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Los Alamos National Laboratory
Los Alamos, New Mexico 87545

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memorandum

TO: Tony Grieggs, ESH-8, MS K490

DATE: February 25, 1994

FROM: Phil Fresquez, ESH-8 *PF*

MAIL STOP/TELEPHONE: K490/7-0815

SYMBOL: ESH-8/EFS-94-0047

SUBJECT: **RESULTS OF THE SOIL SAMPLING SURVEY CONDUCTED OVER ACTIVE RCRA FIRING SITE TA-39-6**

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On March 23, 1993, the Environmental Protection Group (ESH-8) collected 20 soil, two sediment and one water (rinsate) sample(s) from firing site TA-39-6 for the Corrective Activities Program (Phil Fresquez, "Sampling Plan for the Characterization of Active RCRA Firing Site TA-39-6", Los Alamos National Laboratory memorandum EM-8:93-255, to Tony Grieggs [February 2, 1993]).

Four transects radiating outward from the center of the detonation area in opposite directions were established; they radiated towards the N, S, E and W (Figure 1). Soil surface samples (0 to 3-inch-depth) were collected along the length of each transect radiating toward the S, E and W at the 0, 10, 20, 40, 80 and 160-foot-distances. Due to physical barriers encountered along the N transect, soil samples were collected at the 10, 20, 40, 80 and 150-foot-distance. One sediment sample was collected from a drainage channel located on the north eastern side (upper drainage) of the pad and another sediment sample was collected from a drainage channel located on the eastern edge (lower drainage) of the pad. Samples were collected down gradient of the pad where the potential for deposition of contaminants (ponding areas) was most likely to occur.

The last sample (rinsate) was collected from the scattered surface debris from around the firing site. Glass, plastics, metals and wood materials were collected, placed into a stainless steel bucket and rinsed with distilled water--the rinsate was collected for analysis.

All soil and sediment samples were screened for gross alpha, beta and gamma radioactivity before they were submitted under chain-of-custody documentation to the Environmental Chemistry Group (EM-9). Soil, sediment and water samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals (Ag, As, Ba, Cd, Cr, Pb, Hg and Se), total Pb, Hg and Be, Semivolatile Organic Compounds (SVOC's), Volatile Organic Compounds (VOC's), Polychlorinated Biphenyls (PCB's) and total uranium (U). High Explosive (HE) residues (HMX [1,3,5,7-tetranitro-1,3,5,7-tetraazacyclooctane], RDX [1,3,5-trinitrohexahydro-1,3,5-triazine], TETRYL [2,4,6-trinitrophenylmethylnitramine], TNT [2,4,6-trinitrotoluene], and 2,4-DNT [2,4-dinitrotoluene]) were analyzed by the Explosives Technology Group (M-1).

Four soil samples (0-0, N-40, S-40 and W-40) exceeded TCLP-Pb proposed Environmental Protection Agency (EPA) action levels (i.e., >5ppm). No other TCLP metals were detected in any of the other soil, sediment or rinsate samples above EPA action levels.

Total Be and Hg in soil, sediment and rinsate samples were all below EPA action levels (there are no EPA action levels for total Pb). Total Be, Hg and Pb in soil samples



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3.8 ppm or 3.8 ppm
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ranged in concentration from 0.17 to 0.81 $\mu\text{g/g}$, from 0.20 to 3,800 $\mu\text{g/g}$, and from 9 to 870 $\mu\text{g/g}$, respectively. Sediment samples contained an average of 0.24 $\mu\text{g/g}$ of Be and 36 $\mu\text{g/g}$ of Pb.

Eight soil samples contained from one to four SVOC's. The four SVOC's detected were: bis-2-ethylhexylphthalate (490 to 500 $\mu\text{g/Kg}$), butylbenzylphthalate (1,200 to 28,600 $\mu\text{g/Kg}$), di-n-octylphthalate (780 $\mu\text{g/Kg}$), and di-n-butylphthalate (1,000 to 3,600 $\mu\text{g/Kg}$). All of these SVOC's, however, are far below EPA action levels. No SVOC's were detected in either of the drainage channels or in the surface debris rinsate sample.

Five VOC's were detected: acetone (<52 $\mu\text{g/Kg}$), 2-butanone (20 $\mu\text{g/Kg}$), 1,1,1-trichloroethane (32 $\mu\text{g/Kg}$), methylene chloride (<22 $\mu\text{g/Kg}$), and p-isopropyltoluene (12 $\mu\text{g/Kg}$). All of these VOC's, detected at ppb levels, were far below EPA proposed action levels.

No HE residues were detected in any of the soil, sediment or rinsate samples.

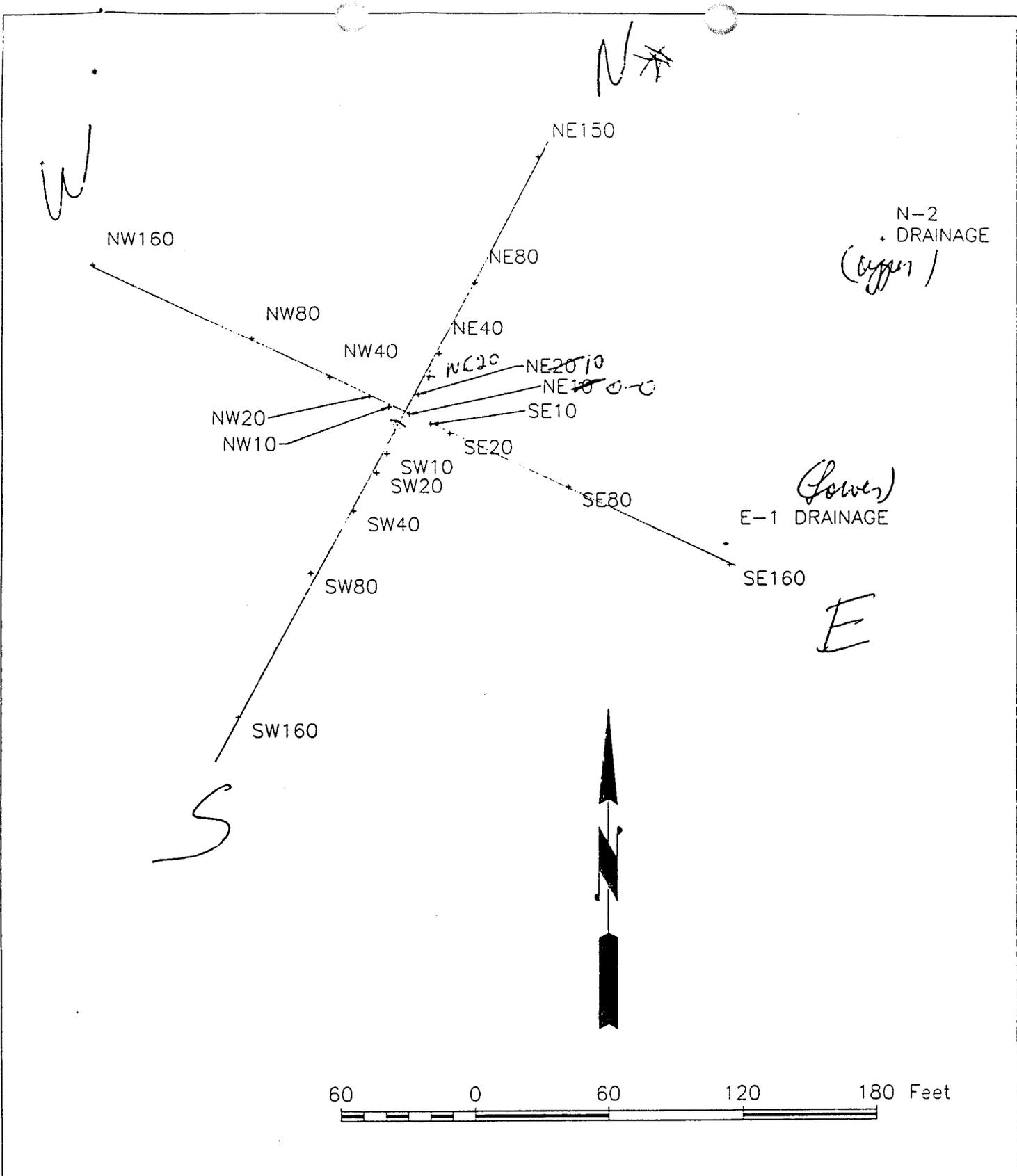
One soil sample (E-80) contained traces of PCB's (1.1 $\mu\text{g/g}$). No PCB's were detected in any of the other soil, sediment or rinsate samples.

Total U in soil samples ranged in concentration from 0.833 to 72.3 $\mu\text{g/g}$, and the average concentration over the entire site was 15.35 (± 21) $\mu\text{g/g}$. The highest U level was detected in sample W-80. Sediment samples averaged 20 $\mu\text{g/g}$ and the rinsate sample contained 48 $\mu\text{g/L}$ total U. Upper limit background concentrations for total U around the Los Alamos area is around 3.4 $\mu\text{g/g}$.

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ESH-8 Reading File



<p>ESH-8 WASTE SITE STUDIES</p>	<p>SAMPLE TRANSECT FOR FIRING SITE TA-39-6</p> <p>TA-39</p>
<p>DR. BY: EDDIE TAFOYA DATE: 02/22/94</p>	<p>DRAWING NO. SHEET 1 OF 1</p>

NORTHING	EASTING	ELEV.	DESCR.
1746394.4832	495741.1785	6420.29	NE10
1746403.3298	495745.0677	6420.32	NE20
1746421.6044	495754.4427	6418.74	NE40
1746454.5980	495770.5142	6404.44	NE80
1746511.5557	495799.1043	6416.23	NE150
1746389.9483	495750.6992	6420.04	SE10
1746385.7539	495759.4149	6420.09	SE20
1746361.8408	495812.8846	6408.62	SE80
1746326.1074	495885.1553	6411.71	SE160
1746376.7543	495731.1150	6419.62	SW10
1746368.1134	495726.5175	6419.62	SW20
1746350.7187	495716.2688	6421.11	SW40
1746322.4320	495697.5801	6439.47	SW80
1746256.8198	495665.3392	6474.15	SW160
1746397.8458	495732.0028	6419.80	NW10
1746402.4677	495723.2953	6419.74	NW20
1746410.8380	495705.6430	6420.13	NW40
1746428.4602	495670.9628	6417.75	NW80
1746462.4276	495600.1363	6432.28	NW160
1746335.8485	495883.3993	6405.81	E-1 DRAINAGE
1746474.9312	495953.2890	6395.49	N-2 DRAINAGE