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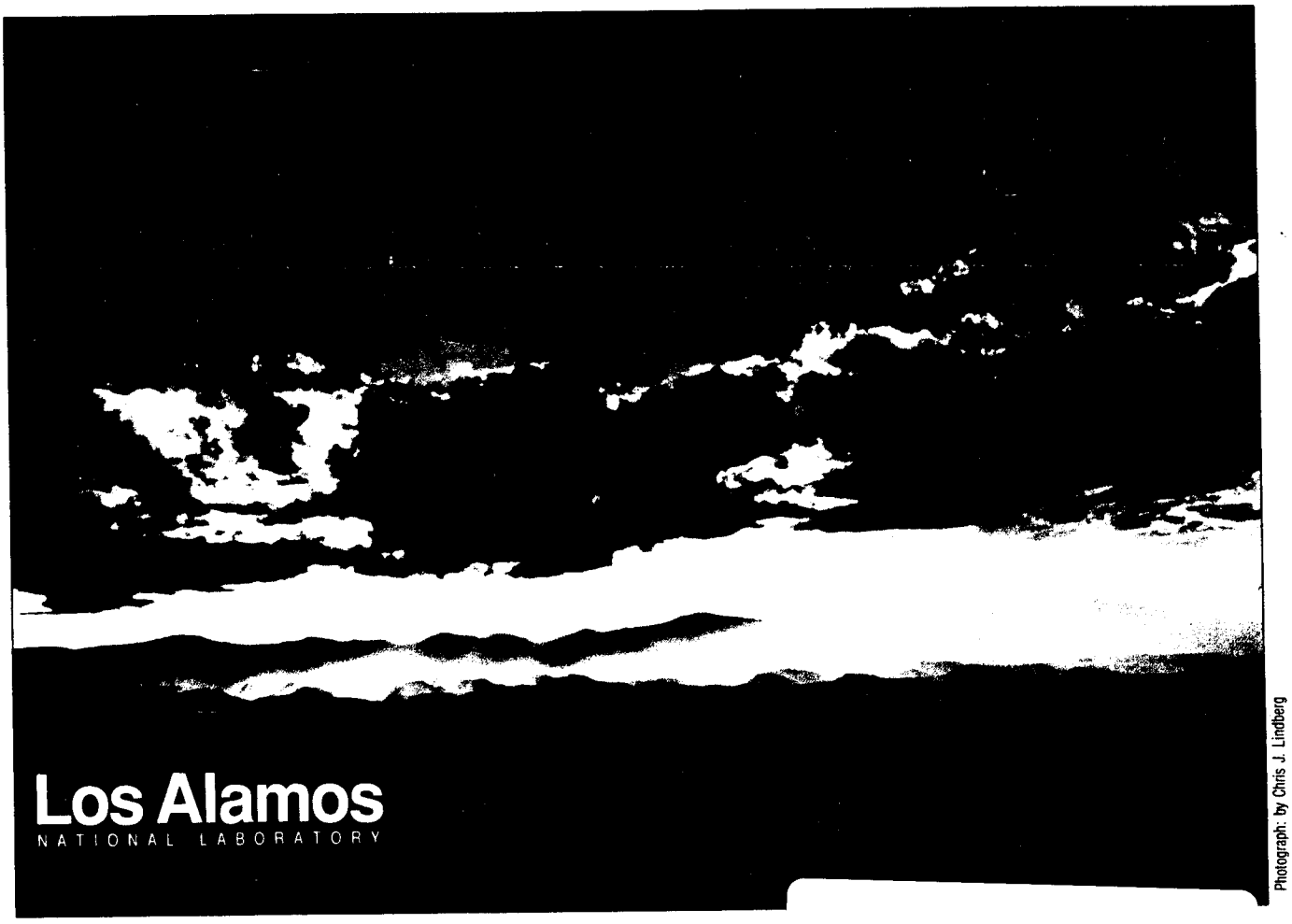

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BACKGROUND GEOCHEMISTRY OF SOILS AND COLLUVIUM AT MDA-P, LOS ALAMOS NATIONAL LABORATORY

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ABSTRACT

Natural background elemental concentrations were determined for 27 inorganic constituents of soils and colluvium in support of the closure plan for Material Disposal Area P (MDA-P) at Technical Area 16. A total of 55 bulk-soil samples were collected from soil profiles along north- and south-facing slopes of Cañon de Valle in the vicinity of the MDA-P waste-pile.

Soils were described and characterized using standard soil survey techniques. Soils were sampled vertically by genetic horizon with an average of about 6 horizons per soil. Soils were sampled to a total depth of between 40 to 237 cm depending on maximum profile depth. Particle-size distribution was determined for all soil samples. Soil samples (< 2 mm size fraction) were analyzed by EPA SW846 methods using two different digestion methods: (1) total (whole-soil) elemental concentrations were determined by complete dissolution of the soil using hydrofluoric acid; (2) leachable elemental concentrations were determined by partial digestion of the sample using nitric acid at pH 1. Background concentrations were determined for 27 inorganic constituents: Ag, Al, As, Ba, Be, Ca, Cd, Cl, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Pb, Sb, Se, SO_4^{2-}, Ta, Th, Tl, U, V, and Zn.

Soils around MDA-P are generally poorly developed and consist of A-R , A-Bw-R, or A-Bw-C soil profiles. Most soils have a low abundance of clay-sized material. Soils have formed in eroded and fractured Bandelier Tuff, and in colluvium derived from eroded tuff and soils. Statistical analysis of leachable and total concentrations, including detection limits, number of samples above and below detection limits, and the minimum, maximum, mean value, and ULTs, are reported for MDA-P and LANL soil master horizons (A, B, C, R). Statistical analysis indicates that the MDA-P acid leachable results generally have less variability and lower concentrations than the LANL-wide acid leachable background samples, whereas total sample results generally have less variability and similar mean concentrations to the LANL-wide total sample background samples. Eight of the nine soil profiles had elevated levels of Ba in the surface horizon relative to underlying soil horizons, indicating that local contamination of soils by wind-blown Ba (probably from burning pits) has probably occurred; however, elevated levels of Ba are below the Laboratory-wide UTLs for this element.

The spatial coverage and population size of background chemistry samples are considered adequate for defining background screening values for soils and colluvium at MDA-P.

INTRODUCTION

This report presents a summary of background geochemistry of soils and colluvium in support of the closure plan for Material Disposal Area P (MDA-P) at Technical Area 16 (TA 16), Los Alamos National Laboratory (Technical Area 16, Material Disposal Area P Closure Plan, Revision 0, February, 1995). MDA-P operated from the early 1950s to 1984 as a landfill for rubble and debris generated by the burning of HE (high explosives), HE-contaminated equipment and material, barium nitrate sands, building materials, and trash. The current waste-pile covers Bandelier Tuff, soils, and colluvium along a steep-north facing slope in Cañon de Valle. A companion report summarizes background geochemistry for the Bandelier Tuff that locally outcrops around MDA-P (Broxton et al., 1996). This background investigation conforms with guidelines set forth in Task IV of the Laboratory's Hazardous and Solid Waste and Amendments (HSWA) permit to "...describe the extent of contamination (qualitative/quantitative) in relation to the background levels indicative for the area". Background data will be used to define performance criteria for clean closure of MDA-P and supplements earlier investigations which define the regional background geochemistry data for soils across the Laboratory (Longmire, et al., in press a,b; McDonald et al., in press).

The background geochemistry information reported here consists of two types of analytical data for inorganic constituents (analytical methods discussed in detail below): (1) leachable elemental concentrations (soil leached with nitric acid at pH 1) are used to estimate the bioavailability of elements for risk assessment calculation, and (2) total elemental concentrations (soil digested with hydrofluoric acid) which measure insoluble forms of elements tightly bound within mineral structures as well as acid leachable forms. Information provided about background elemental chemistry using both total and leachable analytical data provides important information about the (1) natural geochemical variability of soils and associated parent materials, (2) leachability of inorganic constituents in soils, and (3) discrimination of contaminated and noncontaminated media, and geochemical processes controlling contaminant transport.

SAMPLING SITES AND FIELD METHODS

Nine soil profiles distributed across north- and south-facing slopes along Cañon de Valle were described in the field and were sampled for background geochemical analysis (Fig. 1; Table 1). These localities allowed sampling of the range of soils and colluvium likely to be encountered during closure activities. Soils on south-facing slopes across the valley from the waste-pile were included in the data set to ensure that soils on the north-facing slopes marginal to the MDA-P waste pile were not significantly impacted (1) from local transport, either wind-blown and/or surface erosion, of contaminated soil and colluvium or (2) from addition of contaminants due to downwind transport away from MDA-P burning pits.

Elevations of studied soils range from 7355 to 7490 feet (2245 to 2282 m; Fig. 1). Vegetation ranges from dense stands of ponderosa pine, fir, scrub oak, and annual grasses on north

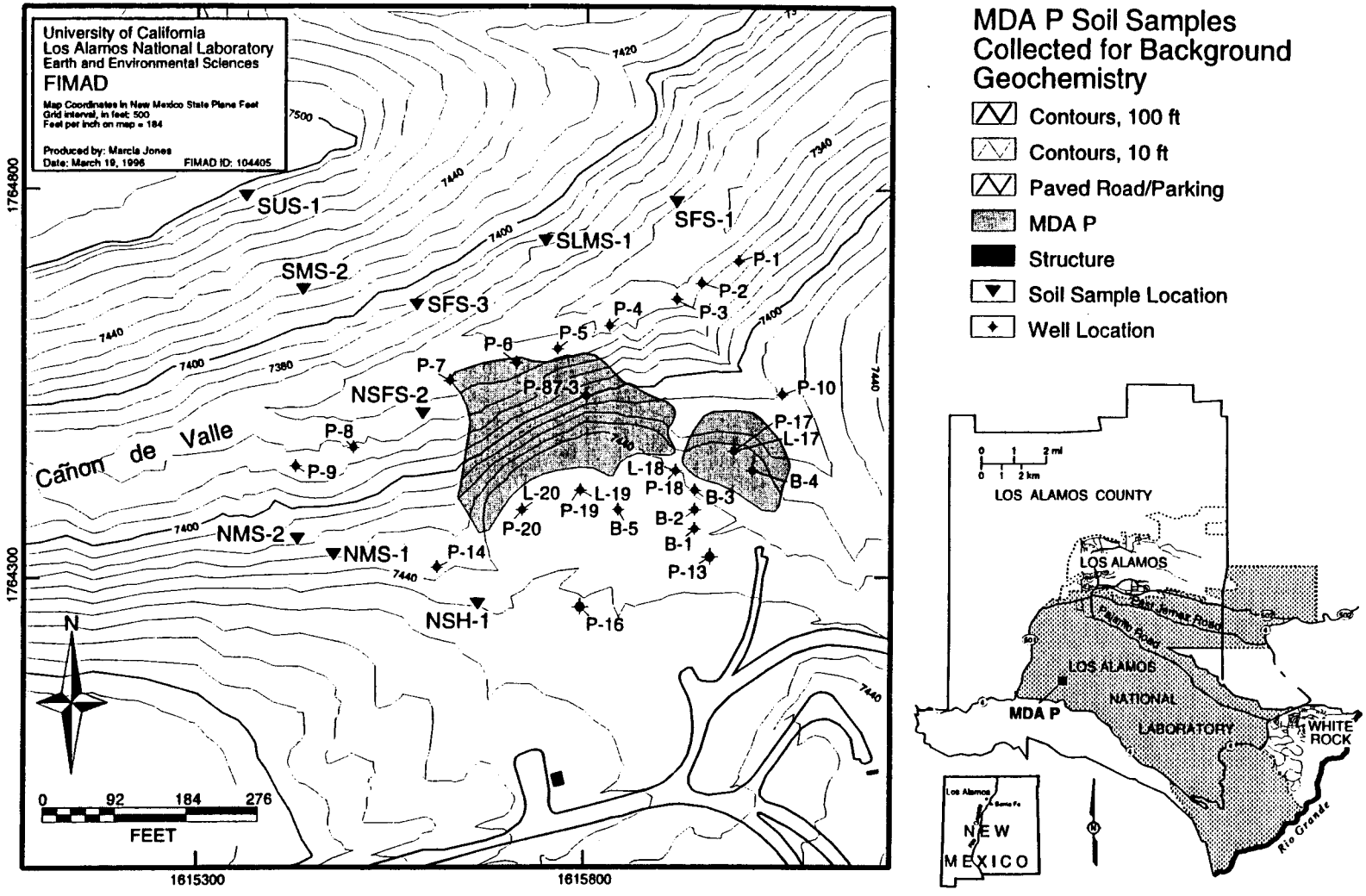

Figure 1. Map showing location of MDA-P on the south rim of Cañon de Valle. Location of background soil samples indicated by triangles. Well locations are shown for reference.

Table 1. General location and environmental setting of sampled soils around MDA-P.

Site	Topographic position	Elevation (feet)	Soil Parent Material	Soil Classification
NSH-1	North-facing slope, upper slope shoulder	7449	Eroded Bandelier Tuff	Lithic Ustorthent
NMS-1	North-facing slope, mid-slope	7428	Eroded Bandelier Tuff	Typic Haplumbredt
NMS-2	North-facing slope, mid-slope	7416	Eroded Bandelier Tuff	Lithic Haplumbredt
NFS-2	North-facing slope, foot-slope	7355	Colluvium from eroded Bandelier Tuff and soils	Cumulic Haplumbredt
SUS-1	South-facing slope, upper slope shoulder	7490	Eroded Bandelier Tuff	Lithic Ustorthent
SMS-2	South-facing slope, mid-slope	7424	Eroded Bandelier Tuff	Lithic Ustorthent
SLMS-1	South-facing slope, mid-slope	7375	Eroded Bandelier Tuff	Lithic Ustorthent
SFS-1	South-facing slope, foot-slope	7385	Colluvium from eroded Bandelier Tuff and soils	Typic Ustochrept
SFS-3	South-facing slope, foot-slope	7384	Pleistocene alluvium of Bandelier Tuff and Tschicoma dacite	Udic Paleoustalf

facing slopes to open stands of ponderosa pine, scrub oak, and annual grasses on south-facing slopes. The parent materials for these soils include fractured Bandelier Tuff, colluvium derived from eroded tuff and pre-existing soils, alluvium partially derived from the Bandelier Tuff and/or Tschicoma Formation dacite, and wind-blown sediment.

Soils were described using standard terminology and techniques of field soil characterization (Soil Conservation Survey, 1981). Soils were sampled vertically by genetic horizon with a single, representative bulk sample of approximately 1-2 kilograms (kg) collected for each horizon. Unweathered Bandelier Tuff and clay-size material lining vertical fractures in the tuff were also collected at a few sites. Depths and numbers of individual soil horizons sampled varied among soils, but all soils were continuously sampled between the surface (excluding O horizons) to the base of the profile (depths varied from 40 to 237 cm).

SAMPLE PREPARATION AND ANALYTICAL METHODS

Soil samples were passed through a 2.0 mm sieve to remove pebbles and organic fragments greater than 2 mm in diameter. Soil samples were air-dried for at least 24 hours. All samples were split using a standard mechanical soil/sediment splitter into two representative fractions with one fraction for soil characterization and the other for trace element chemistry. All equipment used in sample preparation was cleaned between each sample. Particle-size distribution for all soil horizons was determined using standard laboratory pipette analytical procedures (American Society of Agronomy, 1986).

Concentrations of trace elements were analyzed using two sample digestion methods:

(1) Total element concentrations extracted from the complete digestion of soil material using concentrated hydrofluoric acid (HF).

(2) Partial element concentrations extracted from the partial digestion of soil material using concentrated nitric acid (HNO_3) at pH 1 (EPA Method 3050A; EPA, 1986).

The HNO_3 digestion method (also referred to as HNO_3-leachable) is used for estimating the bioavailabilty of elements, information required for performing risk analyses, by approximating the partial dissolution of soil particles and particle coatings, including clay minerals, ferric (oxy)hydroxides, and calcium carbonate, that might occur in a low pH environment inside the human gastrointestinal system (LANL unpubl.; EPA, 1986). In all instances, element concentrations from partial digestion techniques are less than the total-element concentrations.

Trace element chemistry was determined using EPA-SW846 analytical methods (Table 2) and are described in detail in EPA (1986), Gautier and Gladney (1986), and Gladney et al. (1980, 1981). Concentrations were measured for 27 total and leachable elements and nonmetals: Ag, Al, As, Ba, Be, Ca, Cd, Cl, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Pb, Sb, Se, SO_4^{2-}, Ta, Th, Tl, U, V, and Zn. Radioactive isotopes were not analyzed in this investigation. Quality assurance was provided by concurrent analysis of different National Institute of Standards and Technology (NIST), EPA, and United States Geological Survey (USGS) reference materials described by Gladney et al. (1981). Quality control samples, including duplicates and spiked samples, were analyzed at frequencies specified by the EPA (1986). The lowest detection limits for specific elements and species using ICPES, ICPMS, IC, and ETVAA were 0.08 (Be), 0.12 (Ta), 12 (sulfate), and 0.3 (As) ppm, respectively. Precision values were ±20% for As and ±10% for all other elements.

Sample digestion and analyses were performed by Rust-Geotech, Grand Junction Projects Office Analytical Laboratory, Grand Junction, Colorado. Complete documentation of analytical results from Rust-Geotech are reported under request no., LANL 1151 and Project

Table 2. Summary of analytical techniques used in background soil characterization at Los Alamos National Laboratory

Element	Technique	Element	Technique	Element	Technique
Al	ICPES	Cu	ICPES	SO_4	IC
As	ETVAA	Fe	ICPES	Ta	ICPMS
Ba	ICPES	K	ICPES	Tl	ICPMS
Be	ICPES	Mg	ICPES	Th	ICPMS
Ca	ICPES	Mn	ICPES	U	ICPMS
Cd	ICPES	Na	ICPES	V	ICPES
Cl	IC	Ni	ICPES	Zn	ICPES
Co	ICPES	Pb	ICPES		
Cr	ICPES	Sb	ICPES		

IC: ion chromatography
ICPES: inductively coupled plasma emission spectroscopy
ICPMS: inductively coupled plasma mass spectrometry
ETVAA: electrothermal vapor atomic absorption spectroscopy

nunmbers: 6LA414164 and 6LA414165. A summary of analytical results in reported in Appendix A and B.

SOIL AND COLLUVIUM STRATIGRAPHY

Soils along both north- and south-facing slopes are generally weakly developed, consisting of a simple A-R, A-Bw-R, or A-Bw-C profiles. Soils in footslope positions generally consist of a surface soil formed in colluvium that covers a buried soil (horizon followed with a 'b' subscript, Table 3) formed either in older colluvium or alluvium.

Soil A horizon thickness ranges from 8 to 43 cm (Table 3). A horizons are soil layers that are strongly influenced by the accumulation of organic matter and biologic activity (e.g. plant roots). A horizons around MDA-P generally have sandy-loam textures with clay-sized material (< 2 micrometers) ranging from 5.4 to 20.5 % weight. The A horizons on soils on north-facing slopes are covered by an O horizon that ranges in thickness from 2 to 4 cm. O horizons on south-facing slopes range in thickness from 0 to 3 cm. O horizons are layers that largely consists of solid organic matter largely composed of forest litter. O horizons were not sampled and analyzed as part of this background investigation.

Several soils, especially at mid-slope and footslope positions have weakly-developed B horizons. Most B horizons in these soils show evidence for only incipient accumulation of ferric (oxy)hydroxides and illuvial clay. Clay content in soil B horizons ranges from 6.7 to 25.1 % weight. A soil formed in Pleistocene alluvium and buried by Holocene colluvium (SFS-3) has several well-develop B (Bt) horizons that have been strongly-influenced by the accumulation of ferric (oxy)hydroxides and illuvial clay. Increases in B horizon development, especially the accumulation of ferric (oxy)hydroxides and illuvial clay, appear to control the distribution and migration of certain trace metals such as As and Be (Longmire et al., in press a, b; McDonald, in press).

R horizons are common in soils formed on canyon slopes. R horizons around MDA-P consist of weakly weathered and highly fractured Bandelier Tuff. R horizons around MDA-P differ from the local Bandelier tuff bedrock in that R horizons are usually more fractured than the underlying Bandelier tuff, show signs of incipient weathering, and contain abundant soil matrix along fractures. The soil matrix along fractures is commonly rich in ferric (oxy)hydroxides and illuvial clay. Textural analysis for soil filling R horizon fractures shows that clay content ranges from 44.2 to 76.8 % weight. By comparison, clay-sized material in weathered tuff within R horizons ranges from 0.6 to 16.6 % weight; however, most R horizons have clay-sized material less than 5 % weight. Background geochemistry values for many metals, including Ba and Cu, will be significantly higher within soil-lined fractures relative to background geochemical levels within the Bandelier Tuff bedrock, including R horizons. For example, a sampled R horizon (NSH-1, Table 3) yielded concentrations (mg/kg) of 36.2 (Ba), 3.8 (Cu), and 26.6 (Zn), whereas, sampled Bt soil matix within fractures from this R horizon yielded concentrations (mg/kg) of 130 (Ba), 12.6 (Cu), and 43.5 (Zn).

Table 3. Summary of Sample numbers, horion depths, texture, and HNO_3-leachable concentrations of Ba, Cu, Zn for MDA-P soils.

Site	Field Sample #	FIMAD Sample #	Horizon	Depth	% Gravel	% Sand	% Silt	% Clay	Ba (mg/kg)	Cu (mg/kg)	Zn (mg/kg)
NSH-1	FS-2263	0816-95-0051-01	A1	0–3	22	58.0	31.7	10.2	190.0	4.6	23.9
	FS-2264	0816-95-0052-01	A2	3–8	11	57.1	31.4	11.5	106.0	3.3	22.0
	FS-2265	0816-95-0053-01	A3/R	8–28	18	58.1	24.0	17.9	103.0	5.2	26.4
	FS-2266	0816-95-0054-01	Bt1/R	28–41	30	39.5	16.3	44.2	97.6	8.4	32.1
	FS-2267	0816-95-0055-01	R/Bt2	41–96	10	77.9	16.6	5.5	25.1	2.3	19.3
	FS-2268	0816-95-0056-01	R	96–196	16	80.2	16.1	3.7	50.2	4.3	20.9
	FS-2270	0816-95-0058-01	R(Bt1/R)	28–41	3	81.0	16.2	2.8	36.2	3.8	26.6
	FS-2271	0816-95-0059-01	Bt2(R/Bt2)	41–96	30	16.5	6.7	76.8	130.0	12.6	43.5
NMS-1	FS-2272	0816-95-0060-01	A1	0–10	10	70.0	18.6	11.5	141.0	4.4	23.2
	FS-2273	0816-95-0061-01	A2	10–21	11	66.2	21.8	12.0	87.1	3.5	21.4
	FS-2274	0816-95-0062-01	AB	21–33	8	68.9	13.3	17.8	54.1	3.1	24.1
	FS-2275	0816-95-0063-01	Bw (BA)	33–53	5	72.2	21.0	6.7	40.1	3.5	24.7
	FS-2276	0816-95-0064-01	R/Bt	53–82	8	60.4	10.9	28.8	104.0	8.9	52.8
NMS-2	FS-2277	0816-95-0065-01	A1	0–8	11	59.3	20.2	20.5	225.0	5.3	32.1
	FS-2278	0816-95-0066-01	A2	8–25	18	57.5	29.6	13.0	125.0	4.8	44.8
	FS-2279	0816-95-0067-01	BA	25–47	4	63.4	21.6	15.0	59.4	4.2	73.8
	FS-2280	0816-95-0068-01	R/ Bw1	47–63	5	65.4	27.4	7.2	52.6	4.2	46.6
	FS-2281	0816-95-0069-01	R/Bw2	63–109	10	68.0	19.3	12.7	60.2	5.3	35.7
	FS-2282	0816-95-0070-01	R	109–159	0	77.5	5.9	16.6	28.3	3.5	47.8
NFS-2	FS-2283	0816-95-0071-01	A1	0–13	6	60.4	31.3	8.2	249.0	4.3	25.1
	FS-2284	0816-95-0072-01	A2	13–30	4	63.4	27.3	9.3	114.0	3.5	25.2
	FS-2285	0816-95-0073-01	BA	30–48	10	64.0	26.0	10.0	72.5	4.1	33.9
	FS-2286	0816-95-0074-01	Bw1	48–82	9	61.6	29.6	8.8	85.3	4.1	35.3
	FS-2287	0816-95-0075-01	Bw2	82–109	9	63.7	28.6	7.7	105.0	3.9	29.0
	FS-2288	0816-95-0076-01	BC	109–132	7	65.3	27.5	7.2	81.5	3.9	27.4
	FS-2289	0816-95-0077-01	AB1	132–145	7	55.4	35.3	9.2	98.1	3.9	44.2
	FS-2290	0816-95-0078-01	BAb	145–160	13	56.9	34.9	8.2	110.0	5.0	30.4
	FS-2291	0816-95-0079-01	Btb	160–191	12	58.7	33.6	7.7	88.7	4.0	23.3
SUS-1	FS-2236	0816-95-0024-01	A1	0–9	63	ND	ND	ND	190.0	7.2	29.7
	FS-2237	0816-95-0025-01	A2	9–21	20	68.0	26.6	5.4	68.6	4.5	23.2
	FS-2238	0816-95-0026-01	A3	21–43	17	67.63	26.38	5.99	85.4	5.1	30.8
	FS-2239	0816-95-0027-01	R	43–58	3	83.6	15.7	0.6	14.5	0.8	15.7
SMS-2	FS-2240	0816-95-0028-01	A1	0–11	5	68.5	25.0	6.5	47.9	2.7	37.2
	FS-2241	0816-95-0029-01	A2	11–25	8	67.2	26.9	6.0	34.4	3.0	31.0
	FS-2242	0816-95-0030-01	R	25–55	0	72.1	23.2	4.8	19.8	2.2	33.3
SLMS-1	FS-2243	0816-95-0031-01	A1	0–5	9	64.7	27.8	7.5	145.0	4.3	37.0
	FS-2244	0816-95-0032-01	A2	5–18	27	70.6	22.3	7.1	66.2	3.5	34.5
	FS-2245	0816-95-0033-01	Bw	18–40	26	70.1	23.2	6.7	40.9	2.8	32.5
	FS-2246	0816-95-0034-01	Cr	40–48	16	71.4	22.4	6.2	28.5	2.2	26.2
	FS-2247	0816-95-0035-01	R	48–143	3	78.8	15.6	5.6	19.0	2.3	32.8
SFS-1	FS-2248	0816-95-0036-01	A	0–22	29	57.6	32.1	10.3	193.0	6.0	34.1
	FS-2249	0816-95-0037-01	BA	22–35	20	58.6	30.6	10.8	121.0	6.3	39.9
	FS-2250	0816-95-0038-01	Bw1	35–62	47	54.7	33.8	11.5	108.0	6.4	36.3
	FS-2251	0816-95-0039-01	Bw2	62–106	35	58.0	28.5	13.5	94.0	5.8	34.9
	FS-2252	0816-95-0040-01	C/Bt	106–127	36	57.3	31.1	11.6	85.6	5.0	31.2
	FS-2253	0816-95-0041-01	C	127–138	42	59.2	31.3	9.4	69.1	4.4	23.5
	FS-2254	0816-95-0042-01	R	138–146	26	90.4	7.9	1.7	26.2	2.1	32.1
SFS-3	FS-2255	0816-95-0043-01	A1	0–10	19	58.3	33.6	8.1	107.0	3.3	19.2
	FS-2256	0816-95-0044-01	A2	10–22	34	57.1	35.1	7.8	67.6	4.3	34.8
	FS-2257	0816-95-0045-01	E/Btb	22–33	33	58.1	28.9	12.9	70.5	4.2	24.2
	FS-2258	0816-95-0046-01	Bt1b	33–67	18	50.0	24.9	25.1	111.0	9.7	38.0
	FS-2259	0816-95-0047-01	Bt2b	67–123	33	64.7	21.2	14.1	112.0	7.6	34.8
	FS-2260	0816-95-0048-01	2Bt1b	123–167	35	72.8	17.4	9.8	86.1	6.3	30.9
	FS-2261	0816-95-0049-01	2Bt2b	167–195	9	68.2	24.5	7.3	89.4	6.4	31.1
	FS-2262	0816-95-0050-01	2Bt3b	195–237	10	70.4	22.0	7.6	96.1	6.0	31.1

Because soil-lined fractures can extend several meters below the soil, care should be taken when samples are removed from the Bandelier Tuff for contaminant monitoring during and after removal of the waste-pile to ensure that the tuff bedrock and soil-lined fractures are sampled and analyzed separately.

STATISTICAL APPROACH

Statistical Analysis of Soil Horizons

Background data are used to support the RCRA Closure process (Technical Area 16, Material Disposal Area P Closure Plan, Revision 0, February 1995). As a part of the RCRA Closure process, data are compared to natural background concentrations of inorganic analytes. Statistical comparisons will include comparing post-closure data to geologically appropriate background screening values (or hot measurement comparison). The background screening value for inorganic analytes is the upper tolerance limit (UTL) calculated as the upper 95% confidence limit of the 95th percentile. In addition to the background screening comparison, other statistical tests may be used to determine if there are any residual elevated concentrations.

The statistical analysis of the background data consists of the following steps:

(1) Confirm that the statistical data distributions used for the acid leachable LANL-wide soil background data are appropriate for estimating MDA-P UTLs.

(2) Confirm that the whole soil or total sample inorganic data are adequately fit by a normal statistical distribution.

(3) Calculate background screening values for each analyte for individual soil horizons and for combined soil horizons by using either UTLs, or the maximum reported values for infrequently detected analytes or sparsely sampled stratigraphic units. Separate background values will be calculated for the acid leachable results and the total sample results of each inorganic chemical.

Initial Data Analysis Steps

Some of the inorganic results in the MDA-P and LANL background soil data set are reported as less than the detection level (<DL). To facilitate statistical analysis of the data, all values reported as <DL were replaced by one-half of the detection limit. This replacement approach is recommended in the EPA risk assessment guidance (EPA 1992, 1166). Concentrations below detection limits commonly occurred for Sb, Cd, Se, Ag, and Tl. These analytes are excluded from further statistical analyses.

Calculation of Background Screening Values

UTLs were calculated for all inorganic elements, except for Fe, where enough values were detected to allow estimation of the statistical distribution. Iron has an unusual distribution, which do not allow use of a simple statistical distribution model. Therefore, we propose use of the maximum detected value as a background screening value for Fe as well as for the rarely detected elements of: Sb, Cu, Ni, Ag, and Tl.

For the elements that are normally distributed without any data transformation and the elements that are normally distributed after a square root transformation, we calculated parametric tolerance limits by using the following equation:

$$\text{UTL} = \text{mean} + \text{standard deviation} * k_{0.95,0.95} \quad (1)$$

The k-factor depends on the number of background samples; complete tables of k-factors are published in the RCRA ground water statistical analysis document (EPA 1989, 1141) and Gilbert (1987, 0312). Readers are referred to the LANL ER Project policy paper on background comparisons for example k-factors.

The UTLs for log normally distributed elements were estimated by a simulation process. These simulations were run in the S-plus statistical programming environment. The S-plus code is presented in Appendix C. These simulations were run for 10,000 trials, which were sufficient to estimate the lognormal UTLs to two to three significant digits.

The raw calculated UTL results were screened to ensure that the estimated UTLs were not artificially inflated due to a small sample size or the presence of a single high concentration, or outlier, value.

RESULTS AND DISCUSSION

Tables 4 through 6 summarize the detection limits, number of samples above and below detection limits, and the minimum, maximum, and mean value of samples above detection limits for all leachable (HNO_3 sample digestion) inorganic chemicals measured in MDA-P and LANL soil master horizons. Table 7 presents a summary of the same statistics for the MDA-P soil R horizon samples. The combined acid leachable soil master horizon (A, B, C, R) data are summarized in Table 8. The box plot summaries of the acid leachable results for all elements are presented in Figures 2 through 4. The box plots show that the MDA-P acid leachable results generally have less variability and lower concentrations than the LANL-wide acid leachable background samples. It is important to note that C and R horizons for MDA-P are limited to fewer than 10 samples, and the maximum reported value will be used as MDA-P specific background value for these horizons.

Table 4. Summary of acid leachable results for background samples from MDA-P and LANL A soil horizons.

	MDA-P - Soil Horizon A									LANL - Soil Horizon A								
ANALYTE	NON-DETECTS			DETECTS						NON-DETECTS			DETECTS					
	Count	Min	Max	Count	Min	Max	Mean	St. Dev.	UTL	Count	Min	Max	Count	Min	Max	Mean	St. Dev.	UTL
Aluminum	0			22	4730	10500	7370	1470	11900	0			25	2100	23000	8581	4875	26600
Antimony	17	0.1	0.1	5	0.11	0.13	0.066	0.030	n/a	22	0.6	5	3	0.2	0.5	1.248	1.0	n/a
Barium	0			22	34.4	249	117	59.6	283	0			25	27	190	128.9	42.9	263
Beryllium	0			22	0.37	0.84	0.617	0.130	8.62	0			25	0.07	1.2	0.681	0.239	1.41
Cadmium	22	0.1	0.1	0			0.050	0.00	n/a	8	0.4	2	1	1.4	1.4	0.422	0.452	n/a
Calcium	0			22	1260	3940	2520	765	5657	0			25	610	4500	1860	774	4030
Chromium	0			22	2.8	7.1	4.89	0.997	8.20	0			25	1.9	16	8.2	3.25	19.3
Cobalt	0			22	1.5	4.3	2.65	0.761	5.39	0			25	1.9	29	10.41	7.05	31.0
Copper	0			22	2.7	7.2	4.27	1.07	6.98	1	0.5	0.5	24	1.7	12	5.80	2.88	19.3
Iron	0			22	6510	11800	8980	1480	12700	0			25	3300	16000	10363	2751	18100
Lead	0			22	5.1	14.1	8.96	2.53	14.9	1	4	4	23	2	27	15.09	5.73	28.4
Magnesium	0			22	993	1750	1330	209	1974	0			25	440	2800	1628	534	3460
Manganese	0			22	114	446	278	78.1	490	0			25	140	1100	446.9	216	1000
Nickel	0			22	2.7	5.5	4.12	0.828	6.07	4	2	2	21	2.3	12	5.93	2.73	12.2
Potassium	0			22	876	1690	1240	223	1818	0			25	410	2900	1579	548	3070
Selenium	14	0.2	0.21	8	0.35	0.77	0.243	0.210	n/a	8	0.2	0.3	1	0.7	0.7	0.172	0.199	n/a
Silver	21	0.4	0.41	1	0.47	0.47	0.214	0.057	n/a	NA			NA			NA	NA	NA
Sodium	0			22	31.6	123	86.9	26.7	207	0			25	64	660	179	166	602
Thallium	4	0.1	0.1	18	0.1	0.39	0.157	0.076	0.39	8	0.2	1	17	0.2	0.4	0.242	0.125	0.4
Thorium	0			22	2.5	5.8	4.33	0.854	6.24	0			25	2	12.8	7.36	2.59	13.3
Uranium	0			22	0.35	2.5	0.845	0.486	1.33	0			26	0.2	9.9	0.985	0.436	1.87
Vanadium	0			22	5.5	15.4	10.1	2.19	15.7	0			25	4.6	35	20.7	7.62	42.8
Zinc	0			22	19.2	44.8	29.5	7.22	47.9	0			25	14	58	27.1	7.45	47.1

Note: the summary statistics for the non-detects were calculated using detection limits. The means, standard deviations (St. Dev.), and UTLs are calculated using 1/2 detection limits for all non-detects.
NA signifies that the analyte was not analyzed for in the LANL-wide background study.
n/a signifies insufficient data for calculating a UTL.

Table 5. Summary of acid leachable results for background samples from MDA-P and LANL B soil horizons.

	MDA-P - Soil Horizon B									LANL - Soil Horizon B								
ANALYTE	NON-DETECTS			DETECTS						NON-DETECTS			DETECTS					
	Count	Min	Max	Count	Min	Max	Mean	St. Dev.	UTL	Count	Min	Max	Count	Min	Max	Mean	St. Dev.	UTL
Aluminum	0			23	2810	27500	11400	5850	36000	0			132	1400	62000	12574	9498	43600
Antimony	18	0.1	0.1	5	0.11	0.17	0.069	0.038	n/a	118	0.1	5	16	0.2	1	0.818	0.752	1.0
Barium	0			23	25.1	130	85.7	27.9	168	0			132	46	730	155.4	72.8	321
Beryllium	0			23	0.39	2.8	1.10	0.576	2.56	0			132	0.25	4	0.992	0.442	1.91
Cadmium	23	0.1	0.1	0			0.05	0	n/a	18	0.4	2	3	0.6	2.7	0.42	0.573	2.7
Calcium	0			23	882	5470	2290	931	5500	0			132	1100	14000	2937	1919	6480
Chromium	0			23	3.5	14.1	7.13	2.44	15.4	0			132	2.8	46	9.76	4.49	19.0
Cobalt	0			23	1.4	9.3	3.60	1.50	8.79	0			132	1.6	22	6.67	3.61	14.8
Copper	0			23	2.3	12.6	5.73	2.44	12.1	0			132	2.7	16	6.55	2.39	14.3
Iron	0			23	6950	21900	12100	3530	21497	0			132	6800	36000	13085	2751	21800
Lead	0			23	2.6	15.8	9.48	3.33	17.2	1	4	4	131	5	30	13.02	4.60	22.3
Magnesium	0			23	848	4300	1890	789	4684	0			132	800	10000	2335	1138	4480
Manganese	0			23	82.3	679	268	137	634	0			131	76	1000	348.3	146.6	673
Nickel	0			23	1.9	11.7	5.94	2.02	10.7	3	2	2	129	2.3	8	7.73	4.08	16.0
Potassium	0			23	525	2440	1488	450	2727	0			132	680	6900	1820	796	3420
Selenium	20	0.2	0.21	3	0.28	0.61	0.142	0.120	n/a	3	0.2	0.3	19	0.3	1.3	0.625	0.369	1.3
Silver	23	0.4	0.42	0			0.202	0.003	n/a	NA			NA			NA	NA	NA
Sodium	0			23	32.9	225	113.83	50.0	440	0			132	58	1800	286	239	798
Thallium	1	0.1	0.1	22	0.11	0.68	0.257	0.156	0.68	44	0.2	1	90	0.2	1	0.302	0.194	1
Thorium	0			23	2.8	12.5	6.33	1.90	10.8	0			134	4.2	21.6	9.28	2.81	15
Uranium	0			23	0.26	2	0.869	0.456	1.93	0			134	0.5	6.4	1.003	0.353	1.72
Vanadium	0			23	4.7	29	14.9	4.65	27.4	0			132	7.4	57	20.7	7.62	42
Zinc	0			23	19.3	73.8	35.5	11.1	62.5	0			131	14	76	32.8	8.91	51.5

Note: the summary statistics for the non-detects were calculated using detection limits. The means, standard deviations (St. Dev.), and UTLs are calculated using 1/2 detection limits for all non-detects.
NA—the analyte was not analyzed for in the LANL-wide background study.
n/a— insufficient data for calculating a UTL.

Table 6. Summary of acid leachable results for background samples from MDA-P and LANL C soil horizons.

	MDA-P - Soil Horizon C								LANL - Soil Horizon C								
ANALYTE	NON-DETECTS			DETECTS					NON-DETECTS			DETECTS					
	Count	Min	Max	Count	Min	Max	Mean	St. Dev.	Count	Min	Max	Count	Min	Max	Mean	St. Dev.	UTL
Aluminum	0			3	5200	8370	6470	1670	0			24	900	33000	10083	7265	38700
Antimony	3	0.1	0.1	0			0.050	0.000	23	0.2	5	0			1.307	0.988	ND
Barium	0			3	28.5	85.6	61.1	29.4	0			24	21	410	90.3	81.7	286
Beryllium	0			3	0.6	0.83	0.723	0.116	2	0.08	0.08	22	0.09	1.9	0.715	0.505	1.95
Cadmium	3	0.1	0.1	0			0.050	0.000	10	0.4	0.4	0			0.2	0	ND
Calcium	0			3	935	1930	1430	498	0			24	500	87000	1854	1066	5930
Chromium	0			3	3.3	5.8	4.70	1.28	0			24	1.9	15	6.10	3.24	17.0
Cobalt	0			3	1.5	4.2	3.23	1.50	0			24	1	34	8.32	8.74	41.2
Copper	0			3	2.2	5	3.87	1.47	1	0.5	0.5	23	0.6	7.3	3.75	1.99	13.4
Iron	0			3	7880	10000	8690	1150	0			24	3300	17000	9021	3513	18500
Lead	0			3	5.9	11.2	9.40	3.03	7	4	4	17	4	24	8.40	5.83	21.9
Magnesium	0			3	914	1410	1150	249	0			24	420	7400	1773	1416	4610
Manganese	0			3	134	427	299	150	0			24	76	440	193.6	99.4	463
Nickel	0			3	2.3	5.7	4.00	1.70	8	2	2	16	2.4	15	4.79	3.7	13.3
Potassium	0			3	713	1410	1020	356	0			24	410	4200	1536	888	3410
Selenium	1	0.2	0.2	2	0.28	0.29	0.223	0.107	7	0.2	0.3	3	0.3	1.7	0.34	0.503	1.7
Silver	3	0.4	0.4	0			0.2	0.000	NA			NA			NA	NA	NA
Sodium	0			3	42	124	69.5	47.2	0			24	90	1700	524	484	2680
Thallium	0			3	0.14	0.2	0.173	0.031	19	0.125	1	4	0.2	0.6	0.168	0.15	0.6
Thorium	0			3	3.7	6.1	5.23	1.33	0			24	2.1	10.8	6.19	2.63	12.3
Uranium	0			3	0.36	1	0.667	0.321	0			24	0.2	1.5	0.688	0.289	1.36
Vanadium	0			3	8.3	14.1	11.5	2.94	0			24	4	32	13.2	6.89	32.0
Zinc	0			3	23.5	31.2	27.0	3.91	0			24	14	57	29	9.27	50.8

Note: the summary statistics for the non-detects were calculated using detection limits. UTLs are not calculated due to insufficient data.

NA—the analyte was not analyzed for in the LANL-wide background study.

ND—the analyte was not detected in the LANL-wide background study.

Table 7. Summary of acid leachable results for background samples from MDA-P R soil horizons.

MDA-P - Soil Horizon R								
ANALYTE	NON-DETECTS			DETECTS				
	Count	Min	Max	Count	Min	Max	Mean	St. Dev.
Aluminum	0			7	1560	6340	4319	1718
Antimony	6	0.1	0.1	1	0.17	0.17	0.067	0.045
Barium	0			7	14.5	50.2	27.7	12.2
Beryllium	0			7	0.17	1.6	0.674	0.509
Cadmium	7	0.1	0.1	0			0.050	0.000
Calcium	0			7	340	1290	880	349
Chromium	0			7	1	6	3.17	1.81
Cobalt	0			7	0.84	4.1	2.02	1.11
Copper	0			7	0.83	4.4	2.73	1.22
Iron	0			7	5930	11700	8417	1947
Lead	0			7	2.3	6.3	3.96	1.45
Magnesium	0			7	276	1450	752	428
Manganese	0			7	74.9	332	263	88.6
Nickel	0			7	0.88	6.4	3.00	1.93
Potassium	0			7	265	1040	591	255
Selenium	3	0.2	0.21	4	0.21	0.64	0.261	0.197
Silver	7	0.4	0.41	0			0.201	0.002
Sodium	0			7	25.5	164	93.0	45.7
Thallium	5	0.1	0.1	2	0.15	0.19	0.084	0.060
Thorium	0			7	1.2	5.5	4.11	1.44
Uranium	0			7	0.14	0.46	0.374	0.111
Vanadium	0			7	3.5	10.4	6.84	2.78
Zinc	0			7	15.7	47.8	29.9	10.3

Note: the summary statistics for the non-detects were calculated using detection limits.
Means and standard deviations(St. Dev.) are calculated using 1/2 detection limits for all non-detects.

Table 8. Summary of acid leachable results for background samples from all MDA-P and LANL soil horizons.

	MDA-P - All Soil Horizons (A,B,C,R)									LANL - All Horizons (A,B,C)								
ANALYTE	NON-DETECTS			DETECTS						NON-DETECTS			DETECTS					
	Count	Min	Max	Count	Min	Max	Mean	St. Dev.	UTL	Count	Min	Max	Count	Min	Max	Mean	St. Dev.	UTL
Aluminum	0			55	1560	27500	8600	4660	25700	0			181	900	62000	11680	8810	37800
Antimony	44	0.1	0.1	11	0.11	0.17	0.066	0.034	n/a	163	0.1	5	19	0.2	1	0.943	0.844	1
Barium	0			55	14.5	249	89.4	50.9	211	0			181	21	730	142.7	74.1	315
Beryllium	0			55	0.17	2.8	0.833	0.474	1.83	2	0.08	0.08	179	0.07	4	0.911	0.447	1.95
Cadmium	55	0.1	0.1	0			0.050	0.00	n/a	36	0.4	2	4	0.6	2.7	0.364	0.465	2.7
Calcium	0			55	340	5470	63.8	48.2	6759	0			181	500	87000	2644	1771	6120
Chromium	0			55	1	14.1	5.6	2.29	15.3	0			181	1.9	46	9.04	4.36	19.3
Cobalt	0			55	0.84	9.3	3.00	1.30	7.81	0			181	1	34	7.41	5.28	19.2
Copper	0			55	0.83	12.6	4.66	2.04	9.21	2	0.5	0.5	179	0.6	16	6.06	2.59	15.5
Iron	0			55	5930	21900	10200	3010	16500	0			181	3300	36000	12149	4256	21300
Lead	0			55	2.3	15.8	8.57	3.28	15.3	9	4	4	172	4	37	12.66	5.25	23.3
Magnesium	0			55	276	4300	1480	670	4185	0			181	420	10000	2160	1150	4610
Manganese	0			55	74.9	679	273	109	526	0			180	76	1100	340.5	166.4	714
Nickel	0			55	0.88	11.7	4.73	1.91	8.64	15	2	2	166	2.3	30	7.07	4.01	15.2
Potassium	0			55	265	2440	1250	444	2233	0			181	410	6900	1748	786	3410
Selenium	38	0.2	0.21	17	0.21	0.77	0.202	0.175	n/a	18	0.2	0.3	23	0.3	1.7	0.477	0.417	1.7
Silver	54	0.4	0.42	1	0.47	0.47	0.206	0.036	n/a	NA			NA			NA	NA	NA
Sodium	0			55	25.5	225	98.0	42.6	295	0			181	58	1800	304	292	915
Thallium	10	0.1	0.1	45	0.1	0.68	0.190	0.128	0.452	71	0.125	1	111	0.2	1	0.276	0.186	1
Thorium	0			55	1.2	12.5	5.19	1.75	8.76	0			183	2	21.6	8.59	2.98	14.6
Uranium	0			55	0.14	2.5	0.785	0.457	1.72	0			184	0.2	9.9	0.985	0.436	1.87
Vanadium	0			55	3.5	29	11.7	4.51	22.1	0			181	4	57	21.3	8.92	41.9
Zinc	0			55	15.7	73.8	31.9	9.65	52.3	0			180	14	76	31.5	9	50.8

Note: the summary statistics for the non-detects were calculated using detection limits. The means, standard deviations(St. Dev.), and UTLs are calculated using 1/2 detection limits for all non-detects.
NA signifies that the analyte was not analyzed for in the LANL-wide background study.
n/a signifies insufficient data for calculating a UTL.

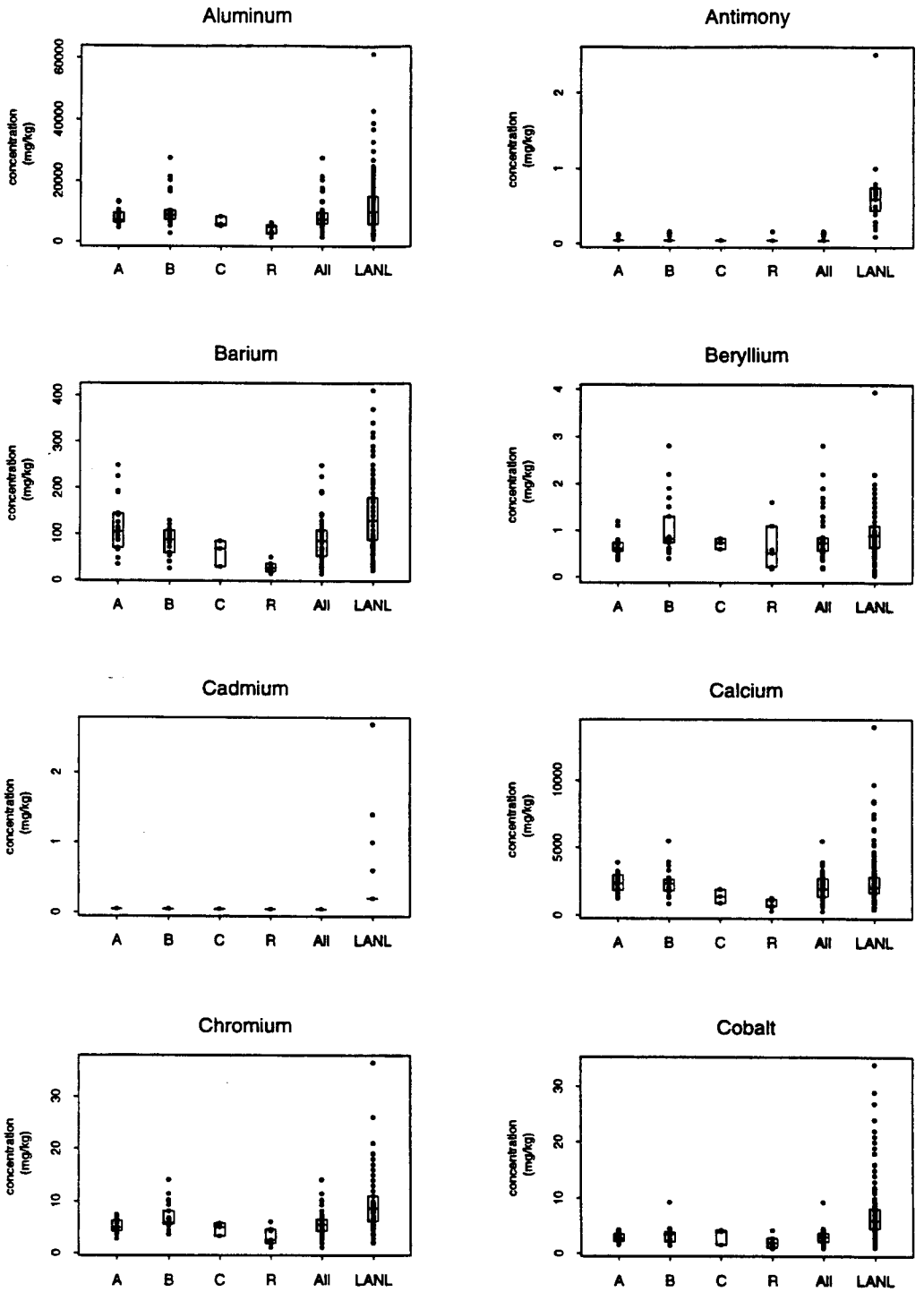

Figure 2. Box plots of acid leachable data from MDA-P background soil sampling by A,B,C,R and all horizons, as well as the combined A,B,C LANL-wide acid leachable results for aluminum, antimony, barium, beryllium, cadmium, calcium, chromium, and cobalt.

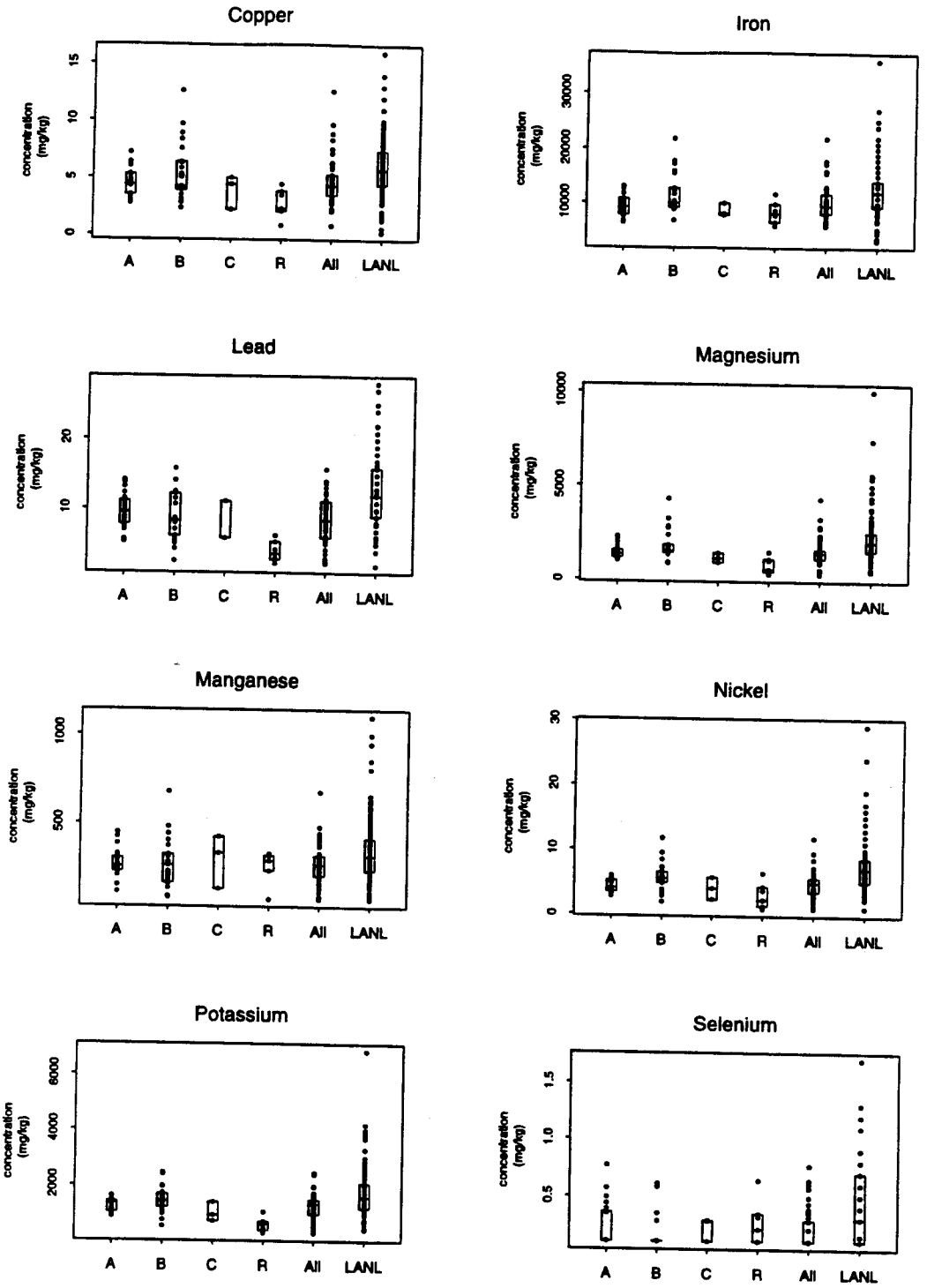

Figure 3. Box plots of acid leachable data from MDA-P background soil sampling by A,B,C,R and all horizons, as well as the combined A,B,C LANL-wide acid leachable results for copper, iron, lead, magnesium, manganese, nickel, potassium, and selenium.

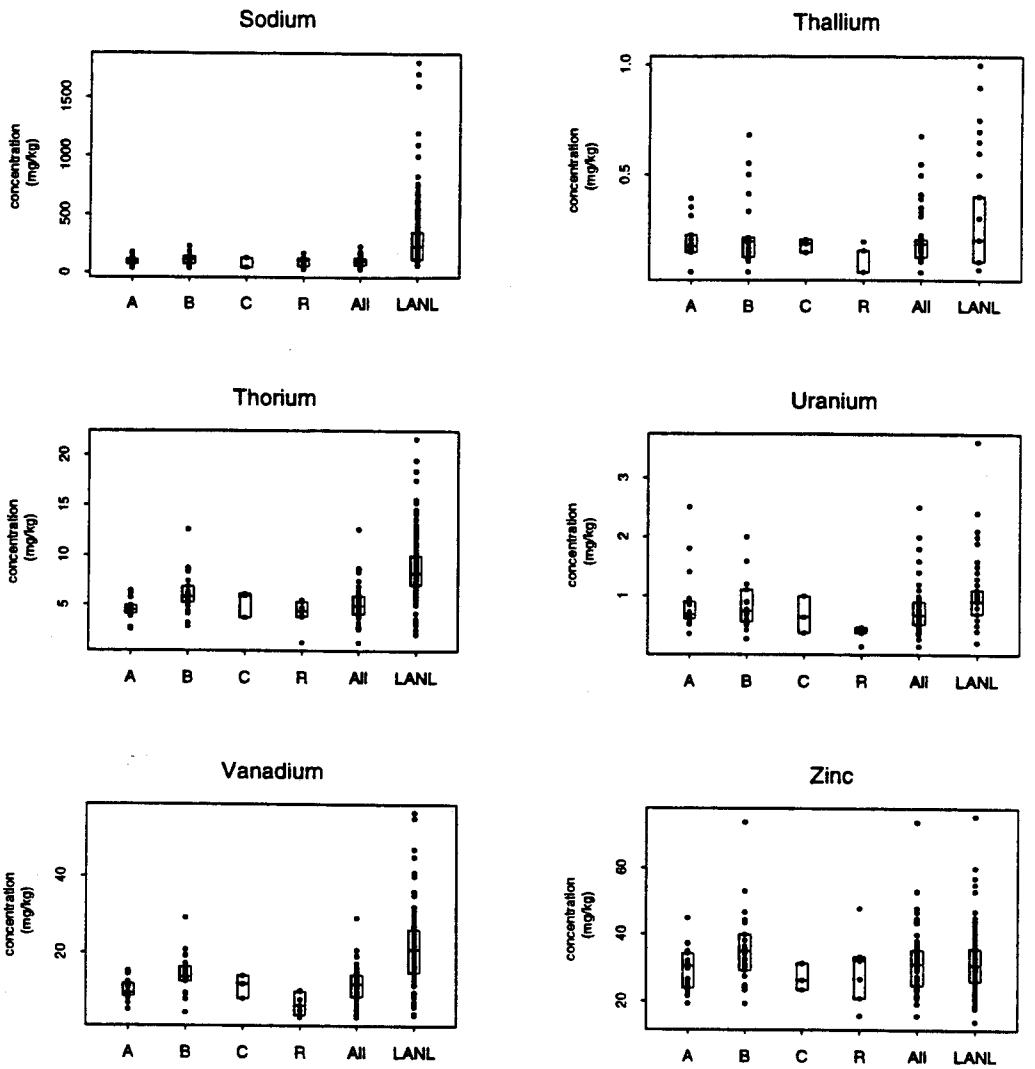

Figure 4. Box plots of acid leachable data from MDA-P background soil sampling by A,B,C,R and all horizons, as well as the combined A,B,C LANL-wide acid leachable results for thallium, thorium, uranium, vanadium, and zinc.

Table 9 summarizes the distribution properties of the acid leachable inorganic analytes, which are based on the statistical distributions of the LANL-wide soil data. Distributions were either normally distributed or were transformed to normality with either a log- or square-root transformation.

Table 9. Statistical distribution properties of the acid leachable soil data for inorganic chemicals.

Analyte	Statistical Distribution
Aluminum	The data appear to originate from a normal distribution.
Antimony	The data do not contain a sufficient number of detects, no distribution was estimated.
Barium	The data appear to originate from a square root normal distribution.
Beryllium	The data appear to originate from a square root normal distribution.
Cadmium	The data do not contain a sufficient number of detects, no distribution was estimated.
Calcium	The data appear to originate from a log normal distribution.
Chromium	The data appear to originate from a log normal distribution.
Cobalt	The data appear to originate from a log normal distribution.
Copper	The data appear to originate from a square root normal distribution.
Iron	The data appear to originate from a square root normal distribution.
Lead	The data appear to originate from a normal distribution.
Magnesium	The data appear to originate from a log normal distribution.
Manganese	The data appear to originate from a square root normal distribution.
Nickel	The data appear to originate from a normal distribution.
Potassium	The data appear to originate from a square root normal distribution.
Selenium	The data do not contain a sufficient number of detects, no distribution was estimated.
Silver	The data do not contain a sufficient number of detects, no distribution was estimated.
Sodium	The data appear to originate from a log normal distribution.
Thallium	The data appear to originate from a normal distribution.
Thorium	The data appear to originate from a normal distribution.
Uranium	The data appear to originate from a normal distribution.
Vanadium	The data appear to originate from a square root normal distribution.
Zinc	The data appear to originate from a square root normal distribution.

The calculated UTLs (or sample maximum) for acid leachable inorganic constituents are presented in Tables 4 through 7. A summary of these acid leachable background screening values calculated for MDA-P are presented in Table 10.

Table 10. Summary of background screening values for acid leachable inorganic chemicals by soil horizon.

ANALYTE	HORIZON				ALL
	A	B	C*	R*	HORIZONS
Aluminum	11900	36000	8370	13800	25700
Antimony	0.130	0.170	<0.1	0.170	0.170
Barium	283	168	85.6	2178	211
Beryllium	0.840	2.5632	0.830	3.23	1.83
Cadmium	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	5657	5509	1930	2690	6759
Chromium	8.20	15.4	5.80	13.4	15.3
Cobalt	5.39	8.79	4.20	7.02	7.81
Copper	19.3	14.3	13.4	8.83	15.5
Iron	12700	21500	10000	16100	16500
Lead	14.9	17.2	11.2	8.90	15.3
Magnesium	1974	4684	1410	2980	4185
Manganese	490	634	427	744	526
Nickel	6.07	10.7	5.70	9.57	8.64
Potassium	1818	2727	1410	1739	2233
Selenium	0.770	0.610	0.290	0.640	0.770
Silver	<0.47	<0.42	<0.4	<0.41	<0.47
Sodium	207	440	124	401	295
Thallium	0.390	0.680	0.200	0.190	0.452
Thorium	6.24	10.8	6.10	9.00	8.76
Uranium	1.33	1.93	1.00	0.753	1.72
Vanadium	15.7	27.4	14.1	19.4	22.1
Zinc	47.9	62.5	31.2	74.4	52.3

Tables 11 through 14 summarize the detection limits, number of samples above and below detection limits, and the minimum, maximum, and mean value of samples above detection limits for all whole soil or total sample inorganic chemicals (HF digestion) measured in MDA-P soil background horizons. The combined total sample soil horizon data are summarized in Table 15. The box plot summaries of the total sample results for all elements are

Table 11. Summary of whole soil or total sample results for background samples from MDA-P soil A horizons.

Total Sample - Horizon A									
ANALYTE	NON-DETECTS			DETECTS					
	Count	Min	Max	Count	Min	Max	Mean	St. Dev.	UTL
Aluminum	0			22	48700	73900	66400	6270	81100
Antimony	0			22	0.34	0.59	0.450	0.065	0.6024
Barium	0			22	337	651	501	72.0	671
Beryllium	0			22	1.4	2.1	1.65	0.211	2.15
Cadmium	0			22	0.14	0.26	0.192	0.034	0.271
Calcium	0			22	4340	6910	5699	852	7700
Chromium	0			22	8.3	18.2	13.1	2.82	19.8
Cobalt	0			22	5.2	9.8	7.38	1.24	10.3
Copper	0			22	4.5	9.7	7	1.52	10.6
Iron	0			22	14300	22200	17600	1815	22000
Lead	0			22	17.3	27.3	22.3	2.70	28.6
Magnesium	0			22	1670	3730	2510	468	3607
Manganese	0			22	289	625	473	71	640
Nickel	0			22	5	10.1	7.04	1.31	10.1
Potassium	0			22	9840	32800	28906	5776	42480
Selenium	18	0.2	0.21	4	0.24	1.8	0.225	0.379	n/a
Silver	19	0.4	0.41	3	0.41	0.52	0.236	0.090	n/a
Sodium	0			22	18800	26800	23300	2270	28700
Thallium	0			22	0.34	1.1	0.660	0.206	1.14
Thorium	0			22	7.3	12.2	9.14	1.09	11.7
Uranium	0			22	1.4	4.8	2.19	0.877	4.25
Vanadium	0			22	17.4	35.8	25.0	5.10	37.0
Zinc	0			22	53.2	73.1	61.1	6.47	76.3

Note: the summary statistics for the non-detects were calculated using detection limits. The means, standard deviations(St. Dev.), and UTLs are calculated using 1/2 detection limits for all non-detects.
n/a signifies insufficient data for calculating a UTL.

presented in Figures 5 through 7. The box plots show that the MDA-P total sample results generally have less variability and similar mean concentrations to the LANL-wide total sample background samples. It is important to note that C and R horizons for MDA-P are limited to fewer than 10 samples, and the maximum reported value will be used as MDA-P specific background value for these horizons.

Table 12. Summary of whole soil or total sample results for background samples from MDA-P soil B horizons.

Total Sample - Horizon B									
ANALYTE	NON-DETECTS			DETECTS					
	Count	Min	Max	Count	Min	Max	Mean	St. Dev.	UTL
Aluminum	0			23	50300	106000	71900	11000	97500
Antimony	0			23	0.27	1	0.557	0.142	0.887
Barium	0			23	313	529	456	60.4	597
Beryllium	0			23	1.5	3.9	2.09	0.535	3.34
Cadmium	0			23	0.11	0.23	0.171	0.028	0.237
Calcium	0			23	4080	6590	5570	563	6880
Chromium	0			23	6.8	39.7	17.2	6.59	32.5
Cobalt	0			23	4.8	11.5	8.23	1.67	12.1
Copper	0			23	3	20.3	8.75	3.63	17.2
Iron	0			23	15300	40800	21200	6040	35300
Lead	0			23	14	28.4	22.4	3.28	30.0
Magnesium	0			23	1560	8940	3400	1540	6990
Manganese	0			23	190	598	418	95	641
Nickel	0			23	4.5	20.8	9.45	3.38	17.3
Potassium	0			23	7970	36300	24200	8150	43200
Selenium	23	0.2	0.21	0			0.101	0.002	n/a
Silver	23	0.4	0.42	0			0.202	0.003	n/a
Sodium	0			23	8690	32000	21900	4760	32900
Thallium	0			23	0.47	1.6	0.825	0.331	1.60
Thorium	0			23	6.5	17.1	10.5	2.19	15.6
Uranium	0			23	0.84	3	2.03	0.492	3.18
Vanadium	0			23	11.5	76.8	33.8	12.7	63.5
Zinc	0			23	50.5	93.7	62.7	9.89	85.7

Note: the summary statistics for the non-detects were calculated using detection limits. The means and standard deviations(St. Dev.) are calculated using 1/2 detection limits for all non-detects.
n/a signifies insufficient data for calculating a UTL.

Table 13. Summary of whole soil or total sample results for background samples from MDA-P soil C horizons.

Total Sample - Horizon C								
ANALYTE	NON-DETECTS			DETECTS				
	Count	Min	Max	Count	Min	Max	Mean	St. Dev.
Aluminum	0			3	42200	67400	53500	12800
Antimony	0			3	0.25	0.53	0.420	0.149
Barium	0			3	318	434	391	63.3
Beryllium	0			3	1.8	2	1.90	0.100
Cadmium	0			3	0.12	0.15	0.137	0.015
Calcium	0			3	3270	4150	3620	469
Chromium	0			3	6	19.4	14.2	7.21
Cobalt	0			3	4.6	9.5	7.83	2.80
Copper	0			3	2.8	9.2	6.43	3.29
Iron	0			3	14500	16800	15400	1210
Lead	0			3	19.1	22.3	20.8	1.61
Magnesium	0			3	1250	2890	2140	830
Manganese	0			3	318	507	406	95
Nickel	0			3	4.2	9.6	7.1	2.72
Potassium	0			3	26100	33900	28900	4320
Selenium	3	0.2	0.2	0			0.100	0.000
Silver	3	0.4	0.4	0			0.200	0.000
Sodium	0			3	18500	25900	21300	4020
Thallium	0			3	0.52	0.55	0.540	0.017
Thorium	0			3	8.2	10.1	8.97	1.00
Uranium	0			3	1.4	2.3	1.97	0.493
Vanadium	0			3	14.8	33.1	26.3	10.0
Zinc	0			3	47.1	53.8	51.2	3.61

Note: the summary statistics for the non-detects were calculated using detection limits. The means and standard deviations(St. Dev.) are calculated using 1/2 detection limits for all non-detects.

Table 14. Summary of whole soil or total sample results for background samples from MDA-P soil R horizons.

Total Sample - Horizon R								
ANALYTE	NON-DETECTS			DETECTS				
	Count	Min	Max	Count	Min	Max	Mean	St. Dev.
Aluminum	0			7	57000	76900	70200	6970
Antimony	0			7	0.2	0.47	0.333	0.107
Barium	0			7	174	523	325	143
Beryllium	0			7	1.4	2.9	2.2	0.554
Cadmium	0			7	0.12	0.26	0.170	0.049
Calcium	0			7	1440	5870	3690	1670
Chromium	0			7	2.1	10.5	5.67	3.45
Cobalt	0			7	2.4	7.6	4.44	1.87
Copper	0			7	2.4	6.4	4.07	1.40
Iron	0			7	10400	18800	15300	3142
Lead	0			7	15.6	32.1	20.7	5.67
Magnesium	0			7	475	2420	1390	737
Manganese	0			7	318	699	448	119
Nickel	0			7	1.6	11.6	4.73	3.40
Potassium	0			7	33400	37300	35100	1520
Selenium	6	0.2	0.21	1	0.37	0.37	0.140	0.101
Silver	7	0.4	0.41	0			0.201	0.002
Sodium	0			7	25400	30700	28100	1910
Thallium	0			7	0.21	0.88	0.473	0.247
Thorium	0			7	7.7	11.2	9.66	1.25
Uranium	0			7	0.95	2.3	1.52	0.414
Vanadium	0			7	6.9	18.9	12.9	5.37
Zinc	0			7	54	68.7	60.4	5.94

Note: the summary statistics for the non-detects were calculated using detection limits. The means and standard deviations(St. Dev.) are calculated using 1/2 detection limits for all non-detects.

Table 15. Summary of whole soil or total sample results for background samples from all MDA-P soil horizons.

Total Sample - All Horizons									
ANALYTE	NON-DETECTS			DETECTS					
	Count	Min	Max	Count	Min	Max	Mean	St. Dev.	UTL
Aluminum	0			55	42200	106000	68500	9760	88400
Antimony	0			55	0.2	1	0.478	0.134	0.751
Barium	0			55	174	651	454	96.0	650
Beryllium	0			55	1.4	3.9	1.92	0.469	2.88
Cadmium	0			55	0.11	0.26	0.177	0.035	0.250
Calcium	0			55	1440	6910	5280	1150	7620
Chromium	0			55	2.1	39.7	13.9	6.14	26.5
Cobalt	0			55	2.4	11.5	7.39	1.96	11.4
Copper	0			55	2.4	20.3	7.33	3.03	13.5
Iron	0			55	10400	40800	18800	4730	28400
Lead	0			55	14	32.1	22.0	3.36	28.9
Magnesium	0			55	475	8940	2720	1270	5310
Manganese	0			55	190	699	443	91.0	629
Nickel	0			55	1.6	20.8	7.76	3.09	14.1
Potassium	0			55	7970	37300	27700	7350	42800
Selenium	50	0.2	0.21	5	0.24	1.8	0.155	0.246	n/a
Silver	52	0.4	0.42	3	0.41	0.52	0.215	0.059	n/a
Sodium	0			55	8690	32000	23200	4040	31500
Thallium	0			55	0.21	1.6	0.698	0.289	1.29
Thorium	0			55	6.5	17.1	9.76	1.75	13.3
Uranium	0			55	0.84	4.8	2.03	0.686	3.43
Vanadium	0			55	6.9	76.8	27.2	11.4	50.6
Zinc	0			55	47.1	93.7	61.2	8.2	77.9

Note: the summary statistics for the non-detects were calculated using detection limits. The means, standard deviations(St. Dev.), and UTLs are calculated using 1/2 detection limits for all non-detects. n/a signifies insufficient data for calculating a UTL.

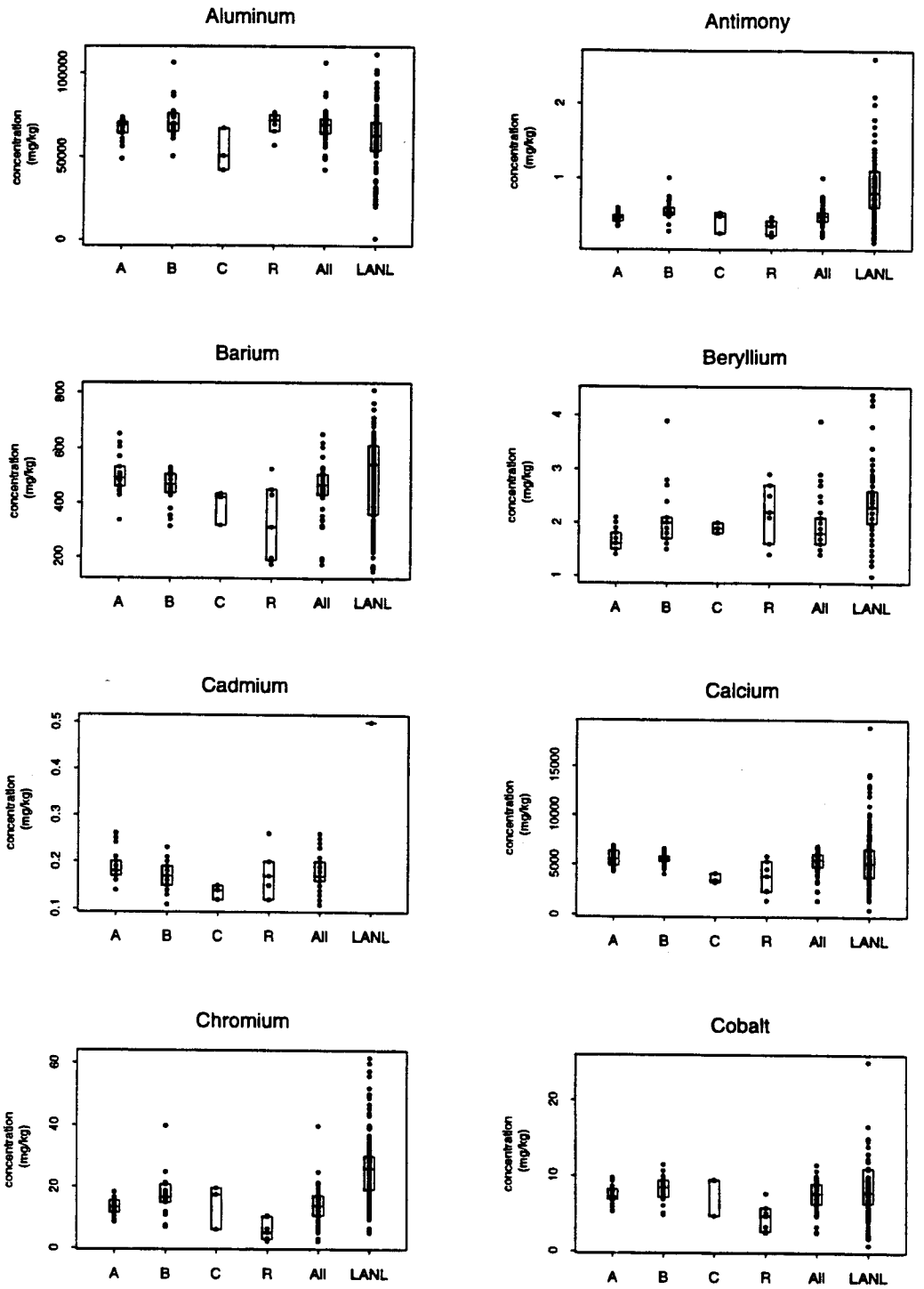

Figure 5. Box plots of whole rock or total sample analysis from MDA-P background soil samples and equivalent LANL background data for aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, and cobalt.

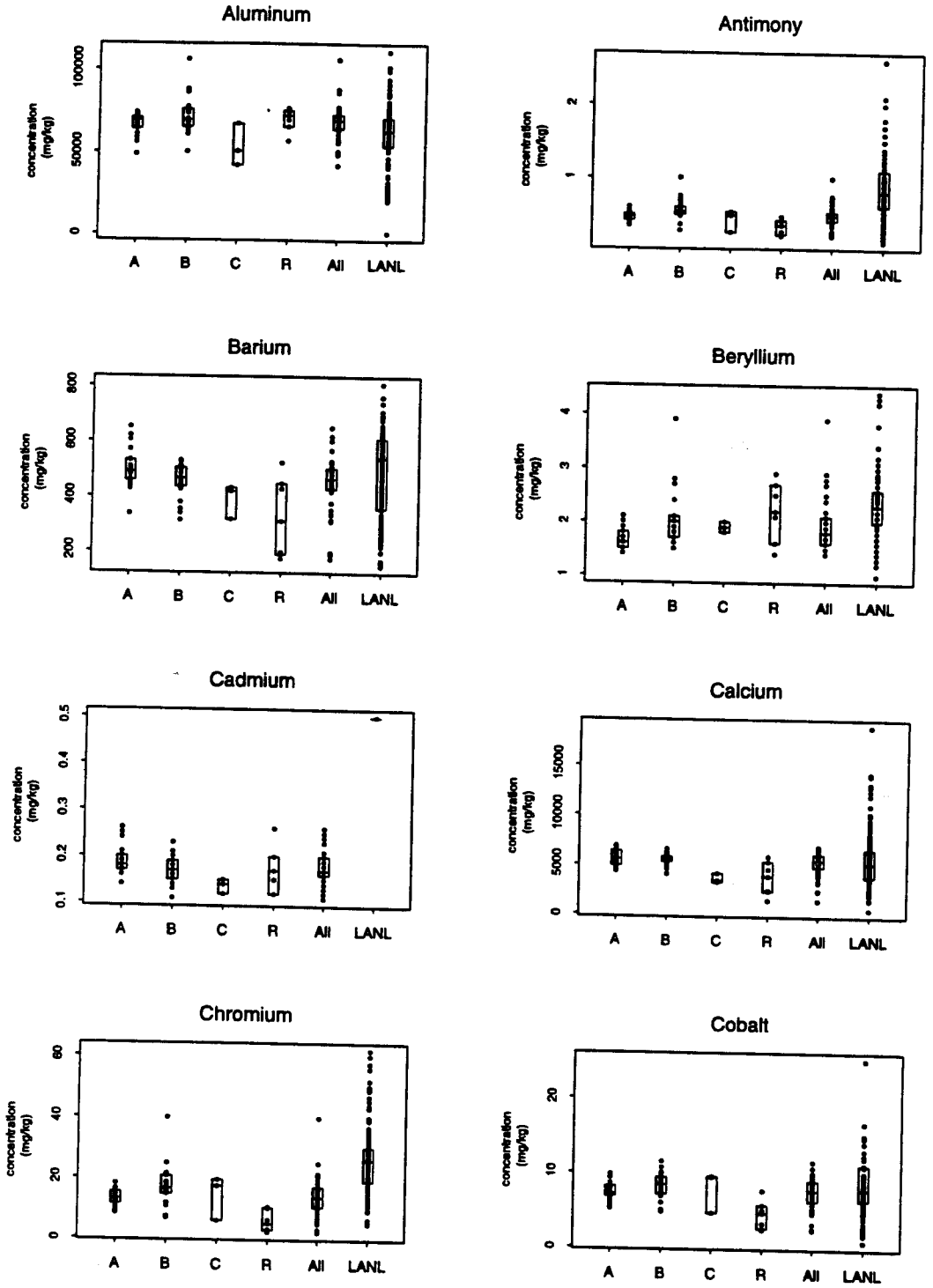

Figure 6. Box plots of whole rock or total sample analysis from MDA-P background soil samples and equivalent LANL background data for copper, iron, lead, magnesium, manganese, nickel, potassium, and sodium.

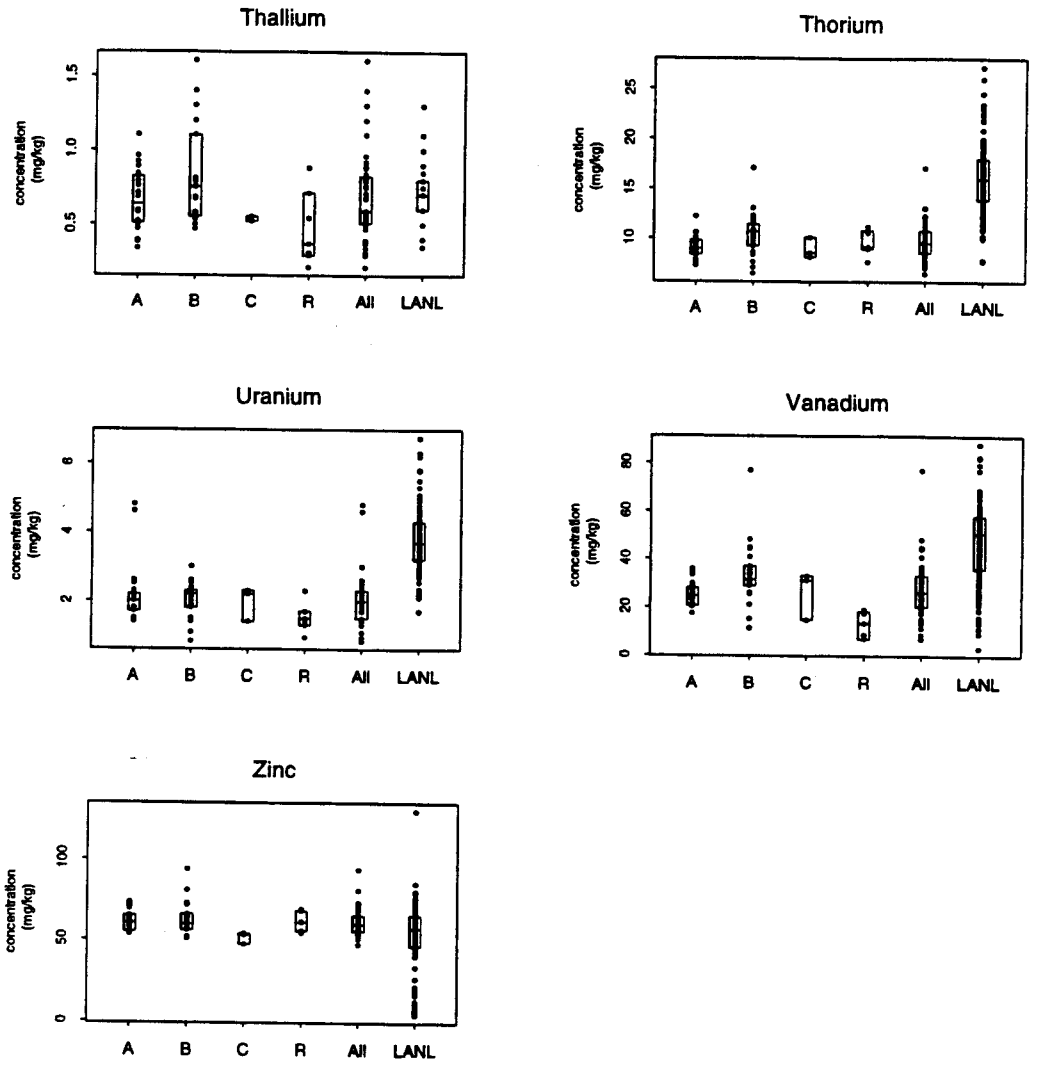

Figure 7. Box plots of whole rock or total sample analysis from MDA-P background soil samples and equivalent LANL background data for thallium, thorium, uranium, vanadium, and zinc.

All of the total sample inorganic results appear to originate from a normal distribution, and equation (1) was used for all elements with greater than a 50% detection frequency. The calculated UTLs (or sample maximum) for the total sample results for inorganic chemicals are presented in Tables 11 through 15. A summary of these new background screening calculated for MDA-P are presented in Table 16.

DISTRIBUTION OF Ba, Cu, Hg, and Zn IN SOILS

Soil concentrations of HNO_3-leachable Ba, Cu, Hg, and Zn are important because the MDA-P waste-pile contains debris that has concentrations of these metals that are significantly above background levels (Technical Area 16, Material Disposal Area P Closure Plan, Revision 0, February, 1995). The distribution of these important elements in the soil environment are discussed below.

Concentration of HNO_3-leachable Ba in eight of the nine surface A horizons sampled near MDA-P have concentrations that are 2 to 3 times greater than Ba concentrations in underlying soil horizons (Fig. 8; Table 3). Concentrations of Ba in A horizons range from 34.4 to

Table 16. Summary of background screening values for whole soil or total sample inorganic chemicals by soil horizon.

ANALYTE	HORIZON				ALL HORIZONS
	A	B	C*	R*	
Aluminum	81100	97500	67400	76900	88400
Antimony	0.6024	0.887	0.53	0.470	0.751
Barium	671	597	434	523	650
Beryllium	2.15	3.34	2.00	2.90	2.88
Cadmium	0.271	0.237	0.150	0.260	0.250
Calcium	7700	6880	4150	5870	7620
Chromium	19.8	32.5	19.4	10.5	26.5
Cobalt	10.3	12.1	9.50	7.60	11.4
Copper	10.6	17.2	9.20	6.40	13.5
Iron	22000	35300	16800	18800	28400
Lead	28.6	30.0	22.3	32.1	28.9
Magnesium	3607	6990	2890	2420	5310
Manganese	640	641	507	699	629
Nickel	10.1	17.3	9.60	11.6	14.1
Potassium	42480	43200	33900	37300	42800
Selenium	1.80	<0.2	<0.2	0.370	1.80
Silver	0.520	<0.4	<0.4	<0.4	0.520
Sodium	28700	32900	25900	30700	31500
Thallium	1.14	1.60	0.550	0.880	1.29
Thorium	11.7	15.6	10.1	11.2	13.3
Uranium	4.25	3.18	2.30	2.30	3.43
Vanadium	37.0	63.5	33.1	18.9	50.6
Zinc	76.3	85.7	53.8	68.7	77.9

* indicates the maximum detect is used as UTL for all analytes.

249 mg/kg and 14.5 to 130 mg/kg in B, C and R horizons. Because there is no direct reason for Ba to be pedologically concentrated within the uppermost soil horizon relative to underlying horizons suggests that surface soil horizons have been at least mildly contaminated by anthropogenic Ba. Elevated levels of Ba on both south- and north-facing slopes indicates localized contamination of Ba probably due to windblown emissions of Ba generated from MDA-P burning pits located above the waste-pile. Although elevated concentrations of Ba

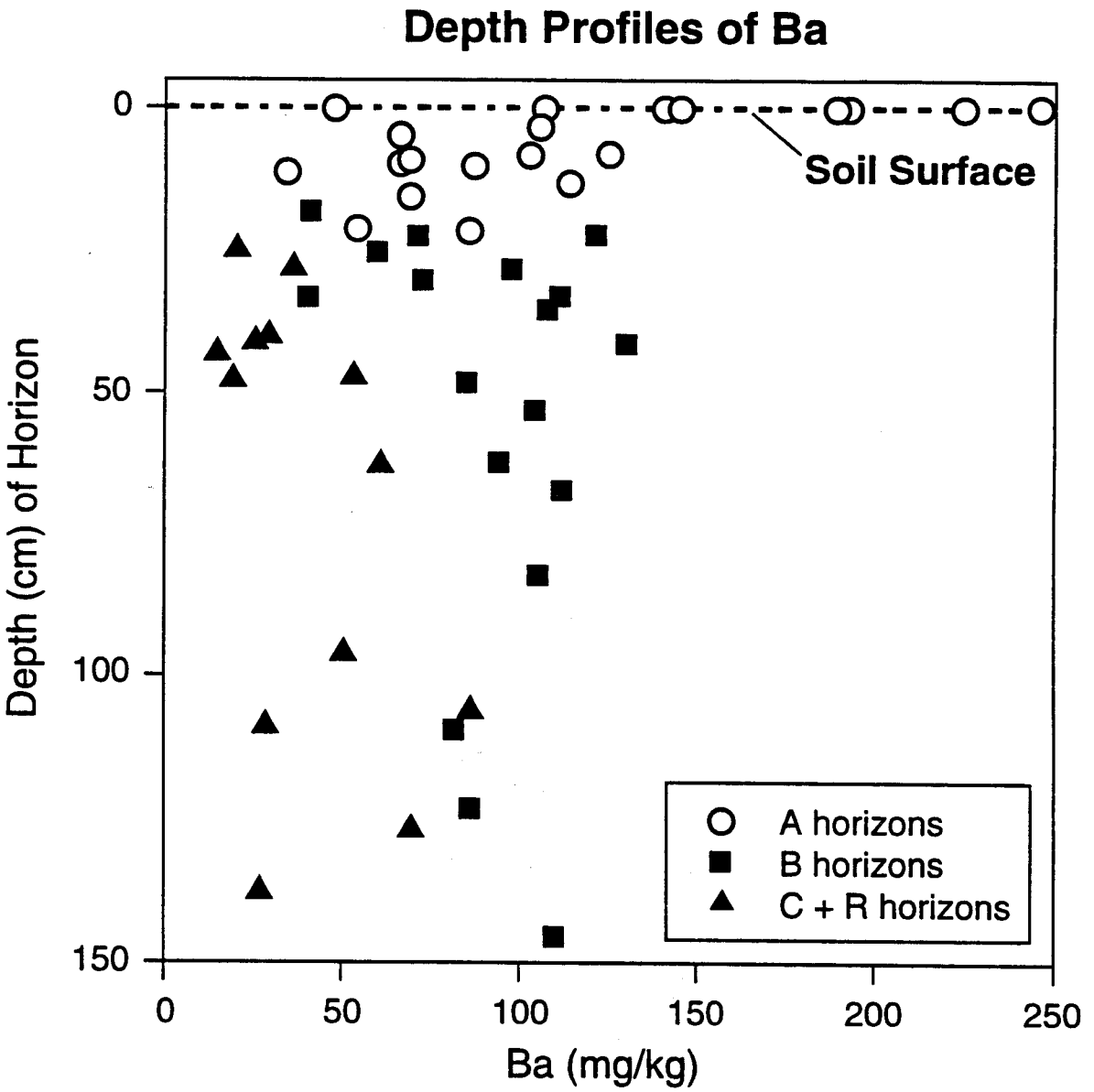

Figure 8. Depth profiles of Ba for the nine sampled soils around MDA-P. Eight of the nine soil profiles have elevated concentrations of Ba relative to underlying soil horizons. Elevated concentrations of Ba at the soil surface probably indicate local contamination by airborne Ba from the nearby burning pits above MDA-P. Sample depths plotted represent the depth of the upper horizon boundary.

are below Laboratory-wide soil UTLs for Ba (Tables 4, 8), these results indicate that Ba may be easily dispersed across areas marginal to MDA-P. As a result, a low level of Ba contamination above background levels may occur in soils and sediments downwind of the MDA-P waste-pile and in areas not currently slated for clean-up. In addition, dust released during clean-up activities around MDA-P (e.g. emission of fine-grained particles during removal of waste-pile) may also result in a significant down-wind transport of Ba onto nearby soils and tuff bedrock surfaces.

Concentrations of both HNO_3-leachable Cu and Zn are generally similar among all soil horizons and do not show depth-related trends such as those that occur for Ba. Concentrations for Cu range from 0.8 to 12.6 mg/kg and are generally below Laboratory-wide soil background concentrations. Concentrations for Zn range from 15.7 to 73.8 mg/kg and are generally similar to Laboratory-wide soil background concentrations.

Mercury was inadvertently not analyzed for MDA-P soil samples. Laboratory-wide investigations of soil background concentrations of Hg indicate that Hg naturally occurs at very low levels (less than 0.1 ppm) in soils across the Pajarito Plateau (Longmire, et al, in press b); therefore, there is no pedological reason to suspect that Hg concentrations in soils marginal to MDA-P would have natural concentrations of Hg higher than those determined from Laboratory-wide soil background investigations.

DISTRIBUTION OF OTHER CONSTITUENTS IN SOILS

Other metals, including Ag, Be, Cr, Cd, Fe, Pb, and U are also of some concern because these metals are associated with materials deposited at MDA-P. Uranium concentrations (mg/kg) exceed acid leachable Laboratory-wide UTLs for four soil samples: 2.5 (SUS-1, A1), 2.0 (NMS-1, R/Bt), 1.8 (NMS-2, A1), and 2.0 (NMS-2, R/Bw2). Uranium concentrations (mg/kg) also exceed HF digestable (total) Laboratory-wide UTLs for two soil samples: 4.6 (SUS-1, A1) and 4.8 (NMS-2, A1). Elevated levels in A horizons may represent local increases due to direct additions from disposal activities around MDA-P. Alternately, these elevated concentrations may be due to additions of airborne U from nearby firing sites. Elevated levels of U due to airborne additions from nearby firing sites has occurred at other Laboratory soil sites (Longmire, et al., in press b). Elevated levels in R horizons may be due to enrichment of the soil matirx along fractures due to pedogenic processes and the fact that background U concentrations in Bandelier tuff are higher than background U conentrations in soils. Nitric acid-leachable mean concentrations of Ag, Be, Cr, Cd, Fe, Pb and the UTLs of these metals in soils around MDA-P are either similar to or below Laboratory-wide mean HNO_3-leachable concentrations and UTLs (Table 8). These metals do not display any apparent depth trends.

Nitates were not analyzed as part of the soil background data, nor were nitrates analyzed as part of the Laboratroy-wide background data. Nitrates are generally low in soil environments that are not under active cultivation. Previous sampling of soils and sediments at MDA-P

indicates that concentrations of nitrates are low (Technical Area 16, Material Disposal Area P Closure Plan, Revision 0, February, 1995).

SUMMARY

Natural background elemental concentrations were determined for 27 inorganic constituents of the soils and colluvium in support of the closure plan for Material Disposal Area P at Technical Area 16. A total of 55 bulk-soil samples were collected from soil profiles along north- and south-facing slopes of Cañon de Valle in the vicinity of the MDA-P waste-pile. Soils were described and characterized using standard soil survey techniques. Soil samples (< 2 mm size fraction) were analyzed by EPA SW846 methods using two different digestion methods: (1) total (whole-soil) concentrations were determined by complete dissolution of the soil using hydrofluoric acid, (2) leachable concentrations were determined by partial digestion of the sample using nitric acid at pH 1. Background concentrations were determined for 27 inorganic constituents: Ag, Al, As, Ba, Be, Ca, Cd, Cl, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Pb, Sb, Se, SO_4^{2-}, Ta, Th, Tl, U, V, and Zn.

Soils around MDA-P are generally poorly developed and consist of A-R , A-Bw-R, or A-Bw-C soil profiles. Most soil samples have low levels of clay-sized material. Soils have formed in eroded and fractured Bandelier Tuff, and in colluvium derived from eroded tuff and soils. Statistical analysis of leachable and total elemental concentrations, including: detection limits, number of samples above and below detection limits, and the minimum, maximum, mean value, and ULTs, are reported for MDA-P and LANL soil master horizons (A, B, C, R). Statistical analysis indicates that the MDA-P acid leachable results generally have less variability and lower concentrations than the LANL-wide acid leachable background samples, whereas total sample results generally have less variability and similar mean concentrations to the LANL-wide total sample background samples. Eight of the nine soils had elevated levels of Ba in the surface horizon relative to underlying soil horizons, indicating that local contamination of soils by wind-blown Ba (probably from burning pits) has occurred; however, elevated levels of Ba are below Laboratory-wide UTLs for Ba.

The spatial coverage and population size of background chemistry samples are considered adequate for defining background screening values for soils and colluvium at MDA-P. The UTLs calculated from these samples will be useful in making screening level background comparisons. Other statistical tests may also be used, as needed, to support the closure plan.

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APPENDIX A
Laboratory Analytical Results for HNO_3-digestable Soil Samples from MDA-P, TA-16, LANL

Notes for Result Quality recorded on the following tables of analytical results:

B: Reading was less than the Required Detection Limit (RDL), but greater than ot equal to the actual Detection Limit (DL).
E: Serial dilutions differed from the original results by more than 10% and the orginal results were more than 50 times the instrumental dectection limits (IDLs).
N: Spike sample recoveris not within control limits.
U: Analyte not detected.
*: duplicate analyses were not within control limits.

ANALYTICAL RESULTS

(SECTION I)

Customer ID: 0816-95-0024-01
Ticket ID: FS-2236

Date: September 27, 1995
Lab ID: 231592

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	~0.47	B	MG/KG	09/12/95	AS-5 R05
Aluminum	5900		MG/KG	09/12/95	AS-5 R05
Arsenic	0.41	*	MG/KG	09/21/95	AS-4 R01
Barium	190		MG/KG	09/12/95	AS-5 R05
Beryllium	0.37		MG/KG	09/08/95	AS-5 R05
Calcium	2250		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	1.5		MG/KG	09/12/95	AS-5 R05
Chromium	4.5	N*	MG/KG	09/12/95	AS-5 R05
Copper	7.2		MG/KG	09/12/95	AS-5 R05
Iron	6770		MG/KG	09/12/95	AS-5 R05
Potassium	944		MG/KG	09/12/95	AS-5 R05
Magnesium	993		MG/KG	09/12/95	AS-5 R05
Manganese	235		MG/KG	09/12/95	AS-5 R05
Sodium	~47.7	B	MG/KG	09/12/95	AS-5 R05
Nickel	3.5		MG/KG	09/12/95	AS-5 R05
Lead	14.1		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.39	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	97.83		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	2.5		MG/KG	09/13/95	AS-6 R05
Thallium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Uranium	2.5		MG/KG	09/13/95	AS-6 R05
Vanadium	7.1		MG/KG	09/12/95	AS-5 R05
Zinc	29.7		MG/KG	09/12/95	AS-5 R05

1.05

ANALYTICAL RESULTS

(SECTION)

Customer ID: 0816-95-0025-01
Ticket ID: FS-2237

Date: September 27, 1995
Lab ID: 231593

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	6570		MG/KG	09/12/95	AS-5 R05
Arsenic	0.44	*	MG/KG	09/21/95	AS-4 R01
Barium	68.6		MG/KG	09/12/95	AS-5 R05
Beryllium	0.40		MG/KG	09/08/95	AS-5 R05
Calcium	2990		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	1.5		MG/KG	09/12/95	AS-5 R05
Chromium	2.8	N*	MG/KG	09/12/95	AS-5 R05
Copper	4.5		MG/KG	09/12/95	AS-5 R05
Iron	6780		MG/KG	09/12/95	AS-5 R05
Potassium	1170		MG/KG	09/12/95	AS-5 R05
Magnesium	1010		MG/KG	09/12/95	AS-5 R05
Manganese	246		MG/KG	09/12/95	AS-5 R05
Sodium	~84.1	B	MG/KG	09/12/95	AS-5 R05
Nickel	3.7		MG/KG	09/12/95	AS-5 R05
Lead	5.7		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.77	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.51		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	2.7		MG/KG	09/13/95	AS-6 R05
Thallium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Uranium	0.35		MG/KG	09/13/95	AS-6 R05
Vanadium	5.5		MG/KG	09/12/95	AS-5 R05
Zinc	23.2		MG/KG	09/12/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0026-01
Ticket ID: FS-2238

Date: September 27, 1995
Lab ID: 231594

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	9510		MG/KG	09/12/95	AS-5 R05
Arsenic	0.34	*	MG/KG	09/21/95	AS-4 R01
Barium	85.4		MG/KG	09/12/95	AS-5 R05
Beryllium	0.61		MG/KG	09/08/95	AS-5 R05
Calcium	3940		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.1		MG/KG	09/12/95	AS-5 R05
Chromium	4.4	N*	MG/KG	09/12/95	AS-5 R05
Copper	5.1		MG/KG	09/12/95	AS-5 R05
Iron	9160		MG/KG	09/12/95	AS-5 R05
Potassium	1690		MG/KG	09/12/95	AS-5 R05
Magnesium	1410		MG/KG	09/12/95	AS-5 R05
Manganese	326		MG/KG	09/12/95	AS-5 R05
Sodium	~118	B	MG/KG	09/12/95	AS-5 R05
Nickel	4.9		MG/KG	09/12/95	AS-5 R05
Lead	6.2		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.58	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.46		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	3.2		MG/KG	09/13/95	AS-6 R05
Thallium	~0.10	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.51		MG/KG	09/13/95	AS-6 R05
Vanadium	8.0		MG/KG	09/12/95	AS-5 R05
Zinc	30.8		MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0027-01
Ticket ID: FS-2239

Date: September 27, 1995
Lab ID: 231595

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	2780		MG/KG	09/12/95	AS-5 R05
Arsenic	0.34	*	MG/KG	09/21/95	AS-4 R01
Barium	14.5		MG/KG	09/12/95	AS-5 R05
Beryllium	0.17		MG/KG	09/08/95	AS-5 R05
Calcium	742		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	~0.84	B	MG/KG	09/12/95	AS-5 R05
Chromium	1.9	N*	MG/KG	09/12/95	AS-5 R05
Copper	~0.83	B	MG/KG	09/12/95	AS-5 R05
Iron	6650		MG/KG	09/12/95	AS-5 R05
Potassium	606		MG/KG	09/12/95	AS-5 R05
Magnesium	~435	B	MG/KG	09/12/95	AS-5 R05
Manganese	74.9		MG/KG	09/12/95	AS-5 R05
Sodium	~164	B	MG/KG	09/12/95	AS-5 R05
Nickel	~0.88	B	MG/KG	09/12/95	AS-5 R05
Lead	2.3		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.32	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.44		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	1.2		MG/KG	09/13/95	AS-6 R05
Thallium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Uranium	0.14		MG/KG	09/13/95	AS-6 R05
Vanadium	3.5		MG/KG	09/12/95	AS-5 R05
Zinc	15.7		MG/KG	09/12/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0028-01
Ticket ID: FS-2240

Date: September 27, 1995
Lab ID: 231596

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	8040		MG/KG	09/12/95	AS-5 R05
Arsenic	0.80	*	MG/KG	09/21/95	AS-4 R01
Barium	47.9		MG/KG	09/12/95	AS-5 R05
Beryllium	0.59		MG/KG	09/08/95	AS-5 R05
Calcium	1590		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.8		MG/KG	09/12/95	AS-5 R05
Chromium	5.1	N*	MG/KG	09/12/95	AS-5 R05
Copper	2.7		MG/KG	09/12/95	AS-5 R05
Iron	11700		MG/KG	09/12/95	AS-5 R05
Potassium	1280		MG/KG	09/12/95	AS-5 R05
Magnesium	1300		MG/KG	09/12/95	AS-5 R05
Manganese	226		MG/KG	09/12/95	AS-5 R05
Sodium	~123	B	MG/KG	09/12/95	AS-5 R05
Nickel	3.5		MG/KG	09/12/95	AS-5 R05
Lead	10.5		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.49	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.8		MG/KG	09/13/95	AS-6 R05
Thallium	~0.17	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.63		MG/KG	09/13/95	AS-6 R05
Vanadium	11.4		MG/KG	09/12/95	AS-5 R05
Zinc	37.2		MG/KG	09/12/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0029-01
Ticket ID: FS-2241

Date: September 27, 1995
Lab ID: 231597

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	6440		MG/KG	09/12/95	AS-5 R05
Arsenic	0.74	*	MG/KG	09/21/95	AS-4 R01
Barium	34.4		MG/KG	09/12/95	AS-5 R05
Beryllium	0.61		MG/KG	09/08/95	AS-5 R05
Calcium	1260		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.2		MG/KG	09/12/95	AS-5 R05
Chromium	4.8	N*	MG/KG	09/12/95	AS-5 R05
Copper	3.0		MG/KG	09/12/95	AS-5 R05
Iron	9260		MG/KG	09/12/95	AS-5 R05
Potassium	1160		MG/KG	09/12/95	AS-5 R05
Magnesium	1240		MG/KG	09/12/95	AS-5 R05
Manganese	153		MG/KG	09/12/95	AS-5 R05
Sodium	~97.7	B	MG/KG	09/12/95	AS-5 R05
Nickel	3.2		MG/KG	09/12/95	AS-5 R05
Lead	8.9		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.36	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.1		MG/KG	09/13/95	AS-6 R05
Thallium	~0.15	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.52		MG/KG	09/13/95	AS-6 R05
Vanadium	9.6		MG/KG	09/12/95	AS-5 R05
Zinc	31.0		MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0030-01
Ticket ID: FS-2242

Date: September 27, 1995
Lab ID: 231598

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	3600		MG/KG	09/12/95	AS-5 R05
Arsenic	1.2	*	MG/KG	09/21/95	AS-4 R01
Barium	19.8		MG/KG	09/12/95	AS-5 R05
Beryllium	1.1		MG/KG	09/08/95	AS-5 R05
Calcium	754		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	~0.99	B	MG/KG	09/12/95	AS-5 R05
Chromium	1.9	N*	MG/KG	09/12/95	AS-5 R05
Copper	2.2		MG/KG	09/12/95	AS-5 R05
Iron	8730		MG/KG	09/12/95	AS-5 R05
Potassium	~375	B	MG/KG	09/12/95	AS-5 R05
Magnesium	~479	B	MG/KG	09/12/95	AS-5 R05
Manganese	293		MG/KG	09/12/95	AS-5 R05
Sodium	~53.2	B	MG/KG	09/12/95	AS-5 R05
Nickel	2.2		MG/KG	09/12/95	AS-5 R05
Lead	4.2		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.64	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.07		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.3		MG/KG	09/13/95	AS-6 R05
Thallium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Uranium	0.46		MG/KG	09/13/95	AS-6 R05
Vanadium	5.3		MG/KG	09/12/95	AS-5 R05
Zinc	33.3		MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0031-01
Ticket ID: FS-2243

Date: September 27, 1995
Lab ID: 231599

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	5780		MG/KG	09/12/95	AS-5 R05
Arsenic	0.53	*	MG/KG	09/21/95	AS-4 R01
Barium	145		MG/KG	09/12/95	AS-5 R05
Beryllium	0.58		MG/KG	09/08/95	AS-5 R05
Calcium	2920		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.1		MG/KG	09/12/95	AS-5 R05
Chromium	3.8	N*	MG/KG	09/12/95	AS-5 R05
Copper	4.3		MG/KG	09/12/95	AS-5 R05
Iron	9720		MG/KG	09/12/95	AS-5 R05
Potassium	973		MG/KG	09/12/95	AS-5 R05
Magnesium	1120		MG/KG	09/12/95	AS-5 R05
Manganese	315		MG/KG	09/12/95	AS-5 R05
Sodium	~82.2	B	MG/KG	09/12/95	AS-5 R05
Nickel	3.0		MG/KG	09/12/95	AS-5 R05
Lead	13.8		MG/KG	09/13/95	AS-6 R05
Antimony	~0.13	BN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.35	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.05		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.3		MG/KG	09/13/95	AS-6 R05
Thallium	~0.14	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.90		MG/KG	09/13/95	AS-6 R05
Vanadium	8.9		MG/KG	09/12/95	AS-5 R05
Zinc	37.0		MG/KG	09/12/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0032-01
Ticket ID: FS-2244

Date: September 27, 1995
Lab ID: 231600

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	6330		MG/KG	09/12/95	AS-5 R05
Arsenic	0.56	*	MG/KG	09/21/95	AS-4 R01
Barium	66.2		MG/KG	09/12/95	AS-5 R05
Beryllium	0.74		MG/KG	09/08/95	AS-5 R05
Calcium	2220		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	1.9		MG/KG	09/12/95	AS-5 R05
Chromium	4.3	N*	MG/KG	09/12/95	AS-5 R05
Copper	3.5		MG/KG	09/12/95	AS-5 R05
Iron	9960		MG/KG	09/12/95	AS-5 R05
Potassium	894		MG/KG	09/12/95	AS-5 R05
Magnesium	1090		MG/KG	09/12/95	AS-5 R05
Manganese	329		MG/KG	09/12/95	AS-5 R05
Sodium	~104	B	MG/KG	09/12/95	AS-5 R05
Nickel	3.8		MG/KG	09/12/95	AS-5 R05
Lead	9.7		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.42		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.8		MG/KG	09/13/95	AS-6 R05
Thallium	~0.17	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.51		MG/KG	09/13/95	AS-6 R05
Vanadium	8.8		MG/KG	09/12/95	AS-5 R05
Zinc	34.5		MG/KG	09/12/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0033-01
Ticket ID: FS-2245

Date: September 27, 1995
Lab ID: 231601

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	5330		MG/KG	09/12/95	AS-5 R05
Arsenic	0.60	*	MG/KG	09/21/95	AS-4 R01
Barium	40.9		MG/KG	09/12/95	AS-5 R05
Beryllium	0.63		MG/KG	09/08/95	AS-5 R05
Calcium	1330		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.0		MG/KG	09/12/95	AS-5 R05
Chromium	3.5	N*	MG/KG	09/12/95	AS-5 R05
Copper	2.8		MG/KG	09/12/95	AS-5 R05
Iron	9050		MG/KG	09/12/95	AS-5 R05
Potassium	750		MG/KG	09/12/95	AS-5 R05
Magnesium	913		MG/KG	09/12/95	AS-5 R05
Manganese	233		MG/KG	09/12/95	AS-5 R05
Sodium	~104	B	MG/KG	09/12/95	AS-5 R05
Nickel	2.8		MG/KG	09/12/95	AS-5 R05
Lead	7.1		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.61	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.63		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.1		MG/KG	09/13/95	AS-6 R05
Thallium	~0.14	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.41		MG/KG	09/13/95	AS-6 R05
Vanadium	8.2		MG/KG	09/12/95	AS-5 R05
Zinc	32.5		MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0034-01
Ticket ID: FS-2246

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Date: September 27, 1995
Lab ID: 231602

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	5200		MG/KG	09/12/95	AS-5 R05
Arsenic	0.81	*	MG/KG	09/21/95	AS-4 R01
Barium	28.5		MG/KG	09/12/95	AS-5 R05
Beryllium	0.60		MG/KG	09/08/95	AS-5 R05
Calcium	935		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	1.5		MG/KG	09/12/95	AS-5 R05
Chromium	3.3	N*	MG/KG	09/12/95	AS-5 R05
Copper	2.2		MG/KG	09/12/95	AS-5 R05
Iron	8190		MG/KG	09/12/95	AS-5 R05
Potassium	713		MG/KG	09/12/95	AS-5 R05
Magnesium	914		MG/KG	09/12/95	AS-5 R05
Manganese	134		MG/KG	09/12/95	AS-5 R05
Sodium	~124	B	MG/KG	09/12/95	AS-5 R05
Nickel	2.3		MG/KG	09/12/95	AS-5 R05
Lead	5.9		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.28	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.43		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	3.7		MG/KG	09/13/95	AS-6 R05
Thallium	~0.14	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.36		MG/KG	09/13/95	AS-6 R05
Vanadium	8.3		MG/KG	09/12/95	AS-5 R05
Zinc	26.2		MG/KG	09/12/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0035-01
Ticket ID: FS-2247

Date: September 27, 1995
Lab ID: 231603

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	5060		MG/KG	09/12/95	AS-5 R05
Arsenic	1.2	*	MG/KG	09/21/95	AS-4 R01
Barium	19.0		MG/KG	09/12/95	AS-5 R05
Beryllium	0.52		MG/KG	09/08/95	AS-5 R05
Calcium	666		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.7		MG/KG	09/12/95	AS-5 R05
Chromium	2.5	N*	MG/KG	09/12/95	AS-5 R05
Copper	2.3		MG/KG	09/12/95	AS-5 R05
Iron	8170		MG/KG	09/12/95	AS-5 R05
Potassium	~467	B	MG/KG	09/12/95	AS-5 R05
Magnesium	547		MG/KG	09/12/95	AS-5 R05
Manganese	332		MG/KG	09/12/95	AS-5 R05
Sodium	~78.6	B	MG/KG	09/12/95	AS-5 R05
Nickel	2.2		MG/KG	09/12/95	AS-5 R05
Lead	5.4		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.21	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.61		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.5		MG/KG	09/13/95	AS-6 R05
Thallium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Uranium	0.41		MG/KG	09/13/95	AS-6 R05
Vanadium	8.0		MG/KG	09/12/95	AS-5 R05
Zinc	32.8		MG/KG	09/12/95	AS-5 R05

V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0036-01
Ticket ID: FS-2248

Date: September 27, 1995
Lab ID: 231604

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	5890		MG/KG	09/12/95	AS-5 R05
Arsenic	0.50	*	MG/KG	09/21/95	AS-4 R01
Barium	193		MG/KG	09/12/95	AS-5 R05
Beryllium	0.70		MG/KG	09/08/95	AS-5 R05
Calcium	3920		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.0		MG/KG	09/12/95	AS-5 R05
Chromium	4.1	N*	MG/KG	09/12/95	AS-5 R05
Copper	6.0		MG/KG	09/12/95	AS-5 R05
Iron	7540		MG/KG	09/12/95	AS-5 R05
Potassium	1360		MG/KG	09/12/95	AS-5 R05
Magnesium	1350		MG/KG	09/12/95	AS-5 R05
Manganese	446		MG/KG	09/12/95	AS-5 R05
Sodium	~31.6	B	MG/KG	09/12/95	AS-5 R05
Nickel	5.2		MG/KG	09/12/95	AS-5 R05
Lead	12.3		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.44	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.63		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.5		MG/KG	09/13/95	AS-6 R05
Thallium	~0.15	B	MG/KG	09/13/95	AS-6 R05
Uranium	1.4		MG/KG	09/13/95	AS-6 R05
Vanadium	9.7		MG/KG	09/12/95	AS-5 R05
Zinc	34.1		MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0037-01
Ticket ID: FS-2249

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Date: September 27, 1995
Lab ID: 231605

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	7170		MG/KG	09/12/95	AS-5 R05
Arsenic	0.58	*	MG/KG	09/21/95	AS-4 R01
Barium	121		MG/KG	09/12/95	AS-5 R05
Beryllium	0.83		MG/KG	09/08/95	AS-5 R05
Calcium	2820		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.7		MG/KG	09/12/95	AS-5 R05
Chromium	5.8	N*	MG/KG	09/12/95	AS-5 R05
Copper	6.3		MG/KG	09/12/95	AS-5 R05
Iron	9540		MG/KG	09/12/95	AS-5 R05
Potassium	1500		MG/KG	09/12/95	AS-5 R05
Magnesium	1410		MG/KG	09/12/95	AS-5 R05
Manganese	480		MG/KG	09/12/95	AS-5 R05
Sodium	~34.5	B	MG/KG	09/12/95	AS-5 R05
Nickel	5.9		MG/KG	09/12/95	AS-5 R05
Lead	12.3		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.28	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.66		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	6.0		MG/KG	09/13/95	AS-6 R05
Thallium	~0.19	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.77		MG/KG	09/13/95	AS-6 R05
Vanadium	12.6		MG/KG	09/12/95	AS-5 R05
Zinc	39.9		MG/KG	09/12/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0038-01
Ticket ID: FS-2250

Date: September 27, 1995
Lab ID: 231606

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	7400		MG/KG	09/12/95	AS-5 R05
Arsenic	0.56	*	MG/KG	09/21/95	AS-4 R01
Barium	108		MG/KG	09/12/95	AS-5 R05
Beryllium	0.86		MG/KG	09/08/95	AS-5 R05
Calcium	2490		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	4.4		MG/KG	09/12/95	AS-5 R05
Chromium	5.7	N*	MG/KG	09/12/95	AS-5 R05
Copper	6.4		MG/KG	09/12/95	AS-5 R05
Iron	9540		MG/KG	09/12/95	AS-5 R05
Potassium	1440		MG/KG	09/12/95	AS-5 R05
Magnesium	1420		MG/KG	09/12/95	AS-5 R05
Manganese	442		MG/KG	09/12/95	AS-5 R05
Sodium	~32.9	B	MG/KG	09/12/95	AS-5 R05
Nickel	5.7		MG/KG	09/12/95	AS-5 R05
Lead	12.4		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.35	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.23		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.9		MG/KG	09/13/95	AS-6 R05
Thallium	~0.19	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.56		MG/KG	09/13/95	AS-6 R05
Vanadium	13.3		MG/KG	09/12/95	AS-5 R05
Zinc	36.3		MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0039-01
Ticket ID: FS-2251

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Date: September 27, 1995
Lab ID: 231607

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	9040		MG/KG	09/12/95	AS-5 R05
Arsenic	0.71	*	MG/KG	09/21/95	AS-4 R01
Barium	94.0		MG/KG	09/12/95	AS-5 R05
Beryllium	0.85		MG/KG	09/08/95	AS-5 R05
Calcium	2360		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.7		MG/KG	09/12/95	AS-5 R05
Chromium	6.2	N*	MG/KG	09/12/95	AS-5 R05
Copper	5.8		MG/KG	09/12/95	AS-5 R05
Iron	10400		MG/KG	09/12/95	AS-5 R05
Potassium	1510		MG/KG	09/12/95	AS-5 R05
Magnesium	1470		MG/KG	09/12/95	AS-5 R05
Manganese	406		MG/KG	09/12/95	AS-5 R05
Sodium	~39.8	B	MG/KG	09/12/95	AS-5 R05
Nickel	6.0		MG/KG	09/12/95	AS-5 R05
Lead	11.5		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.21		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	6.3		MG/KG	09/13/95	AS-6 R05
Thallium	~0.20	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.51		MG/KG	09/13/95	AS-6 R05
Vanadium	13.7		MG/KG	09/12/95	AS-5 R05
Zinc	34.9		MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0040-01
Ticket ID: FS-2252

Date: September 27, 1995
Lab ID: 231608

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	8370		MG/KG	09/12/95	AS-5 R05
Arsenic	0.69	*	MG/KG	09/21/95	AS-4 R01
Barium	85.6		MG/KG	09/12/95	AS-5 R05
Beryllium	0.83		MG/KG	09/08/95	AS-5 R05
Calcium	1930		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	4.2		MG/KG	09/12/95	AS-5 R05
Chromium	5.8	N*	MG/KG	09/12/95	AS-5 R05
Copper	5.0		MG/KG	09/12/95	AS-5 R05
Iron	10000		MG/KG	09/12/95	AS-5 R05
Potassium	1410		MG/KG	09/12/95	AS-5 R05
Magnesium	1410		MG/KG	09/12/95	AS-5 R05
Manganese	427		MG/KG	09/12/95	AS-5 R05
Sodium	~42.5	B	MG/KG	09/12/95	AS-5 R05
Nickel	5.7		MG/KG	09/12/95	AS-5 R05
Lead	11.2		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.83		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	6.1		MG/KG	09/13/95	AS-6 R05
Thallium	0.20		MG/KG	09/13/95	AS-6 R05
Uranium	0.64		MG/KG	09/13/95	AS-6 R05
Vanadium	14.1		MG/KG	09/12/95	AS-5 R05
Zinc	31.2		MG/KG	09/12/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0041-01
Ticket ID: FS-2253

Date: September 27, 1995
Lab ID: 231609

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	5850		MG/KG	09/12/95	AS-5 R05
Arsenic	0.74	*	MG/KG	09/21/95	AS-4 R01
Barium	69.1		MG/KG	09/12/95	AS-5 R05
Beryllium	0.74		MG/KG	09/08/95	AS-5 R05
Calcium	1420		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	4.0		MG/KG	09/12/95	AS-5 R05
Chromium	5.0	N*	MG/KG	09/12/95	AS-5 R05
Copper	4.4		MG/KG	09/12/95	AS-5 R05
Iron	7880		MG/KG	09/12/95	AS-5 R05
Potassium	938		MG/KG	09/12/95	AS-5 R05
Magnesium	1130		MG/KG	09/12/95	AS-5 R05
Manganese	335		MG/KG	09/12/95	AS-5 R05
Sodium	~42.0	B	MG/KG	09/12/95	AS-5 R05
Nickel	4.0		MG/KG	09/12/95	AS-5 R05
Lead	11.1		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.29	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.9		MG/KG	09/13/95	AS-6 R05
Thallium	~0.18	B	MG/KG	09/13/95	AS-6 R05
Uranium	1.0		MG/KG	09/13/95	AS-6 R05
Vanadium	12.0		MG/KG	09/12/95	AS-5 R05
Zinc	23.5		MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0042-01
Ticket ID: FS-2254

Date: September 27, 1995
Lab ID: 231610

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	1560		MG/KG	09/12/95	AS-5 R05
Arsenic	0.38	*	MG/KG	09/21/95	AS-4 R01
Barium	26.2		MG/KG	09/12/95	AS-5 R05
Beryllium	0.22		MG/KG	09/08/95	AS-5 R05
Calcium	~340	B	MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	1.9		MG/KG	09/12/95	AS-5 R05
Chromium	1.0	N*	MG/KG	09/12/95	AS-5 R05
Copper	2.1		MG/KG	09/12/95	AS-5 R05
Iron	5930		MG/KG	09/12/95	AS-5 R05
Potassium	~265	B	MG/KG	09/12/95	AS-5 R05
Magnesium	~276	B	MG/KG	09/12/95	AS-5 R05
Manganese	322		MG/KG	09/12/95	AS-5 R05
Sodium	~25.5	B	MG/KG	09/12/95	AS-5 R05
Nickel	1.3		MG/KG	09/12/95	AS-5 R05
Lead	3.0		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.35	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.81		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	3.9		MG/KG	09/13/95	AS-6 R05
Thallium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Uranium	0.36		MG/KG	09/13/95	AS-6 R05
Vanadium	4.0		MG/KG	09/12/95	AS-5 R05
Zinc	32.1		MG/KG	09/12/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0043-01
Ticket ID: FS-2255

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Date: September 27, 1995
Lab ID: 231611

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	4730		MG/KG	09/12/95	AS-5 R05
Arsenic	0.50	*	MG/KG	09/21/95	AS-4 R01
Barium	107		MG/KG	09/12/95	AS-5 R05
Beryllium	0.47		MG/KG	09/08/95	AS-5 R05
Calcium	1840		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.5		MG/KG	09/12/95	AS-5 R05
Chromium	3.6	N*	MG/KG	09/12/95	AS-5 R05
Copper	3.3		MG/KG	09/12/95	AS-5 R05
Iron	6510		MG/KG	09/12/95	AS-5 R05
Potassium	876		MG/KG	09/12/95	AS-5 R05
Magnesium	1010		MG/KG	09/12/95	AS-5 R05
Manganese	274		MG/KG	09/12/95	AS-5 R05
Sodium	~52.9	B	MG/KG	09/12/95	AS-5 R05
Nickel	2.7		MG/KG	09/12/95	AS-5 R05
Lead	11.0		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	~0.57	B	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.02		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.1		MG/KG	09/13/95	AS-6 R05
Thallium	~0.20	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.84		MG/KG	09/13/95	AS-6 R05
Vanadium	8.3		MG/KG	09/12/95	AS-5 R05
Zinc	19.2		MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0044-01
Ticket ID: FS-2256

Date: September 27, 1995
Lab ID: 231612

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected: .

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	6640		MG/KG	09/12/95	AS-5 R05
Arsenic	0.68	N	MG/KG	09/21/95	AS-4 R01
Barium	67.6		MG/KG	09/12/95	AS-5 R05
Beryllium	0.60		MG/KG	09/08/95	AS-5 R05
Calcium	1260		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.5		MG/KG	09/12/95	AS-5 R05
Chromium	5.8		MG/KG	09/12/95	AS-5 R05
Copper	4.3		MG/KG	09/12/95	AS-5 R05
Iron	9280		MG/KG	09/12/95	AS-5 R05
Potassium	1040		MG/KG	09/12/95	AS-5 R05
Magnesium	1150		MG/KG	09/12/95	AS-5 R05
Manganese	261		MG/KG	09/12/95	AS-5 R05
Sodium	~82.0	B	MG/KG	09/12/95	AS-5 R05
Nickel	5.2		MG/KG	09/12/95	AS-5 R05
Lead	9.0		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.61		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.7		MG/KG	09/13/95	AS-6 R05
Thallium	0.22		MG/KG	09/13/95	AS-6 R05
Uranium	0.66		MG/KG	09/13/95	AS-6 R05
Vanadium	12.0		MG/KG	09/12/95	AS-5 R05
Zinc	34.8	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0045-01
Ticket ID: FS-2257

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Date: September 27, 1995
Lab ID: 231613

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	8660		MG/KG	09/12/95	AS-5 R05
Arsenic	1.0	N	MG/KG	09/21/95	AS-4 R01
Barium	70.5		MG/KG	09/12/95	AS-5 R05
Beryllium	0.81		MG/KG	09/08/95	AS-5 R05
Calcium	1370		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.7		MG/KG	09/12/95	AS-5 R05
Chromium	5.2		MG/KG	09/12/95	AS-5 R05
Copper	4.2		MG/KG	09/12/95	AS-5 R05
Iron	10100		MG/KG	09/12/95	AS-5 R05
Potassium	1360		MG/KG	09/12/95	AS-5 R05
Magnesium	1540		MG/KG	09/12/95	AS-5 R05
Manganese	236		MG/KG	09/12/95	AS-5 R05
Sodium	~87.8	B	MG/KG	09/12/95	AS-5 R05
Nickel	5.5		MG/KG	09/12/95	AS-5 R05
Lead	9.4		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.05		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.7		MG/KG	09/13/95	AS-6 R05
Thallium	0.39		MG/KG	09/13/95	AS-6 R05
Uranium	0.72		MG/KG	09/13/95	AS-6 R05
Vanadium	12.0		MG/KG	09/12/95	AS-5 R05
Zinc	24.2	N*	MG/KG	09/12/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0046-01
Ticket ID: FS-2258

Date: September 27, 1995
Lab ID: 231614

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	21500		MG/KG	09/12/95	AS-5 R05
Arsenic	1.9	N	MG/KG	09/21/95	AS-4 R01
Barium	111		MG/KG	09/12/95	AS-5 R05
Beryllium	1.9		MG/KG	09/08/95	AS-5 R05
Calcium	2650		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.8		MG/KG	09/12/95	AS-5 R05
Chromium	10.3		MG/KG	09/12/95	AS-5 R05
Copper	9.7		MG/KG	09/12/95	AS-5 R05
Iron	17300		MG/KG	09/12/95	AS-5 R05
Potassium	1990		MG/KG	09/12/95	AS-5 R05
Magnesium	2750		MG/KG	09/12/95	AS-5 R05
Manganese	209		MG/KG	09/12/95	AS-5 R05
Sodium	~138	B	MG/KG	09/12/95	AS-5 R05
Nickel	8.5		MG/KG	09/12/95	AS-5 R05
Lead	14.1		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.05		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	8.7		MG/KG	09/13/95	AS-6 R05
Thallium	0.55		MG/KG	09/13/95	AS-6 R05
Uranium	1.2		MG/KG	09/13/95	AS-6 R05
Vanadium	19.3		MG/KG	09/12/95	AS-5 R05
Zinc	38.0	N*	MG/KG	09/12/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0047-01
Ticket ID: FS-2259

Date: September 27, 1995
Lab ID: 231615

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	16600		MG/KG	09/12/95	AS-5 R05
Arsenic	1.7	N	MG/KG	09/21/95	AS-4 R01
Barium	112		MG/KG	09/12/95	AS-5 R05
Beryllium	1.5		MG/KG	09/08/95	AS-5 R05
Calcium	2340		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.5		MG/KG	09/12/95	AS-5 R05
Chromium	9.3		MG/KG	09/12/95	AS-5 R05
Copper	7.6		MG/KG	09/12/95	AS-5 R05
Iron	15500		MG/KG	09/12/95	AS-5 R05
Potassium	1740		MG/KG	09/12/95	AS-5 R05
Magnesium	2360		MG/KG	09/12/95	AS-5 R05
Manganese	273		MG/KG	09/12/95	AS-5 R05
Sodium	~135	B	MG/KG	09/12/95	AS-5 R05
Nickel	7.1		MG/KG	09/12/95	AS-5 R05
Lead	12.5		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.04		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	7.4		MG/KG	09/13/95	AS-6 R05
Thallium	0.41		MG/KG	09/13/95	AS-6 R05
Uranium	0.90		MG/KG	09/13/95	AS-6 R05
Vanadium	17.2		MG/KG	09/12/95	AS-5 R05
Zinc	34.8	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0048-01
Ticket ID: FS-2260

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Date: September 27, 1995
Lab ID: 231616

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	13000		MG/KG	09/12/95	AS-5 R05
Arsenic	1.4	N	MG/KG	09/21/95	AS-4 R01
Barium	86.1		MG/KG	09/12/95	AS-5 R05
Beryllium	1.2		MG/KG	09/08/95	AS-5 R05
Calcium	1850		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.5		MG/KG	09/12/95	AS-5 R05
Chromium	6.5		MG/KG	09/12/95	AS-5 R05
Copper	6.3		MG/KG	09/12/95	AS-5 R05
Iron	13000		MG/KG	09/12/95	AS-5 R05
Potassium	1570		MG/KG	09/12/95	AS-5 R05
Magnesium	1980		MG/KG	09/12/95	AS-5 R05
Manganese	232		MG/KG	09/12/95	AS-5 R05
Sodium	~110	B	MG/KG	09/12/95	AS-5 R05
Nickel	5.4		MG/KG	09/12/95	AS-5 R05
Lead	10.3		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	6.4		MG/KG	09/13/95	AS-6 R05
Thallium	0.31		MG/KG	09/13/95	AS-6 R05
Uranium	0.65		MG/KG	09/13/95	AS-6 R05
Vanadium	14.5		MG/KG	09/12/95	AS-5 R05
Zinc	30.9	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0049-01
Ticket ID: FS-2261

Date: September 27, 1995
Lab ID: 231617

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	13300		MG/KG	09/12/95	AS-5 R05
Arsenic	1.6	N	MG/KG	09/21/95	AS-4 R01
Barium	89.4		MG/KG	09/12/95	AS-5 R05
Beryllium	1.1		MG/KG	09/08/95	AS-5 R05
Calcium	1970		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.2		MG/KG	09/12/95	AS-5 R05
Chromium	7.3		MG/KG	09/12/95	AS-5 R05
Copper	6.4		MG/KG	09/12/95	AS-5 R05
Iron	12900		MG/KG	09/12/95	AS-5 R05
Potassium	1530		MG/KG	09/12/95	AS-5 R05
Magnesium	2130		MG/KG	09/12/95	AS-5 R05
Manganese	224		MG/KG	09/12/95	AS-5 R05
Sodium	~169	B	MG/KG	09/12/95	AS-5 R05
Nickel	5.9		MG/KG	09/12/95	AS-5 R05
Lead	11.2		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	6.3		MG/KG	09/13/95	AS-6 R05
Thallium	0.35		MG/KG	09/13/95	AS-6 R05
Uranium	0.61		MG/KG	09/13/95	AS-6 R05
Vanadium	15.1		MG/KG	09/12/95	AS-5 R05
Zinc	31.1	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0050-01
Ticket ID: FS-2262

Date: September 27, 1995
Lab ID: 231618

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	13100		MG/KG	09/12/95	AS-5 R05
Arsenic	1.8	N	MG/KG	09/21/95	AS-4 R01
Barium	96.1		MG/KG	09/12/95	AS-5 R05
Beryllium	1.2		MG/KG	09/08/95	AS-5 R05
Calcium	1930		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.9		MG/KG	09/12/95	AS-5 R05
Chromium	7.4		MG/KG	09/12/95	AS-5 R05
Copper	6.0		MG/KG	09/12/95	AS-5 R05
Iron	12600		MG/KG	09/12/95	AS-5 R05
Potassium	1610		MG/KG	09/12/95	AS-5 R05
Magnesium	2280		MG/KG	09/12/95	AS-5 R05
Manganese	250		MG/KG	09/12/95	AS-5 R05
Sodium	~158	B	MG/KG	09/12/95	AS-5 R05
Nickel	5.9		MG/KG	09/12/95	AS-5 R05
Lead	13.2		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	6.1		MG/KG	09/13/95	AS-6 R05
Thallium	0.35		MG/KG	09/13/95	AS-6 R05
Uranium	0.64		MG/KG	09/13/95	AS-6 R05
Vanadium	15.4		MG/KG	09/12/95	AS-5 R05
Zinc	31.1	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0051-01
Ticket ID: FS-2263

Date: September 27, 1995
Lab ID: 231619

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	6810		MG/KG	09/12/95	AS-5 R05
Arsenic	0.56	N	MG/KG	09/21/95	AS-4 R01
Barium	190		MG/KG	09/12/95	AS-5 R05
Beryllium	0.56		MG/KG	09/08/95	AS-5 R05
Calcium	3190		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.7		MG/KG	09/12/95	AS-5 R05
Chromium	4.6		MG/KG	09/12/95	AS-5 R05
Copper	4.6		MG/KG	09/12/95	AS-5 R05
Iron	7880		MG/KG	09/12/95	AS-5 R05
Potassium	1420		MG/KG	09/12/95	AS-5 R05
Magnesium	1370		MG/KG	09/12/95	AS-5 R05
Manganese	306		MG/KG	09/12/95	AS-5 R05
Sodium	~97.3	B	MG/KG	09/12/95	AS-5 R05
Nickel	3.5		MG/KG	09/12/95	AS-5 R05
Lead	10.1		MG/KG	09/13/95	AS-6 R05
Antimony	~0.11	BN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	97.66		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	3.8		MG/KG	09/13/95	AS-6 R05
Thallium	~0.20	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.95		MG/KG	09/13/95	AS-6 R05
Vanadium	9.8		MG/KG	09/12/95	AS-5 R05
Zinc	23.9	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0052-01
Ticket ID: FS-2264

Date: September 27, 1995
Lab ID: 231620

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	7320		MG/KG	09/12/95	AS-5 R05
Arsenic	0.41	N	MG/KG	09/21/95	AS-4 R01
Barium	106		MG/KG	09/12/95	AS-5 R05
Beryllium	0.58		MG/KG	09/08/95	AS-5 R05
Calcium	2470		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.4		MG/KG	09/12/95	AS-5 R05
Chromium	5.2		MG/KG	09/12/95	AS-5 R05
Copper	3.3		MG/KG	09/12/95	AS-5 R05
Iron	8020		MG/KG	09/12/95	AS-5 R05
Potassium	1400		MG/KG	09/12/95	AS-5 R05
Magnesium	1430		MG/KG	09/12/95	AS-5 R05
Manganese	208		MG/KG	09/12/95	AS-5 R05
Sodium	~118	B	MG/KG	09/12/95	AS-5 R05
Nickel	3.9		MG/KG	09/12/95	AS-5 R05
Lead	8.3		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.62		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	3.8		MG/KG	09/13/95	AS-6 R05
Thallium	~0.20	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.60		MG/KG	09/13/95	AS-6 R05
Vanadium	9.5		MG/KG	09/12/95	AS-5 R05
Zinc	22.0	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0053-01
Ticket ID: FS-2265

Date: September 27, 1995
Lab ID: 231621

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	9450		MG/KG	09/12/95	AS-5 R05
Arsenic	0.42	N	MG/KG	09/21/95	AS-4 R01
Barium	103		MG/KG	09/12/95	AS-5 R05
Beryllium	0.74		MG/KG	09/08/95	AS-5 R05
Calcium	2760		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.2		MG/KG	09/12/95	AS-5 R05
Chromium	6.3		MG/KG	09/12/95	AS-5 R05
Copper	5.2		MG/KG	09/12/95	AS-5 R05
Iron	10300		MG/KG	09/12/95	AS-5 R05
Potassium	1430		MG/KG	09/12/95	AS-5 R05
Magnesium	1750		MG/KG	09/12/95	AS-5 R05
Manganese	114		MG/KG	09/12/95	AS-5 R05
Sodium	~123	B	MG/KG	09/12/95	AS-5 R05
Nickel	4.8		MG/KG	09/12/95	AS-5 R05
Lead	7.8		MG/KG	09/13/95	AS-6 R05
Antimony	~0.12	BN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.21	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	97.52		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.7		MG/KG	09/13/95	AS-6 R05
Thallium	0.22		MG/KG	09/13/95	AS-6 R05
Uranium	0.69		MG/KG	09/13/95	AS-6 R05
Vanadium	12.0		MG/KG	09/12/95	AS-5 R05
Zinc	26.4	N*	MG/KG	09/12/95	AS-5 R05

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V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0054-01
Ticket ID: FS-2266

Date: September 27, 1995
Lab ID: 231622

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected: .

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	17600		MG/KG	09/12/95	AS-5 R05
Arsenic	0.71	N	MG/KG	09/21/95	AS-4 R01
Barium	97.6		MG/KG	09/12/95	AS-5 R05
Beryllium	1.7		MG/KG	09/08/95	AS-5 R05
Calcium	3670		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.8		MG/KG	09/12/95	AS-5 R05
Chromium	9.9		MG/KG	09/12/95	AS-5 R05
Copper	8.4		MG/KG	09/12/95	AS-5 R05
Iron	16000		MG/KG	09/12/95	AS-5 R05
Potassium	1950		MG/KG	09/12/95	AS-5 R05
Magnesium	2830		MG/KG	09/12/95	AS-5 R05
Manganese	137		MG/KG	09/12/95	AS-5 R05
Sodium	~140	B	MG/KG	09/12/95	AS-5 R05
Nickel	7.3		MG/KG	09/12/95	AS-5 R05
Lead	12.2		MG/KG	09/13/95	AS-6 R05
Antimony	~0.11	BN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.21	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	96.42		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	8.3		MG/KG	09/13/95	AS-6 R05
Thallium	0.50		MG/KG	09/13/95	AS-6 R05
Uranium	1.1		MG/KG	09/13/95	AS-6 R05
Vanadium	20.7		MG/KG	09/12/95	AS-5 R05
Zinc	32.1	N*	MG/KG	09/12/95	AS-5 R05

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1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0055-01
Ticket ID: FS-2267

Date: September 27, 1995
Lab ID: 231623

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	2810		MG/KG	09/12/95	AS-5 R05
Arsenic	1.1	N	MG/KG	09/21/95	AS-4 R01
Barium	25.1		MG/KG	09/12/95	AS-5 R05
Beryllium	0.39		MG/KG	09/08/95	AS-5 R05
Calcium	882		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	1.4		MG/KG	09/12/95	AS-5 R05
Chromium	3.9		MG/KG	09/12/95	AS-5 R05
Copper	2.3		MG/KG	09/12/95	AS-5 R05
Iron	6950		MG/KG	09/12/95	AS-5 R05
Potassium	525		MG/KG	09/12/95	AS-5 R05
Magnesium	848		MG/KG	09/12/95	AS-5 R05
Manganese	200		MG/KG	09/12/95	AS-5 R05
Sodium	~126	B	MG/KG	09/12/95	AS-5 R05
Nickel	1.9		MG/KG	09/12/95	AS-5 R05
Lead	2.6		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.80		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	2.8		MG/KG	09/13/95	AS-6 R05
Thallium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Uranium	0.26		MG/KG	09/13/95	AS-6 R05
Vanadium	4.7		MG/KG	09/12/95	AS-5 R05
Zinc	19.3	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0056-01
Ticket ID: FS-2268

Date: September 27, 1995
Lab ID: 231624

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	5310		MG/KG	09/12/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/21/95	AS-4 R01
Barium	50.2		MG/KG	09/12/95	AS-5 R05
Beryllium	1.6		MG/KG	09/08/95	AS-5 R05
Calcium	1230		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	1.6		MG/KG	09/12/95	AS-5 R05
Chromium	4.3		MG/KG	09/12/95	AS-5 R05
Copper	4.4		MG/KG	09/12/95	AS-5 R05
Iron	7850		MG/KG	09/12/95	AS-5 R05
Potassium	674		MG/KG	09/12/95	AS-5 R05
Magnesium	1080		MG/KG	09/12/95	AS-5 R05
Manganese	292		MG/KG	09/12/95	AS-5 R05
Sodium	~103	B	MG/KG	09/12/95	AS-5 R05
Nickel	6.4		MG/KG	09/12/95	AS-5 R05
Lead	3.7		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.21	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	97.50		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	3.8		MG/KG	09/13/95	AS-6 R05
Thallium	~0.15	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.36		MG/KG	09/13/95	AS-6 R05
Vanadium	6.6		MG/KG	09/12/95	AS-5 R05
Zinc	20.9	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0058-01
Ticket ID: FS-2270

Date: September 27, 1995
Lab ID: 231626

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	6340		MG/KG	09/12/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/21/95	AS-4 R01
Barium	36.2		MG/KG	09/12/95	AS-5 R05
Beryllium	0.52		MG/KG	09/08/95	AS-5 R05
Calcium	1140		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	4.1		MG/KG	09/12/95	AS-5 R05
Chromium	6.0		MG/KG	09/12/95	AS-5 R05
Copper	3.8		MG/KG	09/12/95	AS-5 R05
Iron	9890		MG/KG	09/12/95	AS-5 R05
Potassium	1040		MG/KG	09/12/95	AS-5 R05
Magnesium	1450		MG/KG	09/12/95	AS-5 R05
Manganese	236		MG/KG	09/12/95	AS-5 R05
Sodium	~124	B	MG/KG	09/12/95	AS-5 R05
Nickel	4.3		MG/KG	09/12/95	AS-5 R05
Lead	6.3		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.21		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.4		MG/KG	09/13/95	AS-6 R05
Thallium	~0.19	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.43		MG/KG	09/13/95	AS-6 R05
Vanadium	10.1		MG/KG	09/12/95	AS-5 R05
Zinc	26.6	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0059-01
Ticket ID: FS-2271

Date: September 27, 1995
Lab ID: 231627

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected: .

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.42	U	MG/KG	09/12/95	AS-5 R05
Aluminum	27500		MG/KG	09/12/95	AS-5 R05
Arsenic	0.90	N	MG/KG	09/21/95	AS-4 R01
Barium	130		MG/KG	09/12/95	AS-5 R05
Beryllium	2.8		MG/KG	09/08/95	AS-5 R05
Calcium	5470		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.3		MG/KG	09/12/95	AS-5 R05
Chromium	14.1		MG/KG	09/12/95	AS-5 R05
Copper	12.6		MG/KG	09/12/95	AS-5 R05
Iron	21900		MG/KG	09/12/95	AS-5 R05
Potassium	2440		MG/KG	09/12/95	AS-5 R05
Magnesium	4300		MG/KG	09/12/95	AS-5 R05
Manganese	89.4		MG/KG	09/12/95	AS-5 R05
Sodium	~180	B	MG/KG	09/12/95	AS-5 R05
Nickel	11.7		MG/KG	09/12/95	AS-5 R05
Lead	15.8		MG/KG	09/13/95	AS-6 R05
Antimony	~0.11	BN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.21	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	95.41		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	12.5		MG/KG	09/13/95	AS-6 R05
Thallium	0.68		MG/KG	09/13/95	AS-6 R05
Uranium	1.6		MG/KG	09/13/95	AS-6 R05
Vanadium	29.0		MG/KG	09/12/95	AS-5 R05
Zinc	43.5	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0060-01
Ticket ID: FS-2272

Date: September 27, 1995
Lab ID: 231628

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	6630		MG/KG	09/12/95	AS-5 R05
Arsenic	0.48	N	MG/KG	09/21/95	AS-4 R01
Barium	141		MG/KG	09/12/95	AS-5 R05
Beryllium	0.47		MG/KG	09/08/95	AS-5 R05
Calcium	2800		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.1		MG/KG	09/12/95	AS-5 R05
Chromium	4.7		MG/KG	09/12/95	AS-5 R05
Copper	4.4		MG/KG	09/12/95	AS-5 R05
Iron	8070		MG/KG	09/12/95	AS-5 R05
Potassium	1140		MG/KG	09/12/95	AS-5 R05
Magnesium	1330		MG/KG	09/12/95	AS-5 R05
Manganese	298		MG/KG	09/12/95	AS-5 R05
Sodium	~68.3	B	MG/KG	09/12/95	AS-5 R05
Nickel	3.2		MG/KG	09/12/95	AS-5 R05
Lead	7.5		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.01		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	3.8		MG/KG	09/13/95	AS-6 R05
Thallium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Uranium	0.67		MG/KG	09/13/95	AS-6 R05
Vanadium	8.3		MG/KG	09/12/95	AS-5 R05
Zinc	23.2	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0061-01
Ticket ID: FS-2273

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Date: September 27, 1995
Lab ID: 231629

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	6920		MG/KG	09/12/95	AS-5 R05
Arsenic	0.36	N	MG/KG	09/21/95	AS-4 R01
Barium	87.1		MG/KG	09/12/95	AS-5 R05
Beryllium	0.53		MG/KG	09/08/95	AS-5 R05
Calcium	2980		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.3		MG/KG	09/12/95	AS-5 R05
Chromium	4.3		MG/KG	09/12/95	AS-5 R05
Copper	3.5		MG/KG	09/12/95	AS-5 R05
Iron	8500		MG/KG	09/12/95	AS-5 R05
Potassium	963		MG/KG	09/12/95	AS-5 R05
Magnesium	1380		MG/KG	09/12/95	AS-5 R05
Manganese	270		MG/KG	09/12/95	AS-5 R05
Sodium	~73.0	B	MG/KG	09/12/95	AS-5 R05
Nickel	4.1		MG/KG	09/12/95	AS-5 R05
Lead	5.3		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.45		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.1		MG/KG	09/13/95	AS-6 R05
Thallium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Uranium	0.54		MG/KG	09/13/95	AS-6 R05
Vanadium	9.0		MG/KG	09/12/95	AS-5 R05
Zinc	21.4	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0062-01
Ticket ID: FS-2274

Date: September 27, 1995
Lab ID: 231630

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	6980		MG/KG	09/12/95	AS-5 R05
Arsenic	0.45	N	MG/KG	09/21/95	AS-4 R01
Barium	54.1		MG/KG	09/12/95	AS-5 R05
Beryllium	0.52		MG/KG	09/08/95	AS-5 R05
Calcium	2040		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.1		MG/KG	09/12/95	AS-5 R05
Chromium	5.2		MG/KG	09/12/95	AS-5 R05
Copper	3.1		MG/KG	09/12/95	AS-5 R05
Iron	8990		MG/KG	09/12/95	AS-5 R05
Potassium	1170		MG/KG	09/12/95	AS-5 R05
Magnesium	1460		MG/KG	09/12/95	AS-5 R05
Manganese	221		MG/KG	09/12/95	AS-5 R05
Sodium	~82.3	B	MG/KG	09/12/95	AS-5 R05
Nickel	3.4		MG/KG	09/12/95	AS-5 R05
Lead	5.1		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.02		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.4		MG/KG	09/13/95	AS-6 R05
Thallium	~0.10	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.59		MG/KG	09/13/95	AS-6 R05
Vanadium	9.7		MG/KG	09/12/95	AS-5 R05
Zinc	24.1	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0063-01
Ticket ID: FS-2275

Date: September 27, 1995
Lab ID: 231631

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	6510		MG/KG	09/12/95	AS-5 R05
Arsenic	0.62	N	MG/KG	09/21/95	AS-4 R01
Barium	40.1		MG/KG	09/12/95	AS-5 R05
Beryllium	0.59		MG/KG	09/08/95	AS-5 R05
Calcium	1430		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.0		MG/KG	09/12/95	AS-5 R05
Chromium	5.5		MG/KG	09/12/95	AS-5 R05
Copper	3.5		MG/KG	09/12/95	AS-5 R05
Iron	8860		MG/KG	09/12/95	AS-5 R05
Potassium	969		MG/KG	09/12/95	AS-5 R05
Magnesium	1440		MG/KG	09/12/95	AS-5 R05
Manganese	161		MG/KG	09/12/95	AS-5 R05
Sodium	~83.1	B	MG/KG	09/12/95	AS-5 R05
Nickel	3.8		MG/KG	09/12/95	AS-5 R05
Lead	4.3		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.81		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.8		MG/KG	09/13/95	AS-6 R05
Thallium	~0.11	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.72		MG/KG	09/13/95	AS-6 R05
Vanadium	9.4		MG/KG	09/12/95	AS-5 R05
Zinc	24.7	N*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0064-01
Ticket ID: FS-2276

Date: September 27, 1995
Lab ID: 231632

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	20300		MG/KG	09/12/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/21/95	AS-4 R01
Barium	104		MG/KG	09/12/95	AS-5 R05
Beryllium	2.2		MG/KG	09/08/95	AS-5 R05
Calcium	3340		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.6		MG/KG	09/12/95	AS-5 R05
Chromium	11.4		MG/KG	09/12/95	AS-5 R05
Copper	8.9		MG/KG	09/12/95	AS-5 R05
Iron	17800		MG/KG	09/12/95	AS-5 R05
Potassium	2400		MG/KG	09/12/95	AS-5 R05
Magnesium	3240		MG/KG	09/12/95	AS-5 R05
Manganese	160		MG/KG	09/12/95	AS-5 R05
Sodium	~225	BE	MG/KG	09/12/95	AS-5 R05
Nickel	9.5		MG/KG	09/12/95	AS-5 R05
Lead	8.3		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.21	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	97.35		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	8.6	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.19	B	MG/KG	09/13/95	AS-6 R05
Uranium	2.0		MG/KG	09/13/95	AS-6 R05
Vanadium	19.1		MG/KG	09/12/95	AS-5 R05
Zinc	52.8	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0065-01
Ticket ID: FS-2277

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Date: September 27, 1995
Lab ID: 231633

Case: 14165
Date Received: Aug 22, 1995
Date Collected: .

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	9550		MG/KG	09/12/95	AS-5 R05
Arsenic	0.69	N	MG/KG	09/21/95	AS-4 R01
Barium	225		MG/KG	09/12/95	AS-5 R05
Beryllium	0.62		MG/KG	09/08/95	AS-5 R05
Calcium	3040		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.6		MG/KG	09/12/95	AS-5 R05
Chromium	6.6		MG/KG	09/12/95	AS-5 R05
Copper	5.3		MG/KG	09/12/95	AS-5 R05
Iron	10800		MG/KG	09/12/95	AS-5 R05
Potassium	1380		MG/KG	09/12/95	AS-5 R05
Magnesium	1550		MG/KG	09/12/95	AS-5 R05
Manganese	386		MG/KG	09/12/95	AS-5 R05
Sodium	~96.6	BE	MG/KG	09/12/95	AS-5 R05
Nickel	4.8		MG/KG	09/12/95	AS-5 R05
Lead	11.5		MG/KG	09/13/95	AS-6 R05
Antimony	~0.12	BN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.86		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.5	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.14	B	MG/KG	09/13/95	AS-6 R05
Uranium	1.8		MG/KG	09/13/95	AS-6 R05
Vanadium	12.6		MG/KG	09/12/95	AS-5 R05
Zinc	32.1	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0066-01
Ticket ID: FS-2278

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Date: September 27, 1995
Lab ID: 231634

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	10500		MG/KG	09/12/95	AS-5 R05
Arsenic	0.80	N	MG/KG	09/21/95	AS-4 R01
Barium	125		MG/KG	09/12/95	AS-5 R05
Beryllium	0.80		MG/KG	09/08/95	AS-5 R05
Calcium	2580		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	4.3		MG/KG	09/12/95	AS-5 R05
Chromium	7.1		MG/KG	09/12/95	AS-5 R05
Copper	4.8		MG/KG	09/12/95	AS-5 R05
Iron	11800		MG/KG	09/12/95	AS-5 R05
Potassium	1430		MG/KG	09/12/95	AS-5 R05
Magnesium	1590		MG/KG	09/12/95	AS-5 R05
Manganese	425		MG/KG	09/12/95	AS-5 R05
Sodium	~107	BE	MG/KG	09/12/95	AS-5 R05
Nickel	4.9		MG/KG	09/12/95	AS-5 R05
Lead	7.0		MG/KG	09/13/95	AS-6 R05
Antimony	~0.12	BN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.02		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.7	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.16	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.90		MG/KG	09/13/95	AS-6 R05
Vanadium	15.4		MG/KG	09/12/95	AS-5 R05
Zinc	44.8	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0067-01
Ticket ID: FS-2279

Date: September 27, 1995
Lab ID: 231635

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	9880		MG/KG	09/12/95	AS-5 R05
Arsenic	0.94	N	MG/KG	09/21/95	AS-4 R01
Barium	59.4		MG/KG	09/12/95	AS-5 R05
Beryllium	0.74		MG/KG	09/08/95	AS-5 R05
Calcium	1780		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.4		MG/KG	09/12/95	AS-5 R05
Chromium	8.1		MG/KG	09/12/95	AS-5 R05
Copper	4.2		MG/KG	09/12/95	AS-5 R05
Iron	12800		MG/KG	09/12/95	AS-5 R05
Potassium	1310		MG/KG	09/12/95	AS-5 R05
Magnesium	1740		MG/KG	09/12/95	AS-5 R05
Manganese	185		MG/KG	09/12/95	AS-5 R05
Sodium	~110	BE	MG/KG	09/12/95	AS-5 R05
Nickel	5.5		MG/KG	09/12/95	AS-5 R05
Lead	6.2		MG/KG	09/13/95	AS-6 R05
Antimony	~0.14	BN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.61		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.4	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.12	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.88		MG/KG	09/13/95	AS-6 R05
Vanadium	14.9		MG/KG	09/12/95	AS-5 R05
Zinc	73.8	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0068-01
Ticket ID: FS-2280

Date: September 27, 1995
Lab ID: 231636

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	9260		MG/KG	09/12/95	AS-5 R05
Arsenic	0.96	N	MG/KG	09/21/95	AS-4 R01
Barium	52.6		MG/KG	09/12/95	AS-5 R05
Beryllium	0.82		MG/KG	09/08/95	AS-5 R05
Calcium	1730		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.3		MG/KG	09/12/95	AS-5 R05
Chromium	6.8		MG/KG	09/12/95	AS-5 R05
Copper	4.2		MG/KG	09/12/95	AS-5 R05
Iron	12300		MG/KG	09/12/95	AS-5 R05
Potassium	1220		MG/KG	09/12/95	AS-5 R05
Magnesium	1550		MG/KG	09/12/95	AS-5 R05
Manganese	167		MG/KG	09/12/95	AS-5 R05
Sodium	~109	BE	MG/KG	09/12/95	AS-5 R05
Nickel	5.3		MG/KG	09/12/95	AS-5 R05
Lead	6.0		MG/KG	09/13/95	AS-6 R05
Antimony	~0.15	BN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.81		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.9	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.12	B	MG/KG	09/13/95	AS-6 R05
Uranium	1.1		MG/KG	09/13/95	AS-6 R05
Vanadium	15.1		MG/KG	09/12/95	AS-5 R05
Zinc	46.6	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0069-01
Ticket ID: FS-2281

Date: September 27, 1995
Lab ID: 231637

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	10400		MG/KG	09/12/95	AS-5 R05
Arsenic	0.86	N	MG/KG	09/21/95	AS-4 R01
Barium	60.2		MG/KG	09/12/95	AS-5 R05
Beryllium	1.3		MG/KG	09/08/95	AS-5 R05
Calcium	2450		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.0		MG/KG	09/12/95	AS-5 R05
Chromium	6.6		MG/KG	09/12/95	AS-5 R05
Copper	5.3		MG/KG	09/12/95	AS-5 R05
Iron	11700		MG/KG	09/12/95	AS-5 R05
Potassium	1490		MG/KG	09/12/95	AS-5 R05
Magnesium	1850		MG/KG	09/12/95	AS-5 R05
Manganese	82.3		MG/KG	09/12/95	AS-5 R05
Sodium	~180	BE	MG/KG	09/12/95	AS-5 R05
Nickel	5.2		MG/KG	09/12/95	AS-5 R05
Lead	5.5		MG/KG	09/13/95	AS-6 R05
Antimony	~0.17	BN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.12		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	6.8	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.16	B	MG/KG	09/13/95	AS-6 R05
Uranium	2.0		MG/KG	09/13/95	AS-6 R05
Vanadium	16.3		MG/KG	09/12/95	AS-5 R05
Zinc	35.7	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0070-01
Ticket ID: FS-2282

Date: September 27, 1995
Lab ID: 231638

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	5580		MG/KG	09/12/95	AS-5 R05
Arsenic	1.5	N	MG/KG	09/21/95	AS-4 R01
Barium	28.3		MG/KG	09/12/95	AS-5 R05
Beryllium	0.59		MG/KG	09/08/95	AS-5 R05
Calcium	1290		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.0		MG/KG	09/12/95	AS-5 R05
Chromium	4.6		MG/KG	09/12/95	AS-5 R05
Copper	3.5		MG/KG	09/12/95	AS-5 R05
Iron	11700		MG/KG	09/12/95	AS-5 R05
Potassium	710		MG/KG	09/12/95	AS-5 R05
Magnesium	1000		MG/KG	09/12/95	AS-5 R05
Manganese	294		MG/KG	09/12/95	AS-5 R05
Sodium	~103	BE	MG/KG	09/12/95	AS-5 R05
Nickel	3.7		MG/KG	09/12/95	AS-5 R05
Lead	2.8		MG/KG	09/13/95	AS-6 R05
Antimony	~0.17	BN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.21	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	97.08		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.7	E	MG/KG	09/13/95	AS-6 R05
Thallium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Uranium	0.46		MG/KG	09/13/95	AS-6 R05
Vanadium	10.4		MG/KG	09/12/95	AS-5 R05
Zinc	47.8	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0071-01
Ticket ID: FS-2283

Date: September 27, 1995
Lab ID: 231639

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	7090		MG/KG	09/12/95	AS-5 R05
Arsenic	0.56	N	MG/KG	09/21/95	AS-4 R01
Barium	249		MG/KG	09/12/95	AS-5 R05
Beryllium	0.70		MG/KG	09/08/95	AS-5 R05
Calcium	3280		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	2.7		MG/KG	09/12/95	AS-5 R05
Chromium	4.4		MG/KG	09/12/95	AS-5 R05
Copper	4.3		MG/KG	09/12/95	AS-5 R05
Iron	7900		MG/KG	09/12/95	AS-5 R05
Potassium	1460		MG/KG	09/12/95	AS-5 R05
Magnesium	1290		MG/KG	09/12/95	AS-5 R05
Manganese	294		MG/KG	09/12/95	AS-5 R05
Sodium	~52.5	BE	MG/KG	09/12/95	AS-5 R05
Nickel	4.1		MG/KG	09/12/95	AS-5 R05
Lead	8.7		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.05		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.3	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.17	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.89		MG/KG	09/13/95	AS-6 R05
Vanadium	9.8		MG/KG	09/12/95	AS-5 R05
Zinc	25.1	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0072-01
Ticket ID: FS-2284

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Date: September 27, 1995
Lab ID: 231640

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	7830		MG/KG	09/12/95	AS-5 R05
Arsenic	0.82	N	MG/KG	09/21/95	AS-4 R01
Barium	114		MG/KG	09/12/95	AS-5 R05
Beryllium	0.74		MG/KG	09/08/95	AS-5 R05
Calcium	2290		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.3		MG/KG	09/12/95	AS-5 R05
Chromium	5.2		MG/KG	09/12/95	AS-5 R05
Copper	3.5		MG/KG	09/12/95	AS-5 R05
Iron	8880		MG/KG	09/12/95	AS-5 R05
Potassium	1460		MG/KG	09/12/95	AS-5 R05
Magnesium	1320		MG/KG	09/12/95	AS-5 R05
Manganese	255		MG/KG	09/12/95	AS-5 R05
Sodium	~60.7	BE	MG/KG	09/12/95	AS-5 R05
Nickel	4.9		MG/KG	09/12/95	AS-5 R05
Lead	7.2		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.04		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	4.9	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.18	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.69		MG/KG	09/13/95	AS-6 R05
Vanadium	11.1		MG/KG	09/12/95	AS-5 R05
Zinc	25.2	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0073-01
Ticket ID: FS-2285

Date: September 27, 1995
Lab ID: 231641

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	8720		MG/KG	09/12/95	AS-5 R05
Arsenic	1.1	N	MG/KG	09/21/95	AS-4 R01
Barium	72.5		MG/KG	09/12/95	AS-5 R05
Beryllium	0.76		MG/KG	09/08/95	AS-5 R05
Calcium	1840		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.2		MG/KG	09/12/95	AS-5 R05
Chromium	5.8		MG/KG	09/12/95	AS-5 R05
Copper	4.1		MG/KG	09/12/95	AS-5 R05
Iron	10500		MG/KG	09/12/95	AS-5 R05
Potassium	1650		MG/KG	09/12/95	AS-5 R05
Magnesium	1470		MG/KG	09/12/95	AS-5 R05
Manganese	266		MG/KG	09/12/95	AS-5 R05
Sodium	~59.6	BE	MG/KG	09/12/95	AS-5 R05
Nickel	5.4		MG/KG	09/12/95	AS-5 R05
Lead	8.5		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.24		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.2	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.18	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.67		MG/KG	09/13/95	AS-6 R05
Vanadium	13.6		MG/KG	09/12/95	AS-5 R05
Zinc	33.9	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0074-01
Ticket ID: FS-2286

Date: September 27, 1995
Lab ID: 231642

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	8740		MG/KG	09/12/95	AS-5 R05
Arsenic	1.0	N	MG/KG	09/21/95	AS-4 R01
Barium	85.3		MG/KG	09/12/95	AS-5 R05
Beryllium	0.81		MG/KG	09/08/95	AS-5 R05
Calcium	1990		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.7		MG/KG	09/12/95	AS-5 R05
Chromium	6.2		MG/KG	09/12/95	AS-5 R05
Copper	4.1		MG/KG	09/12/95	AS-5 R05
Iron	10000		MG/KG	09/12/95	AS-5 R05
Potassium	1410		MG/KG	09/12/95	AS-5 R05
Magnesium	1520		MG/KG	09/12/95	AS-5 R05
Manganese	315		MG/KG	09/12/95	AS-5 R05
Sodium	~67.8	BE	MG/KG	09/12/95	AS-5 R05
Nickel	5.3		MG/KG	09/12/95	AS-5 R05
Lead	8.0		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.02		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.4	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.19	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.74		MG/KG	09/13/95	AS-6 R05
Vanadium	13.1		MG/KG	09/12/95	AS-5 R05
Zinc	35.3	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0075-01
Ticket ID: FS-2287

Date: September 27, 1995
Lab ID: 231643

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	7490		MG/KG	09/12/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/21/95	AS-4 R01
Barium	105		MG/KG	09/12/95	AS-5 R05
Beryllium	0.77		MG/KG	09/08/95	AS-5 R05
Calcium	1850		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	9.3		MG/KG	09/12/95	AS-5 R05
Chromium	5.6		MG/KG	09/12/95	AS-5 R05
Copper	3.9		MG/KG	09/12/95	AS-5 R05
Iron	10000		MG/KG	09/12/95	AS-5 R05
Potassium	1040		MG/KG	09/12/95	AS-5 R05
Magnesium	1310		MG/KG	09/12/95	AS-5 R05
Manganese	679		MG/KG	09/12/95	AS-5 R05
Sodium	~75.7	BE	MG/KG	09/12/95	AS-5 R05
Nickel	6.5		MG/KG	09/12/95	AS-5 R05
Lead	10.7		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.3	E	MG/KG	09/13/95	AS-6 R05
Thallium	0.33		MG/KG	09/13/95	AS-6 R05
Uranium	0.74		MG/KG	09/13/95	AS-6 R05
Vanadium	15.8		MG/KG	09/12/95	AS-5 R05
Zinc	29.0	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0076-01
Ticket ID: FS-2288

Date: September 27, 1995
Lab ID: 231644

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected: .

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	7990		MG/KG	09/12/95	AS-5 R05
Arsenic	1.1	N	MG/KG	09/21/95	AS-4 R01
Barium	81.5		MG/KG	09/12/95	AS-5 R05
Beryllium	0.77		MG/KG	09/08/95	AS-5 R05
Calcium	1880		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	4.4		MG/KG	09/12/95	AS-5 R05
Chromium	5.9		MG/KG	09/12/95	AS-5 R05
Copper	3.9		MG/KG	09/12/95	AS-5 R05
Iron	9820		MG/KG	09/12/95	AS-5 R05
Potassium	1240		MG/KG	09/12/95	AS-5 R05
Magnesium	1460		MG/KG	09/12/95	AS-5 R05
Manganese	311		MG/KG	09/12/95	AS-5 R05
Sodium	~86.7	BE	MG/KG	09/12/95	AS-5 R05
Nickel	5.5		MG/KG	09/12/95	AS-5 R05
Lead	8.7		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.82		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.6	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.19	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.74		MG/KG	09/13/95	AS-6 R05
Vanadium	13.7		MG/KG	09/12/95	AS-5 R05
Zinc	27.4	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0077-01
Ticket ID: FS-2289

Date: September 27, 1995
Lab ID: 231645

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected: .

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/12/95	AS-5 R05
Aluminum	8570		MG/KG	09/12/95	AS-5 R05
Arsenic	1.1	N	MG/KG	09/21/95	AS-4 R01
Barium	98.1		MG/KG	09/12/95	AS-5 R05
Beryllium	0.84		MG/KG	09/08/95	AS-5 R05
Calcium	2540		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	3.7		MG/KG	09/12/95	AS-5 R05
Chromium	5.6		MG/KG	09/12/95	AS-5 R05
Copper	3.9		MG/KG	09/12/95	AS-5 R05
Iron	9580		MG/KG	09/12/95	AS-5 R05
Potassium	1330		MG/KG	09/12/95	AS-5 R05
Magnesium	1610		MG/KG	09/12/95	AS-5 R05
Manganese	284		MG/KG	09/12/95	AS-5 R05
Sodium	~122	BE	MG/KG	09/12/95	AS-5 R05
Nickel	4.8		MG/KG	09/12/95	AS-5 R05
Lead	8.1		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.65		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.8	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.19	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.74		MG/KG	09/13/95	AS-6 R05
Vanadium	12.6		MG/KG	09/12/95	AS-5 R05
Zinc	44.2	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0078-01
Ticket ID: FS-2290

Date: September 27, 1995
Lab ID: 231646

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	9310		MG/KG	09/12/95	AS-5 R05
Arsenic	1.1	N	MG/KG	09/21/95	AS-4 R01
Barium	110		MG/KG	09/12/95	AS-5 R05
Beryllium	0.86		MG/KG	09/08/95	AS-5 R05
Calcium	2600		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	4.5		MG/KG	09/12/95	AS-5 R05
Chromium	6.5		MG/KG	09/12/95	AS-5 R05
Copper	5.0		MG/KG	09/12/95	AS-5 R05
Iron	10500		MG/KG	09/12/95	AS-5 R05
Potassium	1560		MG/KG	09/12/95	AS-5 R05
Magnesium	1740		MG/KG	09/12/95	AS-5 R05
Manganese	373		MG/KG	09/12/95	AS-5 R05
Sodium	~129	BE	MG/KG	09/12/95	AS-5 R05
Nickel	5.6		MG/KG	09/12/95	AS-5 R05
Lead	8.6		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	99.02		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	6.1	E	MG/KG	09/13/95	AS-6 R05
Thallium	0.21		MG/KG	09/13/95	AS-6 R05
Uranium	0.68		MG/KG	09/13/95	AS-6 R05
Vanadium	14.4		MG/KG	09/12/95	AS-5 R05
Zinc	30.4	*	MG/KG	09/12/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0079-01
Ticket ID: FS-2291

Date: September 27, 1995
Lab ID: 231647

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414165

Case: 14165
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/12/95	AS-5 R05
Aluminum	8260		MG/KG	09/12/95	AS-5 R05
Arsenic	1.1	N	MG/KG	09/21/95	AS-4 R01
Barium	88.7		MG/KG	09/12/95	AS-5 R05
Beryllium	0.77		MG/KG	09/08/95	AS-5 R05
Calcium	1990		MG/KG	09/12/95	AS-5 R05
Cadmium	<0.10	U	MG/KG	09/13/95	AS-6 R05
Cobalt	4.3		MG/KG	09/12/95	AS-5 R05
Chromium	5.8		MG/KG	09/12/95	AS-5 R05
Copper	4.0		MG/KG	09/12/95	AS-5 R05
Iron	9290		MG/KG	09/12/95	AS-5 R05
Potassium	1380		MG/KG	09/12/95	AS-5 R05
Magnesium	1500		MG/KG	09/12/95	AS-5 R05
Manganese	280		MG/KG	09/12/95	AS-5 R05
Sodium	~125	BE	MG/KG	09/12/95	AS-5 R05
Nickel	5.0		MG/KG	09/12/95	AS-5 R05
Lead	8.1		MG/KG	09/13/95	AS-6 R05
Antimony	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/08/95	AS-5 R05
Percent Solids	98.85		%	09/01/95	M-8 R00
Tantalum	<0.10	UN	MG/KG	09/13/95	AS-6 R05
Thorium	5.8	E	MG/KG	09/13/95	AS-6 R05
Thallium	~0.18	B	MG/KG	09/13/95	AS-6 R05
Uranium	0.50		MG/KG	09/13/95	AS-6 R05
Vanadium	13.3		MG/KG	09/12/95	AS-5 R05
Zinc	23.3	*	MG/KG	09/12/95	AS-5 R05

APPENDIX B
Laboratory Analytical Results for HF-Digestable Soil Samples from MDA-P, TA-16, LANL

Notes for Result Quality recorded on the following tables of analytical results:

B: Reading was less than the Required Detection Limit (RDL), but greater than ot equal to the actual Detection Limit (DL).
E: Serial dilutions differed from the original results by more than 10% and the orginal results were more than 50 times the instrumental dectection limits (IDLs).
N: Spike sample recoveris not within control limits.
U: Analyte not detected.
*: duplicate analyses were not within control limits.

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ANALYTICAL RESULTS

Customer ID: 0816-95-0024-01
Ticket ID: FS-2236

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231519

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/14/95	AS-5 R05
Aluminum	60900		MG/KG	09/14/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/20/95	AS-4 R01
Barium	602		MG/KG	09/14/95	AS-5 R05
Beryllium	1.4		MG/KG	09/12/95	AS-5 R05
Calcium	4800	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.26		MG/KG	09/15/95	AS-6 R05
Cobalt	7.0	*	MG/KG	09/14/95	AS-5 R05
Chromium	11.2		MG/KG	09/14/95	AS-5 R05
Copper	9.7		MG/KG	09/14/95	AS-5 R05
Iron	16900		MG/KG	09/14/95	AS-5 R05
Potassium	29100		MG/KG	09/14/95	AS-5 R05
Magnesium	2280		MG/KG	09/14/95	AS-5 R05
Manganese	449		MG/KG	09/14/95	AS-5 R05
Sodium	24500		MG/KG	09/14/95	AS-5 R05
Nickel	5.7		MG/KG	09/14/95	AS-5 R05
Lead	24.3		MG/KG	09/15/95	AS-6 R05
Antimony	~0.49	B	MG/KG	09/15/95	AS-6 R05
Selenium	1.8		MG/KG	09/18/95	AS-5 R05
Percent Solids	97.83		%	09/01/95	M-8 R00
Tantalum	1.6		MG/KG	09/17/95	AS-6 R05
Thorium	7.3	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.34		MG/KG	09/15/95	AS-6 R05
Uranium	4.6	*	MG/KG	09/15/95	AS-6 R05
Vanadium	20.1		MG/KG	09/14/95	AS-5 R05
Zinc	73.1		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0025-01
Ticket ID: FS-2237

Date: September 29, 1995
Lab ID: 231520

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected: .

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/14/95	AS-5 R05
Aluminum	71200		MG/KG	09/14/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/20/95	AS-4 R01
Barium	445		MG/KG	09/14/95	AS-5 R05
Beryllium	1.8		MG/KG	09/12/95	AS-5 R05
Calcium	6380	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.25		MG/KG	09/15/95	AS-6 R05
Cobalt	6.2	*	MG/KG	09/14/95	AS-5 R05
Chromium	11.8		MG/KG	09/14/95	AS-5 R05
Copper	9.7		MG/KG	09/14/95	AS-5 R05
Iron	16600		MG/KG	09/14/95	AS-5 R05
Potassium	32100		MG/KG	09/14/95	AS-5 R05
Magnesium	2450		MG/KG	09/14/95	AS-5 R05
Manganese	543		MG/KG	09/14/95	AS-5 R05
Sodium	23500		MG/KG	09/14/95	AS-5 R05
Nickel	6.5		MG/KG	09/14/95	AS-5 R05
Lead	18.4		MG/KG	09/15/95	AS-6 R05
Antimony	~0.45	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.51		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	9.8	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.39		MG/KG	09/15/95	AS-6 R05
Uranium	2.2	*	MG/KG	09/15/95	AS-6 R05
Vanadium	20.2		MG/KG	09/14/95	AS-5 R05
Zinc	71.9		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0026-01
Ticket ID: FS-2238

Date: September 29, 1995
Lab ID: 231521

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected: .

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/14/95	AS-5 R05
Aluminum	69500		MG/KG	09/14/95	AS-5 R05
Arsenic	0.98	N	MG/KG	09/20/95	AS-4 R01
Barium	461		MG/KG	09/14/95	AS-5 R05
Beryllium	1.8		MG/KG	09/12/95	AS-5 R05
Calcium	6380	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.20		MG/KG	09/15/95	AS-6 R05
Cobalt	6.6	*	MG/KG	09/14/95	AS-5 R05
Chromium	11.4		MG/KG	09/14/95	AS-5 R05
Copper	8.3		MG/KG	09/14/95	AS-5 R05
Iron	17200		MG/KG	09/14/95	AS-5 R05
Potassium	30300		MG/KG	09/14/95	AS-5 R05
Magnesium	2650		MG/KG	09/14/95	AS-5 R05
Manganese	537		MG/KG	09/14/95	AS-5 R05
Sodium	23400		MG/KG	09/14/95	AS-5 R05
Nickel	6.9		MG/KG	09/14/95	AS-5 R05
Lead	17.3		MG/KG	09/15/95	AS-6 R05
Antimony	~0.41	B	MG/KG	09/15/95	AS-6 R05
Selenium	~0.71	B	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.46		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	9.5	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.38		MG/KG	09/15/95	AS-6 R05
Uranium	2.0	*	MG/KG	09/15/95	AS-6 R05
Vanadium	21.5		MG/KG	09/14/95	AS-5 R05
Zinc	71.0		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0027-01
Ticket ID: FS-2239

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231522

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	65500		MG/KG	09/14/95	AS-5 R05
Arsenic	0.71	N	MG/KG	09/20/95	AS-4 R01
Barium	312		MG/KG	09/14/95	AS-5 R05
Beryllium	2.1		MG/KG	09/12/95	AS-5 R05
Calcium	3840	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.15		MG/KG	09/15/95	AS-6 R05
Cobalt	3.2	*	MG/KG	09/14/95	AS-5 R05
Chromium	2.1		MG/KG	09/14/95	AS-5 R05
Copper	2.4		MG/KG	09/14/95	AS-5 R05
Iron	13900		MG/KG	09/14/95	AS-5 R05
Potassium	37300		MG/KG	09/14/95	AS-5 R05
Magnesium	1180		MG/KG	09/14/95	AS-5 R05
Manganese	409		MG/KG	09/14/95	AS-5 R05
Sodium	26500		MG/KG	09/14/95	AS-5 R05
Nickel	1.6		MG/KG	09/14/95	AS-5 R05
Lead	17.0		MG/KG	09/15/95	AS-6 R05
Antimony	~0.22	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.44		%	09/01/95	M-8 R00
Tantalum	2.5		MG/KG	09/17/95	AS-6 R05
Thorium	10.8	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.37		MG/KG	09/15/95	AS-6 R05
Uranium	2.3	*	MG/KG	09/15/95	AS-6 R05
Vanadium	6.9		MG/KG	09/14/95	AS-5 R05
Zinc	54.0		MG/KG	09/14/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0028-01
Ticket ID: FS-2240

Date: September 29, 1995
Lab ID: 231523

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	70200		MG/KG	09/14/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/20/95	AS-4 R01
Barium	479		MG/KG	09/14/95	AS-5 R05
Beryllium	1.5		MG/KG	09/12/95	AS-5 R05
Calcium	5280	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.20		MG/KG	09/15/95	AS-6 R05
Cobalt	7.1	*	MG/KG	09/14/95	AS-5 R05
Chromium	10.1		MG/KG	09/14/95	AS-5 R05
Copper	4.6		MG/KG	09/14/95	AS-5 R05
Iron	18400		MG/KG	09/14/95	AS-5 R05
Potassium	32100		MG/KG	09/14/95	AS-5 R05
Magnesium	2030		MG/KG	09/14/95	AS-5 R05
Manganese	456		MG/KG	09/14/95	AS-5 R05
Sodium	26800		MG/KG	09/14/95	AS-5 R05
Nickel	5.1		MG/KG	09/14/95	AS-5 R05
Lead	25.9		MG/KG	09/15/95	AS-6 R05
Antimony	~0.34	B	MG/KG	09/15/95	AS-6 R05
Selenium	~0.39	B	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	8.3	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.68		MG/KG	09/15/95	AS-6 R05
Uranium	1.5	*	MG/KG	09/15/95	AS-6 R05
Vanadium	20.5		MG/KG	09/14/95	AS-5 R05
Zinc	70.1		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0029-01
Ticket ID: FS-2241

Date: September 29, 1995
Lab ID: 231524

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	69700		MG/KG	09/14/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/20/95	AS-4 R01
Barium	440		MG/KG	09/14/95	AS-5 R05
Beryllium	1.6		MG/KG	09/12/95	AS-5 R05
Calcium	4920	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.17		MG/KG	09/15/95	AS-6 R05
Cobalt	5.8	*	MG/KG	09/14/95	AS-5 R05
Chromium	9.0		MG/KG	09/14/95	AS-5 R05
Copper	4.8		MG/KG	09/14/95	AS-5 R05
Iron	17000		MG/KG	09/14/95	AS-5 R05
Potassium	32300		MG/KG	09/14/95	AS-5 R05
Magnesium	1890		MG/KG	09/14/95	AS-5 R05
Manganese	349		MG/KG	09/14/95	AS-5 R05
Sodium	26400		MG/KG	09/14/95	AS-5 R05
Nickel	5.5		MG/KG	09/14/95	AS-5 R05
Lead	26.6		MG/KG	09/15/95	AS-6 R05
Antimony	~0.36	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	2.2		MG/KG	09/17/95	AS-6 R05
Thorium	8.3	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.71		MG/KG	09/15/95	AS-6 R05
Uranium	1.4	*	MG/KG	09/15/95	AS-6 R05
Vanadium	20.3		MG/KG	09/14/95	AS-5 R05
Zinc	60.7		MG/KG	09/14/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0030-01
Ticket ID: FS-2242

Date: September 29, 1995
Lab ID: 231525

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	72300		MG/KG	09/14/95	AS-5 R05
Arsenic	1.1	N	MG/KG	09/20/95	AS-4 R01
Barium	198		MG/KG	09/14/95	AS-5 R05
Beryllium	2.9		MG/KG	09/12/95	AS-5 R05
Calcium	2420	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.17		MG/KG	09/15/95	AS-6 R05
Cobalt	2.6	*	MG/KG	09/14/95	AS-5 R05
Chromium	3.1		MG/KG	09/14/95	AS-5 R05
Copper	3.7		MG/KG	09/14/95	AS-5 R05
Iron	14200		MG/KG	09/14/95	AS-5 R05
Potassium	37000		MG/KG	09/14/95	AS-5 R05
Magnesium	767		MG/KG	09/14/95	AS-5 R05
Manganese	318		MG/KG	09/14/95	AS-5 R05
Sodium	29900		MG/KG	09/14/95	AS-5 R05
Nickel	2.4		MG/KG	09/14/95	AS-5 R05
Lead	18.0		MG/KG	09/15/95	AS-6 R05
Antimony	~0.26	B	MG/KG	09/15/95	AS-6 R05
Selenium	~0.37	B	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.07		%	09/01/95	M-8 R00
Tantalum	2.8		MG/KG	09/17/95	AS-6 R05
Thorium	10.6	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.29		MG/KG	09/15/95	AS-6 R05
Uranium	1.5	*	MG/KG	09/15/95	AS-6 R05
Vanadium	8.7		MG/KG	09/14/95	AS-5 R05
Zinc	55.4		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0031-01
Ticket ID: FS-2243

Date: September 29, 1995
Lab ID: 231526

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	64800		MG/KG	09/14/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/20/95	AS-4 R01
Barium	427		MG/KG	09/14/95	AS-5 R05
Beryllium	2.0		MG/KG	09/12/95	AS-5 R05
Calcium	5430	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.26		MG/KG	09/15/95	AS-6 R05
Cobalt	5.2	*	MG/KG	09/14/95	AS-5 R05
Chromium	8.6		MG/KG	09/14/95	AS-5 R05
Copper	6.2		MG/KG	09/14/95	AS-5 R05
Iron	14500		MG/KG	09/14/95	AS-5 R05
Potassium	31900		MG/KG	09/14/95	AS-5 R05
Magnesium	1820		MG/KG	09/14/95	AS-5 R05
Manganese	438		MG/KG	09/14/95	AS-5 R05
Sodium	23700		MG/KG	09/14/95	AS-5 R05
Nickel	5.4		MG/KG	09/14/95	AS-5 R05
Lead	27.3		MG/KG	09/15/95	AS-6 R05
Antimony	~0.44	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.05		%	09/01/95	M-8 R00
Tantalum	2.3		MG/KG	09/17/95	AS-6 R05
Thorium	9.7	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.59		MG/KG	09/15/95	AS-6 R05
Uranium	2.2	*	MG/KG	09/15/95	AS-6 R05
Vanadium	17.4		MG/KG	09/14/95	AS-5 R05
Zinc	56.9		MG/KG	09/14/95	AS-5 R05

.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0032-01
Ticket ID: FS-2244

Date: September 29, 1995
Lab ID: 231527

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	65100		MG/KG	09/14/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/20/95	AS-4 R01
Barium	337		MG/KG	09/14/95	AS-5 R05
Beryllium	2.1		MG/KG	09/12/95	AS-5 R05
Calcium	4340	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.19		MG/KG	09/15/95	AS-6 R05
Cobalt	5.3	*	MG/KG	09/14/95	AS-5 R05
Chromium	8.3		MG/KG	09/14/95	AS-5 R05
Copper	4.5		MG/KG	09/14/95	AS-5 R05
Iron	16700		MG/KG	09/14/95	AS-5 R05
Potassium	31800		MG/KG	09/14/95	AS-5 R05
Magnesium	1670		MG/KG	09/14/95	AS-5 R05
Manganese	475		MG/KG	09/14/95	AS-5 R05
Sodium	24300		MG/KG	09/14/95	AS-5 R05
Nickel	5.0		MG/KG	09/14/95	AS-5 R05
Lead	21.9		MG/KG	09/15/95	AS-6 R05
Antimony	~0.35	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.42		%	09/01/95	M-8 R00
Tantalum	2.3		MG/KG	09/17/95	AS-6 R05
Thorium	9.8	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.58		MG/KG	09/15/95	AS-6 R05
Uranium	1.7	*	MG/KG	09/15/95	AS-6 R05
Vanadium	17.4		MG/KG	09/14/95	AS-5 R05
Zinc	59.5		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0033-01
Ticket ID: FS-2245

Date: September 29, 1995
Lab ID: 231528

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	67500		MG/KG	09/14/95	AS-5 R05
Arsenic	1.0	N	MG/KG	09/20/95	AS-4 R01
Barium	353		MG/KG	09/14/95	AS-5 R05
Beryllium	2.1		MG/KG	09/12/95	AS-5 R05
Calcium	4080	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.17		MG/KG	09/15/95	AS-6 R05
Cobalt	4.8	*	MG/KG	09/14/95	AS-5 R05
Chromium	7.4		MG/KG	09/14/95	AS-5 R05
Copper	3.6		MG/KG	09/14/95	AS-5 R05
Iron	15300		MG/KG	09/14/95	AS-5 R05
Potassium	25000		MG/KG	09/14/95	AS-5 R05
Magnesium	1610		MG/KG	09/14/95	AS-5 R05
Manganese	410		MG/KG	09/14/95	AS-5 R05
Sodium	26200		MG/KG	09/14/95	AS-5 R05
Nickel	4.5		MG/KG	09/14/95	AS-5 R05
Lead	20.0		MG/KG	09/15/95	AS-6 R05
Antimony	~0.27	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.63		%	09/01/95	M-8 R00
Tantalum	2.2		MG/KG	09/17/95	AS-6 R05
Thorium	8.7	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.53		MG/KG	09/15/95	AS-6 R05
Uranium	1.5	*	MG/KG	09/15/95	AS-6 R05
Vanadium	15.2		MG/KG	09/14/95	AS-5 R05
Zinc	55.7		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0034-01
Ticket ID: FS-2246

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231529

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	67400		MG/KG	09/14/95	AS-5 R05
Arsenic	1.0	N	MG/KG	09/20/95	AS-4 R01
Barium	318		MG/KG	09/14/95	AS-5 R05
Beryllium	1.8		MG/KG	09/12/95	AS-5 R05
Calcium	3430	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.14		MG/KG	09/15/95	AS-6 R05
Cobalt	4.6	*	MG/KG	09/14/95	AS-5 R05
Chromium	6.0		MG/KG	09/14/95	AS-5 R05
Copper	2.8		MG/KG	09/14/95	AS-5 R05
Iron	15000		MG/KG	09/14/95	AS-5 R05
Potassium	33900		MG/KG	09/14/95	AS-5 R05
Magnesium	1250		MG/KG	09/14/95	AS-5 R05
Manganese	318		MG/KG	09/14/95	AS-5 R05
Sodium	25900		MG/KG	09/14/95	AS-5 R05
Nickel	4.2		MG/KG	09/14/95	AS-5 R05
Lead	19.1		MG/KG	09/15/95	AS-6 R05
Antimony	~0.25	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.43		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	8.6	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.55		MG/KG	09/15/95	AS-6 R05
Uranium	1.4	*	MG/KG	09/15/95	AS-6 R05
Vanadium	14.8		MG/KG	09/14/95	AS-5 R05
Zinc	53.8		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0035-01
Ticket ID: FS-2247

Date: September 29, 1995
Lab ID: 231530

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	69600		MG/KG	09/14/95	AS-5 R05
Arsenic	1.4	N	MG/KG	09/20/95	AS-4 R01
Barium	190		MG/KG	09/14/95	AS-5 R05
Beryllium	2.5		MG/KG	09/12/95	AS-5 R05
Calcium	2360	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.12		MG/KG	09/15/95	AS-6 R05
Cobalt	4.6	*	MG/KG	09/14/95	AS-5 R05
Chromium	4.9		MG/KG	09/14/95	AS-5 R05
Copper	3.3		MG/KG	09/14/95	AS-5 R05
Iron	13400		MG/KG	09/14/95	AS-5 R05
Potassium	34300		MG/KG	09/14/95	AS-5 R05
Magnesium	1000		MG/KG	09/14/95	AS-5 R05
Manganese	445		MG/KG	09/14/95	AS-5 R05
Sodium	25400		MG/KG	09/14/95	AS-5 R05
Nickel	3.7		MG/KG	09/14/95	AS-5 R05
Lead	23.4		MG/KG	09/15/95	AS-6 R05
Antimony	~0.35	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.61		%	09/01/95	M-8 R00
Tantalum	2.8		MG/KG	09/17/95	AS-6 R05
Thorium	11.2	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.31		MG/KG	09/15/95	AS-6 R05
Uranium	1.7	*	MG/KG	09/15/95	AS-6 R05
Vanadium	13.4		MG/KG	09/14/95	AS-5 R05
Zinc	55.5		MG/KG	09/14/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0036-01
Ticket ID: FS-2248

Date: September 29, 1995
Lab ID: 231531

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/14/95	AS-5 R05
Aluminum	58600		MG/KG	09/14/95	AS-5 R05
Arsenic	1.4	N	MG/KG	09/20/95	AS-4 R01
Barium	455		MG/KG	09/14/95	AS-5 R05
Beryllium	1.9		MG/KG	09/12/95	AS-5 R05
Calcium	6000	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.16		MG/KG	09/15/95	AS-6 R05
Cobalt	7.0	*	MG/KG	09/14/95	AS-5 R05
Chromium	13.1		MG/KG	09/14/95	AS-5 R05
Copper	8.5		MG/KG	09/14/95	AS-5 R05
Iron	14300		MG/KG	09/14/95	AS-5 R05
Potassium	26500		MG/KG	09/14/95	AS-5 R05
Magnesium	2410		MG/KG	09/14/95	AS-5 R05
Manganese	498		MG/KG	09/14/95	AS-5 R05
Sodium	18800		MG/KG	09/14/95	AS-5 R05
Nickel	7.3		MG/KG	09/14/95	AS-5 R05
Lead	22.4		MG/KG	09/15/95	AS-6 R05
Antimony	~0.46	B	MG/KG	09/15/95	AS-6 R05
Selenium	~0.24	B	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.63		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	9.6	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.49		MG/KG	09/15/95	AS-6 R05
Uranium	2.1	*	MG/KG	09/15/95	AS-6 R05
Vanadium	24.6		MG/KG	09/14/95	AS-5 R05
Zinc	58.5		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0037-01
Ticket ID: FS-2249

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231532

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/14/95	AS-5 R05
Aluminum	63100		MG/KG	09/14/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/20/95	AS-4 R01
Barium	435		MG/KG	09/14/95	AS-5 R05
Beryllium	2.1		MG/KG	09/12/95	AS-5 R05
Calcium	5720	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.17		MG/KG	09/15/95	AS-6 R05
Cobalt	8.4	*	MG/KG	09/14/95	AS-5 R05
Chromium	16.1		MG/KG	09/14/95	AS-5 R05
Copper	10.8		MG/KG	09/14/95	AS-5 R05
Iron	16900		MG/KG	09/14/95	AS-5 R05
Potassium	27600		MG/KG	09/14/95	AS-5 R05
Magnesium	2760		MG/KG	09/14/95	AS-5 R05
Manganese	598		MG/KG	09/14/95	AS-5 R05
Sodium	19200		MG/KG	09/14/95	AS-5 R05
Nickel	8.7		MG/KG	09/14/95	AS-5 R05
Lead	24.5		MG/KG	09/15/95	AS-6 R05
Antimony	~0.47	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.66		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	11.4	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.57		MG/KG	09/15/95	AS-6 R05
Uranium	2.3	*	MG/KG	09/15/95	AS-6 R05
Vanadium	31.2		MG/KG	09/14/95	AS-5 R05
Zinc	60.7		MG/KG	09/14/95	AS-5 R05

Grand Junction Projects Office Analytical Laboratory

ANALYTICAL RESULTS

Customer ID: 0816-95-0038-01
Ticket ID: FS-2250

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231533

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	50300		MG/KG	09/14/95	AS-5 R05
Arsenic	1.4	N	MG/KG	09/20/95	AS-4 R01
Barium	439		MG/KG	09/14/95	AS-5 R05
Beryllium	2.1		MG/KG	09/12/95	AS-5 R05
Calcium	4570	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.16		MG/KG	09/15/95	AS-6 R05
Cobalt	8.7	*	MG/KG	09/14/95	AS-5 R05
Chromium	18.2		MG/KG	09/14/95	AS-5 R05
Copper	10.2		MG/KG	09/14/95	AS-5 R05
Iron	16400		MG/KG	09/14/95	AS-5 R05
Potassium	27100		MG/KG	09/14/95	AS-5 R05
Magnesium	2820		MG/KG	09/14/95	AS-5 R05
Manganese	498		MG/KG	09/14/95	AS-5 R05
Sodium	18400		MG/KG	09/14/95	AS-5 R05
Nickel	9.5		MG/KG	09/14/95	AS-5 R05
Lead	23.8		MG/KG	09/15/95	AS-6 R05
Antimony	~0.51	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.23		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	9.8	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.57		MG/KG	09/15/95	AS-6 R05
Uranium	2.1	*	MG/KG	09/15/95	AS-6 R05
Vanadium	30.9		MG/KG	09/14/95	AS-5 R05
Zinc	58.9		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0039-01
Ticket ID: FS-2251

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231534

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	60900		MG/KG	09/14/95	AS-5 R05
Arsenic	1.4	N	MG/KG	09/20/95	AS-4 R01
Barium	426		MG/KG	09/14/95	AS-5 R05
Beryllium	2.1		MG/KG	09/12/95	AS-5 R05
Calcium	5100	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.16		MG/KG	09/15/95	AS-6 R05
Cobalt	8.6	*	MG/KG	09/14/95	AS-5 R05
Chromium	18.1		MG/KG	09/14/95	AS-5 R05
Copper	9.5		MG/KG	09/14/95	AS-5 R05
Iron	17400		MG/KG	09/14/95	AS-5 R05
Potassium	23300		MG/KG	09/14/95	AS-5 R05
Magnesium	2980		MG/KG	09/14/95	AS-5 R05
Manganese	498		MG/KG	09/14/95	AS-5 R05
Sodium	18300		MG/KG	09/14/95	AS-5 R05
Nickel	9.5		MG/KG	09/14/95	AS-5 R05
Lead	22.5		MG/KG	09/15/95	AS-6 R05
Antimony	~0.54	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.21		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	10.9	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.58		MG/KG	09/15/95	AS-6 R05
Uranium	2.0	*	MG/KG	09/15/95	AS-6 R05
Vanadium	33.3		MG/KG	09/14/95	AS-5 R05
Zinc	58.7		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0040-01
Ticket ID: FS-2252

Date: September 29, 1995
Lab ID: 231535

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	50900		MG/KG	09/14/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/20/95	AS-4 R01
Barium	434		MG/KG	09/14/95	AS-5 R05
Beryllium	2.0		MG/KG	09/12/95	AS-5 R05
Calcium	4150	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.15		MG/KG	09/15/95	AS-6 R05
Cobalt	9.5	*	MG/KG	09/14/95	AS-5 R05
Chromium	19.4		MG/KG	09/14/95	AS-5 R05
Copper	9.2		MG/KG	09/14/95	AS-5 R05
Iron	16800		MG/KG	09/14/95	AS-5 R05
Potassium	26800		MG/KG	09/14/95	AS-5 R05
Magnesium	2890		MG/KG	09/14/95	AS-5 R05
Manganese	507		MG/KG	09/14/95	AS-5 R05
Sodium	18500		MG/KG	09/14/95	AS-5 R05
Nickel	9.6		MG/KG	09/14/95	AS-5 R05
Lead	22.3		MG/KG	09/15/95	AS-6 R05
Antimony	~0.53	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.83		%	09/01/95	M-8 R00
Tantalum	2.0		MG/KG	09/17/95	AS-6 R05
Thorium	10.1	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.55		MG/KG	09/15/95	AS-6 R05
Uranium	2.2	*	MG/KG	09/15/95	AS-6 R05
Vanadium	33.1		MG/KG	09/14/95	AS-5 R05
Zinc	52.8		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0041-01
Ticket ID: FS-2253

Date: September 29, 1995
Lab ID: 231536

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	42200		MG/KG	09/14/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/20/95	AS-4 R01
Barium	420		MG/KG	09/14/95	AS-5 R05
Beryllium	1.9		MG/KG	09/12/95	AS-5 R05
Calcium	3270	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.12		MG/KG	09/15/95	AS-6 R05
Cobalt	9.4	*	MG/KG	09/14/95	AS-5 R05
Chromium	17.3		MG/KG	09/14/95	AS-5 R05
Copper	7.3		MG/KG	09/14/95	AS-5 R05
Iron	14500		MG/KG	09/14/95	AS-5 R05
Potassium	26100		MG/KG	09/14/95	AS-5 R05
Magnesium	2290		MG/KG	09/14/95	AS-5 R05
Manganese	393		MG/KG	09/14/95	AS-5 R05
Sodium	19500		MG/KG	09/14/95	AS-5 R05
Nickel	7.5		MG/KG	09/14/95	AS-5 R05
Lead	21.0		MG/KG	09/15/95	AS-6 R05
Antimony	~0.48	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	8.2	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.52		MG/KG	09/15/95	AS-6 R05
Uranium	2.3	*	MG/KG	09/15/95	AS-6 R05
Vanadium	31.0		MG/KG	09/14/95	AS-5 R05
Zinc	47.1		MG/KG	09/14/95	AS-5 R05

V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0042-01
Ticket ID: FS-2254

Date: September 29, 1995
Lab ID: 231537

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	57000		MG/KG	09/14/95	AS-5 R05
Arsenic	0.43	N	MG/KG	09/20/95	AS-4 R01
Barium	174		MG/KG	09/14/95	AS-5 R05
Beryllium	2.2		MG/KG	09/12/95	AS-5 R05
Calcium	1440	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.12		MG/KG	09/15/95	AS-6 R05
Cobalt	2.4	*	MG/KG	09/14/95	AS-5 R05
Chromium	2.8		MG/KG	09/14/95	AS-5 R05
Copper	3.0		MG/KG	09/14/95	AS-5 R05
Iron	10400		MG/KG	09/14/95	AS-5 R05
Potassium	34300		MG/KG	09/14/95	AS-5 R05
Magnesium	~475	B	MG/KG	09/14/95	AS-5 R05
Manganese	396		MG/KG	09/14/95	AS-5 R05
Sodium	26900		MG/KG	09/14/95	AS-5 R05
Nickel	2.8		MG/KG	09/14/95	AS-5 R05
Lead	15.6		MG/KG	09/15/95	AS-6 R05
Antimony	~0.20	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.81		%	09/01/95	M-8 R00
Tantalum	2.5		MG/KG	09/17/95	AS-6 R05
Thorium	9.0	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.21		MG/KG	09/15/95	AS-6 R05
Uranium	1.3	*	MG/KG	09/15/95	AS-6 R05
Vanadium	6.9		MG/KG	09/14/95	AS-5 R05
Zinc	60.6		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0043-01
Ticket ID: FS-2255

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231538

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	60900		MG/KG	09/14/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/20/95	AS-4 R01
Barium	499		MG/KG	09/14/95	AS-5 R05
Beryllium	1.4		MG/KG	09/12/95	AS-5 R05
Calcium	4930	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.20		MG/KG	09/15/95	AS-6 R05
Cobalt	7.7	*	MG/KG	09/14/95	AS-5 R05
Chromium	12.4		MG/KG	09/14/95	AS-5 R05
Copper	6.1		MG/KG	09/14/95	AS-5 R05
Iron	17300		MG/KG	09/14/95	AS-5 R05
Potassium	28600		MG/KG	09/14/95	AS-5 R05
Magnesium	2110		MG/KG	09/14/95	AS-5 R05
Manganese	480		MG/KG	09/14/95	AS-5 R05
Sodium	21500		MG/KG	09/14/95	AS-5 R05
Nickel	6.3		MG/KG	09/14/95	AS-5 R05
Lead	23.2		MG/KG	09/15/95	AS-6 R05
Antimony	~0.45	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	U	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.02		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	9.0	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.76		MG/KG	09/15/95	AS-6 R05
Uranium	2.1	*	MG/KG	09/15/95	AS-6 R05
Vanadium	24.8		MG/KG	09/14/95	AS-5 R05
Zinc	54.6		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0044-01
Ticket ID: FS-2256

Date: September 29, 1995
Lab ID: 231539

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	56000	E	MG/KG	09/14/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/20/95	AS-4 R01
Barium	501		MG/KG	09/14/95	AS-5 R05
Beryllium	1.5		MG/KG	09/12/95	AS-5 R05
Calcium	4340	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.16		MG/KG	09/15/95	AS-6 R05
Cobalt	8.6		MG/KG	09/14/95	AS-5 R05
Chromium	15.8		MG/KG	09/14/95	AS-5 R05
Copper	6.0		MG/KG	09/14/95	AS-5 R05
Iron	16800	E	MG/KG	09/14/95	AS-5 R05
Potassium	31000		MG/KG	09/14/95	AS-5 R05
Magnesium	2280		MG/KG	09/14/95	AS-5 R05
Manganese	445	E	MG/KG	09/14/95	AS-5 R05
Sodium	23900		MG/KG	09/14/95	AS-5 R05
Nickel	8.0		MG/KG	09/14/95	AS-5 R05
Lead	21.7		MG/KG	09/15/95	AS-6 R05
Antimony	~0.41	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.61		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	9.0	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.84		MG/KG	09/15/95	AS-6 R05
Uranium	1.8		MG/KG	09/15/95	AS-6 R05
Vanadium	27.0		MG/KG	09/14/95	AS-5 R05
Zinc	53.2		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0045-01
Ticket ID: FS-2257

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231540

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	72900	E	MG/KG	09/14/95	AS-5 R05
Arsenic	1.5	N	MG/KG	09/20/95	AS-4 R01
Barium	490		MG/KG	09/14/95	AS-5 R05
Beryllium	1.7		MG/KG	09/12/95	AS-5 R05
Calcium	5410	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.18		MG/KG	09/15/95	AS-6 R05
Cobalt	9.8		MG/KG	09/14/95	AS-5 R05
Chromium	18.2		MG/KG	09/14/95	AS-5 R05
Copper	7.0		MG/KG	09/14/95	AS-5 R05
Iron	22200	E	MG/KG	09/14/95	AS-5 R05
Potassium	30700		MG/KG	09/14/95	AS-5 R05
Magnesium	3200		MG/KG	09/14/95	AS-5 R05
Manganese	483	E	MG/KG	09/14/95	AS-5 R05
Sodium	23400		MG/KG	09/14/95	AS-5 R05
Nickel	9.0		MG/KG	09/14/95	AS-5 R05
Lead	24.1		MG/KG	09/15/95	AS-6 R05
Antimony	~0.46	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.05		%	09/01/95	M-8 R00
Tantalum	2.2		MG/KG	09/17/95	AS-6 R05
Thorium	10.6	E	MG/KG	09/15/95	AS-6 R05
Thallium	1.1		MG/KG	09/15/95	AS-6 R05
Uranium	2.0		MG/KG	09/15/95	AS-6 R05
Vanadium	34.3		MG/KG	09/14/95	AS-5 R05
Zinc	68.8		MG/KG	09/14/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0046-01
Ticket ID: FS-2258

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231541

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/14/95	AS-5 R05
Aluminum	88400	E	MG/KG	09/14/95	AS-5 R05
Arsenic	2.8	N	MG/KG	09/20/95	AS-4 R01
Barium	441		MG/KG	09/14/95	AS-5 R05
Beryllium	2.7		MG/KG	09/12/95	AS-5 R05
Calcium	5840	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.17		MG/KG	09/15/95	AS-6 R05
Cobalt	8.9		MG/KG	09/14/95	AS-5 R05
Chromium	21.4		MG/KG	09/14/95	AS-5 R05
Copper	12.7		MG/KG	09/14/95	AS-5 R05
Iron	28000	E	MG/KG	09/14/95	AS-5 R05
Potassium	27700		MG/KG	09/14/95	AS-5 R05
Magnesium	4780		MG/KG	09/14/95	AS-5 R05
Manganese	404	E	MG/KG	09/14/95	AS-5 R05
Sodium	19800		MG/KG	09/14/95	AS-5 R05
Nickel	13.2		MG/KG	09/14/95	AS-5 R05
Lead	26.7		MG/KG	09/15/95	AS-6 R05
Antimony	~0.64	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.05		%	09/01/95	M-8 R00
Tantalum	2.5		MG/KG	09/17/95	AS-6 R05
Thorium	13.0	E	MG/KG	09/15/95	AS-6 R05
Thallium	1.3		MG/KG	09/15/95	AS-6 R05
Uranium	2.4		MG/KG	09/15/95	AS-6 R05
Vanadium	44.4		MG/KG	09/14/95	AS-5 R05
Zinc	71.8		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0047-01
Ticket ID: FS-2259

Date: September 29, 1995
Lab ID: 231542

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	77800	E	MG/KG	09/14/95	AS-5 R05
Arsenic	2.3	N	MG/KG	09/20/95	AS-4 R01
Barium	446		MG/KG	09/14/95	AS-5 R05
Beryllium	2.4		MG/KG	09/12/95	AS-5 R05
Calcium	5790	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.20		MG/KG	09/15/95	AS-6 R05
Cobalt	11.5		MG/KG	09/14/95	AS-5 R05
Chromium	20.6		MG/KG	09/14/95	AS-5 R05
Copper	10.8		MG/KG	09/14/95	AS-5 R05
Iron	29500	E	MG/KG	09/14/95	AS-5 R05
Potassium	26900		MG/KG	09/14/95	AS-5 R05
Magnesium	4460		MG/KG	09/14/95	AS-5 R05
Manganese	531	E	MG/KG	09/14/95	AS-5 R05
Sodium	19900		MG/KG	09/14/95	AS-5 R05
Nickel	11.9		MG/KG	09/14/95	AS-5 R05
Lead	24.5		MG/KG	09/15/95	AS-6 R05
Antimony	~0.58	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.04		%	09/01/95	M-8 R00
Tantalum	2.4		MG/KG	09/17/95	AS-6 R05
Thorium	12.2	E	MG/KG	09/15/95	AS-6 R05
Thallium	1.2		MG/KG	09/15/95	AS-6 R05
Uranium	2.2		MG/KG	09/15/95	AS-6 R05
Vanadium	44.9		MG/KG	09/14/95	AS-5 R05
Zinc	80.5		MG/KG	09/14/95	AS-5 R05

1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0048-01
Ticket ID: FS-2260

Date: September 29, 1995
Lab ID: 231543

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	77500	E	MG/KG	09/14/95	AS-5 R05
Arsenic	1.8	N	MG/KG	09/20/95	AS-4 R01
Barium	451		MG/KG	09/14/95	AS-5 R05
Beryllium	2.1		MG/KG	09/12/95	AS-5 R05
Calcium	5510	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.17		MG/KG	09/15/95	AS-6 R05
Cobalt	9.0		MG/KG	09/14/95	AS-5 R05
Chromium	16.4		MG/KG	09/14/95	AS-5 R05
Copper	8.0		MG/KG	09/14/95	AS-5 R05
Iron	25500	E	MG/KG	09/14/95	AS-5 R05
Potassium	29400		MG/KG	09/14/95	AS-5 R05
Magnesium	3560		MG/KG	09/14/95	AS-5 R05
Manganese	475	E	MG/KG	09/14/95	AS-5 R05
Sodium	23000		MG/KG	09/14/95	AS-5 R05
Nickel	9.2		MG/KG	09/14/95	AS-5 R05
Lead	21.8		MG/KG	09/15/95	AS-6 R05
Antimony	~0.48	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	2.2		MG/KG	09/17/95	AS-6 R05
Thorium	10.7	E	MG/KG	09/15/95	AS-6 R05
Thallium	1.1		MG/KG	09/15/95	AS-6 R05
Uranium	1.8		MG/KG	09/15/95	AS-6 R05
Vanadium	37.1		MG/KG	09/14/95	AS-5 R05
Zinc	71.1		MG/KG	09/14/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0049-01
Ticket ID: FS-2261

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231544

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	73900	E	MG/KG	09/14/95	AS-5 R05
Arsenic	1.9	N	MG/KG	09/20/95	AS-4 R01
Barium	461		MG/KG	09/14/95	AS-5 R05
Beryllium	2.0		MG/KG	09/12/95	AS-5 R05
Calcium	5330	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.18		MG/KG	09/15/95	AS-6 R05
Cobalt	7.7		MG/KG	09/14/95	AS-5 R05
Chromium	15.2		MG/KG	09/14/95	AS-5 R05
Copper	8.0		MG/KG	09/14/95	AS-5 R05
Iron	20700	E	MG/KG	09/14/95	AS-5 R05
Potassium	30200		MG/KG	09/14/95	AS-5 R05
Magnesium	3400		MG/KG	09/14/95	AS-5 R05
Manganese	382	E	MG/KG	09/14/95	AS-5 R05
Sodium	22500		MG/KG	09/14/95	AS-5 R05
Nickel	9.2		MG/KG	09/14/95	AS-5 R05
Lead	24.4		MG/KG	09/15/95	AS-6 R05
Antimony	~0.53	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	10.1	E	MG/KG	09/15/95	AS-6 R05
Thallium	1.2		MG/KG	09/15/95	AS-6 R05
Uranium	1.8		MG/KG	09/15/95	AS-6 R05
Vanadium	31.5		MG/KG	09/14/95	AS-5 R05
Zinc	59.5		MG/KG	09/14/95	AS-5 R05

V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0050-01
Ticket ID: FS-2262

Date: September 29, 1995
Lab ID: 231545

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	67700	E	MG/KG	09/14/95	AS-5 R05
Arsenic	2.2	N	MG/KG	09/20/95	AS-4 R01
Barium	483		MG/KG	09/14/95	AS-5 R05
Beryllium	2.1		MG/KG	09/12/95	AS-5 R05
Calcium	4890	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.21		MG/KG	09/15/95	AS-6 R05
Cobalt	8.9		MG/KG	09/14/95	AS-5 R05
Chromium	16.8		MG/KG	09/14/95	AS-5 R05
Copper	8.3		MG/KG	09/14/95	AS-5 R05
Iron	20200	E	MG/KG	09/14/95	AS-5 R05
Potassium	29800		MG/KG	09/14/95	AS-5 R05
Magnesium	3450		MG/KG	09/14/95	AS-5 R05
Manganese	435	E	MG/KG	09/14/95	AS-5 R05
Sodium	23100		MG/KG	09/14/95	AS-5 R05
Nickel	9.2		MG/KG	09/14/95	AS-5 R05
Lead	24.3		MG/KG	09/15/95	AS-6 R05
Antimony	~0.52	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	9.6	E	MG/KG	09/15/95	AS-6 R05
Thallium	1.1		MG/KG	09/15/95	AS-6 R05
Uranium	1.8		MG/KG	09/15/95	AS-6 R05
Vanadium	34.0		MG/KG	09/14/95	AS-5 R05
Zinc	63.1		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0051-01
Ticket ID: FS-2263

Date: September 29, 1995
Lab ID: 231546

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/14/95	AS-5 R05
Aluminum	68800	E	MG/KG	09/14/95	AS-5 R05
Arsenic	1.4	N	MG/KG	09/20/95	AS-4 R01
Barium	569		MG/KG	09/14/95	AS-5 R05
Beryllium	1.5		MG/KG	09/12/95	AS-5 R05
Calcium	6710	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.17		MG/KG	09/15/95	AS-6 R05
Cobalt	7.9		MG/KG	09/14/95	AS-5 R05
Chromium	13.1		MG/KG	09/14/95	AS-5 R05
Copper	7.7		MG/KG	09/14/95	AS-5 R05
Iron	17500	E	MG/KG	09/14/95	AS-5 R05
Potassium	30700		MG/KG	09/14/95	AS-5 R05
Magnesium	2690		MG/KG	09/14/95	AS-5 R05
Manganese	519	E	MG/KG	09/14/95	AS-5 R05
Sodium	22100		MG/KG	09/14/95	AS-5 R05
Nickel	6.6		MG/KG	09/14/95	AS-5 R05
Lead	21.2		MG/KG	09/15/95	AS-6 R05
Antimony	~0.53	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	97.66		%	09/01/95	M-8 R00
Tantalum	1.8		MG/KG	09/17/95	AS-6 R05
Thorium	8.4	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.89		MG/KG	09/15/95	AS-6 R05
Uranium	2.2		MG/KG	09/15/95	AS-6 R05
Vanadium	25.5		MG/KG	09/14/95	AS-5 R05
Zinc	60.0		MG/KG	09/14/95	AS-5 R05

V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0052-01
Ticket ID: FS-2264

Date: September 29, 1995
Lab ID: 231547

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/14/95	AS-5 R05
Aluminum	64100	E	MG/KG	09/14/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/20/95	AS-4 R01
Barium	484		MG/KG	09/14/95	AS-5 R05
Beryllium	1.5		MG/KG	09/12/95	AS-5 R05
Calcium	5130	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.18		MG/KG	09/15/95	AS-6 R05
Cobalt	7.2		MG/KG	09/14/95	AS-5 R05
Chromium	13.2		MG/KG	09/14/95	AS-5 R05
Copper	6.5		MG/KG	09/14/95	AS-5 R05
Iron	16800	E	MG/KG	09/14/95	AS-5 R05
Potassium	31800		MG/KG	09/14/95	AS-5 R05
Magnesium	2360		MG/KG	09/14/95	AS-5 R05
Manganese	380	E	MG/KG	09/14/95	AS-5 R05
Sodium	23400		MG/KG	09/14/95	AS-5 R05
Nickel	6.2		MG/KG	09/14/95	AS-5 R05
Lead	19.5		MG/KG	09/15/95	AS-6 R05
Antimony	~0.47	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.62		%	09/01/95	M-8 R00
Tantalum	2.0		MG/KG	09/17/95	AS-6 R05
Thorium	7.9	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.92		MG/KG	09/15/95	AS-6 R05
Uranium	1.7		MG/KG	09/15/95	AS-6 R05
Vanadium	24.8		MG/KG	09/14/95	AS-5 R05
Zinc	54.0		MG/KG	09/14/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0053-01
Ticket ID: FS-2265

Date: September 29, 1995
Lab ID: 231548

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	~0.41	B	MG/KG	09/14/95	AS-5 R05
Aluminum	71600	E	MG/KG	09/14/95	AS-5 R05
Arsenic	1.5	N	MG/KG	09/20/95	AS-4 R01
Barium	459		MG/KG	09/14/95	AS-5 R05
Beryllium	1.7		MG/KG	09/12/95	AS-5 R05
Calcium	5380	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.16		MG/KG	09/15/95	AS-6 R05
Cobalt	6.8		MG/KG	09/14/95	AS-5 R05
Chromium	13.7		MG/KG	09/14/95	AS-5 R05
Copper	6.8		MG/KG	09/14/95	AS-5 R05
Iron	18100	E	MG/KG	09/14/95	AS-5 R05
Potassium	31700		MG/KG	09/14/95	AS-5 R05
Magnesium	2760		MG/KG	09/14/95	AS-5 R05
Manganese	289	E	MG/KG	09/14/95	AS-5 R05
Sodium	23300		MG/KG	09/14/95	AS-5 R05
Nickel	7.0		MG/KG	09/14/95	AS-5 R05
Lead	20.3		MG/KG	09/15/95	AS-6 R05
Antimony	~0.46	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.21	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	97.52		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	8.8	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.96		MG/KG	09/15/95	AS-6 R05
Uranium	1.8		MG/KG	09/15/95	AS-6 R05
Vanadium	26.4		MG/KG	09/14/95	AS-5 R05
Zinc	54.9		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0054-01
Ticket ID: FS-2266

Date: September 29, 1995
Lab ID: 231549

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/14/95	AS-5 R05
Aluminum	86400	E	MG/KG	09/14/95	AS-5 R05
Arsenic	3.0	N	MG/KG	09/20/95	AS-4 R01
Barium	379		MG/KG	09/14/95	AS-5 R05
Beryllium	2.7		MG/KG	09/12/95	AS-5 R05
Calcium	5480	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.20		MG/KG	09/15/95	AS-6 R05
Cobalt	10.7		MG/KG	09/14/95	AS-5 R05
Chromium	24.8		MG/KG	09/14/95	AS-5 R05
Copper	12.8		MG/KG	09/14/95	AS-5 R05
Iron	28500	E	MG/KG	09/14/95	AS-5 R05
Potassium	27900		MG/KG	09/14/95	AS-5 R05
Magnesium	5350		MG/KG	09/14/95	AS-5 R05
Manganese	310	E	MG/KG	09/14/95	AS-5 R05
Sodium	17900		MG/KG	09/14/95	AS-5 R05
Nickel	13.7		MG/KG	09/14/95	AS-5 R05
Lead	23.6		MG/KG	09/15/95	AS-6 R05
Antimony	~0.71	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.21	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	96.42		%	09/01/95	M-8 R00
Tantalum	2.6		MG/KG	09/17/95	AS-6 R05
Thorium	12.3	E	MG/KG	09/15/95	AS-6 R05
Thallium	1.4		MG/KG	09/15/95	AS-6 R05
Uranium	2.3		MG/KG	09/15/95	AS-6 R05
Vanadium	48.3		MG/KG	09/14/95	AS-5 R05
Zinc	72.4		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0055-01
Ticket ID: FS-2267

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231550

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	73600	E	MG/KG	09/14/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/20/95	AS-4 R01
Barium	467		MG/KG	09/14/95	AS-5 R05
Beryllium	1.6		MG/KG	09/12/95	AS-5 R05
Calcium	5170	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.19		MG/KG	09/15/95	AS-6 R05
Cobalt	5.0		MG/KG	09/14/95	AS-5 R05
Chromium	6.8		MG/KG	09/14/95	AS-5 R05
Copper	3.0		MG/KG	09/14/95	AS-5 R05
Iron	15600	E	MG/KG	09/14/95	AS-5 R05
Potassium	36300		MG/KG	09/14/95	AS-5 R05
Magnesium	1560		MG/KG	09/14/95	AS-5 R05
Manganese	443	E	MG/KG	09/14/95	AS-5 R05
Sodium	32000		MG/KG	09/14/95	AS-5 R05
Nickel	5.5		MG/KG	09/14/95	AS-5 R05
Lead	18.4		MG/KG	09/15/95	AS-6 R05
Antimony	~0.68	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.80		%	09/01/95	M-8 R00
Tantalum	2.3		MG/KG	09/17/95	AS-6 R05
Thorium	7.1	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.67		MG/KG	09/15/95	AS-6 R05
Uranium	1.1		MG/KG	09/15/95	AS-6 R05
Vanadium	11.5		MG/KG	09/14/95	AS-5 R05
Zinc	64.7		MG/KG	09/14/95	AS-5 R05

V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0056-01
Ticket ID: FS-2268

Date: September 29, 1995
Lab ID: 231551

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/14/95	AS-5 R05
Aluminum	75400	E	MG/KG	09/14/95	AS-5 R05
Arsenic	1.5	N	MG/KG	09/20/95	AS-4 R01
Barium	449		MG/KG	09/14/95	AS-5 R05
Beryllium	2.7		MG/KG	09/12/95	AS-5 R05
Calcium	5340	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.26		MG/KG	09/15/95	AS-6 R05
Cobalt	5.7		MG/KG	09/14/95	AS-5 R05
Chromium	10.1		MG/KG	09/14/95	AS-5 R05
Copper	6.4		MG/KG	09/14/95	AS-5 R05
Iron	18800	E	MG/KG	09/14/95	AS-5 R05
Potassium	33400		MG/KG	09/14/95	AS-5 R05
Magnesium	2420		MG/KG	09/14/95	AS-5 R05
Manganese	699	E	MG/KG	09/14/95	AS-5 R05
Sodium	28600		MG/KG	09/14/95	AS-5 R05
Nickel	11.6		MG/KG	09/14/95	AS-5 R05
Lead	17.8		MG/KG	09/15/95	AS-6 R05
Antimony	~0.41	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.21	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	97.50		%	09/01/95	M-8 R00
Tantalum	2.3		MG/KG	09/17/95	AS-6 R05
Thorium	9.1	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.71		MG/KG	09/15/95	AS-6 R05
Uranium	1.5		MG/KG	09/15/95	AS-6 R05
Vanadium	18.1		MG/KG	09/14/95	AS-5 R05
Zinc	67.6		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0058-01
Ticket ID: FS-2270

Date: September 29, 1995
Lab ID: 231553

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	76900	E	MG/KG	09/14/95	AS-5 R05
Arsenic	1.6	N	MG/KG	09/20/95	AS-4 R01
Barium	429		MG/KG	09/14/95	AS-5 R05
Beryllium	1.6		MG/KG	09/12/95	AS-5 R05
Calcium	4590	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.20		MG/KG	09/15/95	AS-6 R05
Cobalt	7.6		MG/KG	09/14/95	AS-5 R05
Chromium	10.5		MG/KG	09/14/95	AS-5 R05
Copper	5.3		MG/KG	09/14/95	AS-5 R05
Iron	18600	E	MG/KG	09/14/95	AS-5 R05
Potassium	35600		MG/KG	09/14/95	AS-5 R05
Magnesium	2220		MG/KG	09/14/95	AS-5 R05
Manganese	447	E	MG/KG	09/14/95	AS-5 R05
Sodium	28600		MG/KG	09/14/95	AS-5 R05
Nickel	6.2		MG/KG	09/14/95	AS-5 R05
Lead	21.2		MG/KG	09/15/95	AS-6 R05
Antimony	~0.42	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.21		%	09/01/95	M-8 R00
Tantalum	2.4		MG/KG	09/17/95	AS-6 R05
Thorium	9.2	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.88		MG/KG	09/15/95	AS-6 R05
Uranium	1.4		MG/KG	09/15/95	AS-6 R05
Vanadium	18.9		MG/KG	09/14/95	AS-5 R05
Zinc	61.3		MG/KG	09/14/95	AS-5 R05

V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0059-01
Ticket ID: FS-2271

Date: September 29, 1995
Lab ID: 231554

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.42	U	MG/KG	09/14/95	AS-5 R05
Aluminum	106000	E	MG/KG	09/14/95	AS-5 R05
Arsenic	4.6	N	MG/KG	09/21/95	AS-4 R01
Barium	313		MG/KG	09/14/95	AS-5 R05
Beryllium	3.9		MG/KG	09/12/95	AS-5 R05
Calcium	6590	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.15		MG/KG	09/15/95	AS-6 R05
Cobalt	9.5		MG/KG	09/14/95	AS-5 R05
Chromium	39.7		MG/KG	09/14/95	AS-5 R05
Copper	20.3		MG/KG	09/14/95	AS-5 R05
Iron	40800	E	MG/KG	09/14/95	AS-5 R05
Potassium	20300		MG/KG	09/14/95	AS-5 R05
Magnesium	8940		MG/KG	09/14/95	AS-5 R05
Manganese	190	E	MG/KG	09/14/95	AS-5 R05
Sodium	8690		MG/KG	09/14/95	AS-5 R05
Nickel	20.8		MG/KG	09/14/95	AS-5 R05
Lead	24.6		MG/KG	09/15/95	AS-6 R05
Antimony	~1.0	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.21	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	95.41		%	09/01/95	M-8 R00
Tantalum	2.5		MG/KG	09/17/95	AS-6 R05
Thorium	17.1	E	MG/KG	09/15/95	AS-6 R05
Thallium	1.6		MG/KG	09/15/95	AS-6 R05
Uranium	3.0		MG/KG	09/15/95	AS-6 R05
Vanadium	76.8		MG/KG	09/14/95	AS-5 R05
Zinc	93.7		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0060-01
Ticket ID: FS-2272

Date: September 29, 1995
Lab ID: 231555

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	~0.43	B	MG/KG	09/14/95	AS-5 R05
Aluminum	73900	E	MG/KG	09/14/95	AS-5 R05
Arsenic	1.1	N	MG/KG	09/20/95	AS-4 R01
Barium	603		MG/KG	09/14/95	AS-5 R05
Beryllium	1.4		MG/KG	09/12/95	AS-5 R05
Calcium	6880	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.19		MG/KG	09/15/95	AS-6 R05
Cobalt	6.9		MG/KG	09/14/95	AS-5 R05
Chromium	13.1		MG/KG	09/14/95	AS-5 R05
Copper	6.8		MG/KG	09/14/95	AS-5 R05
Iron	17700	E	MG/KG	09/14/95	AS-5 R05
Potassium	31400		MG/KG	09/14/95	AS-5 R05
Magnesium	2760		MG/KG	09/14/95	AS-5 R05
Manganese	538	E	MG/KG	09/14/95	AS-5 R05
Sodium	26400		MG/KG	09/14/95	AS-5 R05
Nickel	7.5		MG/KG	09/14/95	AS-5 R05
Lead	21.7		MG/KG	09/15/95	AS-6 R05
Antimony	~0.43	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.01		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	7.5	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.47		MG/KG	09/15/95	AS-6 R05
Uranium	1.8		MG/KG	09/15/95	AS-6 R05
Vanadium	23.0		MG/KG	09/14/95	AS-5 R05
Zinc	62.6		MG/KG	09/14/95	AS-5 R05

V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0061-01
Ticket ID: FS-2273

Date: September 29, 1995
Lab ID: 231556

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	U	MG/KG	09/14/95	AS-5 R05
Aluminum	72200	E	MG/KG	09/14/95	AS-5 R05
Arsenic	0.85	N	MG/KG	09/20/95	AS-4 R01
Barium	499		MG/KG	09/14/95	AS-5 R05
Beryllium	1.6		MG/KG	09/12/95	AS-5 R05
Calcium	6910	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.18		MG/KG	09/15/95	AS-6 R05
Cobalt	7.2		MG/KG	09/14/95	AS-5 R05
Chromium	12.0		MG/KG	09/14/95	AS-5 R05
Copper	6.5		MG/KG	09/14/95	AS-5 R05
Iron	19300	E	MG/KG	09/14/95	AS-5 R05
Potassium	31400		MG/KG	09/14/95	AS-5 R05
Magnesium	2600		MG/KG	09/14/95	AS-5 R05
Manganese	517	E	MG/KG	09/14/95	AS-5 R05
Sodium	25000		MG/KG	09/14/95	AS-5 R05
Nickel	8.1		MG/KG	09/14/95	AS-5 R05
Lead	21.1		MG/KG	09/15/95	AS-6 R05
Antimony	~0.40	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.45		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	8.6	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.51		MG/KG	09/15/95	AS-6 R05
Uranium	1.5		MG/KG	09/15/95	AS-6 R05
Vanadium	23.5		MG/KG	09/14/95	AS-5 R05
Zinc	64.6		MG/KG	09/14/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0062-01
Ticket ID: FS-2274

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231557

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	69600	E	MG/KG	09/14/95	AS-5 R05
Arsenic	0.87	N	MG/KG	09/20/95	AS-4 R01
Barium	484		MG/KG	09/14/95	AS-5 R05
Beryllium	1.5		MG/KG	09/12/95	AS-5 R05
Calcium	5740	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.18		MG/KG	09/15/95	AS-6 R05
Cobalt	6.9		MG/KG	09/14/95	AS-5 R05
Chromium	12.9		MG/KG	09/14/95	AS-5 R05
Copper	4.9		MG/KG	09/14/95	AS-5 R05
Iron	19600	E	MG/KG	09/14/95	AS-5 R05
Potassium	32800		MG/KG	09/14/95	AS-5 R05
Magnesium	2360		MG/KG	09/14/95	AS-5 R05
Manganese	455	E	MG/KG	09/14/95	AS-5 R05
Sodium	26800		MG/KG	09/14/95	AS-5 R05
Nickel	6.9		MG/KG	09/14/95	AS-5 R05
Lead	21.2		MG/KG	09/15/95	AS-6 R05
Antimony	~0.36	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.02		%	09/01/95	M-8 R00
Tantalum	2.2		MG/KG	09/17/95	AS-6 R05
Thorium	8.9	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.51		MG/KG	09/15/95	AS-6 R05
Uranium	1.4		MG/KG	09/15/95	AS-6 R05
Vanadium	24.0		MG/KG	09/14/95	AS-5 R05
Zinc	63.7		MG/KG	09/14/95	AS-5 R05

V1.05

Grand Junction Projects Office Analytical Laboratory

ANALYTICAL RESULTS

Customer ID: 0816-95-0063-01
Ticket ID: FS-2275

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231558

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	U	MG/KG	09/14/95	AS-5 R05
Aluminum	74900	E	MG/KG	09/14/95	AS-5 R05
Arsenic	0.80	N	MG/KG	09/20/95	AS-4 R01
Barium	512		MG/KG	09/14/95	AS-5 R05
Beryllium	1.5		MG/KG	09/12/95	AS-5 R05
Calcium	5620	E	MG/KG	09/14/95	AS-5 R05
Cadmium	0.19		MG/KG	09/15/95	AS-6 R05
Cobalt	6.0		MG/KG	09/14/95	AS-5 R05
Chromium	10.6		MG/KG	09/14/95	AS-5 R05
Copper	5.2		MG/KG	09/14/95	AS-5 R05
Iron	18600	E	MG/KG	09/14/95	AS-5 R05
Potassium	34500		MG/KG	09/14/95	AS-5 R05
Magnesium	2080		MG/KG	09/14/95	AS-5 R05
Manganese	389	E	MG/KG	09/14/95	AS-5 R05
Sodium	29700		MG/KG	09/14/95	AS-5 R05
Nickel	6.2		MG/KG	09/14/95	AS-5 R05
Lead	23.3		MG/KG	09/15/95	AS-6 R05
Antimony	~0.36	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.81		%	09/01/95	M-8 R00
Tantalum	2.2		MG/KG	09/17/95	AS-6 R05
Thorium	8.4	E	MG/KG	09/15/95	AS-6 R05
Thallium	0.55		MG/KG	09/15/95	AS-6 R05
Uranium	1.4		MG/KG	09/15/95	AS-6 R05
Vanadium	21.1		MG/KG	09/14/95	AS-5 R05
Zinc	62.8		MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0064-01
Ticket ID: FS-2276

Date: September 29, 1995
Lab ID: 231559

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	70300		MG/KG	09/14/95	AS-5 R05
Arsenic	2.0	N	MG/KG	09/20/95	AS-4 R01
Barium	339	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	2.8		MG/KG	09/12/95	AS-5 R05
Calcium	5640		MG/KG	09/14/95	AS-5 R05
Cadmium	0.21		MG/KG	09/15/95	AS-6 R05
Cobalt	7.1		MG/KG	09/14/95	AS-5 R05
Chromium	20.9		MG/KG	09/14/95	AS-5 R05
Copper	10.9		MG/KG	09/14/95	AS-5 R05
Iron	27000		MG/KG	09/14/95	AS-5 R05
Potassium	25600		MG/KG	09/14/95	AS-5 R05
Magnesium	4490		MG/KG	09/14/95	AS-5 R05
Manganese	308		MG/KG	09/14/95	AS-5 R05
Sodium	19900		MG/KG	09/14/95	AS-5 R05
Nickel	12.8		MG/KG	09/14/95	AS-5 R05
Lead	14.0	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.75	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.21	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	97.35		%	09/01/95	M-8 R00
Tantalum	2.3		MG/KG	09/17/95	AS-6 R05
Thorium	7.7	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.54		MG/KG	09/15/95	AS-6 R05
Uranium	1.9	*	MG/KG	09/15/95	AS-6 R05
Vanadium	40.9		MG/KG	09/14/95	AS-5 R05
Zinc	62.2	*	MG/KG	09/14/95	AS-5 R05

V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0065-01
Ticket ID: FS-2277

Date: September 29, 1995
Lab ID: 231560

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	66900		MG/KG	09/14/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/20/95	AS-4 R01
Barium	620	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.5		MG/KG	09/12/95	AS-5 R05
Calcium	6760		MG/KG	09/14/95	AS-5 R05
Cadmium	0.24		MG/KG	09/15/95	AS-6 R05
Cobalt	9.3		MG/KG	09/14/95	AS-5 R05
Chromium	16.4		MG/KG	09/14/95	AS-5 R05
Copper	8.7		MG/KG	09/14/95	AS-5 R05
Iron	20000		MG/KG	09/14/95	AS-5 R05
Potassium	28900		MG/KG	09/14/95	AS-5 R05
Magnesium	2940		MG/KG	09/14/95	AS-5 R05
Manganese	625		MG/KG	09/14/95	AS-5 R05
Sodium	21800		MG/KG	09/14/95	AS-5 R05
Nickel	8.4		MG/KG	09/14/95	AS-5 R05
Lead	27.0	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.59	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.86		%	09/01/95	M-8 R00
Tantalum	2.0		MG/KG	09/17/95	AS-6 R05
Thorium	9.2	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.58		MG/KG	09/15/95	AS-6 R05
Uranium	4.8	*	MG/KG	09/15/95	AS-6 R05
Vanadium	33.2		MG/KG	09/14/95	AS-5 R05
Zinc	60.3	*	MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0066-01
Ticket ID: FS-2278

Date: September 29, 1995
Lab ID: 231561

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	70900		MG/KG	09/14/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/20/95	AS-4 R01
Barium	530	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.5		MG/KG	09/12/95	AS-5 R05
Calcium	6360		MG/KG	09/14/95	AS-5 R05
Cadmium	0.21		MG/KG	09/15/95	AS-6 R05
Cobalt	8.2		MG/KG	09/14/95	AS-5 R05
Chromium	16.4		MG/KG	09/14/95	AS-5 R05
Copper	7.6		MG/KG	09/14/95	AS-5 R05
Iron	19300		MG/KG	09/14/95	AS-5 R05
Potassium	29700		MG/KG	09/14/95	AS-5 R05
Magnesium	2760		MG/KG	09/14/95	AS-5 R05
Manganese	503		MG/KG	09/14/95	AS-5 R05
Sodium	23600		MG/KG	09/14/95	AS-5 R05
Nickel	8.3		MG/KG	09/14/95	AS-5 R05
Lead	23.1	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.51	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.02		%	09/01/95	M-8 R00
Tantalum	2.0		MG/KG	09/17/95	AS-6 R05
Thorium	9.9	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.52		MG/KG	09/15/95	AS-6 R05
Uranium	2.0	*	MG/KG	09/15/95	AS-6 R05
Vanadium	28.7		MG/KG	09/14/95	AS-5 R05
Zinc	62.7	*	MG/KG	09/14/95	AS-5 R05

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ANALYTICAL RESULTS

Customer ID: 0816-95-0067-01
Ticket ID: FS-2279

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231562

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	65200		MG/KG	09/14/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/20/95	AS-4 R01
Barium	506	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.6		MG/KG	09/12/95	AS-5 R05
Calcium	5400		MG/KG	09/14/95	AS-5 R05
Cadmium	0.23		MG/KG	09/15/95	AS-6 R05
Cobalt	7.4		MG/KG	09/14/95	AS-5 R05
Chromium	14.7		MG/KG	09/14/95	AS-5 R05
Copper	6.5		MG/KG	09/14/95	AS-5 R05
Iron	17900		MG/KG	09/14/95	AS-5 R05
Potassium	31600		MG/KG	09/14/95	AS-5 R05
Magnesium	2420		MG/KG	09/14/95	AS-5 R05
Manganese	345		MG/KG	09/14/95	AS-5 R05
Sodium	26100		MG/KG	09/14/95	AS-5 R05
Nickel	7.5		MG/KG	09/14/95	AS-5 R05
Lead	27.0	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.54	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.61		%	09/01/95	M-8 R00
Tantalum	2.2		MG/KG	09/17/95	AS-6 R05
Thorium	9.3	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.50		MG/KG	09/15/95	AS-6 R05
Uranium	1.8	*	MG/KG	09/15/95	AS-6 R05
Vanadium	26.1		MG/KG	09/14/95	AS-5 R05
Zinc	56.1	*	MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0068-01
Ticket ID: FS-2280

Date: September 29, 1995
Lab ID: 231563

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	65100		MG/KG	09/14/95	AS-5 R05
Arsenic	1.2	N	MG/KG	09/20/95	AS-4 R01
Barium	504	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.6		MG/KG	09/12/95	AS-5 R05
Calcium	5730		MG/KG	09/14/95	AS-5 R05
Cadmium	0.17		MG/KG	09/15/95	AS-6 R05
Cobalt	6.9		MG/KG	09/14/95	AS-5 R05
Chromium	11.5		MG/KG	09/14/95	AS-5 R05
Copper	5.8		MG/KG	09/14/95	AS-5 R05
Iron	18000		MG/KG	09/14/95	AS-5 R05
Potassium	15600		MG/KG	09/14/95	AS-5 R05
Magnesium	2070		MG/KG	09/14/95	AS-5 R05
Manganese	321		MG/KG	09/14/95	AS-5 R05
Sodium	27300		MG/KG	09/14/95	AS-5 R05
Nickel	6.4		MG/KG	09/14/95	AS-5 R05
Lead	23.5	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.53	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.81		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	6.5	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.47		MG/KG	09/15/95	AS-6 R05
Uranium	0.84	*	MG/KG	09/15/95	AS-6 R05
Vanadium	25.5		MG/KG	09/14/95	AS-5 R05
Zinc	55.7	*	MG/KG	09/14/95	AS-5 R05

V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0069-01
Ticket ID: FS-2281

Date: September 29, 1995
Lab ID: 231564

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	76100		MG/KG	09/14/95	AS-5 R05
Arsenic	1.7	N	MG/KG	09/20/95	AS-4 R01
Barium	529	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	2.0		MG/KG	09/12/95	AS-5 R05
Calcium	6360		MG/KG	09/14/95	AS-5 R05
Cadmium	0.16		MG/KG	09/15/95	AS-6 R05
Cobalt	6.8		MG/KG	09/14/95	AS-5 R05
Chromium	11.7		MG/KG	09/14/95	AS-5 R05
Copper	6.6		MG/KG	09/14/95	AS-5 R05
Iron	18800		MG/KG	09/14/95	AS-5 R05
Potassium	9220		MG/KG	09/14/95	AS-5 R05
Magnesium	2610		MG/KG	09/14/95	AS-5 R05
Manganese	265		MG/KG	09/14/95	AS-5 R05
Sodium	26300		MG/KG	09/14/95	AS-5 R05
Nickel	7.2		MG/KG	09/14/95	AS-5 R05
Lead	28.4	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.59	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.12		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	10.1	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.50		MG/KG	09/15/95	AS-6 R05
Uranium	2.6	*	MG/KG	09/15/95	AS-6 R05
Vanadium	28.8		MG/KG	09/14/95	AS-5 R05
Zinc	56.8	*	MG/KG	09/14/95	AS-5 R05

1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0070-01
Ticket ID: FS-2282

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231565

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.41	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	74500		MG/KG	09/14/95	AS-5 R05
Arsenic	1.5	N	MG/KG	09/20/95	AS-4 R01
Barium	523	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.4		MG/KG	09/12/95	AS-5 R05
Calcium	5870		MG/KG	09/14/95	AS-5 R05
Cadmium	0.17		MG/KG	09/15/95	AS-6 R05
Cobalt	5.0		MG/KG	09/14/95	AS-5 R05
Chromium	6.2		MG/KG	09/14/95	AS-5 R05
Copper	4.4		MG/KG	09/14/95	AS-5 R05
Iron	17600		MG/KG	09/14/95	AS-5 R05
Potassium	34100		MG/KG	09/14/95	AS-5 R05
Magnesium	1690		MG/KG	09/14/95	AS-5 R05
Manganese	424		MG/KG	09/14/95	AS-5 R05
Sodium	30700		MG/KG	09/14/95	AS-5 R05
Nickel	4.8		MG/KG	09/14/95	AS-5 R05
Lead	32.1	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.47	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.21	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	97.08		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	7.7	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.54		MG/KG	09/15/95	AS-6 R05
Uranium	0.95	*	MG/KG	09/15/95	AS-6 R05
Vanadium	17.4		MG/KG	09/14/95	AS-5 R05
Zinc	68.7	*	MG/KG	09/14/95	AS-5 R05

1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0071-01
Ticket ID: FS-2283

Date: September 29, 1995
Lab ID: 231566

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected: .

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	64300		MG/KG	09/14/95	AS-5 R05
Arsenic	1.4	N	MG/KG	09/20/95	AS-4 R01
Barium	651	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.7		MG/KG	09/12/95	AS-5 R05
Calcium	6620		MG/KG	09/14/95	AS-5 R05
Cadmium	0.18		MG/KG	09/15/95	AS-6 R05
Cobalt	8.1		MG/KG	09/14/95	AS-5 R05
Chromium	14.4		MG/KG	09/14/95	AS-5 R05
Copper	7.6		MG/KG	09/14/95	AS-5 R05
Iron	17500		MG/KG	09/14/95	AS-5 R05
Potassium	9840		MG/KG	09/14/95	AS-5 R05
Magnesium	2730		MG/KG	09/14/95	AS-5 R05
Manganese	494		MG/KG	09/14/95	AS-5 R05
Sodium	20700		MG/KG	09/14/95	AS-5 R05
Nickel	7.1		MG/KG	09/14/95	AS-5 R05
Lead	21.2	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.49	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.05		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	10.1	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.79		MG/KG	09/15/95	AS-6 R05
Uranium	2.5	*	MG/KG	09/15/95	AS-6 R05
Vanadium	28.0		MG/KG	09/14/95	AS-5 R05
Zinc	54.1	*	MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0072-01
Ticket ID: FS-2284

Date: September 29, 1995
Lab ID: 231567

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	48700		MG/KG	09/14/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/20/95	AS-4 R01
Barium	507	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.8		MG/KG	09/12/95	AS-5 R05
Calcium	4560		MG/KG	09/14/95	AS-5 R05
Cadmium	0.14		MG/KG	09/15/95	AS-6 R05
Cobalt	8.2		MG/KG	09/14/95	AS-5 R05
Chromium	15.4		MG/KG	09/14/95	AS-5 R05
Copper	7.2		MG/KG	09/14/95	AS-5 R05
Iron	16800		MG/KG	09/14/95	AS-5 R05
Potassium	27300		MG/KG	09/14/95	AS-5 R05
Magnesium	2690		MG/KG	09/14/95	AS-5 R05
Manganese	423		MG/KG	09/14/95	AS-5 R05
Sodium	20800		MG/KG	09/14/95	AS-5 R05
Nickel	7.9		MG/KG	09/14/95	AS-5 R05
Lead	19.6	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.48	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.04		%	09/01/95	M-8 R00
Tantalum	2.0		MG/KG	09/17/95	AS-6 R05
Thorium	8.7	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.68		MG/KG	09/15/95	AS-6 R05
Uranium	2.3	*	MG/KG	09/15/95	AS-6 R05
Vanadium	29.8		MG/KG	09/14/95	AS-5 R05
Zinc	54.2	*	MG/KG	09/14/95	AS-5 R05

V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0073-01
Ticket ID: FS-2285

Date: September 29, 1995
Lab ID: 231568

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	69600		MG/KG	09/14/95	AS-5 R05
Arsenic	1.5	N	MG/KG	09/20/95	AS-4 R01
Barium	484	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.8		MG/KG	09/12/95	AS-5 R05
Calcium	5600		MG/KG	09/14/95	AS-5 R05
Cadmium	0.14		MG/KG	09/15/95	AS-6 R05
Cobalt	7.8		MG/KG	09/14/95	AS-5 R05
Chromium	15.2		MG/KG	09/14/95	AS-5 R05
Copper	7.1		MG/KG	09/14/95	AS-5 R05
Iron	18900		MG/KG	09/14/95	AS-5 R05
Potassium	7970		MG/KG	09/14/95	AS-5 R05
Magnesium	2920		MG/KG	09/14/95	AS-5 R05
Manganese	428		MG/KG	09/14/95	AS-5 R05
Sodium	20900		MG/KG	09/14/95	AS-5 R05
Nickel	8.5		MG/KG	09/14/95	AS-5 R05
Lead	18.7	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.51	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.24		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	10.4	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.75		MG/KG	09/15/95	AS-6 R05
Uranium	2.2	*	MG/KG	09/15/95	AS-6 R05
Vanadium	31.4		MG/KG	09/14/95	AS-5 R05
Zinc	55.5	*	MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0074-01
Ticket ID: FS-2286

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231569

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	69500		MG/KG	09/14/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/20/95	AS-4 R01
Barium	497	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.8		MG/KG	09/12/95	AS-5 R05
Calcium	5540		MG/KG	09/14/95	AS-5 R05
Cadmium	0.14		MG/KG	09/15/95	AS-6 R05
Cobalt	8.1		MG/KG	09/14/95	AS-5 R05
Chromium	16.5		MG/KG	09/14/95	AS-5 R05
Copper	7.5		MG/KG	09/14/95	AS-5 R05
Iron	17900		MG/KG	09/14/95	AS-5 R05
Potassium	28600		MG/KG	09/14/95	AS-5 R05
Magnesium	2910		MG/KG	09/14/95	AS-5 R05
Manganese	468		MG/KG	09/14/95	AS-5 R05
Sodium	21400		MG/KG	09/14/95	AS-5 R05
Nickel	8.4		MG/KG	09/14/95	AS-5 R05
Lead	19.6	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.49	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.02		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	10.9	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.81		MG/KG	09/15/95	AS-6 R05
Uranium	2.3	*	MG/KG	09/15/95	AS-6 R05
Vanadium	30.1		MG/KG	09/14/95	AS-5 R05
Zinc	55.6	*	MG/KG	09/14/95	AS-5 R05

1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0075-01
Ticket ID: FS-2287

Date: September 29, 1995
Lab ID: 231570

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	69900		MG/KG	09/14/95	AS-5 R05
Arsenic	1.3	N	MG/KG	09/20/95	AS-4 R01
Barium	504	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.7		MG/KG	09/12/95	AS-5 R05
Calcium	5780		MG/KG	09/14/95	AS-5 R05
Cadmium	0.11		MG/KG	09/15/95	AS-6 R05
Cobalt	8.1		MG/KG	09/14/95	AS-5 R05
Chromium	15.8		MG/KG	09/14/95	AS-5 R05
Copper	6.8		MG/KG	09/14/95	AS-5 R05
Iron	18000		MG/KG	09/14/95	AS-5 R05
Potassium	28500		MG/KG	09/14/95	AS-5 R05
Magnesium	2950		MG/KG	09/14/95	AS-5 R05
Manganese	449		MG/KG	09/14/95	AS-5 R05
Sodium	22000		MG/KG	09/14/95	AS-5 R05
Nickel	8.4		MG/KG	09/14/95	AS-5 R05
Lead	20.9	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.47	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.22		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	10.9	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.80		MG/KG	09/15/95	AS-6 R05
Uranium	2.2	*	MG/KG	09/15/95	AS-6 R05
Vanadium	30.7		MG/KG	09/14/95	AS-5 R05
Zinc	50.5	*	MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0076-01
Ticket ID: FS-2288

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231571

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	69100		MG/KG	09/14/95	AS-5 R05
Arsenic	1.5	N	MG/KG	09/20/95	AS-4 R01
Barium	497	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.7		MG/KG	09/12/95	AS-5 R05
Calcium	6080		MG/KG	09/14/95	AS-5 R05
Cadmium	0.18		MG/KG	09/15/95	AS-6 R05
Cobalt	9.9		MG/KG	09/14/95	AS-5 R05
Chromium	17.0		MG/KG	09/14/95	AS-5 R05
Copper	7.1		MG/KG	09/14/95	AS-5 R05
Iron	20200		MG/KG	09/14/95	AS-5 R05
Potassium	9410		MG/KG	09/14/95	AS-5 R05
Magnesium	3160		MG/KG	09/14/95	AS-5 R05
Manganese	485		MG/KG	09/14/95	AS-5 R05
Sodium	20700		MG/KG	09/14/95	AS-5 R05
Nickel	8.6		MG/KG	09/14/95	AS-5 R05
Lead	19.4	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.49	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.82		%	09/01/95	M-8 R00
Tantalum	1.9		MG/KG	09/17/95	AS-6 R05
Thorium	11.4	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.79		MG/KG	09/15/95	AS-6 R05
Uranium	2.5	*	MG/KG	09/15/95	AS-6 R05
Vanadium	34.7		MG/KG	09/14/95	AS-5 R05
Zinc	58.7	*	MG/KG	09/14/95	AS-5 R05

ANALYTICAL RESULTS

Customer ID: 0816-95-0077-01
Ticket ID: FS-2289

Date: September 29, 1995
Lab ID: 231572

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected: .

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	~0.52	BN	MG/KG	09/14/95	AS-5 R05
Aluminum	70300		MG/KG	09/14/95	AS-5 R05
Arsenic	1.8	N	MG/KG	09/20/95	AS-4 R01
Barium	489	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	2.0		MG/KG	09/12/95	AS-5 R05
Calcium	6110		MG/KG	09/14/95	AS-5 R05
Cadmium	0.16		MG/KG	09/15/95	AS-6 R05
Cobalt	9.4		MG/KG	09/14/95	AS-5 R05
Chromium	18.2		MG/KG	09/14/95	AS-5 R05
Copper	8.3		MG/KG	09/14/95	AS-5 R05
Iron	20200		MG/KG	09/14/95	AS-5 R05
Potassium	14000		MG/KG	09/14/95	AS-5 R05
Magnesium	3730		MG/KG	09/14/95	AS-5 R05
Manganese	503		MG/KG	09/14/95	AS-5 R05
Sodium	19000		MG/KG	09/14/95	AS-5 R05
Nickel	10.1		MG/KG	09/14/95	AS-5 R05
Lead	21.6	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.55	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.65		%	09/01/95	M-8 R00
Tantalum	2.1		MG/KG	09/17/95	AS-6 R05
Thorium	12.2	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.82		MG/KG	09/15/95	AS-6 R05
Uranium	2.6	*	MG/KG	09/15/95	AS-6 R05
Vanadium	35.8		MG/KG	09/14/95	AS-5 R05
Zinc	55.1	*	MG/KG	09/14/95	AS-5 R05

Grand Junction Projects Office Analytical Laboratory

ANALYTICAL RESULTS

Customer ID: 0816-95-0078-01
Ticket ID: FS-2290

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Date: September 29, 1995
Lab ID: 231573

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	64400		MG/KG	09/14/95	AS-5 R05
Arsenic	1.6	N	MG/KG	09/20/95	AS-4 R01
Barium	522	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.8		MG/KG	09/12/95	AS-5 R05
Calcium	6180		MG/KG	09/14/95	AS-5 R05
Cadmium	0.15		MG/KG	09/15/95	AS-6 R05
Cobalt	9.4		MG/KG	09/14/95	AS-5 R05
Chromium	18.6		MG/KG	09/14/95	AS-5 R05
Copper	8.7		MG/KG	09/14/95	AS-5 R05
Iron	18100		MG/KG	09/14/95	AS-5 R05
Potassium	23400		MG/KG	09/14/95	AS-5 R05
Magnesium	3450		MG/KG	09/14/95	AS-5 R05
Manganese	524		MG/KG	09/14/95	AS-5 R05
Sodium	20400		MG/KG	09/14/95	AS-5 R05
Nickel	9.3		MG/KG	09/14/95	AS-5 R05
Lead	20.9	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.59	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	99.02		%	09/01/95	M-8 R00
Tantalum	2.0		MG/KG	09/17/95	AS-6 R05
Thorium	10.8	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.76		MG/KG	09/15/95	AS-6 R05
Uranium	2.3	*	MG/KG	09/15/95	AS-6 R05
Vanadium	33.9		MG/KG	09/14/95	AS-5 R05
Zinc	51.6	*	MG/KG	09/14/95	AS-5 R05

V1.05

ANALYTICAL RESULTS

Customer ID: 0816-95-0079-01
Ticket ID: FS-2291

Date: September 29, 1995
Lab ID: 231574

Requestor: LANL 1151
Sample Matrix: SOIL
Project Number: 6LA414164

Case: 14164
Date Received: Aug 22, 1995
Date Collected:

ANALYSIS REQUESTED	RESULTS	RESULT QUALI's	UNITS	DATE ANALYZED	METHOD OF ANALYSIS
Silver	<0.40	UN	MG/KG	09/14/95	AS-5 R05
Aluminum	67600		MG/KG	09/14/95	AS-5 R05
Arsenic	1.6	N	MG/KG	09/20/95	AS-4 R01
Barium	507	N*	MG/KG	09/14/95	AS-5 R05
Beryllium	1.9		MG/KG	09/12/95	AS-5 R05
Calcium	6120		MG/KG	09/14/95	AS-5 R05
Cadmium	0.13		MG/KG	09/15/95	AS-6 R05
Cobalt	10.0		MG/KG	09/14/95	AS-5 R05
Chromium	21.2		MG/KG	09/14/95	AS-5 R05
Copper	11.1		MG/KG	09/14/95	AS-5 R05
Iron	19200		MG/KG	09/14/95	AS-5 R05
Potassium	11200		MG/KG	09/14/95	AS-5 R05
Magnesium	3560		MG/KG	09/14/95	AS-5 R05
Manganese	467		MG/KG	09/14/95	AS-5 R05
Sodium	19200		MG/KG	09/14/95	AS-5 R05
Nickel	9.2		MG/KG	09/14/95	AS-5 R05
Lead	19.7	N*	MG/KG	09/15/95	AS-6 R05
Antimony	~0.57	B	MG/KG	09/15/95	AS-6 R05
Selenium	<0.20	UN	MG/KG	09/18/95	AS-5 R05
Percent Solids	98.85		%	09/01/95	M-8 R00
Tantalum	2.3		MG/KG	09/17/95	AS-6 R05
Thorium	11.8	E*	MG/KG	09/15/95	AS-6 R05
Thallium	0.68		MG/KG	09/15/95	AS-6 R05
Uranium	2.4	*	MG/KG	09/15/95	AS-6 R05
Vanadium	35.7		MG/KG	09/14/95	AS-5 R05
Zinc	65.7	*	MG/KG	09/14/95	AS-5 R05

```
        psi[1] <- ((n - 1) * t)/n
        for(i in 1:25) {
                psi[i + 1] <- (psi[i] * (n - 1)^2 * t)/((i + 1) * n * (n + (2 *
                        i - 1)))
                if(abs((psi[i + 1] - psi[i])/psi[i]) < 1e-09)
                        break
        }
        psi <- 1 + sum(psi)
        psi
}
```

APPENDIX C

S-Plus Code Used to Calculate Lognormal UTLs

File: lnorm_utl1.s

```
function(q,p,n,ave,sd,nt)
{
# lnorm_utl1.s is used as function LUTL1 in Splus
# This function is used to estimate the upper p% CI of the qth percentile
# percentile for a lognormal distribution.  Uses Gilbert's MBE (minimum unbiased
estimator) of LN.
#    q = the quantile to estimate
#    p = the confidence limit of q
#    n = number of values sampled
#  ave = mean of logtranformed data
#   sd = st. dev. of logtranformed data
#   nt = number of simulation trials
#.............................................................

# Calculate the qth quantile of the normal distribution
q1_qnorm(q)

# Initialize arrays
t1_rep(-1,n)
t2_rep(-1,nt)

i_0

repeat

 { i_i+1

# Get the "n" lognormal samples
   t1_rlnorm(n,ave,sd)

# Calculate the mean and sd the hard way
   dummy_lnormUMV.s(t1)
   ave1_dummy$mu
   sd1_sqrt(dummy$s2)
```

```
 # Calculate an estimate of the qth percentile
    t2[i]_exp(ave1+q1*sd1)
    if(i>=nt) break
  }

 # Find the upper p*100% of the qth percentile
 quantile(t2,p)
 }
```

File: lnormUMV.s

```
function(x)
{
# lnormUMV.s (Splus function)
# Calls: psi.s
# Min Variance Unbiased ests of parameters of lognormal(mu,var=s2) distn
# for X~lognorm(mu,s2), Y=log(X)~normal(mu,s2)
# returns:E=mean(X), V=var(X)
#        mu=mean(Y),s2=var(Y)
# ref:Gilbert('87),Stat Methods for Env Pollution Mon, pp165-166
        n <- length(x)
        y <- log(x)
        ymu <- mean(y)
        vy <- var(y)
        psi1 <- psi.s(vy/2, n)
        psi2 <- psi.s(2 * vy, n)
        psi3 <- psi.s((vy * (n - 2))/(n - 1), n)
        E <- exp(ymu) * psi1
        V <- exp(2 * ymu) * (psi2 - psi3)
        mu <- log(E^2/(V + E^2)^0.5)
        s2 <- log(V/E^2 + 1)
        return(E, V, mu, s2)
}
```

File: psi.s

```
function(t, n)
{
# psi.s (Splus function)
# called by lnormUMV.s
# psi function in Gilbert('87) Stat. Meth. Env. Pollution. Mon, pp 165
# for Min Variance Unbiased ests of parameters of lognormal(mu,var=s2) distn
        psi <- 0
```