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Trace Elements in Soils and Vegetation
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Construction Phase (1998)*

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BASELINE CONCENTRATIONS OF RADIONUCLIDES AND TRACE ELEMENTS IN SOILS AND VEGETATION AROUND THE DARHT FACILITY: CONSTRUCTION PHASE (1998)

by

P. R. Fresquez, M. H. Ebinger, H. T. Haagenstad, and L. Naranjo, Jr.

ABSTRACT

The Mitigation Action Plan for the Dual-Axis Radiographic Hydrodynamic Test (DARHT) facility at Los Alamos National Laboratory mandates the establishment of baseline concentrations for potential environmental contaminants. To this end, concentrations of ^3H , ^{137}Cs , ^{90}Sr , ^{238}Pu , $^{239,240}\text{Pu}$, ^{241}Am , and $^{\text{tot}}\text{U}$ and Ag, As, Ba, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, and Tl were determined in surface and subsurface soils, sediments, and vegetation (overstory and understory) around the DARHT facility during the construction phase in 1998 (this is the third of a four year baseline study). Also, volatile (VOC) and semivolatile (SVOC) organic compounds were measured in soils and sediments. Most radionuclides and trace metals in soil, sediment, and vegetation were similar to past years at DARHT and were within regional background concentrations. Exceptions were concentrations of ^{90}Sr , Be, Ba, and total U in some samples—these elements exceeded upper limit regional background concentrations (e.g., >mean plus two std dev). No VOCs and very few SVOCs were detected in soils and sediments at DARHT. Mean ($\pm$ std dev) radionuclide and trace element concentrations measured in soil, sediment, and vegetation summarized over a three-year period (construction phase) are summarized.

I. INTRODUCTION

The United States Department of Energy (DOE) prepared and issued a Mitigation Action Plan (MAP) for the Dual-Axis Radiographic Hydrodynamic Test (DARHT) facility in response to a

Record of Decision (USDOE 1995a) concerning the DARHT Environmental Impact Statement (USDOE 1995b). The DARHT MAP documents, in part, the DOE's commitment to protect natural

and cultural resources during the construction, operation, and decommissioning phases of the DARHT facility (USDOE 1996). One of the initial tasks identified in section VIII.A.1. (a) of the MAP mandates measurement of baseline concentrations of radioactive and stable materials through the collection and analysis of soils, invertebrates, plants, mammals, birds, and animals killed accidentally on Los Alamos National Laboratory (LANL) roads near the DARHT facility during the construction phase.

The objective of this ongoing study was to determine baseline concentrations of radionuclides, stable inorganics such as metals (light and heavy) and nonmetals, and volatile and semi-volatile organic compounds (VOC and SVOC, respectively) in soils, sediments, and vegetation around the DARHT facility prior to the beginning of operations in the latter part of 1999—this particular year, 1998, was the third of a four-year effort to establish baseline information prior to the commencement of DARHT operations. The first and second years can be found in Fresquez et al. (1997a, 1998a), and summary statistics for all of the three years

measured so far during the construction phase of the DARHT facility are summarized.

II. METHODS & MATERIALS

Soil and Sediment Sampling.

Four composite soil surface samples were collected with a stainless steel soil ring 10 cm (4 in.) in diameter driven 5 cm (2 in.) into the soil (ASTM 1990) approximately 24 m (80 ft) away, but within the large berm wall, from the north, east, south and west side of the DARHT facility for radiological and nonradiological (light, heavy, and nonmetal) analyses (Fresquez 1996) (Figure 1). Samples were collected from the center and corners of a square area 10 m (32 ft) per side; the five subsamples were combined and mixed thoroughly in a three-gallon Ziploc® bag to form a composite sample. In addition, four subsurface samples—one on the east, one on the west and two from the berm on the north side of the facility—were collected with a stainless steel auger at the 0- to 30-cm (0- to 12-in.) depth. Three sediment grab samples were also collected at the 0- to 15-cm (0- to 6-in.) depth with a stainless steel scoop within three drainage

Figure 1. Sampling locations at DARHT at TA-15.

channel/ponding areas originating from the DARHT facility on the north, west, and southwest sides. Most of the sediment material on the north side was a result of erosion off the berm wall, whereas sediments from the other sites were from erosional processes off the grounds themselves. All soil and sediment samples collected for radiological analysis were placed in prelabeled 500-mL polypropylene bottles, and prelabeled 125-mL polypropylene bottles were used for inorganic analysis. Similarly, soil and sediment samples collected for VOC and SVOC analyses were collected at the 0- to 15-cm (0- to 6-in.) depth with stainless steel scoops at the same locations as mentioned above; samples were placed into 500-mL amber glass containers for SVOC and 125-mL amber septum glass containers for VOC. All containers were fitted with chain-of-custody tape, placed into individual Ziploc® plastic bags, transported in a locked ice chest cooled to approximately 4°C, and submitted to the Environmental Chemistry Group (CST-9) at LANL for the analysis of radionuclides (^3H , ^{137}Cs , ^{238}Pu , $^{239,240}\text{Pu}$, ^{90}Sr , ^{241}Am , and total uranium), heavy metals (Ag, As, Ba, Be,

Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, and Tl), and SVOC and VOC. All methods of radionuclide (Purtymun et al. 1987, Fresquez et al. 1996a) and trace elements (Fresquez et al. 1996b) analysis have been previously reported; uranium, however, was analyzed by kinetic phosphorescence analysis. Results are reported in pCi mL⁻¹ (of soil moisture) for tritium, µg g⁻¹ dry for uranium and heavy metals, and pCi g⁻¹ dry soil for all the other radioisotopes. SVOC and VOC were prepared and analyzed according to SW 846 (and method ANC 609 for SVOC and 8260 for VOC) by gas chromatography/mass spectrometry.

Vegetation Sampling. Vegetation samples were collected from overstory and understory materials as close as possible to the soil sampling locations. Overstory samples, mostly ponderosa pine (*Pinus ponderosa*), consisted of tree-shoot tips approximately 2.5 to 5 cm (1 to 2 in.) in length at the 1.2- to 1.5-m (4- to 5-ft) height (Fresquez et al. 1996c). Understory samples, mostly top growth of grass and forb species, were collected from the center and corners of a 10- by 10-m (32- by 32-ft) plot. One pine selected for overstory sampling was used

as the center of the understory sample plot. Samples were 0.9 to 1.4 kg (2 to 3 lb) of fresh, composited material and were double bagged in labeled Ziploc® plastic bags before transport to the Ecology Group (ESH-20) laboratory in locked ice chests. At the laboratory, each unwashed sample was divided into three subsamples for preparation and analyses of tritium, other radionuclides, and trace elements.

Subsamples for ^3H analysis were placed in an apparatus to collect distillate water (Salazar 1984). Vegetation subsamples for trace element analysis were dried at 70°C for 48 h then ground in a Wiley mill equipped with a 40-mm screen. The remaining portion of each subsample was placed in 1-L glass beakers and ashed at 500°C for 120 h, pulverized and homogenized after ashing, transferred to labeled 500-mL polypropylene bottles, and with the distillate samples submitted to CST-9 under full chain-of-custody. Results were reported in pCi mL^{-1} of tissue moisture for ^3H , $\mu\text{g g}^{-1}$ ash for total uranium, and pCi g^{-1} of ash for the other radionuclides. Results in grams of ash are usually two to four orders of magnitude greater than live (wet)

weight. Trace elements were reported as $\mu\text{g g}^{-1}$ dry.

III. RESULTS

Baseline data for 1998 are shown in Tables 1 through 4, and analytical reports are attached as Appendices A through G for future reference. The data collected in 1998 were compared to background samples from 1998 and Regional Statistical Reference Levels (RSRLs) data that were collected as part of the Soil and Vegetation Surveillance programs at LANL (Fresquez et al. 1997b, 1998a). The RSRL values are the 95% upper confidence intervals (mean + 2 standard deviations) of radionuclide concentrations from samples at Cochiti, Embudo, and Jemez, New Mexico, from 1983 through 1998 (LANL 1998).

Values from DARHT samples were also compared to LANL screening action levels (SALs) that were developed by the Environmental Restoration Program at Los Alamos. The SALs were based on exposure modeling that assumes 10 mrem yr^{-1} radiological dose to humans. The SALs are used to identify the presence of contaminants of concern (FIMAD 1997).

Surface Soils, Subsurface Soils, and Sediments.

Radionuclide concentrations from surface soils, subsurface soils, and sediments were generally less than RSRLs (Table 1). Concentrations of ^{90}Sr in most samples, however, were slightly greater (ranged from 1.63 to 2.03 pCi g⁻¹ dry) than the current year's background concentration (1.26 pCi g⁻¹ dry) and twice that of RSRLs, and concentrations of total U in sediments were slightly greater than RSRLs. Total U concentrations greater than RSRLs were expected because of the elevated U in the parent material from which the soils developed (Crowe et al. 1978). The slightly higher ^{90}Sr concentrations in soils from DARHT over current background concentrations is not completely certain, but probably related to past worldwide fallout events.

Concentrations of most trace elements in surface soils, subsurface soils, and sediments collected within the DARHT facility were less than RSRLs (Table 2). One subsurface soil sample collected from the east location and one sediment sample collected on the north side of the DARHT facility contained Ba greater than the RSRL. Concentrations of Be in two of the four surface soil, in

three of the four subsurface soil, and the sediment samples were all greater than RSRLs. In addition, the Be concentration from the surface soil collected on the west end was only slightly less than the LANL SAL. Longmire et al. (1995) showed that Be concentrations in the Los Alamos area are typically greater than Be concentrations in other areas.

SVOC and VOC analytical records are found in Appendices E and F. There were no VOCs detected in any of the soil or sediment samples collected around the DARHT facility and only trace amounts of a few SVOCs. The SVOCs detected were methylene chloride (25 µg kg⁻¹) in a soil sample collected at the north location and in a sediment sample (6.2 µg kg⁻¹) collected at the east location; styrene in a soil sample collected from the south location (2.1 µg kg⁻¹) and the east location (1.9 µg kg⁻¹); and chloroform (1.5 µg kg⁻¹) in a sediment sample collected at the north location.

Vegetation Samples. Most radionuclide concentrations in vegetation samples were less than background concentrations and RSRLs, but some values exceeded background

values, RSRLs, or both (Table 3). Concentrations of ^{137}Cs in overstory and understory vegetation were greater than background concentrations from the north, east, and west locations, and only the understory from the east locations exceeded RSRLs. Total U from the overstory sample at the north location was greater than the background value, but all other total U concentrations were less than background and RSRLs. The understory samples from the east location contained ^{90}Sr greater than background and the RSRL, whereas the understory samples from the south and west locations exceeded only background values. The radionuclide data from previous sampling at DARHT were similar to the current sample results.

Table 4 shows that the metal concentrations in many samples were less than background concentrations and RSRLs. However, there were two sets of values that exceeded either background values, RSRL values, or both. One set had detection limits that were greater than background or RSRL values, thus these values could not be realistically compared to background or RSRL values. Examples from Table 4

are results for Ag, As, Be, Cd, Ni, Sb, Se, and Tl. The second set of values was legitimately greater than background or RSRL values. The concentration in the understory sample of Ba from the west location was greater than background but less than the RSRL. Concentrations of Ba in overstory samples from the east and west locations were greater than background, but all concentrations of Ba in overstory samples were less than RSRLs. The concentration of Cu in the understory sample from the east location was greater than both background and the RSRL, and all other understory samples were greater than the background concentration for Cu. Detectable Cu was reported in all overstory samples, but no sample contained a Cu concentration that exceeded background or RSRL values. The Pb concentration in all overstory samples was greater than background, and the sample from the east location was greater than the RSRL as well. The concentration of Pb from the understory sample was greater than background in all but the sample from the south location, and none of the understory samples exceeded the RSRL. The concentration of Ag from the overstory

sample collected at the east location greatly exceeded the Ag concentration of both background and RSRL values, but all other Ag concentrations were less than the detection limit. The data collected during 1998 were similar to results reported previously at DARHT (Fresquez et al. 1997a, 1998a).

Summary of Baseline Data (1996 to Present). Table 5 and 6 show the mean and standard deviations of radionuclides and trace elements in soils, sediment, and vegetation to date (1996 to present). Overall, all radionuclides, with the exception of ^{90}Sr , and trace elements, with exception of Be, are very similar to regional background concentrations collected as part of the environmental surveillance program at LANL; and, at present, confidence in the baseline measurements in these matrices at DARHT are high.

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Table 1. Radionuclide concentrations in surface soil, subsurface soil, and sediment collected around the DARHT facility in 1998.

Location	^3H pCi mL ⁻¹	^{90}Sr pCi g ⁻¹ dry	^{106}U µg g ⁻¹ dry	^{137}Cs pCi g ⁻¹ dry	^{238}Pu pCi g ⁻¹ dry	$^{239,240}\text{Pu}$ pCi g ⁻¹ dry	^{241}Am pCi g ⁻¹ dry
Soil							
North	0.16 (0.64) ¹	2.16 (0.77)	2.53 (0.25)	0.06 (0.01)	0.001 (0.003)	0.005 (0.003)	0.005 (0.001)
East	0.15 (0.64)	1.43 (0.59)	2.71 (0.27)	0.10 (0.02)	0.001 (0.001)	0.003 (0.001)	0.005 (0.001)
South	-0.09 (0.63)	1.07 (0.74)	1.32 (0.13)	-0.00 (0.08)	0.002 (0.002)	0.002 (0.001)	0.003 (0.001)
West	0.25 (0.65)	1.84 (0.64)	2.55 (0.26)	0.07 (0.10)	0.000 (0.000)	0.003 (0.001)	0.002 (0.001)
Mean (SD)	0.12 (0.15)	1.63 (0.48)	2.28 (0.64)	0.06 (0.04)	0.001 (0.001)	0.003 (0.001)	0.004 (0.002)
Subsurface Soil							
East	0.00 (0.63)	2.12 (0.68)	1.67 (0.17)	0.04 (0.01)	0.001 (0.001)	0.017 (0.003)	0.005 (0.001)
West	0.19 (0.65)	1.80 (0.73)	3.16 (0.32)	0.04 (0.06)	0.002 (0.001)	0.021 (0.003)	0.006 (0.001)
Berm NW	0.02 (0.63)	1.34 (0.50)	2.46 (0.25)	0.07 (0.01)	0.001 (0.001)	0.012 (0.002)	0.007 (0.001)
Berm NE	0.13 (0.64)	1.82 (0.64)	3.44 (0.34)	0.08 (0.01)	0.000 (0.000)	0.015 (0.002)	0.004 (0.001)
Mean (SD)	0.09 (0.09)	1.77 (0.32)	2.68 (0.79)	0.06 (0.02)	0.001 (0.001)	0.016 (0.004)	0.006 (0.001)
Sediment							
North	0.29 (0.65)	2.55 (0.80)	4.59 (0.46)	0.18 (0.03)	0.000 (0.001)	0.004 (0.001)	0.003 (0.001)
East	0.46 (0.67)	1.49 (0.56)	6.66 (0.67)	0.42 (0.05)	0.003 (0.001)	0.017 (0.002)	0.006 (0.001)
South west	0.27 (0.65)	2.05 (0.63)	2.78 (0.28)	0.09 (0.02)	-0.000 (0.000)	0.007 (0.001)	0.002 (0.002)
Mean (SD)	0.34 (0.10)	2.03 (0.53)	4.68 (1.94)	0.23 (0.17)	0.001 (0.002)	0.009 (0.007)	0.004 (0.002)
BG ²	0.25 (0.15)	1.26 (0.26)	1.92 (0.44)	0.28 (0.01)	0.001 (0.001)	0.011 (0.003)	0.006 (0.000)
RSRL ³	1.06	0.71	3.16	0.60	0.010	0.021	0.011
LANL SAL ⁴	1900.00	4.40	29.00	5.10	27.000	24.000	22.000

¹ Values in parentheses are one counting uncertainty, that is, uncertainty in the analytical result at the 65% level.

² BG is the background concentration from LANL (1999). No background values were determined for subsurface soils.

³ RSRL is the Regional Statistical Reference Level; this is the upper (95%) limit (mean + 2 standard deviations) of the background concentration for samples from Embudo, Cochiti, and Jemez from 1993–1997 (LANL 1998).

⁴ SAL is the Los Alamos National Laboratory Screening Action Level (FIMAD 1997).

Table 2. Total trace element concentrations ($\mu\text{g g}^{-1}$ dry) in surface and subsurface soils and sediments collected around the DARHT facility in 1998.

Location	Ag	As	Ba	Be	Cd	Cr	Cu	Hg	Ni	Pb	Sb	Se	Tl
Soil													
North	1.0 ¹	1.50	80.0	0.74	0.20 ¹	8.3	3.3	0.005 ¹	4.9	9.8	0.1 ¹	0.6	0.4 ¹
East	1.0 ¹	1.50	69.2	0.57	0.20 ¹	8.0	3.8	0.020	4.9	7.4	0.1 ¹	0.2 ¹	0.1 ¹
South	1.0 ¹	0.70	34.6	0.39	0.20 ¹	3.4	3.7	0.005 ¹	3.3	6.1	0.1 ¹	0.5	0.1 ¹
West	1.0 ¹	3.40	119.6	0.98	0.20 ¹	13.3	5.8	0.005 ¹	7.2	10.0	0.1 ¹	0.5	0.2
Mean	1.0	1.78	75.9	0.67	0.20	8.3	4.2	0.009	5.1	8.3	0.1	0.5	0.2
(SD)		(1.15)	(35.0)	(0.25)		(4.1)	(1.1)	(0.008)	(1.6)	(1.9)		(0.2)	(0.1)
Subsurface Soil													
East	1.0 ¹	4.10	549.6	1.64	0.20 ¹	11.2	7.5	0.031	8.1	12.0	0.1 ¹	0.4	0.3
West	1.0 ¹	2.80	144.2	1.13	0.20 ¹	10.8	6.8	0.005 ¹	9.1	13.3	0.1 ¹	0.2 ¹	0.3
Berm NW	1.0 ¹	2.30	92.7	0.80	0.20 ¹	9.8	4.0	0.005 ¹	6.4	8.5	0.1 ¹	0.2 ¹	0.2
Berm NE	1.0 ¹	1.90	100.7	0.66	0.20 ¹	5.4	4.5	0.017	5.5	9.0	0.1 ¹	0.2 ¹	0.1 ¹
Mean	1.0	2.78	221.8	1.06	0.20	9.3	5.7	0.015	7.3	10.7	0.1	0.3	0.2
(SD)		(0.96)	(219.7)	(0.44)		(2.7)	(1.7)	(0.012)	(1.6)	(2.32)		(0.1)	(0.1)
Sediment													
North	1.0 ¹	1.90	1041.3	0.87	0.20 ¹	6.8	5.3	0.022	5.2	11.4	0.1 ¹	0.2 ¹	0.2
East	1.0 ¹	2.90	117.5	0.87	0.20 ¹	10.8	6.2	0.021	6.5	11.7	0.1 ¹	0.2 ¹	0.2
South west	1.0 ¹	3.06	93.8	0.81	0.20 ¹	10.2	5.9	0.024	6.7	9.3	0.1 ¹	0.2 ¹	0.2
Mean	1.0	2.62	417.5	0.85	0.20	9.3	5.8	0.022	6.1	10.8	0.1	0.2	0.2
(SD)		(0.63)	(540.3)	(0.03)		(2.2)	(0.5)	(0.002)	(0.8)	(1.3)			
BG ²	1.00	2.87	98.9	0.17	0.20	12.49		0.02	7.56	10.57	0.10	0.20	0.10
RSRL ³	2.00	5.9	187	0.71	0.25	14.6	10.8	0.03	10.8	15.2	0.2	0.8	1.4
LANL SAL ⁴	400.	5.9	5600	0.99	80.00	400.0	3000.0	24.00	1600.0	500.0	32.0	400.0	6.4
00													

¹ Less than values are reported as one-half the detection limit.

² BG is the background concentration from Fresquez et al. (1997a). No background values were calculated for subsurface soils.

³ RSRL is the Regional Statistical Reference Level; this is the upper (95%) limit (mean + 2 standard deviations) of the background concentration for samples from Embudo, Cochiti, and Jemez from 1993–1997 (Fresquez et al. 1997b).

⁴ SAL is the Los Alamos National Laboratory Screening Action Level (FIMAD 1997).

Table 3. Radionuclide concentrations in overstory (OS) and understory (US) vegetation collected around the DARHT facility in 1998.

Location	^3H pCi mL ⁻¹	^{90}Sr pCi g ⁻¹ ash	^{101}U µg g ⁻¹ ash	^{137}Cs pCi g ⁻¹ ash	^{238}Pu pCi g ⁻¹ ash	^{239}Pu pCi g ⁻¹ ash	^{241}Am pCi g ⁻¹ ash
North							
OS	1.05 (0.73)	2.20 (0.29)	1.36 (0.14)	1.20 (0.27)	-0.001 (0.001)	-0.000 (0.002)	0.003 (0.005)
US	0.69 (0.71)	0.81 (0.21)	0.37 (0.04)	0.68 (1.03)	-0.001 (0.001)	0.003 (0.002)	0.003 (0.005)
East							
OS	0.65 (0.70)	4.23 (0.61)	0.98 (0.10)	0.91 (1.37)	0.003 (0.002)	-0.001 (0.003)	-0.006 (0.011)
US	-0.02 (0.66)	4.82 (0.48)	0.69 (0.07)	1.22 (0.20)	0.003 (0.001)	0.004 (0.002)	0.013 (0.006)
South							
OS	0.32 (0.68)	2.57 (0.62)	0.35 (0.04)	1.11 (0.25)	0.001 (0.002)	0.004 (0.003)	0.003 (0.003)
US	0.00 (-0.00)	3.50 (0.38)	0.30 (0.03)	0.35 (0.52)	0.000 (0.002)	0.001 (0.004)	0.002 (0.005)
West							
OS	0.34 (0.68)	4.13 (0.54)	0.27 (0.03)	1.13 (0.25)	-0.001 (0.002)	-0.000 (0.003)	0.006 (0.003)
US	-0.19 (0.65)	3.35 (0.48)	0.34 (0.03)	0.6 (1.02)	-0.001 (0.002)	-0.002 (0.002)	-0.001 (0.009)
BG²							
OS	-0.25 (0.28)	7.9 (1.2)	1.21 (0.01)	0.27 (0.12)	0.025 (0.006)	0.051 (0.009)	0.002 (0.002)
US	0.37 (0.28)	3.0 (0.8)	1.16 (0.11)	0.61 (0.22)	0.001 (0.001)	0.008 (0.003)	0.002 (0.002)
RSRL³							
OS	1.87	13.3	1.63	1.65	0.038	0.075	0.004
US	1.56	4.1	1.53	0.93	0.005	0.011	0.004

¹ Values in parentheses are one counting uncertainty, that is, uncertainty in the analytical result at the 65% level.

² BG is background from Fresquez et al. (1997b). ²⁴¹Am background from Fresquez et al. (1996c).

³ RSRL is the Regional Statistical Reference Level; this is the upper (95%) limit background concentration (mean + 2 standard deviations) from Fresquez et al. (1997b).

Table 4. Total heavy metal concentrations ($\mu\text{g g}^{-1}$ dry) in overstory (OS) and understory (US) vegetation collected around the DARHT facility in 1998.

Location	Ag	As	Ba	Be	Cd	Cr	Cu	Hg	Ni	Pb	Sb	Se	Tl
North													
OS	1.00 ¹	0.25 ¹	27.0	0.10 ¹	0.50 ¹	0.50 ¹	3.3	0.005 ¹	3.9	1.1	0.2 ¹	0.25 ¹	0.20 ¹
US	1.00 ¹	0.25 ¹	48.0	0.10 ¹	0.50 ¹	0.50 ¹	6.1	0.031	1.0 ¹	0.8	0.2 ¹	0.20 ¹	0.20 ¹
East													
OS	62.00	0.25 ¹	36.0	0.10 ¹	0.50 ¹	0.50 ¹	4.7	0.005 ¹	1.0 ¹	4.5	0.2 ¹	0.20 ¹	0.20 ¹
US	1.00 ¹	0.25 ¹	50.0	0.10 ¹	0.50 ¹	0.50 ¹	12.0	0.005 ¹	1.0 ¹	1.0	0.2 ¹	0.20 ¹	0.20 ¹
South													
OS	1.00 ¹	0.25 ¹	45.0	0.10 ¹	0.50 ¹	0.50 ¹	3.6	0.005 ¹	1.0 ¹	1.7	0.2 ¹	0.20 ¹	0.20 ¹
US	1.00 ¹	0.25 ¹	43.0	0.10 ¹	0.50 ¹	0.50 ¹	5.3	0.005 ¹	1.0 ¹	0.2 ¹	0.2 ¹	0.20 ¹	0.20 ¹
West													
OS	1.00 ¹	0.25 ¹	61.0	0.10 ¹	0.50 ¹	0.50 ¹	3.5	0.005 ¹	2.3	2.8	0.2 ¹	0.20 ¹	0.20 ¹
US	1.00 ¹	0.25 ¹	82.0	0.10 ¹	0.50 ¹	0.50 ¹	7.1	0.005 ¹	2.9	4.6	0.4	0.20 ¹	0.20 ¹
BG²													
OS	0.13 ¹	0.10 ¹	32.5	0.06 ¹	0.13 ¹	0.63		0.05 ¹	1.1 ¹	0.4	0.2 ¹	0.20	0.50 ¹
US	0.13 ¹	0.10 ¹	69.0	0.06 ¹	0.25	0.63 ¹	4.8 ⁴	0.05 ¹	1.1 ¹	0.7	0.2 ¹	0.20	0.50 ¹
RSRL³													
OS	0.84	0.10	52.2	0.08	0.26	0.98		0.05	1.7	3.5	0.8	0.29	19.36
US	0.84	0.10	122.0	0.08	0.30	0.98	8.5 ⁴	0.05	1.7	3.2	0.8	3.65	19.36

¹ Less than values are reported as one-half the detection limit.

² BG is the background from Fresquez et al. (1997b).

³ RSRL is the Regional Statistical Reference Level; this is the upper (95%) limit background concentration (mean + 2 standard deviations) from Fresquez et al. (1997b).

⁴ Background from Fresquez et al. (1990).

Table 5. Mean ($\pm$ SD) radionuclide (baseline) concentrations in surface soil, sediment, and vegetation collected around the DARHT facility from 1996 through 1998 (construction phase).

Location	^3H pCi mL $^{-1}$	^{90}Sr pCi g $^{-1}$	^{106}U $\mu\text{g g}^{-1}$	^{137}Cs pCi g $^{-1}$	^{238}Pu pCi g $^{-1}$	$^{239,240}\text{Pu}$ pCi g $^{-1}$	^{241}Am pCi g $^{-1}$
Soil (dry)	0.22 (0.18)	1.34 (1.23)	2.03 (0.87)	0.05 (0.04)	0.001 (0.001)	0.002 (0.002)	0.004 (0.002)
Sediment (dry)	0.33 (0.33)	1.67 (1.37)	4.40 (1.41)	0.20 (0.12)	0.001 (0.001)	0.008 (0.005)	0.005 (0.002)
Vegetation (ash)							
OS	0.42 (0.36)	2.95 (2.11)	0.89 (0.54)	0.60 (0.41)	0.001 (0.002)	0.002 (0.002)	0.005 (0.006)
US	0.27 (0.42)	1.90 (1.58)	1.08 (1.09)	0.45 (0.31)	0.000 (0.001)	0.004 (0.005)	0.003 (0.004)

Table 6 Mean ($\pm$ SD) total trace element (baseline) concentrations ($\mu\text{g g}^{-1}$ dry) in surface soils, sediments, and vegetation collected around the DARHT facility from 1996 through 1998 (construction phase).

Location	Ag	As	Ba	Be	Cd	Cr	Cu	Hg	Ni	Pb	Sb	Se	Tl
Soil	0.71 (0.43)	1.59 (0.91)	78 (32)	0.67 (0.21)	0.27 (0.14)	7.2 (3.0)	4.1 (1.5)	0.02 (0.01)	5.1 (2.6)	7.3 (2.8)	0.20 (0.10)	0.30 (0.10)	0.23 (0.09)
Sediment	0.67 (0.45)	2.25 (0.57)	109 (28)	0.82 (0.19)	0.30 (0.16)	8.3 (1.9)	5.4 (1.4)	0.03 (0.01)	6.3 (1.4)	9.0 (2.0)	0.23 (0.10)	0.27 (0.10)	0.23 (0.05)
Vegetation													
OS	0.43 (0.36)	0.17 (0.07)	29 (18)	0.09 (0.01)	0.28 (0.16)	0.37 (0.20)	3.5 (0.5)	0.03 (0.02)	1.8 (2.0)	2.3 (2.0)	2.7 (3.5)	0.20 (0.06)	0.17 (0.02)
US	0.48 (0.38)	0.17 (0.07)	50 (19)	0.09 (0.01)	0.28 (0.16)	0.39 (0.16)	7.7 (2.2)	0.04 (0.03)	2.1 (2.1)	1.1 (1.2)	2.7 (3.5)	0.16 (0.04)	0.17 (0.02)

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APPENDIX A

ANALYTICAL DATA REPORTS OF RADIONUCLIDE CONCENTRATIONS IN SOILS COLLECTED AROUND THE DARHT FACILITY DURING 1998

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: H-3 LS ENV Method Area: EH-ALPHA Submission Id: 100029673

Requester Name: PHIL FRESQUEZ Customer Cost Code: 7C2000CX5030000200 Due Date: 25-AUG-98
Requester Group: ESH-20 Logged Date: 25-JUN-1998 Screening Data: NO SCREENING DATA REQUIRED
Mail Stop: M887 Study: ESH20 BIOLOGICALS Logged by: JWEAVER
Requester Phone: 667-0815 Analytical Service Agreement #:
Requester Fax #: 667-0731

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064779	300158727	N	H-3	160	640	pCi/L	
			H-3 MDA	450		pCi/L	
200064780	300158734	S	H-3	450	630	pCi/L	
			H-3 MDA	450		pCi/L	
200064781	300158741	W	H-3	250	650	pCi/L	
			H-3 MDA	450		pCi/L	
200064782	300158748	E	H-3	150	640	pCi/L	
			H-3 MDA	450		pCi/L	
200064783	300158755	SED-N	H-3	290	650	pCi/L	
			H-3 MDA	470		pCi/L	
200064784	300158762	SED-SW	H-3	270	650	pCi/L	
			H-3 MDA	470		pCi/L	
200064785	300158769	SED-E	H-3	460	670	pCi/L	
			H-3 MDA	460		pCi/L	
200064786	300158776	W-1	H-3	190	650	pCi/L	
			H-3 MDA	460		pCi/L	
200064787	300158783	E-1	H-3	0	630	pCi/L	
			H-3 MDA	450		pCi/L	

**** FINAL REPORT ****

Submission Id : 100029673

Method Area: EH-ALPHA

Method: H-3 LS ENV

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064788	300158790	BNW-1	H-3	20	630	pCi/L	
			H-3 MDA	460		pCi/L	
200064789	300158797	BNE-1	H-3	130	640	pCi/L	
			H-3 MDA	460		pCi/L	

20

A-2

**** FINAL REPORT ****

Method: H-3 LS ENV Method Area: EH-ALPHA Submission Id: 100029673

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
200064790	300158807	H-3	2090	770	pCi/L	2360	62	pCi/L	IN CONTROL

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.38287	300161540	H-3	0.00007	0.00064	uCi/L	0	0	uCi/L	IN CONTROL
00.39929	300161541	H-3	0.0127	0.0013	uCi/L	0.01427	0.00143	uCi/L	IN CONTROL

A-3

***** FINAL REPORT *****

Method: H-3 LS ENV Method Area: EH-ALPHA Submission Id : 100029673

<u><i>Adip</i></u> Analyst	<u><i>Eug</i></u> Review	<u><i>CB</i></u> Team Leader	<u><i>NK</i></u> QA Officer
<u>7/15/98</u> Date	<u>7-17-98</u> Date	<u>7/17/98</u> Date	<u>07/20/98</u> Date

A-4

60

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: SR-90 LS ENV Method Area: EH-ALPHA Submission Id: 100029673

Requester Name: PHIL FRESQUEZ Customer Cost Code: 7C2000CX5030000200 Due Date: 25-AUG-98
Requester Group: ESH-20 Logged Date: 25-JUN-1998 Screening Data: NO SCREENING DATA REQUIRED
Mail Stop: M887 Study: ESH20 BIOLOGICALS Logged by: JWEAVER
Requester Phone: 667-0815 Analytical Service Agreement #:
Requester Fax #: 667-0731

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064779	300158730	N	Sr-90	2.16	0.77	pCi/g	
			Sr-90 MDA	2.00		pCi/g	
200064780	300158737	S	Sr-90	1.07	0.74	pCi/g	
			Sr-90 MDA	2.00		pCi/g	
200064781	300158744	W	Sr-90	1.84	0.64	pCi/g	
			Sr-90 MDA	2.00		pCi/g	
200064782	300158751	E	Sr-90	1.43	0.59	pCi/g	
			Sr-90 MDA	2.00		pCi/g	
200064783	300158758	SED-N	Sr-90	2.55	0.8	pCi/g	
			Sr-90 MDA	2.00		pCi/g	
200064784	300158765	SED-SW	Sr-90	2.05	0.63	pCi/g	
			Sr-90 MDA	2.00		pCi/g	
200064785	300158772	SED-E	Sr-90	1.49	0.56	pCi/g	
			Sr-90 MDA	2.00		pCi/g	
200064786	300158779	W-1	Sr-90	1.8	0.73	pCi/g	
			Sr-90 MDA	2.00		pCi/g	
200064787	300158786	E-1	Sr-90	2.12	0.68	pCi/g	
			Sr-90 MDA	2.00		pCi/g	

***** FINAL REPORT *****

A-5

Method: SR-90 LS ENV Method Area: EH-ALPHA Submission Id : 100029673

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064788	300158793	BNW-1	Sr-90	1.34	0.5	pCi/g	
			Sr-90 MDA	2.00		pCi/g	
200064789	300158800	BNE-1	Sr-90	1.82	0.64	pCi/g	
			Sr-90 MDA	2.00		pCi/g	

DUPLICATE TASKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064779	300158730		Sr-90	2.16	0.77	pCi/g	
			Sr-90 MDA	2.00		pCi/g	
200072417	300172888	300158730	Sr-90	1.86	0.71	pCi/g	
			Sr-90 MDA	2.00		pCi/g	

A-6

**** FINAL REPORT ****

Method: SR-90 LS ENV Method Area: EH-ALPHA Submission Id: 100029673

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
200064792	300158806	Sr-90	Value 30.08	2.18	pCi/g	36.3	1.09	pCi/g	WARNING 2-3SIG

OPEN QC

7-7

Customer Id	Task Id	Component	Result	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.36592	300172890	Sr-90	Value 507.3	56.4	pCi/L	499.5	15.98	pCi/L	IN CONTROL

METHOD BLANK

Customer Id	Task Id	Component	Result	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.22778	300172889	Sr-90	Value 0.09	0.32	pCi/g	0.0	0.0	pCi/g	IN CONTROL

***** FINAL REPORT *****

Method: SR-90 LS ENV Method Area: EH-ALPHA Submission Id : 100029673

Euf
Analyst

SDJ
Review

DB
Team Leader

NK
QA Officer

9-4-98
Date

9/8/98
Date

9/3/98
Date

09/09/98
Date

A-8

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

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for the original page.

Method: GENERIC KPA Method Area: EH-ALPHA Submission Id : 100029673

DUPLICATE TASKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064779	300158726		U	2.53	0.25	ug/g	
200071043	300170415	300158726	U	2.09	0.21	ug/g	

A-10

**** FINAL REPORT ****

718708

Method: GENERIC KPA Method Area: EH-ALPHA Submission Id : 100029673

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
200064793	300158803	U	1.63	0.16	ug/g	2.498	0.25	ug/g	WARNING 2-3SIG

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.38058	300170413	U	10.49	1.05	ug/L	10.1	1.0	ug/L	IN CONTROL

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.22776	300170414	U	0.00	0.01	ug/g	0	0	ug/g	IN CONTROL

**** FINAL REPORT ****

A-11

Method: GENERIC KPA Method Area: EH-ALPHA Submission Id: 100029673

NK
QA Officer

BS
Team Leader

CS
Review
En ew

ml
Analyst

08/26/98
Date

8/25/98
Date

8/1/98
Date

8/25/98
Date

A-12

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: **GENERIC GAMMA** Method Area: **EH-GAMMA** Submission Id: **100029673**

Requester Name: **PHIL FRESQUEZ** Customer Cost Code: **7C2000CX5030000200** Due Date: **25-AUG-98**
 Requester Group: **ESH-20** Logged Date: **25-JUN-1998** Screening Data: **NO SCREENING DATA REQUIRED**
 Mail Stop: **M887** Study: **ESH20 BIOLOGICALS** Logged by: **JWEAVER**
 Requester Phone: **667-0815** Analytical Service Agreement #:
 Requester Fax #: **667-0731**

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064779	300158725	N	CS-137	0.06	0.01	pCi/g	
200064780	300158732	S	CS-137	0.00	0.08	pCi/g	
200064781	300158739	W	CS-137	0.07	0.10	pCi/g	
200064782	300158746	E	CS-137	0.10	0.02	pCi/g	
200064783	300158753	SED-N	CS-137	0.18	0.03	pCi/g	
200064784	300158760	SED-SW	CS-137	0.09	0.02	pCi/g	
200064785	300158767	SED-E	CS-137	0.42	0.05	pCi/g	
200064786	300158774	W-1	CS-137	0.04	0.06	pCi/g	
200064787	300158781	E-1	CS-137	0.04	0.01	pCi/g	
200064788	300158788	BNW-1	CS-137	0.07	0.01	pCi/g	
200064789	300158795	BNE-1	CS-137	0.08	0.01	pCi/g	

**** FINAL REPORT ****

A-13

Method: GENERIC GAMMA Method Area: EH-GAMMA Submission Id: 100029673

DUPLICATE TASKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064779	300158725		CS-137	0.06	0.01	pCi/g	
200073006	300174014	300158725	CS-137	0.10	0.02	pCi/g	

A-14

**** FINAL REPORT ****

Method: GENERIC GAMMA Method Area: EH-GAMMA

Submission Id: 100029673

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	QC Value	QC Uncertainty	QC units pCi/g	QC Evaluation
200064794	300158802	CS-137	31.2	2.3	pCi/g	30.00	0.99		IN CONTROL

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	QC Value	QC Uncertainty	QC units pCi/g	QC Evaluation
00.33404	300174013	CS-137	4.82	0.39	pCi/g	4.9800	0.1600		IN CONTROL

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	QC Value	QC Uncertainty	QC units pCi/g	QC Evaluation
00.22776	300174012	CS-137	0.06	0.10	pCi/g	0.0	0.0		IN CONTROL

**** FINAL REPORT ****

A-15

Method: GENERIC GAMMA Method Area: EH-GAMMA Submission Id: 100029673

[Signature]
Analyst

[Signature]
Review

[Signature]
Team Leader

NK
QA Officer

9/10/98
Date

9/11/98
Date

9/11/98
Date

09/14/98
Date

A-16

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: PU RAS ENV

Method Area: EH-ALPHA

Submission Id: 100029673

Requester Name: PHIL FRESQUEZ
Requester Group: ESH-20
Mail Stop: M887
Requester Phone: 667-0815
Requester Fax #: 667-0731

Customer Cost Code: 7C2000CX5030000200
Logged Date: 25-JUN-1998
Study: ESH20 BIOLOGICALS
Analytical Service Agreement #:

Due Date: 25-AUG-98

Screening Data: NO SCREENING DATA REQUIRED

Logged by: JWEAVER

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064779	300158729	N	Pu-238	0.0012	0.0026	pCi/g	
			Pu-239	0.0046	0.0029	pCi/g	
			Pu-242T Recovery	19.63		%	
200064780	300158736	S	Pu-238	0.0017	0.0015	pCi/g	
			Pu-239	0.0016	0.0011	pCi/g	
			Pu-242T Recovery	32.84		%	
200064781	300158743	W	Pu-238	0.0000	0.0000	pCi/g	
			Pu-239	0.0025	0.0009	pCi/g	
			Pu-242T Recovery	62.81		%	
200064782	300158750	E	Pu-238	0.0011	0.0007	pCi/g	
			Pu-239	0.0028	0.0009	pCi/g	
			Pu-242T Recovery	64.86		%	
200064783	300158757	SED-N	Pu-238	0.0002	0.0007	pCi/g	
			Pu-239	0.0042	0.0013	pCi/g	
			Pu-242T Recovery	74.81		%	
200064784	300158764	SED-SW	Pu-238	-0.0003	0.0004	pCi/g	
			Pu-239	0.0065	0.0013	pCi/g	
			Pu-242T Recovery	83.51		%	

**** FINAL REPORT ****

000000

A-17

Method: PU RAS ENV Method Area: EH-ALPHA Submission Id: 100029673

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064785	300158771	SED-E	Pu-238	0.0026	0.0008	pCi/g	
			Pu-239	0.0165	0.0019	pCi/g	
			Pu-242T Recovery	82.88		%	
200064786	300158778	W-1	Pu-238	0.0023	0.0014	pCi/g	
			Pu-239	0.0206	0.0030	pCi/g	
			Pu-242T Recovery	40.59		%	
200064787	300158785	E-1	Pu-238	0.0013	0.0012	pCi/g	
			Pu-239	0.0165	0.0027	pCi/g	
			Pu-242T Recovery	41.13		%	
200064788	300158792	BNW-1	Pu-238	0.0013	0.0006	pCi/g	
			Pu-239	0.0116	0.0016	pCi/g	
			Pu-242T Recovery	77.10		%	
200064789	300158799	BNE-1	Pu-238	0.0000	0.0000	pCi/g	
			Pu-239	0.0148	0.0022	pCi/g	
			Pu-242T Recovery	56.78		%	

DUPLICATE TASKS

Sample Id	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
200064779	300158729		Pu-238	0.0012	0.0026	pCi/g	
			Pu-239	0.0046	0.0029	pCi/g	
			Pu-242T Recovery	19.63		%	
200070068	300168856	300158729	Pu-238	0.0046	0.0024	pCi/g	
			Pu-239	0.0005	0.0012	pCi/g	
			Pu-242T Recovery	22.07		%	

**** FINAL REPORT ****

000000

A-18

Method: PU RAS ENV

Method Area: EH-ALPHA

Submission Id : 100029673

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
200064791	300158804	Pu-238	0.1730	0.0070	pCi/g	0.17	0.01	pCi/g	IN CONTROL
		Pu-239	0.3861	0.0119	pCi/g	0.36	0.01	pCi/g	IN CONTROL

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.22776	300168857	Pu-238	0.0008	0.0009	pCi/g	0.0	0.0	pCi/g	IN CONTROL
		Pu-239	0.0005	0.0009	pCi/g	0.0	0.0	pCi/g	IN CONTROL

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**** FINAL REPORT ****

00003

Method: PU RAS ENV Method Area: EH-ALPHA Submission Id : 100029673

RJP
Analyst

SZ
Review

63
Team Leader

NK
QA Officer

18 Aug 98
Date

8/19/98
Date

8/19/98
Date

08/19/98
Date

A-20

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: AM RAS ENV Method Area: EH-ALPHA Submission Id : 100029673

Requester Name: PHIL FRESQUEZ Customer Cost Code: 7C2000CX5030000200 Due Date: 25-AUG-98
Requester Group: ESH-20 Logged Date: 25-JUN-1998 Screening Data: NO SCREENING DATA REQUIRED
Mail Stop: M887 Study: ESH20 BIOLOGICALS Logged by: JWEAVER
Requester Phone: 667-0815 Analytical Service Agreement #:
Requester Fax #: 667-0731

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064779	300158731	N	Am-241	0.0047	0.0013	pCi/g	
			Am-243T Recovery	64.25		%	
200064780	300158738	S	Am-241	0.0026	0.0009	pCi/g	
			Am-243T Recovery	64.23		%	
200064781	300158745	W	Am-241	0.0019	0.0008	pCi/g	
			Am-243T Recovery	64.04		%	
200064782	300158752	E	Am-241	0.0052	0.0013	pCi/g	
			Am-243T Recovery	63.94		%	
200064783	300158759	SED-N	Am-241	0.0032	0.0012	pCi/g	
			Am-243T Recovery	57.53		%	
200064784	300158766	SED-SW	Am-241	0.002	0.002	pCi/g	
			Am-243T Recovery	54.81		%	
200064785	300158773	SED-E	Am-241	0.0056	0.0013	pCi/g	
			Am-243T Recovery	57.65		%	
200064786	300158780	W-1	Am-241	0.0060	0.0014	pCi/g	
			Am-243T Recovery	70.75		%	
200064787	300158787	E-1	Am-241	0.0046	0.0011	pCi/g	
			Am-243T Recovery	64.35		%	

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60000

**** FINAL REPORT ****

Method: AM RAS ENV Method Area: EH-ALPHA Submission Id : 100029673

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064788	300158794	BNW-1	Am-241	0.0066	0.0013	pCi/g	
			Am-243T Recovery	64.98		%	
200064789	300158801	BNE-1	Am-241	0.0035	0.0010	pCi/g	
			Am-243T Recovery	73.79		%	

DUPLICATE TASKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064779	300158731		Am-241	0.0047	0.0013	pCi/g	
			Am-243T Recovery	64.25		%	
200072612	300173302	300158731	Am-241	0.0044	0.0021	pCi/g	
			Am-243T Recovery	39.22		%	

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**** FINAL REPORT ****

6.0.0.0

Method: AM RAS ENV Method Area: EH-ALPHA Submission Id : 100029673

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>
200064791	300158805	Am-241	<u>Value</u>	0.0188	pCi/g	<u>Value</u>	<u>Uncertainty</u>	<u>units</u>	<u>Evaluation</u>
			0.6016			0.54	0.02	pCi/g	WARNING 2-3SIG

METHOD BLANK

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>
00.22776	300173303	Am-241	<u>Value</u>	0.0007	pCi/g	<u>Value</u>	<u>Uncertainty</u>	<u>units</u>	<u>Evaluation</u>
			0.0015			0.0	0.0	pCi/g	WARNING 2-3SIG

A-23

***** FINAL REPORT *****

6-2-93

Method: AM RAS ENV Method Area: EH-ALPHA Submission Id : 100029673

RJP
Analyst

STB
Review

TS
Team Leader

NK
QA Officer

9 sep 98
Date

9/10/98
Date

9/10/98
Date

09/10/98
Date

A-24

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

Los Alamos

José Alamos National Laboratory
José Alamos, New Mexico 87545

Soils and Foodstuffs (~~7020~~ ~~W566~~) CX50 3000 0200

[illegible]

CHAIN-OF-CUSTODY RECORD

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Soils and Foodstuffs (7020 ~~WEG~~) 7020 CX50 3000 0200
P.I.# (505) 667-0815
ESH-20 MS M887

Project Name		Request the following analysis:		Sample Name/Number		Sample Location/Remarks	
Date	Time	3H 90Sr totU 137CS	238Pu 239Pu 241Am				
6-25-98	10:40			N		North side of DART Rd	
	10:20			S		South " " " (meters in center)	
	10:00			W		West side of DART Rd	
	10:30			E		East " " "	
	10:40			Sed-N		Sediment on North side	
	10:00			Sed - SW SW		" " South west side	
	10:30			Sed - E		" " East side	
	10:05			W-1		West side of DART - 1 ft depth ^{undisturbed}	
	10:35			E-1		East side of DART - 1 ft depth ^{undisturbed}	
	10:50			BNW-1		Bearm NW side - 1 ft depth (25 yd from beam)	
	10:55			BNE-1		Bearm NE side - 1 ft depth (25 yd from middle of beam)	
						(just noted at depth)	
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)		
<i>Donal Davenport</i>	6/25/98 7:30	<i>Donal Davenport</i>					
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)		
Relinquished by: (signature)	Date/Time	Received for Lab. by: (signature)	Date/Time	Remarks:			

APPENDIX B

ANALYTICAL DATA REPORTS OF TRACE ELEMENTS CONCENTRATIONS IN SOILS COLLECTED AROUND THE DARHT FACILITY DURING 1998

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: GENERIC ICPEs Method Area: EH-OES Submission Id: 100029674

Requester Name: PHIL FRESQUEZ Customer Cost Code: 7C2000CX5030000200 Due Date: 25-AUG-98
Requester Group: ESH-20 Logged Date: 25-JUN-1998 Screening Data: NO SCREENING DATA REQUIRED
Mail Stop: M887 Study: ESH20 BIOLOGICALS Logged by: JWEAVER
Requester Phone: 667-0815 Analytical Service Agreement #:
Requester Fax #: 667-0731

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064795	300158809	N	Ag	<2		ug/g	
			Ba	80.013	8.001	ug/g	
			Be	0.742	0.074	ug/g	
			Cd	<0.4		ug/g	
			Cr	8.292	0.900	ug/g	
			Cu	3.326	1.000	ug/g	
			Ni	4.938	4.000	ug/g	
			Al	10878.992	1087.899	ug/g	
			B	3.034	3.000	ug/g	
			Co	2.870	1.238	ug/g	
			Fe	10647.797	1064.780	ug/g	
			Mn	189.657	18.966	ug/g	
			Mo	1.408	5	ug/g	
			Sn	0.088	5	ug/g	
			Sr	16.051	1.605	ug/g	
			V	14.492	1.449	ug/g	
			Zn	26.031	2.603	ug/g	
200064799	300158813	S	Ag	<2		ug/g	

**** FINAL REPORT ****

Method: GENERIC ICPEs Method Area: EH-OES

Submission Id: 100029674

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064799	300158813	S	Ba	34.550	3.455	ug/g	
			Be	0.387	0.070	ug/g	
			Cd	<0.4		ug/g	
			Cr	3.356	1.190	ug/g	
			Cu	3.710	1.000	ug/g	
			Ni	3.254	4	ug/g	
200064800	300158817	W	Ag	<2		ug/g	
			Ba	119.646	11.965	ug/g	
			Be	0.976	0.098	ug/g	
			Cd	<0.4		ug/g	
			Cr	13.348	1.335	ug/g	
			Cu	5.781	1.000	ug/g	
			Ni	7.182	4.000	ug/g	
200064801	300158821	E	Ag	<2		ug/g	
			Ba	69.200	6.920	ug/g	
			Be	0.569	0.070	ug/g	
			Cd	<0.4		ug/g	
			Cr	7.979	0.900	ug/g	
			Cu	3.842	1.000	ug/g	
			Ni	4.890	4.000	ug/g	
200064802	300158825	SED-N	Ag	<2		ug/g	
			Ba	1041.293	104.129	ug/g	
			Be	0.874	0.087	ug/g	
			Cd	<0.4		ug/g	
			Cr	6.769	0.900	ug/g	
			Cu	5.302	1.000	ug/g	
			Ni	5.159	4.000	ug/g	
200064803	300158829	SED-SW	Ag	<2		ug/g	
			Ba	93.777	9.378	ug/g	
			Be	0.811	0.081	ug/g	
			Cd	<0.4		ug/g	

B-2

**** FINAL REPORT ****

Method: GENERIC ICPES

Method Area: EH-OES

Submission Id: 100029674

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064803	300158829	SED-SW	Cr	10.206	1.021	ug/g	
			Cu	5.925	1.000	ug/g	
			Ni	6.704	4.000	ug/g	
200064804	300158833	SED-E	Ag	<2		ug/g	
			Ba	117.505	11.751	ug/g	
			Be	0.871	0.089	ug/g	
			Cd	<0.4		ug/g	
			Cr	10.782	1.078	ug/g	
			Cu	6.150	1.000	ug/g	
			Ni	6.476	4.000	ug/g	
200064805	300158837	W-1	Ag	<2		ug/g	
			Ba	144.243	14.424	ug/g	
			Be	1.125	0.113	ug/g	
			Cd	<0.4		ug/g	
			Cr	10.761	1.076	ug/g	
			Cu	6.803	1.000	ug/g	
			Ni	9.095	4.000	ug/g	
200064806	300158841	E-1	Ag	<2		ug/g	
			Ba	549.616	54.962	ug/g	
			Be	1.638	0.164	ug/g	
			Cd	<0.4		ug/g	
			Cr	11.201	1.120	ug/g	
			Cu	7.528	1.000	ug/g	
			Ni	8.138	4.260	ug/g	
200064807	300158845	BNW-1	Ag	<2		ug/g	
			Ba	92.733	9.273	ug/g	
			Be	0.801	0.080	ug/g	
			Cd	<0.4		ug/g	
			Cr	9.816	0.982	ug/g	
			Cu	3.996	1.000	ug/g	
			Ni	6.384	4.000	ug/g	

B-3

**** FINAL REPORT ****

Method: **GENERIC ICPES** Method Area: **EH-OES** Submission Id: **100029574**

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064808	300158849	BNE-1	Ag	<2		ug/g	
			Ba	100.710	10.071	ug/g	
			Be	0.658	0.070	ug/g	
			Cd	<0.4		ug/g	
			Cr	5.366	0.900	ug/g	
			Cu	4.470	1.000	ug/g	
			Ni	5.515	4.000	ug/g	

DUPLICATE TASKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064795	300158809		Ag	<2		ug/g	
			Ba	80.013	8.001	ug/g	
			Be	0.742	0.074	ug/g	
			Cd	<0.4		ug/g	
			Cr	8.292	0.900	ug/g	
			Cu	3.326	1.000	ug/g	
			Ni	4.938	4.000	ug/g	
			Al	10878.992	1087.899	ug/g	
			B	3.034	3.000	ug/g	
			Co	2.870	1.238	ug/g	
			Fe	10647.797	1064.780	ug/g	
			Mn	189.657	18.966	ug/g	
			Mo	1.408	5	ug/g	
			Sn	0.088	5	ug/g	
			Sr	16.051	1.605	ug/g	
			V	14.492	1.449	ug/g	
			Zn	26.031	2.603	ug/g	
			Ag	-3.118	2	ug/g	
200071320	300170834	300158809					

B-4

**** FINAL REPORT ****

Method: GENERIC ICPES Method Area: EH-OES Submission Id: 100029674

Sample Id	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
200071320	300170834	300158809	Ba	70.535	7.053	ug/g	
			Be	0.674	0.070	ug/g	
			Cd	0.300	.9	ug/g	
			Cr	5.699	0.900	ug/g	
			Cu	3.634	1.000	ug/g	
			Ni	5.800	4.000	ug/g	
			Al	7381.411	738.141	ug/g	
			B	2.146	3	ug/g	
			Co	2.384	1.000	ug/g	
			Fe	8239.913	823.991	ug/g	
			Mn	172.932	17.293	ug/g	
			Mo	0.982	5	ug/g	
			Sn	-0.569	5	ug/g	
			Sr	15.702	1.570	ug/g	
			V	7.072	1.300	ug/g	
			Zn	23.002	2.300	ug/g	

DILUTION CHECKS

Sample Id	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
200064795	300158809		Ag	<2		ug/g	
			Ba	80.013	8.001	ug/g	
			Be	0.742	0.074	ug/g	
			Cd	<0.4		ug/g	
			Cr	8.292	0.900	ug/g	
			Cu	3.326	1.000	ug/g	
			Ni	4.938	4.000	ug/g	
			Al	10878.992	1087.899	ug/g	

**** FINAL REPORT ****

B-5

Method: **GENERIC ICPES** Method Area: **EH-OES** Submission Id: **100029674**

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064795	300158809		B	3.034	3.000	ug/g	
			Co	2.870	1.238	ug/g	
			Fe	10647.797	1064.780	ug/g	
			Mn	189.657	18.966	ug/g	
			Mo	1.408	5	ug/g	
			Sn	0.088	5	ug/g	
			Sr	16.051	1.605	ug/g	
			V	14.492	1.449	ug/g	
			Zn	26.031	2.603	ug/g	
200071322	300170836	300158809	Ag	-2.451	2	ug/g	
			Ba	80.652	8.065	ug/g	
			Be	0.830	0.221	ug/g	
			Cd	-1.425	.9	ug/g	
			Cr	10.793	5.510	ug/g	
			Cu	5.259	3.968	ug/g	
			Ni	6.806	7.958	ug/g	
			Al	11631.361	1163.136	ug/g	
			B	0.986	3	ug/g	
			Co	4.268	2.313	ug/g	
			Fe	11596.074	1159.607	ug/g	
			Mn	208.779	20.878	ug/g	
			Mo	3.777	5	ug/g	
			Sn	2.183	5	ug/g	
			Sr	16.695	1.670	ug/g	
			V	17.335	6.431	ug/g	
			Zn	30.660	3.066	ug/g	

B-6

**** FINAL REPORT ****

Method: GENERIC ICPES Method Area: EH-OES Submission Id: 100029674

SAMPLE SPIKES

Sample Id	Task Id	Original Task	Spike Type	Component	Amt. Spiked	Units	% Recovered	Qualifier
200071321	300170835	300158809	PreDS	Ag	168.375	ug/g	49.73	
				Ba	33.675	ug/g	65.39	
				Be	33.675	ug/g	81.58	
				Cd	168.375	ug/g	80.36	
				Cr	168.375	ug/g	83.94	
				Cu	168.375	ug/g	87.66	
				Ni	168.375	ug/g	83.16	
200071323	300170837	300158809	PostDS	Ag	170.125	ug/g	76.65	
				Ba	34.025	ug/g	78.02	
				Be	34.025	ug/g	81.56	
				Cd	170.125	ug/g	80.96	
				Cr	170.125	ug/g	83.40	
				Cu	170.125	ug/g	88.66	
				Ni	170.125	ug/g	82.90	

B-7

**** FINAL REPORT ****

Method: GENERIC ICPEs Method Area: EH-OES

Submission Id: 100029674

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Units		QC Value	QC Uncertainty	QC units	QC Evaluation
				Uncertainty	Units				
200064812	300158862	Ag	21.778	2.178	ug/g	28.	1.33	ug/g	WARNING 2-3SIG
		Al	22292.219	2229.222	ug/g	18000	2700	ug/g	IN CONTROL
		Ba	370.705	37.071	ug/g	360.	20.	ug/g	IN CONTROL
		Be	1.233	0.123	ug/g	1.13	0.12	ug/g	IN CONTROL
		Cd	26.301	2.630	ug/g	20.	2.33	ug/g	IN CONTROL
		Co	8.162	1.000	ug/g	8.2	1.27	ug/g	IN CONTROL
		Cr	19.318	1.932	ug/g	19.	1.33	ug/g	IN CONTROL
		Cu	3067.856	306.786	ug/g	2700.	233.33	ug/g	IN CONTROL
		Fe	30217.055	3021.706	ug/g	27000	1700	ug/g	IN CONTROL
		Mn	8406.493	840.649	ug/g	7700.	500.	ug/g	IN CONTROL
		Mo	13.233	5.000	ug/g	20.	2.33	ug/g	IN CONTROL
		Ni	11.464	4.000	ug/g	10.1	1.63	ug/g	IN CONTROL
		Sr	110.781	11.078	ug/g	100.	3.33	ug/g	IN CONTROL
		V	45.232	4.523	ug/g	43.	2.33	ug/g	IN CONTROL
		Zn	6125.592	612.559	ug/g	5900.	333.33	ug/g	IN CONTROL
200067362	300164273	Ag	-3.022	2	ug/g	4.	0.5	ug/g	OUT OF CONTROL
		Al	23694.731	2369.473	ug/g	18000	2000	ug/g	IN CONTROL
		Ba	200.714	20.071	ug/g	200.	20.	ug/g	IN CONTROL
		Be	1.003	0.100	ug/g	1.02	0.22	ug/g	IN CONTROL
		Cd	33.066	3.307	ug/g	40.	2.67	ug/g	IN CONTROL
		Co	7.194	1.000	ug/g	8.2	1.27	ug/g	IN CONTROL
		Cr	24.721	2.472	ug/g	20.	1.67	ug/g	IN CONTROL
		Cu	92.786	9.279	ug/g	100.	3.33	ug/g	IN CONTROL

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**** FINAL REPORT ****

Method: GENERIC ICPES

Method Area: EH-OES

Submission Id: 100029674

Customer Id	Task Id	Component	Result		Uncertainty	Units	QC		QC	QC	Evaluation
			Value	Value			Value	Uncertainty			
200067362	300164273	Fe	21011.234	2101.123	2101.123	ug/g	22000	1670	ug/g	IN CONTROL	
		Mn	434.580	43.458	43.458	ug/g	490.	43.33	ug/g	IN CONTROL	
		Ni	13.910	4.000	4.000	ug/g	16.	1.33	ug/g	IN CONTROL	
		Sr	47.193	4.719	4.719	ug/g	50.	1.67	ug/g	IN CONTROL	
		V	47.555	4.756	4.756	ug/g	42.	2.67	ug/g	IN CONTROL	
		Zn	262.262	26.226	26.226	ug/g	310.	10.	ug/g	IN CONTROL	
200069150	300166925	Ag	0.159	2	2	ug/g	28.	1.33	ug/g	OUT OF CONTROL	
		Al	18460.631	1846.063	1846.063	ug/g	18000	2700	ug/g	IN CONTROL	
		Ba	285.085	28.508	28.508	ug/g	360.	20.	ug/g	WARNING 2-3SIG	
		Be	0.999	0.100	0.100	ug/g	1.13	0.12	ug/g	IN CONTROL	
		Cd	20.069	2.007	2.007	ug/g	20.	2.33	ug/g	IN CONTROL	
		Co	6.441	1.000	1.000	ug/g	8.2	1.27	ug/g	IN CONTROL	
		Cr	15.699	1.570	1.570	ug/g	19.	1.33	ug/g	IN CONTROL	
		Cu	2347.442	234.744	234.744	ug/g	2700.	233.33	ug/g	IN CONTROL	
		Fe	23814.844	2381.484	2381.484	ug/g	27000	1700	ug/g	IN CONTROL	
		Mn	6535.567	653.557	653.557	ug/g	7700.	500.	ug/g	IN CONTROL	
		Mo	10.268	5.000	5.000	ug/g	20.	2.33	ug/g	IN CONTROL	
		Ni	7.888	4.000	4.000	ug/g	10.1	1.63	ug/g	IN CONTROL	
		Sr	85.476	8.548	8.548	ug/g	100.	3.33	ug/g	IN CONTROL	
		V	36.390	3.639	3.639	ug/g	43.	2.33	ug/g	IN CONTROL	
		Zn	4745.792	474.579	474.579	ug/g	5900.	333.33	ug/g	WARNING 2-3SIG	

**** FINAL REPORT ****

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Method: GENERIC ICPES Method Area: EH-OES Submission Id: 100029674

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.35928	300170833	Ag	16.814	0.188	ug/g	117	25.2	ug/g	OUT OF CONTROL
		Al	3957.412	40.420	ug/g	4500	1123	ug/g	IN CONTROL
		B	83.496	0.999	ug/g	102	22.1	ug/g	IN CONTROL
		Ba	144.032	1.575	ug/g	170	29.3	ug/g	IN CONTROL
		Be	99.476	0.705	ug/g	120	18.9	ug/g	IN CONTROL
		Cd	72.909	0.670	ug/g	88.8	14.7	ug/g	IN CONTROL
		Co	61.441	0.834	ug/g	72.9	11.1	ug/g	IN CONTROL
		Cr	111.367	1.281	ug/g	133	19.7	ug/g	IN CONTROL
		Cu	76.681	0.740	ug/g	85	11.3	ug/g	IN CONTROL
		Fe	6739.048	48.257	ug/g	7580	2210	ug/g	IN CONTROL
		Mn	152.339	1.011	ug/g	187	27	ug/g	IN CONTROL
		Mo	68.503	1.410	ug/g	96.1	17.4	ug/g	IN CONTROL
		Ni	83.496	2.761	ug/g	95.5	15.6	ug/g	IN CONTROL
		Sn	13.231	0.823	ug/g	67.1	15.3	ug/g	OUT OF CONTROL
		Sr	82.626	0.823	ug/g	95.6	20.3	ug/g	IN CONTROL
		V	55.531	0.846	ug/g	73.5	17.7	ug/g	IN CONTROL
		Zn	62.545	0.505	ug/g	71.8	12.3	ug/g	IN CONTROL

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.35516	300170832	Ag	-0.021	2	ug/g	0.0	0.0	ug/g	IN CONTROL
		Al	0.018	7	ug/g	0.0	0.0	ug/g	IN CONTROL

**** FINAL REPORT ****

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Method: GENERIC ICPES

Method Area: EH-OES

Submission Id: 100029674

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.33516	300170832	B	0.010	3	ug/g	0.0	0.0	ug/g	IN CONTROL
		Ba	0.000	.2	ug/g	0.0	0.0	ug/g	IN CONTROL
		Be	0.000	.07	ug/g	0.0	0.0	ug/g	IN CONTROL
		Cd	-0.001	.9	ug/g	0.0	0.0	ug/g	IN CONTROL
		Co	-0.001	1	ug/g	0.0	0.0	ug/g	IN CONTROL
		Cr	0.001	.9	ug/g	0.0	0.0	ug/g	IN CONTROL
		Cu	0.003	1	ug/g	0.0	0.0	ug/g	IN CONTROL
		Fe	0.060	1	ug/g	0.0	0.0	ug/g	IN CONTROL
		Mn	0.001	.3	ug/g	0.0	0.0	ug/g	IN CONTROL
		Mo	-0.007	5	ug/g	0.0	0.0	ug/g	IN CONTROL
		Ni	-0.004	4	ug/g	0.0	0.0	ug/g	IN CONTROL
		Sn	0.013	5	ug/g	0.0	0.0	ug/g	IN CONTROL
		Sr	0.000	.2	ug/g	0.0	0.0	ug/g	IN CONTROL
		V	-0.001	1.3	ug/g	0.0	0.0	ug/g	IN CONTROL
		Zn	0.005	.6	ug/g	0.0	0.0	ug/g	IN CONTROL

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**** FINAL REPORT ****

Method: GENERIC ICPEs Method Area: EH-OES

Submission Id: 100029674

Chris Brink
Analyst[Signature]
Reviewer[Signature]
Team LeaderNK
QA Officer8/28/98
Date8/28/98
Date9/28/98
Date09/29/98
Date

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

B-12

Method: **GENERIC CVAA** Method Area: **EH-AA** Submission Id: **100029674**

Requester Name: **PHIL FRESQUEZ** Customer Cost Code: **7C2000CX50300000200** Due Date: **25-AUG-98**
 Requester Group: **ESH-20** Logged Date: **25-JUN-1998** Screening Data: **NO SCREENING DATA REQUIRED**
 Mail Stop: **M887** Study: **ESH20 BIOLOGICALS** Logged by: **JWEAVER**
 Requester Phone: **667-0815** Analytical Service Agreement #:
 Requester Fax #: **667-0731**

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064795	300158812	N	Hg	< 0.01	0	ug/g	
200064799	300158816	S	Hg	< 0.01	0	ug/g	
200064800	300158820	W	Hg	< 0.01	0	ug/g	
200064801	300158824	E	Hg	0.02	0.01	ug/g	
200064802	300158828	SED-N	Hg	0.022	0.01	ug/g	
200064803	300158832	SED-SW	Hg	0.024	0.01	ug/g	
200064804	300158836	SED-E	Hg	0.021	0.01	ug/g	
200064805	300158840	W-1	Hg	< 0.01	0	ug/g	
200064806	300158844	E-1	Hg	0.031	0.01	ug/g	
200064807	300158848	BNW-1	Hg	< 0.01	0	ug/g	
200064808	300158852	BNE-1	Hg	0.017	0.01	ug/g	

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**** FINAL REPORT ****

Method: **GENERIC CVAA** Method Area: **EH-AA** Submission Id: **100029674**

DUPLICATE TASKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064795	300158812		Hg	< 0.01	0	ug/g	
200071137	300170598	300158812	Hg	< 0.01	0	ug/g	
200064799	300158816		Hg	< 0.01	0	ug/g	
200071140	300170601	300158816	Hg	< 0.01	0	ug/g	
200064799	300158816		Hg	< 0.01	0	ug/g	
200071141	300170602	300158816	Hg	< 0.01	0	ug/g	
200064800	300158820		Hg	< 0.01	0	ug/g	
200071142	300170603	300158820	Hg	0.01	0.01	ug/g	
200064800	300158820		Hg	< 0.01	0	ug/g	
200071143	300170604	300158820	Hg	0.014	0.01	ug/g	
200064801	300158824		Hg	0.02	0.01	ug/g	
200071144	300170605	300158824	Hg	< 0.01	0	ug/g	
200064801	300158824		Hg	0.02	0.01	ug/g	
200071145	300170606	300158824	Hg	< 0.01	0	ug/g	
200064802	300158828		Hg	0.022	0.01	ug/g	
200071146	300170607	300158828	Hg	0.029	0.01	ug/g	
200064802	300158828		Hg	0.022	0.01	ug/g	
200071147	300170608	300158828	Hg	0.031	0.01	ug/g	
200064803	300158832		Hg	0.024	0.01	ug/g	

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**** FINAL REPORT ****

Method: GENERIC CVAA Method Area: EH-AA Submission Id: 100029574

Sample Id	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
200071148	300170609	300158832	Hg	0.021	0.01	ug/g	
200064803	300158832		Hg	0.024	0.01	ug/g	
200071149	300170610	300158832	Hg	0.018	0.01	ug/g	
200064804	300158836		Hg	0.021	0.01	ug/g	
200071150	300170611	300158836	Hg	0.016	0.01	ug/g	
200064804	300158836		Hg	0.021	0.01	ug/g	
200071151	300170612	300158836	Hg	0.018	0.01	ug/g	
200064805	300158840		Hg	< 0.01	0	ug/g	
200071152	300170613	300158840	Hg	0.014	0.01	ug/g	
200064805	300158840		Hg	< 0.01	0	ug/g	
200071153	300170614	300158840	Hg	0.024	0.01	ug/g	
200064806	300158844		Hg	0.031	0.01	ug/g	
200071155	300170615	300158844	Hg	0.032	0.01	ug/g	
200064807	300158848		Hg	< 0.01	0	ug/g	
200071156	300170616	300158848	Hg	< 0.01	0	ug/g	
200064807	300158848		Hg	< 0.01	0	ug/g	
200071157	300170617	300158848	Hg	< 0.01	0	ug/g	
200064808	300158852		Hg	0.017	0.01	ug/g	
200071158	300170618	300158852	Hg	< 0.01	0	ug/g	
200064808	300158852		Hg	0.017	0.01	ug/g	
200071159	300170619	300158852	Hg	0.022	0.01	ug/g	

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**** FINAL REPORT ****

Method: GENERIC CVAA Method Area: EH-AA Submission Id: 100029674

SAMPLE SPIKES

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Spike Type</u>	<u>Component</u>	<u>Amt. Spiked</u>	<u>Units</u>	<u>% Recovered</u>	<u>Qualifier</u>
200071139	300170600	300158812	PreDS	Hg	0.225	ug/g	120.00	

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**** FINAL REPORT ****

Method: GENERIC CVAA Method Area: EH-AA Submission ID: 100029674

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units mg/kg	QC Value	QC Uncertainty	QC units mg/kg	QC Evaluation IN CONTROL
200064813	300158863	Hg	0.06	0.01		0.14	0.04		

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units ug/g	QC Value	QC Uncertainty	QC units ug/g	QC Evaluation IN CONTROL
00.35928	300170623	Hg	2.75	0.275		2.86	.72		

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**** FINAL REPORT ****

Method: GENERIC CVAA Method Area: EH-AA Submission Id: 10029674

Madhavi
Analyst

AB for MG
Review

[Signature]
Team Leader

NK
QA Officer

9/28/98
Date

9/28/98
Date

9/28/98
Date

09/29/98
Date

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The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: **GENERIC ETVAA** Method Area: **EH-AA** Submission Id: **100029674**

Requester Name: **PHIL FRESQUEZ** Customer Cost Code: **7C2000CX5030000200** Due Date: **25-AUG-98**
 Requester Group: **ESH-20** Logged Date: **25-JUN-1998** Screening Data: **NO SCREENING DATA REQUIRED**
 Mail Stop: **M887** Study: **ESH20 BIOLOGICALS** Logged by: **JWEAVER**
 Requester Phone: **667-0815** Analytical Service Agreement #:
 Requester Fax #: **667-0731**

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064795	300158811	N	As	1.5	0.6	ug/g	
			Se	0.6	0.4	ug/g	
200064799	300158815	S	As	0.7	0.5	ug/g	
			Se	0.5	0.4	ug/g	
200064800	300158819	W	As	3.4	0.5	ug/g	
			Se	0.5	0.4	ug/g	
200064801	300158823	E	As	1.5	0.5	ug/g	
			Se	<0.4		ug/g	
200064802	300158827	SED-N	As	1.9	0.6	ug/g	
			Se	<0.4		ug/g	
200064803	300158831	SED-SW	As	3.6	0.5	ug/g	
			Se	<0.4		ug/g	
200064804	300158835	SED-E	As	2.9	0.5	ug/g	
			Se	<0.4		ug/g	
200064805	300158839	W-1	As	2.8	0.5	ug/g	
			Se	<0.4		ug/g	
200064806	300158843	E-1	As	4.1	0.5	ug/g	
			Se	0.4	0.4	ug/g	

**** FINAL REPORT ****

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Method: **GENERIC ETVAA** Method Area: **EH-AA** Submission Id: **100029674**

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064807	300158847	BNW-1	As	2.3	0.5	ug/g	
			Se	<0.4		ug/g	
200064808	300158851	BNE-1	As	1.9	0.5	ug/g	
			Se	<0.4		ug/g	

DUPLICATE TASKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064795	300158811		As	1.5	0.6	ug/g	
			Se	0.6	0.4	ug/g	
200074150	300175971	300158811	As	1.1	0.5	ug/g	
			Se	0.5	0.4	ug/g	

DILUTION CHECKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064795	300158811		As	1.5	0.6	ug/g	
			Se	0.6	0.4	ug/g	
200074148	300175969	300158811	As	<3		ug/g	
			Se	<2		ug/g	

**** FINAL REPORT ****

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Method: GENERIC ETVAA Method Area: EH-AA Submission Id: 100029674

SAMPLE SPIKES

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Spike Type</u>	<u>Component</u>	<u>Amt. Spiked</u>	<u>Units</u>	<u>% Recovered</u>	<u>Qualifier</u>
200074151	300175972	300158811	PreDS	As	13.3	ug/g	98.50	
				Se	13.3	ug/g	101.50	
200074149	300175970	300175969	PostDS	As	13.48	ug/g	113.65	
				Se	13.48	ug/g	96.44	

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**** FINAL REPORT ****

Method: GENERIC ETVAA Method Area: EH-AA Submission Id: 100029674

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
200064812	300158861	As	688	40	ug/g	590.	33.33	ug/g	IN CONTROL
		Se	1.0	0.4	ug/g	2.4	2.2	ug/g	IN CONTROL

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.35928	300175968	As	115	20	ug/g	103	19.9	ug/g	IN CONTROL
		Se	133	18	ug/g	129	23.7	ug/g	IN CONTROL

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.24620	300175967	As	-0.15	0.5	ug/g	0.0	0.0	ug/g	IN CONTROL
		Se	0.22	0.4	ug/g	0.0	0.0	ug/g	IN CONTROL

**** FINAL REPORT ****

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Method: GENERIC ETVAA Method Area: EH-AA Submission Id: 100029674

Nicholas Gross
Analyst

9-25-98
Date

[Signature]
Review

9/25/98
Date

[Signature]
Team Leader

9/28/98
Date

NK
QA Officer

9/29/98
Date

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

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**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: **GENERIC ICPMS** Method Area: **EH-IMS** Submission Id: **100029674**

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	7C2000CX5030000200	Due Date:	25-AUG-98
Requester Group:	ESH-20	Logged Date:	25-JUN-1998	Screening Data:	NO SCREENING DATA REQUIRED.
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	JWEAVER
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064795	300158810	N	Pb	9.8	0.8	ug/g	
			Sb	< 0.2		ug/g	
			Tl	0.4	0.2	ug/g	
200064799	300158814	S	Pb	6.1	0.4	ug/g	
			Sb	< 0.2		ug/g	
			Tl	< 0.2		ug/g	
200064800	300158818	W	Pb	10.0	0.4	ug/g	
			Sb	< 0.2		ug/g	
			Tl	0.2	0.2	ug/g	
200064801	300158822	E	Pb	7.4	0.4	ug/g	
			Sb	< 0.2		ug/g	
			Tl	< 0.2		ug/g	
200064802	300158826	SED-N	Pb	11.4	0.4	ug/g	
			Sb	< 0.2		ug/g	
			Tl	0.2	0.2	ug/g	
200064803	300158830	SED-SW	Pb	9.3	0.4	ug/g	
			Sb	< 0.2		ug/g	
			Tl	0.2	0.2	ug/g	

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**** FINAL REPORT ****

Submission id : 100029674

EH-IMS

Method Area:

Method: GENERIC ICPMS

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064804	300158834	SED-E	Pb	11.7	0.4	ug/g	
			Sb	< 0.2		ug/g	
			Tl	0.2	0.2	ug/g	
200064805	300158838	W-1	Pb	13.3	0.4	ug/g	
			Sb	< 0.2		ug/g	
			Tl	0.3	0.2	ug/g	
200064806	300158842	E-1	Pb	12.0	0.4	ug/g	
			Sb	< 0.2		ug/g	
			Tl	0.3	0.2	ug/g	
200064807	300158846	BNW-1	Pb	8.5	0.4	ug/g	
			Sb	< 0.2		ug/g	
			Tl	0.2	0.2	ug/g	
200064808	300158850	BNE-1	Pb	9.0	0.4	ug/g	
			Sb	< 0.2		ug/g	
			Tl	< 0.2		ug/g	

DUPLICATE TASKS

Sample Id	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
200064795	300158810		Pb	9.8	0.8	ug/g	
			Sb	< 0.2		ug/g	
			Tl	0.4	0.2	ug/g	
200071241	300170712	300158810	Pb	8.9	0.4	ug/g	
			Sb	< 0.2		ug/g	
			Tl	0.2	0.2	ug/g	

**** FINAL REPORT ****

B-25

Method: GENERIC ICPMS Method Area: EH-IMS

Submission Id: 100029674

DILUTION CHECKS

Sample Id	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
200064795	300158810		Pb	9.8	0.8	ug/g	
			Sb	< 0.2		ug/g	
			Tl	0.4	0.2	ug/g	
200071243	300170714	300158810	Pb	8.8	0.8	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	

SAMPLE SPIKES

Sample Id	Task Id	Original Task	Spike Type	Component	Amt. Spiked	Units	% Recovered	Qualifier
200071242	300170713	300158810	PreDS	Pb	332.5	ug/g	97.20	
				Sb	13.3	ug/g	3.01	
				Tl	6.65	ug/g	90.23	
200071244	300170715	300158810	PostDS	Pb	26.94	ug/g	112.10	
				Sb	26.94	ug/g	102.82	
				Tl	26.94	ug/g	117.30	

B-26

**** FINAL REPORT ****

Method: GENERIC ICPMS Method Area: EH-IMS Submission Id: 100029574

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
200064812	300158859	Pb	4890	110	ug/g	5100.	633.33	ug/g	IN CONTROL
		Sb	0.4	0.2	ug/g	7.9	1.5	ug/g	OUT OF CONTROL
		Tl	0.6	0.2	ug/g	0.63	0.04	ug/g	IN CONTROL

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.35928	300170711	Pb	81	4	ug/g	86.4	19	ug/g	IN CONTROL
		Sb	1.4	0.2	ug/g	38.2	24.6	ug/g	IN CONTROL
		Tl	99	2	ug/g	105	33.2	ug/g	IN CONTROL

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.24620	300170710	Pb	< 0.4		ug/g	0.0	0.0	ug/g	IN CONTROL
		Sb	< 0.2		ug/g	0.0	0.0	ug/g	IN CONTROL

***** FINAL REPORT *****

B-27

Method: GENERIC ICPMS Method Area: EH-IMS Submission Id: 100029674

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>
00.24620	300170710	TI	<u>Value</u>		ug/g	<u>Value</u>	<u>Uncertainty</u>	<u>units</u>
			< 0.2			0.0	0.0	ug/g
								Evaluation
								IN CONTROL

B-28

**** FINAL REPORT ****

Method: GENERIC ICPMS Method Area: EH-IMS Submission Id: 100029674

[Signature]
Analyst

8/25/98
Date

[Signature]
Review

8/25/98
Date

[Signature]
Team Leader

9/28/98
Date

NK
QA Officer

09/29/98
Date

B-29

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

CHAIN-OF-CUSTODY RECORD

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Soils and Foodstuffs (7000 WLOG) 7C20 CX50 3000 0200
P.I.# (505) 667-0815
ESH-20 MS M887

Project Name DART 98 SOILS		Request the following analysis: Ag As Ba Be Cd Cr Cu Hg Ni Pb Sb Se TL		Sample Name/Number		Sample Location/Remarks	
Date	Time	Signature	Signature	Signature	Signature	Signature	Signature
6-25-98	10:40			N		North side of DART Rd	
	10:20			S		South " " " (with samples for analysis)	
	10:00			W		West side of DART Rd	
	10:30			E		East " " "	
	10:40			Sed-N		Sediment on North side	
	10:00			Sed - SW SW		" " South west side	
	10:30			Sed - E		" " East side	
	10:05			W-1		West side of DART - 1 ft depth (undisturbed)	
	10:35			E-1		East side of DART - 1 ft depth (undisturbed)	
	10:50			B NW-1		Between NW side - 1 ft depth (25 yds to well beam)	
	10:55			B NE-1		Between NE side - 1 ft depth (25 yds from middle of beam)	
						(25 yds from middle of beam)	
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)	Remarks:	
Relinquished by: (signature)	6/25/98 2310	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)		
Relinquished by: (signature)	Date/Time	Received for Lab. by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)		

APPENDIX C

ANALYTICAL DATA REPORTS OF RADIONUCLIDE CONCENTRATIONS IN UNDERSTORY AND OVERSTORY VEGETATION COLLECTED AROUND THE DARHT FACILITY DURING 1998

Method: H-3 LS ENV Method Area: EH-ALPHA Submission Id: 100029689

Requester Name: PHIL FRESQUEZ Customer Cost Code: 000000CX5030000200 Due Date: 31-AUG-98
 Requester Group: ESH-20 Logged Date: 26-JUN-1998 Screening Data: NO SCREENING DATA REQUIRED
 Mail Stop: M887 Study: ESH20 BIOLOGICALS
 Requester Phone: 667-0815
 Requester Fax #: 667-0731 Analytical Service Agreement #:

Logged by: LBRANCH

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200064878	300159003	N-OS	H-3	1050	730	pCi/L	
			H-3 MDA	590		pCi/L	
200064879	300159004	N-US	H-3	690	710	pCi/L	
			H-3 MDA	550		pCi/L	
200064880	300159005	S-OS	H-3	320	680	pCi/L	
			H-3 MDA	520		pCi/L	
200064881	300159006	S-US	H-3	0.00	1000	pCi/L	
			H-3 MDA	486.42		pCi/L	
200064882	300159007	E-OS	H-3	650	700	pCi/L	
			H-3 MDA	540		pCi/L	
200064883	300159008	E-US	H-3	-20	660	pCi/L	
			H-3 MDA	490		pCi/L	
200064884	300159009	W-OS	H-3	340	680	pCi/L	
			H-3 MDA	500		pCi/L	
200064885	300159010	W-US	H-3	-190	650	pCi/L	
			H-3 MDA	490		pCi/L	

***** FINAL REPORT *****

Method: H-3 LS ENV Method Area: EH-ALPHA Submission Id : 100029689

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>
200064886	300159011	H-3	<u>Value</u>	1200	pCi/L	<u>Value</u>	<u>Uncertainty</u>	<u>units</u>
			10900			10700	400	pCi/L
								IN CONTROL

C-2

90

**** FINAL REPORT ****

Method: H-3 LS ENV Method Area: EH-ALPHA Submission Id: 100029689

Cip
Analyst

Eva
Review

CB
Team Leader

NK
QA Officer

7/17/98
Date

7-20-98
Date

7/20/98
Date

07/21/98
Date

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: SR-90 LS ENV Method Area: EH-ALPHA Submission Id: 100029919

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	7C2000CX5030000000	Due Date:	14-SEP-98
Requester Group:	ESH-20	Logged Date:	13-JUL-1998	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	LBRANCH
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065958	300161464	N-OS	Sr-90	2.20	0.29	pCi/g	
			Sr-90 MDA	0.55		pCi/g	
200065960	300161469	N-US	Sr-90	0.81	0.21	pCi/g	
			Sr-90 MDA	0.57		pCi/g	
200065961	300161474	S-OS	Sr-90	2.57	0.62	pCi/g	
			Sr-90 MDA	1.58		pCi/g	
200065962	300161479	S-US	Sr-90	3.50	0.38	pCi/g	
			Sr-90 MDA	0.61		pCi/g	
200065963	300161480	E-OS	Sr-90	4.23	0.61	pCi/g	
			Sr-90 MDA	1.24		pCi/g	
200065964	300161489	E-US	Sr-90	4.82	0.48	pCi/g	
			Sr-90 MDA	0.69		pCi/g	
200065965	300161494	W-OS	Sr-90	4.13	0.54	pCi/g	
			Sr-90 MDA	1.02		pCi/g	
200065966	300161497	W-US	Sr-90	3.35	0.48	pCi/g	
			Sr-90 MDA	0.97		pCi/g	

**** FINAL REPORT ****

Method: SR-90 IS ENV Method Area: EH-ALPHA Submission Id: 100029919

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
200065969	300161502	Sr-90	6.44	1.37	pCi/g	10.03	0.32	pCi/g	WARNING 2-3SIG

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.36592	300186229	Sr-90	541.21	42.80	pCi/L	499.5	15.98	pCi/L	IN CONTROL

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.22784	300186228	Sr-90	-0.34	0.39	pCi/g	0	0	pCi/g	IN CONTROL

**** FINAL REPORT ****

C-5

Method: SR-90 IS ENV Method Area: EH-ALPHA Submission Id : 100029919

Eay
Analyst

SP
Review

CB
Team Leader

NK for PCL
QA Officer

11-9-98
Date

11/16/98
Date

11/13/98
Date

11/16/98
Date

C-6

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

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**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: GENERIC KPA Method Area: EH-ALPHA Submission Id: 100029919

Requester Name: PHIL FRESQUEZ Customer Cost Code: 7C2000CX50300000000
Requester Group: ESH-20 Logged Date: 13-JUL-1998
Mail Stop: M887 Study: ESH20 BIOLOGICALS
Requester Phone: 667-0815
Requester Fax #: 667-0731 Analytical Service Agreement #:

Due Date: 14-SEP-98
Screening Data: NO SCREENING DATA REQUIRED

Logged by: LBRANCH

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065958	300161461	N-OS	U	1.36	0.14	ug/g	
200065960	300161466	N-US	U	0.37	0.04	ug/g	
200065961	300161471	S-OS	U	0.35	0.04	ug/g	
200065962	300161476	S-US	U	0.30	0.03	ug/g	
200065963	300161482	E-OS	U	0.98	0.10	ug/g	
200065964	300161486	E-US	U	0.69	0.07	ug/g	
200065965	300161491	W-OS	U	0.27	0.03	ug/g	
200065966	300161499	W-US	U	0.34	0.03	ug/g	

**** FINAL REPORT ****

Method: GENERIC KPA Method Area: EH-ALPHA Submission Id: 100029919

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
200065970	300161503	U	0.15	0.02	ug/g	0.28	0.028	ug/g	OUT OF CONTROL

OPEN QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.38058	300176116	U	10.60	1.06	ug/L	10.1	1.0	ug/L	IN CONTROL

METHOD BLANK

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.22784	300176117	U	0.00	0.01	ug/g	0	0	ug/g	IN CONTROL

***** FINAL REPORT *****

Method: GENERIC KPA Method Area: EH-ALPHA Submission Id: 100029919

<u>ml</u>	<u>Euf</u>	<u>B</u>	<u>NK</u>
Analyst	Review	Team Leader	QA Officer
<u>9/21/98</u>	<u>9-25-98</u>	<u>9/25/98</u>	<u>09/25/98</u>
Date	Date	Date	Date

C-9

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Page 1

of

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Method: GENERIC GAMMA Method Area: EH-GAMMA Submission Id: 100029919

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	7C2000CX5030000000	Due Date:	14-SEP-98
Requester Group:	ESH-20	Logged Date:	13-JUL-1998	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	LBRANCH
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200065958	300161460	N-OS	CS-137	1.20	0.27	pCi/g	
200065960	300161465	N-US	CS-137	0.68	1.03	pCi/g	
200065961	300161470	S-OS	CS-137	1.11	0.25	pCi/g	
200065962	300161475	S-US	CS-137	0.35	0.52	pCi/g	
200065963	300161481	E-OS	CS-137	0.91	1.37	pCi/g	
200065964	300161485	E-US	CS-137	1.22	0.20	pCi/g	
200065965	300161490	W-OS	CS-137	1.13	0.25	pCi/g	
200065966	300161498	W-US	CS-137	0.68	1.02	pCi/g	

C-10

**** FINAL REPORT ****

Submission Id : 100029919

Method Area: EH-GAMMA

Method: GENERIC GAMMA

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>
200065972	300161507	CS-137	<u>Value</u>	3.8	pCi/g	<u>Value</u>	<u>Uncertainty</u>	<u>units</u>
			44.7			41.0	1.4	pCi/g
								<u>Evaluation</u>
								IN CONTROL

OPEN QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>
00.33382	300170758	CS-137	<u>Value</u>	0.60	pCi/g	<u>Value</u>	<u>Uncertainty</u>	<u>units</u>
			4.76			4.8500	0.1600	pCi/g
								<u>Evaluation</u>
								IN CONTROL

C-11

METHOD BLANK

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>
00.22785	300170757	CS-137	<u>Value</u>	0.08	pCi/g	<u>Value</u>	<u>Uncertainty</u>	<u>units</u>
			0.06			0.0	0.0	pCi/g
								<u>Evaluation</u>
								IN CONTROL

**** FINAL REPORT ****

25-Aug-1998 12:27

Method: GENERIC GAMMA Method Area: EH-GAMMA Submission Id: 100029919

[Signature]
Analyst

[Signature]
Review

[Signature]
Team Leader

[Signature]
QA Officer

8/25/98
Date

8/26/98
Date

8/26/98
Date

08/26/98
Date

C-12

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Submission Id: 100029919

Method: PU RAS ENV Method Area: EH-ALPHA

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	7C2000CX5030000000	Due Date:	14-SEP-98
Requester Group:	ESH-20	Logged Date:	13-JUL-1998	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	LBRANCH
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200065958	300161463	N-OS	Pu-238	-0.0013	0.0012	pCi/g	
			Pu-239	-0.0002	0.0020	pCi/g	
			Pu-242T Recovery	53.12		%	
			Analysis Date	10/1/98		MM/DD/YY	
			Instrument	96 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	39.17		%	
			Pu-242T Spike	2.05		pCi	
			Pu-238 Gross Counts	4.		counts	
			Pu-238 Background Counts	7.4		counts	
			Pu-239 Gross Counts	15.		counts	
			Pu-239 Background Counts	15.4		counts	
200065960	300161468	N-US	Pu-238	-0.0007	0.0013	pCi/g	
			Pu-239	0.0027	0.0023	pCi/g	
			Pu-242T Recovery	65.35		%	
			Analysis Date	10/1/98		MM/DD/YY	
			Instrument	96 ALPHA		NONE	
			Count Time	3000.00		min	

**** FINAL REPORT ****

C-13

Method: PU RAS ENV Method Area: EH-ALPHA Submission Id: 100029919

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065960	300161468	N-US	Efficiency	35.93		%	
			Pu-242T Spike	2.05		pCi	
			Pu-238 Gross Counts	8.		counts	
			Pu-238 Background Counts	10.2		counts	
			Pu-239 Gross Counts	20.		counts	
			Pu-239 Background Counts	11.6		counts	
200065961	300161473	S-US	Pu-238	0.0012	0.0016	pCi/g	
			Pu-239	0.0042	0.0030	pCi/g	
			Pu-242T Recovery	48.72		%	
			Analysis Date	10/1/98		MM/DD/YY	
			Instrument	96 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	34.58		%	
			Pu-242T Spike	2.05		pCi	
			Pu-238 Gross Counts	11.		counts	
			Pu-238 Background Counts	8.4		counts	
			Pu-239 Gross Counts	18.		counts	
			Pu-239 Background Counts	8.6		counts	
200065962	300161478	S-US	Pu-238	0.0001	0.0022	pCi/g	
			Pu-239	0.0012	0.0037	pCi/g	
			Pu-242T Recovery	46.50		%	
			Analysis Date	10/1/98		MM/DD/YY	
			Instrument	96 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	35.43		%	
			Pu-242T Spike	2.05		pCi	
			Pu-238 Gross Counts	8.		counts	
			Pu-238 Background Counts	7.8		counts	
			Pu-239 Gross Counts	14.		counts	
			Pu-239 Background Counts	11.4		counts	
200065963	300161484	E-US	Pu-238	0.0026	0.0023	pCi/g	

C-14

**** FINAL REPORT ****

Method: PU RAS ENV Method Area: EH-ALPHA Submission Id: 100029919

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065963	300161484	E-OS	Pu-239	0.0011	0.0027	pCi/g	
			Pu-242T Recovery	34.83		%	
			Analysis Date	10/1/98		MM/DD/YY	
			Instrument	96 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	36.19		%	
			Pu-242T Spike	2.05		pCi	
			Pu-238 Gross Counts	12.		counts	
			Pu-238 Background Counts	7.6		counts	
			Pu-239 Gross Counts	11.		counts	
			Pu-239 Background Counts	12.8		counts	
200065964	300161488	E-US	Pu-238	0.0028	0.0014	pCi/g	
			Pu-239	0.0037	0.0016	pCi/g	
			Pu-242T Recovery	76.47		%	
			Analysis Date	10/1/98		MM/DD/YY	
			Instrument	96 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	36.18		%	
			Pu-242T Spike	2.05		pCi	
			Pu-238 Gross Counts	20.		counts	
			Pu-238 Background Counts	9.8		counts	
			Pu-239 Gross Counts	26.		counts	
			Pu-239 Background Counts	12.2		counts	
200065965	300161493	W-OS	Pu-238	0.0005	0.0020	pCi/g	
			Pu-239	0.0001	0.0030	pCi/g	
			Pu-242T Recovery	34.75		%	
			Analysis Date	10/1/98		MM/DD/YY	
			Instrument	96 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	36.97		%	
			Pu-242T Spike	2.05		pCi	

**** FINAL REPORT ****

C-15

00000

Method: PU RAS ENV Method Area: EH-ALPHA Submission Id: 100029919

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065965	300161493	W-OS	Pu-238 Gross Counts	10.		counts	
			Pu-238 Background Counts	10.8		counts	
			Pu-239 Gross Counts	13.		counts	
			Pu-239 Background Counts	13.2		counts	
200065966	300161496	W-US	Pu-238	-0.0018	0.0024	pCi/g	
			Pu-239	-0.0018	0.0024	pCi/g	
			Pu-242T Recovery	52.38		%	
			Analysis Date	10/1/98		MM/DD/YY	
			Instrument	96 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	35.34		%	
			Pu-242T Spike	2.05		pCi	
			Pu-238 Gross Counts	11.		counts	
			Pu-238 Background Counts	13.8		counts	
			Pu-239 Gross Counts	9.		counts	
			Pu-239 Background Counts	13.4		counts	

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***** FINAL REPORT *****

00000

Method: PU RAS ENV Method Area: EH-ALPHA Submission Id: 100029919

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
200065968	300161500	Pu-238	4.2530	0.1296	pCi/g	4.30	0.15	pCi/g	IN CONTROL
		Pu-239	3.6842	0.1257	pCi/g	3.61	0.12	pCi/g	IN CONTROL

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.39798	300180090	Pu-238	4132	1543	pCi/L	4180	418	pCi/L	IN CONTROL

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.22784	300180089	Pu-238	0.0002	0.0015	pCi/g	0	0	pCi/g	IN CONTROL
		Pu-239	0.0013	0.0024	pCi/g	0	0	pCi/g	IN CONTROL

**** FINAL REPORT ****

C-17

Method: PU RAS ENV Method Area: EH-ALPHA Submission Id: 100029919

ChA
Analyst

Eun
Review

TS
Team Leader

NK for PCL
QA officer

10/20/98
Date

10-22-98
Date

10/23/98
Date

10/26/98
Date

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

C-18

Method: AM RAS ENV Method Area: EH-ALPHA Submission Id: 100029919

Requester Name: PHIL FRESQUEZ Customer Cost Code: 7C2000CX5030000000 Due Date: 14-SEP-98
 Requester Group: ESH-20 Logged Date: 13-JUL-1998 Screening Data: NO SCREENING DATA REQUIRED
 Mail Stop: M887 Study: ESH20 BIOLOGICALS Logged by: LBRANCH
 Requester Phone: 667-0815 Analytical Service Agreement #:
 Requester Fax #: 667-0731

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065958	300161462	N-OS	Am-241	0.0034	0.0049	pCi/g	
			Am-243T Recovery	20.24		%	
			Analysis Date	10/01/98		MM/DD/YY	
			Instrument	32 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	33.21		%	
			Am-243T Spike	2.05		pCi	
			Am-241 Gross Counts	7.		counts	
			Am-241 Background Counts	4.2		counts	
200065960	300161467	N-US	Am-241	0.0027	0.0047	pCi/g	
			Am-243T Recovery	34.84		%	
			Analysis Date	10/01/98		MM/DD/YY	
			Instrument	32 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	30.45		%	
			Am-243T Spike	2.05		pCi	
			Am-241 Gross Counts	10.		counts	
			Am-241 Background Counts	6.2		counts	

**** FINAL REPORT ****

C-19

Method: AM RAS ENV Method Area: EH-ALPHA Submission Id: 100029919

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065961	300161472	S-OS	Am-241	0.0027	0.0030	pCi/g	
			Am-243T Recovery	39.44		%	
			Analysis Date	10/01/98		MM/DD/YY	
			Instrument	32 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	30.53		%	
			Am-243T Spike	2.05		pCi	
			Am-241 Gross Counts	9.		counts	
			Am-241 Background Counts	4.6		counts	
200065962	300161477	S-US	Am-241	0.0023	0.0051	pCi/g	
			Am-243T Recovery	36.27		%	
			Analysis Date	10/26/98		MM/DD/YY	
			Instrument	32 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	31.92		%	
			Am-243T Spike	2.05		pCi	
			Am-241 Gross Counts	11.		counts	
			Am-241 Background Counts	7.4		counts	
200065963	300161483	E-OS	Am-241	0.0059	0.0109	pCi/g	
			Am-243T Recovery	17.64		%	
			Analysis Date	10/26/98		MM/DD/YY	
			Instrument	32 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	29.05		%	
			Am-243T Spike	2.05		pCi	
			Am-241 Gross Counts	13.		counts	
			Am-241 Background Counts	17.0		counts	
200065964	300161487	E-US	Am-241	0.0126	0.0058	pCi/g	
			Am-243T Recovery	26.41		%	
			Analysis Date	10/01/98		MM/DD/YY	
			Instrument	32 ALPHA		NONE	

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***** FINAL REPORT *****

Method: AM RAS ENV Method Area: EH-ALPHA Submission Id: 100029919

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065964	300161487	E-US	Count Time	3000.00		min	
			Efficiency	30.69		%	
			Am-243T Spike	2.05		pCi	
			Am-241 Gross Counts	19.		counts	
			Am-241 Background Counts	5.4		counts	
200065965	300161492	W-US	Am-241	0.0060	0.0026	pCi/g	
			Am-243T Recovery	45.18		%	
			Analysis Date	10/01/98		MM/DD/YY	
			Instrument	32 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	27.76		%	
			Am-243T Spike	2.05		pCi	
			Am-241 Gross Counts	13.		counts	
			Am-241 Background Counts	3.0		counts	
200065966	300161495	W-US	Am-241	0.0013	0.0091	pCi/g	
			Am-243T Recovery	14.30		%	
			Analysis Date	10/01/98		MM/DD/YY	
			Instrument	32 ALPHA		NONE	
			Count Time	3000.00		min	
			Efficiency	33.16		%	
			Am-243T Spike	2.05		pCi	
			Am-241 Gross Counts	6.		counts	
			Am-241 Background Counts	6.8		counts	

**** FINAL REPORT ****

C-21

Method: AM RAS ENV Method Area: EH-ALPHA Submission Id: 100029919

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>
200065968	300161501	Am-241	<u>Value</u>	0.1551	pCi/g	<u>Value</u>	<u>Uncertainty</u>	<u>Evaluation</u>
			6.7577			6.56	0.30	IN CONTROL

METHOD BLANK

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>
00.22784	300185414	Am-241	<u>Value</u>	0.0055	pCi/g	<u>Value</u>	<u>Uncertainty</u>	<u>Evaluation</u>
			0.0119			0	0	WARNING 2-3SIG

**** FINAL REPORT ****

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00010

Method: AM RAS ENV

Method Area: EH-ALPHA

Submission Id: 100029919

CPA
AnalystEvy
ReviewQZ
Team LeaderNK Jm PCL
QA Officer11/04/98
Date11-04-98
Date11/5/98
Date11/6/98
Date

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

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**** FINAL REPORT ****

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Soils and Foodstuffs (7C20 ~~WE66~~ CX 50 . 3000 . 0200
P.I.# (505) 667-0815
ESH-20 MS M887

[illegible]

APPENDIX D

ANALYTICAL DATA REPORTS OF TRACE ELEMENTS CONCENTRATIONS IN UNDERSTORY AND OVERSTORY VEGETATION COLLECTED AROUND THE DARHT FACILITY DURING 1998

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: **GENERIC ICPE** Method Area: **EH-OES** Submission Id: **100029921**

Requester Name: **PHIL FRESQUEZ** Customer Cost Code: **7C2000CX5030000000** Due Date: **14-SEP-98**
 Requester Group: **ESH-20** Logged Date: **13-JUL-1998** Screening Data: **NO SCREENING DATA REQUIRED**
 Mail Stop: **M887** Study: **ESH20 BIOLOGICALS** Logged by: **LBRANCH**
 Requester Phone: **667-0815** Analytical Service Agreement #:
 Requester Fax #: **667-0731**

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065973	300162573	N-OS	Ba	27	2.7	ug/g	
			Cu	3.3	1	ug/g	
			Ag	< 2	0	ug/g	
			Be	< 0.2	0	ug/g	
			Cd	< 1	0	ug/g	
			Cr	< 1	0.200	ug/g	
			Ni	3.900	2	ug/g	
200065974	300162575	N-US	Ba	48	4.8	ug/g	
			Cu	6.1	1	ug/g	
			Ag	< 2	0	ug/g	
			Be	< 0.2	0	ug/g	
			Cd	< 1	0	ug/g	
			Cr	< 1	0	ug/g	
			Ni	< 2	0	ug/g	
200065975	300162577	S-OS	Ba	45	4.5	ug/g	
			Cu	3.6	1	ug/g	
			Ag	< 2	0	ug/g	
			Be	< 0.2	0	ug/g	

**** FINAL REPORT ****

Method: **GENERIC ICPES** Method Area: **EH-OES** Submission Id: **100029921**

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065975	300162577	S-OS	Cd	< 1	0	ug/g	
			Cr	< 1	0	ug/g	
			Ni	< 2	0	ug/g	
200065976	300162576	S-US	Ba	43	4.3	ug/g	
			Cu	5.3	1	ug/g	
			Ag	< 2	0	ug/g	
			Be	< 0.2	0	ug/g	
			Cd	< 1	0	ug/g	
			Cr	< 1	0	ug/g	
			Ni	< 2	0	ug/g	
200065977	300162580	E-OS	Ag	62.000	6.200	ug/g	
			Ba	36	3.6	ug/g	
			Be	< 0.2	0	ug/g	
			Cd	< 1	0	ug/g	
			Cr	< 1	0	ug/g	
			Cu	4.7	1	ug/g	
			Ni	< 2	0	ug/g	
200065978	300162582	E-US	Ba	50	5	ug/g	
			Cu	12	1.2	ug/g	
			Ag	< 2	0	ug/g	
			Be	< 0.2	0	ug/g	
			Cd	< 1	0	ug/g	
			Cr	< 1	0	ug/g	
			Ni	< 2	0	ug/g	
200065979	300162584	W-OS	Ba	61	6	ug/g	
			Cu	3.5	1	ug/g	
			Ag	< 2	0	ug/g	
			Be	< 0.2	0	ug/g	
			Cd	< 1	0	ug/g	
			Cr	< 1	0	ug/g	
			Ni	2.300	2	ug/g	

D-2

***** FINAL REPORT *****

Method: GENERIC ICPES Method Area: EH-OES Submission Id: 100029921

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065980	300162586	W-US	Ba	82	8.2	ug/g	
			Cu	7.1	1	ug/g	
			Ag	< 2	0	ug/g	
			Be	< 0.20	0	ug/g	
			Cd	< 1	0	ug/g	
			Cr	< 1	0	ug/g	
			Ni	2.900	2.123	ug/g	

DUPLICATE TASKS

Sample Id	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
200065973	300162573		Ba	27	2.7	ug/g	
			Cu	3.3	1	ug/g	
			Ag	< 2	0	ug/g	
			Be	< 0.2	0	ug/g	
			Cd	< 1	0	ug/g	
			Cr	< 1	0.200	ug/g	
			Ni	3.900	2	ug/g	
200074195	300176108	300162573	Ag	49.000	4.900	ug/g	
			Ba	26	2.6	ug/g	
			Be	< 0.2	0	ug/g	
			Cd	< 1	0	ug/g	
			Cr	< 1	0	ug/g	
			Cu	3.2	1	ug/g	
			Ni	< 2	0	ug/g	

**** FINAL REPORT ****

D-3

Method: GENERIC ICPES Method Area: EH-OES Submission Id: 100029921

SAMPLE SPIKES

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Spike Type</u>	<u>Component</u>	<u>Amt. Spiked</u>	<u>Units</u>	<u>% Recovered</u>	<u>Qualifier</u>
200074196	300176109	300162573	PreDS	Ba	26.575	ug/g	-83.16	
				Cu	132.875	ug/g	5.79	
				Ag	132.875	ug/g	97.84	
				Be	26.575	ug/g	86.55	
				Cd	132.875	ug/g	71.50	
				Cr	132.875	ug/g	82.78	
				Ni	132.875	ug/g	79.85	

D-4

**** FINAL REPORT ****

Method: GENERIC ICPES Method Area: EH-OES Submission Id: 100029921

***** CST QUALITY ASSURANCE REPORT *****

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.24620	300176112	Ag	<2.000	0	ug/g	0.0	0.0	ug/g	IN CONTROL
		Ba	< 0.2	0	ug/g	0.0	0.0	ug/g	IN CONTROL
		Be	< 0.2	0	ug/g	0.0	0.0	ug/g	IN CONTROL
		Cd	< 1	0	ug/g	0.0	0.0	ug/g	IN CONTROL
		Cr	< 1	0	ug/g	0.0	0.0	ug/g	IN CONTROL
		Cu	< 1	0	ug/g	0.0	0.0	ug/g	IN CONTROL
		Ni	< 2	0	ug/g	0.0	0.0	ug/g	IN CONTROL

D-5

**** FINAL REPORT ****

Method: GENERIC ICPEs Method Area: EH-OES Submission Id: 100029921

[Signature]
Analyst

11-3-98
Date

[Signature]
Review

11/4/98
Date

[Signature]
Team Leader

11/4/98
Date

[Signature]
QA Officer

11/5/98
Date

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

D-6

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: **GENERIC ICPMS** Method Area: **EH-IMS** Submission Id: **100029921**

Requester Name: **PHIL FRESQUEZ** Customer Cost Code: **7C2000CX5030000000** Due Date: **14-SEP-98**
Requester Group: **ESH-20** Logged Date: **13-JUL-1998** Screening Data: **NO SCREENING DATA REQUIRED**
Mail Stop: **M887** Study: **ESH20 BIOLOGICALS** Logged by: **LBRANCH**
Requester Phone: **667-0815** Analytical Service Agreement #:
Requester Fax #: **667-0731**

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065973	300162572	N-OS	Pb	1.1	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	
200065974	300162571	N-US	Pb	0.8	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	
200065975	300162574	S-OS	Pb	1.7	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	
200065976	300162578	S-US	Pb	< 0.4		ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	
200065977	300162579	E-OS	Pb	4.5	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	
200065978	300162581	E-US	Pb	1.0	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	

**** FINAL REPORT ****

D-7

Method: GENERIC ICPMS Method Area: EH-IMS Submission Id: 100029921

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065979	300162583	W-OS	Pb	2.8	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	
200065980	300162585	W-US	Pb	4.6	0.4	ug/g	
			Sb	0.4	0.4	ug/g	
			Tl	< 0.4		ug/g	

DUPLICATE TASKS

Sample Id	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
200065973	300162572		Pb	1.1	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	
200076790	300181217	300162572	Pb	1.0	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	
200065977	300162579		Pb	4.5	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	
200076795	300181222	300162579	Pb	3.9	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	

**** FINAL REPORT ****

Method: GENERIC ICPMS Method Area: EH-IMS Submission Id: 100029921

DILUTION CHECKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200065973	300162572		Pb	1.1	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	
200076791	300181218	300162572	Pb	< 0.8		ug/g	
			Sb	< 0.8		ug/g	
			Tl	< 0.8		ug/g	
200065977	300162579		Pb	4.5	0.4	ug/g	
			Sb	< 0.4		ug/g	
			Tl	< 0.4		ug/g	
200076797	300181224	300162579	Pb	< 4		ug/g	
			Sb	< 4		ug/g	
			Tl	< 4		ug/g	

D-9

SAMPLE SPIKES

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Spike Type</u>	<u>Component</u>	<u>Amt. Spiked</u>	<u>Units</u>	<u>% Recovered</u>	<u>Qualifier</u>
200076796	300181223	300162579	PreDS	Pb	265.75	ug/g	107.06	
				Sb	10.63	ug/g	113.83	
				Tl	5.315	ug/g	103.48	
200076792	300181219	300162572	PosDS	Pb	37.52	ug/g	95.68	
				Sb	37.52	ug/g	93.28	
				Tl	37.52	ug/g	98.61	

**** FINAL REPORT ****

Method: GENERIC TCPMS Method Area: EH-TMS Submission Id: 100029921

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Spike Type</u>	<u>Component</u>	<u>Amt. Spiked</u>	<u>Units</u>	<u>% Recovered</u>	<u>Qualifier</u>
200076798	300181225	300162579	PostDS	Pb	24.06	ug/g	93.52	
				Sb	24.06	ug/g	95.59	
				Tl	24.06	ug/g	99.75	

D-10

**** FINAL REPORT ****

Method: GENERIC ICPMS Method Area: EH-IMS Submission Id: 100029921

***** CST QUALITY ASSURANCE REPORT *****

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.00533	300181221	Pb	6.7	0.4	mg/kg	6.3	0.3	mg/kg	IN CONTROL
		Sb	< 0.4		mg/kg	0.036	0.007	mg/kg	IN CONTROL
		Tl	< 0.4		mg/kg	0.05	0	mg/kg	IN CONTROL

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.24620	300181216	Pb	< 0.4		ug/g	0.0	0.0	ug/g	IN CONTROL
		Sb	< 0.4		ug/g	0.0	0.0	ug/g	IN CONTROL
		Tl	< 0.4		ug/g	0.0	0.0	ug/g	IN CONTROL
00.24620	300181220	Pb	< 0.4		ug/g	0.0	0.0	ug/g	IN CONTROL
		Sb	< 0.4		ug/g	0.0	0.0	ug/g	IN CONTROL
		Tl	< 0.4		ug/g	0.0	0.0	ug/g	IN CONTROL

**** FINAL REPORT ****

D-11

Method: GENERIC ICPMS Method Area: EH-IMS Submission Id: 100029921

<u> </u> Analyst	<u> </u> Review	<u> </u> Team Leader	<u> </u> QA Officer
<u>10/20/98</u> Date	<u>10/20/98</u> Date	<u>11/3/98</u> Date	<u>11/6/98</u> Date

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

D-12

**** FINAL REPORT ****

Method: **GENERIC ETVA** Method Area: **EH-AA** Submission Id: **100029921**

Requester Name: **PHIL FRESQUEZ** Customer Cost Code: **7C2000CX5030000000** Due Date: **14-SEP-98**
 Requester Group: **ESH-20** Logged Date: **13-JUL-1998** Screening Data: **NO SCREENING DATA REQUIRED**
 Mail Stop: **M887** Study: **ESH20 BIOLOGICALS** Logged by: **LBRANCH**
 Requester Phone: **667-0815**
 Requester Fax #: **667-0731** Analytical Service Agreement #:

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200065973	300161510	N-OS	As	<0.5		ug/g	
			Se	<0.5		ug/g	
200065974	300161514	N-US	As	<0.5		ug/g	
			Se	<0.4		ug/g	
200065975	300161519	S-OS	As	<0.5		ug/g	
			Se	<0.4		ug/g	
200065976	300161522	S-US	As	<0.5		ug/g	
			Se	<0.4		ug/g	
200065977	300161526	E-OS	As	<0.5		ug/g	
			Se	<0.4		ug/g	
200065978	300161530	E-US	As	<0.5		ug/g	
			Se	<0.4		ug/g	
200065979	300161533	W-OS	As	<0.5		ug/g	
			Se	<0.4		ug/g	
200065980	300161538	W-US	As	<0.5		ug/g	
			Se	<0.4		ug/g	

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**** FINAL REPORT ****

Method: GENERIC ETVAA Method Area: EH-AA Submission Id: 100029921

DUPLICATE TASKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200065973	300161510		As	<0.5		ug/g	
			Se	<0.5		ug/g	
200078879	300184966	300161510	As	<0.5		ug/g	
			Se	<0.4		ug/g	

DILUTION CHECKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200065973	300161510		As	<0.5		ug/g	
			Se	<0.5		ug/g	
200078882	300184968	300161510	As	<2		ug/g	
			Se	<2		ug/g	

SAMPLE SPIKES

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Spike Type</u>	<u>Component</u>	<u>Amt. Spiked</u>	<u>Units</u>	<u>% Recovered</u>	<u>Qualifier</u>
200078881	300184967	300161510	PreDS	As	10.63	ug/g	115.80	
				Se	10.63	ug/g	106.21	
200078883	300184969	300184968	PostDS	As	9.38	ug/g	96.27	
				Se	9.38	ug/g	90.09	

**** FINAL REPORT ****

D-14

Method: **GENERIC ETVAA** Method Area: **EH-AA** Submission Id: **100029921**

***** CST QUALITY ASSURANCE REPORT *****

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.00533	300184965	As	<0.5		mg/kg	0.27	0.05	mg/kg	IN CONTROL
		Se	<4		mg/kg	0.054	0.006	mg/kg	IN CONTROL

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.24620	300184964	As	-0.07	0.5	ug/g	0.0	0.0	ug/g	IN CONTROL
		Se	0.09	0.4	ug/g	0.0	0.0	ug/g	IN CONTROL

D-15

**** FINAL REPORT ****

Method: GENERIC ETVAA Method Area: EH-AA Submission Id: 100029921

Nicholas G. Gano
Analyst

Sty Liao
Review

G. A. H.
Team Leader

W. J. H.
QA Officer

10-30-98
Date

10/30/98
Date

11/4/98
Date

11/6/98
Date

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

Method: **GENERIC CVAA** Method Area: **EH-AA** Submission Id: **100029921**

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	7C2000CX5030000000	Due Date:	14-SEP-98
Requester Group:	ESH-20	Logged Date:	13-JUL-1998	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	LBRANCH
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200065973	300161511	N-OS	Hg	< 0.01	0	ug/g	
200065974	300161515	N-US	Hg	0.031	0.01	ug/g	
200065975	300161516	S-OS	Hg	< 0.01	0	ug/g	
200065976	300161523	S-US	Hg	< 0.01	0	ug/g	
200065977	300161527	E-OS	Hg	< 0.01	0	ug/g	
200065978	300161531	E-US	Hg	< 0.01	0	ug/g	
200065979	300161534	W-OS	Hg	< 0.01	0	ug/g	
200065980	300161539	W-US	Hg	< 0.01	0	ug/g	

DUPLICATE TASKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200065973	300161511		Hg	< 0.01	0	ug/g	
200071345	300170875	300161511	Hg	< 0.01	0	ug/g	
200065973	300161511		Hg	< 0.01	0	ug/g	

**** FINAL REPORT ****

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Method: **GENERIC CVAA** Method Area: **EH-AA** Submission Id: **100029921**

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200071346	300170876	300161511	Hg	< 0.01	0	ug/g	
200065974	300161515		Hg	0.031	0.01	ug/g	
200071348	300170878	300161515	Hg	0.019	0.01	ug/g	
200065975	300161516		Hg	< 0.01	0	ug/g	
200071350	300170880	300161516	Hg	< 0.01	0	ug/g	
200065975	300161516		Hg	< 0.01	0	ug/g	
200071351	300170881	300161516	Hg	0.011	0.01	ug/g	
200065976	300161523		Hg	< 0.01	0	ug/g	
200071352	300170882	300161523	Hg	< 0.01	0	ug/g	
200065977	300161527		Hg	< 0.01	0	ug/g	
200071353	300170883	300161527	Hg	< 0.01	0	ug/g	
200065977	300161527		-Hg	< 0.01	0	ug/g	
200071354	300170884	300161527	Hg	< 0.01	0	ug/g	
200065978	300161531		Hg	< 0.01	0	ug/g	
200071355	300170885	300161531	Hg	< 0.01	0	ug/g	
200065979	300161534		Hg	< 0.01	0	ug/g	
200071356	300170886	300161534	Hg	< 0.01	0	ug/g	
200065979	300161534		Hg	< 0.01	0	ug/g	
200071357	300170887	300161534	Hg	< 0.01	0	ug/g	
200065980	300161539		Hg	< 0.01	0	ug/g	
200071358	300170888	300161539	Hg	< 0.01	0	ug/g	

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**** FINAL REPORT ****

Method: GENERIC CVAA Method Area: EH-AA Submission Id: 100029921

March
Analyst

Richerson
Review

Ernst
Team Leader

QAL
QA Officer

9-30-98
Date

10-1-98
Date

10/3/98
Date

11/6/98
Date

D-19

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

Los Alamos

Los Alamos National Laboratory

Los Alamos, New Mexico 87545

Soils and Foodstuffs (7C20 WE6G) Cx50.3000.0200

P.I.# (505) 667-0815

ESH-20 MS M887

Metals

CHAIN-OF-CUSTODY RECORD

[illegible]

APPENDIX E

ANALYTICAL DATA REPORTS OF VOC CONCENTRATIONS IN SOILS AND SEDIMENTS COLLECTED AROUND THE DARHT FACILITY DURING 1998

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: VOA CL Method Area: EH-CONTRACT LABS Submission Id: 100034659

Requester Name: PHIL FRESQUEZ Customer Cost Code: 7C2000CX5030000200 Due Date: 01-FEB-99
Requester Group: ESH-20 Logged Date: 21-DEC-1998 Screening Data: NO SCREENING DATA REQUIRED
Mail Stop: M887 Study: CONTRACT LABS Logged by: LBRANCH
Requester Phone: 667-0815
Requester Fax #: 667-0731 Analytical Service Agreement #:

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200084010	300193556	N	chloromethane	<12		ug/kg	
			bromomethane	<12		ug/kg	
			vinyl chloride	<12		ug/kg	
			chloroethane	<12		ug/kg	
			methylene chloride	25		ug/kg	
			acetone	<23		ug/kg	
			carbon disulfide	<5.8		ug/kg	
			1,1-dichloroethene	<5.8		ug/kg	
			1,1-dichloroethane	<5.8		ug/kg	
			1,2-dichloroethene(total)	<5.8		ug/kg	
			chloroform	<5.8		ug/kg	
			1,2-dichloroethane	<5.8		ug/kg	
			2-butanone	<23		ug/kg	
			1,1,1-trichloroethane	<5.8		ug/kg	
			carbon tetrachloride	<5.8		ug/kg	
			bromodichloromethane	<5.8		ug/kg	
			1,1,2,2-tetrachloroethane	<5.8		ug/kg	
			1,2-dichloropropane	<5.8		ug/kg	

***** FINAL REPORT *****

Method: VOA CL Method Area: EH-CONTRACT LABS Submission Id: 100034669

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200084010	300193556	N	trans-1,3-dichloropropene	<5.8		ug/kg	
			trichloroethene	<5.8		ug/kg	
			tribromochloromethane	<5.8		ug/kg	
			1,1,2-trichloroethane	<5.8		ug/kg	
			benzene	<5.8		ug/kg	
			cis-1,3-dichloropropene	<5.8		ug/kg	
			bromoform	<5.8		ug/kg	
			2-hexanone	<23		ug/kg	
			4-methyl-2-pentanone	<23		ug/kg	
			tetrachloroethene	<5.8		ug/kg	
			toluene	<5.8		ug/kg	
			chlorobenzene	<5.8		ug/kg	
			ethylbenzene	<5.8		ug/kg	
			styrene	<5.8		ug/kg	
			xylenes(total)	<5.8		ug/kg	
			dichlorodifluoromethane	<12		ug/kg	
			trichlorofluoromethane	<5.8		ug/kg	
			Analysis Date	15-JAN-1999		DD-MON-YYYY	
200084019	300193557	S	chloromethane	<12		ug/kg	
			bromomethane	<12		ug/kg	
			vinyl chloride	<12		ug/kg	
			chloroethane	<12		ug/kg	
			methylene chloride	<6.1		ug/kg	
			acetone	<24		ug/kg	
			carbon disulfide	<6.1		ug/kg	
			1,1-dichloroethene	<6.1		ug/kg	
			1,1-dichloroethane	<6.1		ug/kg	
			1,2-dichloroethene(total)	<6.1		ug/kg	
			chloroform	<6.1		ug/kg	
			1,2-dichloroethane	<6.1		ug/kg	
			2-butanone	<24		ug/kg	

E-2

**** FINAL REPORT ****

Method: VOA CL Method Area: EH-CONTRACT LABS Submission Id: 100034669

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200084019	300193557	S	1,1,1-trichloroethane	<6.1		ug/kg	
			carbon tetrachloride	<6.1		ug/kg	
			bromodichloromethane	<6.1		ug/kg	
			1,1,2,2-tetrachloroethane	<6.1		ug/kg	
			1,2-dichloropropane	<6.1		ug/kg	
			trans-1,3-dichloropropene	<6.1		ug/kg	
			trichloroethene	<6.1		ug/kg	
			dibromochloromethane	<6.1		ug/kg	
			1,1,2-trichloroethane	<6.1		ug/kg	
			benzene	<6.1		ug/kg	
			cis-1,3-dichloropropene	<6.1		ug/kg	
			bromoform	<6.1		ug/kg	
			2-hexanone	<24		ug/kg	
			4-methyl-2-pentanone	<24		ug/kg	
			tetrachloroethene	<6.1		ug/kg	
			toluene	<6.1		ug/kg	
			chlorobenzene	<6.1		ug/kg	
			ethylbenzene	<6.1		ug/kg	
			styrene	2.1		ug/kg	
			xylenes(total)	<6.1		ug/kg	
			dichlorodifluoromethane	<12		ug/kg	
			trichlorofluoromethane	<6.1		ug/kg	
			Analysis Date	15-JAN-1999		DD-MON-YYYY	
200084020	300193558	W	chloromethane	<11		ug/kg	
			bromomethane	<11		ug/kg	
			vinyl chloride	<11		ug/kg	
			chloroethane	<11		ug/kg	
			methylene chloride	<5.6		ug/kg	
			acetone	<22		ug/kg	
			carbon disulfide	<5.6		ug/kg	
			1,1-dichloroethene	<5.6		ug/kg	

**** FINAL REPORT ****

11-3

Method: VOA CL Method Area: EH-CONTRACT LABS Submission Id : 100034669

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200084020	300193558	W	1,1-dichloroethane	<5.6		ug/kg	
			1,2-dichloroethene(total)	<5.6		ug/kg	
			chloroform	<5.6		ug/kg	
			1,2-dichloroethane	<5.6		ug/kg	
			2-butanone	<22		ug/kg	
			1,1,1-trichloroethane	<5.6		ug/kg	
			carbon tetrachloride	<5.6		ug/kg	
			bromodichloromethane	<5.6		ug/kg	
			1,1,2,2-tetrachloroethane	<5.6		ug/kg	
			1,2-dichloropropane	<5.6		ug/kg	
			trans-1,3-dichloropropene	<5.6		ug/kg	
			trichloroethene	<5.6		ug/kg	
			dibromochloromethane	<5.6		ug/kg	
			1,1,2-trichloroethane	<5.6		ug/kg	
			benzene	<5.6		ug/kg	
			cis-1,3-dichloropropene	<5.6		ug/kg	
			bromoform	<5.6		ug/kg	
			2-hexanone	<22		ug/kg	
			4-methyl-2-pentanone	<22		ug/kg	
			tetrachloroethene	<5.6		ug/kg	
			toluene	<5.6		ug/kg	
			chlorobenzene	<5.6		ug/kg	
			ethylbenzene	<5.6		ug/kg	
			styrene	<5.6		ug/kg	
			xylenes(total)	<5.6		ug/kg	
			dichlorodifluoromethane	<11		ug/kg	
			trichlorofluoromethane	<5.6		ug/kg	
			Analysis Date	15-JAN-1999		DD-MON-YYYY	
200084021	300193559	E	chloromethane	<13		ug/kg	
			bromomethane	<13		ug/kg	
			vinyl chloride	<13		ug/kg	

E-4

**** FINAL REPORT ****

Method: VOA CL Method Area: EH-CONTRACT LABS Submission Id: 100034669

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200084021	300193559	E	chloroethane	<13		ug/kg	
			methylene chloride	<6.3		ug/kg	
			acetone	<25		ug/kg	
			carbon disulfide	<6.3		ug/kg	
			1,1-dichloroethene	<6.3		ug/kg	
			1,1-dichloroethane	<6.3		ug/kg	
			1,2-dichloroethene(total)	<6.3		ug/kg	
			chloroform	<6.3		ug/kg	
			1,2-dichloroethane	<6.3		ug/kg	
			2-butanone	<25		ug/kg	
			1,1,1-trichloroethane	<6.3		ug/kg	
			carbon tetrachloride	<6.3		ug/kg	
			bromodichloromethane	<6.3		ug/kg	
			1,1,2,2-tetrachloroethane	<6.3		ug/kg	
			1,2-dichloropropane	<6.3		ug/kg	
			trans-1,3-dichloropropene	<6.3		ug/kg	
			trichloroethene	<6.3		ug/kg	
			dibromochloromethane	<6.3		ug/kg	
			1,1,2-trichloroethane	<6.3		ug/kg	
			benzene	<6.3		ug/kg	
			cis-1,3-dichloropropene	<6.3		ug/kg	
			bromoform	<6.3		ug/kg	
			2-hexanone	<25		ug/kg	
			4-methyl-2-pentanone	<25		ug/kg	
			tetrachloroethene	<6.3		ug/kg	
			toluene	<6.3		ug/kg	
			chlorobenzene	<6.3		ug/kg	
			ethylbenzene	<6.3		ug/kg	
			styrene	1.9		ug/kg	
			xylenes(total)	<6.3		ug/kg	
			dichlorodifluoromethane	<13		ug/kg	

**** FINAL REPORT ****

F-5

Method: VOA CL Method Area: EH-CONTRACT LABS

Submission Id: 100034669

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200084021	300193559	E	trichlorofluoromethane	<6.3		ug/kg	
			Analysis Date	15-JAN-1999		DD-MON-YYYY	
200084022	300193560	SED-N	chloromethane	<14		ug/kg	
			bromomethane	<14		ug/kg	
			vinyl chloride	<14		ug/kg	
			chloroethane	<14		ug/kg	
			methylene chloride	<6.9		ug/kg	
			acetone	<28		ug/kg	
			carbon disulfide	<6.9		ug/kg	
			1,1-dichloroethene	<6.9		ug/kg	
			1,1-dichloroethane	<6.9		ug/kg	
			1,2-dichloroethene(total)	<6.9		ug/kg	
			chloroform	1.5		ug/kg	
			1,2-dichloroethane	<6.9		ug/kg	
			2-butanone	<28		ug/kg	
			1,1,1-trichloroethane	<6.9		ug/kg	
			carbon tetrachloride	<6.9		ug/kg	
			bromodichloromethane	<6.9		ug/kg	
			1,1,2,2-tetrachloroethane	<6.9		ug/kg	
			1,2-dichloropropane	<6.9		ug/kg	
			trans-1,3-dichloropropene	<6.9		ug/kg	
			trichloroethene	<6.9		ug/kg	
			dibromochloromethane	<6.9		ug/kg	
			1,1,2-trichloroethane	<6.9		ug/kg	
			benzene	<6.9		ug/kg	
			cis-1,3-dichloropropene	<6.9		ug/kg	
			bromoform	<6.9		ug/kg	
			2-hexanone	<28		ug/kg	
			4-methyl-2-pentanone	<28		ug/kg	
			tetrachloroethene	<6.9		ug/kg	
			toluene	<6.9		ug/kg	

E-6

**** FINAL REPORT ****

Method: VOA CL Method Area: EH-CONTRACT LABS Submission Id: 100034669

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200084022	300193560	SED-N	chlorobenzene	<6.9		ug/kg	
			ethylbenzene	<6.9		ug/kg	
			styrene	<6.9		ug/kg	
			xylenes(total)	<6.9		ug/kg	
			dichlorodifluoromethane	<14		ug/kg	
			trichlorofluoromethane	<6.9		ug/kg	
			Analysis Date	15-JAN-1999		DD-MON-YYYY	
200084023	300193561	SED-SW	chloromethane	<14		ug/kg	
			bromomethane	<14		ug/kg	
			vinyl chloride	<14		ug/kg	
			chloroethane	<14		ug/kg	
			methylene chloride	<6.8		ug/kg	
			acetone	<27		ug/kg	
			carbon disulfide	<6.8		ug/kg	
			1,1-dichloroethene	<6.8		ug/kg	
			1,1-dichloroethane	<6.8		ug/kg	
			1,2-dichloroethene(total)	<6.8		ug/kg	
			chloroform	<6.8		ug/kg	
			1,2-dichloroethane	<6.8		ug/kg	
			2-butanone	<27		ug/kg	
			1,1,1-trichloroethane	<6.8		ug/kg	
			carbon tetrachloride	<6.8		ug/kg	
			bromodichloromethane	<6.8		ug/kg	
			1,1,2,2-tetrachloroethane	<6.8		ug/kg	
			1,2-dichloropropane	<6.8		ug/kg	
			trans-1,3-dichloropropene	<6.8		ug/kg	
			trichloroethene	<6.8		ug/kg	
			dibromochloromethane	<6.8		ug/kg	
			1,1,2-trichloroethane	<6.8		ug/kg	
			benzene	<6.8		ug/kg	
			cis-1,3-dichloropropene	<6.8		ug/kg	

**** FINAL REPORT ****

B-7

Method: VOA CL Method Area: RH-CONTRACT LABS Submission Id: 100034669

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200084023	300193561	SED-SW	bromoform	<6.8		ug/kg	
			2-hexanone	<27		ug/kg	
			4-methyl-2-pentanone	<27		ug/kg	
			tetrachloroethene	<6.8		ug/kg	
			toluene	<6.8		ug/kg	
			chlorobenzene	<6.8		ug/kg	
			ethylbenzene	<6.8		ug/kg	
			styrene	<6.8		ug/kg	
			xylenes(total)	<6.8		ug/kg	
			dichlorodifluoromethane	<14		ug/kg	
			trichlorofluoromethane	<6.8		ug/kg	
			Analysis Date	15-JAN-1999		DD-MON-YYYY	
200084024	300193562	SED-E	chloromethane	<14		ug/kg	
			bromomethane	<14		ug/kg	
			vinyl chloride	<14		ug/kg	
			chloroethane	<14		ug/kg	
			methylene chloride	6.2		ug/kg	
			acetone	<27		ug/kg	
			carbon disulfide	<6.8		ug/kg	
			1,1-dichloroethene	<6.8		ug/kg	
			1,1-dichloroethane	<6.8		ug/kg	
			1,2-dichloroethene(total)	<6.8		ug/kg	
			chloroform	<6.8		ug/kg	
			1,2-dichloroethane	<6.8		ug/kg	
			2-butanone	<27		ug/kg	
			1,1,1-trichloroethane	<6.8		ug/kg	
			carbon tetrachloride	<6.8		ug/kg	
			bromodichloromethane	<6.8		ug/kg	
			1,1,2,2-tetrachloroethane	<6.8		ug/kg	
			1,2-dichloropropane	<6.8		ug/kg	
			trans-1,3-dichloropropene	<6.8		ug/kg	

**** FINAL REPORT ****

Method: VOA CL Method Area: EH-CONTRACT LABS Submission Id : 100034669

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200084024	300193562	SED-E	trichloroethene	<6.8		ug/kg	
			1,1,2-trichloroethane	<6.8		ug/kg	
			benzene	<6.8		ug/kg	
			cis-1,3-dichloropropene	<6.8		ug/kg	
			bromoform	<6.8		ug/kg	
			2-hexanone	<27		ug/kg	
			4-methyl-2-pentanone	<27		ug/kg	
			tetrachloroethene	<6.8		ug/kg	
			toluene	<6.8		ug/kg	
			chlorobenzene	<6.8		ug/kg	
			ethylbenzene	<6.8		ug/kg	
			styrene	<6.8		ug/kg	
			xylenes(total)	<6.8		ug/kg	
			dichlorodifluoromethane	<14		ug/kg	
			trichlorofluoromethane	<6.8		ug/kg	
			Analysis Date	15-JAN-1999			DD-MON-YYYY

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**** FINAL REPORT ****

Method: VOA CL Method Area: EH-CONTRACT LABS

Submission Id : 100034669

_____ Analyst	_____ Review	_____ Team Leader	_____ QA Officer
_____ Date	_____ Date	_____ Date	2/11/99 Date

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

CHAIN-OF-CUSTODY RECORD

CX50 3000 0200

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Soils and Foodstuffs (7C20 ~~WATER~~)
P.I.# (505) 667-0815
ESH-20 MS M887

Project Name DART - Soils - Org.		Request the following analysis: SVOC VOC		Sample Name/Number		Sample Location/Remarks	
Date	Time						
8-11-90	9:00	N		North side of DART Rd.		7 hdding time 4°C	
	9:30	S		South "		"	
	9:05	W		West "		"	
	9:35	E		East "		"	
	9:10	Sed - N		Sediment - North			
	9:00	Sed - SW		" Southwest			
	9:40	Sed - E		" East			
				Note: collected 0-6-inch depth			
				w stainless steel scoops			
				conditions: soil wet, slight overcast.			
				note: asphalt roofing in the North side near our W sample.			
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)		
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)		
Relinquished by: (signature)	Date/Time	Received for Lab. by: (signature)	Date/Time	Remarks:			

APPENDIX F

ANALYTICAL DATA REPORTS OF SVOC CONCENTRATIONS IN SOILS AND SEDIMENTS COLLECTED AROUND THE DARHT FACILITY DURING 1998

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

05-Nov-1998 12:49

Submission Id : 100031228

Method Area: EH-ORGANIC

Requester Name : PHIL FRESQUEZ
Requester Group: ESH-20
Mail Stop : M887
Requester Phone: 667-0815
Requester Fax #: 667-0731
Customer Cost Code: 7C2000CX5030000200
Logged Date : 11-AUG-98
Due Date : 13-OCT-98
Screening Data : NO SCREENING DATA REQUIRED
Logged by: LBRANCH
Analytical Service Agreement #:

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200069643	300168026	N	62-75-9 N-Nitrosodimethylamine	<330		ug/kg	U
				110-86-1 Pyridine	<330		ug/kg	U
				109-06-8 2-Picoline	<330		ug/kg	U
				625-3-3 Aniline	<330		ug/kg	U
				108-95-2 Phenol	<330		ug/kg	U
				111-44-4 bis-2-Chloroethyl ether	<330		ug/kg	U
				95-57-8 2-Chlorophenol	<330		ug/kg	U
				541-73-1 1,3-Dichlorobenzene	<330		ug/kg	U
				106-46-7 1,4-Dichlorobenzene	<330		ug/kg	U
				95-50-1 1,2-Dichlorobenzene	<330		ug/kg	U
				100-51-6 Benzyl alcohol	<330		ug/kg	U
				95-48-7 2-Methylphenol	<330		ug/kg	U
				108-60-1 bis-2-Chloroisopropyl ether	<330		ug/kg	U
				106-44-5 4-Methylphenol	<330		ug/kg	U
				621-64-7	<330		ug/kg	U
				N-Nitroso-di-n-propylamine	<330		ug/kg	U
				67-72-1 Hexachloroethane	<330		ug/kg	U
				98-95-3 Nitrobenzene	<330		ug/kg	U
				78-59-1 Isophorone	<330		ug/kg	U

**** FINAL REPORT ****

F-1

Method Area:

EH-ORGANIC

Submission Id : 100031228

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200069643	300168026	N	88-75-5 2-Nitrophenol	<330		ug/kg	U
				105-67-9 2,4-Dimethylphenol	<330		ug/kg	U
				111-91-1 bis-2-Chloroethoxy methane	<330		ug/kg	U
				120-83-2 2,4-Dichlorophenol	<330		ug/kg	U
				120-82-1	<330		ug/kg	U
				1,2,4-Trichlorobenzene				
				65-85-0 Benzoic acid	<1700		ug/kg	U
				91-20-3 Naphthalene	<330		ug/kg	U
				106-47-8 4-Chloroaniline	<330		ug/kg	U
				87-68-3 Hexachlorobutadiene	<1700		ug/kg	U
				59-50-7	<330		ug/kg	U
				4-Chloro-3-methylphenol				
				91-57-6 2-Methylnaphthalene	<330		ug/kg	U
				77-47-4	<330		ug/kg	U
				Hexachlorocyclopentadiene				
				88-06-2 2,4,6-Trichlorophenol	<330		ug/kg	U
				95-95-4 2,4,5-Trichlorophenol	<330		ug/kg	U
				91-58-7 2-Chloronaphthalene	<330		ug/kg	U
				88-74-4 2-Nitroaniline	<660		ug/kg	U
				131-11-3 Dimethylphthalate	<330		ug/kg	U
				208-96-8 Acenaphthylene	<330		ug/kg	U
				83-32-9 Acenaphthene	<330		ug/kg	U
				99-09-2 3-Nitroaniline	<660		ug/kg	U
				51-28-5 2,4-Dinitrophenol	<1700		ug/kg	U
				100-02-7 4-Nitrophenol	<1700		ug/kg	U
				132-64-9 Dibenzofuran	<330		ug/kg	U
				121-14-2 2,4-Dinitrotoluene	<330		ug/kg	U
				606-20-2 2,6-Dinitrotoluene	<330		ug/kg	U
				86-73-7 Fluorene	<330		ug/kg	U

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**** FINAL REPORT ****

Method Area: EH-ORGANIC

Submission Id : 100031228

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC SVOA-COLD	200069643	300168026	N	7005-72-3 4-Chlorophenyl phenyl ether	<330		ug/kg	U
				84-66-2 Diethylphthalate	<330		ug/kg	U
				100-01-6 4-Nitroaniline	<660		ug/kg	U
				534-52-1	<1700		ug/kg	U
				4,6-Dinitro-2-methylphenol				
				86-30-6 N-Nitrosodiphenylamine	<330		ug/kg	U
				103-33-3 Azobenzene	<330		ug/kg	U
				101-55-3 4-Bromophenyl phenyl ether	<330		ug/kg	U
				118-74-1 Hexachlorobenzene	<330		ug/kg	U
				87-86-5 Pentachlorophenol	<1700		ug/kg	U
				85-01-8 Phenanthrene	<330		ug/kg	U
				120-12-7 Anthracene	<330		ug/kg	U
				84-74-2 Di-n-butylphthalate	<330		ug/kg	U
				206-44-0 Fluoranthene	<330		ug/kg	U
				92-87-5 Benzidine	<1700		ug/kg	U
				129-00-0 Pyrene	<330		ug/kg	U
				85-68-7 Butylbenzylphthalate	<330		ug/kg	U
				91-94-1 3,3'-Dichlorobenzidine	<660		ug/kg	U
				56-55-3 Benzo(a)anthracene	<330		ug/kg	U
				218-01-9 Chrysene	<330		ug/kg	U
				117-81-7	<330		ug/kg	U
				bis-2-Ethylhexylphthalate				
				117-84-0 Di-n-octylphthalate	<330		ug/kg	U
				205-99-2 Benzo(b)fluoranthene	<330		ug/kg	U
				207-08-9 Benzo(k)fluoranthene	<330		ug/kg	U
				50-32-8 Benzo(a)pyrene	<330		ug/kg	U
				193-39-5	<330		ug/kg	U
				Indeno(1,2,3-cd)pyrene				
				53-70-3 Dibenzo(a,h)anthracene	<330		ug/kg	U

**** FINAL REPORT ****

f-3

Method Area: EH-ORGANIC

Submission Id : 100031228

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC SVOA-COLD	200069643	300168026	N	191-24-2 Benzo(g,h,i)perylene	<320		ug/kg	U
	200069644	300168027	S	62-75-9 N-Nitrosodimethylamine	<320		ug/kg	U
				110-86-1 Pyridine	<320		ug/kg	U
				109-06-8 2-Picoline	<320		ug/kg	U
				625-3-3 Aniline	<320		ug/kg	U
				108-95-2 Phenol	<320		ug/kg	U
				111-44-4 bis-2-Chloroethyl ether	<320		ug/kg	U
				95-57-8 2-Chlorophenol	<320		ug/kg	U
				541-73-1 1,3-Dichlorobenzene	<320		ug/kg	U
				106-46-7 1,4-Dichlorobenzene	<320		ug/kg	U
				95-50-1 1,2-Dichlorobenzene	<320		ug/kg	U
				100-51-6 Benzyl alcohol	<320		ug/kg	U
				95-48-7 2-Methylphenol	<320		ug/kg	U
				108-60-1 bis-2-Chloroisopropyl ether	<320		ug/kg	U
				106-44-5 4-Methylphenol	<320		ug/kg	U
				621-64-7	<320		ug/kg	U
				N-Nitroso-di-n-propylamine				
				67-72-1 Hexachloroethane	<320		ug/kg	U
				98-95-3 Nitrobenzene	<320		ug/kg	U
				78-59-1 Isophorone	<320		ug/kg	U
				88-75-5 2-Nitrophenol	<320		ug/kg	U
				105-67-9 2,4-Dimethylphenol	<320		ug/kg	U
				111-91-1 bis-2-Chloroethoxy methane	<320		ug/kg	U
				120-83-2 2,4-Dichlorophenol	<320		ug/kg	U
				120-82-1	<320		ug/kg	U
				1,2,4-Trichlorobenzene				
				65-85-0 Benzoic acid	<1600		ug/kg	U

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**** FINAL REPORT ****

Method Area: EH-ORGANIC

Submission Id : 100031228

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200069644	300168027	S	91-20-3 Naphthalene	<320		ug/kg	U
				106-47-8 4-Chloroaniline	<320		ug/kg	U
				87-68-3 Hexachlorobutadiene	<1600		ug/kg	U
				59-50-7	<320		ug/kg	U
				4-Chloro-3-methylphenol				
				91-57-6 2-Methylnaphthalene	<320		ug/kg	U
				77-47-4	<320		ug/kg	U
				Hexachlorocyclopentadiene				
				88-06-2 2,4,6-Trichlorophenol	<320		ug/kg	U
				95-95-4 2,4,5-Trichlorophenol	<320		ug/kg	U
				91-58-7 2-Chloronaphthalene	<320		ug/kg	U
				88-74-4 2-Nitroaniline	<630		ug/kg	U
				131-11-3 Dimethylphthalate	<320		ug/kg	U
				208-96-8 Acenaphthylene	<320		ug/kg	U
				83-32-9 Acenaphthene	<320		ug/kg	U
				99-09-2 3-Nitroaniline	<630		ug/kg	U
				51-28-5 2,4-Dinitrophenol	<1600		ug/kg	U
				100-02-7 4-Nitrophenol	<1600		ug/kg	U
				132-64-9 Dibenzofuran	<320		ug/kg	U
				121-14-2 2,4-Dinitrotoluene	<320		ug/kg	U
				606-20-2 2,6-Dinitrotoluene	<320		ug/kg	U
				86-73-7 Fluorene	<320		ug/kg	U
				7005-72-3 4-Chlorophenyl phenyl ether	<320		ug/kg	U
				84-66-2 Diethylphthalate	<320		ug/kg	U
				100-01-6 4-Nitroaniline	<630		ug/kg	U
				534-52-1	<1600		ug/kg	U
				4,6-Dinitro-2-methylphenol				
				86-30-6 N-Nitrosodiphenylamine	<320		ug/kg	U
				103-33-3 Azobenzene	<320		ug/kg	U

**** FINAL REPORT ****

F-5

Method Area: EH-ORGANIC

Submission Id : 100031228

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200069644	300168027	S	101-55-3 4-Bromophenyl phenyl ether	<320		ug/kg	U
				118-74-1 Hexachlorobenzene	<320		ug/kg	U
				87-86-5 Pentachlorophenol	<1600		ug/kg	U
				85-01-8 Phenanthrene	<320		ug/kg	U
				120-12-7 Anthracene	<320		ug/kg	U
				84-74-2 Di-n-butylphthalate	<320		ug/kg	U
				206-44-0 Fluoranthene	<320		ug/kg	U
				92-87-5 Benzidine	<1600		ug/kg	U
				129-00-0 Pyrene	<320		ug/kg	U
				85-68-7 Butylbenzylphthalate	<320		ug/kg	U
				91-94-1 3,3'-Dichlorobenzidine	<630		ug/kg	U
				56-55-3 Benzo(a)anthracene	<320		ug/kg	U
				218-01-9 Chrysene	<320		ug/kg	U
				117-81-7 bis-2-Ethylhexylphthalate	<320		ug/kg	U
	200069645	300168025	W	117-84-0 Di-n-octylphthalate	<320		ug/kg	U
				205-99-2 Benzo(b)fluoranthene	<320		ug/kg	U
				207-08-9 Benzo(k)fluoranthene	<320		ug/kg	U
				50-32-8 Benzo(a)pyrene	<320		ug/kg	U
				193-39-5 Indeno(1,2,3-cd)pyrene	<320		ug/kg	U
				53-70-3 Dibenzo(a,h)anthracene	<320		ug/kg	U
				191-24-2 Benzo(g,h,i)perylene	<320		ug/kg	U
				62-75-9 N-Nitrosodimethylamine	<330		ug/kg	U
				110-86-1 Pyridine	<330		ug/kg	U
				109-06-8 2-Picoline	<330		ug/kg	U
				625-3-3 Aniline	<330		ug/kg	U
				108-95-2 Phenol	<330		ug/kg	U
				111-44-4 bis-2-Chloroethyl ether	<330		ug/kg	U

F-6

**** FINAL REPORT ****

Method Area: EH-ORGANIC

Submission Id : 100031228

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200069645	300168025	W	95-57-8 2-Chlorophenol	<330		ug/kg	U
				541-73-1 1,3-Dichlorobenzene	<330		ug/kg	U
				106-46-7 1,4-Dichlorobenzene	<330		ug/kg	U
				95-50-1 1,2-Dichlorobenzene	<330		ug/kg	U
				100-51-6 Benzyl alcohol	<330		ug/kg	U
				95-48-7 2-Methylphenol	<330		ug/kg	U
				108-60-1 bis-2-Chloroisopropyl ether	<330		ug/kg	U
				106-44-5 4-Methylphenol	<330		ug/kg	U
				621-64-7	<330		ug/kg	U
				N-Nitroso-di-n-propylamine	<330		ug/kg	U
				67-72-1 Hexachloroethane	<330		ug/kg	U
				98-95-3 Nitrobenzene	<330		ug/kg	U
				78-59-1 Isophorone	<330		ug/kg	U
				88-75-5 2-Nitrophenol	<330		ug/kg	U
				105-67-9 2,4-Dimethylphenol	<330		ug/kg	U
				111-91-1 bis-2-Chloroethoxy methane	<330		ug/kg	U
				120-83-2 2,4-Dichlorophenol	<330		ug/kg	U
				120-82-1	<330		ug/kg	U
				1,2,4-Trichlorobenzene	<1700		ug/kg	U
				65-85-0 Benzoic acid	<330		ug/kg	U
				91-20-3 Naphthalene	<330		ug/kg	U
				106-47-8 4-Chloroaniline	<1700		ug/kg	U
				87-68-3 Hexachlorobutadiene	<330		ug/kg	U
				59-50-7	<330		ug/kg	U
				4-Chloro-3-methylphenol	<330		ug/kg	U
				91-57-6 2-Methylnaphthalene	<330		ug/kg	U
				77-47-4	<330		ug/kg	U
				Hexachlorocyclopentadiene	<330		ug/kg	U
				88-06-2 2,4,6-Trichlorophenol	<330		ug/kg	U

**** FINAL REPORT ****

F-7

Method Area: EH-ORGANIC

Submission Id : 100031228

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC SVOA-COLD	200069645	300168025	W	95-95-4 2,4,5-Trichlorophenol	<330		ug/kg	U
				91-58-7 2-Chloronaphthalene	<330		ug/kg	U
				88-74-4 2-Nitroaniline	<660		ug/kg	U
				131-11-3 Dimethylphthalate	<330		ug/kg	U
				208-96-8 Acenaphthylene	<330		ug/kg	U
				83-32-9 Acenaphthene	<330		ug/kg	U
				99-09-2 3-Nitroaniline	<660		ug/kg	U
				51-28-5 2,4-Dinitrophenol	<1700		ug/kg	U
				100-02-7 4-Nitrophenol	<1700		ug/kg	U
				132-64-9 Dibenzofuran	<330		ug/kg	U
				121-14-2 2,4-Dinitrotoluene	<330		ug/kg	U
				606-20-2 2,6-Dinitrotoluene	<330		ug/kg	U
				86-73-7 Fluorene	<330		ug/kg	U
				7005-72-3 4-Chlorophenyl phenyl ether	<330		ug/kg	U
				84-66-2 Diethylphthalate	<330		ug/kg	U
				100-01-6 4-Nitroaniline	<660		ug/kg	U
				534-52-1	<1700		ug/kg	U
				4,6-Dinitro-2-methylphenol				
				86-30-6 N-Nitrosodiphenylamine	<330		ug/kg	U
				103-33-3 Azobenzene	<330		ug/kg	U
				101-55-3 4-Bromophenyl phenyl ether	<330		ug/kg	U
				118-74-1 Hexachlorobenzene	<330		ug/kg	U
				87-86-5 Pentachlorophenol	<1700		ug/kg	U
				85-01-8 Phenanthrene	<330		ug/kg	U
				120-12-7 Anthracene	<330		ug/kg	U
				84-74-2 Di-n-butylphthalate	<330		ug/kg	U
				206-44-0 Fluoranthene	<330		ug/kg	U
				92-87-5 Benzidine	<1700		ug/kg	U

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**** FINAL REPORT ****

Method Area: EH-ORGANIC

Submission Id: 100031228

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200069645	300168025	W	129-00-0 Pyrene	<330		ug/kg	U
				85-68-7 Butylbenzylphthalate	<330		ug/kg	U
				91-94-1 3,3'-Dichlorobenzidine	<660		ug/kg	U
				56-55-3 Benzo(a)anthracene	<330		ug/kg	U
				218-01-9 Chrysene	<330		ug/kg	U
				117-81-7	<330		ug/kg	U
				bis-2-Ethylhexylphthalate				
				117-84-0 Di-n-octylphthalate	<330		ug/kg	U
				205-99-2 Benzo(b)fluoranthene	<330		ug/kg	U
				207-08-9 Benzo(k)fluoranthene	<330		ug/kg	U
	200069646	300168028	E	50-32-8 Benzo(a)pyrene	<330		ug/kg	U
				193-39-5	<330		ug/kg	U
				Indeno(1,2,3-cd)pyrene				
				53-70-3 Dibenzo(a,h)anthracene	<330		ug/kg	U
				191-24-2 Benzo(g,h,i)perylene	<330		ug/kg	U
				62-75-9 N-Nitrosodimethylamine	<330		ug/kg	U
				110-86-1 Pyridine	<330		ug/kg	U
				109-06-8 2-Picoline	<330		ug/kg	U
				625-3-3 Aniline	<330		ug/kg	U
				108-95-2 Phenol	<330		ug/kg	U
				111-44-4 bis-2-Chloroethyl ether	<330		ug/kg	U
				95-57-8 2-Chlorophenol	<330		ug/kg	U
				541-73-1 1,3-Dichlorobenzene	<330		ug/kg	U
				106-46-7 1,4-Dichlorobenzene	<330		ug/kg	U
				95-50-1 1,2-Dichlorobenzene	<330		ug/kg	U
				100-51-6 Benzyl alcohol	<330		ug/kg	U
				95-48-7 2-Methylphenol	<330		ug/kg	U
				108-60-1 bis-2-Chloroisopropyl ether	<330		ug/kg	U
				106-44-5 4-Methylphenol	<330		ug/kg	U

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**** FINAL REPORT ****

Method Area: EH-ORGANIC

Submission Id : 100031228

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC SVOA-COLD	200069646	300168028	E	621-64-7	<330		ug/kg	U
				N-Nitroso-di-n-propylamine				
				67-72-1 Hexachloroethane	<330		ug/kg	U
				98-95-3 Nitrobenzene	<330		ug/kg	U
				78-59-1 Isophorone	<330		ug/kg	U
				88-75-5 2-Nitrophenol	<330		ug/kg	U
				105-67-9 2,4-Dimethylphenol	<330		ug/kg	U
				111-91-1 bis-2-Chloroethoxy methane	<330		ug/kg	U
				120-83-2 2,4-Dichlorophenol	<330		ug/kg	U
				120-82-1	<330		ug/kg	U
				1,2,4-Trichlorobenzene				
				65-85-0 Benzoic acid	<1700		ug/kg	U
				91-20-3 Naphthalene	<330		ug/kg	U
				106-47-8 4-Chloroaniline	<330		ug/kg	U
				87-68-3 Hexachlorobutadiene	<1700		ug/kg	U
				59-50-7	<330		ug/kg	U
				4-Chloro-3-methylphenol				
				91-57-6 2-Methylnaphthalene	<330		ug/kg	U
				77-47-4	<330		ug/kg	U
				Hexachlorocyclopentadiene				
				88-06-2 2,4,6-Trichlorophenol	<330		ug/kg	U
				95-95-4 2,4,5-Trichlorophenol	<330		ug/kg	U
				91-58-7 2-Chloronaphthalene	<330		ug/kg	U
				88-74-4 2-Nitroaniline	<670		ug/kg	U
				131-11-3 Dimethylphthalate	<330		ug/kg	U
				208-96-8 Acenaphthylene	<330		ug/kg	U
				83-32-9 Acenaphthene	<330		ug/kg	U
				99-09-2 3-Nitroaniline	<670		ug/kg	U
				51-28-5 2,4-Dinitrophenol	<1700		ug/kg	U

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Method Area: EH-ORGANIC

Submission ID: 100031228

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200069646	300168028	E	100-02-7 4-Nitrophenol	<1700		ug/kg	U
				132-64-9 Dibenzofuran	<330		ug/kg	U
				121-14-2 2,4-Dinitrotoluene	<330		ug/kg	U
				606-20-2 2,6-Dinitrotoluene	<330		ug/kg	U
				86-73-7 Fluorene	<330		ug/kg	U
				7005-72-3 4-Chlorophenyl phenyl ether	<330		ug/kg	U
				84-66-2 Diethylphthalate	<330		ug/kg	U
				100-01-6 4-Nitroaniline	<670		ug/kg	U
				534-52-1	<1700		ug/kg	U
				4,6-Dinitro-2-methylphenol				
				86-30-6 N-Nitrosodiphenylamine	<330		ug/kg	U
				103-33-3 Azobenzene	<330		ug/kg	U
				101-55-3 4-Bromophenyl phenyl ether	<330		ug/kg	U
				118-74-1 Hexachlorobenzene	<330		ug/kg	U
				87-86-5 Pentachlorophenol	<1700		ug/kg	U
				85-01-8 Phenanthrene	<330		ug/kg	U
				120-12-7 Anthracene	<330		ug/kg	U
				84-74-2 Di-n-butylphthalate	<330		ug/kg	U
				206-44-0 Fluoranthene	<330		ug/kg	U
				92-87-5 Benzidine	<1700		ug/kg	U
				129-00-0 Pyrene	<330		ug/kg	U
				85-68-7 Butylbenzylphthalate	<330		ug/kg	U
				91-94-1 3,3'-Dichlorobenzidine	<670		ug/kg	U
				56-55-3 Benzo(a)anthracene	<330		ug/kg	U
				218-01-9 Chrysene	<330		ug/kg	U
				117-81-7	<330		ug/kg	U
				bis-2-Ethylhexylphthalate				
				117-84-0 Di-n-octylphthalate	<330		ug/kg	U

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Method Area: EH-ORGANIC

Submission Id: 100031228

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200069646	300168028	E	205-99-2 Benzo(b)fluoranthene	<330		ug/kg	U
				207-08-9 Benzo(k)fluoranthene	<330		ug/kg	U
				50-32-8 Benzo(a)pyrene	<330		ug/kg	U
				193-39-5	<330		ug/kg	U
	200069647	300168029	SED-N	Indeno(1,2,3-cd)pyrene				
				53-70-3 Dibenzo(a,h)anthracene	<330		ug/kg	U
				191-24-2 Benzo(g,h,i)perylene	<330		ug/kg	U
				62-75-9 N-Nitrosodimethylamine	<340		ug/kg	U
				110-86-1 Pyridine	<340		ug/kg	U
				109-06-8 2-Picoline	<340		ug/kg	U
				625-3-3 Aniline	<340		ug/kg	U
				108-95-2 Phenol	<340		ug/kg	U
				111-44-4 bis-2-Chloroethyl ether	<340		ug/kg	U
				95-57-8 2-Chlorophenol	<340		ug/kg	U
				541-73-1 1,3-Dichlorobenzene	<340		ug/kg	U
				106-46-7 1,4-Dichlorobenzene	<340		ug/kg	U
				95-50-1 1,2-Dichlorobenzene	<340		ug/kg	U
				100-51-6 Benzyl alcohol	<340		ug/kg	U
				95-48-7 2-Methylphenol	<340		ug/kg	U
				108-60-1 bis-2-Chloroisopropyl ether	<340		ug/kg	U
				106-44-5 4-Methylphenol	<340		ug/kg	U
				621-64-7	<340		ug/kg	U
				N-Nitroso-di-n-propylamine				
				67-72-1 Hexachloroethane	<340		ug/kg	U
				98-95-3 Nitrobenzene	<340		ug/kg	U
				78-59-1 Isophorone	<340		ug/kg	U
				88-75-5 2-Nitrophenol	<340		ug/kg	U
				105-67-9 2,4-Dimethylphenol	<340		ug/kg	U

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**** FINAL REPORT ****

Method Area: EH-ORGANIC

Submission ID: 100031228

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC SVOA-COLD	200069647	300168029	SED-N	111-91-1 bis-2-Chloroethoxy methane	<340		ug/kg	U
				120-83-2 2,4-Dichlorophenol	<340		ug/kg	U
				120-82-1	<340		ug/kg	U
				1,2,4-Trichlorobenzene				
				65-85-0 Benzoic acid	<1700		ug/kg	U
				91-20-3 Naphthalene	<340		ug/kg	U
				106-47-8 4-Chloroaniline	<340		ug/kg	U
				87-68-3 Hexachlorobutadiene	<1700		ug/kg	U
				59-50-7	<340		ug/kg	U
				4-Chloro-3-methylphenol				
				91-57-6 2-Methylnaphthalene	<340		ug/kg	U
				77-47-4	<340		ug/kg	U
				Hexachlorocyclopentadiene				
				88-06-2 2,4,6-Trichlorophenol	<340		ug/kg	U
				95-95-4 2,4,5-Trichlorophenol	<340		ug/kg	U
				91-58-7 2-Chloronaphthalene	<340		ug/kg	U
				88-74-4 2-Nitroaniline	<670		ug/kg	U
				131-11-3 Dimethylphthalate	<340		ug/kg	U
				208-96-8 Acenaphthylene	<340		ug/kg	U
				83-32-9 Acenaphthene	<340		ug/kg	U
				99-09-2 3-Nitroaniline	<670		ug/kg	U
				51-28-5 2,4-Dinitrophenol	<1700		ug/kg	U
				100-02-7 4-Nitrophenol	<1700		ug/kg	U
				132-64-9 Dibenzofuran	<340		ug/kg	U
				121-14-2 2,4-Dinitrotoluene	<340		ug/kg	U
				606-20-2 2,6-Dinitrotoluene	<340		ug/kg	U
				86-73-7 Fluorene	<340		ug/kg	U
				7005-72-3 4-Chlorophenyl phenyl ether	<340		ug/kg	U
				84-66-2 Diethylphthalate	<340		ug/kg	U

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Method Area: EH-ORGANIC

Submission Id: 100031228

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200069647	300168029	SED-N	100-01-6 4-Nitroaniline	<670		ug/kg	U
				534-52-1	<1700		ug/kg	U
				4,6-Dinitro-2-methylphenol				
				86-30-6 N-Nitrosodiphenylamine	<340		ug/kg	U
				103-33-3 Azobenzene	<340		ug/kg	U
				101-55-3 4-Bromophenyl phenyl ether	<340		ug/kg	U
				118-74-1 Hexachlorobenzene	<340		ug/kg	U
				87-86-5 Pentachlorophenol	<1700		ug/kg	U
				85-01-8 Phenanthrene	<340		ug/kg	U
				120-12-7 Anthracene	<340		ug/kg	U
				84-74-2 Di-n-butylphthalate	<340		ug/kg	U
				206-44-0 Fluoranthene	<340		ug/kg	U
				92-87-5 Benzidine	<1700		ug/kg	U
				129-00-0 Pyrene	<340		ug/kg	U
				85-68-7 Butylbenzylphthalate	<340		ug/kg	U
				91-94-1 3,3'-Dichlorobenzidine	<670		ug/kg	U
				56-55-3 Benzo(a)anthracene	<340		ug/kg	U
				218-01-9 Chrysene	<340		ug/kg	U
				117-81-7	<340		ug/kg	U
				bis-2-Ethylhexylphthalate				
				117-84-0 Di-n-octylphthalate	<340		ug/kg	U
				205-99-2 Benzo(b)fluoranthene	<340		ug/kg	U
				207-08-9 Benzo(k)fluoranthene	<340		ug/kg	U
				50-32-8 Benzo(a)pyrene	<340		ug/kg	U
				193-39-5	<340		ug/kg	U
				Indeno(1,2,3-cd)pyrene				
				53-70-3 Dibenzo(a,h)anthracene	<340		ug/kg	U
				191-24-2 Benzo(g,h,i)perylene	<340		ug/kg	U
				62-75-9 N-Nitrosodimethylamine	<330		ug/kg	U

200069648

SED-SW

300168030

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**** FINAL REPORT ****

Method Area: EH-ORGANIC

Submission ID: 100031228

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC SVOA-COLD	200069648	300168030	SED-SW	110-86-1 Pyridine	<330		ug/kg	U
				109-06-8 2-Picoline	<330		ug/kg	U
				625-3-3 Aniline	<330		ug/kg	U
				108-95-2 Phenol	<330		ug/kg	U
				111-44-4 bis-2-Chloroethyl ether	<330		ug/kg	U
				95-57-8 2-Chlorophenol	<330		ug/kg	U
				541-73-1 1,3-Dichlorobenzene	<330		ug/kg	U
				106-46-7 1,4-Dichlorobenzene	<330		ug/kg	U
				95-50-1 1,2-Dichlorobenzene	<330		ug/kg	U
				100-51-6 Benzyl alcohol	<330		ug/kg	U
				95-48-7 2-Methylphenol	<330		ug/kg	U
				108-60-1 bis-2-Chloroisopropyl ether	<330		ug/kg	U
				106-44-5 4-Methylphenol	<330		ug/kg	U
				621-64-7	<330		ug/kg	U
				N-Nitroso-di-n-propylamine				
				67-72-1 Hexachloroethane	<330		ug/kg	U
				98-95-3 Nitrobenzene	<330		ug/kg	U
				78-59-1 Isophorone	<330		ug/kg	U
				88-75-5 2-Nitrophenol	<330		ug/kg	U
				105-67-9 2,4-Dimethylphenol	<330		ug/kg	U
				111-91-1 bis-2-Chloroethoxy methane	<330		ug/kg	U
				120-83-2 2,4-Dichlorophenol	<330		ug/kg	U
				120-82-1	<330		ug/kg	U
				1,2,4-Trichlorobenzene				
				65-85-0 Benzoic acid	<1600		ug/kg	U
				91-20-3 Naphthalene	<330		ug/kg	U
				106-47-8 4-Chloroaniline	<330		ug/kg	U

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Method Area: EH-ORGANIC

Submission Id : 100031228

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC SVOA-COLD	200069648	300168030	SED-SW	87-68-3 Hexachlorobutadiene	<1600		ug/kg	U
				59-50-7	<330		ug/kg	U
				4-Chloro-3-methylphenol				
				91-57-6 2-Methylnaphthalene	<330		ug/kg	U
				77-47-4	<330		ug/kg	U
				Hexachlorocyclopentadiene				
				88-06-2 2,4,6-Trichlorophenol	<330		ug/kg	U
				95-95-4 2,4,5-Trichlorophenol	<330		ug/kg	U
				91-58-7 2-Chloronaphthalene	<330		ug/kg	U
				88-74-4 2-Nitroaniline	<650		ug/kg	U
				131-11-3 Dimethylphthalate	<330		ug/kg	U
				208-96-8 Acenaphthylene	<330		ug/kg	U
				83-32-9 Acenaphthene	<330		ug/kg	U
				99-09-2 3-Nitroaniline	<650		ug/kg	U
				51-28-5 2,4-Dinitrophenol	<1600		ug/kg	U
				100-02-7 4-Nitrophenol	<1600		ug/kg	U
				132-64-9 Dibenzofuran	<330		ug/kg	U
				121-14-2 2,4-Dinitrotoluene	<330		ug/kg	U
				606-20-2 2,6-Dinitrotoluene	<330		ug/kg	U
				86-73-7 Fluorene	<330		ug/kg	U
				7005-72-3 4-Chlorophenyl phenyl ether	<330		ug/kg	U
				84-66-2 Diethylphthalate	<330		ug/kg	U
				100-01-6 4-Nitroaniline	<650		ug/kg	U
				534-52-1	<1600		ug/kg	U
				4,6-Dinitro-2-methylphenol				
				86-30-6 N-Nitrosodiphenylamine	<330		ug/kg	U
				103-33-3 Azobenzene	<330		ug/kg	U
				101-55-3 4-Bromophenyl phenyl ether	<330		ug/kg	U
				118-74-1 Hexachlorobenzene	<330		ug/kg	U

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Method Area: EH-ORGANIC

Submission Id: 100031228

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200069648	300168030	SED-SW	87-86-5 Pentachlorophenol	<1600		ug/kg	U
				85-01-8 Phenanthrene	<330		ug/kg	U
				120-12-7 Anthracene	<330		ug/kg	U
				84-74-2 Di-n-butylphthalate	<330		ug/kg	U
				206-44-0 Fluoranthene	<330		ug/kg	U
				92-87-5 Benzidine	<1600		ug/kg	U
				129-00-0 Pyrene	<330		ug/kg	U
				85-68-7 Butylbenzylphthalate	<330		ug/kg	U
				91-94-1 3,3'-Dichlorobenzidine	<650		ug/kg	U
				56-55-3 Benzo(a)anthracene	<330		ug/kg	U
				218-01-9 Chrysene	<330		ug/kg	U
				117-81-7	<330		ug/kg	U
				bis-2-Ethylhexylphthalate				
				117-84-0 Di-n-octylphthalate	<330		ug/kg	U
				205-99-2 Benzo(b)fluoranthene	<330		ug/kg	U
				207-08-9 Benzo(k)fluoranthene	<330		ug/kg	U
				50-32-8 Benzo(a)pyrene	<330		ug/kg	U
				193-39-5	<330		ug/kg	U
				Indeno(1,2,3-cd)pyrene				
				53-70-3 Dibenzo(a,h)anthracene	<330		ug/kg	U
				191-24-2 Benzo(g,h,i)perylene	<330		ug/kg	U
				62-75-9 N-Nitrosodimethylamine	<320		ug/kg	U
	200069649	300168031	SED-E	110-86-1 Pyridine	<320		ug/kg	U
				109-06-8 2-Picoline	<320		ug/kg	U
				625-3-3 Aniline	<320		ug/kg	U
				108-95-2 Phenol	<320		ug/kg	U
				111-44-4 bis-2-Chloroethyl ether	<320		ug/kg	U
				95-57-8 2-Chlorophenol	<320		ug/kg	U
				541-73-1 1,3-Dichlorobenzene	<320		ug/kg	U

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Method Area: EH-ORGANIC

Submission Id: 100031228

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC SVOA-COLD	200069649	300168031	SED-E	106-46-7 1,4-Dichlorobenzene	< 320		ug/kg	U
				95-50-1 1,2-Dichlorobenzene	< 320		ug/kg	U
				100-51-6 Benzyl alcohol	< 320		ug/kg	U
				95-48-7 2-Methylphenol	< 320		ug/kg	U
				108-60-1 bis-2-Chloroisopropyl ether	< 320		ug/kg	U
				106-44-5 4-Methylphenol	< 320		ug/kg	U
				621-64-7	< 320		ug/kg	U
				N-Nitroso-di-n-propylamine				
				67-72-1 Hexachloroethane	< 320		ug/kg	U
				98-95-3 Nitrobenzene	< 320		ug/kg	U
				78-59-1 Isophorone	< 320		ug/kg	U
				88-75-5 2-Nitrophenol	< 320		ug/kg	U
				105-67-9 2,4-Dimethylphenol	< 320		ug/kg	U
				111-91-1 bis-2-Chloroethoxy methane	< 320		ug/kg	U
				120-83-2 2,4-Dichlorophenol	< 320		ug/kg	U
				120-82-1	< 320		ug/kg	U
				1,2,4-Trichlorobenzene				
				65-85-0 Benzoic acid	< 1600		ug/kg	U
				91-20-3 Naphthalene	< 320		ug/kg	U
				106-47-8 4-Chloroaniline	< 320		ug/kg	U
				87-68-3 Hexachlorobutadiene	< 1600		ug/kg	U
				59-50-7	< 320		ug/kg	U
				4-Chloro-3-methylphenol				
				91-57-6 2-Methylnaphthalene	< 320		ug/kg	U
				77-47-4	< 320		ug/kg	U
				Hexachlorocyclopentadiene				
				88-06-2 2,4,6-Trichlorophenol	< 320		ug/kg	U
				95-95-4 2,4,5-Trichlorophenol	< 320		ug/kg	U

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Method Area: EH-ORGANIC

Submission Id : 100031228

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-COLD	200069649	300168031	SED-E	91-58-7 2-Chloronaphthalene	<320		ug/kg	U
				88-74-4 2-Nitroaniline	<650		ug/kg	U
				131-11-3 Dimethylphthalate	<320		ug/kg	U
				208-96-8 Acenaphthylene	<320		ug/kg	U
				83-32-9 Acenaphthene	<320		ug/kg	U
				99-09-2 3-Nitroaniline	<650		ug/kg	U
				51-28-5 2,4-Dinitrophenol	<1600		ug/kg	U
				100-02-7 4-Nitrophenol	<1600		ug/kg	U
				132-64-9 Dibenzofuran	<320		ug/kg	U
				121-14-2 2,4-Dinitrotoluene	<320		ug/kg	U
				606-20-2 2,6-Dinitrotoluene	<320		ug/kg	U
				86-73-7 Fluorene	<320		ug/kg	U
				7005-72-3 4-Chlorophenyl phenyl ether	<320		ug/kg	U
				84-66-2 Diethylphthalate	<320		ug/kg	U
				100-01-6 4-Nitroaniline	<650		ug/kg	U
				534-52-1	<1600		ug/kg	U
				4,6-Dinitro-2-methylphenol				
				86-30-6 N-Nitrosodiphenylamine	<320		ug/kg	U
				103-33-3 Azobenzene	<320		ug/kg	U
				101-55-3 4-Bromophenyl phenyl ether	<320		ug/kg	U
				118-74-1 Hexachlorobenzene	<320		ug/kg	U
				87-86-5 Pentachlorophenol	<1600		ug/kg	U
				85-01-8 Phenanthrene	<320		ug/kg	U
				120-12-7 Anthracene	<320		ug/kg	U
				84-74-2 Di-n-butylphthalate	<320		ug/kg	U
				206-44-0 Fluoranthene	<320		ug/kg	U
				92-87-5 Benzidine	<1600		ug/kg	U
				129-00-0 Pyrene	<320		ug/kg	U

**** FINAL REPORT ****

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Method Area: EH-ORGANIC

Submission Id: 100031228

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC SVOA-COLD	200069649	300168031	SED-E	85-68-7 Butylbenzylphthalate	<320		ug/kg	U
				91-94-1 3,3'-Dichlorobenzidine	<650		ug/kg	U
				56-55-3 Benzo(a)anthracene	<320		ug/kg	U
				218-01-9 Chrysene	<320		ug/kg	U
				117-81-7	<320		ug/kg	U
				bis-2-Ethylhexylphthalate				
				117-84-0 Di-n-octylphthalate	<320		ug/kg	U
				205-99-2 Benzo(b)fluoranthene	<320		ug/kg	U
				207-08-9 Benzo(k)fluoranthene	<320		ug/kg	U
				50-32-8 Benzo(a)pyrene	<320		ug/kg	U
				193-39-5	<320		ug/kg	U
				Indeno(1,2,3-cd)pyrene				
				53-70-3 Dibenzo(a,h)anthracene	<320		ug/kg	U
				191-24-2 Benzo(g,h,i)perylene	<320		ug/kg	U

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**** FINAL REPORT ****

Method Area: EH-ORGANIC

Submission Id: 100031228

TENTATIVELY IDENTIFIED COMPOUNDS

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
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DUPLICATE TASKS

None run for this submission

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**** FINAL REPORT ****

Method Area:

EH-ORGANIC

Submission Id : 100031228

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result		Uncertainty	Units	Qualifier	QC		QC	Units	QC	Evaluation
			Value	<330				Value	Uncertainty				
00.39479	300184910	62-75-9	<330			ug/kg		0	0		ug/kg		Division by 0
		110-86-1	<330			ug/kg		0	0		ug/kg		Division by 0
		109-06-8	<330			ug/kg		0	0		ug/kg		Division by 0
		108-95-2	<330			ug/kg		0	0		ug/kg		Division by 0
		111-44-4	<330			ug/kg		0	0		ug/kg		Division by 0
		95-57-8	720		216.000	ug/kg		5810	581		ug/kg		OUT OF CONTROL
		541-73-1	390		117.000	ug/kg		9270	927		ug/kg		OUT OF CONTROL
		106-46-7	<330			ug/kg		0	0		ug/kg		Division by 0
		95-50-1	650		195.000	ug/kg		10400	1040		ug/kg		OUT OF CONTROL
		100-51-6	<330			ug/kg		0	0		ug/kg		Division by 0
		95-48-7	<330			ug/kg		0	0		ug/kg		Division by 0
		108-60-1	<330			ug/kg		0	0		ug/kg		Division by 0
		106-44-5	<330			ug/kg		6840	684		ug/kg		OUT OF CONTROL
		621-64-7	<330			ug/kg		0	0		ug/kg		Division by 0
		67-72-1	<330			ug/kg		0	0		ug/kg		Division by 0
		98-95-3	<330			ug/kg		0	0		ug/kg		Division by 0
		78-59-1	<330			ug/kg		0	0		ug/kg		Division by 0
		88-75-5	<330			ug/kg		0	0		ug/kg		Division by 0
		105-67-9	<330			ug/kg		0	0		ug/kg		Division by 0
		111-91-1	<330			ug/kg		0	0		ug/kg		Division by 0
		120-83-2	<330			ug/kg		0	0		ug/kg		Division by 0

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***** FINAL REPORT *****

Method Area: EH-ORGANIC

Submission Id: 100031228

Customer Id	Task Id	Component	Result		Uncertainty	Units	Qualifier	QC		QC	Uncertainty	Units	QC	Evaluation
			Value					Value						
00.39479	300184910	120-82-1	350		105.000	ug/kg		5030		503		ug/kg		OUT OF CONTROL
		65-85-0	<1700					0		0		ug/kg		Division by 0
		91-20-3	1600		480.000	ug/kg		13000		1300		ug/kg		OUT OF CONTROL
		106-47-8	<330					0		0		ug/kg		Division by 0
		87-68-3	<1700					0		0		ug/kg		Division by 0
		59-50-7	<330					0		0		ug/kg		Division by 0
		91-57-6	<330					0		0		ug/kg		Division by 0
		77-47-4	<330					0		0		ug/kg		Division by 0
		88-06-2	1000		300.000	ug/kg		8210		821		ug/kg		OUT OF CONTROL
		95-95-4	1400		420.000	ug/kg		9070		907		ug/kg		OUT OF CONTROL
		91-58-7	<330					0		0		ug/kg		Division by 0
		88-74-4	<670					0		0		ug/kg		Division by 0
		131-11-3	<330					0		0		ug/kg		Division by 0
		208-96-8	<330					0		0		ug/kg		Division by 0
		83-32-9	1700		510.000	ug/kg		10300		1030		ug/kg		OUT OF CONTROL
		99-09-2	<670					0		0		ug/kg		Division by 0
		51-28-5	<1700					0		0		ug/kg		Division by 0
		100-02-7	<1700					0		0		ug/kg		Division by 0
		132-64-9	1700		510.000	ug/kg		8520		852		ug/kg		OUT OF CONTROL
		121-14-2	1700		510.000	ug/kg		6990		699		ug/kg		OUT OF CONTROL
		606-20-2	1900		570.000	ug/kg		9370		937		ug/kg		OUT OF CONTROL
		86-73-7	<330					0		0		ug/kg		Division by 0

**** FINAL REPORT ****

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Method Area: EH-ORGANIC

Submission Id: 100031228

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.39479	300184910	7005-72-3	1700	510.000	ug/kg		9050	905	ug/kg	OUT OF CONTROL
		84-66-2	<330		ug/kg		0	0	ug/kg	Division by 0
		100-01-6	<670		ug/kg		0	0	ug/kg	Division by 0
		86-30-6	3500	1050.000	ug/kg		6570	657	ug/kg	WARNING 2-3SIG
		103-33-3	<330		ug/kg		0	0	ug/kg	Division by 0
		101-55-3	<330		ug/kg		0	0	ug/kg	Division by 0
		118-74-1	<330		ug/kg		0	0	ug/kg	Division by 0
		87-86-5	2000	600.000	ug/kg		8550	855	ug/kg	OUT OF CONTROL
		85-01-8	<330		ug/kg		0	0	ug/kg	Division by 0
		120-12-7	1200	360.000	ug/kg		5730	573	ug/kg	OUT OF CONTROL
		84-74-2	<330		ug/kg		0	0	ug/kg	Division by 0
		206-44-0	<330		ug/kg		0	0	ug/kg	Division by 0
		92-87-5	<1700		ug/kg		0	0	ug/kg	Division by 0
		129-00-0	1900	570.000	ug/kg		5640	564	ug/kg	OUT OF CONTROL
		85-68-7	<330		ug/kg		0	0	ug/kg	Division by 0
		91-94-1	<670		ug/kg		0	0	ug/kg	Division by 0
		56-55-3	<330		ug/kg		0	0	ug/kg	Division by 0
		218-01-9	1100	330.000	ug/kg		3080	308	ug/kg	OUT OF CONTROL
		117-81-7	1700	510.000	ug/kg		4720	472	ug/kg	OUT OF CONTROL
		117-84-0	1500	450.000	ug/kg		4280	428	ug/kg	OUT OF CONTROL
		205-99-2	<330		ug/kg		6170	617	ug/kg	OUT OF CONTROL
		207-08-9	2800	840.000	ug/kg		0	0	ug/kg	OUT OF CONTROL

**** FINAL REPORT ****

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Method Area: EH-ORGANIC

Submission Id : 100031228

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.39479	300184910	50-32-8	<330		ug/kg		0	0	ug/kg	Division by 0
		193-39-5	<330		ug/kg		0	0	ug/kg	Division by 0
		53-70-3	<330		ug/kg		0	0	ug/kg	Division by 0
		191-24-2	<330		ug/kg		0	0	ug/kg	Division by 0

OPEN QC

None run for this submission

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**** FINAL REPORT ****

Submission Id: 100031228

Analyst

Review

Review
for *Blondie Cordova*

Team Leader

QA officer

Date _____

Date _____

Date _____

Date _____

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"The reported uncertainties are at the 1 sigma confidence level."

FINAL REPORT

APPENDIX G

ANALYTICAL DATA REPORTS OF PERCENT MOISTURE IN SOILS AND SEDIMENTS COLLECTED AROUND THE DARHT FACILITY DURING 1998

Method: GENERIC MOISTURE

Method Area: EH-ALPHA

Submission Id: 100029673

Requester Name: PHIL FRESQUEZ
Requester Group: ESH-20
Mail Stop: M887
Requester Phone: 667-0815
Requester Fax #: 667-0731

Customer Cost Code: 7C2000CX5030000200
Logged Date: 25-JUN-1998
Study: ESH20 BIOLOGICALS
Analytical Service Agreement #:

Due Date: 25-AUG-98
Screening Data: NO SCREENING DATA REQUIRED
Logged by: JWEAVER

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component
200064779	300158728	N	MOISTURE
200064780	300158735	S	MOISTURE
200064781	300158742	W	MOISTURE
200064782	300158749	E	MOISTURE
200064783	300158756	SED-N	MOISTURE
200064784	300158763	SED-SW	MOISTURE
200064785	300158770	SED-E	MOISTURE
200064786	300158777	W-1	MOISTURE
200064787	300158784	E-1	MOISTURE
200064788	300158791	BNW-1	MOISTURE
200064789	300158798	BNE-1	MOISTURE

Result Value	Uncertainty	Units	Qualifier
8.10	0.40	%	
9.50	0.50	%	
4.10	0.20	%	
7.60	0.40	%	
2.70	0.10	%	
4.50	0.20	%	
2.50	0.10	%	
9.70	0.50	%	
12.60	0.60	%	
8.10	0.40	%	
8.20	0.40	%	

***** FINAL REPORT *****

Method: GENERIC MOISTURE Method Area: EH-ALPHA

Submission Id : 100029673

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>
200064790	300158808	MOISTURE	<u>Value</u>	0.20	%	<u>Value</u>	<u>Uncertainty</u>	<u>units</u>
			3.81			3.85	0.35	%
								IN CONTROL

METHOD BLANK

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u>	<u>Uncertainty</u>	<u>Units</u>	<u>QC</u>	<u>QC</u>	<u>QC</u>
00.22776	300161504	MOISTURE	<u>Value</u>	0.05	%	<u>Value</u>	<u>Uncertainty</u>	<u>units</u>
			0.00			0.0	0.0	%
								IN CONTROL

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**** FINAL REPORT ****

Method: GENERIC MOISTURE Method Area: EH-ALPHA Submission Id: 100029673

Chip Analyst Eug Review BS Team Leader NK QA Officer
7/15/98 Date 7-17-98 Date 7/17/98 Date 07/20/98 Date

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The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****