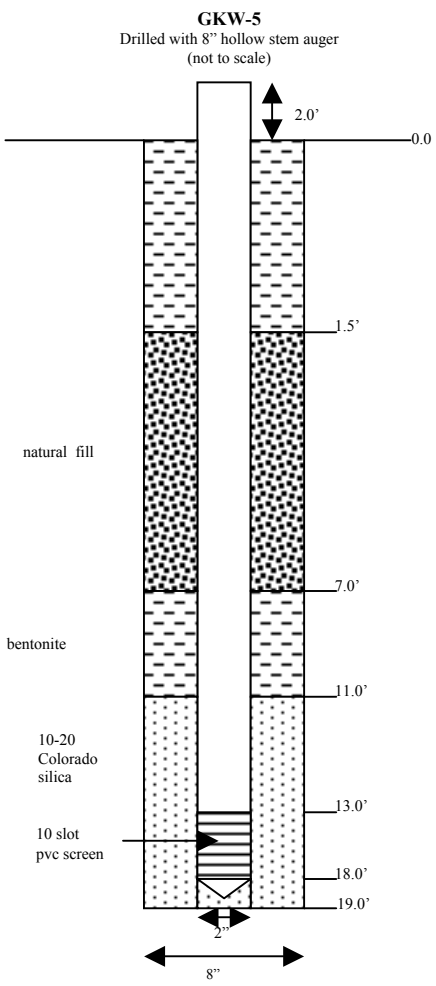


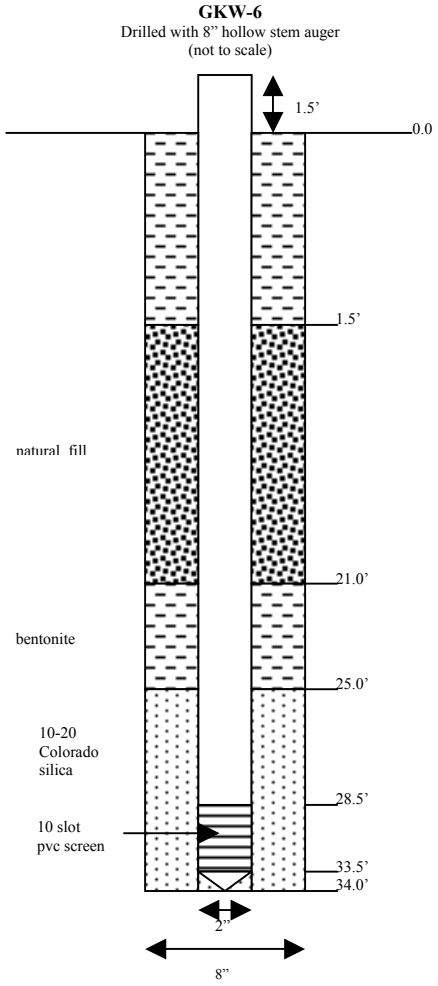
Monitoring Well Diagrams





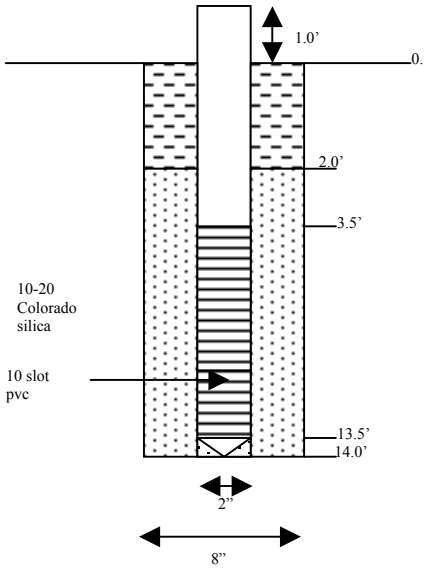
Monitoring Well Diagrams



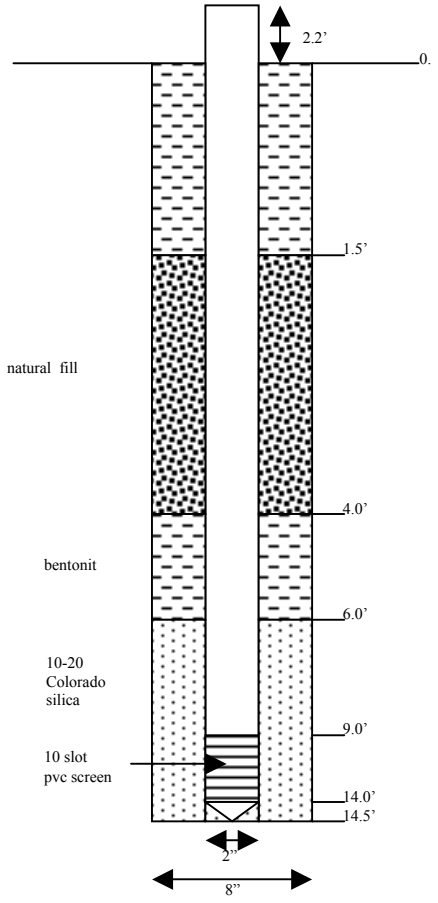


Monitoring Well Diagrams

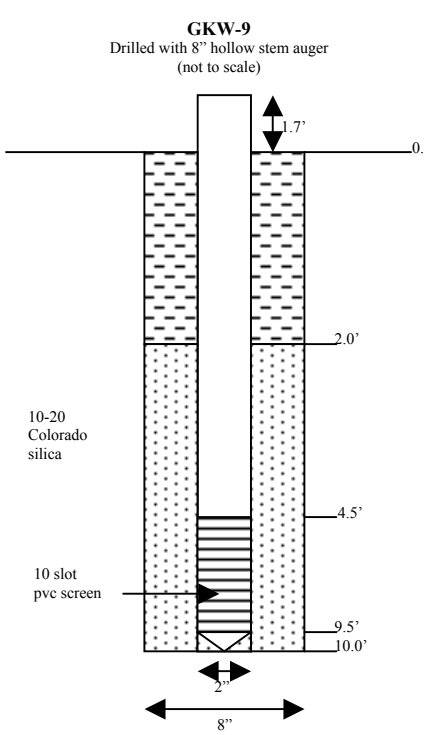
GKW-7
Drilled with 8" hollow stem auger
(not to scale)

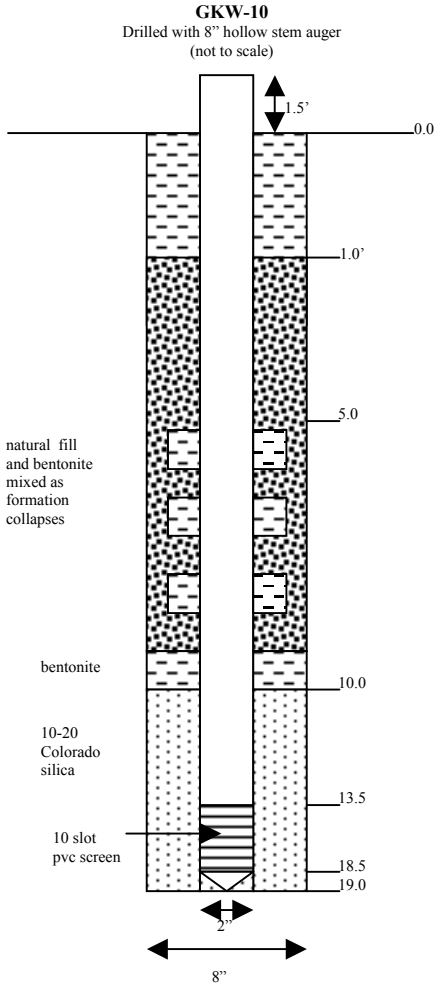


GKW-8
Drilled with 8" hollow stem auger
(not to scale)

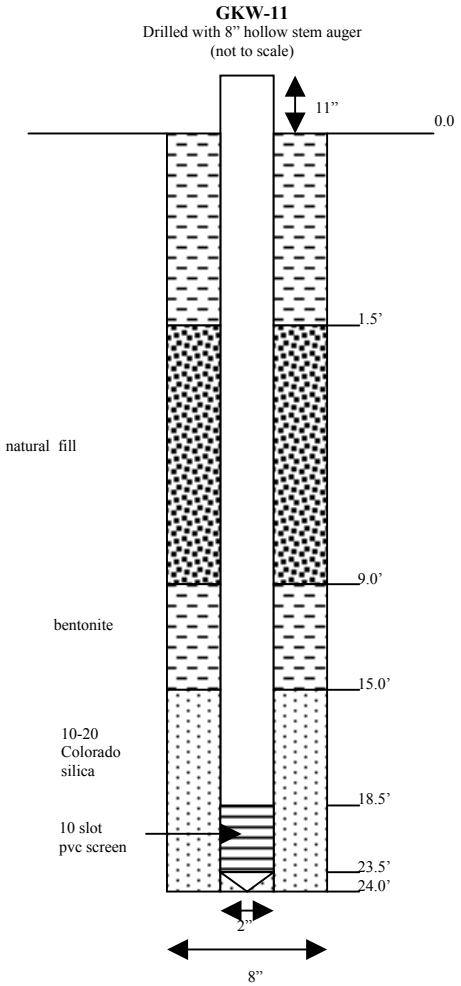


Monitoring Well Diagrams

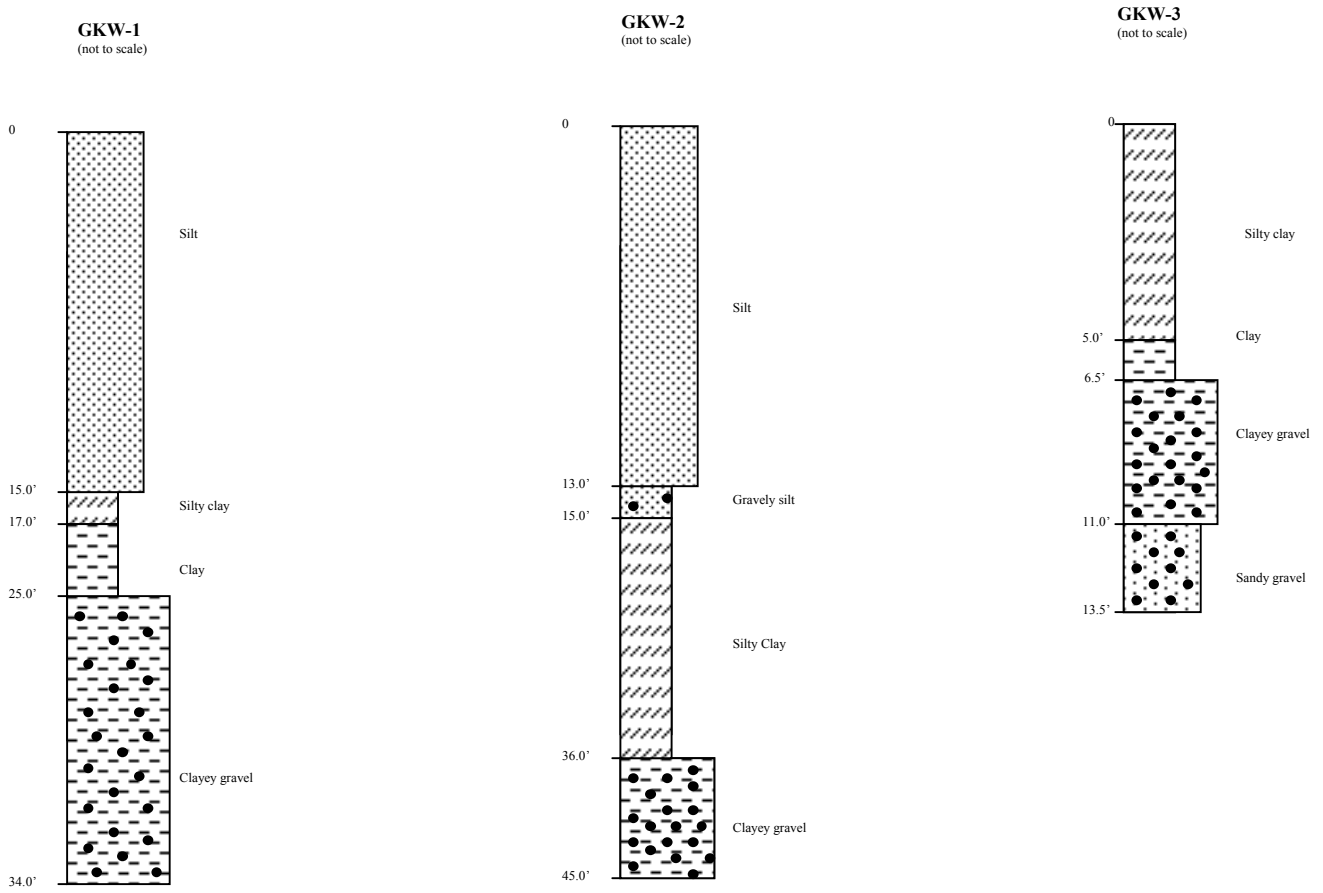




Monitoring Well Diagrams

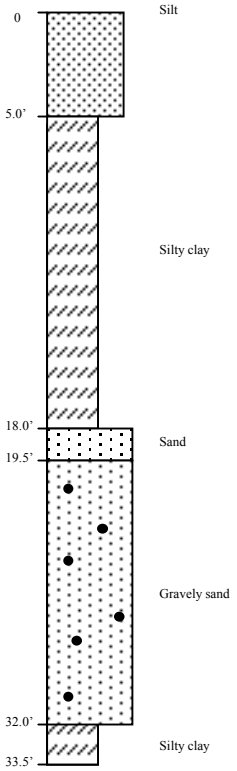


Well Log Diagrams

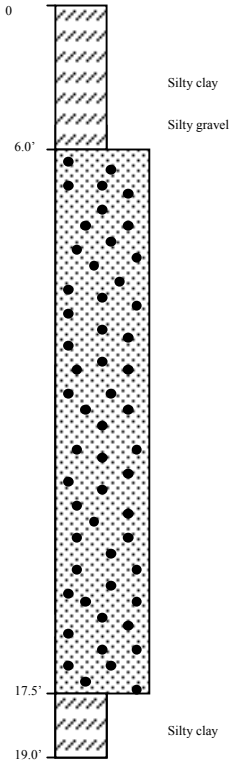


Well Log Diagrams

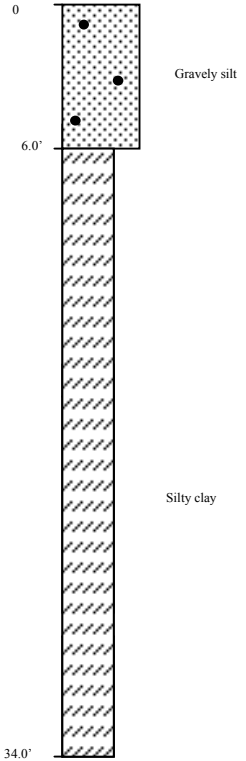
GKW-4
(not to scale)



GKW-5
(not to scale)

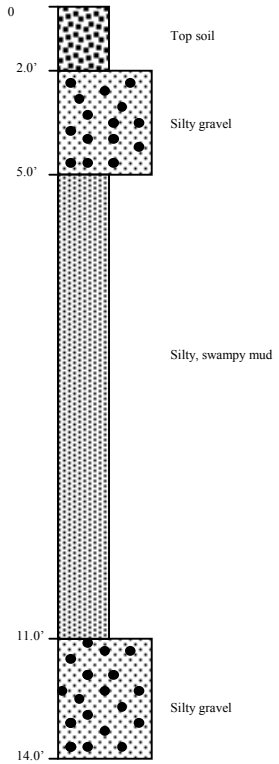


GKW-6
(not to scale)

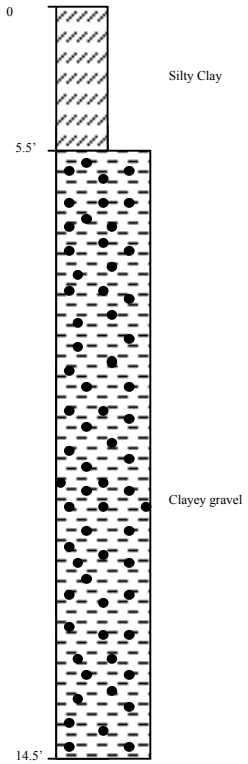


Well Log Diagrams

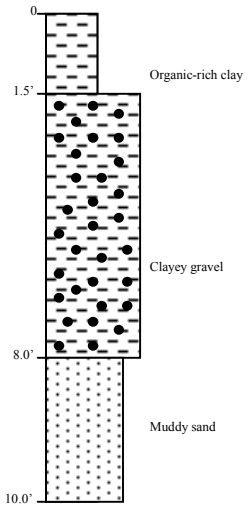
GKW-7
(not to scale)



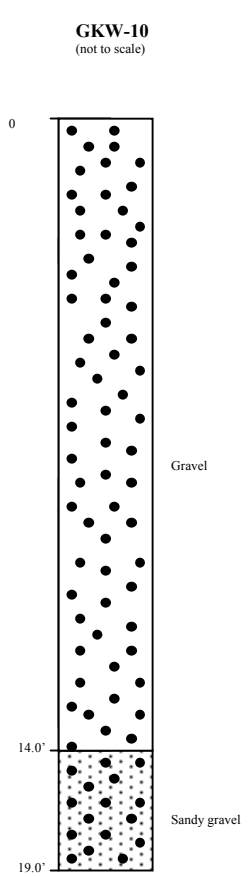
GKW-8
(not to scale)

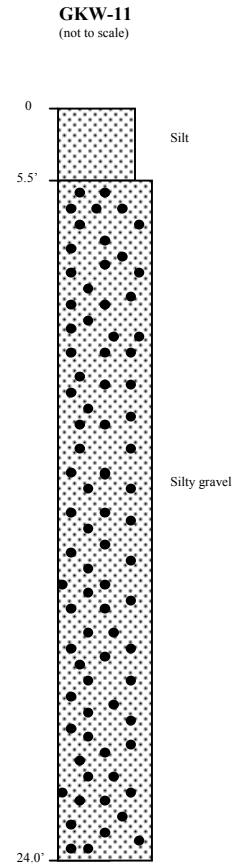


GKW-9
(not to scale)



Well Log Diagrams

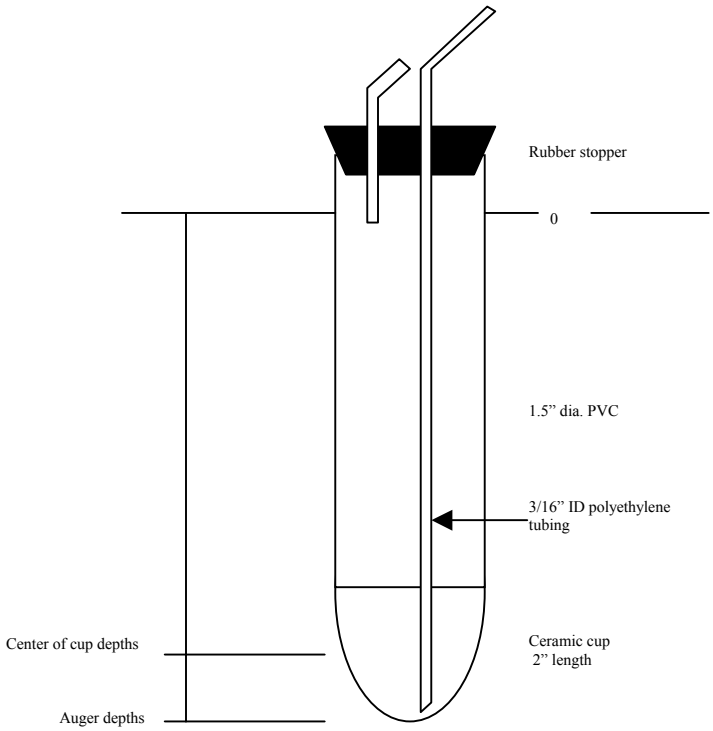




Lysimeter Installation Information

Instrument ID	Instrument	Installation Date	Lysimeter Depth (inches)	Auger Depths (inches)	Top of casing above surface (inches)	Purge Volume
ALYSD-1	lysimeter	7/24/00	14	15	9.00	setting 4- 20 sec.
ALYSD2-2	lysimeter	7/10/00	15	16	4.00	setting 4- 20 sec.
ALYSD2-3	lysimeter	7/10/00	15	16	4.00	setting 4- 20 sec.
ALYSS-1	lysimeter	7/24/00	6	7	2.00	setting 4- 20 sec.
ALYSS2-2	lysimeter	7/24/00	6.5	7.5	5.50	setting 4- 20 sec.
ALYSS2-3	lysimeter	7/10/00	6	7	2.00	setting 4- 20 sec.
BLYSD2	lysimeter	7/10/00	15	16	4.00	setting 4- 20 sec.
BLYSS2	lysimeter	7/10/00	6	7	2.00	setting 4- 20 sec.
LYSD-2	lysimeter	7/11/00	20	21	2.00	setting 4- 20 sec.
LYSD2-1	lysimeter	7/11/00	20	21	2.00	setting 4- 20 sec.
LYSD2-5	lysimeter	7/11/00	20	21	2.00	setting 4- 20 sec.
LYSD2-9	lysimeter	7/10/00	20	21	2.00	setting 4- 20 sec.
LYSD-3	lysimeter	7/11/00	20	21	2.00	setting 4- 20 sec.
LYSD-4	lysimeter	7/11/00	20	21	2.00	setting 4- 20 sec.
LYSD-6	lysimeter	7/11/00	20	21	2.00	setting 4- 20 sec.
LYSD-7	lysimeter	7/10/00	20	21	2.00	setting 4- 20 sec.
LYSD-8	lysimeter	7/10/00	20	21	2.00	setting 4- 20 sec.
LYSS-1	lysimeter	7/11/00	11	12	2.00	setting 4- 20 sec.
LYSS-2	lysimeter	7/11/00	10	11	2.00	setting 4- 20 sec.
LYSS2-4	lysimeter	7/11/00	10	11	2.00	setting 4- 20 sec.
LYSS2-6	lysimeter	7/11/00	10	11	2.00	setting 4- 20 sec.
LYSS-3	lysimeter	7/11/00	11	12	1.00	setting 4- 20 sec.
LYSS-5	lysimeter	7/11/00	11	12	1.00	setting 4- 20 sec.
LYSS-7	lysimeter	7/10/00	10	11	2.00	setting 4- 20 sec.
LYSS-8	lysimeter	7/10/00	10	11	2.00	setting 4- 20 sec.
LYSS-9	lysimeter	7/10/00	10	11	2.00	setting 4- 20 sec.
LYSVD-1	lysimeter	7/11/00	30	31	2.00	setting 4- 30 sec.
LYSVD2-2	lysimeter	7/11/00	29	31	3.00	setting 4- 30 sec.
LYSVD2-3	lysimeter	7/11/00	31	32	1.00	setting 4- 30 sec.
LYSVD2-7	lysimeter	7/10/00	30	31	2.00	setting 4- 30 sec.
LYSVD2-8	lysimeter	7/10/00	31	32	1.00	setting 4- 30 sec.
LYSVD-4	lysimeter	7/11/00	31	32	1.00	setting 4- 30 sec.
LYSVD-5	lysimeter	7/11/00	29	30	3.00	setting 4- 30 sec.
LYSVD-6	lysimeter	7/11/00	30	31	2.00	setting 4- 30 sec.
LYSVD-9	lysimeter	7/10/00	30	31	2.00	setting 4- 30 sec.
NMLYSD2	lysimeter	7/10/00	11	12	8.00	setting 4- 20 sec.
NMLYSS2	lysimeter	7/10/00	5.5	6.5	2.50	setting 4- 20 sec.

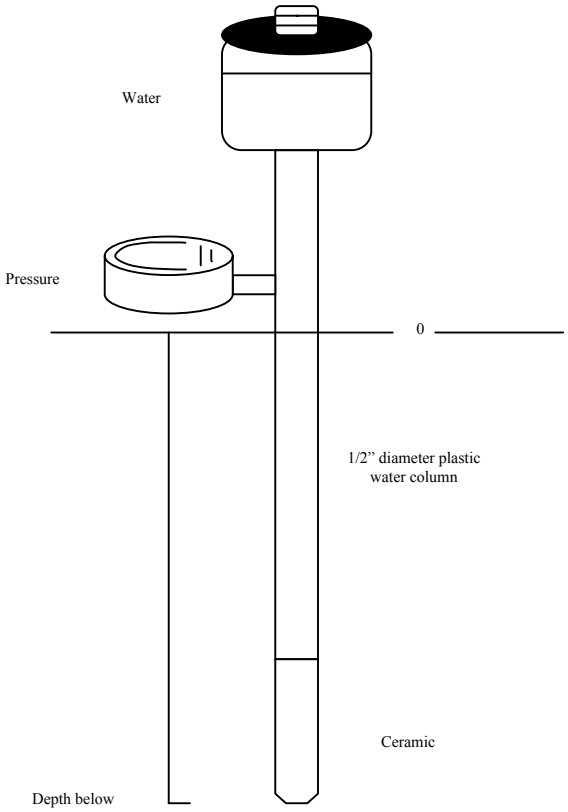
Diagram of a Lysimeter



Tensiometer Installation Information

Instrument ID	Instrument	Installation Date	Tensiometer depth (inches)
BTEN6"	tensiometer	5/18/00	6
BTEN12"	tensiometer	5/18/00	12
ATEN6"-2	tensiometer	5/19/00	6
ATEN12"-2	tensiometer	5/19/00	12
ATEN6"-3	tensiometer	6/1/00	6
ATEN12"-3	tensiometer	6/1/00	12
TEN6"-1	tensiometer	6/6/00	6
TEN12"-1	tensiometer	6/6/00	12
TEN24"-1	tensiometer	6/6/00	24
TEN6"-3	tensiometer	6/6/00	6
TEN12"-3	tensiometer	6/6/00	12
TEN24"-3	tensiometer	6/6/00	24
TEN6"-2	tensiometer	6/7/00	6
TEN12"-2	tensiometer	6/7/00	12
TEN24"-2	tensiometer	6/7/00	24
TEN6"-6	tensiometer	6/7/00	6
TEN12"-6	tensiometer	6/7/00	12
TEN24"-6	tensiometer	6/7/00	24
TEN6"-8	tensiometer	6/7/00	6
TEN24"-8	tensiometer	6/7/00	24
TEN12"-9	tensiometer	6/7/00	12
TEN24"-9	tensiometer	6/7/00	24
TEN6"-4	tensiometer	6/8/00	6
TEN12"-4	tensiometer	6/8/00	12
TEN24"-4	tensiometer	6/8/00	24
TEN12"-5	tensiometer	6/8/00	12
TEN24"-5	tensiometer	6/8/00	24
TEN6"-7	tensiometer	6/8/00	6
TEN12"-7	tensiometer	6/8/00	12
TEN24"-7	tensiometer	6/8/00	24
TEN6"-5	tensiometer	7/31/00	6
TEN12"-8	tensiometer	7/31/00	12
TEN6"-9	tensiometer	7/31/00	6
ATEN6"-1	tensiometer	7/31/00	6
ATEN12"-1	tensiometer	7/31/00	12
NMTEN6"	tensiometer	7/31/00	6
NMTEN12"	tensiometer	7/31/00	12

Diagram of a Tensiometer



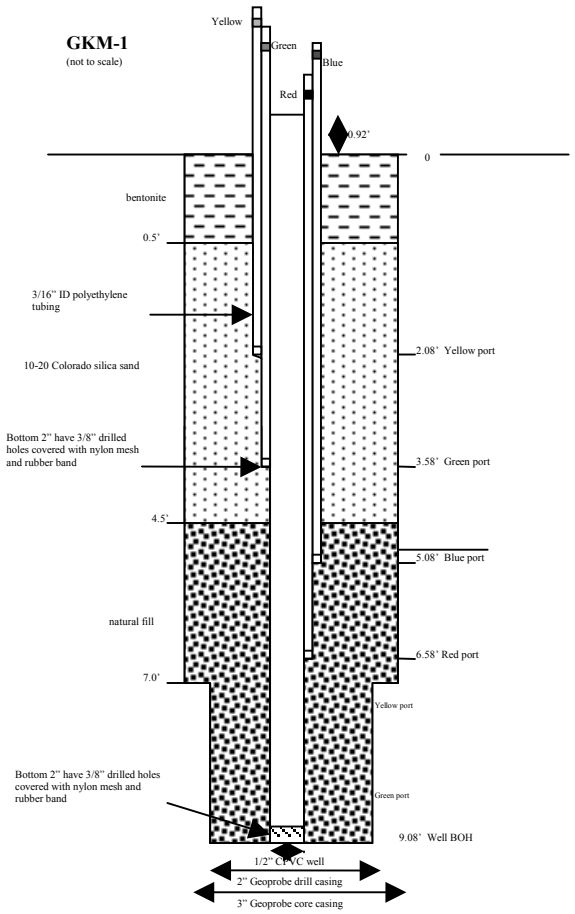
Multi-Level Sampler Installation Information

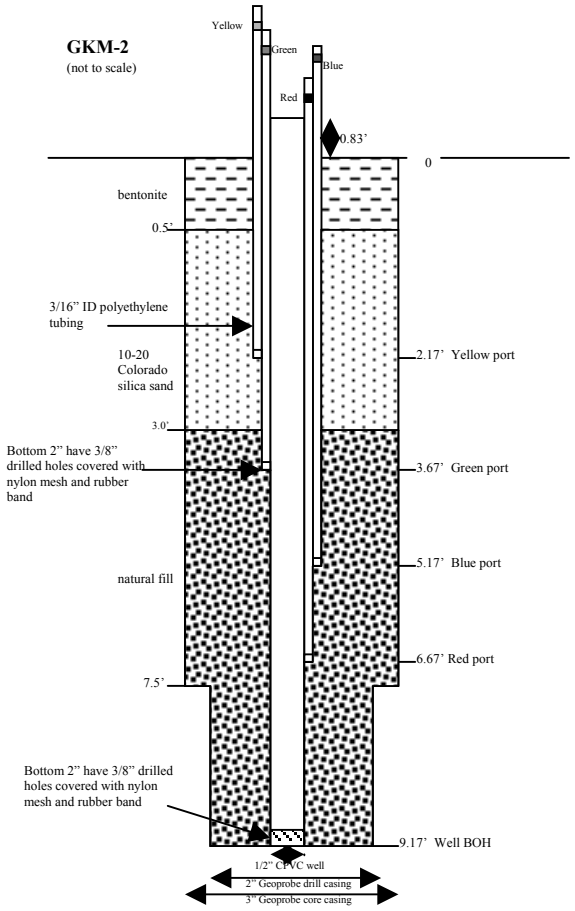
Instrument ID	Instrument	Installation Date	Well depth/port depth (ft)	Top of casing above surface (ft)	Purge Volume
MLS-3W	multi-level sampler	5/18/00	6.75	1.00	40mL/ft
MLS-3Red	multi-level sampler	5/18/00	5.25		6mL/ft
MLS-3Blue	multi-level sampler	5/18/00	3.75		6mL/ft
MLS-3Green	multi-level sampler	5/18/00	2.25		41ml + 6mL/ft
MLS-4W	multi-level sampler	5/18/00	13.00	1.00	40mL/ft
MLS-4Red	multi-level sampler	5/18/00	11.00		6mL/ft
MLS-4Blue	multi-level sampler	5/18/00	9.50		6mL/ft
MLS-4Green	multi-level sampler	5/18/00	8.00		41ml + 6mL/ft
MLS-5W	multi-level sampler	5/19/00	10.50	1.00	40mL/ft
MLS-5Red	multi-level sampler	5/19/00	8.50		6mL/ft
MLS-5Blue	multi-level sampler	5/19/00	7.00		6mL/ft
MLS-5Green	multi-level sampler	5/19/00	5.50		41ml + 6mL/ft
GKM-5W	multi-level sampler	5/19/00	9.00	1.00	40mL/ft
GKM-5Red	multi-level sampler	5/19/00	7.00		6mL/ft
GKM-5Blue	multi-level sampler	5/19/00	5.50		90mL + 6mL/ft
GKM-5Green	multi-level sampler	5/19/00	4.00		90mL + 6mL/ft
GKM-5Yellow	multi-level sampler	5/19/00	2.50		90mL + 6mL/ft
GKM-1W	multi-level sampler	6/6/00	9.08	0.92	40mL/ft
GKM-1Red	multi-level sampler	6/6/00	6.58		6mL/ft
GKM-1Blue	multi-level sampler	6/6/00	5.08		6mL/ft
GKM-1Green	multi-level sampler	6/6/00	3.58		90mL + 6mL/ft
GKM-1Yellow	multi-level sampler	6/6/00	2.08		90mL + 6mL/ft
GKM-3W	multi-level sampler	6/6/00	8.83	1.17	40mL/ft
GKM-3Red	multi-level sampler	6/6/00	6.83		6mL/ft
GKM-3Blue	multi-level sampler	6/6/00	5.33		6mL/ft
GKM-3Green	multi-level sampler	6/6/00	3.83		6mL/ft
GKM-3Yellow	multi-level sampler	6/6/00	2.08		6mL/ft
GKM-2W	multi-level sampler	6/7/00	9.17	0.83	40mL/ft
GKM-2Red	multi-level sampler	6/7/00	6.67		6mL/ft
GKM-2Blue	multi-level sampler	6/7/00	5.17		6mL/ft
GKM-2Green	multi-level sampler	6/7/00	3.67		6mL/ft
GKM-2Yellow	multi-level sampler	6/7/00	2.17		90mL + 6mL/ft
GKM-6W	multi-level sampler	6/7/00	9.17	0.83	40mL/ft
GKM-6Red	multi-level sampler	6/7/00	6.67		6mL/ft
GKM-6Blue	multi-level sampler	6/7/00	5.17		6mL/ft
GKM-6Green	multi-level sampler	6/7/00	3.67		90mL + 6mL/ft
GKM-6Yellow	multi-level sampler	6/7/00	2.17		90mL + 6mL/ft
GKM-8W	multi-level sampler	6/7/00	8.83	1.17	40mL/ft
GKM-8Red	multi-level sampler	6/7/00	6.33		6mL/ft
GKM-8Blue	multi-level sampler	6/7/00	4.83		6mL/ft
GKM-8Green	multi-level sampler	6/7/00	3.33		90mL + 6mL/ft
GKM-8Yellow	multi-level sampler	6/7/00	1.83		90mL + 6mL/ft
GKM-9W	multi-level sampler	6/7/00	9.00	1.00	40mL/ft

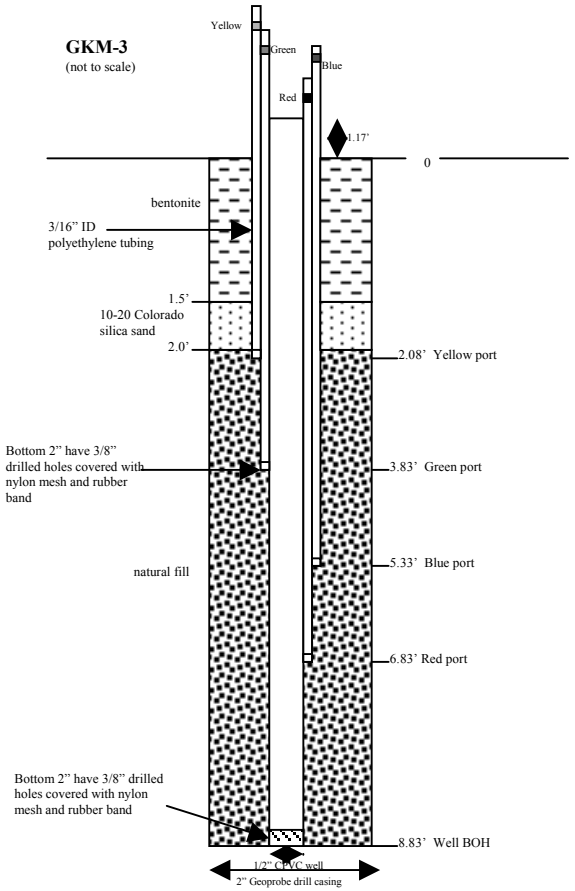
Multi-Level Sampler Installation Information

Instrument ID	Instrument	Installation Date	Well depth/port depth (ft)	Top of casing above surface (ft)	Purge Volume
GKM-9Red	multi-level sampler	6/7/00	6.50		6mL/ft
GKM-9Blue	multi-level sampler	6/7/00	5.00		6mL/ft
GKM-9Green	multi-level sampler	6/7/00	3.50		90mL + 6mL/ft
GKM-9Yellow	multi-level sampler	6/7/00	2.00		90mL + 6mL/ft
GKM-4W	multi-level sampler	6/8/00	9.00	1.00	40mL/ft
GKM-4Red	multi-level sampler	6/8/00	6.50		6mL/ft
GKM-4Blue	multi-level sampler	6/8/00	5.00		6mL/ft
GKM-4Green	multi-level sampler	6/8/00	3.50		90mL + 6mL/ft
GKM-4Yellow	multi-level sampler	6/8/00	2.00		90mL + 6mL/ft
GKM-7W	multi-level sampler	6/8/00	9.00	1.00	40mL/ft
GKM-7Red	multi-level sampler	6/8/00	6.50		6mL/ft
GKM-7Blue	multi-level sampler	6/8/00	5.00		90mL + 6mL/ft
GKM-7Green	multi-level sampler	6/8/00	3.50		90mL + 6mL/ft
GKM-7Yellow	multi-level sampler	6/8/00	2.00		90mL + 6mL/ft

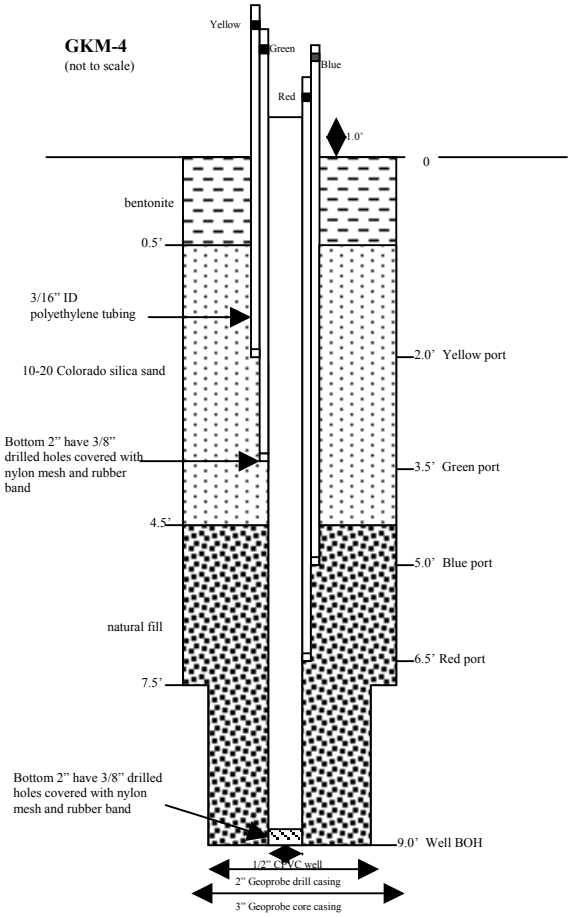
Multi-Level Well Diagrams

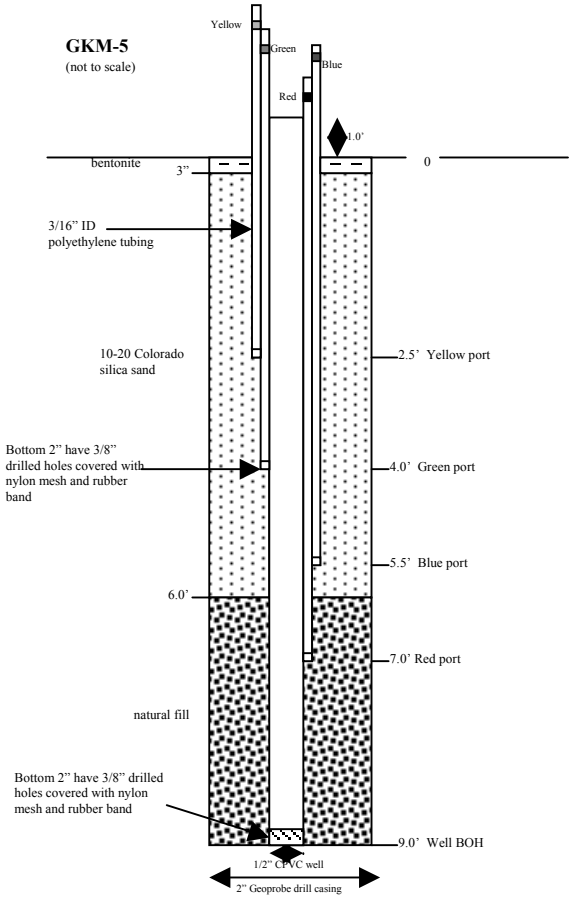


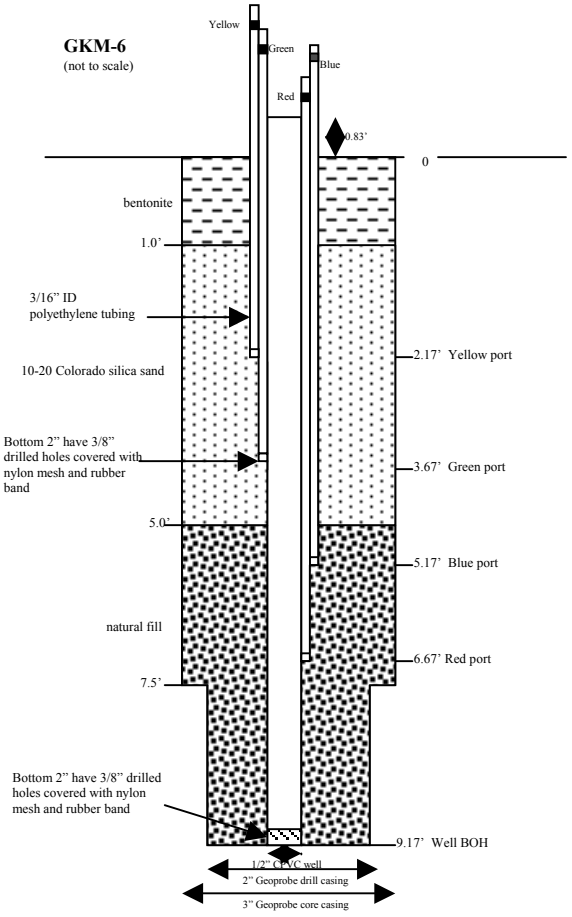




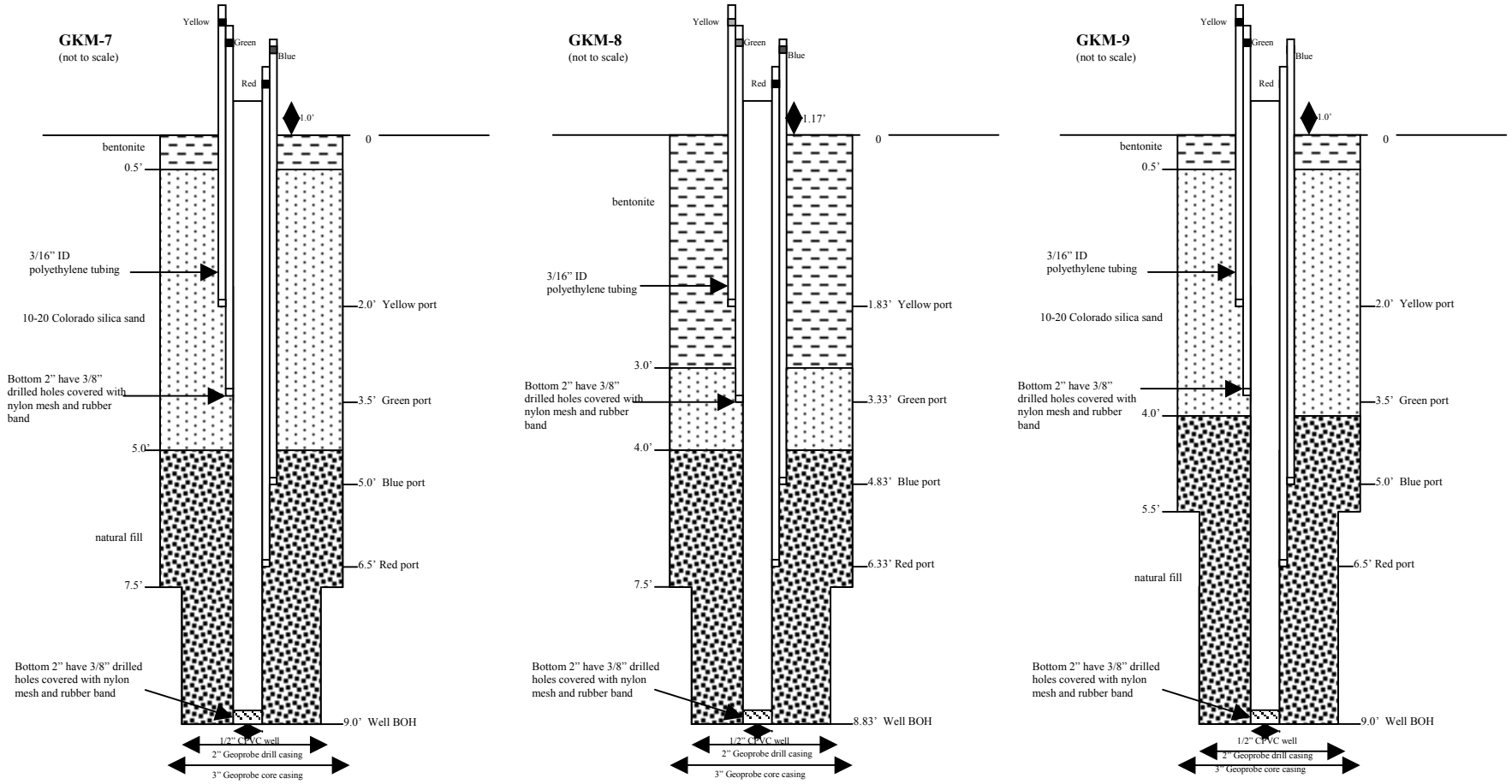
Multi-Level Well Diagrams



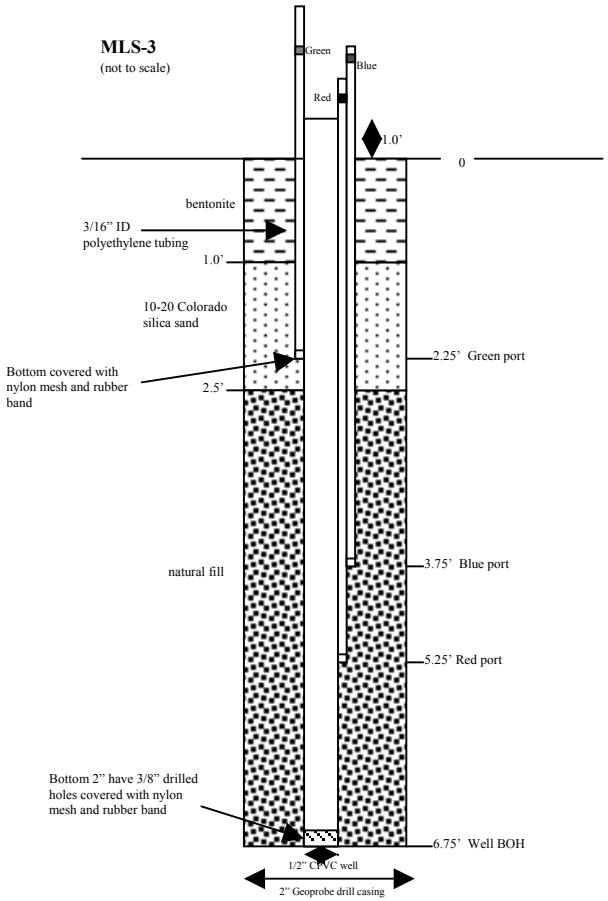


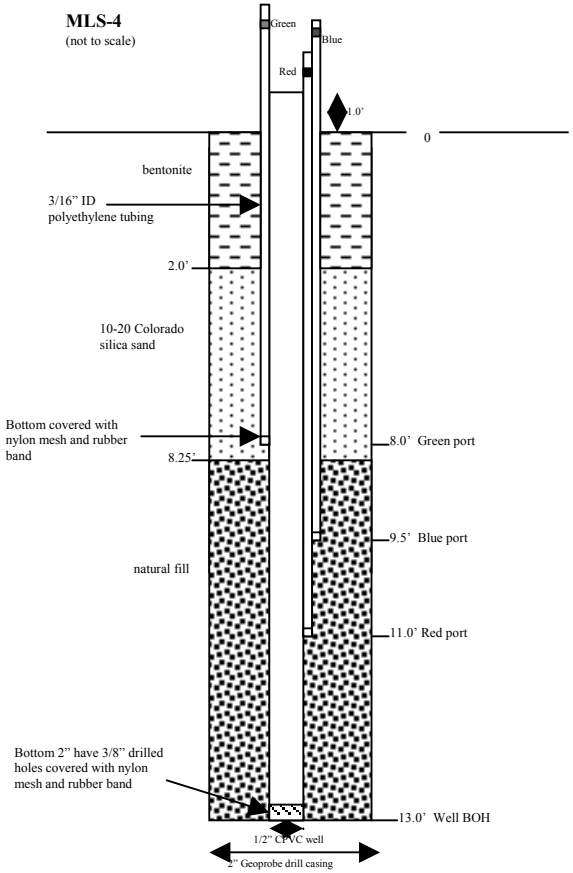


Multi-Level Well Diagrams



Multi-Level Well Diagrams





APPENDIX B – Water Resources

B.2 Field Measurements

Soil moisture, pH, temperature and conductivity and water levels were measured in the field during sampling events. Tensiometer graphs represent vertical characterization of soil moisture content at various dates. Hydrographs represent elevation-corrected water levels between the months of May 2000 thru December 2000.

Tensiometer Readings (centibars)

Instrument ID	Date	5/30/00	6/14/00	6/16/00	6/19/00	6/20/00	6/26/00	7/10/00	7/11/00	7/13/00	7/17/00	7/18/00	7/20/00	7/24/00	8/4/00	8/28/00	8/29/00	8/30/00
TEN6"-1		-	12	-	14	-	-	-	16	16	29	-	-	-	-	-	-	-
TEN12"-1		-	10	-	11	-	-	-	12	12	19	-	-	-	43	-	-	-
TEN24"-1		-	11	-	12	-	-	-	10	10	14	-	-	-	13	14	-	-
TEN6"-2		-	14	-	-	14	-	-	20	23	10	-	-	-	27	-	34	-
TEN12"-2		-	12	-	-	12	-	-	16	18	18	-	-	-	20	-	-	-
TEN24"-2		-	12	-	-	11	-	-	16	18	17	-	-	-	18	-	22	-
TEN6"-3		-	30	-	34	-	-	-	38	43	-	-	-	-	-	-	-	-
TEN12"-3		-	33	-	37	-	-	-	34	46	-	-	-	-	-	-	-	-
TEN24"-3		-	12	-	12	-	-	-	15	17	17	-	-	-	20	-	-	33
TEN6"-4		-	21	-	23	-	-	-	25	28	-	-	30	-	34	-	-	38
TEN12"-4		-	12	-	15	-	-	-	17	20	-	-	12	-	21	-	-	24
TEN24"-4		-	10	-	10	-	-	-	11	14	-	-	10	-	12	-	-	12
TEN6"-5		-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-
TEN12"-5		-	18	-	1	-	-	-	19	22	23	-	-	-	28	-	-	35
TEN24"-5		-	0	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
TEN6"-6		-	-	-	-	66	-	-	70	34	-	-	-	-	-	-	-	-
TEN12"-6		-	-	-	-	33	-	-	44	30	-	-	-	13	-	-	-	-
TEN24"-6		-	-	-	-	20	23	-	24	42	-	-	-	38	-	-	-	-
TEN6"-7		-	-	22	-	-	-	25	-	27	-	-	-	23	36	-	32	-
TEN12"-7		-	-	22	-	-	23	25	-	24	-	-	-	26	21	-	10	-
TEN24"-7		-	-	0	-	-	-	22	-	22	-	-	-	22	22	-	26	-
TEN6"-8		-	-	43	-	-	-	-	-	48	-	-	-	-	44	-	-	-
TEN12"-8		-	-	25	-	-	11	11	-	10	-	-	-	-	30	-	18	-
TEN24"-8		-	-	9	-	-	-	-	-	-	-	-	-	-	10	-	9	-
TEN6"-9		-	-	14	-	-	26	-	-	-	-	-	-	-	-	-	-	-
TEN12"-9		-	-	15	-	-	18	42	-	31	-	-	-	-	-	-	-	-
TEN24"-9		-	-	30	-	-	31	33	-	27	-	-	31	-	30	28**	-	-
ATEN6"-1		-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ATEN12"-1		-	1	-	-	-	-	15	-	18	-	-	-	-	-	28	-	-
ATEN6"-2		-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ATEN12"-2		58	-	10	-	-	-	10	-	15	23	-	-	-	72	-	-	-
ATEN6"-3		-	10	-	-	-	-	9	-	6	-	8	-	-	12	8	-	-
ATEN12"-3		-	11	-	-	-	-	10	-	9	-	9	-	-	14	24	-	-
BTEN6"		64	12	-	-	-	-	17	-	32	-	-	9	-	-	-	-	-
BTEN12"		59	11	-	-	-	-	18	-	31	-	-	8	-	-	-	-	-
NMTEN6"		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NMTEN12"		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**= water in reservoir frozen

Monitoring Well Field Measurements

Well ID	pH	Conductivity (mS)	Temperature (°C)
GKW-1 062800	7.44	0.388	11.7
GKW-1 071900	7.50	0.376	11.5
GKW-1 083000	7.68	0.457	12.2
GKW-10 063000	7.16	0.481	9.3
GKW-10 071800	7.26	0.452	9.1
GKW-10 082800	7.41	0.444	9.6
GKW-11 063000	7.36	0.425	9.5
GKW-11 071800	7.26	0.439	9.5
GKW-11 082800	7.49	0.469	13.4
GKW-2 062800	7.36	0.508	16.2
GKW-2 071900	7.40	0.413	12.5
GKW-2 083000	7.45	0.550	13.0
GKW-3 062900	6.98	0.53	12.4
GKW-3 071900	7.00	0.478	11.4
GKW-4 062800	7.24	0.434	11.8
GKW-4 071900	7.12	0.387	10.6
GKW-4 083000	7.21	0.584	10.9
GKW-5 062900	7.44	0.438	13.9
GKW-5 071900	7.32	0.488	17.3
GKW-5 082800	7.37	0.462	14.9
GKW-7 062900	6.45	0.293	11.6
GKW-7 072000	6.96	0.300	12.3
GKW-7 083000	7.05	0.334	11.4
GKW-8 062900	6.70	0.258	11.6
GKW-8 071900	6.92	0.258	11.7
GKW-8 082900	6.93	0.242	12.4
GKW-9 062900	7.05	0.528	14.3
GKW-9 072400	7.01	0.675	17.4
GKW-9 082900	7.10	0.799	16.9
MW-1 050100	6.91	0.463	7.8
MW-1 062900	7.02	0.509	10.6
MW-1 071800	7.36	0.495	8.2
MW-1 083000	7.47	0.528	9.6
MW-2 050100	6.86	0.440	8.5
MW-2 060200	7.44	0.454	11.1
MW-2 063000	7.09	0.503	9.6
MW-2 071800	7.31	0.481	10.3
MW-2 083000	7.32	0.570	10.3
MW-3 050100	7.18	0.348	14.2
MW-4 050100	7.09	0.436	7.6
MW-4 063000	7.40	0.524	10.2
MW-4 071800	7.34	0.509	10.4
MW-4 082800	7.50	0.513	10.7
MW-5 050100	6.99	0.400	8.5
MW-5 060200	7.41	0.374	12.4
MW-5 062700	7.36	0.446	14.8
MW-5 071800	7.32	0.460	13.1
MW-5 082800	7.47	0.477	14.2

Multi-Level Well Field Measurements

Well ID	pH	Conductivity (mS)	Temperature (^{o}C)
GKM-1Green 082800	7.13	0.506	13.9
GKM-1Green 061900	7.15	0.513	10.4
GKM-1Green 071700	7.04	0.501	13.9
GKM-1Red 082800	7.39	0.497	13.3
GKM-1Red 061900	7.52	0.48	11.3
GKM-1Red 071700	7.20	0.464	13.6
GKM-1W 062900	7.28	0.465	10.9
GKM-1W 071700	7.10	0.484	14.5
GKM-1W 082800	7.48	0.517	14.4
GKM-2Blue 082900	7.15	0.245	13.5
GKM-2Blue 062000	6.69	-	10.9
GKM-2Blue 071700	6.90	0.278	13.7
GKM-2W 062800	6.96	0.309	16.6
GKM-2W 071700	6.68	0.318	13.8
GKM-2W 082900	7.11	0.248	14.8
GKM-3Blue 083000	7.16	0.567	13.6
GKM-3Blue 061900	7.22	0.423	10.5
GKM-3Blue 071700	6.83	0.568	17.2
GKM-3Green 083000	7.10	0.567	13.9
GKM-3Green 071700	6.89	0.582	18.0
GKM-3Red 083000	7.21	0.550	13.2
GKM-3Red 061900	7.26	0.466	13.2
GKM-3Red 071700	6.95	0.590	17.9
GKM-3W 062900	7.00	0.566	17.6
GKM-3W 083000	7.18	0.539	13.2
GKM-4Blue 083000	7.10	0.679	15.0
GKM-4Blue 061900	7.36	0.462	11.1
GKM-4Blue 072000	7.01	0.539	13.5
GKM-4Green 083000	7.38	0.728	16.5
GKM-4Red 083000	7.15	0.671	14.9
GKM-4Red 061900	7.08	0.464	10.9
GKM-4Red 072000	7.05	0.547	14.4
GKM-4W 062800	6.81	0.534	13.2
GKM-4W 072000	7.04	0.541	14.3
GKM-4W 083000	7.20	0.663	15.2
GKM-5Blue 083000	7.09	0.554	12.1
GKM-5Blue 061900	7.09	0.381	10.8
GKM-5Blue 071700	7.09	0.556	17.2
GKM-5Green 061900	7.29	0.391	12
GKM-5W 083000	7.17	0.535	11.4
GKM-6Blue 062000	6.88	-	12.9
GKM-6Blue 062600	6.23	0.409	11.5
GKM-6Green 062000	7.15	-	14.4
GKM-6W 062600	6.57	0.250	10.0
GKM-6W 072400	6.73	0.362	13.3
GKM-6W 082900	6.75	0.255	14.5
GKM-7Blue 082900	6.84	0.489	13.2

Multi-Level Well Field Measurements

Well ID	pH	Conductivity (mS)	Temperature (^{o}C)
GKM-7Blue 062600	6.31	0.459	13.9
GKM-7Blue 072400	6.90	0.423	12.0
GKM-7R 082900	6.93	0.473	13.0
GKM-7W 062600	6.58	0.357	10.5
GKM-7W 072400	7.03	0.391	10.9
GKM-7W 082900	6.85	0.464	12.5
GKM-8B 082900	6.98	0.520	12.8
GKM-8Blue 062600	6.71	0.417	13.6
GKM-8Blue 072000	6.95	0.416	12.5
GKM-8Green 062600	7.13	0.427	14.0
GKM-8Red 082900	6.97	0.576	13.7
GKM-8Red 062600	6.46	0.407	11.5
GKM-8Red 072000	6.85	0.473	14.6
GKM-8W 072000	7.09	0.434	15.6
GKM-8W 082900	7.01	0.505	12.9
GKM-9Blue 082900	7.05	0.457	10.6
GKM-9Blue 062600	7.04	0.444	12.0
GKM-9Blue 072000	6.90	0.397	11.8
GKM-9Green 062600	7.06	0.436	11.8
GKM-9Red 082900	6.99	0.474	10.4
GKM-9Red 062600	6.5	0.411	10.4
GKM-9Red 072000	6.82	0.400	11.4
GKM-9W 062600	7.04	0.306	9.4
GKM-9W 072000	6.75	0.334	12.7
GKM-9W 082900	6.98	0.395	9.7
MLS-3Red 082800	7.60	0.729	16.3
MLS-3Red 062700	7.32	0.857	16.7
MLS-3Red 072000	7.41	0.501	15.4
MLS-3W 062700	7.88	0.618	17.9
MLS-3W 072000	7.51	0.449	14.4
MLS-3W 082800	7.49	0.708	17.3
MLS-4Red 082800	7.60	0.540	12.6
MLS-4Red 062000	6.89	-	22.7
MLS-4Red 063000	7.51	0.579	13.2
MLS-4Red 071800	7.56	0.565	13.9
MLS-4W 063000	7.48	0.563	11.6
MLS-4W 071800	7.60	0.544	12.3
MLS-4W 082800	7.70	0.538	12.1
MLS-5Blue 082800	7.51	0.490	14.4
MLS-5Blue 062000	7.55	-	15.0
MLS-5Blue 062700	7.46	0.558	16.2
MLS-5Blue 071800	7.49	0.531	15.8
MLS-5Green 062000	7.69	-	18.9
MLS-5Green 062700	7.60	0.551	16.8
MLS-5Green 071800	7.46	0.550	17.5
MLS-5Red 082800	7.47	0.483	14.4
MLS-5Red 062000	6.98	-	15.2

Multi-Level Well Field Measurements

Well ID	pH	Conductivity (mS)	Temperature (^{o}C)
MLS-5Red 062700	7.51	0.487	16.5
MLS-5Red 071800	7.44	0.500	15.7
MLS-5W 062700	6.83	0.447	15.2
MLS-5W 071800	7.41	0.497	14.8
MLS-5W 082800	7.53	0.483	14.1

Suction Lysimeter Field Measurements

Lysimter ID	pH	Conductivity (mS)	Temperature (°C)
ALYSD2-3 071800	7.59	0.986	19.2
BLYSD2 072000	7.45	0.823	18.6
LYSD-2 071700	7.01	0.297	18.9
LYSD2-1 071700	7.58	1.764	16.1
LYSD2-1 082800	7.88	1.719	14.6
LYSD-4 072000	6.85	1.844	18.5
LYSD-4 083000	7.28	1.963	17.0
LYSD-7 072400	5.78	1.232	20.4
LYSD-8 082900	7.43	0.713	14.5
LYSVD-1 071700	6.93	0.900	16.3
LYSVD-1 082800	7.06	0.843	15.7
LYSVD2-2 071700	6.96	0.300	18.2
LYSVD2-2 082900	7.18	0.235	16.4
LYSVD2-3 071700	7.53	0.539	18.2
LYSVD2-3 083000	7.56	0.545	15.4
LYSVD2-7 072400	6.18	0.995	16.1
LYSVD2-7 082900	6.09	1.157	16.4
LYSVD2-8 072000	6.67	0.533	17.9
LYSVD2-8 082900	6.70	0.621	14.3
LYSVD-4 083000	6.98	0.693	16.3
LYSVD-9 072000	7.26	0.467	14.3
LYSVD-9 082900	7.74	0.505	9.6

Water Level Measurements – Monitoring Wells

Well ID:	MW1
Elevation of casing (ft):	4532.86

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	4506.98
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	4507.32
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4507.62
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	4507.69
6/30/00	-
7/17/00	
7/18/00	4507.87
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	-
8/30/00	4507.47
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	4507.11
10/28/00	-
12/4/00	4506.88

Well ID:	MW2
Elevation of casing (ft):	4494.52

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	4481.62
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	4482.01
6/6/00	-
6/7/00	4482.52
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4482.8
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	-
6/30/00	4482.83
7/17/00	-
7/18/00	4483.01
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	-
8/30/00	4481.69
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	4481.35
10/28/00	4481.54
12/4/00	4480.92

Water Level Measurements – Monitoring Wells

Well ID:	MW3
Elevation of casing (ft):	4498.22

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	4488.44
5/18/00	4488.78
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	4489.53
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4489.71
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	-
10/28/00	-
12/4/00	-

Well ID:	MW4
Elevation of casing (ft):	4497.65

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	4484
5/18/00	4484.03
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	4484.13
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4484.37
6/26/00	-
6/27/00	4484.29
6/28/00	-
6/29/00	-
6/30/00	4484.26
7/17/00	-
7/18/00	4484.3
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	4483.89
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	4483.92
10/28/00	4483.89
12/4/00	4483.63

Water Level Measurements – Monitoring Wells

Well ID:	MW5
Elevation of casing (ft):	4489.07

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	4477.51
5/18/00	-
5/19/00	4478.36
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	4479.38
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4479.17
6/26/00	-
6/27/00	4479.15
6/28/00	-
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	4478.71
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	4477.32
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	4478.11
10/28/00	4477.17
12/4/00	4476.09

Wells:	Stockwell
Elevation of casing (ft):	4512.9

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	4482.33
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	4483.05
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4477.05
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	4481.28
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	-
10/28/00	4482.9
12/4/00	4482.2

Water Level Measurements – Monitoring Wells

Well ID:	GKW1
Elevation of casing (ft):	4506.47

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	4476.72
5/23/00	-
5/24/00	-
5/25/00	4476.67
5/30/00	-
6/1/00	-
6/2/00	4476.84
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4478.03
6/26/00	-
6/27/00	-
6/28/00	4478.54
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	4478.98
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	-
8/30/00	4478.03
9/28/00	-
9/29/00	-
9/30/00	4477.57
10/1/00	-
10/28/00	4477.39
12/4/00	-

Well ID:	GKW2
Elevation of casing (ft):	4528.14

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	4487.19
5/23/00	-
5/24/00	-
5/25/00	4487.79
5/30/00	-
6/1/00	-
6/2/00	4496.92
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4503.4
6/26/00	-
6/27/00	-
6/28/00	4507.9
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	4503.51
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	-
8/30/00	4492.24
9/28/00	-
9/29/00	-
9/30/00	4493.23
10/1/00	-
10/28/00	4490.34
12/4/00	4488.66

Water Level Measurements – Monitoring Wells

Well ID:	GKW3
Elevation of casing (ft):	4497.44

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	4490.67
5/23/00	-
5/24/00	-
5/25/00	4492.44
5/30/00	-
6/1/00	-
6/2/00	4495.17
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4495.38
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	4495.59
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	4495.39
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	-
8/30/00	4494.09
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	4493.53
10/28/00	4492.06
12/4/00	4490.87

Well ID:	GKW4
Elevation of casing (ft):	4526.12

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	4502.62
5/24/00	-
5/25/00	4503.68
5/30/00	-
6/1/00	-
6/2/00	4508.98
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4512.6
6/26/00	-
6/27/00	-
6/28/00	4513.62
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	4511.12
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	-
8/30/00	4505.83
9/28/00	-
9/29/00	-
9/30/00	4506.77
10/1/00	-
10/28/00	4504.27
12/4/00	4502.89

Water Level Measurements – Monitoring Wells

Well ID:	GKW5
Elevation of casing (ft):	4508.42

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	4498.53
5/24/00	-
5/25/00	4498.97
5/30/00	-
6/1/00	-
6/2/00	4499.85
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4498.67
6/26/00	-
6/27/00	-
6/28/00	
6/29/00	4501.3
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	4498.6
7/20/00	-
7/24/00	-
8/28/00	4498.3
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	4498.79
10/1/00	-
10/28/00	4498.77
12/4/00	4498.75

Well ID:	GKW6
Elevation of casing (ft):	4572.02

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	4551.12
5/24/00	-
5/25/00	4538.27
5/30/00	-
6/1/00	-
6/2/00	4536.69
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4536.66
6/26/00	-
6/27/00	-
6/28/00	4536.66
6/29/00	-
6/30/00	-
7/17/00	GKW6
7/18/00	-
7/19/00	-
7/20/00	4536.56
7/24/00	-
8/28/00	-
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	-
10/28/00	-
12/4/00	4536.52

Water Level Measurements – Monitoring Wells

Well ID:	GKW7
Elevation of casing (ft):	4509.61

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	4505.61
5/25/00	-
5/30/00	4505.56
6/1/00	-
6/2/00	4505.47
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4505.4
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	4505.15
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	4504.59
7/24/00	-
8/28/00	-
8/29/00	-
8/30/00	4504.49
9/28/00	-
9/29/00	-
9/30/00	4505.03
10/1/00	-
10/28/00	4505.62
12/4/00	4505.46

Well ID:	GKW8
Elevation of casing (ft):	4498.86

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	4492.11
5/25/00	-
5/30/00	4492.73
6/1/00	-
6/2/00	4492.9
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4492.52
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	4492.17
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	4492.13
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	4492.06
8/30/00	-
9/28/00	-
9/29/00	4492.85
9/30/00	-
10/1/00	-
10/28/00	4492.84
12/4/00	4492.75

Water Level Measurements – Monitoring Wells

Well ID:	GKW9
Elevation of casing (ft):	4493.25

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	4488.93
5/25/00	4489.21
5/30/00	-
6/1/00	-
6/2/00	4489.14
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4488.99
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	4489.85
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	-
7/24/00	4490.13
8/28/00	-
8/29/00	4488.49
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	4489.79
10/1/00	-
10/28/00	4488.89
12/4/00	4488.7

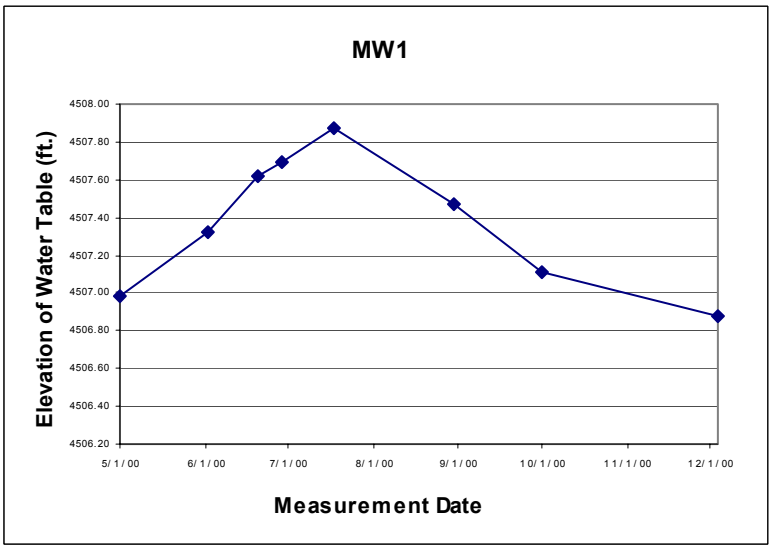
Well ID:	GKW10
Elevation of casing (ft):	4494.68

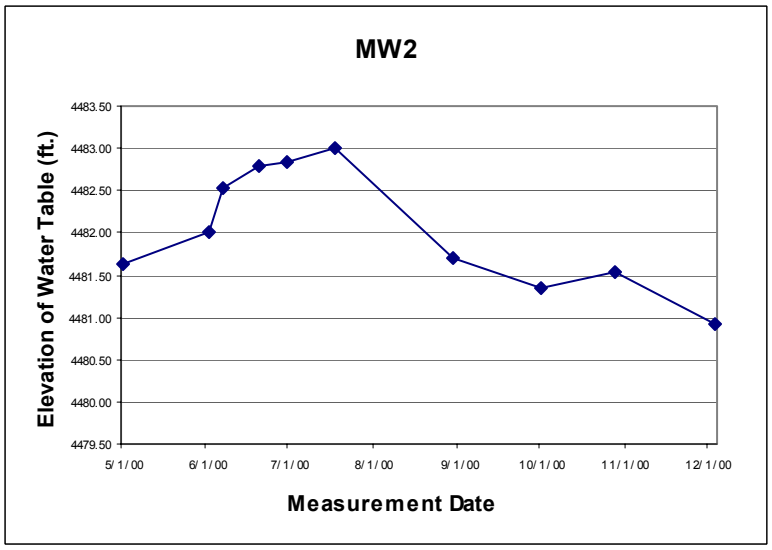
Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	4481.41
5/24/00	-
5/25/00	-
5/30/00	4481.7
6/1/00	-
6/2/00	4481.99
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4481.59
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	-
6/30/00	4481.13
7/17/00	-
7/18/00	4480.98
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	4480.24
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	4480.62
10/28/00	4480.12
12/4/00	4479.66

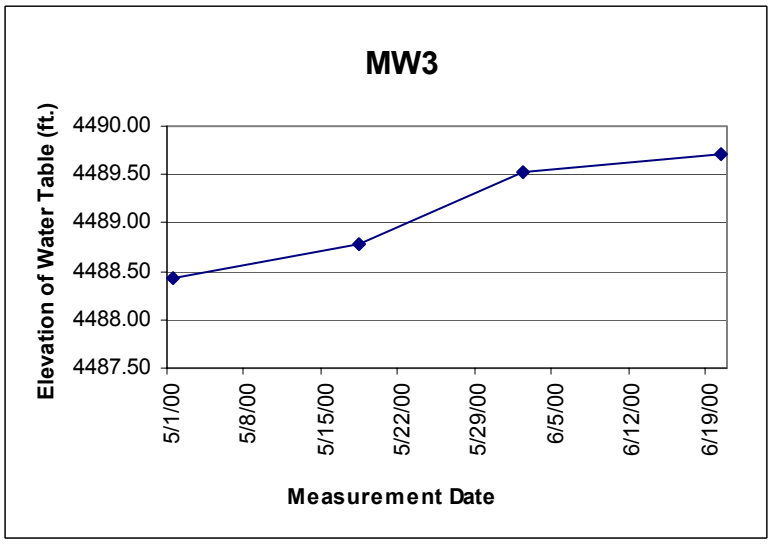
Water Level Measurements – Monitoring Wells

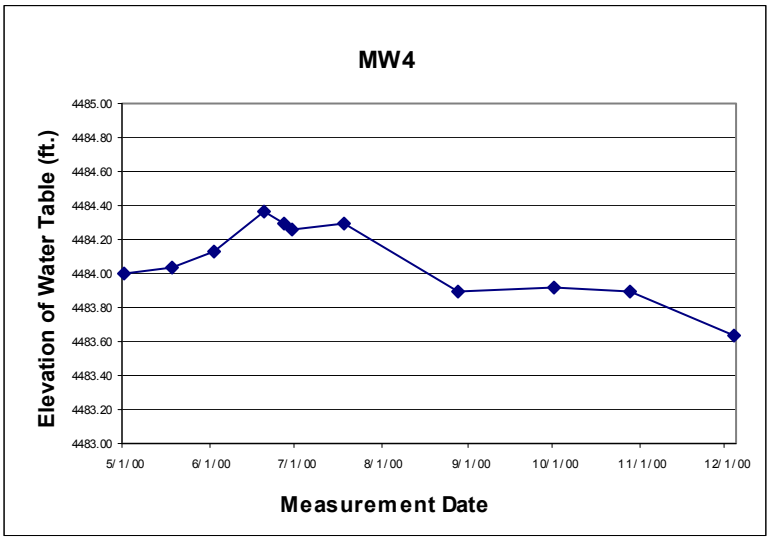
Well ID:	GKW11
Elevation of casing (ft):	4493.25

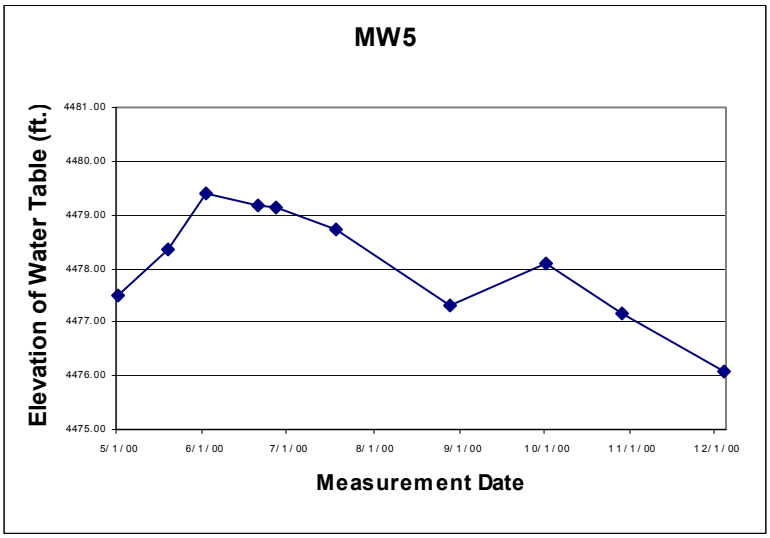
Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	4481.92
5/25/00	-
5/30/00	4482.49
6/1/00	-
6/2/00	4482.63
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4483.05
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	-
6/30/00	4483.8
7/17/00	-
7/18/00	4483.03
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	4482.14
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	4482.05
10/28/00	4482.04
12/4/00	4481.56

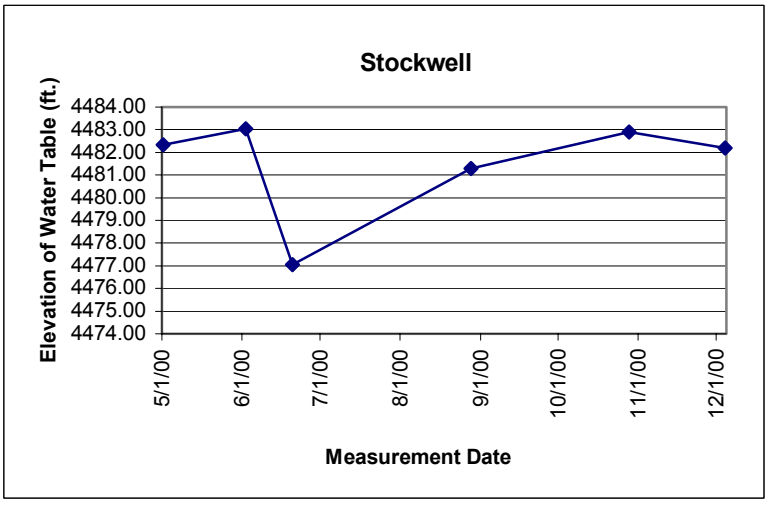

MW1
Elevation of Water Table (ft.)
4508.00
4507.80
4507.60
4507.40
4507.20
4507.00
4506.80
4506.60
4506.40
4506.20
5/ 1 / 00
6/ 1 / 00
7/ 1 / 00
8/ 1 / 00
9/ 1 / 00
10/ 1 / 00
11 / 1 / 00
12/ 1 / 00
Measurement Date


MW2
Elevation of Water Table (ft.)
4483.50
4483.00
4482.50
4482.00
4481.50
4481.00
4480.50
4480.00
4479.50
5/ 1 / 00
6/ 1 / 00
7/ 1 / 00
8/ 1 / 00
9/ 1 / 00
10/ 1 / 00
11 / 1 / 00
12/ 1 / 00
Measurement Date

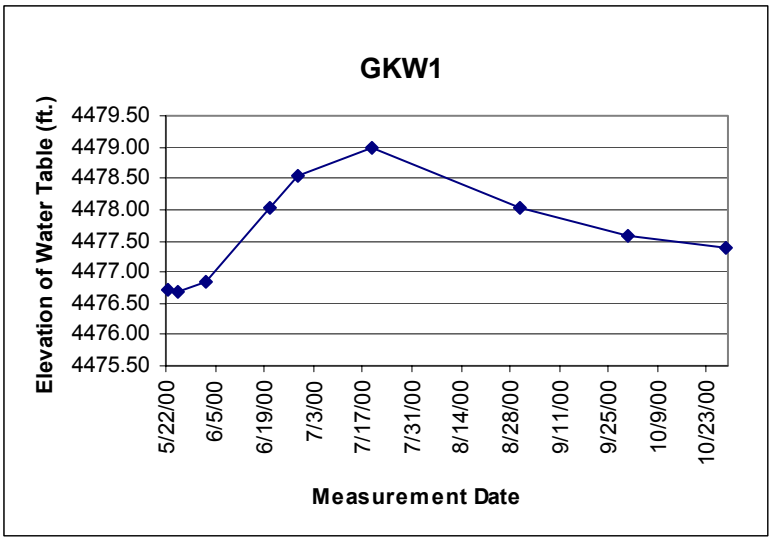

MW3
Elevation of Water Table (ft.)
4490.00
4489.50
4489.00
4488.50
4488.00
4487.50
5/1/00
5/8/00
5/15/00
5/22/00
5/29/00
6/5/00
6/12/00
6/19/00
Measurement Date

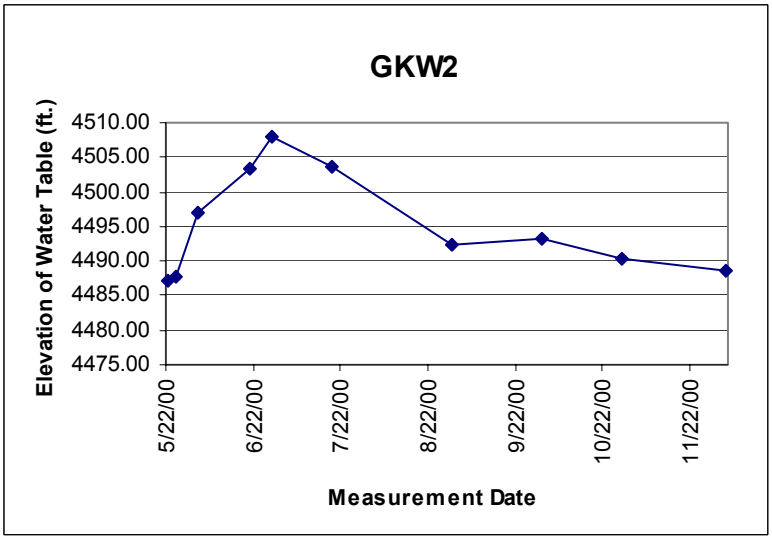


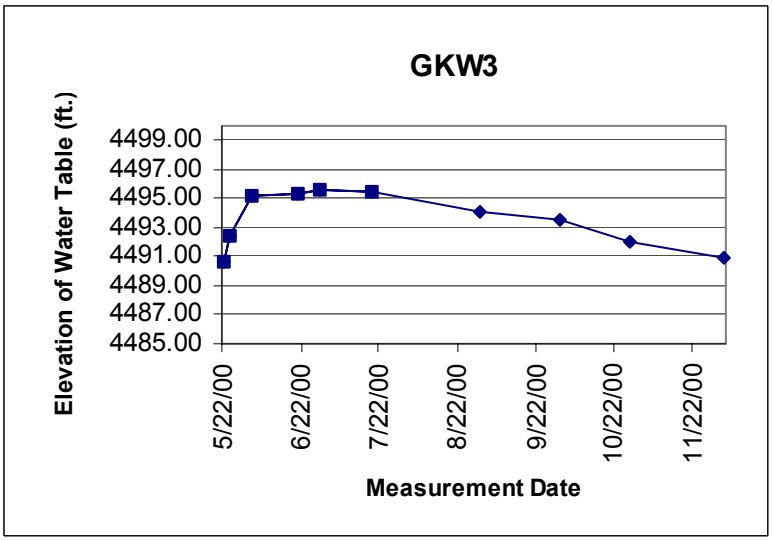




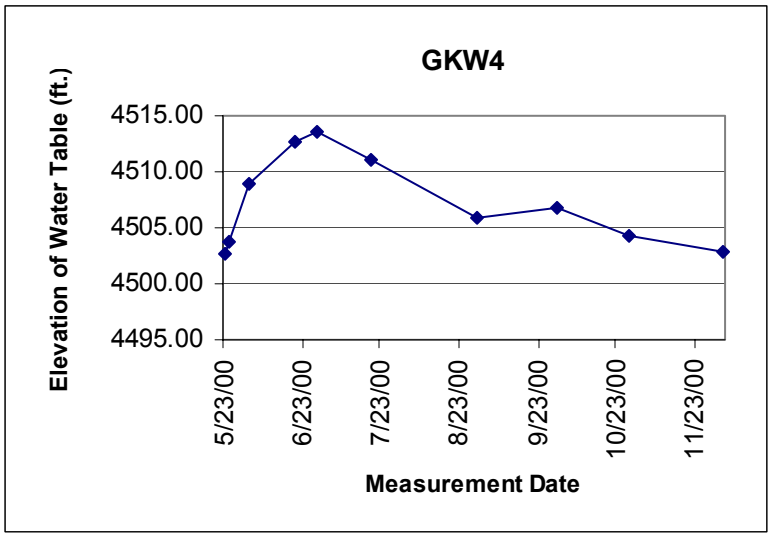
Water Level Measurements – Monitoring Wells

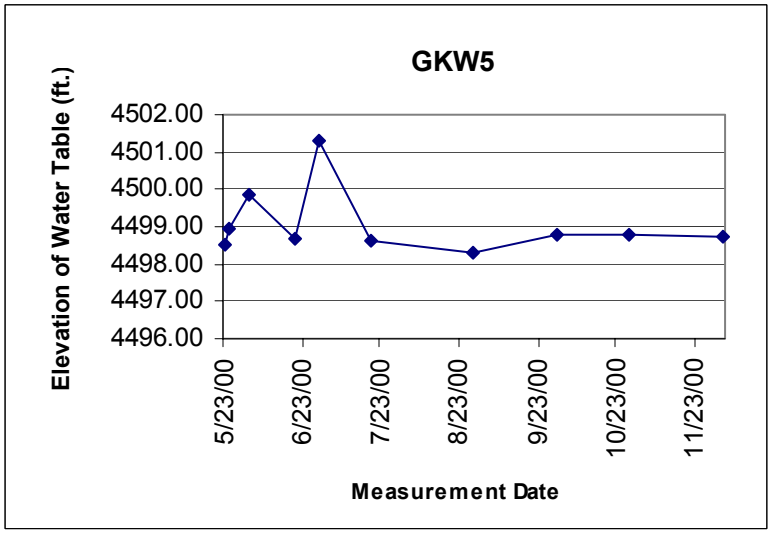


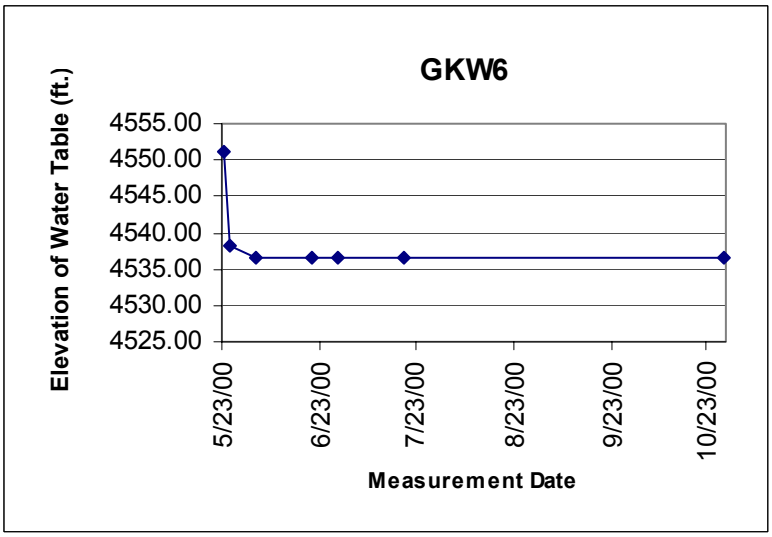


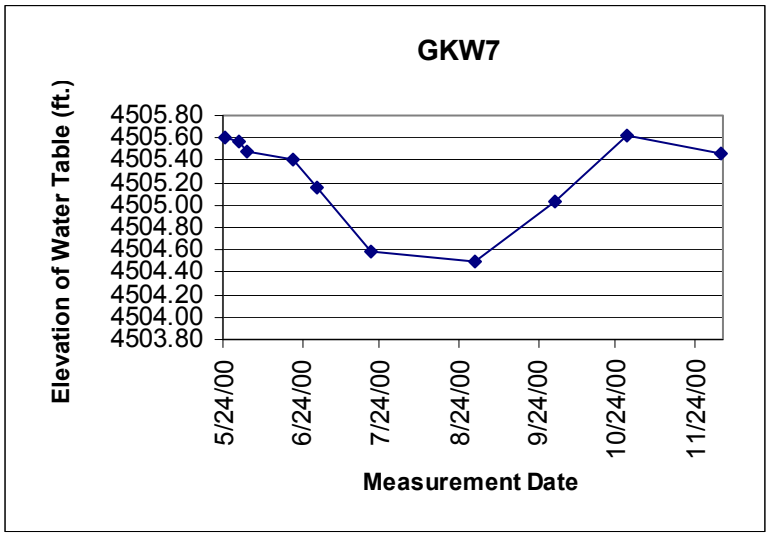


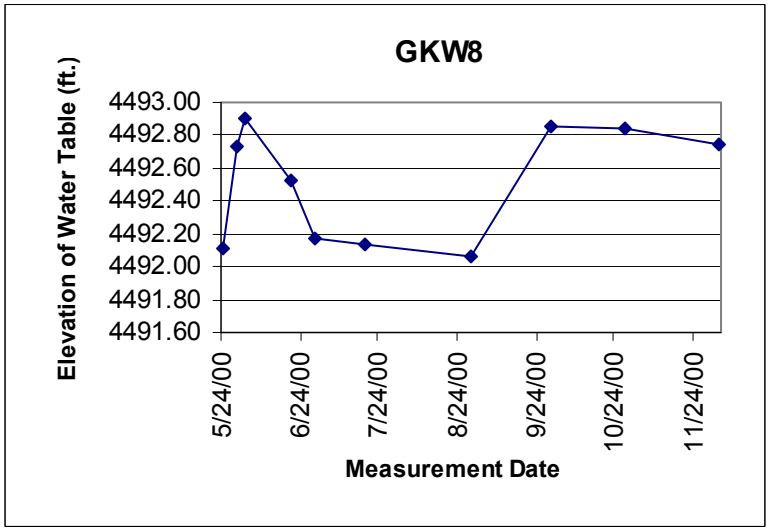
Water Level Measurements – Monitoring Wells

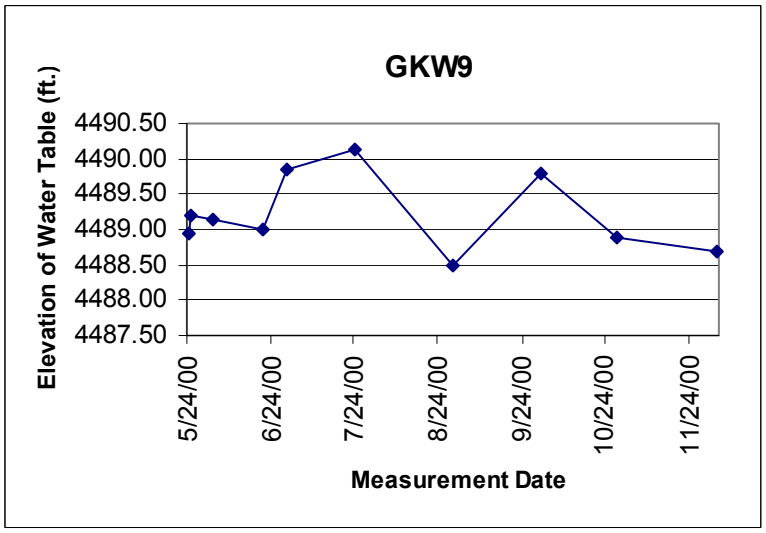

GKW4
Elevation of Water Table (ft.)
4515.00
4510.00
4505.00
4500.00
4495.00
5/23/00
6/23/00
7/23/00
8/23/00
9/23/00
10/23/00
11/23/00
Measurement Date

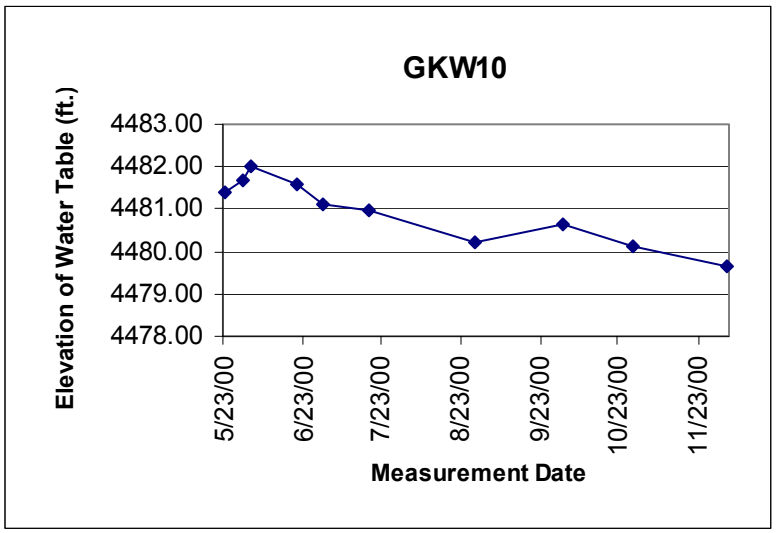

GKW5
Elevation of Water Table (ft.)
4502.00
4501.00
4500.00
4499.00
4498.00
4497.00
4496.00
5/23/00
6/23/00
7/23/00
8/23/00
9/23/00
10/23/00
11/23/00
Measurement Date

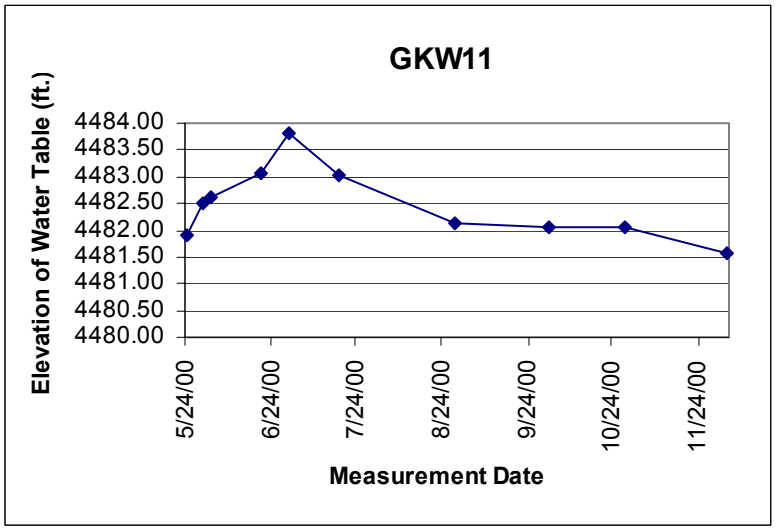

GKW6
Elevation of Water Table (ft.)
4555.00
4550.00
4545.00
4540.00
4535.00
4530.00
4525.00
5/23/00
6/23/00
7/23/00
8/23/00
9/23/00
10/23/00
Measurement Date

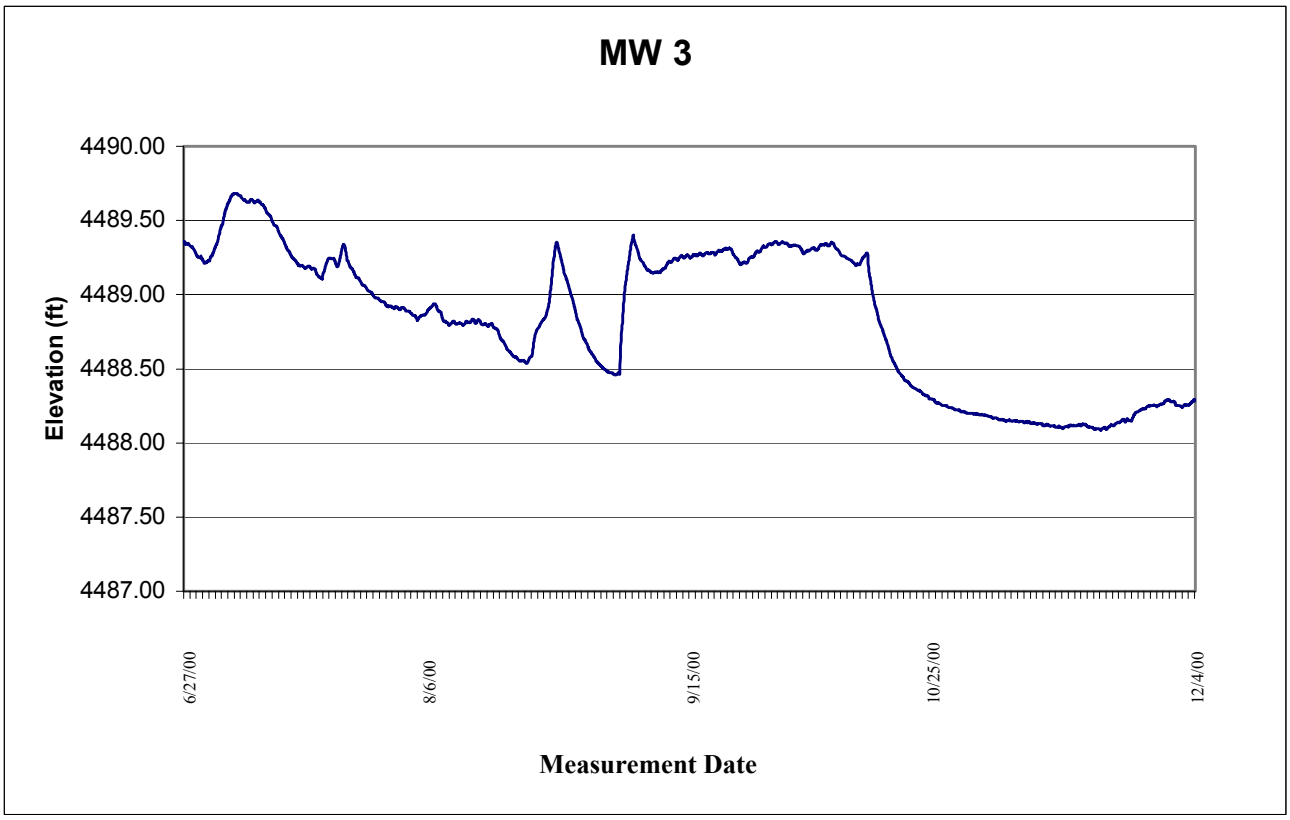

GKW7
Elevation of Water Table (ft.)
4505.80
4505.60
4505.40
4505.20
4505.00
4504.80
4504.60
4504.40
4504.20
4504.00
4503.80
5/24/00
6/24/00
7/24/00
8/24/00
9/24/00
10/24/00
11/24/00
Measurement Date

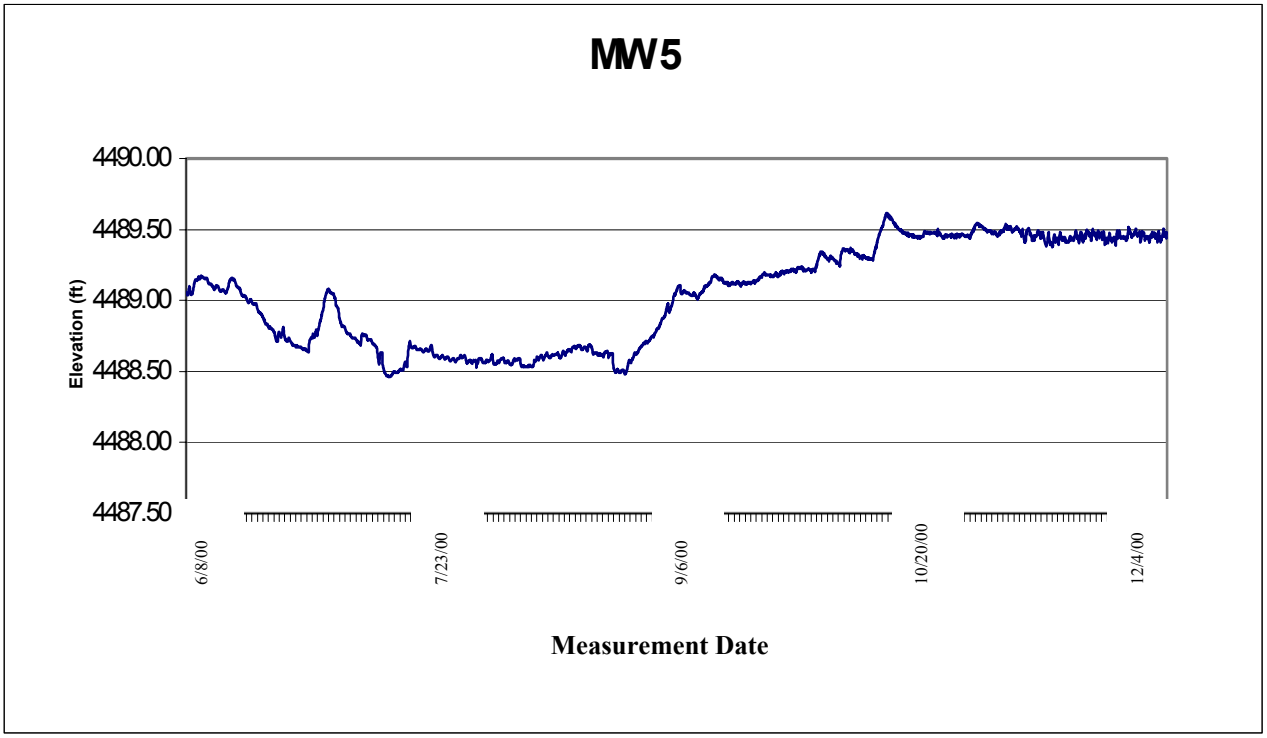

GKW8
Elevation of Water Table (ft.)
4493.00
4492.80
4492.60
4492.40
4492.20
4492.00
4491.80
4491.60
5/24/00
6/24/00
7/24/00
8/24/00
9/24/00
10/24/00
11/24/00
Measurement Date

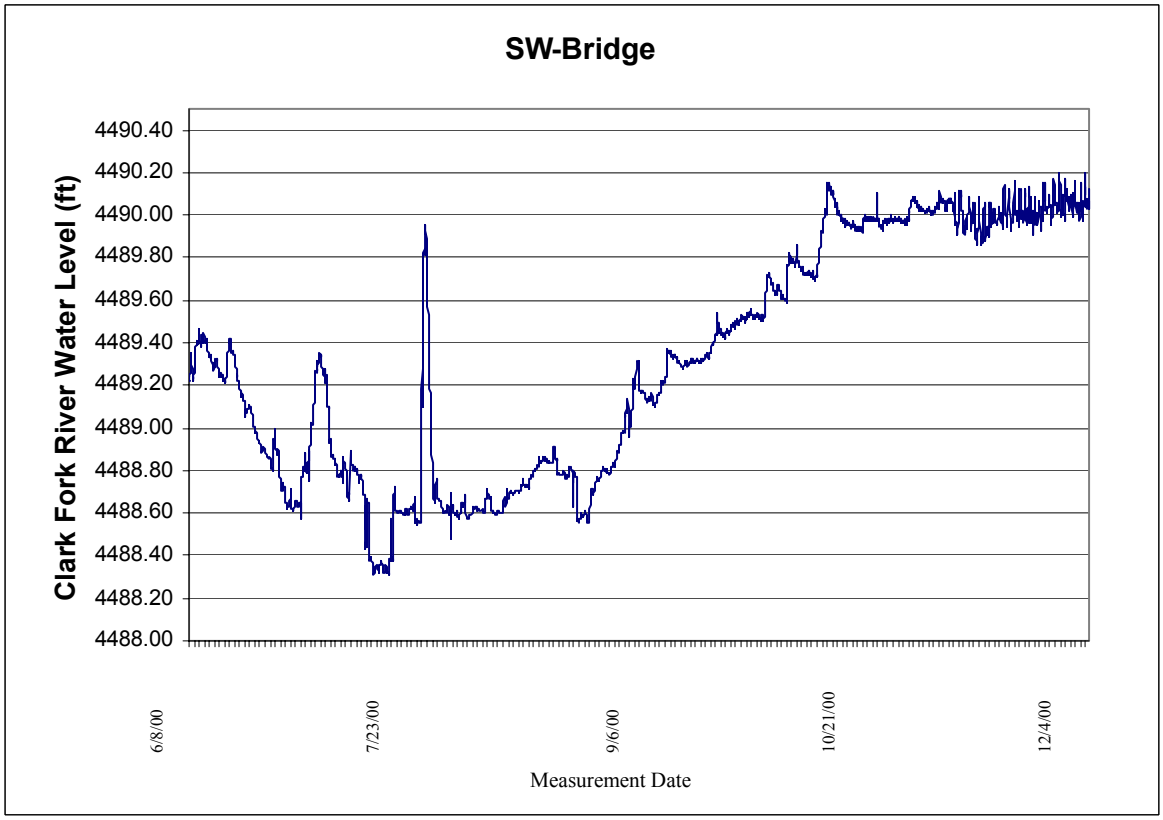

GKW9
Elevation of Water Table (ft.)
4490.50
4490.00
4489.50
4489.00
4488.50
4488.00
4487.50
5/24/00
6/24/00
7/24/00
8/24/00
9/24/00
10/24/00
11/24/00
Measurement Date


GKW10
Elevation of Water Table (ft.)
4483.00
4482.00
4481.00
4480.00
4479.00
4478.00
5/23/00
6/23/00
7/23/00
8/23/00
9/23/00
10/23/00
11/23/00
Measurement Date


GKW11
Elevation of Water Table (ft.)
4484.00
4483.50
4483.00
4482.50
4482.00
4481.50
4481.00
4480.50
4480.00
5/24/00
6/24/00
7/24/00
8/24/00
9/24/00
10/24/00
11/24/00
Measurement Date


MW 3
4490.00
4489.50
4489.00
4488.50
4488.00
4487.50
4487.00
Elevation (ft)
6/27/00
8/6/00
9/15/00
10/25/00
12/4/00
Measurement Date


MW5
4490.00
4489.50
4489.00
4488.50
4488.00
4487.50
Elevation (ft)
6/8/00
7/23/00
9/6/00
10/20/00
12/4/00
Measurement Date


SW-Bridge
4490.40
4490.20
4490.00
4489.80
4489.60
4489.40
4489.20
4489.00
4488.80
4488.60
4488.40
4488.20
4488.00
Clark Fork River Water Level (ft)
6/8/00
7/23/00
9/6/00
10/21/00
12/4/00
Measurement Date

Water Level Measurements – Multi-Level Wells

Well ID:	MLS3
Elevation of casing (ft):	4493.42

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	4488.68
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4488.26
6/26/00	-
6/27/00	4488.62
6/28/00	-
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	4488.53
7/24/00	-
8/28/00	4488.05
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	4488.5
10/28/00	4487.6
12/4/00	4484.48

Well ID:	MLS4
Elevation of casing (ft):	4495.29

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	-
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4484.14
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	-
6/30/00	4484.09
7/17/00	-
7/18/00	4484.18
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	4483.73
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	4483.74
10/28/00	4483.71
12/4/00	4483.44

Water Level Measurements – Multi-Level Wells

Well ID:	MLS5
Elevation of casing (ft):	4484.02

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	4480.81
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4479.51
6/26/00	-
6/27/00	4479.67
6/28/00	-
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	4479.21
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	4477.86
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	4478.54
10/28/00	4477.7
12/4/00	4476.64

Well ID:	GKM1
Elevation of casing (ft):	4499.79

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	-
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	4496.08
6/13/00	-
6/19/00	4495.95
6/20/00	-
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	4495.75
6/30/00	-
7/17/00	4495.5
7/18/00	-
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	4495.63
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	4496.13
10/1/00	-
10/28/00	4496.14
12/4/00	4496.02

Water Level Measurements – Multi-Level Wells

Well ID:	GKM2
Elevation of casing (ft):	4495.15
Measurement Date	**Water Level Depth, in feet (Elevation Corrected)**
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	-
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	4491.58
6/13/00	-
6/19/00	-
6/20/00	4491.43
6/26/00	-
6/27/00	-
6/28/00	4491.23
6/29/00	-
6/30/00	-
7/17/00	4490.92
7/18/00	-
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	4491.02
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	4491.72
10/1/00	-
10/28/00	4491.72
12/4/00	4491.78

Well ID:	GKM3
Elevation of casing (ft):	4493.65
Measurement Date	**Water Level Depth, in feet (Elevation Corrected)**
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	-
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	4489.59
6/13/00	-
6/19/00	4489.62
6/20/00	-
6/26/00	-
6/27/00	-
6/28/00	4489.43
6/29/00	-
6/30/00	-
7/17/00	4488.31
7/18/00	-
7/19/00	4488.78
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	4488.21
8/30/00	-
9/28/00	-
9/29/00	4489.55
9/30/00	-
10/1/00	-
10/28/00	4489.25
12/4/00	4489.43

Water Level Measurements – Multi-Level Wells

Well ID:	GKM4
Elevation of casing (ft):	4484.06
Measurement Date	**Water Level Depth, in feet (Elevation Corrected)**
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	-
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	4480.02
6/13/00	-
6/19/00	4480
6/20/00	-
6/26/00	-
6/27/00	-
6/28/00	4479.66
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	4479.63
7/24/00	-
8/28/00	-
8/29/00	-
8/30/00	4479.47
9/28/00	-
9/29/00	-
9/30/00	-
10/1/00	4479.91
10/28/00	4480.12
12/4/00	

Well ID:	GKM5
Elevation of casing (ft):	4493.84
Measurement Date	**Water Level Depth, in feet (Elevation Corrected)**
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	4489.4
6/6/00	4488.89
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	4489.09
6/19/00	4489.03
6/20/00	-
6/26/00	-
6/27/00	-
6/28/00	4488.82
6/29/00	-
6/30/00	-
7/17/00	4487.14
7/18/00	-
7/19/00	4487.69
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	4488.29
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	4489.21
10/1/00	-
10/28/00	4489.82
12/4/00	4489.49

Water Level Measurements – Multi-Level Wells

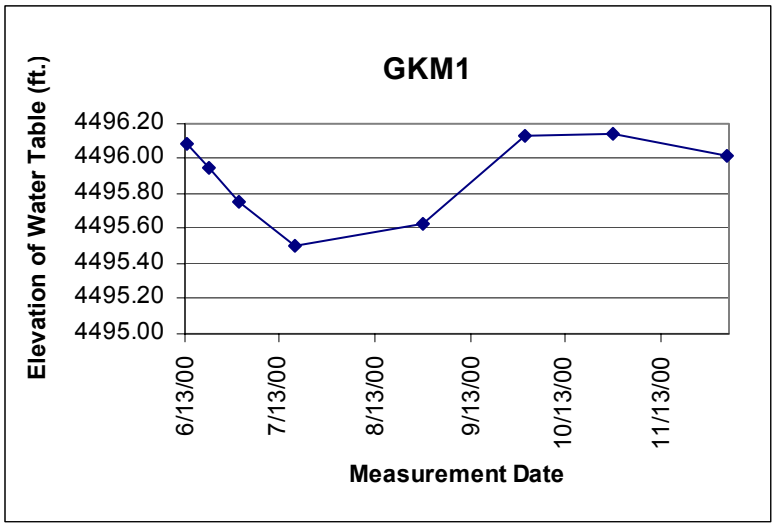
Well ID:	GKM6
Elevation of casing (ft):	4499.63
Measurement Date	**Water Level Depth, in feet (Elevation Corrected)**
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	-
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	4495.23
6/13/00	-
6/19/00	-
6/20/00	4495.14
6/26/00	4494.83
6/27/00	-
6/28/00	-
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	-
7/24/00	4494.55
8/28/00	-
8/29/00	4494.68
8/30/00	-
9/28/00	-
9/29/00	4495.47
9/30/00	-
10/1/00	-
10/28/00	4495.51
12/4/00	4495.53

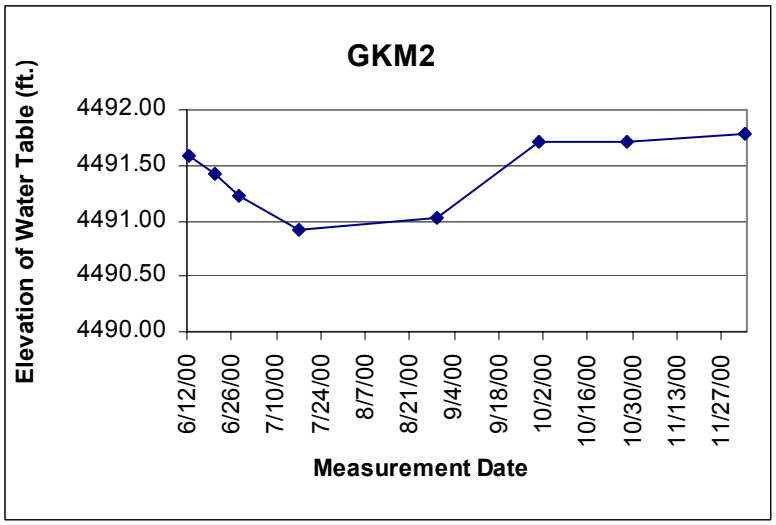
Well ID:	GKM7
Elevation of casing (ft):	4492.72
Measurement Date	**Water Level Depth, in feet (Elevation Corrected)**
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	-
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	4487.48
6/13/00	-
6/19/00	-
6/20/00	-
6/26/00	4487.19
6/27/00	-
6/28/00	-
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	-
7/24/00	4487.04
8/28/00	-
8/29/00	4487.03
8/30/00	-
9/28/00	-
9/29/00	4487.9
9/30/00	-
10/1/00	-
10/28/00	4487.94
12/4/00	4487.92

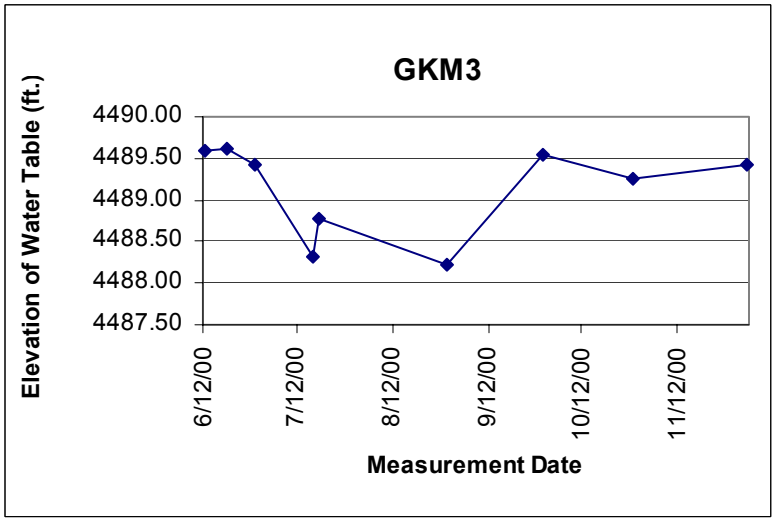
Well ID:	GKM8
Elevation of casing (ft):	4487.64
Measurement Date	**Water Level Depth, in feet (Elevation Corrected)**
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	-
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	-
6/26/00	4483.29
6/27/00	-
6/28/00	-
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	4481.89
7/24/00	-
8/28/00	-
8/29/00	4482.41
8/30/00	-
9/28/00	-
9/29/00	4483.7
9/30/00	-
10/1/00	-
10/28/00	4483.89
12/4/00	4482.69

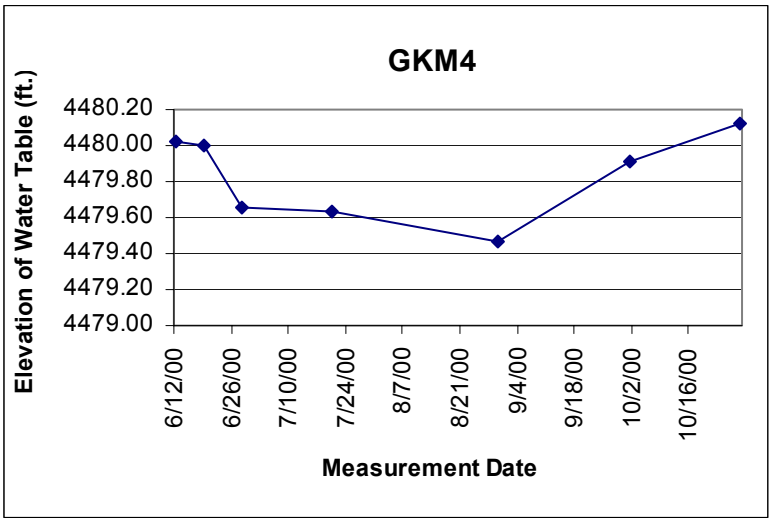
Well ID:	GKM9
Elevation of casing (ft):	4483.79
Measurement Date	**Water Level Depth, in feet (Elevation Corrected)**
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	-
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	-
6/26/00	4479.27
6/27/00	-
6/28/00	-
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	4479.17
7/24/00	-
8/28/00	-
8/29/00	4479.11
8/30/00	-
9/28/00	-
9/29/00	4479.71
9/30/00	-
10/1/00	-
10/28/00	4479.88
12/4/00	4479.91

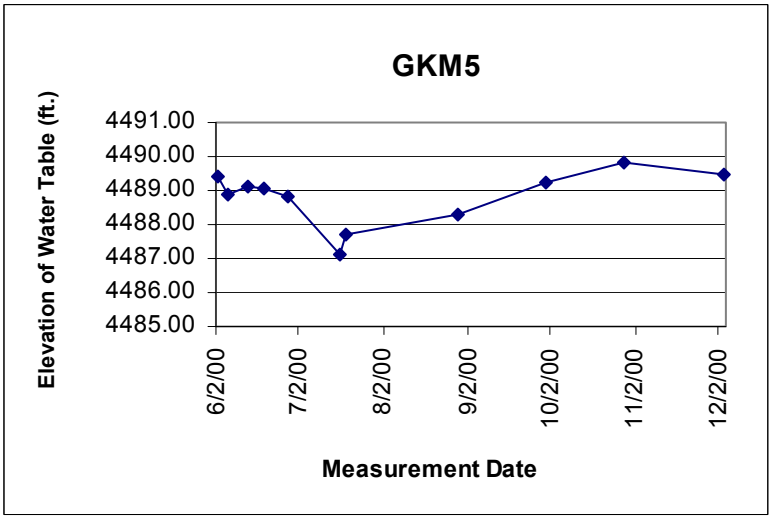
Water Level Measurements – Multi-Level Wells

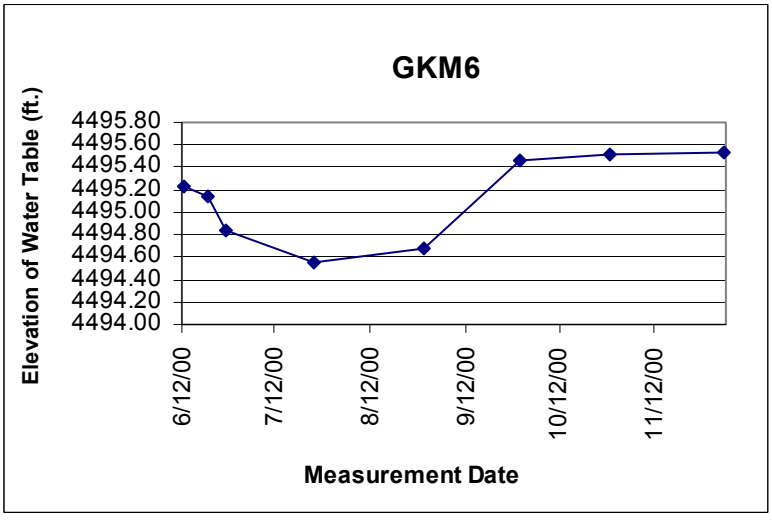

GKM1
Elevation of Water Table (ft.)
4496.20
4496.00
4495.80
4495.60
4495.40
4495.20
4495.00
6/13/00
7/13/00
8/13/00
9/13/00
10/13/00
11/13/00
Measurement Date

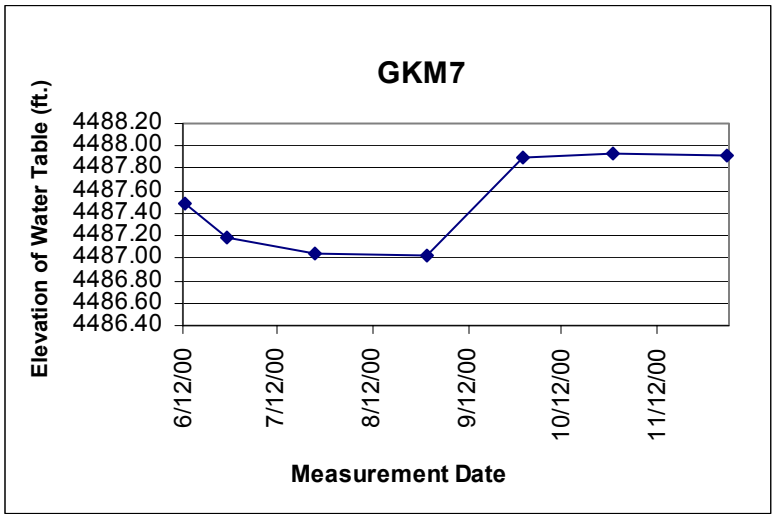

GKM2
Elevation of Water Table (ft.)
4492.00
4491.50
4491.00
4490.50
4490.00
6/12/00
6/26/00
7/10/00
7/24/00
8/7/00
8/21/00
9/4/00
9/18/00
10/2/00
10/16/00
10/30/00
11/13/00
11/27/00
Measurement Date

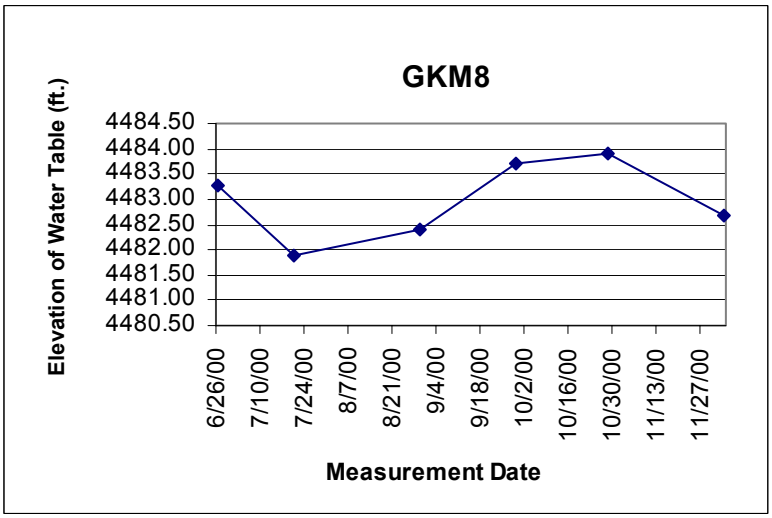

GKM3
Elevation of Water Table (ft.)
4490.00
4489.50
4489.00
4488.50
4488.00
4487.50
6/12/00
7/12/00
8/12/00
9/12/00
10/12/00
11/12/00
Measurement Date

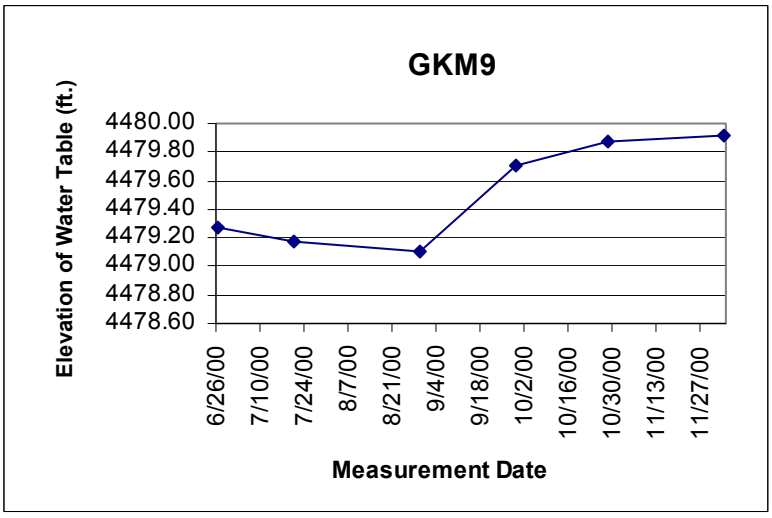

GKM4
Elevation of Water Table (ft.)
4480.20
4480.00
4479.80
4479.60
4479.40
4479.20
4479.00
6/12/00
6/26/00
7/10/00
7/24/00
8/7/00
8/21/00
9/4/00
9/18/00
10/2/00
10/16/00
Measurement Date

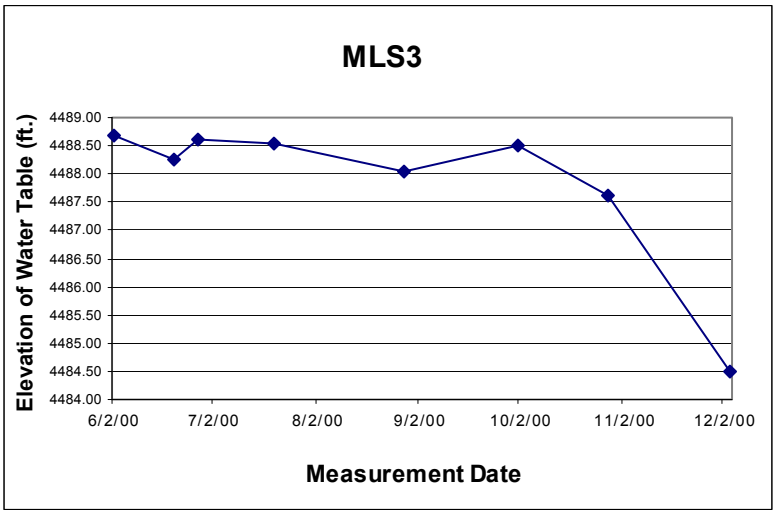

GKM5
Elevation of Water Table (ft.)
4491.00
4490.00
4489.00
4488.00
4487.00
4486.00
4485.00
6/2/00
7/2/00
8/2/00
9/2/00
10/2/00
11/2/00
12/2/00
Measurement Date

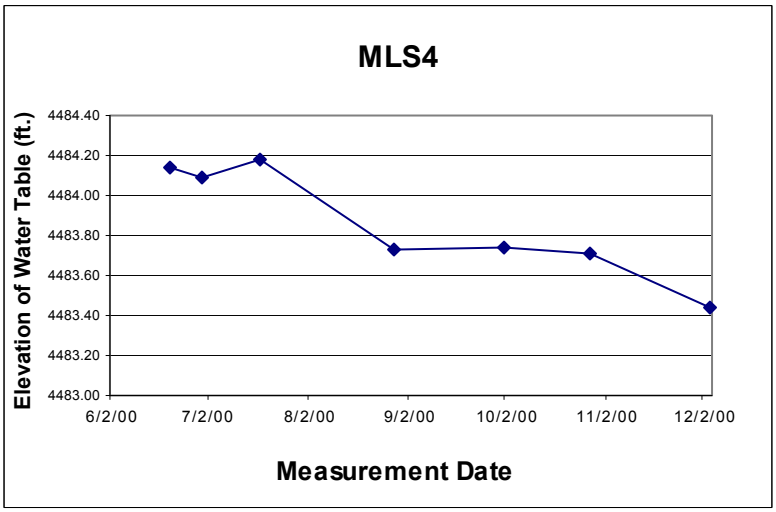

GKM6
Elevation of Water Table (ft.)
4495.80
4495.60
4495.40
4495.20
4495.00
4494.80
4494.60
4494.40
4494.20
4494.00
6/12/00
7/12/00
8/12/00
9/12/00
10/12/00
11/12/00
Measurement Date

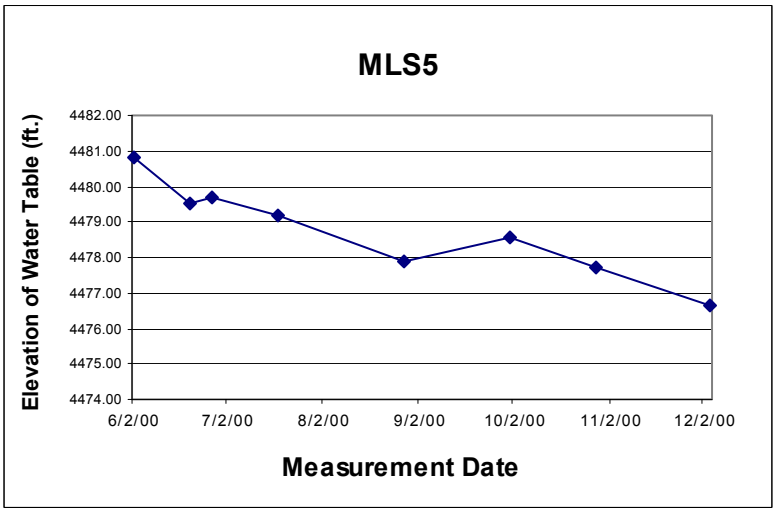

GKM7
Elevation of Water Table (ft.)
4488.20
4488.00
4487.80
4487.60
4487.40
4487.20
4487.00
4486.80
4486.60
4486.40
6/12/00
7/12/00
8/12/00
9/12/00
10/12/00
11/12/00
Measurement Date


GKM8
Elevation of Water Table (ft.)
4484.50
4484.00
4483.50
4483.00
4482.50
4482.00
4481.50
4481.00
4480.50
6/26/00
7/10/00
7/24/00
8/7/00
8/21/00
9/4/00
9/18/00
10/2/00
10/16/00
10/30/00
11/13/00
11/27/00
Measurement Date


GKM9
Elevation of Water Table (ft.)
4480.00
4479.80
4479.60
4479.40
4479.20
4479.00
4478.80
4478.60
6/26/00
7/10/00
7/24/00
8/7/00
8/21/00
9/4/00
9/18/00
10/2/00
10/16/00
10/30/00
11/13/00
11/27/00
Measurement Date


MLS3
Elevation of Water Table (ft.)
4489.00
4488.50
4488.00
4487.50
4487.00
4486.50
4486.00
4485.50
4485.00
4484.50
4484.00
6/2/00
7/2/00
8/2/00
9/2/00
10/2/00
11/2/00
12/2/00
Measurement Date


MLS4
Elevation of Water Table (ft.)
4484.40
4484.20
4484.00
4483.80
4483.60
4483.40
4483.20
4483.00
6/2/00
7/2/00
8/2/00
9/2/00
10/2/00
11/2/00
12/2/00
Measurement Date


MLS5
Elevation of Water Table (ft.)
4482.00
4481.00
4480.00
4479.00
4478.00
4477.00
4476.00
4475.00
4474.00
6/2/00
7/2/00
8/2/00
9/2/00
10/2/00
11/2/00
12/2/00
Measurement Date

Water Level Measurements – Staff Gauges

Gauge ID:	CFSG1
Elevation of casing (ft):	4496.71

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	4498.51
6/2/00	4498.4
6/6/00	-
6/7/00	-
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	4498.09
6/26/00	-
6/27/00	-
6/28/00	-
6/29/00	4497.99
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	4498.01
7/20/00	-
7/24/00	-
8/28/00	4498.07
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	-
9/30/00	4498.43
10/1/00	-
10/28/00	4498.67
12/4/00	4498.61

Gauge ID:	CFSG2 (bridge)
Elevation of casing (ft):	4486.59

Measurement Date	Water Level Depth, in feet (Elevation Corrected)
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	-
6/6/00	-
6/7/00	-
6/8/00	4489.29
6/12/00	-
6/13/00	4489.34
6/19/00	-
6/20/00	4489.15
6/26/00	-
6/27/00	4488.76
6/28/00	-
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	-
7/24/00	4488.59
8/28/00	-
8/29/00	-
8/30/00	-
9/28/00	-
9/29/00	4489.59
9/30/00	-
10/1/00	-
10/28/00	-
12/4/00	-

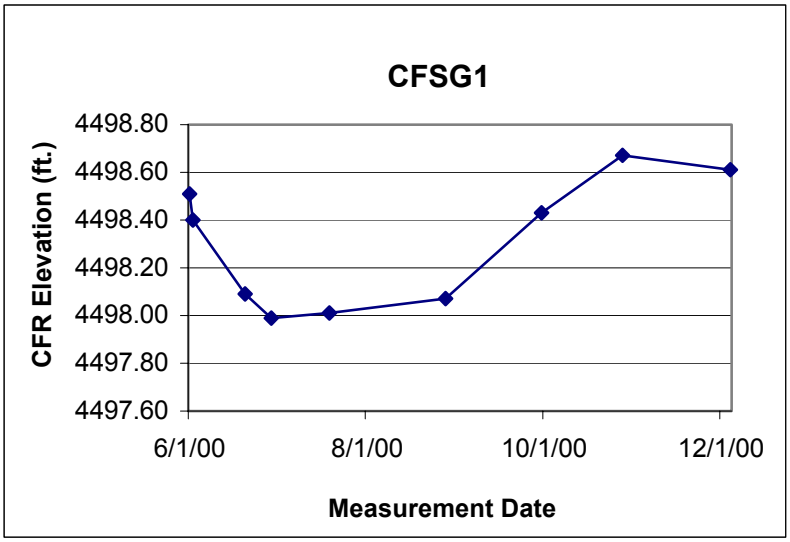
Water Level Measurements – Staff Gauges

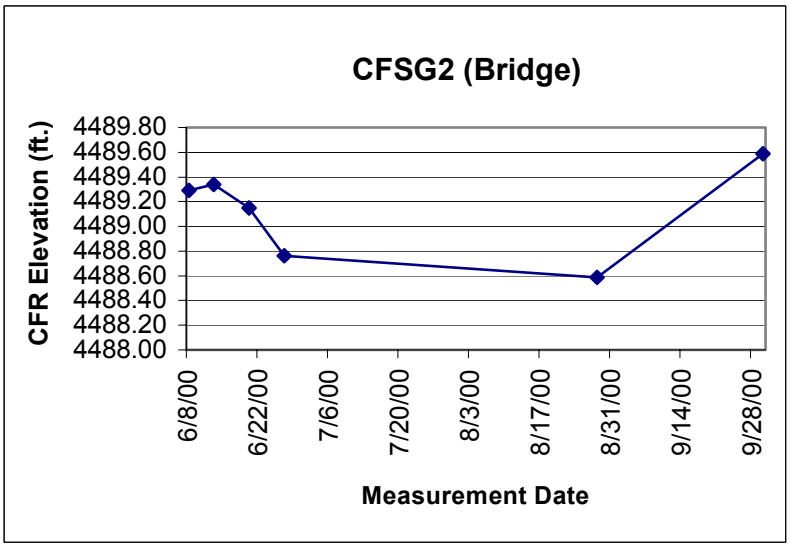
Gauge ID:	CFSG3
Elevation of casing (ft):	4484.35
Measurement Date	**Water Level Depth, in feet (Elevation Corrected)**
5/1/00	
5/18/00	
5/19/00	
5/22/00	
5/23/00	
5/24/00	
5/25/00	
5/30/00	
6/1/00	
6/2/00	
6/6/00	
6/7/00	
6/8/00	4486.3
6/12/00	
6/13/00	
6/19/00	
6/20/00	
6/26/00	4485.85
6/27/00	
6/28/00	
6/29/00	
6/30/00	
7/17/00	
7/18/00	
7/19/00	
7/20/00	
7/24/00	4485.65
8/28/00	
8/29/00	4485.89
8/30/00	
9/28/00	
9/29/00	4486.55
9/30/00	
10/1/00	
10/28/00	4486.95
12/4/00	4487.15

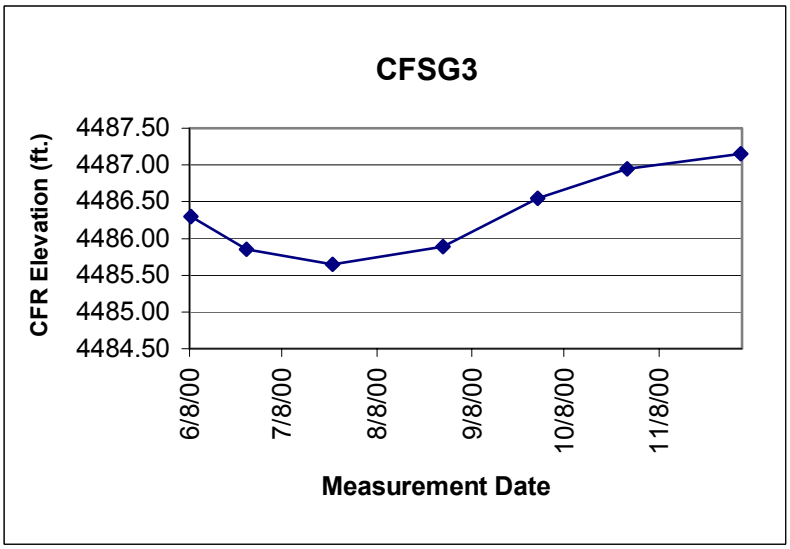
Gauge ID:	CFSG4
Elevation of casing (ft):	4479.11
Measurement Date	**Water Level Depth, in feet (Elevation Corrected)**
5/1/00	
5/18/00	
5/19/00	
5/22/00	
5/23/00	
5/24/00	
5/25/00	
5/30/00	
6/1/00	
6/2/00	
6/6/00	
6/7/00	4481.62
6/8/00	
6/12/00	
6/13/00	
6/19/00	
6/20/00	
6/26/00	4481.31
6/27/00	
6/28/00	
6/29/00	
6/30/00	
7/17/00	
7/18/00	
7/19/00	
7/20/00	4481.21
7/24/00	
8/28/00	
8/29/00	4481.3
8/30/00	
9/28/00	
9/29/00	4481.79
9/30/00	
10/1/00	
10/28/00	4482.09
12/4/00	4481.81

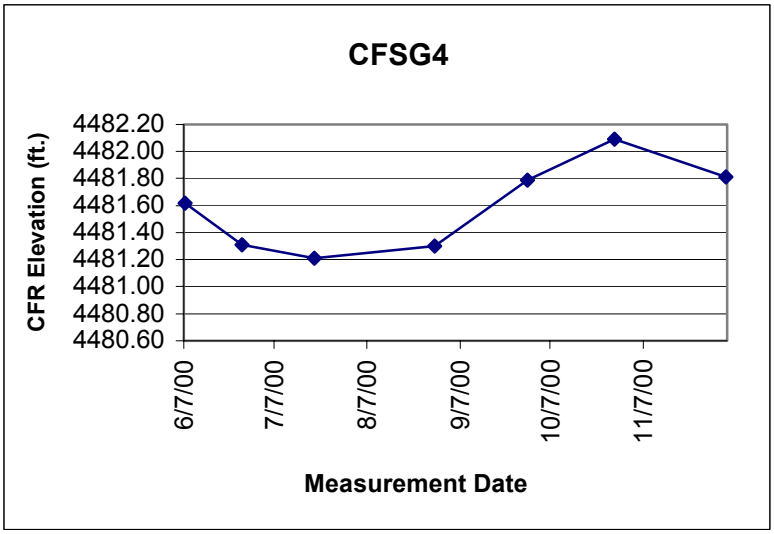
Water Level Measurements – Staff Gauges

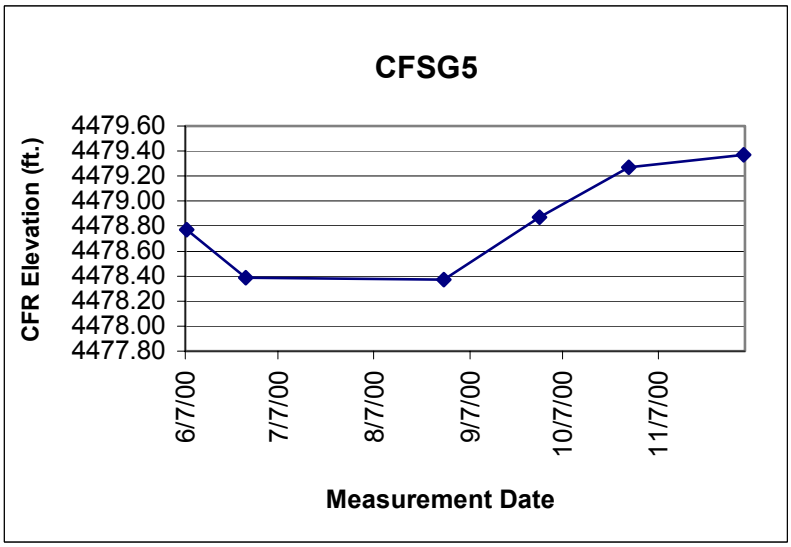
Gauge ID:	CFSG5
Elevation of casing (ft):	4477.07
Measurement Date	**Water Level Depth, in feet (Elevation Corrected)**
5/1/00	-
5/18/00	-
5/19/00	-
5/22/00	-
5/23/00	-
5/24/00	-
5/25/00	-
5/30/00	-
6/1/00	-
6/2/00	-
6/6/00	-
6/7/00	4478.77
6/8/00	-
6/12/00	-
6/13/00	-
6/19/00	-
6/20/00	-
6/26/00	4478.39
6/27/00	-
6/28/00	-
6/29/00	-
6/30/00	-
7/17/00	-
7/18/00	-
7/19/00	-
7/20/00	-
7/24/00	-
8/28/00	-
8/29/00	4478.37
8/30/00	-
9/28/00	-
9/29/00	4478.87
9/30/00	-
10/1/00	-
10/28/00	4479.27
12/4/00	4479.37

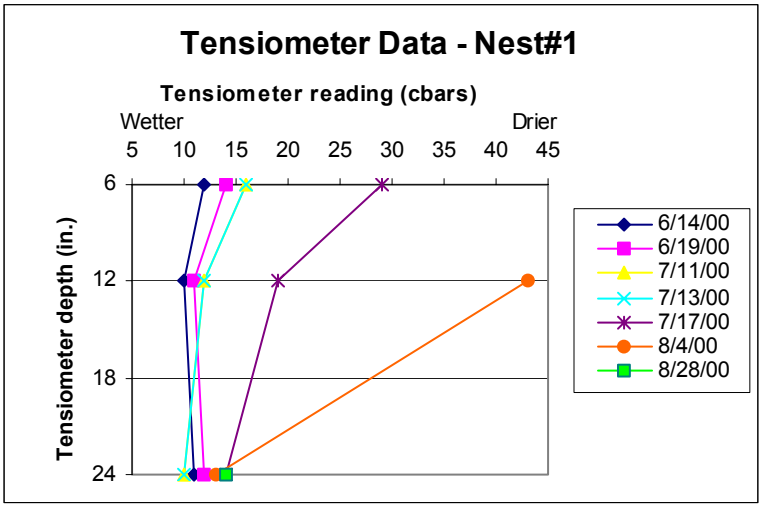

CFSG1
CFR Elevation (ft.)
4498.80
4498.60
4498.40
4498.20
4498.00
4497.80
4497.60
6/1/00
8/1/00
10/1/00
12/1/00
Measurement Date

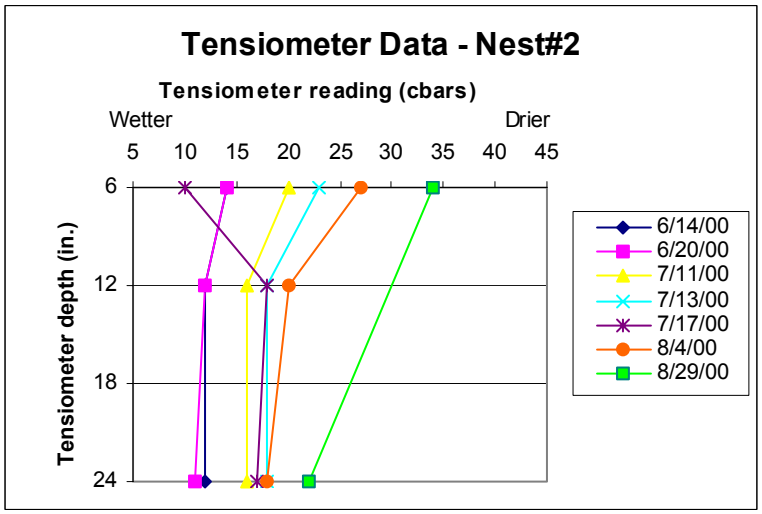

CFSG2 (Bridge)
CFR Elevation (ft.)
4489.80
4489.60
4489.40
4489.20
4489.00
4488.80
4488.60
4488.40
4488.20
4488.00
6/8/00
6/22/00
7/6/00
7/20/00
8/3/00
8/17/00
8/31/00
9/14/00
9/28/00
Measurement Date

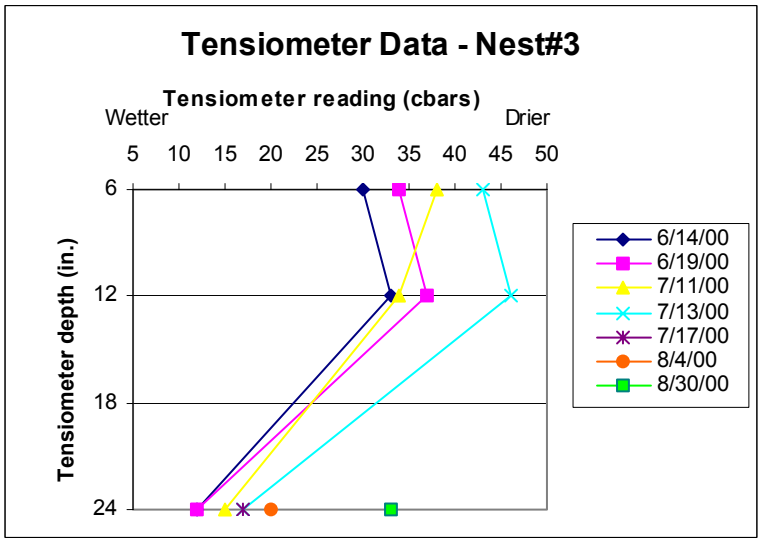

CFSG3
CFR Elevation (ft.)
4487.50
4487.00
4486.50
4486.00
4485.50
4485.00
4484.50
6/8/00
7/8/00
8/8/00
9/8/00
10/8/00
11/8/00
Measurement Date


CFSG4
CFR Elevation (ft.)
4482.20
4482.00
4481.80
4481.60
4481.40
4481.20
4481.00
4480.80
4480.60
6/7/00
7/7/00
8/7/00
9/7/00
10/7/00
11/7/00
Measurement Date

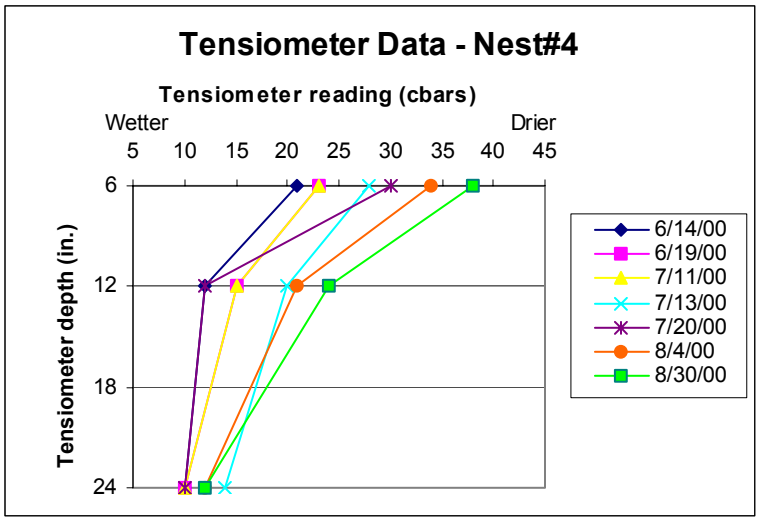

CFSG5
CFR Elevation (ft.)
4479.60
4479.40
4479.20
4479.00
4478.80
4478.60
4478.40
4478.20
4478.00
4477.80
6/7/00
7/7/00
8/7/00
9/7/00
10/7/00
11/7/00
Measurement Date

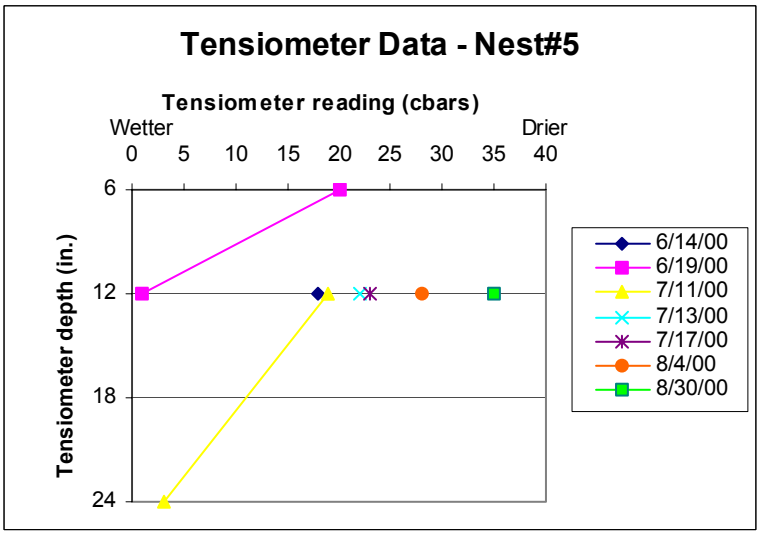


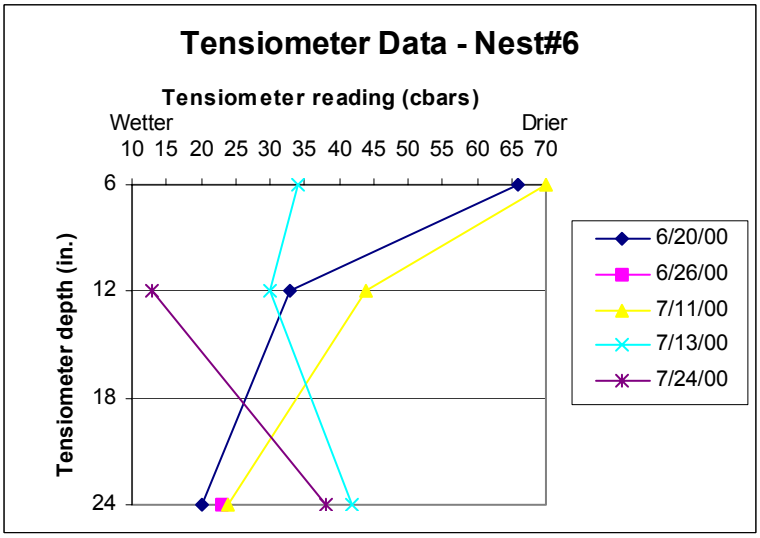




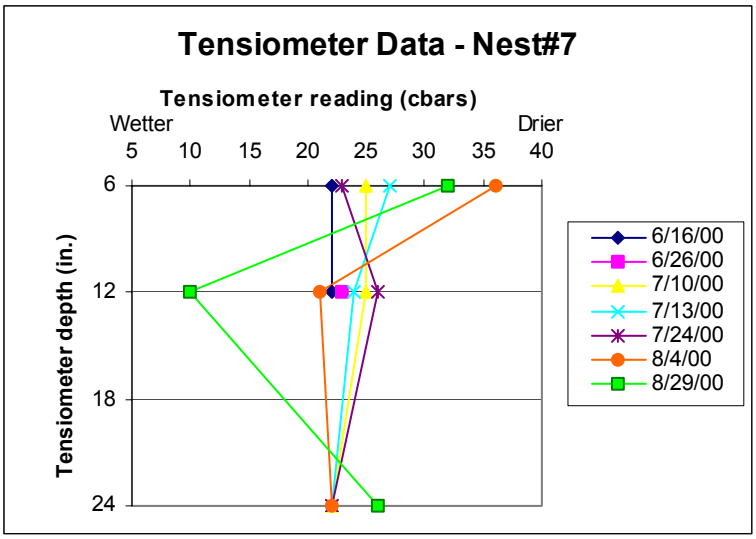
Soil Moisture Content Measurements

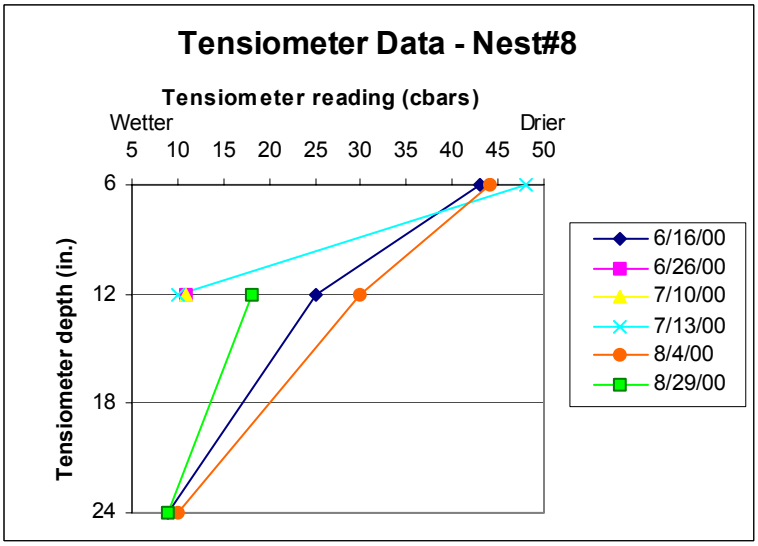


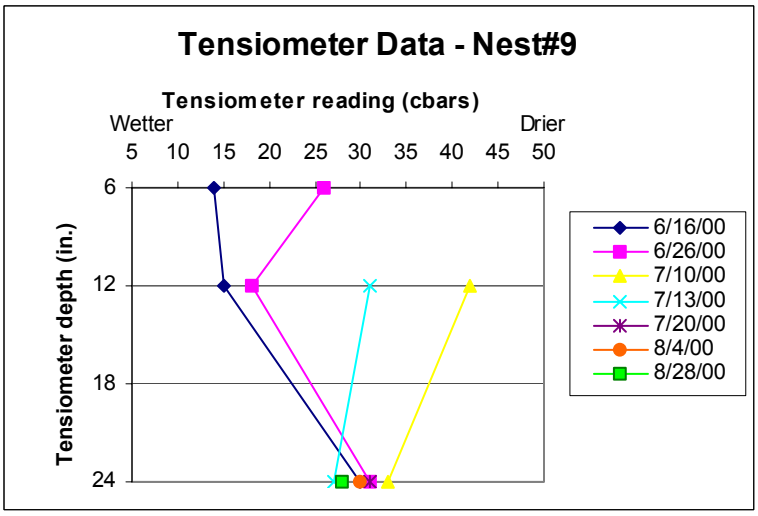




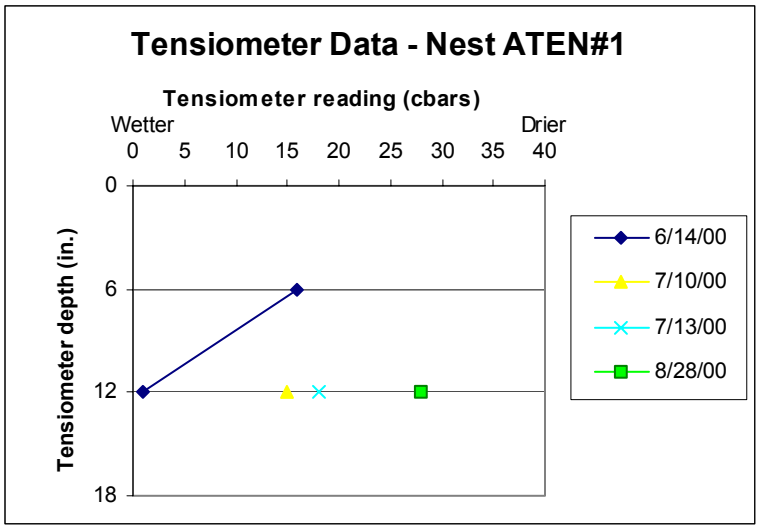
Soil Moisture Content Measurements

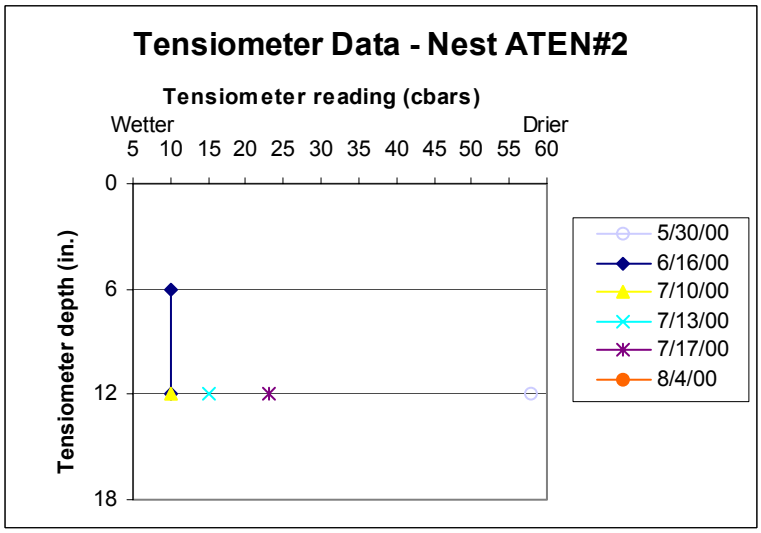


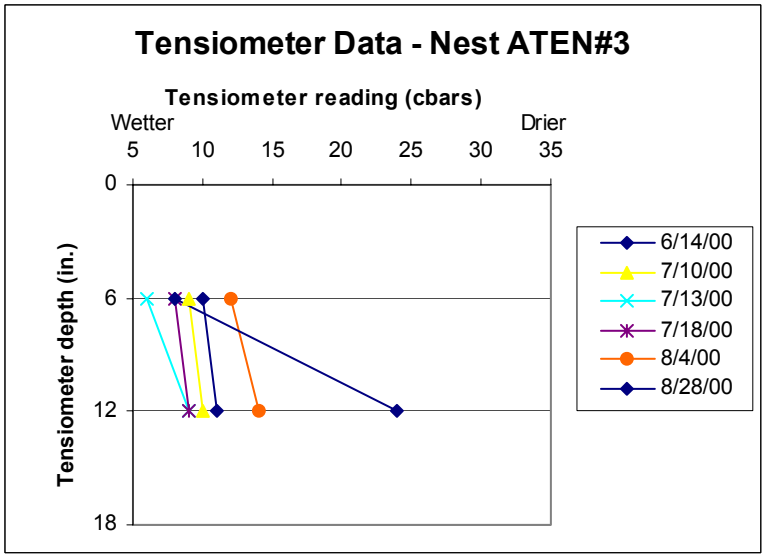


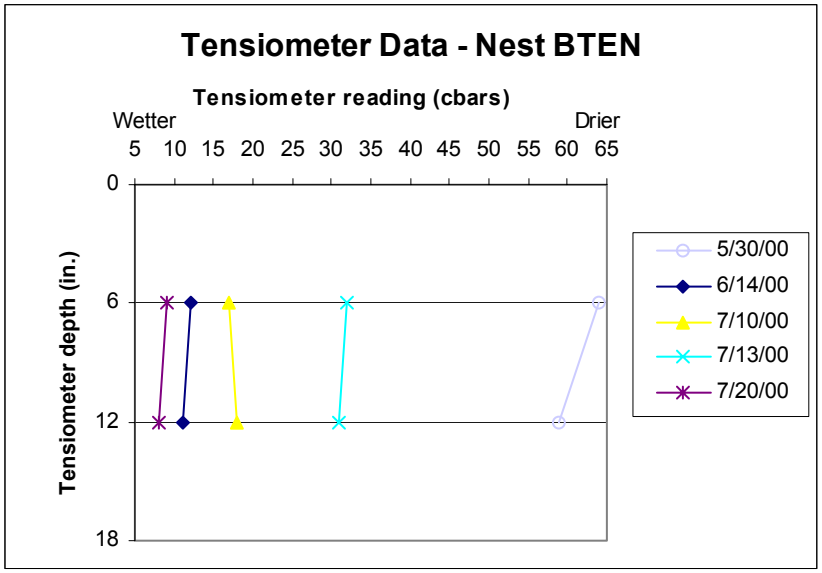


Soil Moisture Content Measurements


Tensiometer Data - Nest ATEN#1
Tensiometer reading (cbars)
Wetter
Drier
0 5 10 15 20 25 30 35 40
Tensiometer depth (in.)
0
6
12
18
6/14/00
7/10/00
7/13/00
8/28/00


Tensiometer Data - Nest ATEN#2
Tensiometer reading (cbars)
Wetter
Drier
5 10 15 20 25 30 35 40 45 50 55 60
Tensiometer depth (in.)
0
6
12
18
5/30/00
6/16/00
7/10/00
7/13/00
7/17/00
8/4/00


Tensiometer Data - Nest ATEN#3
Tensiometer reading (cbars)
Wetter
Drier
5 10 15 20 25 30 35
Tensiometer depth (in.)
0
6
12
18
6/14/00
7/10/00
7/13/00
7/18/00
8/4/00
8/28/00


Tensiometer Data - Nest BTEN
Tensiometer reading (cbars)
Wetter
Drier
5 10 15 20 25 30 35 40 45 50 55 60 65
0
6
12
18
Tensiometer depth (in.)
5/30/00
6/14/00
7/10/00
7/13/00
7/20/00

APPENDIX B – Water Resources
B.3 Laboratory Methods

Tables contain analytical methodologies utilized and probable quantitative limits for metals analysis. Probable quantitative limits were determined by the analysis of the Instrument Performance Check solutions diluted to approximately three-times the Instrument Detection Limit, IDL, (standard deviation of seven exposures of calibration blank). Dilutions greater and less than the three-times IDL concentration were prepared and analyzed. Probable quantitative limits were defined as the diluted concentration in which the relative percent difference between the analytical value and the given value is nearly or less than ten percent.

Table of Analytical Methodologies

Parameter	Method
Alkalinity	Standard Operating Procedure SOP GW-19
Anions (Cl^-, N in NO_3^{2-}, SO_4^{3-})	EPA 300.0 analytical procedure
Metals (Al, As, Ca, Cd, Cr, Cu, Fe, K, Mg, Mn, Na, Pb, Zn)	EPA 200.15 analytical procedure

Table of Probable Quantitative Limits for Metals Analysis

Analyte	Probable Quantitative Limit (ppm)
Aluminum	0.01
Arsenic	0.005
Calcium	0.02
Cadmium	0.001
Chromium	0.005
Copper	0.003
Iron	0.005
Potassium	0.2
Magnesium	0.1
Manganese	0.0005
Sodium	0.5
Phosphorus	0.01
Lead	0.01
Zinc	0.001

APPENDIX B – Water Resources

B.4 Sample Collection and Analysis Information

Tables include information pertaining to sample collection and analysis. Samples may have more than one analytical date, which suggests the sample was reanalyzed due to quality control issues or requirement of a dilution.

Groundwater and Soil Water Sample Information

Sample Name	Collection Date	Collection Time	Sample Type	Sample Collector(s)	Alkalinity Analysis Date	Alkalinity Analyst(s)	Coliform Analysis Date	IC Analysis Date	IC Analysis Time	IC Analyst	ICP Analysis Date	ICP Analysis Time	ICP Analyst
MW-1 050100	5/1/00	16:25	Groundwater	BB, MJ, CW, WW	5/2/00	BB	5/2/00	5/2/00	17:21	CW	8/2/00	16:53	CW
MW-2 050100	5/1/00	15:45	Groundwater	BB, MJ, CW, WW	5/2/00	BB	5/2/00	5/2/00	17:32	CW	8/2/00	16:18	CW
MW-3 050100	5/1/00	14:15	Groundwater	BB, MJ, CW, WW	5/2/00	BB	5/2/00	5/2/00	17:42	CW	8/2/00	16:26	CW
MW-4 050100	5/1/00	14:40	Groundwater	BB, MJ, CW, WW	5/2/00	BB	5/2/00	5/2/00	17:52	CW	8/2/00	16:35	CW
MW-5 050100	5/1/00	15:07	Groundwater	BB, MJ, CW, WW	5/2/00	BB	5/2/00	5/2/00	18:02	CW	8/2/00	17:18	CW
MW-5 050100 F. Dup	5/1/00	15:07	Groundwater	BB, MJ, CW, WW	5/2/00	BB	5/2/00	5/2/00	18:22	CW	8/2/00	16:42	CW
MW-5 050100 Spliilt	5/1/00	15:07	Groundwater	BB, MJ, CW, WW	5/2/00	BB	no analysis	5/2/00	18:12	CW	8/2/00	16:49	CW
SW-1 060100	6/1/00	17:15	Surface Water	JM, AB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/2/00, 9/20/00	17:10, 14:49	CW
SW-2 060100	6/1/00	17:22	Surface Water	JM, AB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/2/00, 9/20/00	17:14, 14:52	CW
MW-2 060200	6/2/00	15:00	Groundwater	BB, MJ	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/2/00	16:22	CW
MW-5 060200	6/2/00	15:30	Groundwater	BB, MJ	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/2/00	17:22	CW
GKM-1GREEN 061900	6/19/00	13:00	Groundwater	CW, MJ, BB	6/20/00	CW	no analysis	6/20/00, 6/21/00	15:34,13:14	CW	8/4/00, 12/1/00	13:54, 11:06	CW
GKM-1RED 061900	6/19/00	12:35	Groundwater	CW, MJ, BB	6/20/00	SD, JH	no analysis	6/20/00, 6/21/00	15:24,13:04	CW	8/4/00, 12/1/00	14:54, 11:10	CW
GKM-3BLUE 061900	6/19/00	14:55	Groundwater	CW, MJ, BB	6/20/00	CW	no analysis	6/20/00, 6/21/00	16:35,14:15	CW	8/4/00	14:58	CW
GKM-3GREEN 061900	6/19/00	15:10	Groundwater	CW, MJ, BB	6/20/00	SD, JH	no analysis	6/20/00, 6/21/00	16:45,14:25	CW	8/4/00	15:09	CW
GKM-3RED 061900	6/19/00	14:40	Groundwater	CW, MJ, BB	6/20/00	SD, JH	no analysis	6/20/00, 6/21/00	16:05,13:44	CW	8/4/00	15:16	CW
GKM-3RED 061900 F. Dup	6/19/00	14:40	Groundwater	CW, MJ, BB	6/20/00	SD, JH	no analysis	6/20/00, 6/21/00	16:15,13:54	CW	8/4/00	15:20	CW
GKM-3RED 061900 Split	6/19/00	14:40	Groundwater	CW, MJ, BB	6/20/00	SD, JH	no analysis	6/20/00, 6/21/00	16:25,14:05	CW	8/4/00	15:13	CW
GKM-4BLUE 061900	6/19/00	10:25	Groundwater	CW, MJ, BB	6/20/00	SD, JH	no analysis	6/20/00, 6/21/00	17:16,14:55	CW	8/4/00	15:24	CW
GKM-4RED 061900	6/19/00	10:00	Groundwater	CW, MJ, BB	6/20/00	SD, JH	no analysis	6/20/00, 6/21/00	17:05,14:45	CW	8/4/00	15:55	CW
GKM-5BLUE 061900	6/19/00	16:00	Groundwater	CW, MJ, BB	6/20/00	SD, JH	no analysis	6/20/00, 6/21/00	17:36,15:16	CW	8/4/00	15:35	CW
GKM-5GREEN 061900	6/19/00	16:15	Groundwater	CW, MJ, BB	6/20/00	SD, JH	no analysis	6/20/00, 6/21/00	17:46,15:26	CW	8/4/00	15:05	CW
GKM-2BLUE 062000	6/20/00	10:10	Groundwater	MJ, BB	6/21/00	SD, JH	no analysis	6/21/00	19:36	CW	8/7/00	12:42	CW
GKM-6BLUE 062000	6/20/00	11:05	Groundwater	MJ, BB	6/21/00	SD, JH	no analysis	6/21/00	19:56	CW	8/4/00	16:21	CW
GKM-6GREEN 062000	6/20/00	11:30	Groundwater	MJ, BB	6/21/00	SD, JH	no analysis	6/21/00	19:46	CW	8/7/00	12:39	CW
MLS-4RED 062000	6/20/00	14:30	Groundwater	MJ, BB	6/21/00	SD, JH	no analysis	6/21/00	20:07	CW	8/4/00	16:25	CW
MLS-5BLUE 062000	6/20/00	15:30	Groundwater	MJ, BB	6/21/00	SD, JH	no analysis	6/21/00	20:47	CW	8/4/00	16:14	CW
MLS-5GREEN 062000	6/20/00	15:45	Groundwater	MJ, BB	6/21/00	SD, JH	no analysis	6/21/00	20:57	CW	8/4/00	15:59	CW
MLS-5RED 062000	6/20/00	15:05	Groundwater	MJ, BB	6/21/00	SD, JH	no analysis	6/21/00	20:17	CW	8/4/00	16:06	CW
MLS-5RED 062000 F. Dup	6/20/00	15:15	Groundwater	MJ, BB	6/21/00	SD, JH	no analysis	6/21/00	20:27	CW	8/4/00	16:10	CW
MLS-5RED 062000 Split	6/20/00	15:20	Groundwater	MJ, BB	6/21/00	SD, JH	no analysis	6/21/00	20:37	CW	8/4/00	16:03	CW
GKM-6BLUE 062600	6/26/00	16:25	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	14:50	CW	8/7/00	14:29	CW
GKM-6W 062600	6/26/00	16:37	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	15:01	CW	8/7/00	14:54	CW
GKM-7BLUE 062600	6/26/00	14:00	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	15:31	CW	8/7/00	14:07	CW
GKM-7BLUE 062600 F. Dup	6/26/00	14:05	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	15:51	CW	8/7/00	14:11	CW
GKM-7BLUE 062600 Split	6/26/00	14:10	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	15:41	CW	8/7/00	14:03	CW

Groundwater and Soil Water Sample Information

Sample Name	Collection Date	Collection Time	Sample Type	Sample Collector(s)	Alkalinity Analysis Date	Alkalinity Analyst(s)	Coliform Analysis Date	IC Analysis Date	IC Analysis Time	IC Analyst	ICP Analysis Date	ICP Analysis Time	ICP Analyst
GKM-7W 062600	6/26/00	14:20	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	16:01	CW	8/7/00	14:18	CW
GKM-8BLUE 062600	6/26/00	11:25	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	16:22	CW	8/7/00	13:52	CW
GKM-8GREEN 062600	6/26/00	11:30	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	16:32	CW	8/7/00	13:56	CW
GKM-8RED 062600	6/26/00	11:20	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	16:12	CW	8/7/00	13:48	CW
GKM-8W 062600	6/26/00	12:00	Groundwater	MJ	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/7/00	14:00	CW
GKM-9BLUE 062600	6/26/00	9:30	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	16:52	CW	8/7/00	12:57	CW
GKM-9GREEN 062600	6/26/00	9:45	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	17:02	CW	8/7/00	12:50	CW
GKM-9RED 062600	6/26/00	9:15	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	16:42	CW	8/7/00	12:53	CW
GKM-9W 062600	6/26/00	9:55	Groundwater	MJ	6/27/00	SD, JH	no analysis	6/27/00	17:13	CW	8/7/00	13:01	CW
MLS-3RED 062700	6/27/00	12:55	Groundwater	MJ, BB	6/28/00	JH	no analysis	6/29/00	12:10	CW	8/7/00, 9/20/00	15:05, 15:03	CW
MLS-3RED 062700 F. Dup	6/27/00	13:10	Groundwater	MJ, BB	6/28/00	JH	no analysis	6/29/00	12:20	CW	8/7/00, 9/20/00	15:20, 15:07	CW
MLS-3RED 062700 Split	6/27/00	13:13	Groundwater	MJ, BB	6/28/00	JH	no analysis	6/29/00	12:30	CW	8/7/00, 9/20/00	16:38, 15:37	CW
MLS-3W 062700	6/27/00	13:40	Groundwater	MJ, BB	6/28/00	JH	no analysis	6/29/00	12:41	CW	8/7/00,9/25/00	15:09, 11:48	CW
MLS-5BLUE 062700	6/27/00	11:10	Groundwater	MJ, BB	6/28/00	JH	no analysis	6/29/00	10:49	CW	8/7/00	16:30	CW
MLS-5GREEN 062700	6/27/00	11:06	Groundwater	MJ, BB	6/28/00	JH	no analysis	6/29/00	10:39	CW	8/7/00	16:34	CW
MLS-5RED 062700	6/27/00	10:59	Groundwater	MJ, BB	6/28/00	JH	no analysis	6/29/00	10:29	CW	8/7/00	15:16	
MLS-5W 062700	6/27/00	10:40	Groundwater	MJ, BB	6/28/00	JH	no analysis	6/29/00	9:58	CW	8/7/00	15:13	CW
MW-5 062700	6/27/00	10:10	Groundwater	MJ, BB	6/28/00	JH	no analysis	6/29/00	9:48	CW	8/7/00	16:24	CW
GKM-2W 062800	6/28/00	16:50	Groundwater	MJ	6/29/00	JH	no analysis	6/29/00	13:21	CW	8/4/00	11:18	CW
GKM-4W 062800	6/28/00	13:30	Groundwater	MJ	6/29/00	JH	no analysis	6/29/00	14:02	CW	8/4/00	11:22	CW
GKW-1 062800	6/28/00	11:10	Groundwater	MJ	6/29/00	JH	no analysis	6/29/00	13:01	CW	8/4/00	11:15	CW
GKW-2 062800	6/28/00	12:30	Groundwater	MJ	6/29/00	JH	no analysis	6/29/00	13:11	CW	8/4/00	11:11	CW
GKW-4 062800	6/28/00	14:40	Groundwater	MJ	6/29/00	JH	no analysis	6/29/00	13:31	CW	8/4/00	11:07	CW
GKW-4 062800 F. Dup	6/28/00	14:50	Groundwater	MJ	6/29/00	JH	no analysis	6/29/00	12:20	CW	8/4/00	11:29	CW
GKM-1W 062900	6/29/00	10:40	Groundwater	MJ, BB	6/30/00	JH	no analysis	6/30/00	12:07	CW	8/4/00	12:29	CW
GKM-3W 062900	6/29/00	12:15	Groundwater	MJ, BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/4/00	12:37	CW
GKM-5W 062900	6/29/00	12:35	Groundwater	MJ, BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/4/00	12:44	CW
GKW-3 062900	6/29/00	11:40	Groundwater	MJ, BB	6/30/00	JH	no analysis	6/30/00	12:17	CW	8/4/00	12:40, 12:31	CW
GKW-5 062900	6/29/00	9:46	Groundwater	MJ, BB	6/30/00	JH	no analysis	6/30/00	12:27	CW	8/4/00	12:33	CW
GKW-7 062900	6/29/00	15:23	Groundwater	MJ, BB	6/30/00	JH	no analysis	6/30/00	12:37	CW	8/4/00	11:33	CW
GKW-8 062900	6/29/00	13:42	Groundwater	MJ, BB	6/30/00	JH	no analysis	6/30/00	12:47	CW	8/4/00	11:37	CW
GKW-8 062900 F. Dup	6/29/00	13:45	Groundwater	MJ, BB	6/30/00	JH	no analysis	6/30/00	12:58	CW	8/4/00	12:04	CW
GKW-8 062900 Split	6/29/00	13:47	Groundwater	MJ, BB	6/30/00	JH	no analysis	6/30/00	13:08	CW	8/4/00	12:22	CW
GKW-9 062900	6/29/00	14:35	Groundwater	MJ, BB	6/30/00	JH	no analysis	6/30/00	13:18	CW	8/4/00	12:18	CW
MW-1 062900	6/29/00	16:00	Groundwater	MJ, BB	6/30/00	JH	no analysis	6/30/00	11:57	CW	8/4/00	12:26	CW
GKW-10 063000	6/30/00	11:38	Groundwater	MJ, BB	6/30/00	CW	no analysis	6/30/00	16:51	CW	8/4/00	13:36	CW

Groundwater and Soil Water Sample Information

Sample Name	Collection Date	Collection Time	Sample Type	Sample Collector(s)	Alkalinity Analysis Date	Alkalinity Analyst(s)	Coliform Analysis Date	IC Analysis Date	IC Analysis Time	IC Analyst	ICP Analysis Date	ICP Analysis Time	ICP Analyst
GKW-11 063000	6/30/00	9:45	Groundwater	MJ, BB	6/30/00	CW	no analysis	6/30/00	17:01	CW	8/4/00	13:43	CW
MLS-4RED 063000	6/30/00	11:03	Groundwater	MJ, BB	6/30/00	CW	no analysis	6/30/00	16:31	CW	8/4/00	13:25	CW
MLS-4W 063000	6/30/00	10:48	Groundwater	MJ, BB	6/30/00	CW	no analysis	6/30/00	16:41	CW	8/4/00	13:32	CW
MW-2 063000	6/30/00	8:47	Groundwater	MJ, BB	6/30/00	CW	no analysis	6/30/00	15:50	CW	8/4/00	13:14	CW
MW-4 063000	6/30/00	10:30	Groundwater	MJ, BB	6/30/00	CW	no analysis	6/30/00	16:00	CW	8/4/00	13:40	CW
MW-4 063000 F. Dup	6/30/00	10:31	Groundwater	MJ, BB	6/30/00	CW	no analysis	6/30/00	16:10	CW	8/4/00	13:21	CW
MW-4 063000 Split	6/30/00	10:34	Groundwater	MJ, BB	6/30/00	CW	no analysis	6/30/00	16:20	CW	8/4/00	13:17	CW
SW-3 070700	7/7/00	13:15	Surface Water	AB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	9/26/00	14:43	CW
SW-4 070700	7/7/00	14:00	Surface Water	AB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	9/26/00, 10/26/00	14:46, 14:36	CW
SW-4 070700 F. Dup	7/7/00	14:00	Surface Water	AB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	9/26/00, 12/1/00	14:50, 11:14	CW
SW-5 070700	7/7/00	14:20	Surface Water	AB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	9/26/00, 10/31/00	14:54, 13:29	CW
ALYSD2-2 071700	7/17/00	10:45	Soil Water	MJ, BB	7/18/00	CW	no analysis	7/18/00	14:10	CW	8/10/00, 12/1/00	13:27, 11:17	CW
ALYSS2-2 071700	7/17/00	10:40	Soil Water	MJ, BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/11/00	11:26	CW
GKM-1GREEN 071700	7/17/00	12:00	Groundwater	MJ, BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/10/00	13:42	CW
GKM-1RED 071700	7/17/00	11:45	Groundwater	MJ, BB	7/18/00	CW	no analysis	7/18/00	14:31	CW	8/11/00	11:23	CW
GKM-1W 071700	7/17/00	11:35	Groundwater	MJ, BB	7/18/00	CW	no analysis	7/18/00	14:20	CW	8/11/00	12:19	CW
GKM-2BLUE 071700	7/17/00	16:54	Groundwater	MJ, BB	7/18/00	CW	no analysis	7/18/00	18:25	CW	8/11/00	12:26	CW
GKM-2W 071700	7/17/00	16:40	Groundwater	MJ, BB	7/18/00	SD	no analysis	7/18/00	17:54	CW	8/11/00	12:11	CW
GKM-2W 071700 Split	7/17/00	16:40	Groundwater	MJ, BB	7/18/00	SD	no analysis	7/18/00, 7/19/00	18:14, 13:02	CW	8/11/00	12:22	CW
GKM-2W FD 071700	7/17/00	16:40	Groundwater	MJ, BB	7/18/00	SD	no analysis	7/18/00	18:04	CW	8/10/00	14:47	CW
GKM-3BLUE 071700	7/17/00	15:10	Groundwater	MJ, BB	7/18/00	SD	no analysis	7/18/00	16:32	CW	8/10/00	13:38	CW
GKM-3GREEN 071700	7/17/00	15:17	Groundwater	MJ, BB	7/18/00	SD	no analysis	7/18/00	16:43	CW	8/10/00	13:23	CW
GKM-3RED 071700	7/17/00	15:00	Groundwater	MJ, BB	7/18/00	SD	no analysis	7/18/00	16:22	CW	8/10/00	13:53	CW
GKM-5BLUE 071700	7/17/00	13:55	Groundwater	MJ, BB	7/18/00	CW	no analysis	7/18/00	16:02	CW	8/10/00	14:36	CW
LYSD-2 071700	7/17/00	17:25	Soil Water	MJ, BB	7/18/00	SD	no analysis	7/18/00	20:16	CW	8/11/00	12:30	CW
LYSD2-1 071700	7/17/00	12:37	Soil Water	MJ, BB	7/18/00	SD	no analysis	7/18/00	15:31	CW	8/11/00, 9/21/00	12:07, 12:29	CW
LYSD-3 071700	7/17/00	15:30	Soil Water	MJ, BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/10/00	13:49	CW
LYSS-1 071700	7/17/00	12:45	Soil Water	MJ, BB	7/18/00	CW	no analysis	7/18/00,7/19/00	15:52, 12:42	CW	8/11/00, 9/21/00	12:14,12:33,12:36	CW
LYSS-2 071700	7/17/00	17:20	Soil Water	MJ, BB	no analysis	no analysis	no analysis	7/18/00	18:35	CW	8/10/00	14:55	CW
LYSS-3 071700	7/17/00	15:25	Soil Water	MJ, BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/10/00, 9/21/00	13:45 and 12:48	CW
LYSS-5 071700	7/17/00	14:30	Soil Water	MJ, BB	7/18/00	SD	no analysis	7/18/00	16:12	CW	8/10/00, 9/21/00, 10/31/00	14:43,12:10,12:44	CW
LYSVD-1 071700	7/17/00	12:10	Soil Water	MJ, BB	7/18/00	SD	no analysis	7/18/00	14:51	CW	8/10/00	14:04, 11:29	CW
LYSVD2-2 071700	7/17/00	17:05	Soil Water	MJ, BB	7/18/00	SD	no analysis	7/18/00	19:56	CW	8/10/00	14:51	CW
LYSVD2-3 071700	7/17/00	15:38	Soil Water	MJ, BB	7/18/00	SD	no analysis	7/18/00	16:53	CW	8/10/00	14:29	CW
LYSVD-5 071700	7/17/00	14:25	Soil Water	MJ, BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/10/00	14:40	CW
ALYSD2-3 071800	7/18/00	9:59	Soil Water	MJ, BB	7/20/00	AG	7/19/00	7/19/00	14:03	CW	8/10/00, 9/21/00	15:56, 13:49	CW

Groundwater and Soil Water Sample Information

Sample Name	Collection Date	Collection Time	Sample Type	Sample Collector(s)	Alkalinity Analysis Date	Alkalinity Analyst(s)	Coliform Analysis Date	IC Analysis Date	IC Analysis Time	IC Analyst	ICP Analysis Date	ICP Analysis Time	ICP Analyst
ALYSS2-3 071800	7/18/00	9:50	Soil Water	MJ, BB	7/20/00	AG	no analysis	7/19/00	13:53	CW	8/10/00, 9/21/00	15:41, 13:46	CW
GKW-10 071800	7/18/00	15:45	Groundwater	MJ, BB	7/20/00	AG	7/19/00	7/19/00	16:45	CW	8/10/00	15:34	CW
GKW-11 071800	7/18/00	10:30	Groundwater	MJ, BB	7/20/00	AG	7/19/00	7/19/00	14:13	CW	8/11/00	10:53	CW
MLS-4RED 071800	7/18/00	14:55	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/19/00	16:35	CW	9/20/00	14:41	CW
MLS-4W 071800	7/18/00	14:45	Groundwater	MJ, BB	7/20/00	AG	7/19/00	7/19/00	16:15	CW	9/20/00	14:37	CW
MLS-5BLUE 071800	7/18/00	13:07	Groundwater	MJ, BB	7/20/00	AG	7/19/00	7/19/00	15:55	CW	8/10/00	14:58	CW
MLS-5GREEN 071800	7/18/00	13:20	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/19/00	16:05	CW	8/11/00	10:46	CW
MLS-5RED 071800	7/18/00	13:01	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/19/00	15:04	CW	8/11/00	10:57	CW
MLS-5W 071800	7/18/00	12:58	Groundwater	MJ, BB	7/20/00	AG	7/19/00	7/19/00	14:54	CW	8/10/00	15:45	CW
MW-1 071800	7/18/00	17:15	Groundwater	MJ, BB	7/20/00	AG	7/19/00	7/19/00	17:06	CW	8/10/00	15:30	CW
MW-2 071800	7/18/00	16:45	Groundwater	MJ, BB	7/20/00	AG	7/19/00	7/19/00	16:56	CW	8/10/00	15:27	CW
MW-4 071800	7/18/00	14:30	Groundwater	MJ, BB	7/20/00	AG	7/19/00	7/19/00	16:25	CW	8/10/00	15:23	CW
MW-5 071800	7/18/00	12:25	Groundwater	MJ, BB	7/20/00	AG	7/19/00	7/19/00	14:23	CW	8/11/00	11:04	CW
MW-5 071800 F. Dup	7/18/00	12:31	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/19/00	14:44	CW	8/11/00	11:08	CW
MW-5 071800 Split	7/18/00	12:33	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/19/00	14:33	CW	8/11/00	11:01	CW
GKM-3W 071900	7/19/00	16:23	Groundwater	MJ, BB	no analysis	no analysis	no analysis	7/20/00	15:14	CW	8/11/00	16:33	CW
GKM-5W 071900	7/19/00	16:10	Groundwater	MJ, BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/11/00	17:34	CW
GKW-1 071900	7/19/00	11:00	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/20/00	13:32	CW	8/11/00	13:48	CW
GKW-2 071900	7/19/00	12:07	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/20/00	13:42	CW	8/11/00	13:51	CW
GKW-3 071900	7/19/00	15:00	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/20/00	14:53	CW	8/11/00	13:55	CW
GKW-4 071900	7/19/00	13:55	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/20/00	13:52	CW	8/11/00	13:59	CW
GKW-4 071900 Split	7/19/00	13:59	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/20/00	14:12	CW	8/11/00	14:03	CW
GKW-5 071900	7/19/00	16:10	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/20/00	15:04	CW	8/11/00	17:06	CW
GKW-8 071900	7/19/00	17:00	Groundwater	MJ, BB	7/20/00	AG	no analysis	7/20/00	15:24	CW	8/11/00	17:30	CW
INFLOW 071900	7/19/00	10:00	Sewage Effluent	MJ, BB	7/21/00	AG	7/20/00	7/20/00	16:25	CW	9/20/00	14:45	CW
OUTFLOW 071900	7/19/00	9:40	Effluent	MJ, BB	7/20/00	AG	7/19/00	7/20/00	16:15	CW	8/11/00	17:03	CW
BLYSD-2 072000	7/20/00	9:05	Soil Water	MJ, BB	7/21/00	JH	no analysis	7/21/00	11:53	CW	8/8/00, 9/21/00	15:14, 13:57	CW
BLYSS-2 072000	7/20/00	9:25	Soil Water	MJ, BB	no analysis	no analysis	7/21/00	no analysis	no analysis	no analysis	8/8/00, 9/21/00	14:26, 14:04	CW
GKM-4BLUE 072000	7/20/00	14:30	Groundwater	MJ, BB	7/21/00	SD	no analysis	7/21/00	16:27	CW	8/11/00	16:06	CW
GKM-4GREEN 072000	7/20/00	14:45	Groundwater	MJ, BB	7/21/00	SD	no analysis	7/21/00	17:39	CW	8/11/00	15:58	CW
GKM-4RED 072000	7/20/00	14:22	Groundwater	MJ, BB	7/21/00	SD	no analysis	7/21/00	16:17	CW	8/11/00	15:47	CW
GKM-4W 072000	7/20/00	14:10	Groundwater	MJ, BB	7/21/00	SD	no analysis	7/21/00	16:07	CW	8/11/00	14:10	CW
GKM-8BLUE 072000	7/20/00	12:52	Groundwater	MJ, BB	7/21/00	SD	no analysis	7/21/00	13:45	CW	8/11/00	16:37	CW
GKM-8RED 072000	7/20/00	12:37	Groundwater	MJ, BB	7/21/00	SD	no analysis	7/21/00	13:35	CW	8/11/00	15:36	CW
GKM-8W 072000	7/20/00	13:29	Groundwater	MJ, BB	7/21/00	SD	no analysis	7/21/00	14:36	CW	8/11/00	15:29	CW
GKM-9BLUE 072000	7/20/00	11:32	Groundwater	MJ, BB	7/21/00	JH	no analysis	7/21/00	13:04	CW	8/11/00	14:17	CW

Groundwater and Soil Water Sample Information

Sample Name	Collection Date	Collection Time	Sample Type	Sample Collector(s)	Alkalinity Analysis Date	Alkalinity Analyst(s)	Coliform Analysis Date	IC Analysis Date	IC Analysis Time	IC Analyst	ICP Analysis Date	ICP Analysis Time	ICP Analyst
GKM-9RED 072000	7/20/00	11:20	Groundwater	MJ, BB	7/21/00	JH	no analysis	7/21/00	12:54	CW	8/11/00	15:50	CW
GKM-9W 072000	7/20/00	11:11	Groundwater	MJ, BB	7/21/00	JH	no analysis	7/21/00	12:44	CW	8/11/00	15:43	CW
GKW-7 072000	7/20/00	17:05	Groundwater	MJ, BB	7/21/00	JH	no analysis	7/21/00	17:49	CW	8/11/00	16:44	CW
GKW-7 072000 Split	7/20/00	17:15	Groundwater	MJ, BB	7/21/00	SD	no analysis	7/21/00	18:39	CW	8/8/00	14:33	CW
GKW-7 072000 F. Dup	7/20/00	17:05	Groundwater	MJ, BB	7/21/00	SD	no analysis	7/21/00	17:59	CW	8/8/00	14:22	CW
LYSD2-9 072000	7/20/00	11:45	Soil Water	MJ, BB	no analysis	no analysis	no analysis	no analysis	NS	no analysis	8/11/00	14:21	CW
LYSD-4 072000	7/20/00	15:03	Soil Water	MJ, BB	7/21/00	SD	no analysis	7/21/00	17:18	CW	8/11/00, 9/21/00	16:29, 15:36	CW
LYSS2-4 072000	7/20/00	14:58	Soil Water	MJ, BB	7/21/00	SD	no analysis	7/21/00, 7/25/00	16:58, 16:43	CW	8/11/00, 9/21/00	16:48,14:12,15:54	CW
LYSVD2-8 072000	7/20/00	13:06	Soil Water	MJ, BB	7/21/00	JH	no analysis	7/21/00	13:55	CW	8/11/00	15:33	CW
LYSVD-9 072000	7/20/00	11:57	Soil Water	MJ, BB	7/21/00	JH	no analysis	7/21/00	13:14	CW	8/11/00	14:14	CW
MLS-3RED 072000	7/20/00	9:55	Groundwater	MJ, BB	7/21/00	SD	7/21/00	7/21/00	12:34	CW	8/8/00, 9/21/00	14:18, 14:08	CW
MLS-3W 072000	7/20/00	10:12	Groundwater	MJ, BB	7/21/00	JH	no analysis	7/21/00	12:23	CW	9/20/00	13:17	CW
SPRINKLER 072000	7/20/00	9:40	Effluent	MJ, BB	no analysis	no analysis	7/21/00	7/21/00	12:13	CW	8/8/00	14:29	CW
GKM-6BLUE 072400	7/24/00	13:35	Groundwater	MJ, BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	8/8/00	16:23	CW
GKM-6W 072400	7/24/00	13:20	Groundwater	MJ, BB	7/25/00	JH	no analysis	7/25/00	14:41	CW	9/20/00	13:10	CW
GKM-7BLUE 072400	7/24/00	10:30	Groundwater	MJ, BB	7/25/00	JH	no analysis	7/25/00	12:59	CW	8/8/00	15:25	CW
GKM-7W 072400	7/24/00	10:20	Groundwater	MJ, BB	7/25/00	JH	no analysis	7/25/00	12:49	CW	8/8/00	16:19	CW
GKW-9 072400	7/24/00	11:55	Groundwater	MJ, BB	7/25/00	JH	no analysis	7/25/00	14:00	CW	8/8/00 and 9/20/00	15:44 and 13:13	CW
GKW-9 072400 Split	7/24/00	11:52	Groundwater	MJ, BB	7/25/00	JH	no analysis	7/25/00	14:21	CW	8/8/00 and 12/1/00	16:34 and 12:38	CW
GKW-9 072400 F. Dup	7/24/00	11:51	Groundwater	MJ, BB	7/25/00	JH	no analysis	7/25/00	14:10	CW	8/8/00 and 12/1/00	15:21 and 11:25	CW
LYSD-7 072400	7/24/00	10:50	Soil Water	MJ, BB	7/25/00	JH	no analysis	7/25/00	13:20	CW	8/8/00, 9/21/00, and 10/26/00	16:30,15:51,15:38	CW
LYSS-7 072400	7/24/00	10:44	Soil Water	MJ, BB	no analysis	no analysis	no analysis	7/25/00	12:39	CW	8/8/00, 9/21/00 and 10/26/00	6:27,15:47,15:34	CW
LYSVD2-7 072400	7/24/00	10:59	Soil Water	MJ, BB	7/25/00	JH	no analysis	7/25/00	13:40	CW	8/8/2000, 9/21/00, 10/31/00	15:40,15:58,12:18	CW
LYSVD-6 072400	7/24/00	13:40	Soil Water	MJ, BB	no analysis	no analysis	no analysis	7/25/00	14:51	CW	8/8/00, 12/1/00	15:36, 11:32	CW
ALYSD-1 081400	8/14/00	11:15	Soil Water	MJ, BB	8/15/00	CW	8/15/00	8/15/00	14:26	CW	9/26/00, 12/1/00	13:50, 11:36	CW
ALYSD-1 082800	8/28/00	10:20	Soil Water	MJ, BB	8/29/00	CW	no analysis	8/29/00, 8/30/00	12:31, 10:12	CW	9/26/00, 12/1/00	12:30, 11:40	CW
GKM-1GREEN 082800	8/28/00	15:51	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	18:06	CW	9/26/00	14:32	CW
GKM-1RED 082800	8/28/00	15:43	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	16:04	CW	9/26/00	13:38	CW
GKM-1W 082800	8/28/00	15:38	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	15:54	CW	9/26/00	13:27	CW
GKW-10 082800	8/28/00	14:23	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	14:43	CW	9/26/00	14:35	CW
GKW-11 082800	8/28/00	10:01	Groundwater	MJ, BB	8/29/00	CW	8/29/00	8/29/00	12:20	CW	9/26/00	13:20	CW
GKW-5 082800	8/28/00	16:37	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	18:16	CW	9/26/00	14:39	CW
LYSD2-1 082800	8/28/00	15:15	Soil Water	MJ, BB	8/29/00	CW	no analysis	8/29/00	15:23	CW	9/26/00, 10/30/00	13:46, 18:29	CW
LYSVD-1 082800	8/28/00	15:01	Soil Water	MJ, BB	8/29/00	CW	no analysis	8/29/00	15:03	CW	9/26/00	13:24	CW

Groundwater and Soil Water Sample Information

Sample Name	Collection Date	Collection Time	Sample Type	Sample Collector(s)	Alkalinity Analysis Date	Alkalinity Analyst(s)	Coliform Analysis Date	IC Analysis Date	IC Analysis Time	IC Analyst	ICP Analysis Date	ICP Analysis Time	ICP Analyst
MLS-3RED 082800	8/28/00	13:42	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	14:33	CW	9/26/00, 10/26/00	13:53, 13:05	CW
MLS-3W 082800	8/28/00	13:30	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00, 8/30/00	14:12, 11:13	CW	9/26/00, 12/1/00	13:35, 12:27	CW
MLS-4RED 082800	8/28/00	12:20	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	14:02	CW	9/25/00	15:59	CW
MLS-4W 082800	8/28/00	12:15	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	13:52	CW	9/26/00	12:15	CW
MLS-5BLUE 082800	8/28/00	11:24	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	13:52	CW	9/26/00	12:19	CW
MLS-5RED 082800	8/28/00	11:16	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	13:01	CW	9/26/00	12:33	CW
MLS-5W 082800	8/28/00	11:06	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	12:51	CW	9/26/00	12:41	CW
MW-4 082800	8/28/00	11:56	Groundwater	MJ, BB	8/29/00	CW	8/29/00	8/29/00	13:21	CW	9/26/00	12:26	CW
MW-4 082800 F. Dup	8/28/00	11:58	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	13:31	CW	9/26/00	12:11	CW
MW-4 082800 Split	8/28/00	12:00	Groundwater	MJ, BB	8/29/00	CW	no analysis	8/29/00	13:42	CW	9/26/00	12:22	CW
MW-5 082800	8/28/00	10:50	Groundwater	MJ, BB	8/29/00	CW	8/29/00	8/29/00	12:41	CW	9/26/00	12:44	CW
GKM-2BLUE 082900	8/29/00	16:40	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	17:31	CW	9/25/00	14:35	CW
GKM-2W 082900	8/29/00	16:39	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	17:01	CW	9/25/00	14:49	CW
GKM-6BLUE 082900	8/29/00	14:21	Groundwater	MJ	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	9/25/00	13:47	CW
GKM-6W 082900	8/29/00	14:10	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	15:17	CW	9/25/00	13:25	CW
GKM-7BLUE 082900	8/29/00	14:08	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	12:35	CW	9/25/00	14:42	CW
GKM-7RED 082900	8/29/00	14:18	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	12:45	CW	9/25/00	13:32	CW
GKM-7W 082900	8/29/00	14:03	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	12:25	CW	9/25/00	15:44	CW
GKM-8BLUE 082900	8/29/00	10:55	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	13:46	CW	9/25/00	14:46	CW
GKM-8RED 082900	8/29/00	10:50	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	13:36	CW	9/25/00	14:31	CW
GKM-8W 082900	8/29/00	11:10	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	13:56	CW	9/25/00	14:57	CW
GKM-9BLUE 082900	8/29/00	9:48	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	11:54	CW	9/25/00	15:26	CW
GKM-9RED 082900	8/29/00	9:42	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	11:44	CW	9/25/00	15:29	CW
GKM-9W 082900	8/29/00	9:35	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	11:34	CW	9/25/00	15:41	CW
GKW-8 082900	8/29/00	14:48	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	15:28	CW	9/25/00	13:21	CW
GKW-9 082900	8/29/00	12:48	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	12:55	CW	9/25/00	13:29	CW
GKW-9 082900 F. Dup	8/29/00	12:48	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	13:05	CW	9/25/00	13:43	CW
GKW-9 082900 Split	8/29/00	13:00	Groundwater	MJ	8/30/00	EN	no analysis	8/30/00	13:15	CW	9/25/00	13:18	CW
LYSD-2 082900	8/29/00	15:20	Soil Water	MJ	8/30/00	EN	no analysis	8/30/00, 8/31/00	15:57, 12:00	CW	9/25/00	14:53	CW
LYSD2-9 082900	8/29/00	8:50	Soil Water	MJ	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	9/25/00	14:38	CW
LYSD-7 082900	8/29/00	11:44	Soil Water	MJ	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	9/25/00, 10/26/00	15:48, 14:29	CW
LYSD-8 082900	8/29/00	10:15	Soil Water	MJ	8/30/00	EN	no analysis	8/30/00	12:04	CW	9/25/00	15:01	CW
LYSVD2-2 082900	8/29/00	16:25	Soil Water	MJ	8/30/00	EN	no analysis	8/30/00, 8/31/00	16:50, 12:20	CW	9/25/00	13:40	CW
LYSVD2-7 082900	8/29/00	11:50	Soil Water	MJ	8/30/00	EN	no analysis	8/30/00, 8/31/00	14:16, 11:50	CW	9/25/00, 10/31/00	15:52, 12:21	CW
LYSVD2-8 082900	8/29/00	10:35	Soil Water	MJ	8/30/00	EN	no analysis	8/30/00	12:14	CW	9/25/00	14:27	CW
LYSVD-9 082900	8/29/00	9:00	Soil Water	MJ	8/30/00	EN	no analysis	8/30/00	11:24	CW	9/25/00	15:37	CW

Groundwater and Soil Water Sample Information

Sample Name	Collection Date	Collection Time	Sample Type	Sample Collector(s)	Alkalinity Analysis Date	Alkalinity Analyst(s)	Coliform Analysis Date	IC Analysis Date	IC Analysis Time	IC Analyst	ICP Analysis Date	ICP Analysis Time	ICP Analyst
GKM-3BLUE 083000	8/30/00	10:32	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	14:32	CW	10/18/00	15:00	CW
GKM-3GREEN 083000	8/30/00	10:38	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	14:42	CW	10/18/00	14:53	CW
GKM-3RED 083000	8/30/00	10:27	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	14:22	CW	10/18/00	14:45	CW
GKM-3W 083000	8/30/00	10:25	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	14:12	CW	10/18/00	13:50	CW
GKM-4BLUE 083000	8/30/00	12:00	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	17:35	CW	10/18/00	13:04	CW
GKM-4RED 083000	8/30/00	11:52	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	17:25	CW	10/18/00	12:56	CW
GKM-4W 083000	8/30/00	11:47	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	17:14	CW	10/18/00	13:39	CW
GKM-5BLUE 083000	8/30/00	9:24	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	13:42	CW	10/18/00	12:37	CW
GKM-5W 083000	8/30/00	9:10	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	13:11	CW	10/18/00	15:07	CW
GKW-1 083000	8/30/00	13:30	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	16:24	CW	10/18/00	13:00	CW
GKW-2 083000	8/30/00	12:46	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	15:53	CW	10/18/00	15:19	CW
GKW-2 083000 F. Dup	8/30/00	12:46	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	16:03	CW	10/18/00	13:43	CW
GKW-2 083000 Split	8/30/00	12:54	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	16:14	CW	10/18/00	12:45	CW
GKW-4 083000	8/30/00	14:45	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	16:34	CW	10/18/00	12:30	CW
GKW-7 083000	8/30/00	15:30	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	16:44	CW	10/18/00	12:41	CW
LYSD2-5 083000	8/30/00	9:00	Soil Water	MJ, BB	9/1/00	CW	no analysis	8/31/00	13:32	CW	10/18/00, 10/26/00	12:33, 13:09	CW
LYSD-3 083000	8/30/00	9:55	Soil Water	MJ, BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	10/18/00	13:47	CW
LYSD-4 083000	8/30/00	11:20	Soil Water	MJ, BB	9/1/00	CW	no analysis	8/31/00, 9/1/00	15:03, 10:25	CW	10/18/00, 10/31/00	15:04, 11:56	CW
LYSS2-4 083000	8/30/00	11:28	Soil Water	MJ, BB	NS	NS	no analysis	no analysis	no analysis	no analysis	10/18/00, 10/30/00	12:48, 17:53	CW
LYSVD2-3 083000	8/30/00	10:00	Soil Water	MJ, BB	9/1/00	CW	no analysis	8/31/00	13:52	CW	10/18/00	13:54	CW
LYSVD-4 083000	8/30/00	11:35	Soil Water	MJ, BB	9/1/00	CW	no analysis	8/31/00	16:54	CW	10/18/00	13:28	CW
MW-1 083000	8/30/00	16:30	Groundwater	MJ, BB	9/1/00	CW	no analysis	8/31/00	18:05	CW	10/18/00	13:58	CW
MW-2 083000	8/30/00	15:55	Groundwater	MJ, BB	9/1/00	CW	8/31/00	8/31/00	17:55	CW	10/18/00	14:02	CW
GKM-6BLUE 092900	9/29/00	16:20	Groundwater	MJ, BB	10/12/00	JH	no analysis	10/4/00	20:13	CW	10/20/00	12:07	CW
GKM-6GREEN 092900	9/29/00	16:31	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	20:23	CW	10/20/00	12:11	CW
GKM-6W 092900	9/29/00	16:15	Groundwater	MJ, BB	10/12/00	JH	no analysis	10/4/00	20:03	CW	10/20/00	12:03	CW
GKM-7BLUE 092900	9/29/00	14:35	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	18:52	CW	10/20/00	12:22	CW
GKM-7RED 092900	9/29/00	14:30	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	18:42	CW	10/20/00	12:18	CW
GKM-7W 092900	9/29/00	14:25	Groundwater	MJ, BB	10/12/00	JH	no analysis	10/4/00	18:32	CW	10/20/00	12:14	CW
GKM-8BLUE 092900	9/29/00	13:17	Groundwater	MJ, BB	10/12/00	JH	no analysis	10/4/00	18:01	CW	10/20/00	14:18	CW
GKM-8GREEN 092900	9/29/00	13:30	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	18:21	CW	10/20/00	14:22	CW
GKM-8RED 092900	9/29/00	13:10	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	17:51	CW	10/20/00	14:25	CW
GKM-8W 092900	9/29/00	13:20	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	18:11	CW	10/20/00	14:14	CW
GKM-9BLUE 092900	9/29/00	12:06	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	17:21	CW	10/20/00	12:54	CW
GKM-9GREEN 092900	9/29/00	12:13	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	17:31	CW	10/20/00	13:05	CW
GKM-9RED 092900	9/29/00	11:57	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	16:50	CW	10/20/00	12:51	CW

Groundwater and Soil Water Sample Information

Sample Name	Collection Date	Collection Time	Sample Type	Sample Collector(s)	Alkalinity Analysis Date	Alkalinity Analyst(s)	Coliform Analysis Date	IC Analysis Date	IC Analysis Time	IC Analyst	ICP Analysis Date	ICP Analysis Time	ICP Analyst
GKM-9W 092900	9/29/00	11:53	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	16:40	CW	10/20/00	13:13	CW
GKW-8 092900	9/29/00	17:00	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	20:34	CW	10/20/00	13:20	CW
GKW-8 092900 F. Dup	9/29/00	17:01	Groundwater	MJ, BB	10/12/00	JH	no analysis	10/4/00	20:44	CW	10/20/00	13:24	CW
GKW-8 092900 Split	9/29/00	17:03	Groundwater	MJ, BB	10/11/00	JH	no analysis	10/4/00	20:54	CW	10/20/00	14:11	CW
LYSD2-9 092900	9/29/00	11:31	Soil Water	MJ, BB	no analysis	no analysis	no analysis	10/4/00, 10/12/00	16:20 , 14:52	CW	10/20/00	13:09	CW
LYSD-7 092900	9/29/00	15:05	Soil Water	MJ, BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	10/20/00, 10/26/00	12:25, 15:08	CW
LYSD-8 092900	9/29/00	12:57	Soil Water	MJ, BB	10/12/00	JH	no analysis	10/4/00	17:41	CW	10/20/00	14:37	CW
LYSVD2-7 092900	9/29/00	14:45	Soil Water	MJ, BB	10/12/00	JH	no analysis	10/4/00	19:02	CW	10/20/00, 10/31/00	12:58, 12:25	CW
LYSVD2-8 092900	9/29/00	12:48	Soil Water	MJ, BB	10/11/00	JH	no analysis	10/4/00, 10/12/00	17:10, 15:02	CW	10/20/00	14:33	CW
LYSVD-9 092900	9/29/00	11:35	Soil Water	MJ, BB	10/11/00	JH	no analysis	10/4/00	16:30	CW	10/20/00	13:17	CW
GKM-1GREENB 093000	9/30/00	11:58	Groundwater	BB	10/12/00	JH	no analysis	10/2/00	21:38	CW	10/20/00, 10/26/00	16:35, 14:03	CW
GKM-1GREENC 093000	9/30/00	12:02	Groundwater	BB	10/12/00	JH	no analysis	10/2/00	21:48	CW	10/20/00	16:38	CW
GKM-1REDA 093000	9/30/00	11:35	Groundwater	BB	10/12/00	JH	no analysis	10/2/00	20:57	CW	10/20/00	16:27	CW
GKM-1REDB 093000	9/30/00	11:40	Groundwater	BB	10/12/00	JH	no analysis	10/2/00	21:07	CW	10/20/00	16:20	CW
GKM-1REDC 093000	9/30/00	11:45	Groundwater	BB	10/12/00	JH	no analysis	10/2/00	21:17	CW	10/20/00	16:31	CW
GKM-1WA 093000	9/30/00	11:25	Groundwater	BB	10/12/00	JH	no analysis	10/2/00	18:45	CW	10/20/00	16:12	CW
GKM-1WB 093000	9/30/00	11:28	Groundwater	BB	10/12/00	JH	no analysis	10/2/00	20:37	CW	10/20/00	16:16	CW
GKM-1WC 093000	9/30/00	11:31	Groundwater	BB	10/12/00	JH	no analysis	10/2/00	20:47	CW	10/20/00	16:24	CW
GKM-2BLUE 093000	9/30/00	10:19	Groundwater	BB	10/12/00	JH	no analysis	10/2/00	18:05	CW	10/20/00	15:19	CW
GKM-2W 093000	9/30/00	10:07	Groundwater	BB	10/12/00	JH	no analysis	10/2/00	17:55	CW	10/20/00	15:23	CW
GKM-3BLUE 093000	9/30/00	14:15	Groundwater	BB	10/13/00	TMC	no analysis	10/3/00	15:25	CW	10/26/00	11:46	CW
GKM-3GREEN 093000	9/30/00	14:25	Groundwater	BB	10/12/00	JH	no analysis	10/3/00	15:35	CW	10/26/00	12:15	CW
GKM-3RED 093000	9/30/00	14:08	Groundwater	BB	10/13/00	TMC	no analysis	10/3/00	15:15	CW	10/26/00	12:43	CW
GKM-3W 093000	9/30/00	14:02	Groundwater	BB	10/13/00	AY	no analysis	10/3/00	15:05	CW	10/26/00	11:50	CW
GKM-5BLUE 093000	9/30/00	13:17	Groundwater	BB	10/13/00	TMC	no analysis	10/3/00	14:44	CW	10/26/00	11:57	CW
GKM-5W 093000	9/30/00	13:10	Groundwater	BB	10/12/00	JH	no analysis	10/3/00	14:34	CW	10/26/00	12:01	CW
GKW-1 093000	9/30/00	16:25	Groundwater	BB	10/12/00	JH	no analysis	10/3/00	16:16	CW	10/20/00	15:34	CW
GKW-1 093000 F. Dup	9/30/00	16:26	Groundwater	BB	10/12/00	JH	no analysis	10/3/00	16:26	CW	10/20/00	15:38	CW
GKW-1 093000 Split	9/30/00	16:30	Groundwater	BB	10/13/00	TMC	no analysis	10/3/00	16:36	CW	10/20/00	15:41	CW
GKW-4 093000	9/30/00	17:05	Groundwater	BB	10/13/00	AY	no analysis	10/3/00	16:46	CW	10/20/00	15:12	CW
GKW-7 093000	9/30/00	9:42	Groundwater	BB	10/12/00	JH	no analysis	10/2/00	17:45	CW	10/20/00	14:40	CW
GKW-9 093000	9/30/00	9:10	Groundwater	BB	10/13/00	TMC	no analysis	10/2/00	17:34	CW	10/20/00	14:44	CW
LYSD-2 093000	9/30/00	10:40	Soil Water	BB	10/12/00	JH	no analysis	10/2/00, 10/3/00	18:25, 13:33	CW	10/20/00	15:30	CW
LYSD2-1 093000	9/30/00	12:22	Soil Water	BB	10/12/00	JH	no analysis	10/3/00	14:24	CW	10/26/00, 10/30/00	12:12, 18:33	CW
LYSD2-5 093000	9/30/00	13:29	Soil Water	BB	10/12/00	JH	no analysis	10/3/00	14:54		10/26/00, 10/30/00	11:42, 18:37	CW
LYSD-3 093000	9/30/00	14:35	Soil Water	BB	no analysis	no analysis	no analysis	no analysis	NS	no analysis	10/26/00	12:47	CW

Groundwater and Soil Water Sample Information

Sample Name	Collection Date	Collection Time	Sample Type	Sample Collector(s)	Alkalinity Analysis Date	Alkalinity Analyst(s)	Coliform Analysis Date	IC Analysis Date	IC Analysis Time	IC Analyst	ICP Analysis Date	ICP Analysis Time	ICP Analyst
LYSS-1 093000	9/30/00	12:30	Soil Water	BB	no analysis	no analysis	no analysis	no analysis	NS	no analysis	10/20/00, 10/30/00, and 10/31/00	16:43,17:57,11:07	CW
LYSVD-1 093000	9/30/00	12:08	Soil Water	BB	10/12/00	JH	no analysis	10/2/00	21:58	CW	10/26/00	12:08	CW
LYSVD2-2 093000	9/30/00	10:46	Soil Water	BB	10/12/00	JH	no analysis	10/2/00	18:35	CW	10/20/00	15:26	CW
LYSVD2-3 093000	9/30/00	14:40	Soil Water	BB	10/12/00	JH	no analysis	10/3/00	15:45	CW	10/26/00	11:53	CW
ALYSS-1 100100	10/1/00	15:27	Soil Water	BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	10/20/00, 12/1/00	11:56, 12:19	CW
GKM-4BLUE 100100	10/1/00	8:15	Groundwater	BB	10/13/00	AY	no analysis	10/2/00	13:31	CW	10/19/00	14:26	CW
GKM-4GREEN 100100	10/1/00	8:30	Groundwater	BB	10/13/00	AY	no analysis	10/2/00	13:41	CW	10/19/00	14:11	CW
GKM-4RED 100100	10/1/00	8:10	Groundwater	BB	10/13/00	AY	no analysis	10/2/00	13:21	CW	10/19/00	14:08	CW
GKM-4W 100100	10/1/00	8:00	Groundwater	BB	10/13/00	AY	no analysis	10/2/00	13:10	CW	10/19/00	15:01	CW
GKW-10 100100	10/1/00	10:52	Groundwater	BB	10/13/00	AY	10/2/00	10/2/00	14:42	CW	10/19/00	14:22	CW
GKW-11 100100	10/1/00	15:03	Groundwater	BB	10/13/00	TMC	10/2/00	10/2/00	17:04	CW	10/19/00	15:27	CW
LYSD-4 100100	10/1/00	8:50	Soil Water	BB	10/13/00	AY	no analysis	10/2/00	14:01	CW	10/19/00, 10/31/00	14:00, 11:59	CW
LYSS2-4 100100	10/1/00	8:50	Soil Water	BB	no analysis	no analysis	no analysis	no analysis	no analysis	no analysis	10/19/00, 10/30/00	15:05, 18:10	CW
LYSVD-4 100100	10/1/00	8:40	Soil Water	BB	10/13/00	AY	no analysis	10/2/00	13:51	CW	10/19/00	13:56	CW
MLS-3RED 100100	10/1/00	10:22	Groundwater	BB	10/13/00	AY	10/2/00	10/2/00	14:21	CW	10/19/00, 10/26/00	14:19, 1:13	CW
MLS-3W 100100	10/1/00	10:20	Groundwater	BB	10/13/00	AY	no analysis	10/2/00, 10/3/00	14:11, 13:43	CW	10/18/00, 12/1/00	15:15, 12:23	CW
MLS-4RED 100100	10/1/00	11:55	Groundwater	BB	10/13/00	AY	no analysis	10/2/00, 10/3/00	15:02, 11:32	CW	10/19/00	13:52	CW
MLS-4W 100100	10/1/00	11:50	Groundwater	BB	10/13/00	AY	10/2/00	10/2/00, 10/3/00	14:52, 11:22	CW	10/19/00	15:24	CW
MLS-5RED 100100	10/1/00	12:44	Groundwater	BB	10/13/00	AY	no analysis	10/2/00	16:03	CW	10/20/00	11:52	CW
MLS-5W 100100	10/1/00	12:40	Groundwater	BB	10/13/00	AY	10/2/00	10/2/00	15:53	CW	10/19/00	15:09	CW
MW-1 100100	10/1/00	16:15	Groundwater	BB	10/13/00	AY	10/2/00	10/2/00	17:14	CW	10/19/00	15:31	CW
MW-2 100100	10/1/00	15:55	Groundwater	BB	10/13/00	AY	10/2/00	10/2/00	17:24	CW	10/19/00	15:16	CW
MW-4 100100	10/1/00	12:07	Groundwater	BB	10/13/00	AY	10/2/00	10/2/00	15:22	CW	10/19/00	15:35	CW
MW-4 100100 F. Dup	10/1/00	12:07	Groundwater	BB	10/13/00	AY	no analysis	10/2/00	15:12	CW	10/19/00	15:20	CW
MW-4 100100 Split	10/1/00	12:10	Groundwater	BB	10/13/00	AY	no analysis	10/2/00	15:33	CW	10/19/00	15:13	CW
MW-5 100100	10/1/00	13:16	Groundwater	BB	10/13/00	AY	10/2/00	10/2/00	16:54	CW	10/19/00	14:15	CW

APPENDIX B – Water Resources

B.5 Alkalinity and Anion QC Data

B.5.1 Standards

Calibration standards are periodically analyzed as unknowns in order to verify initial instrument calibration and to assess instrument performance over the duration of analysis.

IC Check Standards – Std 1

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD1	5/2/00	0.5	0.1	2.7
STD1	5/2/00	0.5	0.1	2.7
STD1	6/20/00	-	0.1	-
STD1	6/20/00	-	0.1	-
STD1	6/21/00	0.5	-	2.6
STD1	6/21/00	0.5	-	2.6
N		*4*	*4*	*4*
Given Value		*0.5*	*0.1*	*2.5*
Average		*0.5*	*0.1*	*2.7*
Standard Deviation		*0.0*	*0.0*	*0.1*

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD1	8/29/00	1.1	0.05	6.3
STD1	8/29/00	1.1	0.05	6.4
STD1	8/29/00	1.1	0.05	6.4
STD1	8/30/00	1.1	0.05	6.2
STD1	8/30/00	1.1	0.04	6.2
STD1	8/30/00	1.1	0.04	6.2
STD1	11/8/00	1.1	0.05	6.3
STD1	11/8/00	1.1	0.05	6.3
N		*8*	*8*	*8*
Given Value		*1*	*0.05*	*6*
Average		*1.1*	*0.0*	*6.3*
Standard Deviation		*0.0*	*0.0*	*0.1*

IC Check Standards – Std 1

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD1	6/21/00	1.1	0.1	6.3
STD1	6/21/00	1.1	0.1	6.2
STD1	6/27/00	1.1	0.1	6.3
STD1	6/27/00	1.1	0.1	6.3
STD1	6/29/00	1.1	0.1	6.3
STD1	6/29/00	1.0	0.1	6.3
STD1	6/30/00	1.0	0.1	6.3
STD1	6/30/00	1.0	0.1	6.3
STD1	7/6/00	1.1	0.1	6.3
STD1	7/6/00	1.1	0.1	6.3
STD1	7/11/00	1.1	0.1	6.3
STD1	7/11/00	1.1	0.1	6.2
STD1	7/11/00	1.1	0.1	6.2
STD1	7/12/00	1.1	0.1	6.2
STD1	7/12/00	1.1	0.1	6.3
STD1	7/18/00	1.1	0.1	6.3
STD1	7/18/00	1.0	0.1	6.1
STD1	7/18/00	1.0	0.1	6.2
STD1	7/19/00	1.1	0.1	6.4
STD1	7/19/00	1.0	0.1	6.3
STD1	7/19/00	1.0	0.1	6.4
STD1	7/20/00	1.1	0.1	6.4
STD1	7/20/00	1.1	0.1	6.4
STD1	7/20/00	1.1	0.1	6.4
STD1	7/21/00	1.1	0.1	6.3
STD1	7/21/00	1.1	0.1	6.3
STD1	7/21/00	1.1	0.1	6.5
STD1	7/25/00	1.0	0.1	6.2
STD1	7/25/00	1.1	0.1	6.7
STD1	7/25/00	1.0	0.1	6.3
STD1	8/15/00	1.1	0.1	6.3
STD1	8/15/00	1.1	0.1	6.5
STD1	8/31/00	1.1	0.1	6.3
STD1	8/31/00	1.1	0.1	6.3
STD1	8/31/00	1.1	0.1	6.3
STD1	9/1/00	1.1	0.1	6.3
STD1	9/1/00	1.1	0.1	6.3
STD1	10/2/00	1.1	0.1	6.3
STD1	10/2/00	1.1	0.1	6.2
STD1	10/2/00	1.1	0.1	6.2
STD1	10/2/00	1.1	0.1	6.2
STD1	10/3/00	1.1	0.1	6.2
STD1	10/3/00	1.1	0.1	6.1
STD1	10/3/00	1.1	0.1	6.2
STD1	10/4/00	1.1	0.1	6.3
STD1	10/4/00	1.1	0.1	6.2
STD1	10/4/00	1.1	0.1	6.2
STD1	10/12/00	-	-	6.2
STD1	10/12/00	-	-	6
N		*47*	*47*	*49*
Given Value		*1*	*0.1*	*6*
Average		*1.1*	*0.1*	*6.3*
Standard Deviation		*0.0*	*0.0*	*0.1*

IC Check Standards – Std 2

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD2	5/2/00	1	0.2	4.9
STD2	5/2/00	1	0.2	4.9
STD2	6/20/00	-	0.2	-
STD2	6/21/00	1	-	4.8
STD2	6/21/00	1	-	4.8
N		*4*	*3*	*4*
Given Value		*1*	*0.2*	*5*
Average		*1.0*	*0.2*	*4.9*
Standard Deviation		*0.0*	*0.0*	*0.1*

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD2	8/29/00	1.9	0.1	11.7
STD2	8/29/00	1.9	0.1	11.8
STD2	8/29/00	1.9	0.1	11.9
STD2	8/30/00	1.9	0.1	11.7
STD2	8/30/00	1.9	0.1	11.7
STD2	8/30/00	2	0.09	11.8
STD2	11/8/00	1.9	0.1	11.5
STD2	11/8/00	1.9	0.1	11.7
N		*8*	*8*	*8*
Given Value		*2*	*0.1*	*12*
Average		*1.9*	*0.1*	*11.7*
Standard Deviation		*0.0*	*0.0*	*0.1*

IC Check Standards – Std 2

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD2	6/21/00	1.9	0.2	11.6
STD2	6/21/00	1.9	0.2	11.5
STD2	6/27/00	1.9	0.2	11.6
STD2	6/27/00	2.1	0.2	11.7
STD2	6/29/00	1.9	0.2	11.8
STD2	6/29/00	1.9	0.2	11.9
STD2	6/30/00	1.9	0.2	11.6
STD2	6/30/00	1.9	0.2	11.7
STD2	7/6/00	1.9	0.2	11.8
STD2	7/6/00	1.9	0.2	11.8
STD2	7/11/00	1.9	0.2	11.6
STD2	7/11/00	2.0	0.2	11.5
STD2	7/11/00	1.9	0.2	11.5
STD2	7/12/00	1.9	0.2	11.6
STD2	7/12/00	1.9	0.2	11.7
STD2	7/18/00	1.9	0.2	11.8
STD2	7/18/00	1.9	0.2	11.6
STD2	7/18/00	1.8	0.2	11.7
STD2	7/19/00	1.9	0.2	11.6
STD2	7/19/00	1.9	0.2	11.6
STD2	7/19/00	1.9	0.2	11.7
STD2	7/20/00	1.9	0.2	11.7
STD2	7/20/00	1.9	0.2	11.7
STD2	7/20/00	2.0	0.2	12.0
STD2	7/21/00	1.9	0.2	11.6
STD2	7/21/00	1.9	0.2	11.7
STD2	7/21/00	1.9	0.2	11.7
STD2	7/25/00	1.9	0.2	11.6
STD2	7/25/00	1.9	0.2	11.7
STD2	7/25/00	1.9	0.2	11.7
STD2	8/15/00	1.9	0.2	11.8
STD2	8/15/00	2.0	0.2	12.1
STD2	8/31/00	1.9	0.2	11.6
STD2	8/31/00	1.9	0.2	11.8
STD2	8/31/00	1.9	0.2	11.8
STD2	9/1/00	1.9	0.2	11.6
STD2	9/1/00	1.9	0.2	11.6
STD2	10/2/00	2.0	0.2	11.8
STD2	10/2/00	2.0	0.2	11.8
STD2	10/2/00	2.0	0.2	11.7
STD2	10/2/00	2.0	0.2	11.9
STD2	10/3/00	2.0	0.2	11.7
STD2	10/3/00	2.0	0.2	11.6
STD2	10/3/00	1.9	0.2	11.6
STD2	10/4/00	1.9	0.2	11.6
STD2	10/4/00	1.9	0.2	11.6
STD2	10/4/00	1.9	0.2	11.6
STD2	10/12/00	-	-	11.7
STD2	10/12/00	-	-	11.5
N		*47*	*47*	*49*
Given Value		*2*	*0.2*	*12*
Average		*1.9*	*0.2*	*11.7*
Standard Deviation		*0.1*	*0.0*	*0.1*

IC Check Standards – Std 3

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD3	5/2/00	5.1	1.0	25.1
STD3	5/2/00	5.0	1.0	25.2
STD3	6/20/00	-	1.0	-
STD3	6/21/00	5.0	-	24.9
STD3	6/21/00	5.0	-	25.2
N		*4*	*3*	*4*
Given Value		*5*	*1*	*25*
Average		*5*	*1*	*25.1*
Standard Deviation		*0.0*	*0.0*	*0.1*

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD3	8/29/00	10.0	0.50	60.1
STD3	8/29/00	10.1	0.51	60.7
STD3	8/29/00	10.2	0.51	61.1
STD3	8/30/00	10.0	0.48	60.3
STD3	8/30/00	10.1	0.48	60.6
STD3	8/30/00	10.4	0.49	61.1
STD3	11/8/00	10.0	0.50	60.2
STD3	11/8/00	10.1	0.50	60.7
N		*8*	*8*	*8*
Given Value		*10*	*0.5*	*60*
Average		*10*	*0.5*	*61*
Standard Deviation		*0.1*	*0.0*	*0.4*

IC Check Standards – Std 3

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD3	6/21/00	10.0	1.0	59.8
STD3	6/21/00	10.1	1.0	60.3
STD3	6/27/00	10.0	1.0	60.1
STD3	6/27/00	10.1	1.0	60.7
STD3	6/29/00	10.1	1.0	60.4
STD3	6/29/00	10.1	1.0	60.9
STD3	6/30/00	9.9	1.0	60.3
STD3	6/30/00	10.0	1.0	60.2
STD3	7/6/00	9.9	1.0	60.1
STD3	7/6/00	9.9	1.1	60.1
STD3	7/11/00	10.1	0.9	59.9
STD3	7/11/00	10.2	1.0	60.3
STD3	7/11/00	10.0	1.0	60.0
STD3	7/12/00	10.0	1.0	60.3
STD3	7/12/00	10.1	1.0	60.9
STD3	7/18/00	10.2	1.0	60.4
STD3	7/18/00	10.2	1.1	60.5
STD3	7/18/00	10.1	1.0	60.6
STD3	7/19/00	10.1	1.0	60.1
STD3	7/19/00	10.1	1.0	60.2
STD3	7/19/00	10.1	1.0	60.4
STD3	7/20/00	10.1	1.0	60.1
STD3	7/20/00	10.1	1.0	60.3
STD3	7/20/00	10.1	1.0	60.4
STD3	7/21/00	10.0	1.0	60.4
STD3	7/21/00	10.1	1.0	60.4
STD3	7/21/00	10.1	1.1	60.4
STD3	7/25/00	10.0	1.0	60.2
STD3	7/25/00	10.1	1.0	60.2
STD3	7/25/00	10.1	1.0	60.0
STD3	8/15/00	10.1	1.0	60.5
STD3	8/15/00	10.2	1.0	61.3
STD3	8/31/00	10.1	1.0	60.3
STD3	8/31/00	10.1	1.0	60.5
STD3	8/31/00	10.1	1.0	60.5
STD3	9/1/00	10.0	1.0	60.1
STD3	9/1/00	10.1	1.0	60.2
STD3	10/2/00	10.2	1.0	60.5
STD3	10/2/00	10.2	1.0	60.8
STD3	10/2/00	10.2	1.0	60.9
STD3	10/2/00	10.2	1.0	60.8
STD3	10/3/00	10.1	1.0	60.0
STD3	10/3/00	10.3	1.0	60.1
STD3	10/3/00	10.1	1.0	60.2
STD3	10/4/00	10.0	1.0	60.0
STD3	10/4/00	10.1	1.0	60.2
STD3	10/4/00	10.1	1.0	60.1
STD3	10/12/00	-	-	59.9
STD3	10/12/00	-	-	59.9
N		*47*	*47*	*49*
Given Value		*10*	*1*	*60*
Average		*10*	*1*	*60*
Standard Deviation		*0.1*	*0.0*	*0.3*

IC Check Standards – Std 4

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD4	5/2/00	10.0	2.0	49.7
STD4	5/3/00	10.0	2.0	49.6
STD4	6/20/00	-	2.0	-
STD4	6/21/00	10.0	-	49.7
STD4	6/21/00	10.2	-	49.7
N		*4*	*3*	*4*
Given Value		*10*	*2*	*50*
Average		*10*	*2.0*	*50*
Standard Deviation		*0.1*	*0.0*	*0.1*

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD4	8/29/00	20.1	1.0	120.4
STD4	8/29/00	20.2	1.0	121.6
STD4	8/29/00	20.7	1.0	121.7
STD4	8/30/00	20.0	1.0	120.3
STD4	8/30/00	20.4	1.0	120.9
STD4	8/30/00	20.4	1.0	121.4
STD4	11/8/00	20.1	1.0	120.9
STD4	11/8/00	20.2	1.0	121.1
N		*8*	*8*	*8*
Given Value		*20*	*1*	*120*
Average		*20*	*1*	*121*
Standard Deviation		*0.2*	*0.0*	*0.5*

IC Check Standards – Std 4

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
STD4	6/21/00	20.2	2.0	120.7
STD4	6/21/00	20.0	2.1	120.1
STD4	6/27/00	19.5	2.1	120.0
STD4	6/27/00	19.6	2.1	121.1
STD4	6/29/00	20.0	2.0	120.4
STD4	6/29/00	20.1	2.0	120.8
STD4	6/30/00	20.0	2.0	120.0
STD4	6/30/00	20.0	2.0	120.2
STD4	7/6/00	20.0	2.0	119.9
STD4	7/6/00	19.9	2.1	119.8
STD4	7/11/00	19.9	2.0	119.6
STD4	7/11/00	20.0	2.0	120.1
STD4	7/11/00	20.0	2.0	120.1
STD4	7/12/00	20.1	2.0	120.6
STD4	7/12/00	20.1	2.0	120.7
STD4	7/18/00	20.0	2.0	119.8
STD4	7/18/00	19.9	2.1	119.9
STD4	7/18/00	20.0	2.0	120.2
STD4	7/19/00	20.1	2.0	120.3
STD4	7/19/00	20.0	1.9	120.9
STD4	7/19/00	20.1	1.9	121.0
STD4	7/20/00	20.0	2.0	121.5
STD4	7/20/00	20.0	2.1	120.8
STD4	7/20/00	20.1	2.1	120.9
STD4	7/21/00	19.7	2.0	119.6
STD4	7/21/00	19.8	2.1	120.3
STD4	7/21/00	19.9	2.1	120.7
STD4	7/25/00	20.0	2.0	120.1
STD4	7/25/00	20.2	2.0	120.5
STD4	7/25/00	20.1	2.0	120.5
STD4	8/15/00	20.2	2.0	121.0
STD4	8/15/00	20.9	2.1	122.6
STD4	8/31/00	20.0	2.0	120.1
STD4	8/31/00	20.1	2.0	120.8
STD4	8/31/00	20.2	2.0	120.8
STD4	9/1/00	20.1	2.0	122.3
STD4	9/1/00	20.1	2.0	120.5
STD4	10/2/00	19.7	2.0	119.2
STD4	10/2/00	19.8	2.0	119.6
STD4	10/2/00	19.8	2.0	120.7
STD4	10/2/00	19.8	2.0	122.2
STD4	10/3/00	19.6	2.0	119.3
STD4	10/3/00	19.6	2.0	119.3
STD4	10/3/00	19.6	2.0	119.5
STD4	10/4/00	20.0	2.0	120.1
STD4	10/4/00	20.0	2.0	120.2
STD4	10/4/00	20.1	2.0	120.4
STD4	10/12/00	-	-	119.9
STD4	10/12/00	-	-	120.3
N		*47*	*47*	*49*
Given Value		*20*	*2*	*120*
Average		*20*	*2*	*120*
Standard Deviation		*0.2*	*0.0*	*0.7*

B.5 Alkalinity and Anion QC Data

B.5.2 Bottle Blanks, Trip Blanks, Lab Reagent Blanks and Preparation Blanks

Bottle Blanks verify that the interior surfaces of sample bottles are free of contamination (below detection limit). The blank consists of a de-ionized water rinse of a bottle after bottles have been prepared for sample collection.

Trip Blanks measure potential sample contamination from the sample bottle, reagent water, or contamination from preparing, handling or transporting the blank from the field to the laboratory and back. A trip blank was prepared by filling a sample bottle with de-ionized water. It was transported in the sample-shipping container to the field. The bottle cap was removed in the field and was exposed to the sampling environment for the length of time an actual sample would be open to the elements. The bottle was capped and transported back to the lab where it was then analyzed.

Lab Reagent Blanks verify that the reagent water used in the preparation of standards and dilutions is free of contamination (below detection limit). It also verifies that autosampler vials and caps are free of contamination. Reagent water is poured directly into an autosampler vial and analyzed.

Preparation Blanks verify that there is no introduction of contamination through the preparation of samples. These blanks were only prepared when a sample or samples required filtration in the laboratory. Preparation Blanks were prepared by filtering and analyzing an aliquot of reagent water.

Detection limits are defined as the concentration of the most dilute calibration standard (standard 1).

EPA Method 300.00 Bottle Blanks by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
Bottle Blank AN-001	5/1/00	bdl	bdl	bdl
Bottle Blank AN-002	6/27/00	bdl	bdl	bdl
Bottle Blank AN-003	7/12/00	bdl	bdl	bdl
Bottle Blank AN-004	7/11/00	bdl	bdl	bdl
Bottle Blank AN-005	8/15/00	bdl	bdl	bdl
Bottle Blank AN-006	8/15/00	bdl	bdl	bdl
Bottle Blank AN-007	8/15/00	bdl	bdl	bdl
Bottle Blank AN-009 (Trip Blank 082800)	8/29/00	bdl	bdl	bdl
Bottle Blank AN-010	11/8/00	bdl	bdl	bdl
Bottle Blank AN-011	11/8/00	bdl	bdl	bdl
Bottle Blank AN-012	11/8/00	bdl	bdl	bdl

Note: bdl = below detection limit

# of runs	*11*	*11*	*11*
# of runs above DL	*0*	*0*	*0*
Maximum value above DL	*N/A*	*N/A*	*N/A*

EPA Method 300.00 Trip Blanks by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
TRIP BLANK 050100	5/2/00	bdl	bdl	bdl
TRIP BLANK 061900	6/20/00	bdl	-	bdl
TRIP BLANK 062000	6/21/00	bdl	bdl	bdl
TRIP BLANK 062600	6/27/00	bdl	bdl	bdl
TRIP BLANK 062700	6/29/00	bdl	bdl	bdl
TRIP BLANK 062800	6/29/00	bdl	bdl	bdl
TRIP BLANK 062900	6/30/00	bdl	bdl	bdl
TRIP BLANK 063000	6/30/00	bdl	bdl	bdl
TRIP BLANK 071000	7/11/00	bdl	bdl	bdl
TRIP BLANK 071700	7/18/00	bdl	bdl	bdl
TRIP BLANK 071800	7/19/00	bdl	bdl	bdl
TRIP BLANK 071900	7/20/00	bdl	bdl	bdl
TRIP BLANK 072000	7/21/00	bdl	bdl	bdl
TRIP BLANK 072400	7/25/00	bdl	bdl	bdl
TRIP BLANK 081400	8/15/00	bdl	bdl	bdl
TRIP BLANK 082800	8/29/00	bdl	bdl	bdl
TRIP BLANK 082900	8/30/00	bdl	bdl	bdl
TRIP BLANK 083000	8/31/00	bdl	bdl	bdl
TRIP BLANK 093000	10/3/00	bdl	bdl	bdl
TRIP BLANK 100100	10/2/00	bdl	bdl	bdl
Note: bdl = below detection limit				
	# of runs	*19*	*18*	*19*
	# of runs above DL	*0*	*0*	*0*
	Maximum value above DL	*N/A*	*N/A*	*N/A*

EPA Method 300.00 Laboratory Reagent Blanks by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
REAGENT WATER BLANK	5/2/00	bdl	bdl	bdl
REAGENT WATER BLANK	6/20/00	-	bdl	-
REAGENT WATER BLANK	6/21/00	bdl	-	bdl
REAGENT WATER BLANK	6/21/00	bdl	bdl	bdl
REAGENT WATER BLANK	6/27/00	bdl	bdl	bdl
REAGENT WATER BLANK	6/29/00	bdl	bdl	bdl
REAGENT WATER BLANK	6/30/00	bdl	bdl	bdl
REAGENT WATER BLANK	7/6/00	bdl	bdl	bdl
REAGENT WATER BLANK	7/11/00	bdl	bdl	bdl
REAGENT WATER BLANK	7/12/00	bdl	bdl	bdl
REAGENT WATER BLANK	7/18/00	bdl	bdl	bdl
REAGENT WATER BLANK	7/19/00	bdl	bdl	bdl
REAGENT WATER BLANK	7/20/00	bdl	bdl	bdl
REAGENT WATER BLANK	7/21/00	bdl	bdl	bdl
REAGENT WATER BLANK	7/25/00	bdl	bdl	bdl
REAGENT WATER BLANK	8/15/00	bdl	bdl	bdl
REAGENT WATER BLANK	8/29/00	bdl	bdl	bdl
REAGENT WATER BLANK	8/30/00	bdl	bdl	bdl
REAGENT WATER BLANK	8/31/00	bdl	bdl	bdl
REAGENT WATER BLANK	10/2/00	bdl	bdl	bdl
REAGENT WATER BLANK	10/3/00	bdl	bdl	bdl
REAGENT WATER BLANK	10/4/00	bdl	bdl	bdl
REAGENT WATER BLANK	10/12/00	-	-	bdl
REAGENT WATER BLANK	11/8/00	bdl	bdl	bdl

Note: bdl = below detection limit

# of runs	*22*	*22*	*23*
# of runs above DL	*0*	*0*	*0*
Maximum value above DL	*n/a*	*n/a*	*n/a*

EPA Method 300.00 Anion Preparation Blanks by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
-				-
PREP BLANK	5/2/00	bdl	bdl	bdl
PREP BLANK	6/20/00	-	bdl	-
PREP BLANK	6/21/00	bdl	-	bdl
PREP BLANK	6/30/00	bdl	bdl	bdl
PREP BLANK	7/11/00	bdl	bdl	bdl
PREP BLANK	7/18/00	bdl	bdl	bdl
PREP BLANK	7/19/00	bdl	bdl	bdl
PREP BLANK	7/21/00	bdl	bdl	bdl
PREP BLANK	7/25/00	bdl	bdl	bdl
PREP BLANK	8/31/00	bdl	bdl	bdl
Note: bdl = below detection limit				
	# of runs	*9*	*9*	*9*
	# of runs above DL	*0*	*0*	*0*
	Maximum value above DL	*n/a*	*n/a*	*n/a*

APPENDIX B – Water Resources

B.5 Alkalinity and Anion QC Data

B.5.3 Field Duplicates and Splits and Laboratory Duplicates

Field duplicates are samples collected identically and consecutively over a minimum period of time. They provide a measure of the total field sampling and laboratory analytical precision, including that resulting from the heterogeneity of the medium being sampled.

Field Splits are randomly chosen samples that have been collected into a sample bottle and then "split" by pouring half the sample into another sample bottle. They provide a measure of the heterogeneity of the medium being sampled.

Laboratory Duplicates are random samples analyzed twice, non-consecutively, in order to assess instrument or method performance over the duration of analysis.

Percent difference of duplicates samples are calculated by dividing the absolute value of the difference between the original and the duplicate sample by the average value of the two samples. We then multiply this value by 100 to obtain percent units.

Alkalinity Field Duplicate Samples

Sample Name	CaCO3 (mg/L)
MW-5 050100	250
MW-5 050100 Field Dup	240
% difference	*4%*
GKM-3RED 061900	225
GKM-3RED 061900 Field Dup	220
% difference	*2%*
MLS-5RED 062000	210
MLS-5RED 062000 Field Dup	200
% difference	*5%*
GKM-7BLUE 062600	230
GKM-7BLUE 062600 Field Dup	220
% difference	*4%*
MLS-3RED 062700	255
MLS-3RED 062700 Field Dup	260
% difference	*2%*
GKW-4 062800	180
GKW-4 062800 Field Dup	180
% difference	*0%*
MW-4 063000	315
MW-4 063000 Field Dup	325
% difference	*3%*
GKW-8 062900	115
GKW-8 062900 Field Dup	120
% difference	*4%*
GKM-2W 071700	130
GKM-2W 071700 Field Dup	140
% difference	*7%*
GKW-4 071900	185
GKW-4 071900 Field Dup	195
% difference	*5%*

Sample Name	CaCO3 (mg/L)
MW-5 071800	270
MW-5 071800 Field Dup	255
% difference	*6%*
GKW-7 072000	160
GKW-7 072000 Field Dup	155
% difference	*3%*
GKW-9 072400	260
GKW-9 072400 Field Dup	315
% difference	*19%*
MW-4 082800	295
MW-4 082800 Field Dup	305
% difference	*3%*
GKW-9 082900	305
GKW-9 082900 Field Dup	285
% difference	*7%*
GKW-2 083000	275
GKW-2 083000 Field Dup	285
% difference	*4%*
GKW-1 093000	155
GKW-1 093000 Field Dup	165
% difference	*6%*
GKW-8 092900	120
GKW-8 092900 Field Dup	125
% difference	*4%*
MW-4 100100	290
MW-4 100100 Field Dup	280
% difference	*4%*

Alkalinity Field Split Samples

Sample Name	CaCO3 (mg/L)
MW-5 050100	250
MW-5 050100 Field Split	270
% difference	*8%*
GKM-3RED 061900	225
GKM-3RED 061900 Field Split	195
% difference	*14%*
MLS-5RED 062000	210
MLS-5RED 062000 Field Split	200
% difference	*5%*
GKM-7BLUE 062600	230
GKM-7BLUE 062600 Field Split	220
% difference	*4%*
MLS-3RED 062700	255
MLS-3RED 062700 Field Split	245
% difference	*4%*
GKW-4 062800	180
GKW-4 062800 Field Split	180
% difference	*0%*
GKW-8 062900	115
GKW-8 062900 Field Split	105
% difference	*9%*
MW-4 063000	315
MW-4 063000 Field Split	305
% difference	*3%*
GKM-2W 071700	130
GKM-2W 071700 Field Split	135
% difference	*4%*
GKW-4 071900	185
GKW-4 071900 Field Split	190
% difference	*3%*

Sample Name	CaCO3 (mg/L)
MW-5 071800	270
MW-5 071800 Field Split	270
% difference	*0%*
GKW-7 072000	160
GKW-7 072000 Field Split	160
% difference	*0%*
GKW-9 072400	260
GKW-9 072400 Field Split	315
% difference	*19%*
MW-4 082800	295
MW-4 082800 Field Split	300
% difference	*2%*
GKW-9 082900	305
GKW-9 082900 Field Split	265
% difference	*14%*
GKW-2 083000	275
GKW-2 083000 Field Split	215
% difference	*24%*
GKW-8 092900	120
GKW-8 092900 Field Split	110
% difference	*9%*
GKW-1 093000	155
GKW-1 093000 Field Split	315
% difference	*68%*
MW-4 100100	290
MW-4 100100 Field Split	275
% difference	*5%*

Alkalinity Laboratory Duplicate Samples

Sample Name	CaCO3 (mg/L)
ALYSD-1 081400	225
ALYSD-1 081400 Lab Dup	225
% difference	*0%*
ALYSD2-2 071700	290
ALYSD2-2 071700 Lab Dup	290
% difference	*0%*
BLYSD-2 072000	270
BLYSD-2 072000 Lab Dup	270
% difference	*0%*
GKM-1WB 093000	240
GKM-1WB 093000 Lab Dup	245
% difference	*2%*
GKM-2BLUE 071700	150
GKM-2BLUE 071700 Lab Dup	145
% difference	*3%*
GKM-3BLUE 093000	215
GKM-3BLUE 093000 Lab Dup	215
% difference	*0%*
GKM-3GREEN 071700	235
GKM-3GREEN 071700 Lab Dup	225
% difference	*4%*
GKM-3RED 083000	205
GKM-3RED 083000 Lab Dup	210
% difference	*2%*
GKM-3W 083000	210
GKM-3W 083000 Lab Dup	220
% difference	*5%*
GKM-4RED 072000	255
GKM-4RED 072000 Lab Dup	280
% difference	*9%*

Sample Name	CaCO3 (mg/L)
GKM-4W 100100	240
GKM-4W 100100 Lab Dup	245
% difference	*2%*
GKM-5BLUE 061900	162
GKM-5BLUE 061900 Lab Dup	155
% difference	*4%*
GKM-6GREEN 092900	130
GKM-6GREEN 092900 Lab Dup	135
% difference	*4%*
GKM-6W 082900	135
GKM-6W 082900 Lab Dup	140
% difference	*4%*
GKM-7W 072400	195
GKM-7W 072400 Lab Dup	190
% difference	*3%*
GKM-7W 092900	180
GKM-7W 092900 Lab Dup	165
% difference	*9%*
GKM-8 BLUE 062600	245
GKM-8 BLUE 062600 Lab Dup	245
% difference	*0%*
GKM-8RED 082900	235
GKM-8RED 082900 Lab Dup	225
% difference	*4%*
GKM-9W 082900	175
GKM-9W 082900 Lab Dup	185
% difference	*6%*
GKW-10 082800	280
GKW-10 082800 Lab Dup	275
% difference	*2%*

Sample Name	CaCO3 (mg/L)
GKW-11 071800	240
GKW-11 071800 Lab Dup	235
% difference	*2%*
GKW-2 062800	175
GKW-2 062800 Lab Dup	175
% difference	*0%*
GKW-2 071900	200
GKW-2 071900 Lab Dup	185
% difference	*8%*
GKW-5 062900	155
GKW-5 062900 Lab Dup	165
% difference	*6%*
LYSD2-1 082800	720
LYSD2-1 082800 Lab Dup	700
% difference	*3%*
LYSD2-5 083000	15
LYSD2-5 083000 Lab Dup	15
% difference	*0%*
LYSS-5 071700	15
LYSS-5 071700 Lab Dup	20
% difference	*29%*
LYSVD-1 082800	355
LYSVD-1 082800 Lab Dup	370
% difference	*4%*
LYSVD-9 092900	150
LYSVD-9 092900 Lab Dup	155
% difference	*3%*
MLS-3RED 072000	230
MLS-3RED 072000 Lab Dup	210
% difference	*9%*

Sample Name	CaCO3 (mg/L)
MLS-4RED 100100	285
MLS-4RED 100100 Lab Dup	275
% difference	*4%*
MLS-4W 100100	275
MLS-4W 100100 Lab Dup	280
% difference	*2%*
MLS-5GREEN 062700	235
MLS-5GREEN 062700 Lab Dup	225
% difference	*4%*
MLS-5W 071800	275
MLS-5W 071800 Lab Dup	250
% difference	*10%*
MW-1 050100	327
MW-1 050100 Lab Dup	315
% difference	*4%*
MW-1 100100	320
MW-1 100100 Lab Dup	320
% difference	*0%*
MW-2 063000	270
MW-2 063000 Lab Dup	280
% difference	*4%*

EPA Method 300.0 Field Split Samples by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
MW-5 FIELD SPLIT 050100	5/2/00	6	0.4	32.6
MW-5 050100	5/2/00	6	0.4	32.6
GKM-3RED 061900	6/21/00	8.9	-	91.6
GKM-3RED 061900 Field Split	6/21/00	9.3	-	92.6
% difference		*4.4%*	*N/A*	*1.1%*
MLS-5 RED 062000	6/21/00	8	0.2	58.7
MLS-5 RED 062000 Field Split	6/21/00	8.1	0.2	58.8
% difference		*1.2%*	*0.0%*	*0.2%*
GKM-7BLUE 062600	6/27/00	6.1	bdl	70.7
GKM-7BLUE 062600 Field Split	6/27/00	6.1	bdl	70.7
% difference		*0.0%*	*N/A*	*0.0%*
MLS-3 RED 062700	6/29/00	36	0.6	273.5
MLS-3 RED 062700 Field Split	6/29/00	35.5	0.7	267.7
% difference		*1.4%*	*15.4%*	*2.1%*
GKW-4 062800	6/29/00	8.7	0.8	92.8
GKW-4 062800 Field Split	6/29/00	8.6	0.8	92.8
% difference		*1.2%*	*0.0%*	*0.0%*
GKW-8 062900	6/30/00	8	0.6	35.6
GKW-8 062900 Field Split	6/30/00	8	0.6	35.7
% difference		*0.0%*	*0.0%*	*0.3%*
MW-4 063000	6/30/00	10.1	1.2	34.3
MW-4 063000 Field Split	6/30/00	9.9	1.2	34.2
% difference		*2.0%*	*0.0%*	*0.3%*
MW-5 071800	7/19/00	7.6	0.6	38.9
MW-5 071800 Field Split	7/19/00	7.5	0.6	39
% difference		*1%*	*0%*	*0%*
GKM-2W 071700	7/18/00	5.3	0.4	28.4
GKM-2W 071700 Field Split	7/19/00	5.2	0.4	28.2
% difference		*1.9%*	*0.0%*	*0.7%*
GKW-4 071900	7/20/00	8.5	0.4	84.7
GKW-4 071900 Field Split	7/20/00	8.4	0.4	84.8
% difference		*1.2%*	*0.0%*	*0.2%*
GKW-7 072000	7/21/00	6.8	bdl	31.9
GKW-7 072000 Field Split	7/21/00	6.8	bdl	31.8
% difference		*0.0%*	*N/A*	*0.0%*

Note: bdl = below detection limit

EPA Method 300.0 Field Split Samples by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
GKW-9 072400	7/25/00	13	bdl	56.6
GKW-9 072400 Field Split	7/25/00	13	bdl	56.6
% difference		*0.8%*	*N/A*	*0.2%*
MW-4 082800	8/29/00	16.5	1.94	47.8
MW-4 082800 Field Split	8/29/00	16.4	1.94	47.7
% difference		*1%*	*0%*	*0%*
GKW-9 082900	8/30/00	11.5	bdl	68.1
GKW-9 082900 Field Split	8/30/00	11.5	bdl	68.2
% difference		*0%*	*N/A*	*0%*
GKW-2 083000	8/31/00	9.2	0.9	85.5
GKW-2 083000 Field Split	8/31/00	9.3	0.9	85.6
% difference		*1%*	*0%*	*0%*
MW-4 100100	10/2/00	18.6	2.2	49.8
MW-4 100100 Field Split	10/2/00	18.5	2.2	49.9
% difference		*1%*	*0%*	*0%*
GKW-1 093000	10/3/00	16.1	1	75.9
GKW-1 093000 Field Split	10/3/00	16.1	1	75.7
% difference		*0%*	*0%*	*0%*
MW-4 100100	10/3/00	18.9	2.2	48
MW-4 100100 Field Split	10/3/00	18.8	2.2	47.9
% difference		*0%*	*0%*	*0%*
GKW-8 092900	10/4/00	7.5	0.5	35.1
GKW-8 092900 Field Split	10/4/00	7.6	0.5	35.1
% difference		*0%*	*0%*	*0%*

Note: bdl = below detection limit

EPA Method 300.0 Field Duplicate Samples by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
MW-5 050100	5/2/00	6	0.4	32.6
MW-5 050100 Field Dup	5/2/00	6	0.4	32.7
% difference		*0%*	*0%*	*0%*
GKM-3RED 061900	6/21/00	8.9	-	91.6
GKM-3RED 061900 Field Dup	6/21/00	9.4	-	92.6
% difference		*5%*	*N/A*	*1%*
MLS-5 RED 062000	6/21/00	8	0.2	58.7
MLS-5 RED 062000 Field Dup	6/21/00	8	0.2	58.9
% difference		*0%*	*0%*	*0%*
GKM-7BLUE 062600	6/27/00	6.1	bdl	70.7
GKM-7BLUE 062600 Field Dup	6/27/00	6.3	bdl	73.8
% difference		*3%*	*N/A*	*4%*
MLS-3 RED 062700	6/29/00	36	0.6	273.5
MLS-3 RED 062700 Field Dup	6/29/00	30.1	1.2	198.7
% difference		*18%*	*67%*	*32%*
GKW-4 062800	6/29/00	8.7	0.8	92.8
GKW-4 062800 Field Dup	6/29/00	8.6	0.8	92.8
% difference		*1%*	*0%*	*0%*
GKW-8 062900	6/30/00	8	0.6	35.6
GKW-8 062900 Field Dup	6/30/00	8.1	0.6	35.6
% difference		*1%*	*0%*	*0%*
MW-4 063000	6/30/00	10.1	1.2	34.3
MW-4 063000 Field Dup	6/30/00	10	1.2	35
% difference		*1%*	*0%*	*2%*
GKM-2W 071700 Field Dup	7/18/00	5.3	0.4	28.5
GKM-2W 071700	7/18/00	5.3	0.4	28.4
% difference		*0%*	*0%*	*0%*
MW-5 071800 Field Dup	7/19/00	7.5	0.6	39.1
MW-5 071800	7/19/00	7.6	0.6	38.9
% difference		*1%*	*0%*	*1%*
GKW-4 071900	7/20/00	8.5	0.4	84.7
GKW-4 071900 Field Dup	7/20/00	8.5	0.4	84.6
% difference		*0%*	*0%*	*0%*
GKW-7 072000	7/21/00	6.8	bdl	31.9
GKW-7 072000 Field Dup	7/21/00	6.8	bdl	31.8
% difference		*0%*	*N/A*	*0%*

Note: bdl = below detection limit

EPA Method 300.0 Field Duplicate Samples by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
GKW-9 072400	7/25/00	13	bdl	56.6
GKW-9 072400 Field Dup	7/25/00	13.1	bdl	56.5
% difference		*1%*	*N/A*	*0%*
MW-4 082800 Field Dup	8/29/00	16.5	1.95	47.9
MW-4 082800	8/29/00	16.5	1.94	47.8
% difference		*0%*	*1%*	*0%*
GKW-9 082900 Field Dup	8/30/00	11.5	bdl	68.1
GKW-9 082900	8/30/00	11.5	bdl	68.1
% difference		*0%*	*N/A*	*0%*
GKW-2 083000 Field Dup	8/31/00	9.2	0.9	85.5
GKW-2 083000	8/31/00	9.2	0.9	85.5
% difference		*0%*	*0%*	*0%*
MW-4 100100 Field Dup	10/2/00	18.7	2.2	50.1
MW-4 100100	10/2/00	18.6	2.2	49.8
% difference		*1%*	*0%*	*1%*
GKW-1 093000	10/3/00	16.1	1	75.9
GKW-1 093000 Field Dup	10/3/00	16.1	1	75.7
% difference		*0%*	*0%*	*0%*
MW-4 100100	10/3/00	18.9	2.2	48
MW-4 100100 Field Dup	10/3/00	18.8	2.2	48.1
% difference		*0%*	*0%*	*0%*
GKW-8 092900	10/4/00	7.5	0.5	35.1
GKW-8 092900 Field Dup	10/4/00	7.5	0.5	35.1
% difference		*0%*	*0%*	*0%*

Note: bdl = below detection limit

EPA Method 300.0 Laboratory Duplicate Samples by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
MW-4 050100	5/2/00	9.5	1.1	35.2
MW-4 050100 Lab Dup	5/2/00	9.5	1.1	35.5
% difference		*0%*	*0%*	*1%*
GKM-1RED 061900	6/20/00	-	0.4	-
GKM-1RED 061900 Lab Dup	6/20/00	-	0.4	-
% difference		*N/A*	*0%*	*N/A*
GKM-4RED 061900	6/20/00	-	0.2	-
GKM-4RED 061900 Lab Dup	6/20/00	-	0.2	-
% difference		*N/A*	*0%*	*N/A*
GKM-1RED 061900 1/4 DIL	6/21/00	3	-	27.6
GKM-1RED 061900 1/4 DIL Lab Dup	6/21/00	3	-	27.7
% difference		*0%*	*N/A*	*0%*
GKM-4RED 061900 1/4 DIL	6/21/00	1.5	-	21.1
GKM-4RED 061900 1/4 DIL Lab Dup	6/21/00	1.5	-	20.7
% difference		0%	*N/A*	2%
GKM-2BLUE 062000	6/21/00	4.3	0.1	24.3
GKM-2BLUE 062000 Lab Dup	6/21/00	4.4	0.2	24.5
% difference		*2%*	*67%*	*1%*
GKM-6BLUE 062600	6/27/00	11.2	bdl	96.2
GKM-6BLUE 062600 Lab Dup	6/27/00	11.3	bdl	96.5
% difference		*1%*	*N/A*	*0%*
GKM-8GREEN 062600	6/27/00	7.5	bdl	9.9
GKM-8GREEN 062600 Lab Dup	6/27/00	7.4	bdl	9.9
% difference		*1%*	*N/A*	*0%*
MLS-5W 062700	6/29/00	7.8	bdl	58.2
MLS-5W 062700 Lab Dup	6/29/00	7.7	0.2	58.6
% difference		*1%*	*N/A*	*1%*
GKW-1 062800	6/29/00	18.8	1.1	72.1
GKW-1 062800 Lab Dup	6/29/00	18.7	1.1	72.3
% difference		*1%*	*0%*	*0%*
GKM-2W 062800	6/29/00	4.7	0.4	27.3
GKM-2W 062800 Lab Dup	6/29/00	4.6	0.4	27.3
% difference		*2%*	*0%*	*0%*
MW-2 063000	6/30/00	13	0.5	51.6
MW-2 063000 Lab Dup	6/30/00	12.8	0.5	51.7
% difference		*2%*	*0%*	*0%*
LYSA-300 BLANK	7/6/00	bdl	bdl	bdl
LYSA-300 BLANK Lab Dup	7/6/00	bdl	bdl	bdl
% difference		*N/A*	*N/A*	*N/A*

Note: bdl = below detection limit

EPA Method 300.0 Laboratory Duplicate Samples by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
GKM-1W 071700	7/18/00	10.3	0.2	97.6
GKM-1W 071700 Lab Dup	7/18/00	10.2	0.2	97.7
% difference		*1%*	*0%*	*0%*
GKM-1RED 071700	7/18/00	10	0.2	95.6
GKM-1RED 071700 Lab Dup	7/18/00	9.9	0.2	95.2
% difference		*1%*	*0%*	*0%*
GKM-2BLUE 071700	7/18/00	5	0.4	27.8
GKM-2BLUE 071700 Lab Dup	7/18/00	5.1	0.4	28.3
% difference		*2%*	*0%*	*2%*
GKW-11 071800	7/19/00	25.2	0.3	48
GKW-11 071800 Lab Dup	7/19/00	25.1	0.3	48.2
% difference		*0%*	*0%*	*0%*
MLS-4W 071800	7/19/00	12.6	1.2	39.3
MLS-4W 071800 Lab Dup	7/19/00	12.6	1.2	39.7
% difference		*0%*	*0%*	*1%*
GKW-11 071800 1/2 DIL	7/19/00	12.8	0.1	23.5
GKW-11 071800 1/2 DIL Lab Dup	7/19/00	12.9	0.1	23.6
% difference		*1%*	*0%*	*0%*
GKW-1 071900	7/20/00	18.8	1.1	69.9
GKW-1 071900 Lab Dup	7/20/00	18.7	1.1	70
% difference		*1%*	*0%*	*0%*
GKW-3 071900	7/20/00	8.2	0.2	88.4
GKW-3 071900 Lab Dup	7/20/00	8.1	0.1	88.5
% difference		*1%*	*67%*	*0%*
MLS-3W 072000	7/21/00	bdl	bdl	bdl
MLS-3W 072000 Lab Dup	7/21/00	bdl	bdl	bdl
% difference		*N/A*	*N/A*	*N/A*
GKM-8BLUE 072000	7/21/00	bdl	bdl	bdl
GKM-8BLUE 072000 Lab Dup	7/21/00	bdl	bdl	bdl
% difference		*N/A*	*N/A*	*N/A*
GKM-4BLUE 072000	7/21/00	bdl	bdl	bdl
GKM-4BLUE 072000 Lab Dup	7/21/00	bdl	bdl	bdl
% difference		*N/A*	*N/A*	*N/A*
GKW-9 072400	7/25/00	bdl	bdl	bdl
GKW-9 072400 Lab Dup	7/25/00	bdl	bdl	bdl
% difference		*N/A*	*N/A*	*N/A*
GKM-7W 072400	7/25/00	bdl	bdl	bdl
GKM-7W 072400 Lab Dup	7/25/00	bdl	bdl	bdl
% difference		*N/A*	*N/A*	*N/A*

Note: bdl = below detection limit

EPA Method 300.0 Laboratory Duplicate Samples by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
ALYSD-1 081400 1/5 DIL	8/15/00	10.6	1.1	19.4
ALYSD-1 081400 1/5 DIL Lab Dup	8/15/00	10.6	1.1	19.4
% difference		*0%*	*0%*	*0%*
GKW-11 082800	8/29/00	9.9	0.56	40
GKW-11 082800 Lab Dup	8/29/00	10	0.55	40.7
% difference		*1%*	*2%*	*2%*
MW-4 082800 FD	8/29/00	16.5	1.81	47.9
MW-4 082800 FD Lab Dup	8/29/00	16.7	1.82	48.6
% difference		*1%*	*1%*	*1%*
GKW-10 082800	8/29/00	9.1	0.07	31.1
GKW-10 082800 Lab Dup	8/29/00	9.1	0.06	31.4
% difference		*0%*	*15%*	*1%*
MLS-5W 082800	8/29/00	7.7	0.11	42
MLS-5W 082800 Lab Dup	8/29/00	7.7	0.1	42.8
% difference		*0%*	*10%*	*2%*
LYSVD-9 082900	8/30/00	8.4	0.3	56.3
LYSVD-9 082900 Lab Dup	8/30/00	8.7	0.31	57.8
% difference		*4%*	*3%*	*3%*
GKM-8RED 082900	8/30/00	6.5	bdl	30.1
GKM-8RED 082900 Lab Dup	8/30/00	6.6	bdl	30.4
% difference		*2%*	*N/A*	*1%*
GKW-9 082900 FD	8/30/00	11.5	bdl	68.1
GKW-9 082900 FD Lab Dup	8/30/00	11.8	bdl	68.8
% difference		*3%*	*N/A*	*1%*
GKM-3GREEN 083000	8/31/00	9.7	bdl	59.4
GKM-3GREEN 083000 Lab Dup	8/31/00	9.7	bdl	59.6
% difference		*0%*	*N/A*	*0%*
GKM-4W 083000	8/31/00	6.2	0.3	94.8
GKM-4W 083000 Lab Dup	8/31/00	6.3	0.3	94.9
% difference		*2%*	*0%*	*0%*
GKW-4 083000	8/31/00	8	0.5	93.4
GKW-4 083000 Lab Dup	8/31/00	8.2	0.5	93.2
% difference		*2%*	*0%*	*0%*
LYSD-4 083000 1/20 DIL	9/1/00	1.9	1.1	37.2
LYSD-4 083000 1/20 DIL Lab Dup	9/1/00	1.9	1.1	37
% difference		*0%*	*0%*	*1%*

Note: bdl = below detection limit

EPA Method 300.0 Laboratory Duplicate Samples by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
GKM-1WC 093000	10/2/00	11.8	0.2	100.4
GKM-1WC 093000 Lab Dup	10/2/00	11.8	0.2	100.2
% difference		*0%*	*0%*	*0%*
GKM-4W 100100	10/2/00	7.2	0.4	92.6
GKM-4W 100100 Lab Dup	10/2/00	7.5	0.4	92.8
% difference		*4%*	*0%*	*0%*
GKW-10 100100	10/2/00	7.9	0.1	15.8
GKW-10 100100 Lab Dup	10/2/00	8	0.1	15.8
% difference		*1%*	*0%*	*0%*
MW-1 100100	10/2/00	10.8	0.3	25.3
MW-1 100100 Lab Dup	10/2/00	10.8	0.3	25.2
% difference		*0%*	*0%*	*0%*
GKM-3W 093000	10/3/00	10.9	0.3	92
GKM-3W 093000 Lab Dup	10/3/00	10.9	0.3	91.6
% difference		*0%*	*0%*	*0%*
GKM-5W 093000	10/3/00	9.7	0.3	94.7
GKM-5W 093000 Lab Dup	10/3/00	9.5	0.3	94.9
% difference		*2%*	*0%*	*0%*
GKW-1 093000	10/3/00	16.1	1	75.9
GKW-1 093000 FD Lab Dup	10/3/00	16.1	1	75.8
% difference		*0%*	*0%*	*0%*
GKM-6W 092900	10/4/00	5.7	bdl	29.3
GKM-6W 092900 Lab Dup	10/4/00	5.8	bdl	29.2
% difference		*2%*	*N/A*	*0%*
GKM-8RED 092900	10/4/00	6.7	bdl	33.1
GKM-8RED 092900 Lab Dup	10/4/00	6.7	bdl	33.1
% difference		*0%*	*N/A*	*0%*
GKM-9W 092900	10/4/00	5.2	bdl	23.4
GKM-9W 092900 Lab Dup	10/4/00	5.2	bdl	23.6
% difference		*0%*	*N/A*	*1%*
LYSVD2-8 092900 1/2 DIL Lab Dup	10/12/00	-	-	62.7
LYSVD2-8 092900 1/2 DIL Lab Dup	10/12/00	-	-	62.7
% difference		*N/A*	*N/A*	*0%*
Bottle Blank AN-011	11/8/00	bdl	bdl	bdl
Bottle Blank AN-011 Duplicate	11/8/00	bdl	bdl	bdl
% difference		*N/A*	*N/A*	*N/A*

Note: bdl = below detection limit

APPENDIX B – Water Resources

B.5 Alkalinity and Anion QC Data

B.5.4 Laboratory Sample Matrix Spike Samples and Laboratory Fortified Matrix Blanks

Laboratory spikes are samples in which analytes of known concentrations have been added to an aliquot of the sample digest in order to assess matrix effects on analyte recoveries.

Lab Fortified Blank - Lab Fortified Blanks (LFBs) are samples in which analytes of known concentrations have been added to an aliquot of the calibration blank in order to assess matrix effects on analyte recoveries.

Percent spike recoveries are calculated by subtracting the diluted sample value from the spiked sample value and dividing the difference by the amount of spike added. We then multiply this value by 100 to obtain percent units.

EPA Method 300.0 Laboratory Sample Matrix Spikes by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
MW-4 050100	5/2/00	9.5	1.1	35.2
MW-4 050100 Spike	5/2/00	9.6	1.2	37.2
% spike recovery		*105%*	*105%*	*110%*
GKM-1RED 061900	6/20/00	-	0.4	-
GKM-1RED 061900 Spike	6/20/00	-	0.6	-
% spike recovery		*N/A*	*120%*	*N/A*
GKM-4RED 061900	6/20/00	-	0.2	-
GKM-4RED 061900 Spike	6/20/00	-	0.4	-
% spike recovery		*N/A*	*110%*	*N/A*
GKM-1RED 061900 1/4 DIL	6/21/00	3	-	27.6
GKM-1RED 061900 1/4 DIL Spike	6/21/00	3.7	-	29.8
% spike recovery		*100%*	*N/A*	*99%*
GKM-4RED 061900 1/4 DIL	6/21/00	1.5	-	21.1
GKM-4RED 061900 1/4 DIL Spike	6/21/00	2.3	-	24.1
% spike recovery		*95%*	*N/A*	*102%*
GKM-2BLUE 062000	6/21/00	4.3	0.1	24.3
GKM-2BLUE 062000 Spike	6/21/00	5.8	0.3	34.5
% spike recovery		*97%*	*105%*	*105%*
GKM-6BLUE 062600	6/27/00	11.2	bdl	96.2
GKM-6BLUE 062600 Spike	6/27/00	12.5	0.2	99.6
% spike recovery		*121%*	*N/A*	*109%*
GKM-8GREEN 062600	6/27/00	7.5	bdl	9.9
GKM-8GREEN 062600 Spike	6/27/00	9	0.2	21
% spike recovery		*113%*	*N/A*	*101%*
MLS-5W 062700	6/29/00	7.8	bdl	58.2
MLS-5W 062700 Spike	6/29/00	9	0.4	65.1
amount spike added		2	0.2	12
% spike recovery		*99%*	*N/A*	*106%*
GKW-1 062800	6/29/00	18.8	1.1	72.1
GKW-1 062800 Spike	6/29/00	19	1.2	77.3
% spike recovery		*104%*	*105%*	*103%*
MW-2 063000	6/30/00	13	0.5	51.6
MW-2 063000 Spike	6/30/00	13.9	0.6	58.7
% spike recovery		*110%*	*75%*	*102%*

Note: bdl = below detection limit

EPA Method 300.0 Laboratory Sample Matrix Spikes by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
LYSA-300 BLANK	7/6/00	bdl	bdl	bdl
LYSA-300 BLANK Spike	7/6/00	2.1	0.2	11.9
% spike recovery		*N/A*	*N/A*	*N/A*
GKM-1W 071700	7/18/00	10.3	0.2	97.6
GKM-1W 071700 Spike	7/18/00	11.6	0.4	100.1
% spike recovery		*117%*	*110%*	*102%*
GKM-1RED 071700	7/18/00	10	0.2	95.6
GKM-1RED 071700 Spike	7/18/00	11.3	0.4	98.2
% spike recovery		*115%*	*110%*	*101%*
GKM-2BLUE 071700	7/18/00	5	0.4	27.8
GKM-2BLUE 071700 Spike	7/18/00	6.8	0.5	37.3
% spike recovery		*115%*	*70%*	*102%*
GKW-11 071800	7/19/00	25.2	0.3	48
GKW-11 071800 Spike	7/19/00	25	0.4	55.6
% spike recovery		*116%*	*65%*	*103%*
MLS-4W 071800	7/19/00	12.6	1.2	39.3
MLS-4W 071800 Spike	7/19/00	13.7	1.3	47.6
% spike recovery		*118%*	*110%*	*102%*
GKW-11 071800 1/2 DIL	7/20/00	12	0.2	23.3
GKW-11 071800 1/2 DIL Spike	7/20/00	12.8	0.3	32.9
% spike recovery		*100%*	*60%*	*99%*
GKW-1 071900	7/20/00	18.8	1.1	69.9
GKW-1 071900 Spike	7/20/00	19	1.2	75.2
% spike recovery		*104%*	*105%*	*102%*
GKW-3 071900	7/20/00	8.2	0.2	88.4
GKW-3 071900 Spike	7/20/00	9.4	0.3	92.2
% spike recovery		*101%*	*60%*	*105%*
MLS-3W 072000	7/21/00	bdl	bdl	bdl
MLS-3W 072000 Spike	7/21/00	bdl	bdl	bdl
% spike recovery		*N/A*	*N/A*	*N/A*
GKM-8BLUE 072000	7/21/00	bdl	bdl	bdl
GKM-8BLUE 072000 Spike	7/21/00	bdl	bdl	bdl
% spike recovery		*N/A*	*N/A*	*N/A*

Note: bdl = below detection limit

EPA Method 300.0 Laboratory Sample Matrix Spikes by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
GKM-4BLUE 072000	7/21/00	bdl	bdl	bdl
GKM-4BLUE 072000 Spike	7/21/00	bdl	bdl	bdl
% spike recovery		*N/A*	*N/A*	*N/A*
GKW-9 072400	7/25/00	bdl	bdl	bdl
GKW-9 072400 Spike	7/25/00	bdl	bdl	bdl
% spike recovery		*N/A*	*N/A*	*N/A*
GKM-7W 072400	7/25/00	bdl	bdl	bdl
GKM-7W 072400 Spike	7/25/00	bdl	bdl	bdl
% spike recovery		*N/A*	*N/A*	*N/A*
ALYSD-1 081400 1/5 DIL	8/15/00	10.6	1.1	19.4
ALYSD-1 081400 1/5 DIL Spike	8/15/00	11.6	1.2	29.7
% spike recovery		*103%*	*105%*	*102%*
GKW-11 082800	8/29/00	9.9	0.56	40
GKW-11 082800 Spike	8/29/00	11.1	0.61	48.9
% spike recovery		*110%*	*106%*	*108%*
MW-4 082800 FD	8/29/00	16.5	1.81	47.9
MW-4 082800 FD Spike	8/29/00	17.1	1.75	56.1
% spike recovery		*113%*	*121%*	*108%*
GKW-10 082800	8/29/00	9.1	0.07	31.1
GKW-10 082800 Spike	8/29/00	10.2	0.15	40.5
% spike recovery		*101%*	*87%*	*104%*
MLS-5W 082800	8/29/00	7.7	0.11	42
MLS-5W 082800 Spike	8/29/00	9	0.19	50.7
% spike recovery		*104%*	*91%*	*108%*
LYSVD-9 082900	8/30/00	8.4	0.3	56.3
LYSVD-9 082900 Spike	8/30/00	9.9	0.37	63.6
% spike recovery		*117%*	*100%*	*108%*
GKM-8RED 082900	8/30/00	6.5	0	30.1
GKM-8RED 082900 Spike	8/30/00	7.9	0.08	39.7
% spike recovery		*103%*	*80%*	*105%*
GKW-9 082900 FD	8/30/00	11.5	0	68.1
GKW-9 082900 FD Spike	8/30/00	12.7	0.07	74.6
% spike recovery		*118%*	*70%*	*111%*

Note: bdl = below detection limit

EPA Method 300.0 Laboratory Sample Matrix Spikes by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
GKM-3GREEN 083000	8/31/00	9.7	bdl	59.4
GKM-3GREEN 083000 Spike	8/31/00	10.8	0.2	65.8
% spike recovery		*104%*	*N/A*	*103%*
GKM-4W 083000	8/31/00	6.2	0.3	94.8
GKM-4W 083000 Spike	8/31/00	7.6	0.5	97.3
% spike recovery		*101%*	*115%*	*100%*
GKW-4 083000	8/31/00	8	0.5	93.4
GKW-4 083000 Spike	8/31/00	9.2	0.6	96.1
% spike recovery		*100%*	*75%*	*100%*
LYSD-4 083000 1/20 DIL	9/1/00	1.9	1.1	37.2
LYSD-4 083000 1/20 DIL Spike	9/1/00	3.6	1.2	45.6
% spike recovery		*95%*	*105%*	*101%*
GKM-1WC 093000	10/2/00	11.8	0.2	100.4
GKM-1WC 093000 Spike	10/2/00	12.7	0.4	102.8
% spike recovery		*104%*	*110%*	*104%*
GKM-4W 100100	10/2/00	7.2	0.4	92.6
GKM-4W 100100 Spike	10/2/00	8.8	0.6	95.6
% spike recovery		*116%*	*120%*	*102%*
GKW-10 100100	10/2/00	7.9	0.1	15.8
GKW-10 100100 Spike	10/2/00	9.2	0.3	26.3
% spike recovery		*105%*	*105%*	*101%*
MW-1 100100	10/2/00	10.8	0.3	25.3
MW-1 100100 Spike	10/2/00	11.7	0.5	35.1
% spike recovery		*99%*	*115%*	*103%*
GKM-3W 093000	10/3/00	10.9	0.3	92
GKM-3W 093000 Spike	10/3/00	11.8	0.5	94.3
% spike recovery		*100%*	*115%*	*96%*
GKM-5W 093000	10/3/00	9.7	0.3	94.7
GKM-5W 093000 Spike	10/3/00	10.7	0.5	97.5
% spike recovery		*98%*	*115%*	*102%*
GKW-1 093000	10/3/00	16.1	1	75.9
GKW-1 093000 FD Spike	10/3/00	16.4	1.1	80.2
% spike recovery		*95%*	*100%*	*99%*

Note: bdl = below detection limit

EPA Method 300.0 Laboratory Sample Matrix Spikes by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
GKM-6W 092900	10/4/00	5.7	0	29.3
GKM-6W 092900 Spike	10/4/00	7.1	0.2	38.3
% spike recovery		*99%*	*100%*	*99%*
GKM-8RED 092900	10/4/00	6.7	0	33.1
GKM-8RED 092900 Spike	10/4/00	7.9	0.2	41.8
% spike recovery		*94%*	*100%*	*100%*
GKM-9W 092900	10/4/00	5.2	0	23.4
GKM-9W 092900 Spike	10/4/00	6.6	0.2	33.1
% spike recovery		*96%*	*100%*	*100%*
LYSVD2-8 092900 1/2 DIL	10/12/00	-	-	62.7
LYSVD2-8 092900 1/2 DIL Spike	10/12/00	-	-	68.6
% spike recovery		*N/A*	*N/A*	*101%*
Bottle Blank AN-012	11/8/00	bdl	bdl	bdl
Bottle Blank AN-012 Spike	11/8/00	1.9	0.1	11.6
% spike recovery		*95%*	*100%*	*97%*

Note: bdl = below detection limit

EPA Method 300.0 Laboratory Fortified Blanks by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
-				-
LAB FORTIFIED BLANK	5/3/00	1	0.2	4.9
% spike recovery		*100%*	*100%*	*98%*
LAB FORTIFIED BLANK	6/20/00	-	0.2	-
% spike recovery		*N/A*	*100%*	*N/A*
LAB FORTIFIED BLANK	6/21/00	1.1	-	4.8
% spike recovery		*110%*	*N/A*	*96%*
LAB FORTIFIED BLANK	6/27/00	2	0.2	11.6
% spike recovery		*100%*	*100%*	*97%*
LAB FORTIFIED BLANK	6/29/00	1.9	0.2	11.7
% spike recovery		*95%*	*100%*	*98%*
LAB FORTIFIED BLANK	6/30/00	1.9	0.2	11.6
% spike recovery		*95%*	*100%*	*97%*
LAB FORTIFIED BLANK	7/12/00	1.9	0.2	11.7
% spike recovery		*95%*	*100%*	*98%*
LAB FORTIFIED BLANK	7/18/00	1.9	0.2	11.5
% spike recovery		*95%*	*100%*	*96%*
LAB FORTIFIED BLANK	7/19/00	1.9	0.2	11.7
% spike recovery		*95%*	*100%*	*98%*
LAB FORTIFIED BLANK	7/20/00	2	0.2	11.9
% spike recovery		*100%*	*100%*	*99%*
LAB FORTIFIED BLANK	7/21/00	2	0.2	11.6
% spike recovery		*100%*	*100%*	*97%*
LAB FORTIFIED BLANK	7/25/00	1.9	0.2	11.6
% spike recovery		*95%*	*100%*	*97%*
LAB FORTIFIED BLANK	8/15/00	1.9	0.2	11.8
% spike recovery		*95%*	*100%*	*98%*
LAB FORTIFIED BLANK	8/29/00	1.9	0.1	11.8
% spike recovery		*95%*	*100%*	*98%*
LAB FORTIFIED BLANK	8/30/00	2	0.09	11.7
% spike recovery		*100%*	*90%*	*98%*
LAB FORTIFIED BLANK	8/31/00	1.9	0.2	11.6
% spike recovery		*95%*	*100%*	*97%*
LAB FORTIFIED BLANK	9/1/00	2.1	0.2	11.8
% spike recovery		*105%*	*100%*	*98%*

EPA Method 300.0 Laboratory Fortified Blanks by Ion Chromatography

Sample Name	IC Analysis Date	Chloride (ppm)	N in Nitrate (ppm)	Sulfate (ppm)
LAB FORTIFIED BLANK	10/2/00	2	0.2	11.7
% spike recovery		*100%*	*100%*	*98%*
LAB FORTIFIED BLANK	10/3/00	2	0.2	11.6
% spike recovery		*100%*	*100%*	*97%*
LAB FORTIFIED BLANK	10/12/00	-	-	11.3
% spike recovery		*N/A*	*N/A*	*94%*

APPENDIX B – Water Resources

B.6 Metals QC Data

B.6.1 Instrument Performance Check Solutions

The Instrument Performance Check (IPC) is a composite solution containing known concentrations of analytes. The IPC is analyzed for initial and continuous calibration verification.

EPA Method 200.15 Instrument Performance Check Solutions by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
8/2/00	14:35	CW	IPC	0.4727	0.488	10.41	0.4989	0.523	0.499	0.5283	5.029	9.933	0.512	10.49	0.542	0.521	0.502
8/2/00	16:58	CW	IPC	0.4826	0.478	9.911	0.4994	0.513	0.502	0.5154	5.033	10.06	0.506	10.24	0.518	0.507	0.5
8/2/00	17:56	CW	IPC	0.487	0.482	9.927	0.501	0.512	0.503	0.514	5.033	10.09	0.507	9.948	0.518	0.506	0.5
8/4/00	10:41	CW	IPC	0.4866	0.472	9.857	0.5082	0.51	0.504	0.5033	4.912	10.14	0.498	10.64	0.482	0.497	0.493
8/4/00	11:59	CW	IPC	0.4873	0.475	9.768	0.5099	0.505	0.501	0.5028	4.905	10.1	0.498	10.28	0.486	0.496	0.494
8/4/00	12:59	CW	IPC	0.4841	0.465	9.773	0.5006	0.507	0.501	0.4979	4.921	10.1	0.49	10.53	0.478	0.489	0.486
8/4/00	13:58	CW	IPC	0.4831	0.47	9.793	0.5033	0.504	0.499	0.4997	4.899	10.08	0.496	10.18	0.483	0.493	0.489
8/4/00	15:39	CW	IPC	0.4858	0.466	9.714	0.5038	0.505	0.502	0.5025	4.909	10.1	0.494	10.51	0.476	0.493	0.489
8/4/00	16:36	CW	IPC	0.4862	0.461	9.723	0.5017	0.506	0.501	0.4974	4.898	10.1	0.491	10.26	0.474	0.487	0.486
8/7/00	11:33	CW	IPC	0.4778	0.48	9.672	0.5229	0.503	0.499	0.5136	4.95	9.941	0.504	10.35	0.497	0.505	0.499
8/7/00	13:23	CW	IPC	0.47	0.461	9.28	0.5203	0.495	0.497	0.5143	4.941	9.802	0.496	9.973	0.487	0.499	0.494
8/7/00	14:33	CW	IPC	0.4801	0.468	9.643	0.5106	0.504	0.5	0.5033	4.897	9.991	0.495	10.11	0.481	0.491	0.489
8/7/00	15:31	CW	IPC	0.4726	0.47	9.326	0.5253	0.495	0.496	0.521	4.928	9.829	0.505	9.902	0.5	0.505	0.501
8/7/00	17:02	CW	IPC	0.4724	0.459	9.388	0.5085	0.496	0.495	0.5016	4.867	9.847	0.489	10.25	0.482	0.49	0.485
8/8/00	11:26	CW	IPC	0.4897	0.482	9.737	0.5168	0.504	0.501	0.5088	4.99	10.04	0.501	10.54	0.496	0.502	0.496
8/8/00	12:34	CW	IPC	0.4916	0.48	9.738	0.5181	0.507	0.504	0.5109	5.037	10.13	0.506	10.45	0.497	0.502	0.497
8/8/00	13:47	CW	IPC	0.5196	0.515	10.44	0.5371	0.527	0.522	0.5255	5.068	10.66	0.528	10.93	0.506	0.522	0.517
8/8/00	14:48	CW	IPC	0.5069	0.496	10	0.5226	0.518	0.514	0.5162	5.121	10.41	0.515	10.62	0.502	0.509	0.504
8/8/00	15:55	CW	IPC	0.5109	0.506	10.24	0.5313	0.524	0.513	0.5274	5.061	10.44	0.526	10.35	0.511	0.521	0.512
8/8/00	16:45	CW	IPC	0.5107	0.482	10.16	0.5066	0.52	0.512	0.5024	5.037	10.42	0.502	10.78	0.488	0.496	0.488
8/10/00	13:14	CW	IPC	0.4806	0.49	9.736	0.5291	0.501	0.499	0.5265	4.968	9.912	0.514	10.24	0.516	0.515	0.507
8/10/00	14:08	CW	IPC	0.4758	0.457	9.545	0.5013	0.495	0.49	0.4971	4.891	9.802	0.484	10.33	0.475	0.483	0.477
8/10/00	15:09	CW	IPC	0.4721	0.456	9.338	0.5041	0.488	0.482	0.5035	4.836	9.668	0.488	9.973	0.473	0.487	0.478
8/10/00	16:08	CW	IPC	0.472	0.454	9.359	0.4981	0.487	0.482	0.4971	4.84	9.682	0.485	10.01	0.472	0.481	0.474
8/11/00	10:27	CW	IPC	0.4891	0.474	9.797	0.5043	0.507	0.499	0.5075	4.962	10.03	0.498	10.32	0.498	0.5	0.492
8/11/00	11:30	CW	IPC	0.4921	0.463	9.424	0.5077	0.495	0.502	0.5045	4.988	10.02	0.496	9.848	0.486	0.497	0.492
8/11/00	12:41	CW	IPC	0.4928	0.456	9.562	0.4982	0.501	0.503	0.4973	5.019	10.07	0.49	10.18	0.481	0.489	0.484
8/11/00	13:26	CW	IPC	0.4892	0.476	9.615	0.5239	0.504	0.502	0.5159	4.983	9.995	0.504	10.25	0.493	0.506	0.5
8/11/00	13:31	CW	IPC	0.4918	0.481	9.752	0.5213	0.506	0.504	0.5139	4.943	10.07	0.505	10.38	0.49	0.506	0.499
8/11/00	14:47	CW	IPC	0.4887	0.468	9.626	0.5114	0.505	0.501	0.5044	4.959	9.978	0.492	10.78	0.484	0.496	0.489

EPA Method 200.15 Instrument Performance Check Solutions by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
8/11/00	16:17	CW	IPC	0.4894	0.471	9.59	0.5145	0.505	0.504	0.5064	4.946	10.04	0.493	10.7	0.482	0.496	0.49
8/11/00	17:17	CW	IPC	0.4973	0.459	9.692	0.503	0.506	0.504	0.4921	4.966	10.12	0.484	10.56	0.472	0.484	0.479
8/11/00	17:45	CW	IPC	0.4922	0.468	9.6	0.5145	0.502	0.5	0.5066	4.942	10	0.494	10.51	0.484	0.497	0.49
9/20/00	10:49	CW	IPC	0.4905	0.471	9.594	0.4976	0.502	0.504	0.5048	4.95	10.02	0.495	10.3	0.486	0.499	0.493
9/20/00	12:18	CW	IPC	0.4808	0.46	9.419	0.488	0.498	0.497	0.5014	5.025	9.835	0.489	10.02	0.496	0.491	0.485
9/20/00	13:28	CW	IPC	0.4842	0.463	9.473	0.4892	0.5	0.499	0.5055	5.026	9.906	0.491	10.03	0.496	0.495	0.487
9/20/00	15:18	CW	IPC	0.4826	0.452	9.236	0.4863	0.492	0.498	0.5008	5.018	9.835	0.485	10.01	0.49	0.488	0.483
9/20/00	16:29	CW	IPC	0.4911	0.444	8.966	0.4892	0.482	0.501	0.489	4.965	9.936	0.479	10.1	0.467	0.476	0.479
9/21/00	12:05	CW	IPC	0.4872	0.469	9.733	0.4948	0.503	0.501	0.5061	4.962	9.926	0.494	10.39	0.496	0.497	0.49
9/21/00	13:02	CW	IPC	0.4852	0.462	9.702	0.4908	0.501	0.5	0.5062	4.948	9.858	0.491	10.01	0.496	0.495	0.486
9/21/00	14:23	CW	IPC	0.4816	0.469	9.738	0.4932	0.503	0.499	0.5137	4.994	9.857	0.497	10.01	0.512	0.503	0.49
9/21/00	16:13	CW	IPC	0.4812	0.461	9.749	0.4886	0.504	0.499	0.5098	4.989	9.826	0.491	10.03	0.515	0.497	0.485
9/25/00	11:36	CW	IPC	0.484	0.464	9.733	0.4933	0.505	0.498	0.5063	4.943	9.822	0.491	10.4	0.497	0.499	0.49
9/25/00	13:09	CW	IPC	0.4926	0.471	9.779	0.5003	0.501	0.503	0.507	4.973	9.992	0.497	10.25	0.489	0.503	0.496
9/25/00	12:29	CW	IPC	0.4807	0.461	9.562	0.4941	0.5	0.495	0.5103	4.967	9.728	0.49	10	0.5	0.501	0.49
9/25/00	13:58	CW	IPC	0.4931	0.472	9.77	0.5004	0.503	0.505	0.5075	5.009	10.04	0.498	10.31	0.489	0.501	0.496
9/25/00	15:12	CW	IPC	0.4955	0.473	9.837	0.4949	0.504	0.504	0.5021	4.981	10.07	0.496	10.25	0.481	0.496	0.492
9/25/00	16:11	CW	IPC	0.5022	0.479	9.953	0.5	0.508	0.51	0.5075	4.983	10.21	0.503	10.2	0.483	0.502	0.498
9/26/00	12:05	CW	IPC	0.4849	0.473	9.905	0.4896	0.509	0.494	0.5011	4.857	9.941	0.496	10.26	0.5	0.498	0.489
9/26/00	12:56	CW	IPC	0.4714	0.464	9.82	0.4897	0.5	0.487	0.5077	4.907	9.684	0.491	10.14	0.511	0.499	0.488
9/26/00	14:05	CW	IPC	0.4762	0.47	9.839	0.4888	0.504	0.487	0.5073	4.879	9.775	0.496	9.854	0.506	0.5	0.489
9/26/00	15:09	CW	IPC	0.4827	0.46	9.5	0.4913	0.496	0.492	0.4975	4.838	9.837	0.489	9.117	0.481	0.492	0.488
10/18/00	11:51	CW	IPC	0.4735	0.48	9.972	0.4957	0.51	0.493	0.508	4.984	9.918	0.498	10.41	0.514	0.509	0.492
10/18/00	13:15	CW	IPC	0.465	0.467	9.652	0.4978	0.5	0.493	0.5121	4.956	9.743	0.492	10.56	0.508	0.505	0.492
10/18/00	14:13	CW	IPC	0.4633	0.465	9.599	0.4945	0.499	0.49	0.5138	4.963	9.699	0.492	10.31	0.506	0.505	0.49
10/18/00	15:30	CW	IPC	0.4678	0.479	9.892	0.5042	0.513	0.493	0.5246	5.043	9.858	0.502	10.6	0.525	0.518	0.497
10/19/00	13:45	CW	IPC	0.483	0.469	9.676	0.4972	0.505	0.503	0.4972	4.994	10.11	0.49	10.44	0.485	0.494	0.487
10/19/00	14:37	CW	IPC	0.4863	0.47	9.727	0.4962	0.504	0.505	0.4952	5.016	10.19	0.491	10.62	0.488	0.494	0.487
10/19/00	15:46	CW	IPC	0.4581	0.459	9.556	0.4845	0.492	0.484	0.4977	4.939	9.645	0.481	10.28	0.495	0.49	0.476
10/20/00	11:24	CW	IPC	0.4838	0.471	9.929	0.496	0.509	0.502	0.4997	4.999	10.1	0.492	10.44	0.495	0.498	0.485

EPA Method 200.15 Instrument Performance Check Solutions by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
10/20/00	12:37	CW	IPC	0.4697	0.457	9.568	0.4848	0.489	0.487	0.4899	4.846	9.795	0.482	10.17	0.483	0.486	0.474
10/20/00	13:35	CW	IPC	0.4809	0.457	9.451	0.4957	0.493	0.501	0.4971	4.963	9.99	0.487	10.15	0.48	0.491	0.482
10/20/00	14:55	CW	IPC	0.4834	0.463	9.635	0.4966	0.499	0.504	0.5027	5.026	10.11	0.492	10.1	0.49	0.496	0.486
10/20/00	15:56	CW	IPC	0.4945	0.453	9.325	0.5015	0.491	0.51	0.4937	4.998	10.24	0.487	10.03	0.452	0.487	0.483
10/20/00	16:58	CW	IPC	0.4847	0.455	9.411	0.4915	0.492	0.5	0.4925	4.953	10.07	0.485	10.12	0.473	0.486	0.478
10/26/00	11:37	CW	IPC	0.4837	0.473	9.876	0.4987	0.502	0.501	0.5023	4.993	10.07	0.494	10.4	0.497	0.5	0.491
10/26/00	12:27	CW	IPC	0.4891	0.458	9.513	0.5045	0.491	0.509	0.4996	5.004	10.16	0.487	10.39	0.477	0.493	0.491
10/26/00	13:24	CW	IPC	0.4953	0.466	9.464	0.5035	0.495	0.507	0.4985	5.048	10.22	0.492	9.894	0.484	0.494	0.492
10/26/00	14:44	CW	IPC	0.4944	0.463	9.439	0.5117	0.49	0.506	0.499	5.122	10.19	0.495	8.167	0.479	0.496	0.492
10/26/00	15:53	CW	IPC	0.502	0.446	9.171	0.5096	0.481	0.514	0.4958	5.252	10.26	0.487	5.386	0.45	0.489	0.484
10/30/00	17:46	TMC	IPC	0.4835	0.48	9.939	0.5036	0.507	0.5	0.5071	4.984	10.09	0.499	9.987	0.498	0.507	0.495
10/30/00	19:08	TMC	IPC	0.4834	0.486	10.03	0.5024	0.509	0.498	0.5102	5.004	10.11	0.504	10	0.501	0.511	0.497
10/31/00	10:52	CW	IPC	0.4737	0.467	9.772	0.4946	0.502	0.496	0.5016	4.977	9.961	0.489	9.93	0.494	0.496	0.485
10/31/00	12:40	CW	IPC	0.4704	0.476	9.953	0.4926	0.507	0.493	0.5018	4.9	9.91	0.494	9.866	0.499	0.5	0.485
10/31/00	14:07	CW	IPC	0.4824	0.483	10.13	0.4977	0.51	0.501	0.4992	4.928	10.14	0.498	10.13	0.495	0.501	0.49
12/1/00	11:02	CW	IPC	n/a	n/a	10.09	n/a	n/a	0.487	n/a	4.905	9.95	0.499	10.19	n/a	n/a	0.49
12/1/00	11:51	CW	IPC	n/a	n/a	9.4	n/a	n/a	0.485	n/a	4.943	9.781	0.487	9.798	n/a	n/a	0.49
12/1/00	12:49	CW	IPC	n/a	n/a	9.461	n/a	n/a	0.482	n/a	4.939	9.686	0.491	9.731	n/a	n/a	0.489
			Average	*0.48*	*0.47*	*9.69*	*0.50*	*0.50*	*0.52*	*0.51*	*4.97*	*10.0*	*0.50*	*10.1*	*0.49*	*0.50*	*0.49*
			Standard Deviation	*0.01*	*0.01*	*0.27*	*0.01*	*0.01*	*0.01*	*0.01*	*0.07*	*0.19*	*0.01*	*0.66*	*0.02*	*0.01*	*0.01*
			N	*75*	*75*	*78*	*75*	*75*	*78*	*75*	*78*	*78*	*78*	*78*	*75*	*75*	*78*
			Maximum	*0.52*	*0.52*	*10.4*	*0.54*	*0.53*	*0.52*	*0.53*	*5.252*	*10.7*	*0.53*	*10.9*	*0.54*	*0.52*	*0.52*
			Minimum	*0.46*	*0.44*	*8.97*	*0.48*	*0.48*	*0.48*	*0.49*	*4.836*	*9.65*	*0.48*	*5.39*	*0.45*	*0.48*	*0.47*
			Given Value	*0.5*	*0.5*	*10*	*0.5*	*0.5*	*0.5*	*0.5*	*5*	*10*	*0.5*	*10*	*0.5*	*0.5*	*0.5*

APPENDIX B – Water Resources

B.6 Metals QC Data

B.6.2 Bottle Blanks, Trip Blanks, Lab Reagent Blanks and Calibration Blanks

Bottle Blanks verify that the interior surfaces of sample bottles are free of contamination (below probable quantitative limit). The blank consists of a de-ionized water rinse of a bottle after bottles have been prepared for sample collection.

Trip Blanks measure potential sample contamination from the sample bottle, reagent water, preservation reagents, or contamination from preparing, preservation, handling or transporting the blank from the field to the laboratory and back. A trip blank was prepared by filling a sample bottle with de-ionized water. It was transported in the sample-shipping container to the field. The bottle cap was removed in the field and was exposed to the sampling environment for the length of time an actual sample would be open to the elements and then preserved. The bottle was capped and transported back to the lab where it was then analyzed.

Lab Reagent Blanks verify that the reagent water used in the preparation of standards and dilutions is free of contamination (below probable quantitative limit). It also verifies that autosampler vials and caps are free of contamination. Reagent water is prepared exactly as a sample as per EPA method 200.15 and analyzed.

Calibration Blanks are the blank solution used for standardization of the ICAP-ES. Calibration Blanks assess instrument or method performance over the duration of analysis.

Probable quantitative limits were determined by the analysis of the Instrument Performance Check solutions diluted to approximately three-times the Instrument Detection Limit, IDL, (standard deviation of seven exposures of calibration blank). Dilutions greater and less than the three-times IDL concentration were made and analyzed. Probable quantitative limits were defined as the diluted concentration in which the relative percent difference between the analytical value and the given value is nearly or less than ten percent.

EPA Method 200.15 Bottle Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
8/2/00	17:40	CW	Bottle Blank CAT-001	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/20/00	13:06	CW	Bottle Blank CAT-002	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/11/00	16:52	CW	Bottle Blank CAT-003	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0036	bpql	bpql	bpql	0.0025
10/31/00	13:33	CW	Bottle Blank CAT-004	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/31/00	13:37	CW	Bottle Blank CAT-005	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/31/00	13:41	CW	Bottle Blank CAT-006	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/31/00	13:45	CW	Bottle Blank CAT-007	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/31/00	13:48	CW	Bottle Blank CAT-008	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/31/00	13:52	CW	Bottle Blank CAT-009	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/20/00	15:08	CW	Bottle Blank CAT-010 (Trip Blank 093000)	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/25/00	13:14	CW	Bottle Blank CAT-011 (Trip Blank 082900)	bpql	bpql	0.022	bpql	bpql	0.0042	bpql	bpql	bpql	bpql	bpql	0.0206	bpql	0.0024
10/31/00	13:56	CW	Bottle Blank CAT-012	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
			# of runs	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*
			# of runs above PQL	*0*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*1*	*0*	*1*	*0*	*2*
			Maximum value above PQL	*N/A*	*N/A*	*0.022*	*N/A*	*N/A*	*0.004*	*N/A*	*N/A*	*N/A*	*0.0036*	*N/A*	*0.021*	*N/A*	*0.003*

EPA Method 200.15 Trip Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
8/2/00	16:38	CW	TRIP BLANK 050100	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/10/00	15:53	CW	TRIP BLANK 071800	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/8/00	11:53	CW	TRIP BLANK 071000	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/8/00	12:08	CW	TRIP BLANK 071300	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/8/00	15:32	CW	TRIP BLANK 072400	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/7/00	14:14	CW	TRIP BLANK 062600	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/7/00	15:02	CW	TRIP BLANK 062700	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	15:02	CW	TRIP BLANK 061900	bpql	bpql	0.2745	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0166
8/4/00	16:17	CW	TRIP BLANK 062000	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0012
8/4/00	11:04	CW	TRIP BLANK 062800	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	12:48	CW	TRIP BLANK 062900	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	13:28	CW	TRIP BLANK 063000	bpql	bpql	0.0256	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0015
8/11/00	12:33	CW	TRIP BLANK 071700	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/11/00	14:06	CW	TRIP BLANK 071900	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/11/00	16:41	CW	TRIP BLANK 072000	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/25/00	13:14	CW	TRIP BLANK 082900	bpql	bpql	0.022	bpql	bpql	0.0042	bpql	bpql	bpql	bpql	bpql	0.0206	bpql	0.0024
9/26/00	14:57	CW	TRIP BLANK 070700	bpql	bpql	0.0509	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/26/00	13:42	CW	TRIP BLANK 081400	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0022
9/26/00	12:37	CW	TRIP BLANK 082800	bpql	bpql	0.0222	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/18/00	13:36	CW	PREP BLANK 070700	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0017
10/18/00	13:32	CW	TRIP BLANK 083000	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0011
10/18/00	15:11	CW	TRIP BLANK 100100	bpql	bpql	0.0559	bpql	bpql	bpql	bpql	bpql	bpql	0.0007	bpql	bpql	bpql	bpql
10/20/00	15:08	CW	TRIP BLANK 093000	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
			# of runs	*23*	*23*	*23*	*23*	*23*	*23*	*23*	*23*	*23*	*23*	*23*	*23*	*23*	*23*
			# of runs above PQL	*0*	*0*	*6*	*0*	*0*	*1*	*0*	*0*	*0*	*1*	*0*	*1*	*0*	*7*
			Maximum value above PQL	*N/A*	*N/A*	*0.2745*	*N/A*	*N/A*	*0.004*	*N/A*	*N/A*	*N/A*	*0.0007*	*N/A*	*0.021*	*N/A*	*0.017*

EPA Method 200.15 Laboratory Reagent Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit				0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
8/2/00	17:35	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0022
8/10/00	16:25	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/8/00	17:16	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.001
8/7/00	17:06	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	16:51	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0014
8/11/00	17:49	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0011
8/11/00	13:03	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0018
9/25/00	14:14	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/25/00	16:23	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/20/00	16:39	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/20/00	13:44	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/21/00	15:06	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	0.0151	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/21/00	16:40	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/30/00	19:04	TMC	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/18/00	14:41	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/26/00	13:54	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/20/00	14:06	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/20/00	16:09	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/20/00	17:11	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/19/00	14:56	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/26/00	14:19	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/26/00	15:23	CW	LAB REAGENT BLANK	bpql	bpql	0.0306	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/31/00	11:25	CW	LAB REAGENT BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/31/00	14:38	CW	LAB REAGENT BLANK	bpql	bpql	0.0344	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
12/1/00	12:11	TMC	LAB REAGENT BLANK	n/a	n/a	bpql	n/a	n/a	0.0141	n/a	bpql	bpql	bpql	bpql	n/a	n/a	bpql
			# of runs	*24*	*24*	*25*	*24*	*24*	*25*	*24*	*25*	*25*	*25*	*25*	*24*	*24*	*25*
			# of runs above PQL	*0*	*0*	*2*	*0*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*5*
			Maximum value above PQL	*n/a*	*n/a*	*0.034*	*n/a*	*n/a*	*0.014*	*0.015*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*0.002*

bpql = below the probable quantitative limit

EPA Method 200.15 Calibration Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit				0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
8/2/00	15:30	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/2/00	17:02	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/2/00	18:09	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	10:58	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	11:41	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	11:47	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	12:52	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	13:47	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	15:27	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	16:28	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/4/00	16:54	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/7/00	11:38	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/7/00	13:16	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/7/00	14:22	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/7/00	15:24	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/7/00	15:36	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/7/00	16:55	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/8/00	12:27	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/8/00	14:40	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/8/00	15:47	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/8/00	16:38	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/8/00	17:08	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/10/00	14:00	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/10/00	15:06	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/10/00	16:04	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/10/00	16:29	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/11/00	10:31	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/11/00	11:19	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/11/00	13:13	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql

EPA Method 200.15 Calibration Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit				0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
8/11/00	14:43	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/11/00	16:13	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/11/00	17:14	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/11/00	17:41	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/11/00	17:53	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/20/00	12:14	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0022	bpql	bpql	bpql	bpql
9/20/00	13:24	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/20/00	13:49	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/20/00	15:15	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.002	bpql	bpql	bpql	bpql
9/20/00	16:20	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0007	bpql	bpql	bpql	bpql
9/21/00	12:59	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/21/00	14:19	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/21/00	15:15	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/21/00	16:09	CW	CAL BLANK	bpql	bpql	0.0505	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0011
9/25/00	12:25	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/25/00	13:54	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/25/00	14:19	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/25/00	15:08	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/25/00	16:07	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/26/00	12:52	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/26/00	14:01	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/26/00	14:23	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
9/26/00	15:05	CW	CAL BLANK	bpql	bpql	0.0554	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/18/00	13:11	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	0.0036	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0019
10/18/00	14:09	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/18/00	14:32	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/18/00	15:26	CW	CAL BLANK	bpql	bpql	0.0343	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/19/00	14:33	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/19/00	15:42	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql

EPA Method 200.15 Calibration Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit				0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
10/19/00	16:13	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/20/00	12:33	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/20/00	13:31	CW	CAL BLANK	0.0141	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/20/00	13:57	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/20/00	14:51	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/20/00	15:52	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/20/00	16:54	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/26/00	12:23	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/26/00	13:20	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/26/00	13:44	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/26/00	15:04	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/30/00	18:45	TMC	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/31/00	11:21	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/31/00	12:36	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
10/31/00	12:56	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	0.0005	bpql	bpql	bpql	bpql
10/31/00	14:03	CW	CAL BLANK	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
12/1/00	11:47	CW	CAL BLANK	n/a	n/a	bpql	n/a	n/a	bpql	n/a	bpql	bpql	0.0007	bpql	n/a	n/a	bpql
12/1/00	12:46	CW	CAL BLANK	n/a	n/a	bpql	n/a	n/a	bpql	n/a	bpql	bpql	bpql	bpql	n/a	n/a	bpql
			# of runs	*74*	*74*	*76*	*74*	*74*	*76*	*74*	*76*	*76*	*76*	*76*	*74*	*74*	*76*
			# of runs above PQL	*1*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*5*	*0*	*0*	*0*	*2*
			Maximum value above PQL	*0.0141*	*n/a*	*0.055*	*n/a*	*n/a*	*0.004*	*n/a*	*n/a*	*n/a*	*0.002*	*n/a*	*n/a*	*n/a*	*0.002*

bpql = below the probable quantitative limit

APPENDIX B – Water Resources

B.6 Metals QC Data

B.6.3 Field Duplicates and Splits and Laboratory Duplicates

Field duplicates are samples collected identically and consecutively over a minimum period of time. They provide a measure of the total field sampling and laboratory analytical precision, including that resulting from the heterogeneity of the medium being sampled.

Field Splits are randomly chosen samples that have been collected into a sample bottle and then "split" by pouring half the sample into another sample bottle. They provide a measure of the heterogeneity of the medium being sampled.

Laboratory Duplicates are random samples analyzed twice, non-consecutively, in order to assess instrument performance over the duration of analysis.

Percent difference of duplicates samples are calculated by dividing the absolute value of the difference between the original and the duplicate sample by the average value of the two samples. We then multiply this value by 100 to obtain percent units.

EPA Method 200.15 Field Duplicates by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
MW-5 050100	0.26	0.007	73	bpql	bpql	0.003	0.181	3.5	29	0.030	12	0.15	bpql	0.009
MW-5 050100 Field Dup	0.28	bpql	72	bpql	bpql	0.003	0.181	3.5	28	0.034	13	0.16	bpql	0.006
% difference	*7%*	*N/A*	*1%*	*N/A*	*N/A*	*0%*	*0%*	*0%*	*4%*	*12%*	*8%*	*6%*	*N/A*	*40%*
GKM-3RED 061900	0.11	0.009	84	bpql	bpql	bpql	0.147	6.6	16	0.027	23	0.04	bpql	0.140
GKM-3RED 061900 Field Dup	0.02	0.011	84	bpql	bpql	bpql	0.049	6.5	16	0.020	23	0.03	bpql	0.164
% difference	*138%*	*20%*	*0%*	*N/A*	*N/A*	*N/A*	*100%*	*2%*	*0%*	*26%*	*0%*	*29%*	*N/A*	*15%*
MLS-5RED 062000	0.01	0.006	63	bpql	bpql	bpql	0.030	3.6	25	0.043	13	0.03	bpql	0.002
MLS-5RED 062000 Field Dup	0.02	0.005	63	bpql	bpql	bpql	0.036	3.7	25	0.039	13	0.03	bpql	0.001
% difference	*67%*	*18%*	*0%*	*N/A*	*N/A*	*N/A*	*17%*	*3%*	*0%*	*10%*	*0%*	*0%*	*N/A*	*67%*
GKM-7BLUE 062600	0.06	0.084	67	0.011	bpql	0.033	0.066	3.7	19	3.19	17	0.02	bpql	1.11
GKM-7BLUE 062600 Field Dup	0.03	0.084	69	0.013	bpql	0.035	0.044	3.8	19	3.16	17	0.02	bpql	1.10
% difference	*67%*	*0%*	*3%*	*17%*	*N/A*	*6%*	*40%*	*3%*	*0%*	*1%*	*0%*	*0%*	*N/A*	*1%*
MLS-3RED 062700	0.11	0.096	110	0.002	bpql	0.007	0.332	34	59	2.30	70	0.30	bpql	0.005
MLS-3RED 062700 Field Dup	0.04	0.041	85	bpql	bpql	0.020	0.063	19	36	0.662	52	0.16	bpql	0.003
% difference	*93%*	*80%*	*26%*	*N/A*	*N/A*	*186%*	*136%*	*57%*	*48%*	*247%*	*30%*	*88%*	*N/A*	*50%*
GKW-4 062800	bpql	0.015	75	bpql	bpql	bpql	0.040	6.8	12	0.007	25	0.08	bpql	0.003
GKW-4 062800 Field Dup	bpql	0.016	75	bpql	bpql	0.006	0.028	6.9	12	0.004	25	0.08	bpql	0.003
% difference	*N/A*	*6%*	*0%*	*N/A*	*N/A*	*N/A*	*43%*	*1%*	*0%*	*55%*	*0%*	*0%*	*N/A*	*0%*
GKW-8 062900	0.01	bpql	43	bpql	bpql	bpql	0.068	5.1	8.8	0.078	12	0.02	bpql	0.002
GKW-8 062900 Field Dup	0.01	bpql	43	bpql	bpql	bpql	0.060	5.1	8.8	0.083	12	0.02	bpql	0.003
% difference	*0%*	*N/A*	*0%*	*N/A*	*N/A*	*N/A*	*12%*	*0%*	*0%*	*6%*	*0%*	*0%*	*N/A*	*40%*

EPA Method 200.15 Field Duplicates by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
MW-4 063000	0.03	bpql	79	bpql	bpql	0.004	0.025	4.2	27	0.014	28	0.05	bpql	0.002
MW-4 063000 Field Dup	bpql	bpql	79	bpql	bpql	bpql	0.023	4.2	27	0.013	28	0.05	bpql	0.002
% difference	*N/A*	*N/A*	*0%*	*N/A*	*N/A*	*N/A*	*8%*	*0%*	*0%*	*7%*	*0%*	*0%*	*N/A*	*0%*
SW-4 070700	bpql	0.279	96	0.007	bpql	0.124	0.145	23	27	0.15	26	0.51	bpql	0.148
SW-4 070700 Field Dup	bpql	0.26	99	0.006	bpql	0.079	0.136	21	25	0.093	25	0.49	bpql	0.167
% difference	*N/A*	*7%*	*3%*	*15%*	*N/A*	*44%*	*6%*	*9%*	*8%*	*47%*	*4%*	*4%*	*N/A*	*12%*
GKM-2W 071700	bpql	bpql	33	bpql	bpql	bpql	0.035	6.5	5.8	0.010	27	0.03	bpql	0.003
GKM-2W 071700 Field Dup	bpql	bpql	32	bpql	bpql	bpql	0.038	6.4	5.5	0.007	26	0.02	bpql	0.004
% difference	*N/A*	*N/A*	*3%*	*N/A*	*N/A*	*N/A*	*8%*	*2%*	*5%*	*43%*	*4%*	*40%*	*N/A*	*29%*
MW-5 071800	bpql	bpql	67	bpql	bpql	bpql	0.020	3.8	27	0.004	13	0.04	bpql	0.002
MW-5 071800 Field Dup	bpql	0.005	67	bpql	bpql	bpql	0.020	3.8	27	0.001	12	0.04	bpql	0.002
% difference	*N/A*	*N/A*	*0%*	*N/A*	*N/A*	*N/A*	*0%*	*0%*	*0%*	*120%*	*8%*	*0%*	*N/A*	*0%*
GKW-7 072000	0.04	bpql	44	bpql	bpql	bpql	0.161	1.6	12	0.367	19	0.01	bpql	0.002
GKW-7 072000 Field Dup	0.05	bpql	46	bpql	bpql	0.003	0.170	1.7	12	0.373	20	0.01	bpql	0.003
% difference	*22%*	*N/A*	*4%*	*N/A*	*N/A*	*N/A*	*6%*	*6%*	*0%*	*2%*	*5%*	*0%*	*N/A*	*40%*
GKW-9 072400	0.02	bpql	86	bpql	bpql	0.005	0.162	7.7	30	0.362	25	0.03	bpql	0.003
GKW-9 072400 Field Dup	0.02	bpql	89	bpql	bpql	0.004	0.127	7.7	30	0.360	25	0.03	bpql	0.006
% difference	*0%*	*N/A*	*3%*	*N/A*	*N/A*	*22%*	*24%*	*0%*	*0%*	*1%*	*0%*	*0%*	*N/A*	*67%*
MW-4 082800	bpql	bpql	80	bpql	bpql	bpql	0.032	4.5	27	0.029	26	0.06	bpql	0.002
MW-4 082800 Field Dup	bpql	bpql	78	bpql	bpql	bpql	0.027	4.4	27	0.036	27	0.05	bpql	0.001
% difference	*N/A*	*N/A*	*3%*	*N/A*	*N/A*	*N/A*	*17%*	*2%*	*0%*	*22%*	*4%*	*18%*	*N/A*	*67%*

EPA Method 200.15 Field Duplicates by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
GKW-9 082900	bpql	bpql	81	bpql	bpql	bpql	0.22	6.4	26	0.282	21	0.02	bpql	0.003
GKW-9 082900 Field Dup	bpql	bpql	82	bpql	bpql	bpql	0.186	6.4	26	0.28	21	0.02	bpql	0.002
% difference	*N/A*	*N/A*	*1%*	*N/A*	*N/A*	*N/A*	*17%*	*0%*	*0%*	*1%*	*0%*	*0%*	*N/A*	*40%*
GKW-2 083000	bpql	0.006	74	bpql	bpql	0.007	0.038	8.4	13	0.013	28	0.05	bpql	0.003
GKW-2 083000 Field Dup	bpql	0.006	71	bpql	bpql	0.004	0.034	8.2	13	0.009	29	0.05	bpql	0.003
% difference	*N/A*	*0%*	*4%*	*N/A*	*N/A*	*55%*	*11%*	*2%*	*0%*	*36%*	*4%*	*0%*	*N/A*	*0%*
GKW-8 092900	0.02	bpql	41	bpql	bpql	bpql	0.032	5.4	8.4	0.012	12	0.02	bpql	0.002
GKW-8 092900 Field Dup	0.01	bpql	41	bpql	bpql	bpql	0.032	5.5	8.4	0.007	12	0.02	bpql	0.001
% difference	*67%*	*N/A*	*0%*	*N/A*	*N/A*	*N/A*	*0%*	*2%*	*0%*	*53%*	*0%*	*0%*	*N/A*	*67%*
GKW-1 093000	0.03	bpql	59	bpql	bpql	bpql	0.038	6.5	12	0.036	24	0.03	bpql	0.003
GKW-1 093000 Field Dup	0.02	bpql	59	bpql	bpql	bpql	0.035	6.4	12	0.033	23	0.02	bpql	0.002
% difference	*40%*	*N/A*	*0%*	*N/A*	*N/A*	*N/A*	*8%*	*2%*	*0%*	*9%*	*4%*	*40%*	*N/A*	*40%*
MW-4 100100	bpql	bpql	81	bpql	bpql	bpql	0.03	4.6	28	0.103	26	0.05	bpql	0.002
MW-4 100100 Field Dup	bpql	bpql	79	bpql	bpql	bpql	0.03	4.7	28	0.088	27	0.05	bpql	0.002
% difference	*N/A*	*N/A*	*3%*	*N/A*	*N/A*	*N/A*	*0%*	*2%*	*0%*	*16%*	*4%*	*0%*	*N/A*	*0%*

bpql = below the probable quantitative limit

EPA Method 200.15 Field Splits by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
MW-5 050100	0.26	0.007	73	bpql	bpql	0.003	0.181	3.5	29	0.030	12	0.15	bpql	0.009
MW-5 050100 Split	0.24	0.005	72	bpql	bpql	0.005	0.162	3.5	28	0.027	13	0.14	bpql	0.008
% difference	*8%*	*33%*	*1%*	*N/A*	*N/A*	*50%*	*11%*	*0%*	*4%*	*11%*	*8%*	*7%*	*N/A*	*12%*
GKM-3RED 061900	0.11	0.009	84	bpql	bpql	bpql	0.147	6.6	16	0.027	23	0.04	bpql	0.140
GKM-3RED 061900 Split	0.07	0.010	85	bpql	bpql	bpql	0.102	6.6	16	0.027	23	0.04	bpql	0.141
% difference	*44%*	*11%*	*1%*	*N/A*	*N/A*	*N/A*	*36%*	*0%*	*0%*	*0%*	*0%*	*0%*	*N/A*	*1%*
MLS-5RED 062000	0.01	0.006	63	bpql	bpql	bpql	0.030	3.6	25	0.043	13	0.03	bpql	0.002
MLS-5RED 062000 Split	0.01	0.006	65	bpql	bpql	bpql	0.031	3.6	25	0.045	13	0.03	bpql	0.003
% difference	*0%*	*0%*	*3%*	*N/A*	*N/A*	*N/A*	*3%*	*0%*	*0%*	*5%*	*0%*	*0%*	*N/A*	*40%*
GKM-7BLUE 062600	0.06	0.084	67	0.011	bpql	0.033	0.066	3.7	19	3.19	17	0.02	bpql	1.11
GKM-7BLUE 062600 Split	0.06	0.083	66	0.011	bpql	0.033	0.065	3.7	19	3.14	17	0.02	bpql	1.10
% difference	*0%*	*1%*	*2%*	*0%*	*N/A*	*0%*	*2%*	*0%*	*0%*	*2%*	*0%*	*0%*	*N/A*	*1%*
MLS-3RED 062700	0.11	0.096	110	0.002	bpql	0.007	0.332	34	59	2.30	70	0.30	bpql	0.005
MLS-3RED 062700 Split	0.11	0.096	110	0.002	bpql	0.006	0.318	34	59	2.30	71	0.29	bpql	0.004
% difference	*0%*	*0%*	*0%*	*0%*	*N/A*	*15%*	*4%*	*0%*	*0%*	*N/A*	*1%*	*3%*	*N/A*	*22%*
GKW-8 062900	0.01	bpql	43	bpql	bpql	bpql	0.068	5.1	8.8	0.078	12	0.02	bpql	0.002
GKW-8 062900 Split	0.02	bpql	42	bpql	bpql	bpql	0.066	5.1	8.6	0.076	12	0.02	bpql	0.002
% difference	*67%*	*N/A*	*2%*	*N/A*	*N/A*	*N/A*	*3%*	*0%*	*2%*	*3%*	*0%*	*0%*	*N/A*	*0%*
MW-4 063000	0.03	bpql	79	bpql	bpql	0.004	0.025	4.2	27	0.014	28	0.05	bpql	0.002
MW-4 063000 Split	bpql	bpql	79	bpql	bpql	bpql	0.022	4.2	27	0.014	27	0.05	bpql	0.002
% difference	*N/A*	*N/A*	*0%*	*N/A*	*N/A*	*N/A*	*13%*	*0%*	*0%*	*0%*	*4%*	*0%*	*N/A*	*0%*
GKM-2W 071700	bpql	bpql	33	bpql	bpql	bpql	0.035	6.5	5.8	0.010	27	0.03	bpql	0.003
GKM-2W 071700 Split	bpql	bpql	33	bpql	bpql	bpql	0.036	6.6	5.8	0.010	26	0.03	bpql	0.003
% difference	*N/A*	*N/A*	*0%*	*N/A*	*N/A*	*N/A*	*3%*	*2%*	*0%*	*N/A*	*4%*	*0%*	*N/A*	*0%*

EPA Method 200.15 Field Splits by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
MW-5 071800	bpql	bpql	67	bpql	bpql	bpql	0.020	3.8	27	0.004	13	0.04	bpql	0.002
MW-5 071800 Split	bpql	bpql	68	bpql	bpql	bpql	0.018	3.8	27	0.004	12	0.04	bpql	0.002
% difference	*N/A*	*N/A*	*1%*	*N/A*	*N/A*	*N/A*	*11%*	*0%*	*0%*	*0%*	*8%*	*0%*	*N/A*	*0%*
GKW-4 071900	bpql	0.015	69	bpql	bpql	bpql	0.038	6.5	11	0.004	22	0.08	bpql	0.002
GKW-4 071900 Split	bpql	0.016	68	bpql	bpql	bpql	0.027	6.5	11	0.004	22	0.08	bpql	0.003
% difference	*N/A*	*6%*	*1%*	*N/A*	*N/A*	*N/A*	*34%*	*0%*	*0%*	*0%*	*0%*	*0%*	*N/A*	*40%*
GKW-7 072000	0.04	bpql	44	bpql	bpql	bpql	0.161	1.6	12	0.367	19	0.01	bpql	0.002
GKW-7 072000 Split	0.03	bpql	46	bpql	bpql	bpql	0.161	1.7	12	0.385	20	0.01	bpql	0.003
% difference	*29%*	*N/A*	*4%*	*N/A*	*N/A*	*N/A*	*0%*	*6%*	*0%*	*5%*	*5%*	*0%*	*N/A*	*40%*
GKW-9 072400	0.02	bpql	86	bpql	bpql	0.005	0.162	7.7	30	0.362	25	0.03	bpql	0.003
GKW-9 072400 Split	0.01	bpql	86	bpql	bpql	0.006	0.131	7.7	31	0.370	25	0.03	bpql	0.006
% difference	*67%*	*N/A*	*0%*	*N/A*	*N/A*	*18%*	*21%*	*0%*	*3%*	*2%*	*0%*	*0%*	*N/A*	*67%*
MW-4 082800	bpql	bpql	80	bpql	bpql	bpql	0.032	4.5	27	0.029	26	0.06	bpql	0.002
MW-4 082800 Split	bpql	bpql	78	bpql	bpql	bpql	0.027	4.4	26	0.029	26	0.05	bpql	0.002
% difference	*N/A*	*N/A*	*3%*	*N/A*	*N/A*	*N/A*	*17%*	*2%*	*4%*	*0%*	*0%*	*18%*	*N/A*	*0%*
GKW-9 082900	bpql	bpql	81	bpql	bpql	bpql	0.22	6.4	26	0.282	21	0.02	bpql	0.003
GKW-9 082900 Split	bpql	bpql	83	bpql	bpql	0.003	0.221	6.4	26	0.284	21	0.02	bpql	0.003
% difference	*N/A*	*N/A*	*2%*	*N/A*	*N/A*	*N/A*	*0%*	*0%*	*0%*	*1%*	*0%*	*0%*	*N/A*	*0%*
GKW-2 083000	bpql	0.006	74	bpql	bpql	0.007	0.038	8.4	13	0.013	28	0.05	bpql	0.003
GKW-2 083000 Split	bpql	0.007	72	bpql	bpql	bpql	0.033	8.1	13	0.012	28	0.05	bpql	0.003
% difference	*N/A*	*15%*	*3%*	*N/A*	*N/A*	*N/A*	*14%*	*4%*	*0%*	*8%*	*0%*	*0%*	*N/A*	*0%*
GKW-8 092900	0.02	bpql	41	bpql	bpql	bpql	0.032	5.4	8.4	0.012	12	0.02	bpql	0.002
GKW-8 092900 Split	0.02	bpql	30	bpql	bpql	bpql	0.021	3.9	6	0.009	9	0.02	bpql	0.001
% difference	*0%*	*N/A*	*31%*	*N/A*	*N/A*	*N/A*	*42%*	*32%*	*33%*	*29%*	*29%*	*0%*	*N/A*	*67%*

EPA Method 200.15 Field Splits by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
GKW-1 093000	0.03	bpql	59	bpql	bpql	bpql	0.038	6.5	12	0.036	24	0.03	bpql	0.003
GKW-1 093000 Split	0.02	bpql	60	bpql	bpql	bpql	0.033	6.7	12	0.037	24	0.03	bpql	0.003
% difference	*40%*	*N/A*	*2%*	*N/A*	*N/A*	*N/A*	*14%*	*3%*	*0%*	*3%*	*0%*	*0%*	*N/A*	*0%*
MW-4 100100	bpql	bpql	81	bpql	bpql	bpql	0.03	4.6	28	0.103	26	0.05	bpql	0.002
MW-4 100100 Split	bpql	bpql	78	bpql	bpql	bpql	0.03	4.6	28	0.1	26	0.05	bpql	0.002
% difference	*N/A*	*N/A*	*4%*	*N/A*	*N/A*	*N/A*	*0%*	*0%*	*0%*	*3%*	*0%*	*0%*	*N/A*	*0%*

bpql = below the probable quantitative limit

EPA Method 200.15 Lab Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
8/2/00	16:12	CW	MW-1 050100	bpql	bpql	80.72	bpql	bpql	bpql	0.0135	2.617	31.2	0.0018	24.3	0.0677	bpql	0.0059
8/2/00	17:05	CW	MW-1 050100 Lab Dup	bpql	bpql	81.62	bpql	bpql	bpql	0.014	2.577	31.17	0.0019	25.58	0.067	bpql	0.0019
			% difference of dups	N/A	N/A	1%	N/A	N/A	N/A	4%	2%	0%	5%	5%	1%	N/A	103%
8/2/00	17:10	CW	SW-1 060100	bpql	0.3406	311.6	0.0079	bpql	0.4102	0.103	234.3	156.8	0.6022	386.5	1.562	0.0149	0.0328
8/2/00	18:04	CW	SW-1 060100 Lab Dup	bpql	0.3287	303.7	0.0077	bpql	0.4057	0.0988	226.8	156.8	0.5802	372	1.481	0.0158	0.0316
			% difference of dups	N/A	4%	3%	3%	N/A	1%	4%	3%	0%	4%	4%	5%	6%	4%
8/4/00	13:54	CW	GKM-1GREEN 061900	0.0512	bpql	84.98	bpql	bpql	bpql	0.1916	5.303	25.75	9.481	26.64	0.0169	bpql	0.0116
8/4/00	15:31	CW	GKM-1GREEN 061900 Lab Dup	0.0493	bpql	86.7	bpql	bpql	bpql	0.1909	5.339	26.12	9.625	26.93	0.0165	bpql	0.0117
			% difference of dups	4%	N/A	2%	N/A	N/A	N/A	0%	1%	1%	2%	1%	2%	N/A	1%
8/4/00	15:35	CW	GKM-5BLUE 061900	0.0707	bpql	70.63	0.0035	bpql	0.0303	0.0791	4.652	15.33	1.046	16.93	0.0146	bpql	0.2488
8/4/00	16:32	CW	GKM-5BLUE 061900 Lab Dup	0.056	bpql	68.031	0.0035	bpql	0.0298	0.0698	4.6523	15.101	1.02362	16.777	0.0129	bpql	0.2447
			% difference of dups	23%	N/A	4%	1%	N/A	2%	13%	0%	2%	2%	1%	12%	N/A	2%
8/4/00	11:07	CW	GKW-4 062800	bpql	0.0153	75.05	bpql	bpql	bpql	0.0398	6.841	11.84	0.0065	25.35	0.0798	bpql	0.003
8/4/00	11:51	CW	GKW-4 062800 Lab Dup	bpql	0.0144	75.26	bpql	bpql	bpql	0.039	6.853	12.03	0.0066	24.08	0.0767	bpql	0.003
			% difference of dups	N/A	6%	0%	N/A	N/A	N/A	2%	0%	2%	2%	5%	4%	N/A	0%
8/4/00	12:04	CW	GKW-8 062900 FD	0.0119	bpql	42.91	bpql	bpql	bpql	0.0597	5.061	8.778	0.0826	11.59	0.0226	bpql	0.0025
8/4/00	12:55	CW	GKW-8 062900 FD Lab Dup	0.0121	bpql	42.68	bpql	bpql	bpql	0.0586	5.06	8.755	0.0802	11.94	0.0208	bpql	0.0023
			% difference of dups	2%	N/A	1%	N/A	N/A	N/A	2%	0%	0%	3%	3%	8%	N/A	8%
8/4/00	13:14	CW	MW-2 063000	0.0305	bpql	81.47	bpql	bpql	bpql	0.0459	2.236	30.32	0.0054	16.27	0.0688	bpql	0.0025
8/4/00	13:51	CW	MW-2 063000 Lab Dup	0.0334	bpql	82.81	bpql	bpql	bpql	0.0449	2.229	30.72	0.004	16.32	0.0687	bpql	0.0019
			% difference of dups	9%	N/A	2%	N/A	N/A	N/A	2%	0%	1%	30%	0%	0%	N/A	27%

EPA Method 200.15 Lab Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
8/7/00	14:07	CW	GKM-7BLUE 062600	0.063	0.0844	67.32	0.0114	bpql	0.0334	0.0662	3.688	19.42	3.194	16.75	0.0247	bpql	1.112
8/7/00	14:26	CW	GKM-7BLUE 062600 Lab Dup	0.0648	0.085	68.55	0.0115	bpql	0.0343	0.0668	3.702	19.75	3.232	17.14	0.0233	bpql	1.119
			% difference of dups	3%	1%	2%	1%	N/A	3%	1%	0%	2%	1%	2%	6%	N/A	1%
8/7/00	12:50	CW	GKM-9GREEN 062600	bpql	0.0395	69.12	bpql	bpql	bpql	1.845	6.08	17.89	0.8699	22.93	0.0474	bpql	0.008
8/7/00	13:19	CW	GKM-9GREEN 062600 Lab Dup	bpql	0.0412	70.07	bpql	bpql	bpql	1.874	6.093	18.04	0.8887	23.03	0.0463	bpql	0.008
			% difference of dups	N/A	4%	1%	N/A	N/A	N/A	2%	0%	1%	2%	0%	2%	N/A	0%
8/8/00	15:25	CW	GKM-7BLUE 072400	0.1043	0.1114	65.22	0.0053	bpql	0.0407	0.2088	3.383	18.41	2.365	16.97	0.0524	bpql	0.609
8/8/00	15:51	CW	GKM-7BLUE 072400 Lab Dup	0.0707	0.1092	65.58	0.0053	bpql	0.0403	0.1828	3.358	18.5	2.347	17.45	0.0528	bpql	0.6029
			% difference of dups	38%	2%	1%	0%	N/A	1%	13%	1%	0%	1%	3%	1%	N/A	1%
8/8/00	16:19	CW	GKM-7W 072400	bpql	0.014	60.5	bpql	bpql	bpql	3.472	2.603	16.82	0.6694	16.32	0.0819	bpql	0.0053
8/8/00	16:42	CW	GKM-7W 072400 Lab Dup	bpql	0.0127	60.58	bpql	bpql	0.0031	3.442	2.645	16.91	0.6658	16.57	0.0823	bpql	0.0061
			% difference of dups	N/A	10%	0%	N/A	N/A	N/A	1%	2%	1%	1%	2%	0%	N/A	14%
8/8/00	14:18	CW	MLS-3RED 072000	0.0856	0.0161	62.61	bpql	bpql	0.006	0.1807	14.35	22.6	0.7975	26.73	0.18	bpql	0.0042
8/8/00	14:44	CW	MLS-3RED 072000 Lab Dup	0.0859	0.0165	62.04	bpql	bpql	0.0046	0.1826	14.34	22.61	0.8009	26.36	0.1789	bpql	0.0035
			% difference of dups	0%	2%	1%	N/A	N/A	26%	1%	0%	0%	0%	1%	1%	N/A	18%
8/10/00	13:23	CW	GKM-3GREEN 071700	bpql	0.0088	85.52	bpql	bpql	bpql	0.0352	6.946	16.09	0.0152	23.54	0.018	bpql	0.0944
8/10/00	13:57	CW	GKM-3GREEN 071700 Lab Dup	bpql	0.0087	85.68	bpql	bpql	bpql	0.0345	6.978	16.36	0.015	23.35	0.0192	bpql	0.0932
			% difference of dups	N/A	1%	0%	N/A	N/A	N/A	2%	0%	2%	1%	1%	6%	N/A	1%
8/10/00	14:04	CW	LYSVD-1 071700	bpql	0.019	92.73	bpql	bpql	0.0094	0.0286	3.317	31.65	0.0272	88.97	0.0371	bpql	0.0057
8/10/00	15:02	CW	LYSVD-1 071700 Lab Dup	bpql	0.0209	92.22	bpql	bpql	0.0085	0.0289	3.341	31.52	0.0275	84.69	0.0375	bpql	0.0058
			% difference of dups	N/A	10%	1%	N/A	N/A	10%	1%	1%	0%	1%	5%	1%	N/A	2%

EPA Method 200.15 Lab Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
8/10/00	15:23	CW	MW-4 071800	0.0139	bpql	76.21	bpql	bpql	bpql	0.0266	4.254	25.87	0.0304	26.22	0.0503	bpql	0.0021
8/10/00	16:00	CW	MW-4 071800 Lab Dup	0.013	bpql	74.51	bpql	bpql	bpql	0.0261	4.24	25.41	0.0301	25.81	0.0506	bpql	0.0019
			% difference of dups	7%	N/A	2%	N/A	N/A	N/A	2%	0%	2%	1%	2%	1%	N/A	10%
8/11/00	11:23	CW	GKM-1RED 071700	bpql	0.011	75.73	bpql	bpql	bpql	0.0295	5.195	14.25	0.0051	17.16	0.057	bpql	0.0023
8/11/00	12:37	CW	GKM-1RED 071700 Lab Dup	bpql	0.0104	75.07	bpql	bpql	bpql	0.0293	5.302	14.31	0.0051	16.67	0.0576	bpql	0.0022
			% difference of duplicates	N/A	6%	1%	N/A	N/A	N/A	1%	2%	0%	0%	3%	1%	N/A	4%
8/11/00	16:33	CW	GKM-3W 071900	0.0157	0.0057	80.86	0.0013	bpql	0.0031	0.0477	7.16	15.19	0.1508	22.26	0.0213	bpql	0.0833
8/11/00	17:10	CW	GKM-3W 071900 Lab Dup	0.0177	0.0052	81.17	0.0014	bpql	0.0033	0.0483	7.2	15.39	0.1545	22.96	0.0221	bpql	0.0838
			% difference of duplicates	12%	9%	0%	7%	N/A	6%	1%	1%	1%	2%	3%	4%	N/A	1%
8/11/00	15:47	CW	GKM-4RED 072000	bpql	bpql	81.57	bpql	bpql	0.0065	0.0583	5.575	21.2	0.0078	29.48	0.0469	bpql	0.0131
8/11/00	16:09	CW	GKM-4RED 072000 Lab Dup	bpql	bpql	80.58	bpql	bpql	0.0068	0.0567	5.626	21.3	0.0077	29.41	0.0461	bpql	0.0125
			% difference of duplicates	N/A	N/A	1%	N/A	N/A	5%	3%	1%	0%	1%	0%	2%	N/A	5%
8/11/00	13:55	CW	GKW-3 071900	0.0245	0.0135	83.73	bpql	bpql	bpql	0.056	6.666	15.83	0.2274	22.71	0.1632	bpql	0.0022
8/11/00	14:25	CW	GKW-3 071900 Lab Dup	0.0322	0.015	85.15	bpql	bpql	bpql	0.0595	6.634	15.94	0.2301	21.71	0.1668	bpql	0.0025
			% difference of duplicates	27%	11%	2%	N/A	N/A	N/A	6%	0%	1%	1%	5%	2%	N/A	13%
8/11/00	17:30	CW	GKW-8 071900	0.0108	bpql	41.53	bpql	bpql	bpql	0.0369	5.181	8.527	0.0202	12.18	0.0231	bpql	0.0022
8/11/00	17:37	CW	GKW-8 071900 Lab Dup	0.0102	bpql	41.34	bpql	bpql	bpql	0.037	5.124	8.498	0.0201	12.17	0.0228	bpql	0.0022
			% difference of duplicates	6%	N/A	0%	N/A	N/A	N/A	0%	1%	0%	0%	0%	1%	N/A	0%
8/11/00	10:46	CW	MLS-5GREEN 071800	0.0138	0.0084	80.74	bpql	bpql	bpql	0.0314	4.373	33.8	0.1526	17.89	0.0347	bpql	0.0027
8/11/00	11:15	CW	MLS-5GREEN 071800 Lab Dup	0.0132	0.0087	79.68	bpql	bpql	bpql	0.0318	4.356	33.61	0.1537	17.78	0.0346	bpql	0.003
			% difference of duplicates	4%	4%	1%	N/A	N/A	N/A	1%	0%	1%	1%	1%	0%	N/A	11%

EPA Method 200.15 Lab Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
9/20/00	13:10	CW	GKM-6W 072400	bpql	bpql	37.33	bpql	bpql	bpql	3.674	4.216	7.97	0.4259	17.39	0.0672	bpql	0.0011
9/20/00	13:21	CW	GKM-6W 072400 Lab Dup	bpql	bpql	37.86	bpql	bpql	bpql	3.737	4.241	8.005	0.4338	17.44	0.0697	bpql	0.0011
			% difference of duplicates	N/A	N/A	1%	N/A	N/A	N/A	2%	1%	0%	2%	0%	4%	N/A	0%
9/20/00	11:33	CW	SiO2 Flour Lot #1 063000	bpql	bpql	0.7705	bpql	bpql	bpql	bpql	bpql	0.134	0.003	bpql	bpql	bpql	0.0049
9/20/00	12:11	CW	SiO2 Flour Lot #1 063000 Lab Dup	bpql	bpql	0.7605	bpql	bpql	bpql	bpql	bpql	0.1364	0.0031	bpql	bpql	bpql	0.0048
			% difference of duplicates	N/A	N/A	1%	N/A	N/A	N/A	N/A	N/A	2%	3%	N/A	N/A	N/A	2%
9/20/00	14:49	CW	SW-1 060100 1/50 dil	bpql	bpql	7.161	bpql	bpql	0.0063	bpql	5.017	2.696	0.0109	10.17	0.0272	bpql	0.0137
9/20/00	15:11	CW	SW-1 060100 1/50 dil Lab Dup	bpql	0.0052	7.236	bpql	bpql	0.0059	bpql	4.973	2.718	0.011	10.35	0.0258	bpql	bpql
			% difference of duplicates	N/A	N/A	1%	N/A	N/A	7%	N/A	1%	1%	1%	2%	5%	N/A	N/A
9/21/00	15:54	CW	LYSS2-4 072000 1/50 dil	0.0157	bpql	4.273	0.0053	bpql	0.9193	bpql	1.016	6.886	1.42	34.38	bpql	bpql	1.031
9/21/00	15:32	CW	LYSS2-4 072000 1/50 dil Lab Dup	0.0169	bpql	4.185	0.0054	bpql	0.9207	bpql	1.013	6.881	1.406	34.52	bpql	bpql	1.029
			% difference of duplicates	7%	N/A	2%	2%	N/A	0%	N/A	0%	0%	1%	0%	N/A	N/A	0%
9/21/00	12:25	CW	LYSVD-1 071700 1/2 dil	bpql	0.0093	48.53	bpql	bpql	0.0048	0.0155	1.675	15.97	0.0142	46.8	0.0198	bpql	0.0028
9/21/00	12:55	CW	LYSVD-1 071700 1/2 dil Lab Dup	bpql	0.0103	48.04	bpql	bpql	0.0047	0.0145	1.72	15.92	0.0142	45.91	0.0195	bpql	0.003
			% difference of duplicates	N/A	10%	1%	N/A	N/A	2%	7%	3%	0%	0%	2%	2%	N/A	7%
9/21/00	15:58	CW	LYSVD2-7 072400 1/2 dil	bpql	bpql	86.16	0.0202	bpql	0.9514	0.019	1.57	14.34	0.6835	11.13	bpql	bpql	4.971
9/21/00	16:05	CW	LYSVD2-7 072400 1/2 dil Lab Dup	bpql	bpql	86.66	0.0204	bpql	0.9552	0.0184	1.587	14.42	0.6868	10.78	bpql	bpql	5.026
			% difference of duplicates	N/A	N/A	1%	1%	N/A	0%	3%	1%	1%	0%	3%	N/A	N/A	1%
9/25/00	14:31	CW	GKM-8RED 082900	0.0235	0.0212	64.68	bpql	bpql	bpql	1.166	3.667	15.14	1.026	17.58	0.177	bpql	0.0029
9/25/00	15:04	CW	GKM-8RED 082900 Lab Dup	0.0211	0.021	64.4	bpql	bpql	bpql	1.153	3.618	15.01	1.022	17.29	0.1744	bpql	0.0029
			% difference of duplicates	11%	1%	0%	N/A	N/A	N/A	1%	1%	1%	0%	2%	1%	N/A	0%

EPA Method 200.15 Lab Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
9/25/00	15:26	CW	GKM-9BLUE 082900	0.0119	0.0795	50.3	0.0012	bpql	bpql	5.759	5.388	13.62	0.6372	21.04	0.1546	bpql	bpql
9/25/00	16:03	CW	GKM-9BLUE 082900 Lab Dup	0.0114	0.0795	50.11	0.0012	bpql	bpql	5.792	5.43	13.67	0.6392	20.72	0.153	bpql	0.0017
			% difference of duplicates	4%	0%	0%	0%	N/A	N/A	1%	1%	0%	0%	2%	1%	N/A	N/A
9/25/00	13:18	CW	GKW-9 082900 Split	bpql	bpql	82.98	bpql	bpql	0.003	0.221	6.434	26	0.284	20.58	0.0183	bpql	0.0032
9/25/00	13:51	CW	GKW-9 082900 Split Lab Dup	bpql	bpql	82.67	bpql	bpql	bpql	0.1845	6.421	26.19	0.2843	20.43	0.0178	bpql	0.0026
			% difference of duplicates	N/A	N/A	0%	N/A	N/A	N/A	18%	0%	1%	0%	1%	3%	N/A	21%
9/26/00	13:20	CW	GKW-11 082800	bpql	bpql	67.26	bpql	bpql	bpql	0.0186	2.897	27.45	0.0068	12.95	0.0562	bpql	0.0019
9/26/00	13:57	CW	GKW-11 082800 Lab Dup	bpql	bpql	67.23	bpql	bpql	bpql	0.018	2.93	26.65	0.0069	12.28	0.0581	bpql	0.0017
			% difference of duplicates	N/A	N/A	0%	N/A	N/A	N/A	3%	1%	3%	1%	5%	3%	N/A	11%
9/26/00	14:32	CW	GKM-1GREEN 082800	bpql	bpql	74.75	bpql	bpql	bpql	0.0524	5.116	21	0.7154	19.69	0.0145	bpql	0.0051
9/26/00	15:01	CW	GKM-1GREEN 082800 Lab Dup	bpql	bpql	77.34	bpql	bpql	bpql	0.0538	5.415	22.3	0.7473	18.22	0.0162	bpql	0.0053
			% difference of duplicates	N/A	N/A	3%	N/A	N/A	N/A	3%	6%	6%	4%	8%	11%	N/A	4%
9/25/00	15:59	CW	MLS-4RED 082800	bpql	0.005	76.03	bpql	bpql	bpql	0.0197	4.526	27.8	0.0041	26.9	0.0466	bpql	0.0029
9/26/00	12:48	CW	MLS-4RED 082800 Lab Dup	bpql	bpql	74.55	bpql	bpql	bpql	0.021	4.453	26.64	0.0039	28.09	0.0488	bpql	0.0025
			% difference of duplicates	N/A	N/A	2%	N/A	N/A	N/A	6%	2%	4%	5%	4%	5%	N/A	15%
10/18/00	14:53	CW	GKM-3GREEN 083000	bpql	0.0089	77.56	bpql	bpql	0.003	0.0363	6.931	14.59	0.0086	23.81	0.0182	bpql	0.0968
10/18/00	15:22	CW	GKM-3GREEN 083000 Lab Dup	bpql	0.0091	77.99	bpql	bpql	0.0045	0.0434	6.99	14.91	0.0094	24.4	0.0181	bpql	0.0978
			% difference of duplicates	N/A	2%	1%	N/A	N/A	40%	18%	1%	2%	9%	2%	1%	N/A	1%
10/18/00	13:43	CW	GKW-2 083000 FD	bpql	0.0064	71.26	bpql	bpql	0.0044	0.0335	8.246	12.6	0.0091	28.53	0.0505	bpql	0.0027
10/18/00	14:05	CW	GKW-2 083000 FD Lab Dup	bpql	0.0073	72.72	bpql	bpql	0.0039	0.0351	8.483	13.1	0.0094	28.44	0.0513	bpql	0.0025
			% difference of duplicates	N/A	13%	2%	N/A	N/A	12%	5%	3%	4%	3%	0%	2%	N/A	8%

EPA Method 200.15 Lab Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
10/18/00	12:41	CW	GKW-7 083000	0.0326	bpql	42.68	bpql	bpql	bpql	0.2715	1.578	11.05	0.3494	19.67	0.0163	bpql	0.0026
10/18/00	13:08	CW	GKW-7 083000 Lab Dup	0.0436	bpql	43.23	bpql	bpql	0.0055	0.2782	1.578	11.32	0.3518	20.24	0.0169	bpql	0.006
			% difference of duplicates	29%	N/A	1%	N/A	N/A	N/A	2%	0%	2%	1%	3%	4%	N/A	79%
10/19/00	15:01	CW	GKM-4W 100100	bpql	bpql	81.9	bpql	bpql	0.0032	0.0296	5.664	21.64	0.0038	26.37	0.0727	bpql	0.0068
10/19/00	15:38	CW	GKM-4W 100100 Lab Dup	bpql	bpql	84.15	bpql	bpql	bpql	0.0303	5.745	21.42	0.0039	26.07	0.0781	bpql	0.0075
			% difference of duplicates	N/A	N/A	3%	N/A	N/A	N/A	2%	1%	1%	3%	1%	7%	N/A	10%
10/18/00	15:15	CW	MLS-3W 100100	bpql	bpql	108.8	bpql	bpql	0.0066	0.0246	5.845	29.14	0.0701	17.25	0.05	bpql	0.0251
10/19/00	14:30	CW	MLS-3W 100100 Lab Dup	bpql	bpql	110.7	bpql	bpql	0.0066	0.0212	5.735	29.99	0.0682	17.52	0.0456	bpql	0.0241
			% difference of duplicates	N/A	N/A	2%	N/A	N/A	0%	15%	2%	3%	3%	2%	9%	N/A	4%
10/20/00	16:24	CW	GKM-1WC 093000	bpql	0.0149	85.64	bpql	bpql	bpql	0.0215	6.226	17.46	0.0011	21.45	0.0594	bpql	bpql
10/20/00	16:50	CW	GKM-1WC 093000 Lab Dup	bpql	0.0145	83.63	bpql	bpql	bpql	0.0208	6.184	17.4	0.0011	21.41	0.0577	bpql	bpql
			% difference of duplicates	N/A	3%	2%	N/A	N/A	N/A	3%	1%	0%	0%	0%	3%	N/A	N/A
10/20/00	15:19	CW	GKM-2BLUE 093000	0.0562	0.0057	30.74	bpql	bpql	0.0091	0.1529	6.594	5.482	0.0065	26.17	0.032	bpql	0.008
10/20/00	15:48	CW	GKM-2BLUE 093000 Lab Dup	0.0632	0.0052	29.87	bpql	bpql	0.0092	0.1627	6.639	5.524	0.0062	25.5	0.0302	bpql	0.0079
			% difference of duplicates	12%	9%	3%	N/A	N/A	1%	6%	1%	1%	5%	3%	6%	N/A	1%
10/20/00	12:03	CW	GKM-6W 092900	0.0116	bpql	36.82	bpql	bpql	bpql	3.607	4.208	7.785	0.4086	18.13	0.0844	bpql	0.0028
10/20/00	12:29	CW	GKM-6W 092900 Lab Dup	bpql	bpql	36.9	bpql	bpql	bpql	3.626	4.248	7.797	0.4132	17.65	0.0842	bpql	0.0056
			% difference of duplicates	N/A	N/A	0%	N/A	N/A	N/A	1%	1%	0%	1%	3%	0%	N/A	67%
10/20/00	14:22	CW	GKM-8GREEN 092900	0.0288	0.0155	60.69	bpql	bpql	0.0052	2.441	3.403	14.65	0.7179	17.75	0.3914	bpql	0.0076
10/20/00	14:48	CW	GKM-8GREEN 093000 Lab Dup	0.0225	0.0159	60.69	bpql	bpql	0.0048	2.468	3.388	14.67	0.7282	17.43	0.3956	bpql	0.0079
			% difference of duplicates	25%	3%	0%	N/A	N/A	8%	1%	0%	0%	1%	2%	1%	N/A	4%

EPA Method 200.15 Lab Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
10/20/00	12:51	CW	GKM-9RED 092900	0.012	0.0722	51.25	0.0011	bpql	bpql	3.897	5.471	12.83	0.804	20.72	0.1608	bpql	0.0017
10/20/00	13:28	CW	GKM-9RED 092900 Lab Dup	0.0179	0.0701	49.9	0.001	bpql	bpql	3.899	5.514	12.88	0.7956	20.56	0.156	bpql	0.0019
			% difference of duplicates	39%	3%	3%	10%	N/A	N/A	0%	1%	0%	1%	1%	3%	N/A	11%
10/20/00	11:52	CW	MLS-5RED 100100	bpql	0.0055	68.94	bpql	bpql	bpql	0.0327	3.953	27.66	0.0096	13.92	0.0311	bpql	bpql
10/20/00	12:00	CW	MLS-5RED 100100 Lab Dup	bpql	0.0059	69.29	bpql	bpql	bpql	0.031	3.907	27.7	0.0096	13.95	0.0313	bpql	0.0017
			% difference of duplicates	N/A	7%	1%	N/A	N/A	N/A	5%	1%	0%	0%	0%	1%	N/A	N/A
10/30/00	17:53	TMC	LYSS2-4 083000	0.2682	bpql	7.5772	0.0078	bpql	1.6964	bpql	1.5991	10.237	1.92717	60.154	bpql	bpql	1.4221
10/30/00	18:41	TMC	LYSS2-4 083000 Lab Dup	0.2631	bpql	7.522	0.0076	bpql	1.667	bpql	1.536	10.11	1.897	59.37	bpql	bpql	1.399
			% difference of duplicates	2%	N/A	1%	2%	N/A	2%	N/A	4%	1%	2%	1%	N/A	N/A	2%
10/26/00	11:42	CW	LYSD2-5 093000	bpql	bpql	156.1	0.0307	bpql	1.336	0.0341	8.55	31.6	0.4281	39.6	0.0136	bpql	10.54
10/26/00	12:19	CW	LYSD2-5 093000 Lab Dup	bpql	bpql	153.2	0.0311	bpql	1.35	0.0327	8.648	31.96	0.4238	39.42	0.0122	bpql	10.48
			% difference of duplicates	N/A	N/A	2%	1%	N/A	1%	4%	1%	1%	1%	0%	11%	N/A	1%
10/26/00	13:59	CW	GKM-1GREEN 061900 1/2 dil	0.049	bpql	42.59	bpql	bpql	bpql	0.1209	2.825	12.76	5.002	12.66	bpql	bpql	0.009
10/26/00	14:40	CW	GKM-1GREEN 061900 1/2 dil L.Dup	0.0548	bpql	40.87	bpql	bpql	bpql	0.1187	2.976	12.57	4.959	10.17	bpql	bpql	0.007
			% difference of duplicates	11%	N/A	4%	N/A	N/A	N/A	2%	5%	2%	1%	22%	N/A	N/A	25%
10/26/00	15:08	CW	LYSD-7 092900 1/4 dil	0.2921	bpql	42.86	0.0147	bpql	4.766	0.0083	0.7796	5.555	1.302	4.514	bpql	bpql	3.373
10/26/00	15:45	CW	LYSD-7 092900 1/4 dil Lab Dup	0.2923	bpql	43.29	0.0176	bpql	5.103	0.0061	1.406	5.855	1.36	3.064	bpql	bpql	3.652
			% difference of duplicates	0%	N/A	1%	18%	N/A	7%	31%	57%	5%	4%	38%	N/A	N/A	8%
10/31/00	11:07	CW	LYSS-1 093000	bpql	0.0142	18.17	bpql	bpql	bpql	bpql	0.3923	10.61	bpql	46.19	bpql	bpql	0.0011
10/31/00	11:16	CW	LYSS-1 093000 Lab Dup	bpql	0.0141	18.48	bpql	bpql	bpql	bpql	0.3699	10.64	bpql	46.77	bpql	bpql	0.0014
			% difference of duplicates	N/A	1%	2%	N/A	N/A	N/A	N/A	6%	0%	N/A	1%	N/A	N/A	24%

EPA Method 200.15 Lab Duplicates by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
10/31/00	11:56	CW	LYSD-4 083000 1/4 dil	bpql	0.0074	25.38	0.0019	bpql	0.1664	0.012	1.507	8.1	0.0695	72.89	0.0484	bpql	0.2298
10/31/00	12:32	CW	LYSD-4 083000 1/4 dil Lab Dup	bpql	0.0079	26.28	0.002	bpql	0.1783	0.0125	1.63	8.692	0.0729	76.93	0.051	bpql	0.2432
			% difference of duplicates	N/A	7%	3%	5%	N/A	7%	4%	8%	7%	5%	5%	5%	N/A	6%
10/31/00	13:22	CW	LYSVD-7 082900 1/4 dil	bpql	bpql	51.54	0.0144	bpql	0.3447	0.0082	1.416	6.767	0.0666	44.21	bpql	bpql	3.509
10/31/00	14:00	CW	LYSVD-7 082900 1/4 dil Lab Dup	bpql	bpql	54.91	0.0151	bpql	0.3661	0.0088	1.456	7.285	0.0702	46.62	bpql	bpql	3.708
			% difference of duplicates	N/A	N/A	6%	5%	N/A	6%	7%	3%	7%	5%	5%	N/A	N/A	6%
12/1/00	11:06	CW	GKM-1GREEN 061900 1/4 dil	n/a	n/a	22.27	n/a	n/a	bpql	n/a	1.421	6.119	2.66	6.863	n/a	n/a	0.0041
12/1/00	11:43	CW	GKM-1GREEN 061900 1/4 dil Lab Dup	n/a	n/a	21.24	n/a	n/a	bpql	n/a	1.45	6.127	2.618	6.91	n/a	n/a	0.0047
			% difference of duplicates	n/a	n/a	5%	n/a	n/a	N/A	n/a	2%	0%	2%	1%	n/a	n/a	14%

bpql = below the probable quantitative limit

APPENDIX B – Water Resources

B.6 Metals QC Data

B.6.4 Laboratory Sample Fortified Matrix Sample Spikes and Fortified Matrix Blanks

Laboratory spikes are samples in which analytes of known concentrations have been added to an aliquot of the sample digest in order to assess matrix effects on analyte recoveries.

Lab Fortified Blank - Lab Fortified Blanks (LFBs) are samples in which analytes of known concentrations have been added to an aliquot of the calibration blank in order to assess matrix effects on analyte recoveries.

Spike recoveries are calculated by subtracting the diluted sample value from the spiked sample value and dividing the difference by the amount of spike added. We then multiply this value by 100 to obtain percent units.

EPA Method 200.15 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
		Amount Spike Added		0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
8/2/00	15:48	CW	MW-2 060200 SPK DIL	bpql	bpql	76.69	bpql	bpql	0.0032	0.0173	1.998	27.61	bpql	15.89	0.07	bpql	0.0034
8/2/00	15:59	CW	MW-2 060200 SPK	0.5161	0.5481	93.44	0.2114	0.5246	0.528	0.5483	7.124	32.73	0.524	26.25	1.178	0.533	0.5234
			% spike recovery	N/A	N/A	84%	N/A	N/A	105%	106%	103%	102%	N/A	104%	111%	N/A	104%
8/2/00	16:01	CW	SW-2 060100 SPK DIL	bpql	0.0596	110.5	0.0014	bpql	0.0627	0.0402	12.68	22.79	0.0246	44.8	0.146	bpql	0.0144
8/2/00	16:06	CW	SW-2 060100 SPK	0.5265	0.5913	124.9	0.2126	0.5118	0.6106	0.5624	17.35	28.72	0.5426	52.49	1.175	0.527	0.5359
			% spike recovery	N/A	106%	72%	106%	N/A	110%	104%	93%	119%	104%	77%	103%	N/A	104%
8/4/00	15:45	CW	GKM-1RED 061900SPK DIL	0.0117	bpql	87.88	bpql	bpql	bpql	0.0408	5.187	17.02	1.084	17.3	0.017	bpql	0.0035
8/4/00	15:49	CW	GKM-1RED 061900 SPK	0.5485	0.5519	107.3	0.2093	0.5229	0.5334	0.5513	9.802	22.7	1.598	27.35	1.009	0.521	0.5209
			% spike recovery	107%	N/A	97%	N/A	N/A	N/A	102%	92%	114%	103%	101%	99%	N/A	103%
8/4/00	16:41	CW	GKM-4RED 062000 SPK DIL	0.022	bpql	75	bpql	bpql	0.007	0.0554	5.016	19.34	0.2298	26.6	0.023	bpql	0.0176
8/4/00	16:44	CW	GKM-4RED 062000 SPK	0.5384	0.519	96.62	0.2018	0.4964	0.5198	0.5528	11.53	26.06	0.7226	39.31	0.993	0.498	0.5154
			% spike recovery	103%	N/A	108%	N/A	N/A	103%	99%	130%	134%	99%	127%	97%	N/A	100%
8/4/00	12:09	CW	GKW-2 062800 SPK DIL	0.0125	0.0113	74.22	bpql	bpql	bpql	0.0372	7.355	12.74	0.0075	16.42	0.068	bpql	0.0038
8/4/00	12:14	CW	GKW-2 062800 SPK	0.5336	0.5354	91	0.2061	0.5036	0.5202	0.545	12.03	17.99	0.5144	26.04	1.056	0.512	0.5125
			% spike recovery	104%	105%	84%	N/A	N/A	N/A	102%	94%	105%	101%	96%	99%	N/A	102%
8/4/00	13:05	CW	GKW-9 062900 SPK DIL	0.014	bpql	72.7	bpql	bpql	0.0033	0.0668	6.234	22.06	0.5277	20.06	0.014	bpql	0.0042
8/4/00	13:08	CW	GKW-9 062900 SPK	0.531	0.5157	88.52	0.2028	0.5066	0.5227	0.5643	10.93	27.01	1.003	29.28	0.996	0.503	0.5036
			% spike recovery	103%	N/A	79%	N/A	N/A	104%	100%	94%	99%	95%	92%	98%	N/A	100%
8/4/00	17:13	CW	MLS-5RED 062000 SPK DIL	0.0138	0.0054	57.45	bpql	bpql	bpql	0.028	3.408	22.49	0.0393	12.14	0.027	bpql	0.0047
8/4/00	17:17	CW	MLS-5RED 062000 SPK	0.5444	0.5305	78.97	0.2111	0.5177	0.5259	0.5491	8.356	28.67	0.5644	22.09	1.056	0.525	0.5251
			% spike recovery	106%	105%	108%	N/A	N/A	N/A	104%	99%	124%	105%	100%	103%	N/A	104%

EPA Method 200.15 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
		Amount Spike Added		0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
8/4/00	14:03	CW	MW-4 SPLIT 063000 SPK DIL	bpql	bpql	74.77	bpql	bpql	bpql	0.0208	3.986	25.74	0.0137	25	0.054	bpql	0.0034
8/4/00	14:07	CW	MW-4 SPLIT 063000 SPK	0.535	0.5281	92.44	0.2059	0.5168	0.5288	0.5251	8.823	31.05	0.518	35.11	1.04	0.51	0.5112
			% spike recovery	N/A	N/A	88%	N/A	N/A	N/A	101%	97%	106%	101%	101%	99%	N/A	102%
8/7/00	16:16	CW	GKM-6BLUE 062700 SPK DIL	0.0196	bpql	65.18	bpql	bpql	bpql	4.916	4.259	14.88	1.225	20.48	0.047	bpql	0.0056
8/7/00	16:20	CW	GKM-6BLUE 062700 SPK	0.5296	0.5239	82.36	0.2083	0.4957	0.515	5.345	8.582	20.07	1.68	30.18	0.986	0.515	0.5141
			% spike recovery	102%	N/A	86%	N/A	N/A	N/A	86%	86%	104%	91%	97%	94%	N/A	102%
8/7/00	14:43	CW	GKM-8GREEN 062600 SPK DIL	0.0508	0.1149	67.45	0.0019	bpql	bpql	1.78	3.725	16.08	0.6413	17.77	0.138	bpql	0.0292
8/7/00	14:47	CW	GKM-8GREEN 062600 SPK	0.5802	0.516	85.68	0.2144	0.5136	0.5141	2.294	8.453	21.43	1.137	27.55	1.132	0.524	0.5526
			% spike recovery	106%	80%	91%	106%	N/A	N/A	103%	95%	107%	99%	98%	99%	N/A	105%
8/7/00	13:29	CW	GKM-9RED 062600 SPK DIL	0.015	0.0662	61.02	bpql	bpql	bpql	5.244	6.393	15.9	0.9489	23.31	0.068	bpql	0.0029
8/7/00	13:33	CW	GKM-9RED 062600 SPK	0.5444	0.4957	80.95	0.2132	0.5161	0.5176	5.777	10.99	21.31	1.445	32.97	1.034	0.528	0.5267
			% spike recovery	106%	86%	100%	N/A	N/A	N/A	107%	92%	108%	99%	97%	97%	N/A	105%
8/7/00	15:55	CW	TRIP BLANK 062700 SPK DIL	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql	bpql
8/7/00	15:46	CW	TRIP BLANK 062700 SPK	0.5242	0.2959	20.23	0.2065	0.5269	0.5208	0.5348	5.233	5.178	0.5268	10.63	1.056	0.527	0.5209
			% spike recovery	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8/8/00	16:50	CW	GKM-6BLUE 072400 SPK DIL	0.1391	bpql	44.49	bpql	bpql	0.0031	0.3491	4.271	9.564	0.6359	18.09	0.015	bpql	0.0049
8/8/00	16:54	CW	GKM-6BLUE 072400 SPK	0.5226	0.4063	47.99	0.1558	0.3947	0.4001	0.6635	7.076	11.3	0.8621	26.35	0.775	0.391	0.391
			% spike recovery	77%	N/A	18%	N/A	N/A	79%	63%	56%	35%	45%	83%	76%	N/A	77%
8/8/00	16:00	CW	GKM-6W 072400 SPK DIL	bpql	bpql	38.78	bpql	bpql	bpql	3.582	3.998	7.969	0.433	17.56	0.072	bpql	0.0047
8/8/00	16:07	CW	GKM-6W 072400 SPK	0.5366	0.5348	57.52	0.2047	0.5189	0.5202	4.013	8.774	13.3	0.9238	26.94	1.021	0.519	0.5127
			% spike recovery	N/A	N/A	94%	N/A	N/A	N/A	86%	96%	107%	98%	94%	95%	N/A	102%

EPA Method 200.15 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
			Amount Spike Added	0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
8/8/00	17:01	CW	GKM-9 072400 FD SPK DIL	0.0159	bpql	87.45	bpql	bpql	0.0045	0.1181	7.231	28.15	0.3317	23.68	0.027	bpql	0.0047
8/8/00	17:04	CW	GKM-9 072400 FD SPK	0.5558	0.5663	107.6	0.2121	0.5284	0.5381	0.6451	12.15	33.95	0.8725	32.86	1.061	0.53	0.526
			% spike recovery	108%	N/A	101%	N/A	N/A	107%	105%	98%	116%	108%	92%	103%	N/A	104%
8/8/00	14:53	CW	GKW-7 072000 FD SPK DIL	0.0537	bpql	43.83	bpql	bpql	bpql	0.1629	1.482	11.3	0.3512	18.56	0.012	bpql	0.0034
8/8/00	14:57	CW	GKW-7 072000 FD SPK	0.5924	0.5528	63.27	0.2103	0.5295	0.5341	0.6922	6.727	16.86	0.8771	28.03	1.044	0.529	0.5236
			% spike recovery	108%	N/A	97%	N/A	N/A	N/A	106%	105%	111%	105%	95%	103%	N/A	104%
8/8/00	13:15	CW	MLS-3RED 072000 SPK DIL	0.1202	0.0137	56.99	bpql	bpql	0.0048	0.198	13.05	20.52	0.7301	24.19	0.165	bpql	0.0045
8/8/00	13:56	CW	MLS-3RED 072000 SPK	0.6735	0.5208	79.72	0.2108	0.5325	0.5461	0.7258	18.3	27.19	1.276	35.1	1.182	0.528	0.5274
			% spike recovery	111%	101%	114%	N/A	N/A	108%	106%	105%	133%	109%	109%	102%	N/A	105%
8/10/00	14:16	CW	GKM-2W 071700 FD SPK DIL	bpql	bpql	30.72	bpql	bpql	bpql	0.0371	5.939	5.212	0.0063	25.4	0.023	bpql	0.0029
8/10/00	14:21	CW	GKM-2W 071700 FD SPK	0.4962	0.5063	49.57	0.1991	0.4953	0.502	0.5375	10.68	10.16	0.5027	35.1	1.016	0.497	0.4952
			% spike recovery	N/A	N/A	94%	N/A	N/A	N/A	100%	95%	99%	99%	97%	99%	N/A	98%
8/10/00	15:15	CW	MLS-5RED 071800 SPK DIL	bpql	0.0053	64.1	bpql	bpql	bpql	0.0182	3.48	24.8	0.0117	12.09	0.029	bpql	0.0039
8/10/00	15:19	CW	MLS-5RED 071800 SPK	0.5097	0.5207	81.41	0.2047	0.4942	0.5023	0.528	8.381	29.95	0.5106	21.39	1.02	0.507	0.5001
			% spike recovery	N/A	103%	87%	N/A	N/A	N/A	102%	98%	103%	100%	93%	99%	N/A	99%
8/10/00	16:16	CW	GKM-1GREEN 071700 SPK DIL	0.0651	bpql	65.13	bpql	bpql	bpql	0.2486	4.328	18.59	3.938	18.56	0.011	bpql	0.0067
8/10/00	16:21	CW	GKM-1GREEN 071700 SPK	0.5705	0.5149	82.4	0.2021	0.4879	0.501	0.7554	8.814	23.88	4.409	27.56	0.951	0.498	0.4983
			% spike recovery	101%	N/A	86%	N/A	N/A	N/A	101%	90%	106%	94%	90%	94%	N/A	98%
8/11/00	12:54	CW	GKM-2BLUE 071700 SPK DIL	0.1093	0.0082	29.55	bpql	bpql	0.0193	0.3706	6.428	5.144	0.1256	25.41	0.037	bpql	0.0118
8/11/00	12:58	CW	GKM-2BLUE 071700 SPK	0.6959	0.5012	48.26	0.1989	0.4953	0.5279	0.9417	11.1	10.25	0.6237	33.61	1.025	0.498	0.5097
			% spike recovery	117%	99%	94%	N/A	N/A	102%	114%	93%	102%	100%	82%	99%	N/A	100%

EPA Method 200.15 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
		Amount Spike Added		0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
8/11/00	17:22	CW	GKM-9W 072000 SPK DIL	bpql	0.0455	47.2	bpql	bpql	bpql	0.5307	4.273	11.4	1.024	16.23	0.092	bpql	0.005
8/11/00	17:26	CW	GKM-9W 072000 SPK	0.5146	0.5533	66.1	0.2033	0.4945	0.5099	1.032	8.917	16.72	1.506	26.18	1.046	0.496	0.4986
			% spike recovery	N/A	102%	95%	N/A	N/A	N/A	100%	93%	106%	96%	100%	95%	N/A	99%
8/11/00	15:20	CW	GKW-1 071900 SPK DIL	0.0447	bpql	54.48	bpql	bpql	bpql	0.0501	5.849	10.13	0.0433	23.55	0.025	bpql	0.0033
8/11/00	15:24	CW	GKW-1 071900 SPK	0.5361	0.5188	71.5	0.2075	0.4922	0.506	0.5568	10.69	15.22	0.5473	31.91	1.028	0.509	0.5107
			% spike recovery	98%	N/A	85%	N/A	N/A	N/A	101%	97%	102%	101%	84%	100%	N/A	101%
8/11/00	16:25	CW	GKW-5 071900 SPK DIL	bpql	0.0296	73.54	bpql	bpql	0.005	0.0266	7.541	15.3	0.0089	16.51	0.088	bpql	0.0039
8/11/00	16:21	CW	GKW-5 071900 SPK	0.5187	0.5526	90.92	0.2054	0.5098	0.5264	0.5257	12.18	20.6	0.5056	27.45	1.061	0.502	0.5019
			% spike recovery	N/A	105%	87%	N/A	N/A	104%	100%	93%	106%	99%	109%	97%	N/A	100%
8/11/00	11:43	CW	MLS-5BLUE 071800 SPK DIL	bpql	bpql	69.1	bpql	bpql	0.0037	0.0318	4.958	29.25	0.3002	15.47	0.022	bpql	0.0041
8/11/00	11:47	CW	MLS-5BLUE 071800 SPK	0.5265	0.5189	86.6	0.2025	0.5062	0.5223	0.5327	9.787	34.52	0.79	24.98	1.03	0.504	0.503
			% spike recovery	N/A	N/A	88%	N/A	N/A	104%	100%	97%	105%	98%	95%	101%	N/A	100%
9/20/00	12:35	CW	GKM-6BLUE 072400 SPK DIL	0.2557	bpql	41	bpql	bpql	bpql	0.413	4.246	8.95	0.6061	17	0.01	bpql	0.0023
9/20/00	12:39	CW	GKM-6BLUE 072400 SPK	0.7527	0.499	57.9	0.2043	0.495	0.5163	0.9238	9.099	14.06	1.085	26.25	1.009	0.506	0.5047
			% spike recovery	99%	N/A	85%	N/A	N/A	N/A	102%	97%	102%	96%	93%	100%	N/A	100%
9/20/00	13:34	CW	MLS-3W 062700 1/2 dil SPK DIL	bpql	bpql	31.27	bpql	bpql	bpql	0.015	3.229	8.366	0.0854	6.705	0.024	bpql	0.0014
9/20/00	13:37	CW	MLS-3W 062700 1/2 dil SPK	0.5185	0.515	49.94	0.2081	0.5106	0.5229	0.5376	8.234	13.63	0.5964	16.29	1.061	0.517	0.5145
			% spike recovery	N/A	N/A	93%	N/A	N/A	N/A	105%	100%	105%	102%	96%	104%	N/A	103%
9/20/00	15:24	CW	MLS-4W 071800 SPK DIL	bpql	bpql	69.32	bpql	bpql	bpql	0.0247	4.01	25.02	0.0132	24.67	0.042	bpql	0.0051
9/20/00	15:31	CW	MLS-4W 071800 SPK	0.5241	0.509	83.69	0.2096	0.4934	0.536	0.5302	9.14	30.33	0.5063	34.4	1.017	0.504	0.5141
			% spike recovery	N/A	N/A	72%	N/A	N/A	N/A	101%	103%	106%	99%	97%	98%	N/A	102%

EPA Method 200.15 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
			Amount Spike Added	0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
9/20/00	12:26	CW	SiO2 Flour #1 063000 SPK DIL	bpql	bpql	0.7156	bpql	bpql	bpql	bpql	bpql	0.125	0.0033	bpql	bpql	bpql	0.0051
9/20/00	12:30	CW	SiO2 Flour #1 063000 SPK	0.5076	0.4866	19.79	0.2064	0.5182	0.5146	0.534	5.124	4.94	0.5209	10.05	1.079	0.523	0.5167
			% spike recovery	N/A	N/A	95%	N/A	N/A	N/A	N/A	N/A	96%	104%	N/A	N/A	N/A	102%
9/21/00	16:20	CW	GKM-6W 072400 SPK DIL	bpql	bpql	34.79	bpql	bpql	bpql	3.475	3.902	7.399	0.4042	16.35	0.068	bpql	0.0029
9/21/00	16:24	CW	GKM-6W 072400 SPK	0.468	0.4644	53.27	0.1873	0.4606	0.4742	3.913	8.638	12.58	0.8456	26.1	0.987	0.468	0.4643
			% spike recovery	N/A	N/A	92%	N/A	N/A	N/A	88%	95%	104%	88%	98%	92%	N/A	92%
9/25/00	15:17	CW	GKM-8RED 082900 SPK DIL	0.0185	0.0187	60.2	bpql	bpql	bpql	1.088	3.376	14	0.9498	16.24	0.16	bpql	0.0031
9/25/00	15:21	CW	GKM-8RED 082900 SPK	0.569	0.57	75.71	0.2193	0.5255	0.5531	1.616	8.07	18.96	1.454	25.49	1.178	0.534	0.5405
			% spike recovery	110%	110%	78%	N/A	N/A	N/A	106%	94%	99%	101%	93%	102%	N/A	107%
9/25/00	16:15	CW	GKM-9RED 082900 SPK DIL	0.0141	0.0666	51.53	0.0011	bpql	bpql	3.893	5.36	13.07	0.8155	20.3	0.141	bpql	0.0026
9/25/00	16:19	CW	GKM-9RED 082900 SPK	0.5576	0.6083	68.1	0.2142	0.5196	0.5463	4.35	9.928	18.2	1.296	29.92	1.094	0.525	0.5269
			% spike recovery	109%	108%	83%	107%	N/A	N/A	91%	91%	103%	96%	96%	95%	N/A	105%
9/25/00	14:03	CW	GKW-8 082900 SPK DIL	0.0624	bpql	39.62	bpql	bpql	bpql	0.1972	4.829	8.094	0.0132	11.31	0.028	bpql	0.0031
9/25/00	14:09	CW	GKW-8 082900 SPK	0.6311	0.561	57.78	0.2229	0.5389	0.5595	0.7607	9.829	13.45	0.5589	21.27	1.094	0.549	0.5509
			% spike recovery	114%	N/A	91%	N/A	N/A	N/A	113%	100%	107%	109%	100%	107%	N/A	110%
9/25/00	12:49	CW	MLS-3W 062700 1/2 dil SPK DIL	bpql	0.0058	30.09	bpql	bpql	bpql	0.0272	7.703	11.26	0.3812	15.61	0.042	bpql	0.0024
9/25/00	12:53	CW	MLS-3W 062700 1/2 dil SPK	0.5146	0.5141	48.26	0.2102	0.5084	0.5203	0.5511	12.61	16.45	0.8817	25.14	1.081	0.52	0.5149
			% spike recovery	N/A	102%	91%	N/A	N/A	N/A	105%	98%	104%	100%	95%	104%	N/A	103%
9/26/00	15:13	CW	GKW-10 082800 SPK DIL	0.0575	bpql	69.3	bpql	bpql	bpql	0.0917	3.784	22.24	0.0176	14.75	0.044	bpql	0.0036
9/26/00	15:19	CW	GKW-10 082800 SPK	0.6107	0.5241	85.93	0.2108	0.5046	0.527	0.6339	8.583	27.61	0.5232	23.32	1.061	0.513	0.518
			% spike recovery	111%	N/A	83%	N/A	N/A	N/A	108%	96%	107%	101%	86%	102%	N/A	103%

EPA Method 200.15 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
			Amount Spike Added	0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
9/26/00	14:09	CW	LYSVD-1 082800 SPK DIL	bpql	0.0162	84.49	bpql	bpql	0.0074	0.0237	2.692	27.52	bpql	67.17	0.023	bpql	0.0104
9/26/00	14:15	CW	LYSVD-1 082800 SPK	0.5275	0.5642	100.6	0.2172	0.5193	0.5528	0.5494	7.576	32.93	0.5217	77.08	1.08	0.527	0.5401
			% spike recovery	N/A	110%	81%	N/A	N/A	109%	105%	98%	108%	N/A	99%	106%	N/A	106%
9/26/00	13:05	CW	MW-4 FD 082800 SPK DIL	bpql	bpql	74.48	bpql	bpql	bpql	0.0251	4.125	24.77	0.0343	24.69	0.05	bpql	0.0016
9/26/00	13:09	CW	MW-4 FD 082800 SPK	0.4813	0.511	91.76	0.1971	0.4869	0.491	0.5146	8.892	29.86	0.5185	34.64	1.058	0.493	0.4881
			% spike recovery	N/A	N/A	86%	N/A	N/A	N/A	98%	95%	102%	97%	100%	101%	N/A	97%
10/18/00	13:20	CW	GKM-3RED 083000 SPK DIL	bpql	0.0098	70.5	bpql	bpql	0.0058	0.0349	6.323	12.76	0.0064	21.16	0.036	bpql	0.1471
10/18/00	13:24	CW	GKM-3RED 083000 SPK	0.5081	0.5443	87.57	0.2101	0.5074	0.5249	0.5565	11.11	17.94	0.5197	30.43	1.084	0.521	0.6688
			% spike recovery	N/A	107%	85%	N/A	N/A	104%	104%	96%	104%	103%	93%	105%	N/A	104%
10/18/00	15:37	CW	GKM-4W 083000 SPK DIL	bpql	bpql	77.1	bpql	bpql	bpql	0.0289	5.445	19.61	0.0064	23.87	0.074	bpql	0.0083
10/18/00	15:41	CW	GKM-4W 083000 SPK	0.5747	0.6173	102.6	0.2366	0.5893	0.5974	0.6314	10.86	26.5	0.5915	34.4	1.294	0.596	0.5962
			% spike recovery	N/A	N/A	128%	N/A	N/A	N/A	121%	108%	138%	117%	105%	122%	N/A	118%
10/18/00	14:20	CW	GKM-5BLUE 083000 SPK DIL	bpql	0.008	73.39	0.0021	bpql	0.0333	0.039	5.064	15.97	0.0275	19.48	0.022	bpql	0.2056
10/18/00	14:24	CW	GKM-5BLUE 083000 SPK	0.5325	0.5711	91.8	0.222	0.5377	0.574	0.5959	9.877	21.34	0.5694	29.25	1.141	0.555	0.7528
			% spike recovery	N/A	113%	92%	110%	N/A	108%	111%	96%	107%	108%	98%	112%	N/A	109%
10/18/00	15:46	CW	INFLOW 071900 SPK DIL	bpql	bpql	54.69	bpql	bpql	bpql	0.0297	6.416	13.06	0.0629	29.86	1.318	bpql	0.0043
10/18/00	15:51	CW	INFLOW 071900 SPK	0.5119	0.5405	69.39	0.2107	0.5163	0.5274	0.5609	10.98	17.72	0.5836	37.69	2.245	0.533	0.5316
			% spike recovery	N/A	N/A	74%	N/A	N/A	N/A	106%	91%	93%	104%	78%	93%	N/A	105%
10/19/00	16:05	CW	GKM-4RED 100100 SPK DIL	bpql	bpql	78.44	bpql	bpql	0.0062	0.0287	5.276	20.98	0.0005	25.81	0.053	bpql	0.011
10/19/00	16:09	CW	GKM-4RED 100100 SPK	0.5304	0.5452	94.34	0.2144	0.5093	0.5528	0.5458	10.3	26.37	0.5145	35.21	1.036	0.518	0.5339
			% spike recovery	N/A	N/A	80%	N/A	N/A	109%	103%	100%	108%	103%	94%	98%	N/A	105%

EPA Method 200.15 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
		Probable Quantitative Limit		0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
		Amount Spike Added		0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
10/19/00	14:44	CW	MLS-4RED 100100 SPK DIL	bpql	bpql	72.54	bpql	bpql	bpql	0.0217	4.331	26.33	0.0044	25.49	0.045	bpql	0.0035
10/19/00	14:51	CW	MLS-4RED 100100 SPK	0.5439	0.527	88.64	0.2159	0.4989	0.549	0.526	9.274	32.31	0.5042	35.19	0.976	0.511	0.5218
			% spike recovery	N/A	N/A	81%	N/A	N/A	N/A	101%	99%	120%	100%	97%	93%	N/A	104%
10/19/00	15:58	CW	MLS-5W 100100 SPK DIL	bpql	0.0056	64.66	bpql	bpql	bpql	0.025	3.694	25.82	0.0395	12.52	0.03	bpql	0.0025
10/19/00	15:52	CW	MLS-5W 100100 SPK	0.5075	0.516	81.64	0.2031	0.4946	0.5155	0.5283	8.651	30.76	0.5318	22.14	0.999	0.502	0.5001
			% spike recovery	N/A	102%	85%	N/A	N/A	N/A	101%	99%	99%	98%	96%	97%	N/A	100%
10/20/00	16:01	CW	GKM-1REDA 093000 SPK DIL	bpql	0.0128	85.47	bpql	bpql	bpql	0.0305	6.139	17.77	0.0067	20.21	0.05	bpql	0.0038
10/20/00	16:05	CW	GKM-1REDA 093000 SPK	0.5734	0.5844	102.7	0.2273	0.5362	0.5838	0.5678	11.36	23.49	0.5309	30.13	1.067	0.531	0.537
			% spike recovery	N/A	114%	86%	N/A	N/A	N/A	107%	104%	114%	105%	99%	102%	N/A	107%
10/20/00	17:03	CW	GKM-2W 093000 SPK DIL	0.0145	bpql	31.46	bpql	bpql	bpql	0.0664	6.737	5.704	0.0049	26.41	0.023	bpql	0.0031
10/20/00	17:07	CW	GKM-2W 093000 SPK	0.5951	0.5794	49.17	0.2317	0.5595	0.589	0.6327	11.58	10.83	0.5547	35.88	1.128	0.554	0.5582
			% spike recovery	116%	N/A	89%	N/A	N/A	N/A	113%	97%	103%	110%	95%	110%	N/A	111%
10/20/00	12:42		GKM-6BLUE 092900 SPK DIL	0.1008	bpql	35.73	bpql	bpql	bpql	3.375	3.115	7.636	0.6234	16.26	0.068	bpql	0.0027
10/20/00	12:46	CW	GKM-6BLUE 092900 SPK	0.5793	0.512	53.78	0.2018	0.4962	0.5098	3.857	7.747	12.79	1.068	25.97	1.016	0.486	0.4814
			% spike recovery	96%	N/A	90%	N/A	N/A	N/A	96%	93%	103%	89%	97%	95%	N/A	96%
10/20/00	15:00	CW	GKM-8RED 092900 SPK DIL	bpql	0.0179	57.57	bpql	bpql	bpql	0.9475	3.302	13.61	0.8872	16.07	0.172	bpql	0.0033
10/20/00	15:04	CW	GKM-8RED 092900 SPK	0.5192	0.5413	71.72	0.2102	0.4974	0.5314	1.44	7.964	18.33	1.342	25.19	1.15	0.496	0.4997
			% spike recovery	N/A	105%	71%	N/A	N/A	N/A	99%	93%	94%	91%	91%	98%	N/A	99%
10/20/00	13:49	CW	GKM-9BLUE 092900 SPK DIL	0.0384	0.0921	43.7	0.0014	bpql	bpql	4.597	4.891	11.97	0.5423	17.75	0.104	bpql	0.002
10/20/00	13:53	CW	GKM-9BLUE 092900 SPK	0.5418	0.5971	59.5	0.2087	0.4916	0.5234	5.121	9.44	16.99	0.9865	27.38	1.026	0.493	0.4895
			% spike recovery	101%	101%	79%	104%	N/A	N/A	105%	91%	100%	89%	96%	92%	N/A	98%

EPA Method 200.15 Sample Fortified Matrix Spikes by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
			Amount Spike Added	0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
10/26/00	12:31	CW	GKM-3BLUE 093000 SPK DIL	bpql	0.0132	69.74	0.0024	bpql	bpql	0.0322	6.502	13.48	0.0068	21.27	0.035	bpql	0.3074
10/26/00	12:35	CW	GKM-3BLUE 093000 SPK	0.5898	0.61	85.32	0.2436	0.5556	0.608	0.5985	11.21	18.76	0.5553	30.58	1.12	0.562	0.8737
			% spike recovery	N/A	119%	78%	121%	N/A	N/A	113%	94%	106%	110%	93%	109%	N/A	113%
10/26/00	13:36	CW	GKM-3RED 093000 SPK DIL	bpql	0.0103	70.23	bpql	bpql	bpql	0.0395	6.469	13.35	0.0046	20.09	0.035	bpql	0.1472
10/26/00	13:40	CW	GKM-3RED 093000 SPK	0.5483	0.5613	86.21	0.2238	0.5154	0.5585	0.5645	11.14	18.48	0.5116	28.93	1.053	0.519	0.6745
			% spike recovery	N/A	110%	80%	N/A	N/A	N/A	105%	93%	103%	101%	88%	102%	N/A	105%
10/26/00	14:52	CW	GKM-1GREENB 093000 1/2 dil SPK DIL	bpql	bpql	43.71	bpql	bpql	bpql	0.1636	2.683	11.04	2.232	8.437	bpql	bpql	0.0037
10/26/00	14:56	CW	GKM-1GREENB 093000 1/2 dil SPK	0.5494	0.5206	60.92	0.2115	0.4985	0.5415	0.6607	7.556	16.4	2.677	16.52	0.938	0.496	0.5038
			% spike recovery	N/A	N/A	86%	N/A	N/A	N/A	99%	97%	107%	89%	81%	N/A	N/A	100%
12/1/00	11:58	TMC	GKW-3 062900 1/10 dil SPK DIL	n/a	n/a	8.061	n/a	n/a	bpql	n/a	0.7151	1.45	0.0422	2.292	n/a	n/a	0.0022
12/1/00	12:02	TMC	GKW-3 062900 1/10 dil SPK	n/a	n/a	25.9	n/a	n/a	0.4971	n/a	5.419	6.137	0.5402	11.56	n/a	n/a	0.4991
			% spike recovery	n/a	n/a	89%	n/a	n/a	N/A	n/a	94%	94%	100%	93%	n/a	n/a	99%
12/1/00	12:58	TMC	MLS-3W 082800 1/10 dil SPK DIL	n/a	n/a	9.644	n/a	n/a	bpql	n/a	0.5592	2.251	0.0077	1.46	n/a	n/a	0.0018
12/1/00	13:02	TMC	MLS-3W 082800 1/10 dil SPK	n/a	n/a	28.04	n/a	n/a	0.4093	n/a	5.602	7.175	0.4173	11.32	n/a	n/a	0.4109
			% spike recovery	n/a	n/a	92%	n/a	n/a	N/A	n/a	101%	98%	82%	99%	n/a	n/a	82%

bpql = below the probable quantitative limit

EPA Method 200.15 Laboratory Fortified Matrix Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)

		Probable Quantitative Limit		0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
		Amount Spike Added		0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
8/2/00	15:30	CW	CAL BLANK	0.0022	0	-0.0011	-0.0003	0.0007	0.0003	0.0003	0.0329	-0.0011	0	-0.025	-1E-04	-7E-04	0.0002
8/2/00	15:38	CW	CAL BLANK_RQ	0.508	0.4942	21.33	0.2083	0.5339	0.5137	0.5446	5.302	5.17	0.5318	11.11	1.13	0.5351	0.5208
			% spike recovery	101%	99%	107%	104%	107%	103%	109%	105%	103%	106%	111%	113%	107%	104%
8/4/00	16:54	CW	CAL BLANK	-0.0006	0.0001	-0.0007	-0.0004	-2E-04	-0.0001	0.0001	-0.006	0.0005	0.0001	0.0398	-0.002	-7E-04	0.0002
8/4/00	16:59	CW	CAL BLANK_RQ	0.5193	0.5075	20.51	0.2091	0.52	0.5135	0.5158	5.168	5.211	0.516	10.87	1.027	0.5114	0.512
			% spike recovery	104%	101%	103%	105%	104%	103%	103%	103%	104%	103%	108%	103%	102%	102%
8/4/00	16:54	CW	CAL BLANK	-0.0006	0.0001	-0.0007	-0.0004	-2E-04	-0.0001	0.0001	-0.006	0.0005	0.0001	0.0398	-0.002	-7E-04	0.0002
8/4/00	17:08	CW	CAL BLANK_RQ	0.5212	0.5128	20.28	0.2137	0.5191	0.5138	0.5236	5.132	5.147	0.5237	10.35	1.05	0.5192	0.5161
			% spike recovery	104%	103%	101%	107%	104%	103%	105%	103%	103%	105%	103%	105%	104%	103%
8/7/00	15:36	CW	CAL BLANK	0.0003	-0.0002	0.0003	-0.0003	0.0003	-0.0002	0.0006	0.0291	0.0017	0	0.1029	-0.002	0.0003	0.0001
8/7/00	15:40	CW	CAL BLANK_RQ	0.513	0.4916	19.98	0.2102	0.5175	0.5108	0.5365	5.154	5.064	0.5289	10.08	1.073	0.5297	0.5207
			% spike recovery	103%	98%	100%	105%	103%	102%	107%	102%	101%	106%	100%	108%	106%	104%
8/8/00	17:08	CW	CAL BLANK	0.0003	-0.0002	0.0036	-0.0008	0.0009	0.0007	-0.0012	-0.037	0.0069	0	0.1017	0.0016	-0.001	0.0005
8/8/00	17:12	CW	CAL BLANK_RQ	0.5348	0.54	21.31	0.2119	0.5338	0.5217	0.5367	5.364	5.363	0.5405	10.85	1.075	0.53	0.524
			% spike recovery	100%	100%	100%	100%	100%	100%	100%	101%	100%	100%	99%	100%	100%	100%
8/10/00	16:29	CW	CAL BLANK	-0.0003	-0.0002	-0.0006	-0.0003	-6E-04	-0.0014	-0.0001	0.0169	0.0099	0	-0.017	0.0003	-8E-04	-3E-04
8/10/00	16:33	CW	CAL BLANK_RQ	0.491	0.464	19.36	0.2004	0.4963	0.4888	0.5107	5.052	4.909	0.4987	10.36	1.002	0.4986	0.4879
			% spike recovery	98%	93%	97%	100%	99%	98%	102%	101%	98%	100%	104%	100%	100%	98%
8/11/00	17:53	CW	CAL BLANK	0.0006	-0.0011	-0.0006	-0.0001	0.0007	0.0001	-0.0001	-0.017	0.0053	0	0.0098	-0.001	-0.002	0
8/11/00	17:57	CW	CAL BLANK_RQ	0.5204	0.514	19.93	0.2144	0.5187	0.5143	0.525	5.086	5.1	0.5191	10.78	1.03	0.5177	0.5176
			% spike recovery	104%	103%	100%	107%	104%	103%	105%	102%	102%	104%	108%	103%	104%	104%

EPA Method 200.15 Laboratory Fortified Matrix Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
			Amount Spike Added	0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
9/20/00	13:49	CW	CAL BLANK	0.0005	0.0006	-0.0019	-0.0003	0.0001	-0.001	-0.0001	0.077	0.0096	0	-0.048	-0.001	-0.002	-7E-04
9/20/00	13:56	CW	CAL BLANK_RQ	0.5454	0.5299	19.51	0.2202	0.5477	0.5506	0.5617	5.195	5.017	0.5492	10.1	1.129	0.5524	0.5425
			% spike recovery	109%	106%	98%	110%	110%	110%	112%	102%	100%	110%	101%	113%	111%	109%
9/21/00	15:15	CW	CAL BLANK	0.0002	0	-0.001	-0.0003	-7E-04	-0.0005	0.0004	0.0102	0.0083	0	0.0522	0.0012	-0.001	-4E-04
9/21/00	15:24	CW	CAL BLANK_RQ	0.5262	0.5184	20.35	0.2131	0.5307	0.529	0.5468	5.34	5.167	0.5344	10.34	1.121	0.5389	0.5253
			% spike recovery	105%	104%	102%	107%	106%	106%	109%	107%	103%	107%	103%	112%	108%	105%
9/25/00	14:19	CW	CAL BLANK	-0.0003	-0.0002	0.0002	0	-2E-04	0.0001	0	0	0.0061	0	-0.063	0.0002	0.0005	0
9/25/00	14:23	CW	CAL BLANK_RQ	0.5364	0.528	20.26	0.2162	0.5315	0.5329	0.5419	5.256	5.177	0.5396	10.31	1.069	0.5383	0.5335
			% spike recovery	107%	106%	101%	108%	106%	107%	108%	105%	103%	108%	104%	107%	108%	107%
9/26/00	14:23	CW	CAL BLANK	-0.0009	0	0.0002	-0.0001	-3E-04	-0.0006	0	0.0255	0.0005	-1E-04	-0.055	0.0007	-0.002	-3E-04
9/26/00	14:27	CW	CAL BLANK_RQ	0.5219	0.526	21.23	0.2143	0.5368	0.5243	0.5503	5.452	5.307	0.5388	10.93	1.126	0.542	0.5313
			spike added	0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
			% spike recovery	105%	105%	106%	107%	107%	105%	110%	109%	106%	108%	110%	113%	109%	106%
10/18/00	14:32	CW	CAL BLANK	0.0001	-0.0001	0.0001	-0.0001	-3E-04	0.0012	0.0003	0.021	0.0015	0	0.0014	0.0001	-0.003	-1E-04
10/18/00	14:36	CW	CAL BLANK_RQ	0.5234	0.4672	19.05	0.2192	0.5459	0.5359	0.5623	4.963	4.754	0.534	9.966	1.139	0.547	0.5301
			% spike recovery	105%	93%	95%	110%	109%	107%	112%	99%	95%	107%	100%	114%	110%	106%
10/19/00	16:13	CW	CAL BLANK	-0.0004	-0.001	-0.0024	-0.0001	-4E-04	-0.0001	-0.0004	0.0159	0.0073	0	-0.015	-1E-04	-0.001	-4E-04
10/19/00	16:19	CW	CAL BLANK_RQ	0.5115	0.4355	20.65	0.2059	0.5249	0.5209	0.5213	5.304	5.214	0.5049	10.9	1.025	0.5098	0.4983
			% spike recovery	102%	87%	103%	103%	105%	104%	104%	106%	104%	101%	109%	103%	102%	100%
10/20/00	13:57	CW	CAL BLANK	0	-0.0002	-0.0021	-0.0002	-5E-04	-0.001	0.0009	0.0423	-0.0015	0	0.0218	-3E-04	-0.001	-4E-04
10/20/00	14:02	CW	CAL BLANK_RQ	0.5039	0.4259	19.57	0.2044	0.5066	0.5116	0.5088	5.197	5.073	0.4908	10.29	1.015	0.4964	0.4872
			% spike recovery	101%	85%	98%	102%	101%	103%	102%	103%	101%	98%	103%	102%	99%	98%

EPA Method 200.15 Laboratory Fortified Matrix Blanks by ICAP-ES

ICAP-ES Analysis Date	ICAP-ES Analysis Time	Analyst	Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
			Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
			Amount Spike Added	0.5	0.5	20	0.2	0.5	0.5	0.5	5	5	0.5	10	1	0.5	0.5
10/26/00	13:44	CW	CAL BLANK	-0.0008	-0.0006	0.0005	-0.0001	-2E-04	-0.0003	0	0.0235	0.0084	0	-0.015	-9E-04	0.0002	-7E-04
10/26/00	13:48	CW	CAL BLANK_RQ	0.5432	0.4609	20.42	0.219	0.5337	0.5458	0.5397	5.375	5.348	0.5217	10.23	1.059	0.5267	0.5224
			% spike recovery	109%	92%	102%	110%	107%	109%	108%	107%	107%	104%	102%	106%	105%	105%
10/30/00	18:45	TMC	CAL BLANK	-0.0006	-0.0007	0.0037	-0.0001	0.0002	0.0004	-0.0004	-0.046	0.0045	0.0001	0.0341	0.0004	0.0012	0.0007
10/30/00	18:49	TMC	CAL BLANK_RQ	0.4948	0.4906	21.04	0.2026	0.5065	0.4963	0.5034	5.292	5.279	0.4924	10.69	1.011	0.4983	0.4866
			% spike recovery	99%	98%	105%	101%	101%	99%	101%	107%	105%	98%	107%	101%	99%	97%
10/31/00	12:56	CW	CAL BLANK	0.0014	-0.0003	0.0016	0	-4E-04	0.0002	-0.0002	0.0005	-0.001	0.0005	-0.004	-9E-04	-3E-04	-1E-04
10/31/00	13:04	CW	CAL BLANK_RQ	0.5447	0.49	19.72	0.2215	0.5632	0.5516	0.5525	4.854	4.885	0.54	9.975	1.124	0.545	0.5304
			% spike recovery	109%	98%	99%	111%	113%	110%	111%	97%	98%	108%	100%	112%	109%	106%
12/1/00	11:47	CW	CAL BLANK	n/a	n/a	0.0053	n/a	n/a	-0.0004	n/a	0.0215	0.0091	0.0007	0.0313	n/a	n/a	0.0002
12/1/00	12:07	CW	CAL BLANK_RQ	n/a	n/a	19.31	n/a	n/a	0.5317	n/a	5.09	4.983	0.5279	10.15	n/a	n/a	0.5281
			% spike recovery	n/a	n/a	97%	n/a	n/a	106%	n/a	101%	99%	105%	101%	n/a	n/a	106%

bpql = below the probable quantitative limit

APPENDIX B – Water Resources

B.7 Alkalinity, Anion and Coliform Data

Alkalinity, Coliform, and EPA Method 300.0 Anion by Ion Chromatography – Suction Lysimeter Samples

Sample Name	Collection Date	Alkalinity (mg/L $CaCO_3$)	Coliform	Cl^- (ppm)	N in NO_3^- (ppm)	SO_4^{2-} (ppm)
ALYSD2-2 071700	7/17/00	290	no analysis	31.8	3.4	68.4
ALYSS2-2 071700	7/17/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSD-2 071700	7/17/00	85	no analysis	8.6	2.4	45.9
LYSD2-1 071700	7/17/00	665	no analysis	27.6	bdl	451.7
LYSD-3 071700	7/17/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSS-1 071700	7/17/00	445	no analysis	178	bdl	2891.7
LYSS-2 071700	7/17/00	no analysis	no analysis	11.6	3.4	46.3
LYSS-3 071700	7/17/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSS-5 071700	7/17/00	15	no analysis	32.5	1.9	418.4
LYSVD-1 071700	7/17/00	365	no analysis	13.4	bdl	176.5
LYSVD2-2 071700	7/17/00	100	no analysis	7.4	1.2	41.5
LYSVD2-3 071700	7/17/00	180	no analysis	13.9	0.3	95.4
LYSVD-5 071700	7/17/00	no analysis	no analysis	no analysis	no analysis	no analysis
ALYSD2-3 071800	7/18/00	270	<1 COL/100 ML	41.3	30.3	82.9
ALYSS2-3 071800	7/18/00	305	no analysis	32.7	22.1	90.9
BLYSD-2 072000	7/20/00	270	no analysis	47.8	1.6	120.6
BLYSS-2 072000	7/20/00	no analysis	P/A- EC-	no analysis	no analysis	no analysis
LYSD2-9 072000	7/20/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSD-4 072000	7/20/00	105	no analysis	55.9	24.9	824.9
LYSS2-4 072000	7/20/00	95	no analysis	188.1	66.7	5619.6
LYSVD2-8 072000	7/20/00	205	no analysis	8	0.8	40.1
LYSVD-9 072000	7/20/00	225	no analysis	9.7	0.3	58.1
LYSD-7 072400	7/24/00	5	no analysis	10.1	18.4	593.2
LYSS-7 072400	7/24/00	no analysis	no analysis	16.1	8.8	732
LYSVD2-7 072400	7/24/00	15	no analysis	18.5	5.9	550
LYSVD-6 072400	7/24/00	no analysis	no analysis	19.9	0.2	122.4
ALYSD-1 081400	8/14/00	225	<1 COL/100 ML	53.1	5.3	97.1
ALYSD-1 082800	8/28/00	355	no analysis	59.2	6.07	137.4
LYSD2-1 082800	8/28/00	720	no analysis	21.6	bdl	398.8
LYSVD-1 082800	8/28/00	355	no analysis	11.7	bdl	144.7
LYSD-2 082900	8/29/00	70	no analysis	5.2	2.53	38.5
LYSD2-9 082900	8/29/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSD-7 082900	8/29/00	no analysis	no analysis	no analysis	no analysis	no analysis

Alkalinity, Coliform, and EPA Method 300.0 Anion by Ion Chromatography – Suction Lysimeter Samples

Sample Name	Collection Date	Alkalinity (mg/L $CaCO_3$)	Coliform	Cl^- (ppm)	N in NO_3^- (ppm)	SO_4^{2-} (ppm)
LYSD-8 082900	8/29/00	205	no analysis	7.9	3.33	84.7
LYSVD2-2 082900	8/29/00	80	no analysis	5.5	1.22	41.2
LYSVD2-7 082900	8/29/00	15	no analysis	10.2	9.28	489.6
LYSVD2-8 082900	8/29/00	235	no analysis	7.1	0.91	77
LYSVD-9 082900	8/29/00	205	no analysis	8.4	0.3	56.3
LYSD2-5 083000	8/30/00	15	no analysis	24.2	4.4	578.7
LYSD-3 083000	8/30/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSD-4 083000	8/30/00	125	no analysis	37.3	21.7	751.1
LYSS2-4 083000	8/30/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSVD2-3 083000	8/30/00	260	no analysis	10.5	0.2	93
LYSVD-4 083000	8/30/00	175	no analysis	8.5	0.6	145.8
LYSD2-9 092900	9/29/00	no analysis	no analysis	13.5	1.9	165.6
LYSD-7 092900	9/29/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSD-8 092900	9/29/00	165	no analysis	7.3	3.1	114.3
LYSVD2-7 092900	9/29/00	30	no analysis	7.5	10.8	371.1
LYSVD2-8 092900	9/29/00	155	no analysis	7	1.2	127.3
LYSVD-9 092900	9/29/00	150	no analysis	6.2	0.6	46.3
LYSD-2 093000	9/30/00	55	no analysis	4.9	2.7	41.2
LYSD2-1 093000	9/30/00	725	no analysis	22.5	bdl	352.5
LYSD2-5 093000	9/30/00	10	no analysis	24.4	4.4	576.8
LYSD-3 093000	9/30/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSS-1 093000	9/30/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSVD-1 093000	9/30/00	305	no analysis	12	bdl	120.6
LYSVD2-2 093000	9/30/00	65	no analysis	5.5	1.9	49.3
LYSVD2-3 093000	9/30/00	140	no analysis	10.3	0.6	93
ALYSS-1 100100	10/1/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSD-4 100100	10/1/00	85	no analysis	31.8	21.6	587.9
LYSS2-4 100100	10/1/00	no analysis	no analysis	no analysis	no analysis	no analysis
LYSVD-4 100100	10/1/00	190	no analysis	7.9	1.2	152.3

Alkalinity, Coliform, and EPA Method 300.0 Anion by Ion Chromatography – Multi-Level Well Samples

Sample Name	Collection Date	Alkalinity (mg/L $CaCO_3$)	Coliform	Cl^- (ppm)	N in NO_3^- (ppm)	SO_4^{2-} (ppm)
GKM-1GREEN 061900	6/19/00	235	no analysis	12.7	bdl	108.4
GKM-1GREEN 071700	7/17/00	no analysis	no analysis	no analysis	no analysis	no analysis
GKM-1GREEN 082800	8/28/00	210	no analysis	9.1	bdl	96.4
GKM-1GREENB 093000	9/30/00	235	no analysis	13	bdl	112.8
GKM-1GREENC 093000	9/30/00	230	no analysis	13	bdl	111.9
GKM-1RED 061900	6/19/00	215	no analysis	11.9	0.4	110.3
GKM-1RED 071700	7/17/00	190	no analysis	10	0.2	95.6
GKM-1RED 082800	8/28/00	240	no analysis	9.1	0.14	90.8
GKM-1REDA 093000	9/30/00	235	no analysis	12	0.2	101.9
GKM-1REDB 093000	9/30/00	230	no analysis	12	0.2	102.2
GKM-1REDC 093000	9/30/00	220	no analysis	12	0.2	102.3
GKM-1W 062900	6/29/00	175	no analysis	10.8	0.6	99.3
GKM-1W 071700	7/17/00	190	no analysis	10.3	0.2	97.6
GKM-1W 082800	8/28/00	215	no analysis	9.3	0.15	91.6
GKM-1WA 093000	9/30/00	230	no analysis	11.8	0.2	100.1
GKM-1WB 093000	9/30/00	240	no analysis	11.6	0.2	100.8
GKM-1WC 093000	9/30/00	35	no analysis	11.8	0.2	100.4
GKM-2BLUE 062000	6/20/00	140	no analysis	4.3	0.1	24.3
GKM-2BLUE 071700	7/17/00	150	no analysis	5	0.4	27.8
GKM-2BLUE 082900	8/29/00	125	no analysis	4.7	0.31	25.8
GKM-2BLUE 093000	9/30/00	150	no analysis	4.6	0.3	25.1
GKM-2W 062800	6/28/00	130	no analysis	4.7	0.4	27.3
GKM-2W 071700	7/17/00	130	no analysis	5.3	0.4	28.4
GKM-2W 071700 Split	7/17/00	135	no analysis	5.2	0.4	28.2
GKM-2W 082900	8/29/00	110	no analysis	4.8	0.32	25.8
GKM-2W 093000	9/30/00	135	no analysis	4.9	0.4	26.4
GKM-2W FD 071700	7/17/00	140	no analysis	5.3	0.4	28.5
GKM-3BLUE 061900	6/19/00	220	no analysis	9	0.2	82.6
GKM-3BLUE 071700	7/17/00	215	no analysis	10.7	0.3	98.5
GKM-3BLUE 083000	8/30/00	215	no analysis	9.6	bdl	78.4
GKM-3BLUE 093000	9/30/00	215	no analysis	11.2	0.2	81
GKM-3GREEN 061900	6/19/00	245	no analysis	8.7	bdl	58.6

Alkalinity, Coliform, and EPA Method 300.0 Anion by Ion Chromatography – Multi-Level Well Samples

Sample Name	Collection Date	Alkalinity (mg/L $CaCO_3$)	Coliform	Cl^- (ppm)	N in NO_3^- (ppm)	SO_4^{2-} (ppm)
GKM-3GREEN 071700	7/17/00	235	no analysis	10.6	bdl	92.4
GKM-3GREEN 083000	8/30/00	280	no analysis	9.7	bdl	59.4
GKM-3GREEN 093000	9/30/00	250	no analysis	11.4	bdl	52.6
GKM-3RED 061900	6/19/00	225	no analysis	8.9	0.3	91.6
GKM-3RED 061900 Field Dup	6/19/00	220	no analysis	9.4	0.3	92.6
GKM-3RED 061900 Split	6/19/00	195	no analysis	9.3	0.3	92.6
GKM-3RED 071700	7/17/00	215	no analysis	10.9	0.4	99.9
GKM-3RED 083000	8/30/00	205	no analysis	9.9	0.2	87.1
GKM-3RED 093000	9/30/00	205	no analysis	11	0.3	91.4
GKM-3W 062900	6/29/00	no analysis	no analysis	no analysis	no analysis	no analysis
GKM-3W 071900	7/19/00	no analysis	no analysis	10.4	0.4	100.2
GKM-3W 083000	8/30/00	210	no analysis	10.1	0.2	90
GKM-3W 093000	9/30/00	210	no analysis	10.9	0.3	92
GKM-4BLUE 061900	6/19/00	230	no analysis	6.7	0.1	88.3
GKM-4BLUE 072000	7/20/00	260	no analysis	5.7	bdl	91.3
GKM-4BLUE 083000	8/30/00	305	no analysis	6.3	0.2	102
GKM-4BLUE 100100	10/1/00	250	no analysis	7.2	0.2	97.9
GKM-4GREEN 072000	7/20/00	260	no analysis	5.6	bdl	93.1
GKM-4GREEN 100100	10/1/00	255	no analysis	7.1	bdl	102
GKM-4RED 061900	6/19/00	245	no analysis	6	0.2	84.2
GKM-4RED 072000	7/20/00	255	no analysis	5.7	bdl	90.9
GKM-4RED 083000	8/30/00	265	no analysis	6.4	0.2	100.6
GKM-4RED 100100	10/1/00	240	no analysis	7.2	0.3	96.8
GKM-4W 062800	6/28/00	220	no analysis	5.6	0.5	83.1
GKM-4W 072000	7/20/00	245	no analysis	5.6	0.3	89.5
GKM-4W 083000	8/30/00	385	no analysis	6.2	0.3	94.8
GKM-4W 100100	10/1/00	240	no analysis	7.2	0.4	92.6
GKM-5BLUE 061900	6/19/00	162	no analysis	8.8	0.2	106.7
GKM-5BLUE 071700	7/17/00	205	no analysis	9.4	0.4	97.4
GKM-5BLUE 083000	8/30/00	220	no analysis	8.9	0.4	99.1
GKM-5BLUE 093000	9/30/00	230	no analysis	9.7	0.3	96.2
GKM-5GREEN 061900	6/19/00	365	no analysis	8.7	bdl	116.1

Alkalinity, Coliform, and EPA Method 300.0 Anion by Ion Chromatography – Multi-Level Well Samples

Sample Name	Collection Date	Alkalinity (mg/L $CaCO_3$)	Coliform	Cl^- (ppm)	N in NO_3^- (ppm)	SO_4^{2-} (ppm)
GKM-5W 062900	6/29/00	no analysis	no analysis	no analysis	no analysis	no analysis
GKM-5W 071900	7/19/00	no analysis	no analysis	no analysis	no analysis	no analysis
GKM-5W 083000	8/30/00	210	no analysis	9.5	0.2	93.8
GKM-5W 093000	9/30/00	220	no analysis	9.7	0.3	94.7
GKM-6BLUE 062000	6/20/00	175	no analysis	10.7	bdl	88.2
GKM-6BLUE 062600	6/26/00	180	no analysis	11.2	bdl	96.2
GKM-6BLUE 072400	7/24/00	no analysis	no analysis	no analysis	no analysis	no analysis
GKM-6BLUE 082900	8/29/00	no analysis	no analysis	no analysis	no analysis	no analysis
GKM-6BLUE 092900	9/29/00	115	no analysis	6.1	bdl	28.3
GKM-6GREEN 062000	6/20/00	215	no analysis	14.6	bdl	108.6
GKM-6GREEN 092900	9/29/00	130	no analysis	7.1	bdl	49.9
GKM-6W 062600	6/26/00	130	no analysis	6.5	bdl	30
GKM-6W 072400	7/24/00	125	no analysis	6.1	bdl	29.6
GKM-6W 072400	7/24/00	125	no analysis	6.1	bdl	29.6
GKM-6W 082900	8/29/00	135	no analysis	5.8	bdl	29.5
GKM-6W 092900	9/29/00	110	no analysis	5.7	bdl	29.3
GKM-7BLUE 062600	6/26/00	230	no analysis	6.1	bdl	70.7
GKM-7BLUE 062600 Field Dup	6/26/00	220	no analysis	6.3	bdl	73.8
GKM-7BLUE 062600 Split	6/26/00	220	no analysis	6.1	bdl	70.7
GKM-7BLUE 072400	7/24/00	0	no analysis	6.1	bdl	47.6
GKM-7BLUE 082900	8/29/00	190	no analysis	6.2	bdl	44.9
GKM-7BLUE 092900	9/29/00	150	no analysis	8.1	0.4	96.4
GKM-7RED 082900	8/29/00	185	no analysis	6.2	bdl	36
GKM-7RED 092900	9/29/00	160	no analysis	8.2	bdl	85
GKM-7W 062600	6/26/00	185	no analysis	6.3	bdl	40.5
GKM-7W 072400	7/24/00	195	no analysis	6.3	bdl	38.1
GKM-7W 082900	8/29/00	205	no analysis	6.3	bdl	35.7
GKM-7W 092900	9/29/00	180	no analysis	7.7	bdl	71.8
GKM-8BLUE 062600	6/26/00	245	no analysis	7.2	bdl	21.8
GKM-8BLUE 072000	7/20/00	250	no analysis	6.5	bdl	22.8
GKM-8BLUE 082900	8/29/00	200	no analysis	6.4	bdl	30.4
GKM-8BLUE 092900	9/29/00	150	no analysis	6.7	bdl	33.6

Alkalinity, Coliform, and EPA Method 300.0 Anion by Ion Chromatography – Multi-Level Well Samples

Sample Name	Collection Date	Alkalinity (mg/L $CaCO_3$)	Coliform	Cl^- (ppm)	N in NO_3^- (ppm)	SO_4^{2-} (ppm)
GKM-8GREEN 062600	6/26/00	245	no analysis	7.5	bdl	9.9
GKM-8GREEN 092900	9/29/00	220	no analysis	6.8	bdl	20.2
GKM-8RED 062600	6/26/00	235	no analysis	6.9	bdl	31.6
GKM-8RED 072000	7/20/00	245	no analysis	6.4	bdl	28.8
GKM-8RED 082900	8/29/00	235	no analysis	6.5	bdl	30.1
GKM-8RED 092900	9/29/00	195	no analysis	7	bdl	33
GKM-8W 062600	6/26/00	NS	no analysis	NS	NS	NS
GKM-8W 072000	7/20/00	205	no analysis	6.2	bdl	34.8
GKM-8W 082900	8/29/00	210	no analysis	6.3	bdl	34.9
GKM-8W 092900	9/29/00	185	no analysis	7	bdl	35
GKM-9BLUE 062600	6/26/00	250	no analysis	5.9	bdl	16.8
GKM-9BLUE 072000	7/20/00	225	no analysis	5.1	bdl	18.2
GKM-9BLUE 082900	8/29/00	200	no analysis	5	bdl	20.1
GKM-9BLUE 092900	9/29/00	175	no analysis	5	bdl	21
GKM-9GREEN 062600	6/26/00	270	no analysis	6.7	bdl	28.1
GKM-9GREEN 092900	9/29/00	185	no analysis	5.4	bdl	23.3
GKM-9RED 062600	6/26/00	240	no analysis	6	bdl	20.3
GKM-9RED 072000	7/20/00	240	no analysis	5.5	bdl	20.5
GKM-9RED 082900	8/29/00	225	no analysis	5.1	bdl	21.3
GKM-9RED 092900	9/29/00	175	no analysis	5	bdl	21
GKM-9W 062600	6/26/00	195	no analysis	5.6	bdl	24
GKM-9W 072000	7/20/00	200	no analysis	5.2	bdl	24.1
GKM-9W 082900	8/29/00	175	no analysis	5.1	bdl	24.1
GKM-9W 092900	9/29/00	175	no analysis	5.2	bdl	23.4
MLS-3RED 062700	6/27/00	255	no analysis	36	0.6	273.5
MLS-3RED 062700 Field Dup	6/27/00	260	no analysis	30.1	1.2	198.7
MLS-3RED 062700 Split	6/27/00	245	no analysis	35.5	0.7	267.7
MLS-3RED 072000	7/20/00	230	40 COL/100 ML	9.7	0.5	66.6
MLS-3RED 082800	8/28/00	275	no analysis	22.6	2.11	173.6
MLS-3RED 100100	10/1/00	270	1CFU/100 ML	22	0.9	127.6
MLS-3W 062700	6/27/00	210	no analysis	15.4	1	99.8
MLS-3W 072000	7/20/00	190	no analysis	8.9	0.3	62.8

Alkalinity, Coliform, and EPA Method 300.0 Anion by Ion Chromatography – Multi-Level Well Samples

Sample Name	Collection Date	Alkalinity (mg/L $CaCO_3$)	Coliform	Cl^- (ppm)	N in NO_3^- (ppm)	SO_4^{2-} (ppm)
MLS-3W 072000	7/20/00	190	no analysis	8.9	0.3	62.8
MLS-3W 082800	8/28/00	235	no analysis	18.5	3.02	143.6
MLS-3W 100100	10/1/00	265	no analysis	23.1	0.8	131.8
MLS-4RED 062000	6/20/00	295	no analysis	10.2	1	36.8
MLS-4RED 063000	6/30/00	310	no analysis	11	1.2	37.2
MLS-4RED 071800	7/18/00	305	no analysis	12.9	1.1	40
MLS-4RED 082800	8/28/00	310	no analysis	18.1	2.04	51.4
MLS-4RED 100100	10/1/00	285	no analysis	19.7	2.3	53.6
MLS-4W 063000	6/30/00	305	no analysis	10.7	1.2	36.2
MLS-4W 071800	7/18/00	310	<1 COL/100 ML	12.6	1.2	39.3
MLS-4W 082800	8/28/00	300	no analysis	18.4	2.12	51.8
MLS-4W 100100	10/1/00	275	<1CFU/100 ML	19.6	2.3	53.4
MLS-5BLUE 062000	6/20/00	210	no analysis	9.7	bdl	75.8
MLS-5BLUE 062700	6/27/00	230	no analysis	9.5	bdl	79
MLS-5BLUE 071800	7/18/00	285	40 COL/100 ML	9.7	bdl	65.3
MLS-5BLUE 082800	8/28/00	280	no analysis	7.7	bdl	42.7
MLS-5GREEN 062000	6/20/00	230	no analysis	9.8	bdl	86.1
MLS-5GREEN 062700	6/27/00	235	no analysis	9.4	bdl	78.4
MLS-5GREEN 071800	7/18/00	275	no analysis	11.2	bdl	79.4
MLS-5RED 062000	6/20/00	210	no analysis	8	0.2	58.7
MLS-5RED 062000 Field Dup	6/20/00	200	no analysis	8	0.2	58.9
MLS-5RED 062000 Split	6/20/00	200	no analysis	8.1	0.2	58.8
MLS-5RED 062700	6/27/00	225	no analysis	7.9	bdl	61.7
MLS-5RED 071800	7/18/00	260	no analysis	7.9	bdl	48.9
MLS-5RED 082800	8/28/00	255	no analysis	7.6	0.13	41.6
MLS-5RED 100100	10/1/00	255	no analysis	8.3	bdl	42.2
MLS-5W 062700	6/27/00	190	no analysis	7.8	bdl	58.2
MLS-5W 071800	7/18/00	275	14 COL/100 ML	8	0.1	49.4
MLS-5W 082800	8/28/00	275	no analysis	7.7	0.11	42
MLS-5W 100100	10/1/00	250	<1COL/100 ML	8.2	bdl	41.4
MW-1 050100	5/1/00	327	P/A-, EC-	10.1	0.5	29.2
MW-1 062900	6/29/00	310	no analysis	10.4	0.5	26.8

Alkalinity, Coliform, and EPA Method 300.0 Anion by Ion Chromatography – Monitoring Well Samples

Sample Name	Collection Date	Alkalinity (mg/L $CaCO_3$)	Coliform	Cl^- (ppm)	N in NO_3^- (ppm)	SO_4^{2-} (ppm)
MW-1 071800	7/18/00	335	<1 COL/100 ML	10.6	0.3	26.8
MW-1 083000	8/30/00	335	no analysis	9.9	0.3	26.2
MW-1 100100	10/1/00	320	<1CFU/100 ML	10.8	0.3	25.3
MW-2 050100	5/1/00	290	P/A-, EC-	11.6	1.2	49.2
MW-2 060200	6/2/00	no analysis	no analysis	no analysis	no analysis	no analysis
MW-2 063000	6/30/00	270	no analysis	13	0.5	51.6
MW-2 071800	7/18/00	275	<1 COL/100 ML	13	0.6	52
MW-2 083000	8/30/00	290	P/A- EC-	12.1	0.5	52.5
MW-2 100100	10/1/00	285	<1CFU/100 ML	13	0.5	53.1
MW-3 050100	5/1/00	205	P/A-, EC-	6.4	0.1	34.1
MW-4 050100	5/1/00	295	P/A-, EC-	9.5	1.1	35.2
MW-4 063000	6/30/00	315	no analysis	10.1	1.2	34.3
MW-4 063000 Field Dup	6/30/00	325	no analysis	10	1.2	35
MW-4 063000 Split	6/30/00	305	no analysis	9.9	1.2	34.2
MW-4 071800	7/18/00	315	690 COL/100 ML	12	1.2	38.1
MW-4 082800	8/28/00	295	P/A+ EC-	16.5	1.94	47.8
MW-4 082800 Field Dup	8/28/00	305	no analysis	16.5	1.95	47.9
MW-4 082800 Split	8/28/00	300	no analysis	16.4	1.94	47.7
MW-4 100100	10/1/00	290	579 COL/100 ML	18.6	2.2	49.8
MW-4 100100 Field Dup	10/1/00	280	no analysis	18.7	2.2	50.1
MW-4 100100 Split	10/1/00	275	no analysis	18.5	2.2	49.9
MW-5 050100	5/1/00	250	P/A+, EC-	6	0.4	32.6
MW-5 050100 Field Dup	5/1/00	240	P/A-, EC-	6	0.4	32.7
MW-5 050100 Splilt	5/1/00	270	no analysis	6	0.4	32.6
MW-5 060200	6/2/00	no analysis	no analysis	no analysis	no analysis	no analysis
MW-5 062700	6/27/00	215	no analysis	6.9	0.4	44.3
MW-5 071800	7/18/00	270	<1 COL/100 ML	7.6	0.6	38.9
MW-5 071800 Field Dup	7/18/00	255	no analysis	7.5	0.6	39.1
MW-5 071800 Split	7/18/00	270	no analysis	7.5	0.6	39
MW-5 082800	8/28/00	260	P/A+ EC-	7.6	0.37	42.3
MW-5 100100	10/1/00	260	12 CFU/100 ML	8.1	0.2	42.1
GKW-1 062800	6/28/00	140	no analysis	18.8	1.1	72.1

Alkalinity, Coliform, and EPA Method 300.0 Anion by Ion Chromatography – Monitoring Well Samples

Sample Name	Collection Date	Alkalinity (mg/L $CaCO_3$)	Coliform	Cl^- (ppm)	N in NO_3^- (ppm)	SO_4^{2-} (ppm)
GKW-1 071900	7/19/00	170	no analysis	18.8	1.1	69.9
GKW-1 083000	8/30/00	150	no analysis	17.3	1	73.9
GKW-1 093000	9/30/00	155	no analysis	16.1	1	75.9
GKW-1 093000 Field Dup	9/30/00	165	no analysis	16.1	1	75.7
GKW-1 093000 Split	9/30/00	315	no analysis	16.1	1	75.7
GKW-10 063000	6/30/00	285	no analysis	10.8	bdl	43.9
GKW-10 071800	7/18/00	275	<1 COL/100 ML	11.8	bdl	51.3
GKW-10 082800	8/28/00	280	no analysis	9.1	0.07	31.1
GKW-10 100100	10/1/00	290	<1CFU/100 ML	7.9	bdl	15.8
GKW-11 063000	6/30/00	255	no analysis	5.4	0.2	31.2
GKW-11 071800	7/18/00	240	4 COL/100 ML	25.6	0.3	48
GKW-11 082800	8/28/00	255	P/A- EC-	9.9	0.56	40
GKW-11 100100	10/1/00	240	<1CFU/100 ML	9.3	0.6	40.4
GKW-2 062800	6/28/00	175	no analysis	9	0.8	91.3
GKW-2 071900	7/19/00	200	no analysis	8.2	0.4	85.4
GKW-2 083000	8/30/00	275	no analysis	9.2	0.9	85.5
GKW-2 083000 Field Dup	8/30/00	285	no analysis	9.2	0.9	85.5
GKW-2 083000 Split	8/30/00	215	no analysis	9.3	0.9	85.6
GKW-3 062900	6/29/00	250	no analysis	8.2	0.4	88.2
GKW-3 071900	7/19/00	240	no analysis	8.2	0.2	88.4
GKW-4 062800	6/28/00	180	no analysis	8.7	0.8	92.8
GKW-4 062800 Field Dup	6/28/00	180	no analysis	8.6	0.8	92.8
GKW-4 071900	7/19/00	185	no analysis	8.5	0.4	84.7
GKW-4 071900 Split	7/19/00	190	no analysis	8.4	0.4	84.8
GKW-4 083000	8/30/00	265	no analysis	8	0.5	93.4
GKW-4 093000	9/30/00	230	no analysis	9.6	0.6	94.1
GKW-5 062900	6/29/00	155	no analysis	11.3	0.2	87.5
GKW-5 071900	7/19/00	230	no analysis	9.2	0.3	86.4
GKW-5 082800	8/28/00	205	no analysis	9.5	0.67	78.2
GKW-7 062900	6/29/00	150	no analysis	7.2	0.1	32.2
GKW-7 072000	7/20/00	160	no analysis	6.8	bdl	31.9
GKW-7 072000 Field Dup	7/20/00	155	no analysis	6.8	bdl	31.8

Alkalinity, Coliform, and EPA Method 300.0 Anion by Ion Chromatography – Monitoring Well, Surface Water and Other Samples

Sample Name	Collection Date	Alkalinity (mg/L $CaCO_3$)	Coliform	Cl^- (ppm)	N in NO_3^- (ppm)	SO_4^{2-} (ppm)
GKW-7 072000 Split	7/20/00	160	no analysis	6.8	bdl	31.8
GKW-7 083000	8/30/00	160	no analysis	6.5	bdl	27.8
GKW-7 093000	9/30/00	175	no analysis	6.3	bdl	27.5
GKW-8 062900	6/29/00	115	no analysis	8	0.6	35.6
GKW-8 062900 Field Dup	6/29/00	120	no analysis	8.1	0.6	35.6
GKW-8 062900 Split	6/29/00	105	no analysis	8	0.6	35.7
GKW-8 071900	7/19/00	140	no analysis	7.4	0.5	35.5
GKW-8 082900	8/29/00	110	no analysis	7.7	0.45	35.8
GKW-8 092900	9/29/00	120	no analysis	7.5	0.5	35.1
GKW-8 092900 Field Dup	9/29/00	125	no analysis	7.5	0.5	35.1
GKW-8 092900 Split	9/29/00	110	no analysis	7.6	0.5	35.1
GKW-9 062900	6/29/00	235	no analysis	11	0.2	82.4
GKW-9 072400	7/24/00	260	no analysis	13	bdl	56.6
GKW-9 072400 Field Dup	7/24/00	315	no analysis	13.1	bdl	56.5
GKW-9 072400 Split	7/24/00	315	no analysis	13	bdl	56.6
GKW-9 082900	8/29/00	305	no analysis	11.5	bdl	68.1
GKW-9 082900 Field Dup	8/29/00	285	no analysis	11.5	bdl	68.1
GKW-9 082900 Split	8/29/00	265	no analysis	11.5	bdl	68.2
GKW-9 093000	9/30/00	180	no analysis	8.7	bdl	100.6
SW-1 060100	6/1/00	no analysis	no analysis	no analysis	no analysis	no analysis
SW-2 060100	6/1/00	no analysis	no analysis	no analysis	no analysis	no analysis
SW-3 070700	7/7/00	no analysis	no analysis	no analysis	no analysis	no analysis
SW-4 070700	7/7/00	no analysis	no analysis	no analysis	no analysis	no analysis
SW-4 070700 Field Dup	7/7/00	no analysis	no analysis	no analysis	no analysis	no analysis
SW-5 070700	7/7/00	no analysis	no analysis	no analysis	no analysis	no analysis
INFLOW 071900	7/19/00	230	575 COL/100 ML	23.6	bdl	45.9
OUTFLOW 071900	7/19/00	220	575 COL/ 100ML	23.7	bdl	45.6
SPRINKLER 072000	7/20/00	no analysis	600 COL/100 ML	22.9	bdl	45.8

bdl = below detection limit

APPENDIX B – Water Resources

B.8 Metals Data

EPA Method 200.15 Surface Water Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
SW-1 060100	bpql	0.341	360	0.008	bpql	0.410	0.103	250	130	0.602	510	1.6	0.01	0.033
SW-2 060100	bpql	0.065	120	0.002	bpql	0.069	0.043	14	25	0.026	46	0.15	bpql	0.014
SW-3 070700	bpql	0.04	64	0.003	bpql	0.187	0.057	7.7	17	0.896	20	0.09	bpql	0.572
SW-4 070700	bpql	0.279	96	0.007	bpql	0.124	0.145	23	27	0.15	26	0.51	bpql	0.148
SW-4 FD 070700	bpql	0.26	99	0.006	bpql	0.079	0.136	21	25	0.093	25	0.49	bpql	0.167
SW-5 070700	bpql	0.095	57	0.002	bpql	0.023	0.074	83	50	0.038	58	2.8	bpql	0.007

Note: bpql = below probable quantitative limit

EPA Method 200.15 Monitoring Well Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
GKW-1 062800	0.03	bpql	61	bpql	bpql	bpql	0.053	6.8	11	0.059	25	0.03	bpql	0.002
GKW-1 071900	0.02	bpql	58	bpql	bpql	bpql	0.042	6.4	11	0.048	23	0.03	bpql	0.002
GKW-1 083000	0.01	bpql	59	bpql	bpql	0.007	0.037	6.4	11	0.04	25	0.03	bpql	0.005
GKW-1 093000	0.03	bpql	59	bpql	bpql	bpql	0.038	6.5	12	0.036	24	0.03	bpql	0.003
GKW-1 093000 F. Dup	0.02	bpql	59	bpql	bpql	bpql	0.035	6.4	12	0.033	23	0.02	bpql	0.002
GKW-1 093000 Split	0.02	bpql	60	bpql	bpql	bpql	0.033	6.7	12	0.037	24	0.03	bpql	0.003
GKW-10 063000	bpql	bpql	81	bpql	bpql	bpql	0.025	4.2	26	0.008	17	0.03	bpql	0.002
GKW-10 071800	0.01	bpql	78	bpql	bpql	bpql	0.025	4.0	25	0.010	16	0.04	bpql	0.003
GKW-10 082800	0.05	bpql	76	bpql	bpql	0.004	0.093	4.2	24	0.02	17	0.05	bpql	0.005
GKW-10 100100	bpql	bpql	76	bpql	bpql	0.003	0.02	4.3	25	0.005	18	0.04	bpql	0.004
GKW-11 063000	0.05	bpql	67	bpql	bpql	bpql	0.067	4.3	27	0.054	13	0.03	bpql	0.002
GKW-11 071800	bpql	bpql	68	bpql	bpql	0.003	0.020	3.0	28	0.016	11	0.06	bpql	0.002
GKW-11 082800	bpql	bpql	67	bpql	bpql	bpql	0.019	2.9	27	0.007	13	0.06	bpql	0.002
GKW-11 100100	0.02	bpql	70	bpql	bpql	bpql	0.04	2.9	28	0.007	13	0.06	bpql	0.002
GKW-2 062800	0.01	0.011	79	bpql	bpql	bpql	0.039	7.9	14	0.008	19	0.07	bpql	0.002
GKW-2 071900	bpql	0.012	70	bpql	bpql	0.003	0.031	7.5	12	0.011	17	0.07	bpql	0.003
GKW-2 083000	bpql	0.006	74	bpql	bpql	0.007	0.038	8.4	13	0.013	28	0.05	bpql	0.003
GKW-2 083000 F. Dup	bpql	0.006	71	bpql	bpql	0.004	0.034	8.2	13	0.009	29	0.05	bpql	0.003
GKW-2 083000 Split	bpql	0.007	72	bpql	bpql	bpql	0.033	8.1	13	0.012	28	0.05	bpql	0.003
GKW-3 062900	0.03	0.013	91	bpql	bpql	bpql	0.056	7.5	17	0.488	24	0.06	bpql	0.002
GKW-3 071900	0.02	0.014	84	bpql	bpql	bpql	0.056	6.7	16	0.227	23	0.16	bpql	0.002
GKW-4 062800	bpql	0.015	75	bpql	bpql	bpql	0.040	6.8	12	0.007	25	0.08	bpql	0.003
GKW-4 062800 F. Dup	bpql	0.016	75	bpql	bpql	0.006	0.028	6.9	12	0.004	25	0.08	bpql	0.003
GKW-4 071900	bpql	0.015	69	bpql	bpql	bpql	0.038	6.5	11	0.004	22	0.08	bpql	0.002
GKW-4 071900 Split	bpql	0.016	68	bpql	bpql	bpql	0.027	6.5	11	0.004	22	0.08	bpql	0.003
GKW-4 083000	bpql	0.013	87	bpql	bpql	bpql	0.034	7.5	14	0.006	29	0.07	bpql	0.003
GKW-4 093000	bpql	0.014	81	bpql	bpql	bpql	0.024	7.6	14	bpql	28	0.07	bpql	0.009
GKW-5 062900	0.01	0.039	68	bpql	bpql	0.007	0.036	7.4	14	0.009	19	0.09	bpql	0.003
GKW-5 071900	bpql	0.030	76	bpql	bpql	0.004	0.027	8.1	16	0.009	18	0.09	bpql	0.003
GKW-5 082800	bpql	0.019	73	bpql	bpql	bpql	0.028	7.8	14	0.007	18	0.07	bpql	0.002

EPA Method 200.15 Monitoring Well Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
GKW-7 062900	0.05	bpql	44	bpql	bpql	bpql	0.707	1.8	12	0.605	19	0.01	bpql	0.003
GKW-7 072000	0.04	bpql	44	bpql	bpql	bpql	0.161	1.6	12	0.367	19	0.01	bpql	0.002
GKW-7 072000 F. Dup	0.05	bpql	46	bpql	bpql	0.003	0.170	1.7	12	0.373	20	0.01	bpql	0.003
GKW-7 072000 Split	0.03	bpql	46	bpql	bpql	bpql	0.161	1.7	12	0.385	20	0.01	bpql	0.003
GKW-7 083000	0.03	bpql	43	bpql	bpql	bpql	0.272	1.6	11	0.349	20	0.02	bpql	0.003
GKW-7 093000	0.06	bpql	44	bpql	bpql	bpql	0.066	1.6	12	0.037	20	0.02	bpql	0.001
GKW-8 062900	0.01	bpql	43	bpql	bpql	bpql	0.068	5.1	8.8	0.078	12	0.02	bpql	0.002
GKW-8 062900 F. Dup	0.01	bpql	43	bpql	bpql	bpql	0.060	5.1	8.8	0.083	12	0.02	bpql	0.003
GKW-8 062900 Split	0.02	bpql	42	bpql	bpql	bpql	0.066	5.1	8.6	0.076	12	0.02	bpql	0.002
GKW-8 071900	0.01	bpql	42	bpql	bpql	bpql	0.037	5.2	8.5	0.020	12	0.02	bpql	0.002
GKW-8 082900	0.07	bpql	42	bpql	bpql	bpql	0.209	5.1	8.6	0.014	12	0.03	bpql	0.003
GKW-8 092900	0.02	bpql	41	bpql	bpql	bpql	0.032	5.4	8.4	0.012	12	0.02	bpql	0.002
GKW-8 092900 F. Dup	0.01	bpql	41	bpql	bpql	bpql	0.032	5.5	8.4	0.007	12	0.02	bpql	0.001
GKW-8 092900 Split	0.02	bpql	30	bpql	bpql	bpql	0.021	3.9	6	0.009	9	0.02	bpql	0.001
GKW-9 062900	0.02	bpql	76	bpql	bpql	0.003	0.071	6.7	24	0.568	21	0.02	bpql	0.003
GKW-9 072400	0.02	bpql	86	bpql	bpql	0.005	0.162	7.7	30	0.362	25	0.03	bpql	0.003
GKW-9 072400 F. Dup	0.02	bpql	89	bpql	bpql	0.004	0.127	7.7	30	0.360	25	0.03	bpql	0.006
GKW-9 072400 Split	0.01	bpql	86	bpql	bpql	0.006	0.131	7.7	31	0.370	25	0.03	bpql	0.006
GKW-9 082900	bpql	bpql	81	bpql	bpql	bpql	0.22	6.4	26	0.282	21	0.02	bpql	0.003
GKW-9 082900 F. Dup	bpql	bpql	82	bpql	bpql	bpql	0.186	6.4	26	0.28	21	0.02	bpql	0.002
GKW-9 082900 Split	bpql	bpql	83	bpql	bpql	0.003	0.221	6.4	26	0.284	21	0.02	bpql	0.003
GKW-9 093000	bpql	bpql	65	bpql	bpql	bpql	0.097	5.5	21	0.127	18	bpql	bpql	0.002
MW-1 050100 (+ sample refiltered)	bpql	bpql	81	bpql	bpql	bpql	0.014	2.6	31	0.002	24	0.07	bpql	0.006
MW-1 062900	bpql	bpql	77	bpql	bpql	bpql	0.014	2.5	30	0.003	26	0.06	bpql	0.002
MW-1 071800	bpql	bpql	77	bpql	bpql	bpql	0.015	2.5	29	0.004	24	0.06	bpql	0.002
MW-1 083000	0.02	bpql	79	bpql	bpql	0.004	0.034	2.5	30	0.005	26	0.06	bpql	0.003
MW-1 100100	bpql	bpql	79	bpql	bpql	bpql	0.02	2.6	31	0.003	26	0.06	bpql	0.002
MW-2 050100 (+ sample refiltered)	1.2	bpql	80	bpql	bpql	0.009	0.657	2.4	30	0.209	16	0.61	bpql	0.009
MW-2 060200	bpql	bpql	77	bpql	bpql	bpql	0.017	2.2	29	bpql	16	0.07	bpql	0.001
MW-2 063000	0.03	bpql	81	bpql	bpql	bpql	0.046	2.2	30	0.005	16	0.07	bpql	0.003

EPA Method 200.15 Monitoring Well Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
MW-2 071800	0.17	bpql	77	bpql	bpql	bpql	0.196	2.3	28	0.015	16	0.11	bpql	0.003
MW-2 083000	0.13	bpql	80	bpql	bpql	0.004	0.14	2.4	30	0.009	16	0.07	bpql	0.003
MW-2 100100	0.02	bpql	80	bpql	bpql	bpql	0.05	2.3	31	0.005	16	0.07	bpql	0.003
MW-3 050100 (+ sample refiltered)	bpql	0.008	57	bpql	bpql	0.004	0.010	2.8	15	0.003	13	0.04	bpql	0.006
MW-4 050100 (+ sample refiltered)	0.02	bpql	79	bpql	bpql	bpql	0.033	4.2	28	0.016	25	0.06	bpql	0.005
MW-4 063000	0.03	bpql	79	bpql	bpql	0.004	0.025	4.2	27	0.014	28	0.05	bpql	0.002
MW-4 063000 F. Dup	bpql	bpql	79	bpql	bpql	bpql	0.023	4.2	27	0.013	28	0.05	bpql	0.002
MW-4 063000 Split	bpql	bpql	79	bpql	bpql	bpql	0.022	4.2	27	0.014	27	0.05	bpql	0.002
MW-4 071800	0.01	bpql	76	bpql	bpql	bpql	0.027	4.3	26	0.030	26	0.05	bpql	0.002
MW-4 082800	bpql	bpql	80	bpql	bpql	bpql	0.032	4.5	27	0.029	26	0.06	bpql	0.002
MW-4 082800 F. Dup	bpql	bpql	78	bpql	bpql	bpql	0.027	4.4	27	0.036	27	0.05	bpql	0.001
MW-4 082800 Split	bpql	bpql	78	bpql	bpql	bpql	0.027	4.4	26	0.029	26	0.05	bpql	0.002
MW-4 100100	bpql	bpql	81	bpql	bpql	bpql	0.03	4.6	28	0.103	26	0.05	bpql	0.002
MW-4 100100 F. Dup	bpql	bpql	79	bpql	bpql	bpql	0.03	4.7	28	0.088	27	0.05	bpql	0.002
MW-4 100100 Split	bpql	bpql	78	bpql	bpql	bpql	0.03	4.6	28	0.1	26	0.05	bpql	0.002
MW-5 050100 (+ sample refiltered)	0.26	0.007	73	bpql	bpql	0.003	0.181	3.5	29	0.030	12	0.15	bpql	0.009
MW-5 050100 F. Dup (+ sample refiltered)	0.28	bpql	72	bpql	bpql	0.003	0.181	3.5	28	0.034	13	0.16	bpql	0.006
MW-5 050100 Split (+ sample refiltered)	0.24	0.005	72	bpql	bpql	0.005	0.162	3.5	28	0.027	13	0.14	bpql	0.008
MW-5 060200	bpql	bpql	60	bpql	bpql	bpql	0.018	3.3	24	0.003	11	0.03	bpql	0.002
MW-5 062700	bpql	0.006	62	bpql	bpql	bpql	0.020	3.5	25	0.004	12	0.04	bpql	0.002
MW-5 071800	bpql	bpql	67	bpql	bpql	bpql	0.020	3.8	27	0.004	13	0.04	bpql	0.002
MW-5 071800 F. Dup	bpql	0.005	67	bpql	bpql	bpql	0.020	3.8	27	0.001	12	0.04	bpql	0.002
MW-5 071800 Split	bpql	bpql	68	bpql	bpql	bpql	0.018	3.8	27	0.004	12	0.04	bpql	0.002
MW-5 082800	bpql	bpql	69	bpql	bpql	bpql	0.024	3.9	27	0.004	13	0.04	bpql	0.002
MW-5 100100	bpql	0.005	68	bpql	bpql	0.005	0.03	4.1	28	0.005	13	0.04	bpql	0.004

Note: bpql = below probable quantitative limit

EPA Method 200.15 Multi-Level Piezometer Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
GKM-1GREEN 061900	0.05	bpql	85	bpql	bpql	bpql	0.192	5.3	26	10.6	27	0.02	bpql	0.012
GKM-1RED 061900	0.01	bpql	94	bpql	bpql	bpql	0.042	5.5	18	1.14	19	0.02	bpql	0.002
GKM-3BLUE 061900	bpql	0.012	82	0.003	bpql	bpql	0.048	6.5	15	0.099	23	0.03	bpql	0.409
GKM-3GREEN 061900	0.01	0.008	80	bpql	bpql	bpql	0.041	6.3	15	0.042	23	0.01	bpql	0.100
GKM-3RED 061900	0.11	0.009	84	bpql	bpql	bpql	0.147	6.6	16	0.027	23	0.04	bpql	0.140
GKM-3RED 061900 Field Dup	0.02	0.011	84	bpql	bpql	bpql	0.049	6.5	16	0.020	23	0.03	bpql	0.164
GKM-3RED 061900 Split	0.07	0.010	85	bpql	bpql	bpql	0.102	6.6	16	0.027	23	0.04	bpql	0.141
GKM-4BLUE 061900	0.07	0.007	81	bpql	bpql	0.012	0.122	5.4	21	0.385	29	0.03	bpql	0.038
GKM-4RED 061900	0.02	bpql	80	bpql	bpql	0.008	0.055	5.4	21	0.255	28	0.03	bpql	0.018
GKM-5BLUE 061900	0.07	bpql	71	0.004	bpql	0.030	0.079	4.7	15	1.05	17	0.01	bpql	0.249
GKM-5GREEN 061900	bpql	0.009	71	0.003	bpql	0.051	0.019	4.5	15	0.026	17	0.02	bpql	0.441
GKM-2BLUE 062000	0.56	0.009	31	bpql	bpql	0.024	0.902	6.6	5.5	0.598	27	0.03	bpql	0.019
GKM-6BLUE 062000	0.04	0.007	70	bpql	bpql	bpql	2.56	5.7	17	1.23	23	bpql	bpql	0.005
GKM-6GREEN 062000	0.08	0.013	72	bpql	bpql	bpql	0.887	7.5	19	1.11	29	0.02	bpql	0.011
MLS-4RED 062000	bpql	bpql	78	bpql	bpql	0.005	0.035	4	28	0.008	26	0.04	bpql	0.004
MLS-5BLUE 062000	0.03	0.006	63	bpql	bpql	bpql	0.091	6.4	26	0.551	19	0.02	bpql	0.002
MLS-5GREEN 062000	0.04	bpql	72	bpql	bpql	bpql	0.070	4.8	30	0.238	17	0.03	bpql	0.002
MLS-5RED 062000	0.01	0.006	63	bpql	bpql	bpql	0.030	3.6	25	0.043	13	0.03	bpql	0.002
MLS-5RED 062000 Field Dup	0.02	0.005	63	bpql	bpql	bpql	0.036	3.7	25	0.039	13	0.03	bpql	0.001
MLS-5RED 062000 Split	0.01	0.006	65	bpql	bpql	bpql	0.031	3.6	25	0.045	13	0.03	bpql	0.003
GKM-6BLUE 062600	0.02	bpql	71	bpql	bpql	bpql	5.25	4.6	16	1.31	22	0.05	bpql	0.005
GKM-6W 062600	0.08	bpql	39	bpql	bpql	0.003	4.26	4.1	8.3	0.468	17	0.08	bpql	0.006
GKM-7BLUE 062600	0.06	0.084	67	0.011	bpql	0.033	0.066	3.7	19	3.19	17	0.02	bpql	1.11
GKM-7BLUE 062600 Field Dup	0.03	0.084	69	0.013	bpql	0.035	0.044	3.8	19	3.16	17	0.02	bpql	1.10
GKM-7BLUE 062600 Split	0.06	0.083	66	0.011	bpql	0.033	0.065	3.7	19	3.14	17	0.02	bpql	1.10
GKM-7W 062600	bpql	0.013	60	bpql	bpql	bpql	3.71	2.6	17	0.697	17	0.08	bpql	0.008
GKM-8BLUE 062600	0.03	0.158	72	0.003	bpql	bpql	3.67	4.0	17	0.965	18	0.21	bpql	0.045
GKM-8GREEN 062600	0.04	0.123	70	0.002	bpql	0.004	1.86	3.8	17	0.672	18	0.15	bpql	0.030
GKM-8RED 062600	0.03	0.020	72	bpql	bpql	bpql	2.24	3.6	16	1.32	17	0.15	bpql	0.004
GKM-8W 062600	0.01	0.016	65	bpql	bpql	bpql	0.866	7.1	15	0.837	18	0.04	bpql	0.003
GKM-9BLUE 062600	bpql	0.074	67	bpql	bpql	bpql	7.55	6.2	18	1.07	23	0.17	bpql	0.002
GKM-9GREEN 062600	bpql	0.040	69	bpql	bpql	bpql	1.85	6.1	18	0.870	23	0.05	bpql	0.008

PA Method 200.15 Multi-Level Piezometer Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
GKM-9RED 062600	0.01	0.071	64	bpql	bpql	bpql	5.39	6.7	16	0.976	24	0.07	bpql	0.002
GKM-9W 062600	bpql	0.049	53	bpql	bpql	bpql	0.909	4.6	13	1.21	18	0.10	bpql	0.003
MLS-3RED 062700	0.11	0.096	110	0.002	bpql	0.007	0.332	34	59	2.30	70	0.30	bpql	0.005
MLS-3RED 062700 Field Dup	0.04	0.041	85	bpql	bpql	0.020	0.063	19	36	0.662	52	0.16	bpql	0.003
MLS-3RED 062700 Split	0.11	0.096	110	0.002	bpql	0.006	0.318	34	59	2.30	71	0.29	bpql	0.004
MLS-3W 062700	0.03	0.013	63	bpql	bpql	0.004	0.061	17	25	0.814	33	0.09	bpql	0.003
MLS-5BLUE 062700	bpql	bpql	68	bpql	bpql	bpql	0.024	4.4	29	0.024	15	0.02	bpql	0.002
MLS-5GREEN 062700	0.02	0.008	69	bpql	bpql	bpql	0.040	3.9	29	0.006	15	0.04	bpql	0.003
MLS-5RED 062700	bpql	bpql	65	bpql	bpql	bpql	0.021	4.2	26	0.034	13	0.03	bpql	0.002
MLS-5W 062700	0.02	bpql	61	bpql	bpql	bpql	0.040	3.9	24	0.383	12	0.02	bpql	0.003
GKM-2W 062800	0.02	0.006	34	bpql	bpql	0.008	0.074	6.5	5.8	0.167	27	0.02	bpql	0.005
GKM-4W 062800	bpql	bpql	81	bpql	bpql	0.004	0.042	5.1	20	0.116	26	0.06	bpql	0.009
GKM-1W 062900	0.01	0.007	79	bpql	bpql	bpql	0.045	5.6	15	0.769	18	0.03	bpql	0.002
GKM-3W 062900	bpql	bpql	83	0.002	bpql	bpql	0.042	7.1	16	0.174	23	0.02	bpql	0.066
GKM-5W 062900	0.03	bpql	69	bpql	bpql	0.004	0.212	8.7	14	0.300	23	0.02	bpql	0.012
MLS-4RED 063000	bpql	bpql	79	bpql	bpql	bpql	0.031	4.2	28	0.006	27	0.04	bpql	0.003
MLS-4W 063000	bpql	bpql	77	bpql	bpql	bpql	0.022	4.2	27	0.050	27	0.05	bpql	0.012
GKM-1GREEN 071700	0.06	bpql	72	bpql	bpql	bpql	0.261	4.7	21	4.38	20	0.01	bpql	0.007
GKM-1RED 071700	bpql	0.011	76	bpql	bpql	bpql	0.030	5.2	14	0.005	17	0.06	bpql	0.002
GKM-1W 071700	bpql	0.012	76	bpql	bpql	bpql	0.029	5.4	15	0.014	17	0.06	bpql	0.005
GKM-2BLUE 071700	0.11	0.009	32	bpql	bpql	0.020	0.389	7.0	5.6	0.138	26	0.04	bpql	0.012
GKM-2W 071700	bpql	bpql	33	bpql	bpql	bpql	0.035	6.5	5.8	0.010	27	0.03	bpql	0.003
GKM-2W 071700 Split	bpql	bpql	33	bpql	bpql	bpql	0.036	6.6	5.8	0.010	26	0.03	bpql	0.003
GKM-2W FD 071700	bpql	bpql	32	bpql	bpql	bpql	0.038	6.4	5.5	0.007	26	0.02	bpql	0.004
GKM-3BLUE 071700	bpql	0.015	84	0.003	bpql	bpql	0.031	6.9	16	0.005	22	0.04	bpql	0.368
GKM-3GREEN 071700	bpql	0.009	86	bpql	bpql	bpql	0.035	6.9	16	0.015	24	0.02	bpql	0.094
GKM-3RED 071700	bpql	0.012	82	0.001	bpql	bpql	0.040	6.7	15	0.004	22	0.04	bpql	0.164
GKM-5BLUE 071700	0.02	0.006	78	0.004	bpql	0.047	0.032	5.1	17	0.393	19	0.02	bpql	0.220
MLS-4RED 071800	bpql	bpql	74	bpql	bpql	bpql	0.022	4.4	27	0.003	27	0.05	bpql	0.001
MLS-4W 071800	bpql	bpql	73	bpql	bpql	bpql	0.026	4.3	27	0.014	27	0.04	bpql	0.005
MLS-5BLUE 071800	bpql	bpql	73	bpql	bpql	bpql	0.034	5.3	31	0.319	16	0.02	bpql	0.003
MLS-5GREEN 071800	0.01	0.008	81	bpql	bpql	bpql	0.031	4.4	34	0.153	18	0.03	bpql	0.003

EPA Method

200.15 Multi-Level Piezometer Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
MLS-5RED 071800	bpql	0.006	69	bpql	bpql	bpql	0.021	3.8	27	0.013	13	0.03	bpql	0.003
MLS-5W 071800	0.01	bpql	68	bpql	bpql	bpql	0.040	3.8	27	0.175	12	0.03	bpql	0.003
GKM-3W 071900	0.02	0.006	81	0.001	bpql	0.003	0.048	7.2	15	0.151	22	0.02	bpql	0.083
GKM-5W 071900	0.03	bpql	74	bpql	bpql	bpql	0.100	8.1	16	0.259	21	0.01	bpql	0.016
GKM-4BLUE 072000	bpql	bpql	82	bpql	bpql	0.007	0.045	5.6	21	0.041	29	0.05	bpql	0.018
GKM-4GREEN 072000	0.04	0.008	79	bpql	bpql	0.010	0.092	5.7	20	0.529	31	0.03	bpql	0.057
GKM-4RED 072000	bpql	bpql	82	bpql	bpql	0.007	0.058	5.6	21	0.008	29	0.05	bpql	0.013
GKM-4W 072000	0.01	bpql	80	bpql	bpql	0.003	0.043	5.3	20	0.009	24	0.08	bpql	0.008
GKM-8BLUE 072000	0.03	0.088	67	0.002	bpql	0.003	4.13	3.8	16	0.971	17	0.22	bpql	0.042
GKM-8RED 072000	bpql	0.022	69	bpql	bpql	bpql	1.53	3.6	16	1.12	18	0.14	bpql	0.004
GKM-8W 072000	0.01	bpql	61	bpql	bpql	bpql	1.94	4.3	14	0.962	16	0.03	bpql	0.004
GKM-9BLUE 072000	0.01	0.064	57	bpql	bpql	bpql	6.97	5.9	15	0.829	22	0.16	bpql	0.002
GKM-9RED 072000	0.01	0.087	62	0.002	bpql	bpql	4.46	6.2	16	0.968	24	0.10	bpql	0.002
GKM-9W 072000	bpql	0.049	51	0.001	bpql	bpql	0.566	4.5	12	1.09	18	0.10	bpql	0.003
MLS-3RED 072000	0.09	0.016	63	bpql	bpql	0.006	0.181	14	23	0.798	27	0.18	bpql	0.003
MLS-3W 072000	bpql	0.006	64	bpql	bpql	bpql	0.034	6.9	18	0.18	14	0.05	bpql	0.002
GKM-6BLUE 072400	0.15	bpql	48	bpql	bpql	bpql	0.383	4.6	10	0.693	19	0.02	bpql	0.003
GKM-6W 072400	bpql	bpql	37	bpql	bpql	bpql	3.67	4.2	8	0.426	17	0.07	bpql	0.001
GKM-7BLUE 072400	0.10	0.111	65	0.005	bpql	0.041	0.209	3.4	18	2.37	17	0.05	bpql	0.609
GKM-7W 072400	bpql	0.014	61	bpql	bpql	bpql	3.47	2.6	17	0.669	16	0.08	bpql	0.005
GKM-1GREEN 082800	bpql	bpql	75	bpql	bpql	bpql	0.052	5.1	21	0.715	20	0.01	bpql	0.005
GKM-1RED 082800	bpql	0.013	85	bpql	bpql	bpql	0.045	5.6	15	0.004	19	0.06	bpql	0.002
GKM-1W 082800	bpql	0.015	83	bpql	bpql	bpql	0.037	5.7	16	0.011	20	0.06	bpql	0.002
MLS-3RED 082800	0.03	0.009	110	bpql	bpql	0.004	0.077	12	31	0.915	19	0.09	bpql	0.002
MLS-3W 082800	0.01	bpql	110	bpql	bpql	0.004	0.038	5.9	26	0.089	15	0.05	bpql	0.003
MLS-4RED 082800	bpql	0.005	76	bpql	bpql	bpql	0.02	4.5	28	0.004	27	0.05	bpql	0.003
MLS-4W 082800	bpql	bpql	78	bpql	bpql	bpql	0.02	4.4	27	0.004	27	0.05	bpql	0.004
MLS-5BLUE 082800	bpql	bpql	70	bpql	bpql	bpql	0.158	5.1	28	0.423	14	0.02	bpql	0.002
MLS-5RED 082800	bpql	0.006	68	bpql	bpql	bpql	0.025	3.9	27	0.01	13	0.03	bpql	0.002
MLS-5W 082800	bpql	bpql	68	bpql	bpql	bpql	0.029	3.9	27	0.072	13	0.03	bpql	0.002

EPA Method 200.15 Multi-Level Piezometer Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
GKM-2BLUE 082900	0.04	0.006	32	bpql	bpql	0.01	0.134	6.7	5.5	0.012	27	0.03	bpql	0.006
GKM-2W 082900	bpql	bpql	33	bpql	bpql	bpql	0.043	6.7	5.6	0.004	27	0.03	bpql	0.002
GKM-6BLUE 082900	0.04	0.005	39	bpql	bpql	bpql	1.35	4.2	8.3	0.632	17	0.02	bpql	0.002
GKM-6W 082900	bpql	bpql	37	bpql	bpql	bpql	3.7	4.3	7.9	0.417	18	0.08	bpql	0.003
GKM-7BLUE 082900	0.13	0.097	55	0.003	bpql	0.033	0.832	3	16	1.77	16	0.07	bpql	0.329
GKM-7RED 082900	0.08	0.074	54	0.003	bpql	0.021	0.941	3.1	15	1.16	15	0.03	bpql	0.118
GKM-7W 082900	bpql	0.013	52	bpql	bpql	bpql	2.96	2.5	15	0.567	15	0.08	bpql	0.003
GKM-8BLUE 082900	0.02	0.048	62	bpql	bpql	bpql	4.43	3.4	14	0.897	17	0.36	bpql	0.012
GKM-8RED 082900	0.02	0.021	65	bpql	bpql	bpql	1.17	3.7	15	1.03	18	0.18	bpql	0.003
GKM-8W 082900	0.04	bpql	59	bpql	bpql	bpql	0.562	4.3	13	0.771	16	0.04	bpql	0.003
GKM-9BLUE 082900	0.01	0.08	50	0.001	bpql	bpql	5.76	5.4	14	0.637	21	0.15	bpql	bpql
GKM-9RED 082900	0.02	0.072	54	0.001	bpql	bpql	4.14	5.7	14	0.866	22	0.15	bpql	0.001
GKM-9W 082900	bpql	0.052	48	0.001	bpql	bpql	0.483	4.5	11	1.03	17	0.11	bpql	0.002
GKM-3BLUE 083000	bpql	0.015	79	0.003	bpql	bpql	0.036	7.3	14	0.012	23	0.05	bpql	0.367
GKM-3GREEN 083000	bpql	0.009	78	bpql	bpql	0.003	0.036	6.9	15	0.009	24	0.02	bpql	0.097
GKM-3RED 083000	bpql	0.011	75	bpql	bpql	0.003	0.036	6.8	14	0.007	23	0.04	bpql	0.158
GKM-3W 083000	bpql	0.008	76	0.005	bpql	0.009	0.061	7.1	14	0.075	23	0.03	bpql	0.125
GKM-4BLUE 083000	bpql	bpql	85	bpql	bpql	0.011	0.037	5.8	23	0.013	29	0.05	bpql	0.017
GKM-4RED 083000	bpql	bpql	85	bpql	bpql	0.016	0.034	5.8	23	0.011	28	0.05	bpql	0.021
GKM-4W 083000	bpql	bpql	83	bpql	bpql	0.004	0.031	5.7	21	0.007	25	0.08	bpql	0.009
GKM-5BLUE 083000	bpql	0.009	79	0.003	bpql	0.035	0.042	5.3	17	0.03	21	0.02	bpql	0.223
GKM-5W 083000	0.33	bpql	79	0.002	bpql	0.01	0.457	8.5	16	0.289	21	0.04	bpql	0.061
GKM-6BLUE 092900	0.08	bpql	39	bpql	bpql	bpql	3.65	3.3	8.3	0.67	18	0.07	bpql	0.002
GKM-6GREEN 092900	0.05	bpql	47	bpql	bpql	bpql	0.173	4.2	11	0.347	21	0.01	bpql	0.01
GKM-6W 092900	0.01	bpql	37	bpql	bpql	bpql	3.61	4.2	7.8	0.409	18	0.08	bpql	0.003
GKM-7BLUE 092900	0.02	0.034	60	0.003	bpql	0.014	0.662	3	17	1.7	16	0.03	bpql	0.363
GKM-7RED 092900	0.05	0.04	59	bpql	bpql	0.017	2.29	2.8	17	1.06	16	0.08	bpql	0.068
GKM-7W 092900	bpql	0.012	55	bpql	bpql	bpql	3.24	2.5	16	0.606	16	0.08	bpql	0.003
GKM-8BLUE 092900	0.06	0.035	57	bpql	bpql	bpql	4.23	3.4	14	0.848	16	0.35	bpql	0.009
GKM-8GREEN 092900	0.03	0.016	61	bpql	bpql	0.005	2.44	3.4	15	0.718	18	0.39	bpql	0.008
GKM-8RED 092900	0.01	0.018	62	bpql	bpql	bpql	1.01	3.5	15	0.953	17	0.19	bpql	0.003
GKM-8W 092900	0.03	bpql	58	bpql	bpql	bpql	0.329	4.4	13	0.66	16	0.04	bpql	0.003

EPA Method 200.15 Multi-Level Piezometer Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
GKM-9BLUE 092900	0.03	0.099	47	0.002	bpql	bpql	4.99	5.3	13	0.583	19	0.11	bpql	0.002
GKM-9GREEN 092900	0.01	0.047	48	bpql	bpql	bpql	1.71	5.1	13	1	19	0.03	bpql	0.009
GKM-9RED 092900	0.01	0.072	51	0.001	bpql	bpql	3.9	5.5	13	0.804	21	0.16	bpql	0.002
GKM-9W 092900	0.01	0.052	48	bpql	bpql	bpql	0.445	4.7	12	1.06	18	0.11	bpql	0.002
GKM-1GREENB 093000	bpql	bpql	89	bpql	bpql	bpql	0.345	5.5	23	4.66	21	bpql	bpql	0.006
GKM-1GREENC 093000	bpql	bpql	89	bpql	bpql	bpql	0.417	5.5	23	4.37	21	bpql	bpql	0.005
GKM-1REDA 093000	bpql	0.013	86	bpql	bpql	bpql	0.031	6.1	18	0.006	20	0.05	bpql	0.002
GKM-1REDB 093000	bpql	0.012	86	bpql	bpql	bpql	0.031	6.1	18	0.001	21	0.05	bpql	bpql
GKM-1REDC 093000	bpql	0.013	87	bpql	bpql	bpql	0.032	6.1	17	0.001	21	0.05	bpql	bpql
GKM-1WA 093000	bpql	0.015	85	bpql	bpql	bpql	0.026	6.2	17	0.004	21	0.06	bpql	0.001
GKM-1WB 093000	bpql	0.015	85	bpql	bpql	bpql	0.023	6.2	18	0.002	21	0.06	bpql	bpql
GKM-1WC 093000	bpql	0.015	86	bpql	bpql	bpql	0.022	6.2	17	0.001	21	0.06	bpql	bpql
GKM-2BLUE 093000	0.06	0.006	31	bpql	bpql	0.009	0.153	6.6	5.5	0.007	26	0.03	bpql	0.008
GKM-2W 093000	0.02	bpql	31	bpql	bpql	bpql	0.067	6.7	5.6	0.005	26	0.02	bpql	0.002
GKM-3BLUE 093000	bpql	0.015	77	0.003	bpql	bpql	0.035	6.9	14	0.007	23	0.04	bpql	0.337
GKM-3GREEN 093000	bpql	0.009	77	bpql	bpql	bpql	0.033	6.8	15	0.004	23	0.02	bpql	0.092
GKM-3RED 093000	bpql	0.012	76	bpql	bpql	bpql	0.043	7	15	0.005	23	0.04	bpql	0.166
GKM-3W 093000	bpql	0.011	78	0.002	bpql	bpql	0.044	7.1	14	0.006	23	0.04	bpql	0.179
GKM-5BLUE 093000	bpql	0.01	81	0.002	bpql	0.036	0.04	5.2	19	0.029	21	0.03	bpql	0.226
GKM-5W 093000	bpql	bpql	79	bpql	bpql	0.003	0.052	7.7	17	0.154	21	0.01	bpql	0.043
GKM-4BLUE 100100	bpql	0.005	85	bpql	bpql	0.01	0.03	5.7	23	0.004	28	0.06	bpql	0.014
GKM-4GREEN 100100	0.02	0.008	87	bpql	bpql	0.009	0.11	5.5	24	0.372	30	0.04	bpql	0.031
GKM-4RED 100100	bpql	bpql	82	bpql	bpql	0.013	0.03	5.7	23	0.009	27	0.06	bpql	0.02
GKM-4W 100100	bpql	bpql	82	bpql	bpql	0.003	0.03	5.7	22	0.004	26	0.07	bpql	0.007
MLS-3RED 100100	bpql	0.009	97	bpql	bpql	0.005	0.17	13	33	1.37	19	0.15	bpql	0.015
MLS-3W 100100	bpql	bpql	110	bpql	bpql	0.007	0.025	5.8	29	0.07	17	0.05	bpql	0.025
MLS-4RED 100100	bpql	bpql	79	bpql	bpql	bpql	0.02	4.6	28	0.005	27	0.05	bpql	0.002
MLS-4W 100100	bpql	bpql	79	bpql	bpql	bpql	0.02	4.7	28	bpql	28	0.05	bpql	0.016
MLS-5RED 100100	bpql	0.006	69	bpql	bpql	bpql	0.033	4	28	0.01	14	0.03	bpql	bpql
MLS-5W 100100	bpql	0.005	70	bpql	bpql	bpql	0.03	4.1	29	0.045	13	0.03	bpql	0.004

Note: bpql = below probable quantitative limit

EPA Method 200.15 Suction Lysimeter Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
ALYSD2-2 071700	bpql	0.016	93	bpql	bpql	0.011	0.041	3.8	31	0.012	28	0.14	bpql	0.002
ALYSS2-2 071700	0.01	0.212	57	0.005	bpql	0.013	0.047	6.4	16	0.013	14	0.61	bpql	0.003
LYSD-2 071700	0.03	0.01	31	0.001	bpql	0.012	0.040	4.1	4.4	0.166	20	0.30	bpql	0.088
LYSD2-1 071700	bpql	0.026	130	bpql	bpql	0.014	0.034	2.5	56	0.014	310	0.08	bpql	0.002
LYSD-3 071700	0.09	bpql	59	0.002	bpql	0.011	0.085	4.5	16	0.301	26	0.07	bpql	0.226
LYSS-1 071700	bpql	0.295	320	0.007	bpql	0.057	0.070	13	250	0.031	860	0.06	0.0135	0.006
LYSS-2 071700	0.03	bpql	23	bpql	bpql	0.008	0.041	2.4	4.3	0.098	20	0.13	bpql	0.018
LYSS-3 071700	0.05	bpql	67	0.014	bpql	0.020	0.067	6.8	31	1.11	54	0.05	bpql	4.75
LYSS-5 071700	bpql	bpql	110	0.077	bpql	1.15	0.044	9.6	17	1.91	32	0.03	bpql	25.3
LYSVD-1 071700	bpql	0.019	94	bpql	bpql	0.009	0.029	3.3	32	0.027	89	0.04	bpql	0.006
LYSVD2-2 071700	0.07	0.013	31	0.002	bpql	0.016	0.061	4.7	4.8	0.434	25	0.18	bpql	0.340
LYSVD2-3 071700	bpql	0.022	68	bpql	bpql	0.004	0.036	4.0	14	0.018	23	0.12	bpql	0.002
LYSVD-5 071700	0.07	0.007	53	bpql	bpql	bpql	0.068	1.9	8.1	0.027	21	0.07	bpql	0.060
ALYSD2-3 071800	bpql	0.128	130	0.003	bpql	0.013	0.041	24	38	0.017	19	0.20	bpql	0.003
ALYSS2-3 071800	0.01	0.240	84	0.005	bpql	0.041	0.051	23	16	0.003	49	1.5	bpql	0.003
BLYSD-2 072000	bpql	0.016	89	bpql	bpql	0.025	0.040	18	28	0.018	57	0.13	bpql	0.005
BLYSS-2 072000	0.01	0.111	61	0.002	bpql	0.052	0.045	16	16	0.014	68	0.44	bpql	0.004
LYSD2-9 072000	bpql	0.049	60	0.001	bpql	0.006	0.036	3.5	13	0.001	17	0.10	bpql	0.002
LYSD-4 072000	0.05	0.027	97	0.010	bpql	0.694	0.079	7.2	40	0.769	310	0.18	bpql	1.29
LYSS2-4 072000	0.78	0.006	210	0.314	bpql	50.4	0.125	43	340	71	1700	0.01	0.0143	51.6
LYSVD2-8 072000	bpql	0.006	66	0.001	bpql	0.022	0.082	1.8	15	0.281	24	0.04	bpql	0.198
LYSVD-9 072000	bpql	0.048	67	0.001	bpql	0.006	0.028	5.9	16	0.002	22	0.06	bpql	0.002
LYSD-7 072400	0.18	0.005	200	0.096	bpql	21.9	0.043	3.9	31	8.2	23	0.02	0.01	22.3
LYSS-7 072400	bpql	bpql	180	0.149	bpql	22.4	0.045	4.8	34	13.7	29	0.02	0.01	33
LYSVD2-7 072400	bpql	bpql	170	0.043	bpql	1.99	0.042	3.1	31	1.40	22	0.02	bpql	10.6
LYSVD-6 072400	0.01	0.015	97	bpql	bpql	0.015	0.049	8.5	30	0.003	67	0.26	bpql	0.005
ALYSD-1 081400	bpql	0.185	140	0.004	bpql	0.046	0.039	6.9	27	0.003	56	0.41	bpql	0.003
ALYSD-1 082800	bpql	0.205	140	0.005	bpql	0.057	0.047	5.9	28	0.001	59	0.49	bpql	0.005
LYSD2-1 082800	bpql	0.024	130	bpql	bpql	0.012	0.037	1.9	55	0.001	300	0.04	bpql	0.003
LYSVD-1 082800	bpql	0.018	93	bpql	bpql	0.008	0.026	3.3	30	bpql	75	0.03	bpql	0.01
LYSD-2 082900	0.01	0.02	26	0.001	bpql	0.015	0.037	3.9	3.8	0.07	19	0.31	bpql	0.031
LYSD2-9 082900	0.01	0.208	58	0.005	bpql	0.009	0.038	4.8	14	0.001	17	0.13	bpql	0.003

EPA Method 200.15 Suction Lysimeter Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	0.0005	0.5	0.01	0.01	0.001
LYSD-7 082900	0.61	bpql	190	0.066	bpql	19.9	0.041	3.2	23	6.21	20	bpql	bpql	15.6
LYSD-8 082900	bpql	0.027	76	0.004	bpql	0.034	0.032	6.1	18	0.021	21	0.08	bpql	1
LYSVD2-2 082900	0.02	0.022	26	0.001	bpql	0.018	0.038	4.5	3.9	0.159	23	0.18	bpql	0.078
LYSVD2-7 082900	bpql	bpql	140	0.037	bpql	2.72	0.033	3	27	0.848	19	0.02	bpql	9.46
LYSVD2-8 082900	bpql	0.013	69	0.002	bpql	0.05	0.039	2	16	0.126	24	0.03	bpql	0.502
LYSVD-9 082900	bpql	0.076	61	0.002	bpql	0.006	0.027	5.8	15	0.002	21	0.04	bpql	0.009
LYSD2-5 083000	bpql	bpql	150	0.02	bpql	0.244	0.035	8.3	27	0.434	38	bpql	bpql	7.98
LYSD-3 083000	bpql	0.02	74	0.002	bpql	0.015	0.035	6.1	21	0.121	35	0.09	bpql	0.145
LYSD-4 083000	0.01	0.031	100	0.008	bpql	0.685	0.055	6	32	0.276	290	0.2	bpql	0.947
LYSS2-4 083000	5.8	bpql	150	0.166	bpql	35.6	0.093	32	200	38.5	1200	bpql	0.134	28.4
LYSVD2-3 083000	bpql	0.027	65	bpql	bpql	0.005	0.037	4.4	13	bpql	24	0.11	bpql	0.006
LYSVD-4 083000	bpql	0.014	62	0.003	bpql	0.134	0.032	3.9	19	0.273	55	0.03	bpql	0.479
LYSD2-9 092900	bpql	0.2	64	0.004	bpql	0.008	0.033	5	16	0.001	17	0.08	bpql	0.002
LYSD-7 092900	1.1	bpql	170	0.055	bpql	17.7	0.038	2.7	21	5.21	19	bpql	bpql	13.5
LYSD-8 092900	bpql	0.025	72	0.004	bpql	0.043	0.027	5.6	17	0.005	20	0.07	bpql	1.26
LYSVD2-7 092900	0.03	bpql	110	0.031	bpql	3.14	0.028	2.6	23	0.555	18	0.02	bpql	8.3
LYSVD2-8 092900	bpql	0.013	71	0.001	bpql	0.048	0.034	1.7	16	0.036	24	0.02	bpql	0.399
LYSVD-9 092900	bpql	0.043	25	bpql	bpql	bpql	0.011	2.7	5.7	bpql	9.5	0.02	bpql	0.002
LYSD-2 093000	0.02	0.023	22	0.001	bpql	0.024	0.033	3.5	3.3	0.031	18	0.31	bpql	0.044
LYSD2-1 093000	bpql	0.02	120	bpql	bpql	0.012	0.031	1.5	53	0.002	290	0.02	bpql	0.014
LYSD2-5 093000	bpql	bpql	190	0.031	bpql	1.34	0.034	8.6	32	0.428	40	0.01	bpql	12.9
LYSD-3 093000	bpql	0.023	80	0.003	bpql	0.018	0.033	6	23	0.05	35	0.08	bpql	0.392
LYSS-1 093000	bpql	0.318	380	0.006	bpql	0.041	0.054	6.7	230	0.002	920	0.01	bpql	0.004
LYSVD-1 093000	bpql	0.01	80	bpql	bpql	0.01	0.023	2.6	27	0.042	52	0.02	bpql	0.027
LYSVD2-2 093000	0.07	0.029	20	0.002	bpql	0.042	0.058	4	3.3	0.065	21	0.16	bpql	0.128
LYSVD2-3 093000	bpql	0.034	57	bpql	bpql	0.005	0.035	4	11	bpql	23	0.15	bpql	0.002
ALYSS-1 100100	bpql	0.244	120	0.006	bpql	0.045	0.041	4.8	24	bpql	57	0.64	bpql	0.003
LYSD-4 100100	bpql	0.037	76	0.007	bpql	0.8	0.05	4.9	26	0.077	250	0.2	bpql	0.941
LYSS2-4 100100	6.4	bpql	120	0.122	bpql	29.1	0.14	25	150	27.6	1000	0.02	0.143	20.6
LYSVD-4 100100	bpql	0.017	63	0.003	bpql	0.159	0.03	3.6	19	0.097	57	0.02	bpql	0.418

Note: bpql = below probable quantitative limit

EPA Method 200.15 Effluent Samples by ICAP-ES

Sample Name	Al (ppm)	As (ppm)	Ca (ppm)	Cd (ppm)	Cr (ppm)	Cu (ppm)	Fe (ppm)	K (ppm)	Mg (ppm)	Mn (ppm)	Na (ppm)	P (ppm)	Pb (ppm)	Zn (ppm)
Probable Quantitative Limit	0.01	0.005	0.02	0.001	0.005	0.003	0.005	0.2	0.1	5E-04	0.5	0.01	0.01	0.001
INFLOW 071900	bpql	bpql	54	bpql	bpql	bpql	0.03	6.7	14	0.063	32	1.3	bpql	0.002
OUTFLOW 071900	bpql	bpql	55	bpql	bpql	0.034	0.029	6.6	14	0.056	32	1.3	bpql	0.005
SPRINKLER 072000	0.03	bpql	58	bpql	bpql	0.007	0.083	6.8	15	0.112	33	1.5	bpql	0.012

Note: bpql = below probable quantitative limit

Geologic, Soil Water, and Groundwater Report-2000
Location Data

APPENDIX C

APPENDIX C

C.1 Site Location Methods

Sites were located using a Trimble GPS TCP1 Asset Surveyor. All location data were taken using Universal Transverse Mercator, Zone 12 North, North American Datum 1983, HPGN (Idaho/Montana) with units of meters. Data are also reported in decimal degrees. The Asset Surveyor automatically makes the differential correction in the field so data were differentially corrected, transferred to the Pathfinder software and exported as text files or shape files for use with ArcView.

This appendix contains quality control measurements for the GPS measurements taken.

APPENDIX C

C.2 Site Location QC

C.2.1 Accuracy Assessment

Three benchmarks are within close proximity of the Grant Kohrs National Historic Site. We measured the locations of these benchmarks with our GPS and compared readings to those reported by Ken Marchand (GPS Specialist at Grant Kohrs National Historic Site) and the National Geodetic Survey.

ACCURACY											
Benchmarks	**Site**	**PDOP**	**Date**	**Time**	**N**	**Altitude (m)**	**Northing (m)**	**Easting (m)**	**Longitude (degrees)**	**Latitude (degrees)**	**Altitude (geographic)**
Measured* (UM)	BM K313 1959	2.5	5/19/2000	03:04:47PM	22	1372.2	5141884.13	366524.35	-112.736889	46.417339	1359.537
Given* (GKR)	BM K313 1959	--	--	--	--	1372.1	5141882.22	366525.28	--	--	--
National Geodetic Survey	BM K313 1959	--	--	--	--	--	--	--	-112.737500	46.415278	1373.965
Difference						*0.08*	*1.91*	*0.93*	*-0.000611*	*-0.002061*	*14.428*
Measured* (UM)	BM L313 1959	2.3	5/19/2000	03:16:25PM	25	1376.0	5140851.40	366417.44	-112.7379846	46.40802777	1363.375
Given* (GKR)	BM L313 1959	--	--	--		1375.9	5140850.06	366417.71	--	--	--
National Geodetic Survey	BM L313 1959	--	--	--		--	--	--	-112.7375	46.40805556	1377.992
Difference						*0.11*	*1.34*	*0.27*	*0.000485*	*0.000028*	14.617
Measured* (UM)	BM S448 1979	2.3	5/19/2000	03:23:25PM	25	1378.8	5140901.66	366662.04	-112.7348182	46.40852815	1366.122
Given* (GKR)	BM S448 1979	--	--	--	--	1379.6	5140900.92	366663.25	--	--	--
National Geodetic Survey	BM S448 1979	--	--	--	--	--	--	--	-112.7352778	46.40861111	1379.992
Difference						*0.85*	*0.74*	*1.21*	*-0.000460*	*0.000083*	*13.87*

*Note: Measured (UM) represents sites measured by Anna B. Breuninger and Johnnie N. Moore during the 2000 field season using University of Montana, Geology Department Trimble TCP1 Asset Surveyor GPS instruments. These instruments automatically differentially correct the data in the field. Given (GKR) measurements were made by Ken Marchand using a Grant Kohrs National Historic Site Pro-XRS instrument. Data were post-processed using the base station in Helena after data collection. The National Geodetic Survey estimated accuracyof their data to be +/- 6 seconds (0.000278 degrees).
Using: UTM 12 North, NAD 1983, HPGN (Idaho/Montana)

APPENDIX C

C.2 Site Location QC

C.2.2 Replicate Measurements

Sites were reoccupied with the GPS after waits ranging from one minute to 166 days and duplicate measurements were recorded. The comparisons of the replicate measurements are given in meters. Data are summarized with the following plots: (1) difference in measurements versus length of time between measurements (for northing, easting and altitude), (2) difference in measurement of northing versus difference in measurement of easting, (3) difference in measurement of northing versus difference in measurement of altitude, (4) difference in measurement of easting versus difference in measurement of altitude.

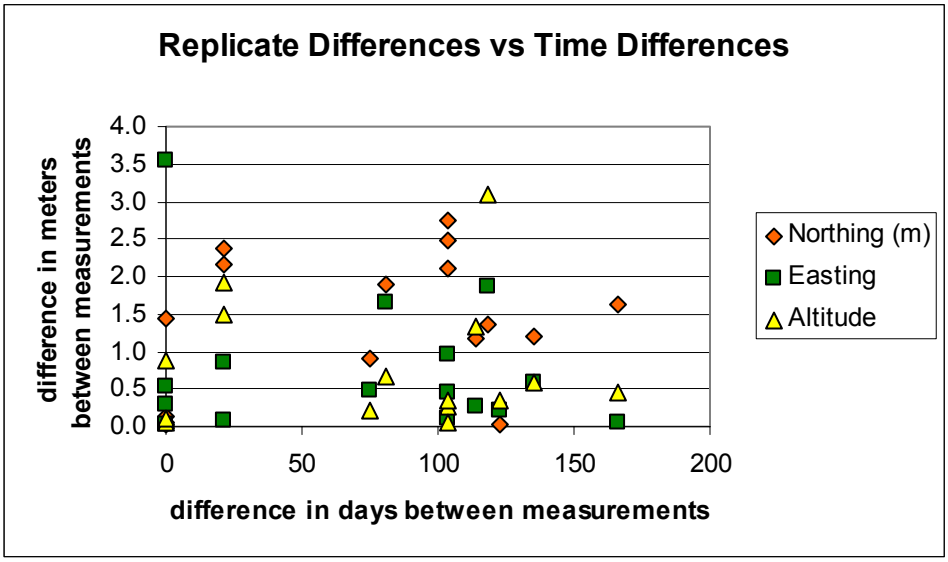
REPLICATES							Precisions					
Sample	PDOP	Time (Days)	Date	Time	N	Altitude	Horiz.	Vert.	Northing	Easting	Longitude	Latitude (N)
SS 01	2.3		5/15/2000	04:49:30PM	5	1412.319	0.375	0.584	5139753.575	364375.548	-112.7642197	46.3977456
SS 01	3.2	*0.21*	5/15/2000	11:50:22AM	8	1411.435	0.413	0.838	5139753.631	364376.079	-112.7642128	46.397746
Difference						*0.884*			*0.056*	*0.531*	*6.893E-06*	*6.020E-07*
T4-4	3.2		7/19/00	09:01:22AM	10	1154.329	0.631	0.675	5175867.856	325514.264	-113.2829571	46.7135859
T4-4	3.2	*0.001*	7/19/00	09:02:35AM	8	1154.416	0.639	0.684	5175869.303	325514.297	-113.2829572	46.7135989
Difference						*0.087*			*1.447*	*0.033*	*1.000E-07*	*1.302E-05*
MT13	3.1		9/12/2000	12:38:40PM	10	1365.36	0.442	0.769	5141884.272	365840.308	-112.7457865	46.417205
MT13	3.1	*0.001*	9/12/2000	12:39:42PM	10	1365.409	0.442	0.769	5141884.301	365843.847	-112.7457405	46.417206
Difference						*0.049*			*0.029*	*3.539*	*4.602E-05*	*9.600E-07*
REG04	3.1		6/1/2000	11:04:18AM	8	1378.209	0.416	0.802	5140916.301	366448.836	-112.7375949	46.408618
REG04	3.1	*0.08*	6/1/2000	11:06:20AM	30	1378.322	0.357	0.688	5140916.447	366449.138	-112.7375911	46.408619
Difference						*0.113*			*0.147*	*0.303*	*3.894E-06*	*1.379E-06*
MLS4	3.3		10/13/2000	10:43:43AM	10	1369.55	0.452	0.808	5142235.013	366539.543	-112.736792	46.420498
MLS4	1.8	*166.06*	6/1/2000	09:19:56AM	13	1370.015	0.277	0.375	5142236.645	366539.601	-112.7367917	46.420513
Difference						*0.465*			*1.631*	*0.058*	*2.820E-07*	*1.469E-05*
MW4	5.6		9/22/2000	10:50:49AM	25	1371.8	0.721	1.194	5142236.366	366539.637	-112.7367912	46.42051
MW4	3.3	*20.99*	10/13/2000	10:41:39AM	12	1370.308	0.446	0.796	5142234.203	366539.727	-112.7367894	46.420491
Difference						*1.492*			*2.163*	*0.091*	*1.795E-06*	*1.944E-05*
BNEST	2.1		9/26/2000	03:12:35PM	11	1374.826	0.329	0.487	5141607.698	366394.530	-112.7384988	46.414827
BNEST	3.0	*118.28*	6/1/2000	08:30:39AM	12	1371.723	0.429	0.714	5141606.333	366396.401	-112.7384741	46.414815
Difference						*3.103*			*1.365*	*1.871*	*2.472E-05*	*1.191E-05*
NEST9	2.1		8/22/2000	11:17:20AM	10	1365.529	0.342	0.494	5141957.968	365952.198	-112.7443523	46.41789
NEST9	2.7	*74.99*	6/8/2000	11:26:17AM	13	1365.739	0.447	0.621	5141958.877	365951.726	-112.7443587	46.417898
Difference						*0.21*			*0.909*	*0.472*	*6.430E-06*	*8.084E-06*
GKW9	3.3		9/26/2000	03:27:47PM	10	1369.74	0.384	0.675	5141369.472	366205.810	-112.7408851	46.412646
GKW9	2.3	*81.08*	7/7/2000	01:32:08PM	10	1369.072	0.3	0.597	5141367.592	366207.451	-112.7408633	46.41263
Difference						*0.668*			*1.880*	*1.641*	*2.188E-05*	*1.659E-05*
GKW3	1.8		9/12/2000	10:40:14AM	17	1370.402	0.313	0.365	5141189.988	365519.868	-112.7497545	46.410895
GKW3	3.9	*103.80*	6/1/2000	03:33:25PM	21	1370.662	0.281	0.474	5141187.884	365519.980	-112.7497524	46.410877
Difference						*0.26*			*2.104*	*0.112*	*2.059E-06*	*1.890E-05*
GKW4	1.9		9/12/2000	10:32:01AM	12	1378.779	0.346	0.403	5140787.429	365291.670	-112.7526062	46.407229
GKW4	2.3	*103.88*	6/1/2000	01:19:29PM	12	1379.128	0.322	0.557	5140784.941	365292.124	-112.7525996	46.407207
Difference						*0.349*			*2.488*	*0.455*	*6.633E-06*	*2.229E-05*

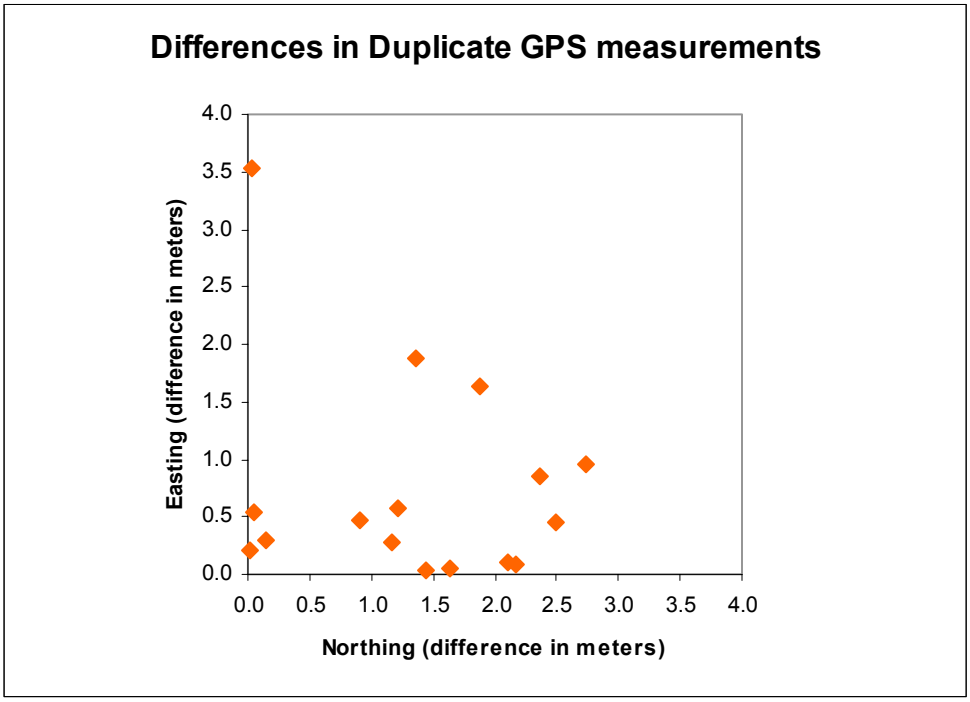
REPLICATES							Precisions					
Sample	PDOP	Time (Days)	Date	Time	N	Altitude	Horiz.	Vert.	Northing	Easting	Longitude	Latitude (N)
NEST1	2.2		6/12/2000	12:04:51PM	11	1371.414	0.365	0.5	5140473.069	365893.409	-112.7446909	46.404521
NEST1	2.3	*122.89*	9/12/2000	09:32:34AM	12	1371.063	0.327	0.547	5140473.048	365893.627	-112.744688	46.404521
Difference						0.351			*0.021*	*0.217*	*2.832E-06*	1.420E-07
GKW5	2.0		9/12/2000	09:58:06AM	12	1373.338	0.336	0.444	5140207.525	365884.193	-112.7447346	46.40213
GKW5	2.5	*103.85*	6/1/2000	01:37:45PM	10	1373.401	0.373	0.621	5140204.791	365885.152	-112.7447213	46.402106
Difference						*0.063*			*2.734*	*0.960*	*1.326E-05*	*2.440E-05*
MLS5	3.2		10/13/2000	10:48:13AM	12	1365.69	0.44	0.775	5142974.679	366661.142	-112.7354215	46.427176
MLS5	5.6	*21.00*	9/22/2000	10:45:17AM	20	1367.611	0.77	1.276	5142977.051	366661.986	-112.7354112	46.427197
Difference						*1.921*			*2.372*	*0.844*	*1.030E-05*	*2.150E-05*
MLS5	3.2		10/13/2000	10:48:13AM	12	1365.69	0.44	0.775	5142974.679	366661.142	-112.7354215	46.427176
MLS5	2.7	*135.05*	6/1/2000	09:33:35AM	9	1366.265	0.459	0.64	5142975.890	366661.715	-112.7354144	46.427187
Difference						*0.575*			*1.211*	*0.573*	*7.114E-06*	*1.101E-05*
MLS5	5.6		9/22/2000	10:45:17AM	20	1367.611	0.77	1.276	5142977.051	366661.986	-112.7354112	46.427197
MLS5	2.7	*114.05*	6/1/2000	09:33:35AM	9	1366.265	0.459	0.64	5142975.890	366661.715	-112.7354144	46.427187
Difference						*1.346*			*1.161*	*0.271*	*3.189E-06*	*1.050E-05*

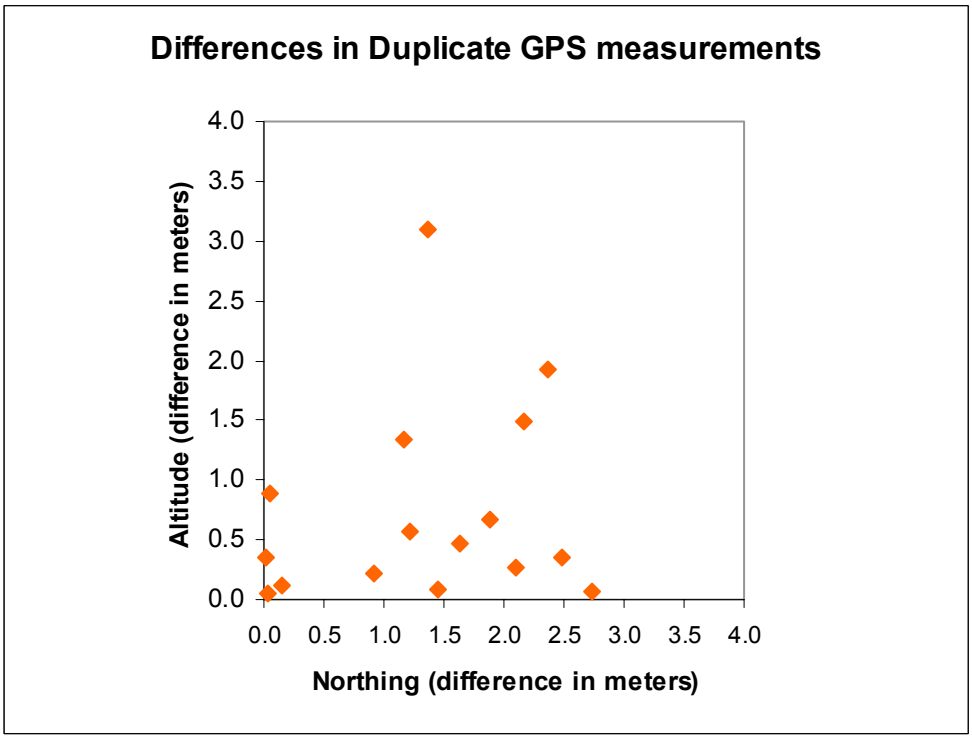
Notes: Altitude, Northing, easting, horizontal and vertical precisions are all in units of meters. degrees.
Latitude and Longitude are in units of decimal

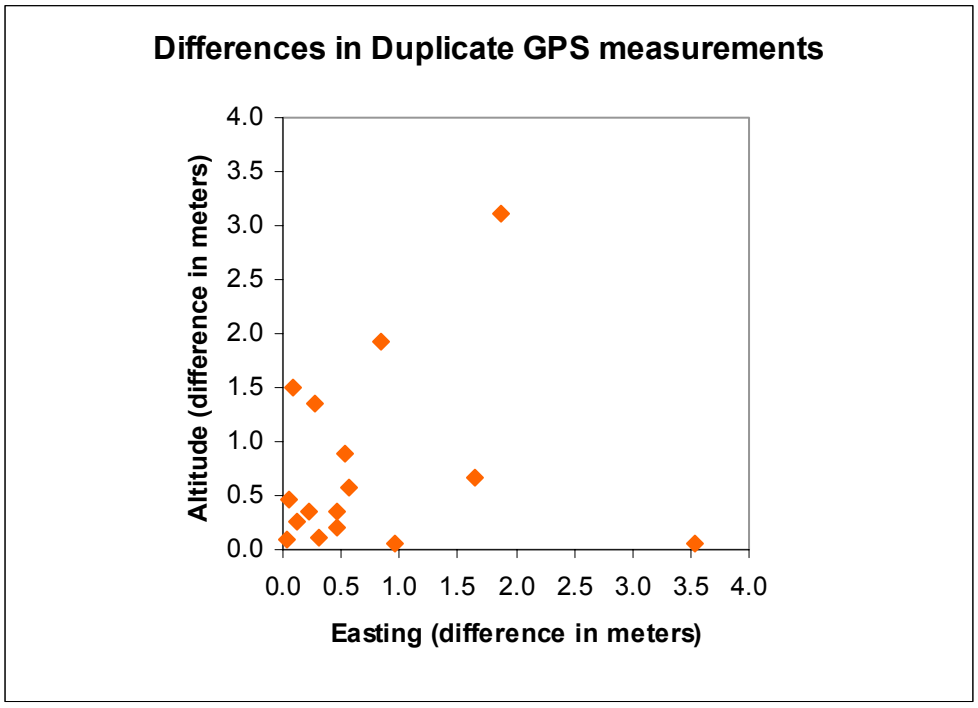
REPLICATE MEASUREMENTS		Differences		
Site	Time gap (Days)	Northing (m)	Easting (m)	Altitude (m)
SS 01	0.208	0.056	0.531	0.884
T4-4	0.001	1.447	0.033	0.087
MT13	0.001	0.029	3.539	0.049
REG04	0.085	0.147	0.303	0.113
MLS4	166.058	1.631	0.058	0.465
MW4	20.994	2.163	0.091	1.492
BTEN	118.279	1.365	1.871	3.103
GKM9	74.994	0.909	0.472	0.210
GKW9	81.080	1.880	1.641	0.668
GKW3	103.796	2.104	0.112	0.260
GKW4	103.884	2.488	0.455	0.349
NEST1	122.894	0.021	0.217	0.351
GKW5	103.847	2.734	0.960	0.063
MLS5	21.002	2.372	0.844	1.921
MLS5	135.052	1.211	0.573	0.575
MLS5	114.050	1.161	0.271	1.346
Average	*72.889*	*1.357*	*0.748*	*0.746*
Standard Deviation	*56.768*	*0.922*	*0.919*	*0.841*
Median	*92.438*	*1.406*	*0.463*	*0.408*
N	*16*	*16*	*16*	*16*

Data were colelcted with a Trimble TCP1 Asset Surveyor with automatic differential correction. Coordinates: UTM 12 North NAD 1983, HPGN (Idaho/Montana). Units: meters.



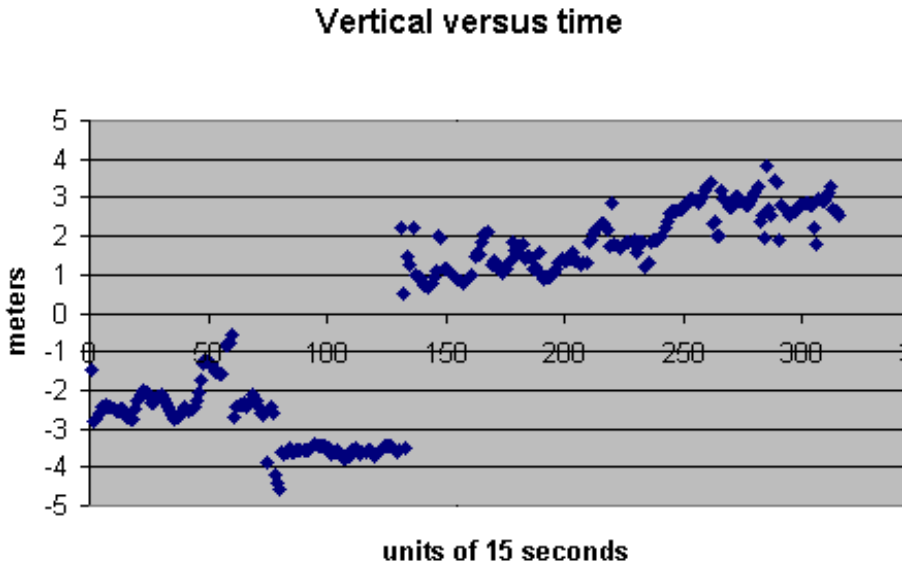

Differences in Duplicate GPS measurements
Easting (difference in meters)
Northing (difference in meters)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0

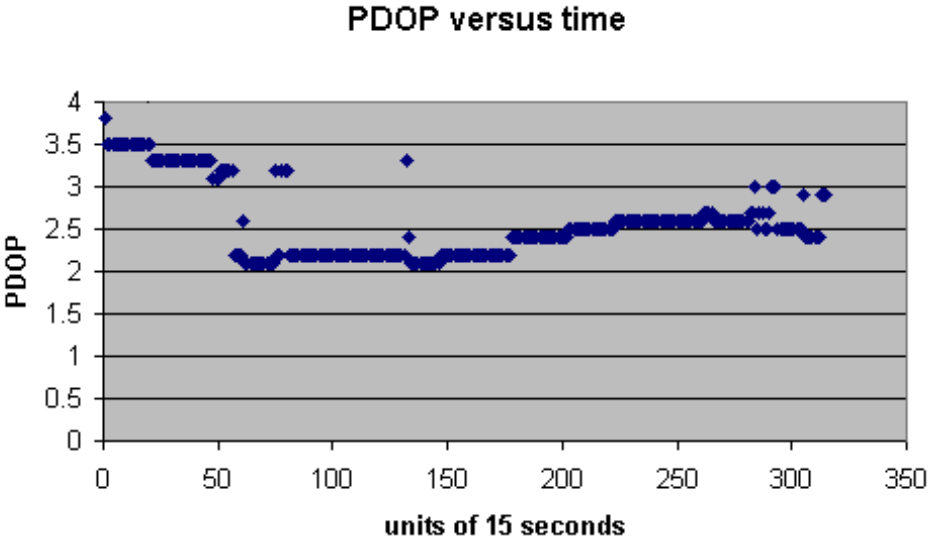

Differences in Duplicate GPS measurements
Altitude (difference in meters)
Northing (difference in meters)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0

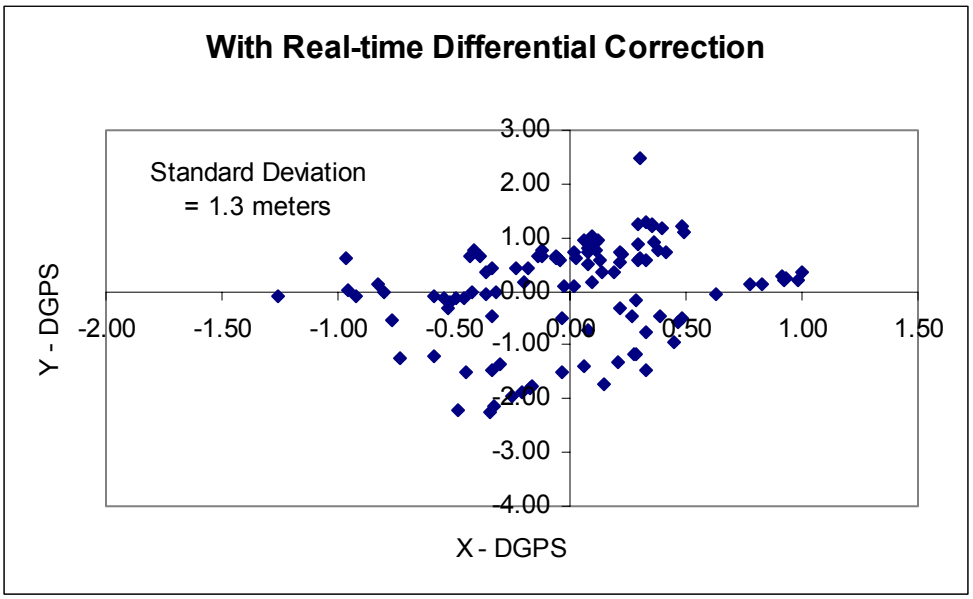

Differences in Duplicate GPS measurements
Altitude (difference in meters)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0
Easting (difference in meters)

C.2.3 Instrument Precision

Instrument precision was quantified by collecting data with the GPS for 0.5 hour and plotting all data with the real time differential correction included. Horizontal precision of location is shown in the first figure. The second page shows the change in PDOP and in vertical measurement using data were measured in 15 second increments over an hour-long time-period. Units are in meters.


Vertical versus time
meters
5
4
3
2
1
0
-1
-2
-3
-4
-5
0
50
100
150
200
250
300
units of 15 seconds


PDOP versus time
PDOP
4
3.5
3
2.5
2
1.5
1
0.5
0
0
50
100
150
200
250
300
350
units of 15 seconds


With Real-time Differential Correction
Standard Deviation
= 1.3 meters
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
-4.00
-2.00
-1.50
-1.00
-0.50
0.00
0.50
1.00
1.50
Y - DGPS
X - DGPS

APPENDIX C

C.3 Site Location Data

Location data (GPS) are listed here. The data include the following: Sample/site name, PDOP (position dilution of precision), horizontal and vertical precision values (68% precision), UTM coordinates (altitude, northing and easting for Zone 12 North), geographic coordinates and the date and time the values were collected. Location data are listed in the following order: surface soil sample sites, soil profile sites (bank profiles, cores and soil pits), ditch sediment sites, surface water collection sites, groundwater and soil pore water sites (includes stream gates) and microbiology sample sites.

Sample	PDOP	N	Horizontal Precision	Vertical Precision	Longitude (deg.)	Latitude (deg.)	Northing (m)	Easting (m)	Altitude (m)	Date/Time
SS 01 REPEAT	3.2	8	0.413	0.838	-112.764213	46.3977462	5139753.631	364376.079	1411.435	5/15/2000 11:50:22AM
SS 01	2.3	5	0.375	0.584	-112.7642197	46.3977456	5139753.58	364375.548	1412.319	05/15/00 04:49:30PM
SS 02	2.0	8	0.336	0.464	-112.7597103	46.3993005	5139918.62	364726.048	1404.802	05/15/00 05:10:32PM
SS 03	1.9	9	0.331	0.436	-112.7559441	46.3992977	5139911.88	365015.554	1398.397	05/15/00 05:17:45PM
SS 04	1.8	7	0.337	0.414	-112.7517087	46.3986401	5139831.59	365339.521	1391.030	05/15/00 05:27:40PM
SS 05	2.2	8	0.403	0.494	-112.7530216	46.4012627	5140125.23	365245.052	1422.544	05/15/00 05:52:22PM
SS 06	2.5	10	0.363	0.615	-112.7565784	46.4019745	5140210.38	364973.395	1399.420	05/15/00 06:18:17PM
SS 07	2.9	7	0.390	0.761	-112.7623469	46.4019684	5140219.57	364529.973	1437.700	05/15/00 06:33:45PM
SS 08	3.2	17	0.589	0.622	-112.7551040	46.4073494	5140805.09	365099.99	1384.736	05/15/00 08:29:00PM
SS 09	2.6	26	0.378	0.553	-112.7589160	46.4073198	5140808.30	364806.918	1392.972	05/15/00 08:40:32PM
SS 10	2.3	4	0.406	0.554	-112.7588642	46.4097319	5141076.23	364816.867	1413.201	05/15/00 08:52:57PM
SS 11	2.1	4	0.377	0.504	-112.7547703	46.4095220	5141045.92	365130.99	1399.683	05/15/00 09:02:02PM
SS 12	3.2	31	0.398	0.680	-112.7521031	46.4040071	5140428.60	365322.412	1384.487	05/15/00 09:41:15PM
SS 13	3.0	7	0.473	0.744	-112.7481003	46.4009227	5140079.07	365622.509	1389.469	05/15/00 10:02:20PM
SS 14	3.0	8	0.463	0.720	-112.7460275	46.4008457	5140067.00	365781.654	1378.132	05/15/00 10:10:27PM
SS 15	2.3	12	0.349	0.540	-112.7478999	46.4030408	5140314.08	365643.119	1374.027	05/15/00 10:29:52PM
SS 16	2.3	3	0.374	0.579	-112.7458875	46.4026367	5140265.76	365796.807	1372.233	05/15/00 10:24:20PM
SS 17	2.4	10	0.351	0.593	-112.7489582	46.4043290	5140459.01	365564.935	1375.490	05/15/00 10:50:12PM
SS 18	1.8	12	0.298	0.405	-112.7461026	46.4044755	5140470.44	365784.787	1369.932	05/16/00 02:09:32PM
SS 19	1.8	14	0.295	0.404	-112.7443825	46.4045334	5140473.96	365917.143	1370.927	05/16/00 02:19:27PM
SS 20	5.3	10	0.853	1.247	-112.7444403	46.4059801	5140634.80	365916.249	1370.978	05/16/00 02:38:57PM
SS 21	3.1	8	0.556	0.719	-112.7443317	46.4072150	5140771.83	365927.62	1369.927	05/16/00 03:10:17PM
SS 22	2.8	8	0.447	0.665	-112.7457427	46.4072914	5140782.72	365819.355	1369.811	05/16/00 03:17:57PM
SS 23	2.8	14	0.427	0.636	-112.7456546	46.4058961	5140627.53	365822.707	1369.594	05/16/00 03:27:12PM
SS 24	2.8	11	0.437	0.651	-112.7474111	46.4065249	5140700.38	365689.243	1370.743	05/16/00 03:43:10PM
SS 25	2.3	7	0.325	0.576	-112.7471843	46.4059287	5140633.75	365705.21	1371.665	05/16/00 03:51:45PM
SS 26	2.3	10	0.322	0.584	-112.7480376	46.4074799	5140807.56	365643.43	1369.417	05/16/00 04:00:47PM
SS 27	2.4	12	0.321	0.579	-112.7506884	46.4060368	5140651.71	365436.145	1377.443	05/16/00 04:11:07PM
SS 28	2.7	10	0.369	0.676	-112.7480044	46.4087734	5140951.22	365649.159	1369.399	05/16/00 06:21:57PM
SS 29	3.1	11	0.417	0.777	-112.7519877	46.4118917	5141304.48	365350.685	1377.860	05/16/00 07:05:00PM
SS 30	3.2	10	0.404	0.816	-112.7479243	46.4131322	5141435.40	365666.023	1367.298	05/16/00 07:22:32PM

Sample	PDOP	N	Horizontal Precision	Vertical Precision	Longitude (deg.)	Latitude (deg.)	Northing (m)	Easting (m)	Altitude (m)	Date/Time
SS 31	2.4	10	0.384	0.553	-112.7479438	46.4143031	5141565.53	365667.402	1367.871	05/16/00 07:36:37PM
SS 32	2.4	15	0.370	0.533	-112.7479600	46.4155313	5141702.04	365669.174	1367.623	05/16/00 07:53:20PM
SS 33	3.2	13	0.618	0.638	-112.7456784	46.4154929	5141693.90	365844.42	1366.113	05/16/00 08:09:10PM
SS 34	3.2	12	0.612	0.646	-112.7456428	46.4142597	5141556.81	365844.129	1366.077	05/16/00 08:23:07PM
SS 35	2.3	12	0.386	0.523	-112.7454846	46.4171999	5141883.24	365863.496	1367.575	05/16/00 08:47:57PM
SS 36	2.1	14	0.348	0.460	-112.7451593	46.4185132	5142028.61	365891.715	1366.812	05/16/00 09:04:32PM
SS 37	2.9	13	0.421	0.700	-112.7454270	46.4194770	5142136.15	365873.51	1364.828	05/16/00 09:14:50PM
SS 38	3.2	11	0.470	0.789	-112.7483303	46.4174475	5141915.58	365645.424	1365.882	05/16/00 09:41:45PM
SS 39	3.0	7	0.468	0.730	-112.7506883	46.4171843	5141890.35	365463.572	1367.832	05/16/00 10:05:05PM
SS 40	2.3	9	0.356	0.562	-112.7512471	46.4137010	5141504.26	365412.055	1375.993	05/16/00 10:21:10PM
SS 41	2.5	12	0.346	0.551	-112.7490398	46.4110841	5141209.73	365575.258	1368.996	05/16/00 10:36:32PM
SS 42	2.4	11	0.348	0.578	-112.7489060	46.4110611	5141206.94	365585.49	1368.423	05/16/00 10:40:10PM
SS 43	3.7	10	0.608	0.857	-112.7481339	46.4187092	5142055.43	365663.613	1367.152	05/17/00 02:16:32PM
SS 44	5.4	24	0.777	1.171	-112.7476341	46.4205858	5142263.10	365706.628	1366.179	05/17/00 02:35:32PM
SS 45	2.7	13	0.356	0.665	-112.7493300	46.4213724	5142353.38	365578.246	1374.017	05/17/00 03:35:14PM
SS 46	2.4	15	0.314	0.567	-112.7490168	46.4245952	5142710.95	365610.233	1378.180	05/17/00 04:01:05PM
SS 47	3.1	10	0.398	0.780	-112.7473212	46.4243363	5142679.30	365739.881	1366.601	05/17/00 04:13:42PM
SS 48	3.0	11	0.423	0.750	-112.7456523	46.4239825	5142637.15	365867.246	1364.838	05/17/00 04:27:25PM
SS 49	2.4	17	0.344	0.536	-112.7457165	46.4228693	5142513.57	365859.585	1365.719	05/17/00 04:40:55PM
SS 50	2.2	56	0.249	0.347	-112.7459120	46.4217447	5142388.95	365841.803	1365.417	05/17/00 05:02:42PM
SS 51	2.5	10	0.363	0.607	-112.7444312	46.4216981	5142381.26	365955.473	1366.468	05/17/00 06:08:42PM
SS 52	3.0	12	0.378	0.744	-112.7439830	46.4227647	5142499.01	365992.531	1365.872	05/17/00 06:26:37PM
SS 53	3.1	9	0.429	0.785	-112.7427414	46.4225580	5142473.94	366087.425	1364.897	05/17/00 06:58:37PM
SS 54	3.2	8	0.420	0.814	-112.7416941	46.4225932	5142476.07	366167.983	1365.796	05/17/00 07:06:17PM
SS 55	3.2	10	0.405	0.816	-112.7419532	46.4232303	5142547.30	366149.634	1365.519	05/17/00 07:17:42PM
SS 56	2.7	10	0.446	0.620	-112.7429468	46.4236338	5142593.82	366074.279	1365.431	05/17/00 07:53:47PM
SS 57	2.8	12	0.469	0.625	-112.7441894	46.4237975	5142614.11	365979.197	1364.227	05/17/00 08:02:27PM
SS 58	2.6	22	0.295	0.421	-112.7457425	46.4091139	5140985.22	365823.843	1370.332	05/18/00 01:47:22PM
SS 59	1.8	11	0.276	0.394	-112.7457822	46.4100183	5141085.77	365823.008	1370.154	05/18/00 02:03:55PM
SS 60	4.3	14	0.655	0.976	-112.7452599	46.4110606	5141200.70	365865.71	1367.686	05/18/00 02:20:37PM

Sample	PDOP	N	Horizontal Precision	Vertical Precision	Longitude (deg.)	Latitude (deg.)	Northing (m)	Easting (m)	Altitude (m)	Date/Time
SS 61	3.1	14	0.509	0.681	-112.7476733	46.4117000	5141275.84	365681.798	1369.193	05/18/00 03:04:52PM
SS 62	2.7	13	0.390	0.649	-112.7477927	46.4103055	5141121.10	365669.199	1369.220	05/18/00 03:17:50PM
SS 63	3.0	17	0.371	0.732	-112.7444654	46.4080155	5140861.01	365919.308	1367.465	05/18/00 04:06:30PM
SS 64	3.0	10	0.434	0.727	-112.7444214	46.4089893	5140969.13	365925.074	1366.597	05/18/00 04:26:37PM
SS 65	2.1	10	0.342	0.505	-112.7441032	46.4101154	5141093.71	365952.291	1367.403	05/18/00 04:47:42PM
SS 66	1.9	12	0.324	0.424	-112.7446750	46.4110312	5141196.44	365910.588	1368.179	05/18/00 05:08:22PM
SS 67	1.7	11	0.308	0.387	-112.7441538	46.4118671	5141288.44	365952.692	1368.424	05/18/00 05:25:15PM
SS 68	3.2	14	0.393	0.792	-112.7441656	46.4131295	5141428.72	365954.884	1368.477	05/18/00 07:13:57PM
SS 69	2.4	10	0.391	0.568	-112.7462753	46.4133248	5141454.00	365793.225	1367.981	05/18/00 07:32:12PM
SS 70	2.7	11	0.444	0.617	-112.7474054	46.4139593	5141526.42	365707.932	1366.700	05/18/00 07:50:05PM
SS 71	3.2	9	0.637	0.658	-112.7464204	46.4126829	5141382.93	365780.5	1367.414	05/18/00 08:02:20PM
SS 72	3.6	9	0.617	0.664	-112.7463556	46.4117247	5141276.34	365783.129	1367.589	05/18/00 08:16:22PM
SS 73	2.3	10	0.379	0.519	-112.7442772	46.4144874	5141579.80	365949.632	1366.696	05/18/00 08:38:22PM
SS 74	1.7	11	0.270	0.402	-112.7440033	46.4154654	5141688.00	365973.081	1366.481	05/18/00 08:54:25PM
SS 75	2.5	13	0.368	0.604	-112.7439363	46.4168128	5141837.60	365981.53	1365.560	05/18/00 09:41:50PM
SS 76	3.0	10	0.461	0.724	-112.7437140	46.4184518	5142019.33	366002.63	1365.572	05/18/00 09:56:47PM
SS 77	2.4	10	0.366	0.560	-112.7445021	46.4191982	5142103.61	365943.897	1365.996	05/18/00 10:13:57PM
SS 78	2.4	10	0.352	0.593	-112.7455165	46.4201860	5142215.09	365868.367	1365.615	05/18/00 10:33:47PM
SS 79	2.4	10	0.351	0.596	-112.7438529	46.4212491	5142330.38	365998.812	1365.313	05/18/00 10:51:12PM
SS 80	3.7	10	0.591	0.876	-112.7437947	46.4197203	5142160.41	365999.536	1366.034	05/18/00 11:03:27PM
SS 81	2.5	10	0.378	0.616	-112.7416141	46.4088008	5140943.43	366140.373	1370.167	05/19/00 09:38:07PM
SS 82	2.4	12	0.341	0.593	-112.7418014	46.4100327	5141080.62	366128.994	1370.473	05/19/00 09:19:57PM
SS 83	1.7	11	0.250	0.394	-112.7413911	46.4119837	5141296.71	366165.304	1368.631	05/19/00 08:38:15PM
SS 84	2.9	24	0.345	0.673	-112.7415817	46.4130880	5141419.74	366153.36	1369.257	05/19/00 06:17:42PM
SS 85	2.4	12	0.358	0.573	-112.7415597	46.4143896	5141564.33	366158.233	1369.010	05/19/00 05:56:47PM
SS 86	2.4	11	0.400	0.563	-112.7415829	46.4153578	5141671.94	366158.824	1367.924	05/19/00 05:25:40PM
SS 87	1.8	12	0.324	0.404	-112.7414882	46.4166708	5141817.67	366169.311	1367.336	05/19/00 05:08:37PM
SS 88	3.2	13	0.409	0.756	-112.7414586	46.4184082	5142010.67	366175.839	1367.876	05/19/00 04:13:38PM
SS 89	2.4	13	0.317	0.574	-112.7416813	46.4196959	5142154.12	366161.877	1366.405	05/19/00 03:50:35PM

Sample	PDOP	N	Horizontal Precision	Vertical Precision	Longitude (deg.)	Latitude (deg.)	Northing (m)	Easting (m)	Altitude (m)	Date/Time
SS 91	4.7	15	0.711	1.093	-112.7397014	46.4235038	5142573.89	366323.329	1368.722	05/19/00 02:20:00PM
SS 92	2.7	11	0.412	0.654	-112.7400249	46.4210708	5142304.09	366292.522	1365.669	05/19/00 03:09:10PM
SS 93	5.0	9	0.779	1.217	-112.7398088	46.4186861	5142038.75	366303.298	1369.899	05/19/00 02:23:00PM
SS 94	3.1	10	0.398	0.781	-112.7401869	46.4102223	5141098.96	366253.545	1371.244	05/19/00 04:05:27PM
SS 95	2.7	10	0.367	0.685	-112.7377740	46.4102619	5141099.29	366439.087	1374.833	05/19/00 03:26:52PM
SS 96	2.3	10	0.320	0.574	-112.7363030	46.4102727	5141098.00	366552.169	1376.978	05/19/00 03:42:47PM
SS 97	3.2	9	0.623	0.660	-112.7399023	46.4071077	5140752.41	366267.808	1372.767	05/19/00 08:11:15PM
SS 98	2.2	19	0.238	0.372	-112.7420427	46.4071935	5140765.57	366103.504	1370.738	05/19/00 08:37:34PM
SS 99	3.2	10	0.407	0.827	-112.7417627	46.4059676	5140628.88	366122.022	1371.606	05/19/00 06:41:52PM
SS 100	1.7	10	0.282	0.386	-112.7440929	46.4046710	5140488.76	365939.737	1371.792	05/19/00 05:15:22PM
SS 101	2.1	10	0.338	0.489	-112.7417663	46.4045924	5140476.08	366118.383	1371.857	05/19/00 04:47:37PM
SS 102	2.2	10	0.381	0.507	-112.7419845	46.4028420	5140281.96	366097.322	1373.139	05/19/00 05:42:27PM
SS 105	2.4	15	0.347	0.570	-112.7397726	46.4028286	5140276.73	366267.31	1374.745	05/19/00 06:00:38PM
SS 106	2.4	13	0.362	0.569	-112.7397472	46.4047104	5140485.77	366273.867	1374.127	05/19/00 04:28:45PM
SS 107	2.7	10	0.460	0.629	-112.7359623	46.4059063	5140612.27	366567.704	1376.945	05/19/00 07:49:22PM
SS 108	2.7	12	0.357	0.680	-112.7416872	46.4211373	5142314.30	366164.951	1365.348	05/19/00 03:30:27PM
SS 110	3.1	10	0.551	0.706	-112.7349704	46.4278930	5143053.59	366697.545	1367.632	05/19/00 02:58:12PM
SS 111	2.7	5	0.441	0.683	-112.7371726	46.4151375	5141640.01	366497.207	1372.342	05/19/00 03:06:30PM
ESS1	3.1	11	0.4	0.774	-112.732403	46.4287236	5143141.552	366896.835	1368.019	6/1/2000 10:52:41AM
ESS2	3.3	11	0.405	0.834	-112.733084	46.4243918	5142661.382	366833.949	1372.164	6/1/2000 10:43:35AM
ESS3	3.3	32	0.345	0.718	-112.734308	46.4220964	5142408.394	366734.338	1370.449	6/1/2000 10:34:13AM
ESS4	3.1	11	0.382	0.775	-112.734145	46.4183494	5141991.785	366737.736	1372.834	6/1/2000 10:27:21AM
ESS5	2.9	9	0.378	0.727	-112.734509	46.4160144	5141732.947	366704.011	1370.899	6/1/2000 10:20:10AM
ESS6	2.6	18	0.345	0.612	-112.734855	46.4131798	5141418.579	366670.568	1375.091	6/1/2000 10:11:52AM

Sample	PDOP	N	Horizontal Precision	Vertical Precision	Longitude (deg.)	Latitude (deg.)	Northing (m)	Easting (m)	Altitude (m)	Date	Time
CP1	2.3	12	0.327	0.547	-112.74469	46.40452	5140473	365893.6	1371.063		
CP2	2.0	12	0.28	0.495	-112.74446	46.408	5140859	365919.8	1370.21		
CP3	2.7	5	0.44	0.66	-112.74635	46.41015	5141101	365779.4	1366.687	10/13/2000	11:12:49AM
CP4	3.2	10	0.444	0.804	-112.74548	46.41721	5141885	365864	1365.105		
CP5	2.1	10	0.315	0.523	-112.74555	46.40925	5140999	365839.2	1369.099		
CP6	6.2	30	0.831	1.289	-112.74365	46.40557	5140588	365976.1	1370.404	10/13/2000	12:17:18PM
CP7	2.8	10	0.574	0.549	-112.74461	46.41121	5141216	365916.2	1368.985	10/13/2000	11:27:22AM
CP8	2.5	10	0.318	0.631	-112.74486	46.41411	5141538	365904.2	1369.281		
CP9	2.1	10	0.342	0.494	-112.74435	46.41789	5141958	365952.2	1365.529		
CP10	5.4	12	0.511	0.932	-112.74409	46.41236	5141343	365958.9	1367.919	8/8/2000	08:48:47AM
CP11	2.2	10	0.337	0.528	-112.74526	46.41306	5141423	365870.8	1368.238	8/8/2000	10:18:03AM
CP12	3.5	14	0.514	0.714	-112.74323	46.40875	5140941	366015.7	1369.769	8/8/2000	12:39:52PM
CP14	2.7	10	0.368	0.681	-112.74564	46.40517	5140547	365821.8	1369.492	8/8/2000	03:33:08PM
CP15	2.5	11	0.434	0.500	-112.74592	46.40166	5140157	365791.8	1374.6	8/8/2000	04:09:02PM
CP16	3.1	12	0.484	0.714	-112.74742	46.40635	5140681	365688.2	1368.866	8/9/2000	09:06:12AM
CP17	2.4	11	0.495	0.480	-112.74539	46.41915	5142100	365875.9	1365.344	8/9/2000	12:34:51PM
CP18	2.1	7	0.429	0.440	-112.74707	46.42287	5142516	365755.4	1365.134	8/9/2000	01:37:05PM
CP19	2.9	5	0.367	0.775	-112.75052	46.41024	5141118	365459.5	1372.629	8/9/2000	02:38:11PM
CP20	2.6	10	0.442	0.581	-112.74772	46.41119	5141220	365676.7	1368.129	8/9/2000	03:58:25PM
CP21	2.4	10	0.409	0.482	-112.74566	46.41044	5141133	365833.2	1368.119	8/9/2000	04:11:57PM

Sample	PDOP	N	Horizontal Precision	Vertical Precision	Longitude (deg.)	Latitude (deg.)	Northing (m)	Easting (m)	Altitude (m)	Date	Time
BP 1	3.1	34	0.345	0.674	-112.74523	46.40871	5140939	365862.5	1370.516	6/6/2000	10:47:41AM
BP 2	2.5	10	0.35	0.606	-112.74479	46.4107	5141160	365901.1	1369.324	6/6/2000	01:05:45PM
BP 3	2.4	12	0.35	0.590	-112.74633	46.41149	5141251	365784.6	1369.012	6/6/2000	02:33:05PM
BP 4	2.1	10	0.263	0.443	-112.74751	46.41369	5141497	365699.3	1367.839	6/6/2000	03:22:09PM
BP 5	2.5	11	0.4	0.585	-112.74512	46.41532	5141674	365886.8	1367.349	6/8/2000	11:10:22AM
BP 6	3.1	11	0.396	0.791	-112.745	46.40691	5140739	365875.4	1370.872	6/12/2000	10:31:27AM
BP 7	2.6	12	0.425	0.612	-112.74403	46.40615	5140653	365948.5	1370.502	6/12/2000	11:02:28AM
BP 8	2.6	22	0.335	0.587	112.74457	46.41886	5142066	365937.7	1366.587	6/15/2000	9:11:44AM
BP 9	2.5	10	0.538	0.682	112.74297	46.42408	5142644	366073.5	1365.158	6/15/2000	2:18:49PM
BP 10	2.5	21	0.303	0.572	112.74119	46.4229	5142509	366207.3	1365.725	6/15/2000	3:33:10PM
BP 11	2.6	10	0.366	0.647	-112.74287	46.40726	5140774	366039.7	1370.635	6/16/2000	09:09:52AM
BP 12	3.1	10	0.612	0.656	-112.74405	46.40454	5140474	365943.1	1372.445	6/16/2000	11:23:07AM
BP 13	2.4	73	0.243	0.411	-112.74531	46.4176	5141928	365878	1368.096	6/16/2000	01:40:18PM
BP 14	2.0	12	0.282	0.481	-112.74629	46.42029	5142228	365809	1364.779	7/21/2000	09:39:02AM
BP 15	2.5	12	0.356	0.600	-112.74341	46.42234	5142451	366035.6	1363.506	7/21/2000	11:23:23AM

Sample	PDOP	N	Horizontal Precision	Vertical Precision	Longitude (deg.)	Latitude (deg.)	Northing (m)	Easting (m)	Altitude (m)	Date	Time
SED 1	2.5	11	0.399	0.590	-112.7517943	46.419133	5142109	365383	1378.66	7/13/2000	08:47:57AM
SED 2	3.2	10	0.629	0.678	-112.7530423	46.411435	5141255	365269	1378.96	7/13/2000	09:22:56AM
SED 3	2.5	10	0.388	0.598	-112.751971	46.404948	5140533	365335	1379.82	7/13/2000	10:15:39AM
SED 4	3.3	10	0.463	0.812	-112.7471289	46.400877	5140072	365697	1382.3	7/13/2000	10:35:42AM
SED 5	2.5	12	0.354	0.598	-112.7402363	46.423492	5142573	366282	1367.92	7/13/2000	11:55:46AM
SED 6	4	10	0.328	0.539	-112.7401804	46.416844	5141835	366270	1369.07	7/13/2000	12:27:59PM
SED 7	2.2	11	0.280	0.545	-112.740975	46.410022	5141078	366192	1370.89	7/13/2000	01:14:16PM
SED 8	2.2	11	0.340	0.506	-112.7420252	46.407546	5140805	366106	1369.94	7/13/2000	02:02:09PM
SED 9	2.4	10	0.505	0.469	-112.7436353	46.403513	5140359	365972	1371.97	7/13/2000	02:28:50PM

Sample	PDOP	N	Horizontal Precision	Vertical Precision	Longitude (deg.)	Latitude (deg.)	Northing (m)	Easting (m)	Altitude (m)	Date	Time
SW1	2.7	11	0.347	0.676	-112.74714	46.40928	5141006	365716.66	1368.636	6/1/2000	04:10:33PM
SW3	2	10	0.288	0.501	-112.74293	46.412646	5141373	366049.03	1368.12	7/7/2000	01:13:02PM
SW4	2	16	0.276	0.48	-112.74276	46.412652	5141373	366061.88	1368.363	7/7/2000	01:15:16PM
SW5	2.3	10	0.296	0.588	-112.74054	46.412632	5141367	366232.34	1368.788	7/7/2000	01:30:52PM

Note: SW2 was measured as an area.

	Site	PDOP	N	Horizontal Precision	Vertical Precision	Longitude	Latitude	Northing	Easting	Altitude	Date	Time
Gages												
	CFSG1	2.5	12	0.468	0.509	-112.7445	46.40217	5140212.01	365903.3512	1369.418	9/12/2000	10:03:36AM
	CFSG2	2.7	12	0.323	0.575	-112.7457	46.40864	5140932.72	365824.7683	1369.724	9/12/2000	09:15:55AM
	CFSG3	2.8	10	0.580	0.546	-112.7449	46.41114	5141209.29	365896.2381	1367.133	10/13/2000	11:30:42AM
	CFSG4	2.8	10	0.593	0.535	-112.7451	46.41432	5141562.7	365884.2066	1365.371	10/13/2000	11:38:30AM
	CFSG5	2.8	11	0.467	0.633	-112.7448	46.4175	5141965.21	365906.7405	1364.110	6/8/2000	11:30:10AM
Effluent Nests												
ESS1	ANEST1	3.1	11	0.400	0.774	-112.7324	46.42872	5143141.55	366896.8351	1368.019	6/1/2000	10:52:41AM
	ANEST2	3.3	32	0.345	0.718	-112.7343	46.4221	5142408.39	366734.3381	1370.449	6/1/2000	10:43:36AM
	ANEST3	2.9	9	0.378	0.727	-112.7345	46.41601	5141732.95	366704.0109	1370.899	6/1/2000	10:34:13AM
	BNEST	3	12	0.429	0.714	-112.7385	46.41481	5141606.33	366396.4008	1371.723	6/1/2000	08:30:39AM
	NMNEST	3.2	15	0.397	0.776	-112.7393	46.42349	5142571.48	366354.683	1367.799		
Floodplain Nests												
	NEST1	2.3	12	0.327	0.547	-112.7447	46.40452	5140473.05	365893.6267	1371.063	9/12/2000	09:32:34AM
	NEST2	2	12	0.280	0.495	-112.7445	46.408	5140859.32	365919.7608	1370.210	9/12/2000	09:08:42AM
	NEST3	2.7	5	0.440	0.66	-112.7464	46.41015	5141101.4	365779.4152	1366.687	10/13/2000	11:12:49AM
	NEST4	3.2	10	0.444	0.804	-112.7455	46.41721	5141884.68	365863.9902	1365.105	9/12/2000	12:41:46PM
	NEST5	2.1	10	0.315	0.523	-112.7455	46.40925	5140999.47	365839.1766	1369.099	6/1/2000	1:06:43 AM
	NEST6	6.2	30	0.831	1.289	-112.7436	46.40557	5140587.86	365976.0968	1370.404	10/13/2000	12:17:18PM
	NEST7	2.8	10	0.574	0.549	-112.7446	46.41121	5141216.31	365916.1979	1368.985	10/13/2000	11:27:22AM
	NEST8	2.5	10	0.318	0.631	-112.7449	46.41411	5141538.36	365904.1744	1369.281	8/22/2000	10:30:05AM
ABB	NEST9	2.1	10	0.342	0.494	-112.7444	46.41789	5141957.97	365952.1978	1365.529	8/22/2000	11:17:21AM

Site	PDOP	N	Horizontal Precision	Vertical Precision	Longitude	Latitude	Northing	Easting	Altitude	Date	Time
Grant Kohrs Wells											
GKW1	2.6	9	0.424	0.597	-112.7481	46.42455	5142704.12	365683.064	1373.114	6/1/2000	02:29:37PM
GKW2	3	10	0.463	0.713	-112.7519	46.41489	5141637.78	365365.7081	1378.677	6/1/2000	02:05:01PM
GKW3	1.8	17	0.313	0.365	-112.7498	46.4109	5141189.99	365519.868	1370.402	9/12/2000	10:40:14AM
GKW4	1.9	12	0.346	0.403	-112.7526	46.40723	5140787.43	365291.6695	1378.779	9/12/2000	10:32:01AM
GKW5	2	12	0.336	0.444	-112.7447	46.40213	5140207.53	365884.1927	1373.338	9/12/2000	09:58:06AM
GKW6	2.4	12	0.497	0.442	-112.7549	46.40265	5140282.28	365101.7092	1391.719	9/12/2000	10:19:51AM
GKW7	4.3	9	0.600	1.079	-112.7391	46.40278	5140269.86	366317.4942	1372.978	6/1/2000	12:52:11PM
GKW8	2.4	6	0.447	0.563	-112.7434	46.40781	5140835.86	365999.1688	1371.342	10/13/2000	11:54:51AM
GKW9	3.3	10	0.384	0.675	-112.7409	46.41265	5141369.47	366205.81	1369.740	9/26/2000	03:27:47PM
GKW10	**3.2**	**15**	**0.397**	**0.776**	**-112.7393**	**46.42349**	**5142571.48**	**366354.683**	**1367.799**		
GKW11	2.8	20	0.396	0.629	-112.7351	46.42304	5142514.71	366676.8398	1372.155	10/13/2000	10:21:41AM
Monitoring Wells											
MW1	0	33	--	--	-112.7279	46.41476	5141582.08	367208.1966	1379.731	10/13/2000	10:00:32AM
MW2	6	30	0.937	1.147	-112.7311	46.42403	5142618.27	366986.4802	1372.050	10/13/2000	10:11:31AM
MW3	3.2	14	0.437	0.776	-112.7399	46.41727	5141881.97	366291.1152	1371.193	10/13/2000	10:35:54AM
MW4	3.3	12	0.446	0.796	-112.7368	46.42049	5142234.2	366539.7271	1370.308	10/13/2000	10:41:39AM
MW5	3.2	12	0.440	0.775	-112.7352	46.42743	5143002.11	366676.4898	1366.702	10/13/2000	10:50:34AM
Multi-level Samplers											
MLS3	2.2	23	0.319	0.478	-112.7393	46.41724	5141877.15	366336.0434	1368.967	6/1/2000	08:47:32AM
MLS4	1.8	13	0.277	0.375	-112.7368	46.42051	5142236.64	366539.6009	1370.015	6/1/2000	09:19:56AM
MLS5	2.7	9	0.459	0.64	-112.7354	46.42719	5142975.89	366661.7151	1366.265	6/1/2000	09:33:35AM