

MEMORANDUM FOR: PM-E Van-Saun

SUBJECT: Report for Sampling at Camp Funston Incinerator December 2007
pbm

Introduction:

At the request of Fort Riley, environmental sampling was performed at the site of an abandoned incinerator located at Camp Funston on Fort Riley, KS. The Camp Funston Incinerator (CFI) site is a WWI- era facility that mapping indicates was just south of the present Huebner Road and railroad tracks and just west of Threemile Creek. Foundation and slab remnants have been identified at the site. No other information about the site is currently available, including operational practices. The interest, was to determine if areas where residual ash or ash-contaminated soils may be present. The identified foundations comprise an area of approximately 60 by 75 feet; the entire area of interest is estimated to be approximately 75 by 150 feet.

Current installation plans call for the site to remain in non-residential use.

Objective:

To verify results of previous XRF study of the site.

To determine distribution of metals concentrations possibly arising from previous use as an incinerator site.

Sampling:

100 of 108 planned samples for metals by Method 6010 and 6020 were collected from the former Camp Funston Incinerator site. Samples were hand augered to a depth of 24" with samples being taken at 0-6", 6"-12" and 12"-24". Locations 1 and 2 were not taken due to rock being encountered at less than 6" and indications that soil disturbance had occurred during the installation of the railroad line. All other sample locations were collected except the 12"-24" at locations 7 and 15. Several sampling locations were offset during the sampling due to encountering rock. Sampled locations were located using GPS except in those locations where trees made satellite reception problematic. Sampling sites for those locations that could not be located with GPS are approximate. Sampling sites are presented in Figure 1 and GIS coordinates in Table 9. Samples 25 through 30 were taken on the slope of the hill south of the incinerator and samples 31 through 36 were taken at the bottom of the embankment. All sites were marked with pin flags with sample numbers. Samples taken are presented in Table 1. Duplicate samples were taken at four locations as presented in Table 2. Sample numbers 1 and 2 were used to represent duplicates as they were not taken as normal samples.



Results:

Results were compared to Residential Soil RSKs, those samples exceeding the RSK are presented in Table 3.

A comparison of sample results was also made to Non-Residential Soil RSKs. Those samples above this limit are given in Table 4 and Figure 2.

Results of the analysis for all samples and analytes are presented in Table 7.

TCLP extraction of samples from all three depths were taken at locations 9, 14, 16 & 27. Analysis of these samples showed no metals above leaching limits. Results of TCLP analysis are presented in Table 8.

In order to examine the distribution of concentrations in the sampled area, arsenic (As) concentrations above 5 mg/kg (Table 5) and lead (Pb) results greater than 100 mg/kg (Table 6) were used. This does not indicate that these samples are of concern; they are only used to illustrate the extent of possible incinerator activity. Results are presented in Figure 3 and Table 5 and Table 6. The sample locations are approximate in Figures 2 and 3; for more precise locations of samples refer to Figure 1.

Conclusions:

Findings from this study roughly approximate the results from the XRF sampling. As in the XRF, this study indicates that the contamination of the site is concentrated west and south of the incinerator pad.

Arsenic

At INC14, INC15 and INC13 in the XRF study, higher As was indicated southwest and south of the pad. This study confirmed this finding but indicated that higher As levels were wider spread than the XRF. The indications are that As is generally confined to the top 12" of the soil to the west of the pad (Samples 7, 8, 13, 19, 20, 25 and 31) and down to 24" south of the pad (Samples 21, 22, 26, 27, 28, 29, 32, 33 and 34). XRF samples in the area west of the pad (INC5, INC6, INC26, INC25, and INC30) do not indicate higher As, which is indicated in this study. Sensitivity and selectivity of the two methods of analysis may be the reason for this discrepancy.

Lead

The high Pb detection at INC13 was confirmed in samples 26, 27 and 32. All of these samples indicated Pb above RSKs in the soil at the 0-6" level but not below. Lead concentrations above 100 mg/kg but below the RSKs were detected in most of the samples that indicated As at elevated levels. These concentrations did extend below 6". The high Pb detection at location 8 is not congruous with detections at locations surrounding this sample. The high Pb concentration isolated from other Pb detections may indicate that the source of Pb in this sample is spurious and is not indicative of past activities.

Not corroborated was the Pb detection at INC10. Samples in the northeast quadrant of the sampled area are clear of any Pb in excess of 100 mg/kg except for Location 5, which had a detection above 100 but below any RSKs.

Lead concentrations above 100 mg/kg are essentially congruent with arsenic concentrations in excess of 5 mg/kg. Lead at these concentrations is seen in the south and west of the site and extend below 6" as do the arsenic concentrations.

Mercury

Only one sample at location 26 in the 0-6" range had concentrations of mercury above the Residential but not above the Non-Residential RSKs.

Interpretation:

This sampling demonstrates that the results of the XRF sampling are generally representative of the site.

Arsenic and lead levels below the RSKs but above background indicate that any effects of past incinerator activities are limited to the west and south of the site.

Due to the low results for TCLP leaching in these samples there is a low probability that contaminants will leach from the soil to the groundwater at the site.

Table 1: Samples Taken

Location	06	12	24
CFI06-01			
CFI06-02			
CFI06-03	X	X	X
CFI06-04	X	X	X
CFI06-05	X	X	X
CFI06-06	X	X	X
CFI06-07	X	X	
CFI06-08	X	X	X
CFI06-09	X	X	X
CFI06-10	X	X	X
CFI06-11	X	X	X
CFI06-12	X	X	X
CFI06-13	X	X	X
CFI06-14	X	X	X
CFI06-15	X	X	
CFI06-16	X	X	X
CFI06-17	X	X	X
CFI06-18	X	X	X
CFI06-19	X	X	X
CFI06-20	X	X	X
CFI06-21	X	X	X
CFI06-22	X	X	X
CFI06-23	X	X	X
CFI06-24	X	X	X
CFI06-25	X	X	X
CFI06-26	X	X	X
CFI06-27	X	X	X
CFI06-28	X	X	X
CFI06-29	X	X	X
CFI06-30	X	X	X
CFI06-31	X	X	X
CFI06-32	X	X	X
CFI06-33	X	X	X
CFI06-34	X	X	X
CFI06-35	X	X	X
CFI06-36	X	X	X

Table 2: Duplicate Pairs

Sample	Duplicate
CFI06-11	CFI06-37
CFI06-16	CFI06-38
CFI06-24	CFI06-02
CFI06-36	CFI06-01

Table 3: Camp Funston Incinerator 2006 Soil Results > Residential Soil RSKs

Sample ID	Location	Depth	Arsenic	Lead	Mercury	
RSK Residential Soil	11	mg/kg	400	mg/kg	12	mg/kg
CFI06-07 0-6	07	0-6	64.4 mg/kg			
CFI06-07 6-12	07	6-12	52.4 mg/kg			
CFI06-08 0-6	08	0-6		1300 mg/kg		
CFI06-19 0-6	19	0-6	18.3 mg/kg			
CFI06-20 6-12	20	6-12	11.9 mg/kg			
CFI06-21 0-6	21	0-6	20.9 mg/kg			
CFI06-21 6-12	21	6-12	14.7 mg/kg			
CFI06-21 12-24	21	12-24	14.6 mg/kg			
CFI06-22 6-12	22	6-12	22.2 mg/kg			
CFI06-22 12-24	22	12-24	16.2 mg/kg			
CFI06-26 0-6	26	0-6	16.4 mg/kg	509 mg/kg		
CFI06-26 6-12	26	6-12	20.7 mg/kg		16.5 mg/kg	
CFI06-26 12-24	26	12-24	26.2 mg/kg			
CFI06-27 0-6	27	0-6	47.4 mg/kg	844 mg/kg		
CFI06-27 6-12	27	6-12	37.5 mg/kg			
CFI06-27 12-24	27	12-24	36.2 mg/kg			
CFI06-28 0-6	28	0-6	15.2 mg/kg			
CFI06-28 6-12	28	6-12	16.8 mg/kg			
CFI06-28 12-24	28	12-24	14.3 mg/kg			
CFI06-29 0-6	29	0-6	15.2 mg/kg			
CFI06-29 6-12	29	6-12	25.9 mg/kg			
CFI06-29 12-24	29	12-24	21.1 mg/kg			
CFI06-32 6-12	32	6-12	15.2 mg/kg	439 mg/kg	400 mg/kg	
CFI06-32 12-24	32	12-24	22.3 mg/kg			
CFI06-33 0-6	33	0-6	13.7 mg/kg			
CFI06-33 6-12	33	6-12	11.7 mg/kg			

Table 4: Camp Funston Incinerator 2006 Soil Results > Non-Residential Soil RSKs

Sample ID	Location	Depth	Arsenic	Lead
RSK Non-residential Soil	38	mg/kg	1000	mg/kg
CFI06-07 0-6	07	0-6	64.4 mg/kg	
CFI06-07 6-12	07	6-12	52.4 mg/kg	
CFI06-08 0-6	08	0-6		1300 mg/kg
CFI06-27 0-6	27	0-6	47.4 mg/kg	

Table 5: Camp Funston Incinerator 2006 Soil Arsenic Results > 5

Location	Depth		
	0-6"	6-12"	12-24"
05	6 mg/kg		
07	64.4 mg/kg	52.4 mg/kg	
08	8.75 mg/kg		
09	5.86 mg/kg		
13	9.78 mg/kg		
19	18.3 mg/kg	10.9 mg/kg	
20	9.07 mg/kg	11.9 mg/kg	5.43 mg/kg
21	20.9 mg/kg	14.7 mg/kg	14.6 mg/kg
22		22.2 mg/kg	16.2 mg/kg
25	5.61 mg/kg	5.46 mg/kg	
26	16.4 mg/kg	20.7 mg/kg	26.2 mg/kg
27	47.4 mg/kg	37.5 mg/kg	36.2 mg/kg
28	15.2 mg/kg	16.8 mg/kg	14.3 mg/kg
29	15.2 mg/kg	25.9 mg/kg	21.1 mg/kg
31	7.4 mg/kg	6.69 mg/kg	5.26 mg/kg
32	5.43 mg/kg	15.2 mg/kg	22.3 mg/kg
33	13.7 mg/kg	11.7 mg/kg	8.87 mg/kg
34	6.24 mg/kg		6.54 mg/kg
35		5.4 mg/kg	5.4 mg/kg
36		5.1 mg/kg	5.44 mg/kg

Table 6: Camp Funston Incinerator 2006 Soil Lead Results > 100

Location	Depth		
	0-6"	6-12"	12-24"
05	220 mg/kg		
07	189 mg/kg		
08	1300 mg/kg		
13	136 mg/kg		
19	187 mg/kg		
20		105 mg/kg	
21	172 mg/kg	115 mg/kg	
22		264 mg/kg	270 mg/kg
26	509 mg/kg	123 mg/kg	362 mg/kg
27	844 mg/kg	277 mg/kg	344 mg/kg
28	220 mg/kg	106 mg/kg	136 mg/kg
29	147 mg/kg	333 mg/kg	143 mg/kg
32		439 mg/kg	400 mg/kg
33	110 mg/kg	107 mg/kg	

Table 7: Camp Funston Incinerator 2006 Soil Results

Location	Depth	Arsenic	Barium	Cadmium	Chromium
03	0-6	4.92 mg/kg	138 mg/kg	0.901 mg/kg	5.57 mg/kg
03	6-12	4.48 mg/kg	93.2 mg/kg	0.158 mg/kg	6.56 mg/kg
03	12-24	3.28 mg/kg	106 mg/kg	0.0478 mg/kg J	6.65 mg/kg
04	0-6	3.65 mg/kg	93.1 mg/kg	0.712 mg/kg	5.57 mg/kg
04	6-12	3.41 mg/kg	85.4 mg/kg	0.0823 mg/kg	5.74 mg/kg
04	12-24	2.73 mg/kg	97.3 mg/kg	0.0468 mg/kg J	5.54 mg/kg
05	0-6	6 mg/kg	835 mg/kg	0.475 mg/kg	6.02 mg/kg
05	6-12	3.82 mg/kg	253 mg/kg	0.2 mg/kg	5.76 mg/kg
05	12-24	2.5 mg/kg	142 mg/kg	0.0858 mg/kg U	5.69 mg/kg
06	0-6	2.65 mg/kg	135 mg/kg	0.259 mg/kg	6.99 mg/kg
06	6-12	2.74 mg/kg	116 mg/kg	0.0668 mg/kg J	6.86 mg/kg
06	12-24	3.08 mg/kg	101 mg/kg	0.105 mg/kg U	6.82 mg/kg
07	0-6	64.4 mg/kg	206 mg/kg	0.858 mg/kg	5.77 mg/kg
07	6-12	52.4 mg/kg	120 mg/kg	0.725 mg/kg	5.98 mg/kg
08	0-6	8.75 mg/kg	268 mg/kg	7.35 mg/kg	25.9 mg/kg
08	6-12	3.82 mg/kg	103 mg/kg	0.0994 mg/kg U	6.92 mg/kg
08	12-24	2.68 mg/kg	99.5 mg/kg	0.0906 mg/kg U	5.76 mg/kg
09	0-6	5.86 mg/kg	121 mg/kg	0.331 mg/kg	5.83 mg/kg
09	6-12	3.78 mg/kg	95 mg/kg	0.119 mg/kg	5.85 mg/kg
09	12-24	3.33 mg/kg	112 mg/kg	0.283 mg/kg	6.62 mg/kg
10	0-6	4.28 mg/kg	158 mg/kg	0.287 mg/kg	6.96 mg/kg
10	6-12	2.96 mg/kg	103 mg/kg	0.155 mg/kg	6.16 mg/kg
10	12-24	2.89 mg/kg	94.1 mg/kg	0.0913 mg/kg U	5.75 mg/kg
11	0-6	2.96 mg/kg	78.3 mg/kg	0.249 mg/kg	5.84 mg/kg
11	6-12	3.13 mg/kg	91.7 mg/kg	0.0516 mg/kg J	7.09 mg/kg
11	12-24	2.76 mg/kg	96.5 mg/kg	0.0537 mg/kg J	5.7 mg/kg
12	0-6	4.24 mg/kg	139 mg/kg	0.241 mg/kg	7.25 mg/kg
12	6-12	2.78 mg/kg	96.9 mg/kg	0.0634 mg/kg J	7.23 mg/kg
12	12-24	3.54 mg/kg	87.6 mg/kg	0.0815 mg/kg U	6.33 mg/kg
13	0-6	9.78 mg/kg	168 mg/kg	0.559 mg/kg	5.2 mg/kg
13	6-12	2.96 mg/kg	85.1 mg/kg	0.1 mg/kg U	5.82 mg/kg
13	12-24	3.57 mg/kg	107 mg/kg	0.0951 mg/kg U	7.2 mg/kg
14	0-6	3.02 mg/kg	101 mg/kg	0.101 mg/kg U	6.4 mg/kg
14	6-12	2.93 mg/kg	103 mg/kg	0.11 mg/kg U	5.89 mg/kg
14	12-24	3.39 mg/kg	89.7 mg/kg	0.298 mg/kg	5.85 mg/kg
15	0-6	3.26 mg/kg	144 mg/kg	0.667 mg/kg	6.98 mg/kg
15	6-12	2.89 mg/kg	86.5 mg/kg	0.337 mg/kg	5.69 mg/kg
16	0-6	2.74 mg/kg	57.3 mg/kg	0.645 mg/kg	8.93 mg/kg
16	6-12	3.58 mg/kg	118 mg/kg	0.0952 mg/kg J	6.51 mg/kg
16	12-24	3.64 mg/kg	112 mg/kg	0.0829 mg/kg J	6.48 mg/kg
17	0-6	4.02 mg/kg	113 mg/kg	0.56 mg/kg	7.86 mg/kg
17	6-12	4.77 mg/kg	84.4 mg/kg	0.751 mg/kg	13.8 mg/kg
17	12-24	2.8 mg/kg	95.3 mg/kg	0.113 mg/kg	6.18 mg/kg
18	0-6	3.08 mg/kg	134 mg/kg	0.316 mg/kg	5.96 mg/kg
18	6-12	2.98 mg/kg	119 mg/kg	0.187 mg/kg	6.2 mg/kg

Table 7: Camp Funston Incinerator 2006 Soil Results

Location	Depth	Arsenic	Barium	Cadmium	Chromium
18	12-24	3.08 mg/kg	83.6 mg/kg	0.0883 mg/kg U	6.4 mg/kg
19	0-6	18.3 mg/kg	296 mg/kg	2.53 mg/kg	6.31 mg/kg
19	6-12	10.9 mg/kg	532 mg/kg	0.772 mg/kg	7.06 mg/kg
19	12-24	4.35 mg/kg	143 mg/kg	0.484 mg/kg	7.81 mg/kg
20	0-6	9.07 mg/kg	149 mg/kg	2.39 mg/kg	5.71 mg/kg
20	6-12	11.9 mg/kg	100 mg/kg	4.08 mg/kg	6.56 mg/kg
20	12-24	5.43 mg/kg	136 mg/kg	0.103 mg/kg U	7.38 mg/kg
21	0-6	20.9 mg/kg	309 mg/kg	2.85 mg/kg	6.33 mg/kg
21	6-12	14.7 mg/kg	1040 mg/kg	2.51 mg/kg	6.82 mg/kg
21	12-24	14.6 mg/kg	867 mg/kg	3.07 mg/kg	19.3 mg/kg
22	0-6	3.7 mg/kg	77 mg/kg	1.19 mg/kg	9.83 mg/kg
22	6-12	22.2 mg/kg	374 mg/kg	2.99 mg/kg	9.01 mg/kg
22	12-24	16.2 mg/kg	1100 mg/kg	1.72 mg/kg	9.66 mg/kg
23	0-6	4.85 mg/kg	212 mg/kg	0.632 mg/kg	6.97 mg/kg
23	6-12	4.95 mg/kg	119 mg/kg	0.488 mg/kg	6.19 mg/kg
23	12-24	4.94 mg/kg	135 mg/kg	0.379 mg/kg	7.35 mg/kg
24	0-6	3.8 mg/kg	113 mg/kg	0.504 mg/kg	6.87 mg/kg
24	6-12	3.2 mg/kg	128 mg/kg	0.204 mg/kg	6.75 mg/kg
24	12-24	4.46 mg/kg	118 mg/kg	0.137 mg/kg	5.84 mg/kg
25	0-6	5.61 mg/kg	185 mg/kg	0.725 mg/kg	7.78 mg/kg
25	6-12	5.46 mg/kg	133 mg/kg	0.398 mg/kg	7.33 mg/kg
25	12-24	4.41 mg/kg	128 mg/kg	0.269 mg/kg	6.77 mg/kg
26	0-6	16.4 mg/kg	269 mg/kg	3.66 mg/kg	11.2 mg/kg
26	6-12	20.7 mg/kg	265 mg/kg	11.7 mg/kg	11.5 mg/kg
26	12-24	26.2 mg/kg	175 mg/kg	6.25 mg/kg	9.64 mg/kg
27	0-6	47.4 mg/kg	510 mg/kg	9.57 mg/kg	11.8 mg/kg
27	6-12	37.5 mg/kg	559 mg/kg	10.8 mg/kg	10.9 mg/kg
27	12-24	36.2 mg/kg	395 mg/kg	4.98 mg/kg	10 mg/kg
28	0-6	15.2 mg/kg	614 mg/kg	1.89 mg/kg	9.22 mg/kg
28	6-12	16.8 mg/kg	640 mg/kg	1.27 mg/kg	8.32 mg/kg
28	12-24	14.3 mg/kg	406 mg/kg	1.92 mg/kg	11.3 mg/kg
29	0-6	15.2 mg/kg	359 mg/kg	3 mg/kg	7.87 mg/kg
29	6-12	25.9 mg/kg	440 mg/kg	4.19 mg/kg	9.01 mg/kg
29	12-24	21.1 mg/kg	644 mg/kg	1.97 mg/kg	8.05 mg/kg
30	0-6	2.98 mg/kg	131 mg/kg	0.12 mg/kg	6.53 mg/kg
30	6-12	3.14 mg/kg	132 mg/kg	0.087 mg/kg U	7.41 mg/kg
30	12-24	3.53 mg/kg	123 mg/kg	0.0941 mg/kg U	7.59 mg/kg
31	0-6	7.4 mg/kg	182 mg/kg	0.225 mg/kg	10.2 mg/kg
31	6-12	6.69 mg/kg	169 mg/kg	0.126 mg/kg	9.23 mg/kg
31	12-24	5.26 mg/kg	158 mg/kg	0.0583 mg/kg J	9.16 mg/kg
32	0-6	5.43 mg/kg	173 mg/kg	1.12 mg/kg	10.8 mg/kg
32	6-12	15.2 mg/kg	277 mg/kg	4.91 mg/kg	11.7 mg/kg
32	12-24	22.3 mg/kg	311 mg/kg	6.81 mg/kg	12.7 mg/kg
33	0-6	13.7 mg/kg	188 mg/kg	1.78 mg/kg	8.93 mg/kg
33	6-12	11.7 mg/kg	266 mg/kg	2.2 mg/kg	10.3 mg/kg
33	12-24	8.87 mg/kg	191 mg/kg	0.828 mg/kg	9.71 mg/kg

Table 7: Camp Funston Incinerator 2006 Soil Results

Location	Depth	Arsenic	Barium	Cadmium	Chromium
34	0-6	6.24 mg/kg	196 mg/kg	0.253 mg/kg	10.1 mg/kg
34	6-12	4.56 mg/kg	158 mg/kg	0.085 mg/kg	9.19 mg/kg
34	12-24	6.54 mg/kg	203 mg/kg	0.0589 mg/kg J	10.7 mg/kg
35	0-6	4.66 mg/kg	169 mg/kg	0.192 mg/kg	9.05 mg/kg
35	6-12	5.4 mg/kg	173 mg/kg	0.0589 mg/kg J	9.28 mg/kg
35	12-24	5.4 mg/kg	188 mg/kg	0.179 mg/kg	9.78 mg/kg
36	0-6	4.25 mg/kg	148 mg/kg	0.111 mg/kg	8.4 mg/kg
36	6-12	4.98 mg/kg	151 mg/kg	0.0959 mg/kg U	8.84 mg/kg
36	12-24	5.44 mg/kg	215 mg/kg	0.0672 mg/kg J	10 mg/kg

Table 7: Camp Funston Incinerator 2006 Soil Results

Location	Depth	Lead	Mercury	Selenium	Silver
03	0-6	67.8 mg/kg	0.115 mg/kg	0.721 mg/kg J	0.249 mg/kg U
03	6-12	23.7 mg/kg	0.07 mg/kg	0.89 mg/kg U	0.273 mg/kg U
03	12-24	16 mg/kg	0.016 mg/kg J	1.14 mg/kg U	0.226 mg/kg U
04	0-6	48.5 mg/kg	0.422 mg/kg	0.574 mg/kg J	0.953 mg/kg
04	6-12	16.2 mg/kg	0.028 mg/kg	0.996 mg/kg U	0.204 mg/kg U
04	12-24	13.1 mg/kg	0.014 mg/kg J	0.899 mg/kg U	0.234 mg/kg U
05	0-6	220 mg/kg	0.221 mg/kg	0.7 mg/kg J	0.228 mg/kg U
05	6-12	23.4 mg/kg	0.042 mg/kg	0.461 mg/kg J	0.231 mg/kg U
05	12-24	13.8 mg/kg	0.021 mg/kg	0.762 mg/kg U	0.214 mg/kg U
06	0-6	32 mg/kg	0.05 mg/kg	0.601 mg/kg J	0.281 mg/kg U
06	6-12	17.6 mg/kg	0.02 mg/kg J	0.958 mg/kg U	0.267 mg/kg U
06	12-24	16 mg/kg	0.012 mg/kg J	0.847 mg/kg U	0.262 mg/kg U
07	0-6	189 mg/kg	0.129 mg/kg	1.13 mg/kg	0.285 mg/kg U
07	6-12	70.7 mg/kg	0.504 mg/kg	0.696 mg/kg J	0.278 mg/kg U
08	0-6	1300 mg/kg	0.085 mg/kg	0.881 mg/kg U	0.258 mg/kg U
08	6-12	16.9 mg/kg	0.165 mg/kg	0.897 mg/kg U	0.248 mg/kg U
08	12-24	15.2 mg/kg	0.025 mg/kg	0.963 mg/kg U	0.227 mg/kg U
09	0-6	40.9 mg/kg	0.059 mg/kg	0.708 mg/kg J	0.226 mg/kg U
09	6-12	19.6 mg/kg	0.054 mg/kg	0.999 mg/kg U	0.25 mg/kg U
09	12-24	19.6 mg/kg	0.468 mg/kg	0.486 mg/kg J	0.213 mg/kg U
10	0-6	46.3 mg/kg	0.115 mg/kg	0.972 mg/kg U	0.241 mg/kg U
10	6-12	16.1 mg/kg	0.02 mg/kg	0.941 mg/kg U	0.237 mg/kg U
10	12-24	12.5 mg/kg	0.019 mg/kg U	0.898 mg/kg U	0.228 mg/kg U
11	0-6	21.7 mg/kg	0.034 mg/kg	0.984 mg/kg U	0.261 mg/kg U
11	6-12	14.6 mg/kg	0.016 mg/kg J	1.05 mg/kg U	0.218 mg/kg U
11	12-24	13 mg/kg	0.021 mg/kg	0.849 mg/kg U	0.268 mg/kg U
12	0-6	42.5 mg/kg	0.291 mg/kg	1.04 mg/kg U	0.248 mg/kg U
12	6-12	15 mg/kg	0.02 mg/kg	1.05 mg/kg U	0.238 mg/kg U
12	12-24	15.7 mg/kg	0.025 mg/kg	0.982 mg/kg U	0.204 mg/kg U
13	0-6	136 mg/kg	0.101 mg/kg	0.884 mg/kg J	0.263 mg/kg U
13	6-12	11.1 mg/kg	0.012 mg/kg J	0.938 mg/kg U	0.25 mg/kg U
13	12-24	13.8 mg/kg	0.011 mg/kg J	0.501 mg/kg J	0.238 mg/kg U
14	0-6	18 mg/kg	0.141 mg/kg	0.928 mg/kg U	0.253 mg/kg U

Table 7 Camp Funston Incinerator 2006 Soil Results						
Location	Depth	Lead	Mercury	Selenium	Cadmium	Silver
14	6-12	15.6 mg/kg	0.117 mg/kg	1 mg/kg U	0.275 mg/kg U	
14	12-24	24.8 mg/kg	0.093 mg/kg	1.15 mg/kg U	0.267 mg/kg U	
15	0-6	54.5 mg/kg	0.147 mg/kg	0.75 mg/kg J	0.299 mg/kg U	
15	6-12	20.9 mg/kg	0.147 mg/kg	0.468 mg/kg J	0.229 mg/kg U	
16	0-6	30.5 mg/kg	0.08 mg/kg	0.684 mg/kg J	2.51 mg/kg	
16	6-12	21.2 mg/kg	0.032 mg/kg	1.07 mg/kg U	0.259 mg/kg U	
16	12-24	19.7 mg/kg	0.021 mg/kg	0.958 mg/kg U	0.254 mg/kg U	
17	0-6	73.1 mg/kg	0.094 mg/kg	0.522 mg/kg J	0.23 mg/kg U	
17	6-12	95.4 mg/kg	0.092 mg/kg	0.542 mg/kg J	0.775 mg/kg	
17	12-24	14.1 mg/kg	0.297 mg/kg	0.383 mg/kg J	0.222 mg/kg U	
18	0-6	37 mg/kg	0.058 mg/kg	0.581 mg/kg J	0.229 mg/kg U	
18	6-12	30.9 mg/kg	0.042 mg/kg	0.483 mg/kg J	0.217 mg/kg U	
18	12-24	13.6 mg/kg	0.018 mg/kg U	0.869 mg/kg U	0.221 mg/kg U	
19	0-6	187 mg/kg	0.447 mg/kg	0.948 mg/kg J	0.215 mg/kg U	
19	6-12	86.5 mg/kg	0.053 mg/kg	0.951 mg/kg	0.212 mg/kg U	
19	12-24	22.5 mg/kg	0.021 mg/kg	0.551 mg/kg J	0.224 mg/kg U	
20	0-6	72.4 mg/kg	0.112 mg/kg	0.891 mg/kg J	0.387 mg/kg U	
20	6-12	105 mg/kg	0.076 mg/kg	0.752 mg/kg J	0.266 mg/kg U	
20	12-24	19.2 mg/kg	0.024 mg/kg	0.504 mg/kg J	0.257 mg/kg U	
21	0-6	172 mg/kg	0.082 mg/kg	0.785 mg/kg J	0.197 mg/kg U	
21	6-12	115 mg/kg	0.062 mg/kg	0.872 mg/kg J	0.215 mg/kg U	
21	12-24	96.5 mg/kg	0.044 mg/kg	0.981 mg/kg J	0.231 mg/kg U	
22	0-6	63.5 mg/kg	0.128 mg/kg	0.623 mg/kg J	2.85 mg/kg	
22	6-12	264 mg/kg	0.078 mg/kg	1.07 mg/kg	0.219 mg/kg U	
22	12-24	270 mg/kg	0.06 mg/kg	0.686 mg/kg J	0.244 mg/kg U	
23	0-6	55 mg/kg	0.151 mg/kg	0.487 mg/kg J	0.227 mg/kg U	
23	6-12	40.8 mg/kg	0.07 mg/kg	0.859 mg/kg U	0.232 mg/kg U	
23	12-24	37.8 mg/kg	0.035 mg/kg	0.83 mg/kg U	0.247 mg/kg U	
24	0-6	39.2 mg/kg	0.046 mg/kg	0.556 mg/kg J	0.252 mg/kg U	
24	6-12	22.1 mg/kg	0.025 mg/kg	1.01 mg/kg U	0.242 mg/kg U	
24	12-24	26.4 mg/kg	0.028 mg/kg	0.919 mg/kg U	0.251 mg/kg U	
25	0-6	47.8 mg/kg	0.057 mg/kg	0.884 mg/kg J	0.238 mg/kg U	
25	6-12	33.7 mg/kg	0.041 mg/kg	0.645 mg/kg J	0.212 mg/kg U	
25	12-24	22.1 mg/kg	0.023 mg/kg	0.659 mg/kg J	0.255 mg/kg U	
26	0-6	509 mg/kg	0.238 mg/kg	0.99 mg/kg	0.221 mg/kg U	
26	6-12	123 mg/kg	16.5 mg/kg	1.31 mg/kg	0.242 mg/kg U	
26	12-24	362 mg/kg	0.024 mg/kg	1.01 mg/kg	0.21 mg/kg U	
27	0-6	844 mg/kg	0.073 mg/kg	1.35 mg/kg	0.234 mg/kg U	
27	6-12	277 mg/kg	0.057 mg/kg	1.34 mg/kg	0.23 mg/kg U	
27	12-24	344 mg/kg	0.048 mg/kg	1.63 mg/kg	0.22 mg/kg U	
28	0-6	220 mg/kg	0.079 mg/kg	0.868 mg/kg J	0.278 mg/kg U	
28	6-12	106 mg/kg	0.058 mg/kg	1.06 mg/kg	0.19 mg/kg U	
28	12-24	136 mg/kg	0.037 mg/kg	0.879 mg/kg J	0.239 mg/kg U	
29	0-6	147 mg/kg	0.064 mg/kg	0.935 mg/kg J	0.252 mg/kg U	
29	6-12	333 mg/kg	0.075 mg/kg	1.06 mg/kg	0.243 mg/kg U	
29	12-24	143 mg/kg	0.077 mg/kg	0.888 mg/kg J	0.278 mg/kg U	

Table 7 Camp Funston Incinerator 2006 Soil Results

Location	Depth	Lead	Mercury	Selenium	Silver
30	0-6	26.6 mg/kg	0.034 mg/kg	0.517 mg/kg J	0.253 mg/kg U
30	6-12	18.4 mg/kg	0.015 mg/kg J	0.962 mg/kg U	0.218 mg/kg U
30	12-24	15.6 mg/kg	0.014 mg/kg J	1 mg/kg U	0.235 mg/kg U
31	0-6	25.7 mg/kg	0.026 mg/kg	0.619 mg/kg J	0.26 mg/kg U
31	6-12	22.7 mg/kg	0.02 mg/kg J	0.595 mg/kg J	0.244 mg/kg U
31	12-24	22.4 mg/kg	0.019 mg/kg J	0.482 mg/kg J	0.255 mg/kg U
32	0-6	91.8 mg/kg	0.037 mg/kg	0.775 mg/kg J	0.269 mg/kg U
32	6-12	439 mg/kg	0.059 mg/kg	0.627 mg/kg J	0.238 mg/kg U
32	12-24	400 mg/kg	0.041 mg/kg	0.796 mg/kg J	0.254 mg/kg U
33	0-6	110 mg/kg	0.093 mg/kg	1.07 mg/kg	0.219 mg/kg U
33	6-12	107 mg/kg	0.224 mg/kg	0.87 mg/kg J	0.247 mg/kg U
33	12-24	52.8 mg/kg	0.035 mg/kg	0.908 mg/kg	0.242 mg/kg U
34	0-6	26.7 mg/kg	0.035 mg/kg	0.777 mg/kg J	0.271 mg/kg U
34	6-12	21.3 mg/kg	0.022 mg/kg	0.532 mg/kg J	0.208 mg/kg U
34	12-24	26.5 mg/kg	0.03 mg/kg	0.665 mg/kg J	0.257 mg/kg U
35	0-6	24.2 mg/kg	0.035 mg/kg	0.715 mg/kg J	0.239 mg/kg U
35	6-12	22.6 mg/kg	0.025 mg/kg	0.613 mg/kg J	0.232 mg/kg U
35	12-24	33.3 mg/kg	0.029 mg/kg	0.588 mg/kg J	0.258 mg/kg U
36	0-6	22.6 mg/kg	0.034 mg/kg	0.759 mg/kg J	0.236 mg/kg U
36	6-12	20.5 mg/kg	0.021 mg/kg	0.959 mg/kg U	0.24 mg/kg U
36	12-24	23.5 mg/kg	0.03 mg/kg	0.635 mg/kg J	0.271 mg/kg U

Table 8: Camp Funston Incinerator 2006 TCLP Results

Location	Depth	Arsenic	Barium	Cadmium	Chromium
9	0-6	0.0327 mg/L	0.575 mg/L	0.004 mg/L U	0.004 mg/L U
9	6-12	0.0286 mg/L J	0.39 mg/L	0.004 mg/L U	0.004 mg/L U
9	12-24	0.032 mg/L	0.423 mg/L	0.004 mg/L U	0.004 mg/L U
14	0-6	0.0228 mg/L J	0.751 mg/L	0.004 mg/L U	0.004 mg/L U
14	6-12	0.041 mg/L	0.777 mg/L	0.004 mg/L U	0.004 mg/L U
14	12-24	0.0349 mg/L	0.588 mg/L	0.004 mg/L U	0.004 mg/L U
16	0-6	0.0246 mg/L J	0.475 mg/L	0.004 mg/L U	0.004 mg/L U
16	6-12	0.037 mg/L	0.944 mg/L	0.004 mg/L U	0.004 mg/L U
16	12-24	0.0345 mg/L	1.05 mg/L	0.004 mg/L U	0.004 mg/L U
27	0-6	0.0767 mg/L	0.802 mg/L	0.0114 mg/L	0.004 mg/L U
27	6-12	0.0499 mg/L	0.873 mg/L	0.00823 mg/L	0.004 mg/L U
27	12-24	0.0385 mg/L	0.787 mg/L	0.0126 mg/L	0.004 mg/L U

Table 8: Camp Funston Incinerator 2006 TCLP Results

Location	Depth	Lead	Mercury	Selenium	Silver
9	0-6	0.02 mg/L U	0.128 ug/L J	0.03 mg/L U	0.01 mg/L U
9	6-12	0.02 mg/L U	0.2 ug/L U	0.03 mg/L U	0.01 mg/L U
9	12-24	0.02 mg/L U	0.21 ug/L	0.03 mg/L U	0.00608 mg/L J
14	0-6	0.02 mg/L U	0.146 ug/L J	0.03 mg/L U	0.01 mg/L U
14	6-12	0.02 mg/L U	0.2 ug/L U	0.03 mg/L U	0.01 mg/L U
14	12-24	0.02 mg/L U	0.109 ug/L J	0.03 mg/L U	0.01 mg/L U
16	0-6	0.02 mg/L U	0.2 ug/L U	0.03 mg/L U	0.01 mg/L U
16	6-12	0.02 mg/L U	0.2 ug/L U	0.03 mg/L U	0.01 mg/L U
16	12-24	0.02 mg/L U	0.2 ug/L U	0.03 mg/L U	0.01 mg/L U
27	0-6	0.0767 mg/L	0.132 ug/L J	0.03 mg/L U	0.01 mg/L U
27	6-12	0.02 mg/L U	0.109 ug/L J	0.03 mg/L U	0.01 mg/L U
27	12-24	0.0242 mg/L	0.111 ug/L J	0.03 mg/L U	0.01 mg/L U

**Table 9: Camp Funston Incinerator
2006 GPS Coordinates**

Location	Easting	Northing
3	175949.566	4334143.315
4	175963.650	4334150.396
5	175979.042	4334155.155
6	175997.197	4334164.825
12	175999.221	4334158.336
11	175988.546	4334156.757
10	175967.726	4334146.027
16	175968.973	4334143.815
15	175956.159	4334133.504
9	175953.420	4334136.645
8	175933.370	4334124.702
14	175936.071	4334118.296
13	175922.675	4334112.042
7	175919.243	4334117.517
19	175927.639	4334105.508
20	175940.996	4334112.770
21	175958.839	4334120.636
22	175974.979	4334126.674
23	175989.435	4334137.407
24	176006.277	4334144.617
18	176003.728	4334149.282
17	175989.856	4334142.448
25	175931.483	4334099.334

All Concentrations in mg/kg

TRAIN TRACKS

#7	As	
0-6	64.4	
6-12	52.4	

#8	Pb	
0-6	1300	

INC06

INC27

9

4

5

6

7

26

INC05

14

INC01



INC03

15

INC07

PUSH
PILE

16

INC09

11

12

13

INC30

19

20

PUSH

INC14

1234

INC01

130612

SCATTERED
DEBRIS

(ALSO REST OF
AREA)

INC04

INC28

SCATTERED CONCRETE

21

INC01

17

INC11

23

INC12

18

INC10006

Pb 544 ppm

19

INC29

24

25

26

INC14

1234

INC01

130612

SCATTERED
DEBRIS

(ALSO REST OF
AREA)

INC04

INC28

SCATTERED CONCRETE

21

INC01

17

INC11

23

INC12

18

INC10006

Pb 544 ppm

19

INC29

31

32

INC150006

As 233 ppm

INC16

INC17

INC18

INC19

INC20

INC21

INC22

INC23

#27	As	
0-6	47.4	
6-12	37.5	
12-24	36.2	

INC24

LEGEND:

INC29 ● SAMPLE LOCATIONS

— APPROXIMATE LIMITS OF FOUNDATION BASED ON VISUAL OBSERVATION OF CONCRETE/REMNANTS

NOTE:

1. FOUNDATION LIMITS AND SAMPLE LOCATION ARE APPROXIMATE.

TCLP Sample

Sample



30 0 30
SCALE
SCALE IS APPROXIMATE
NW Camp Funston Incinerator

Arrowhead Contracting Inc.
Overland Park, Kansas 66213

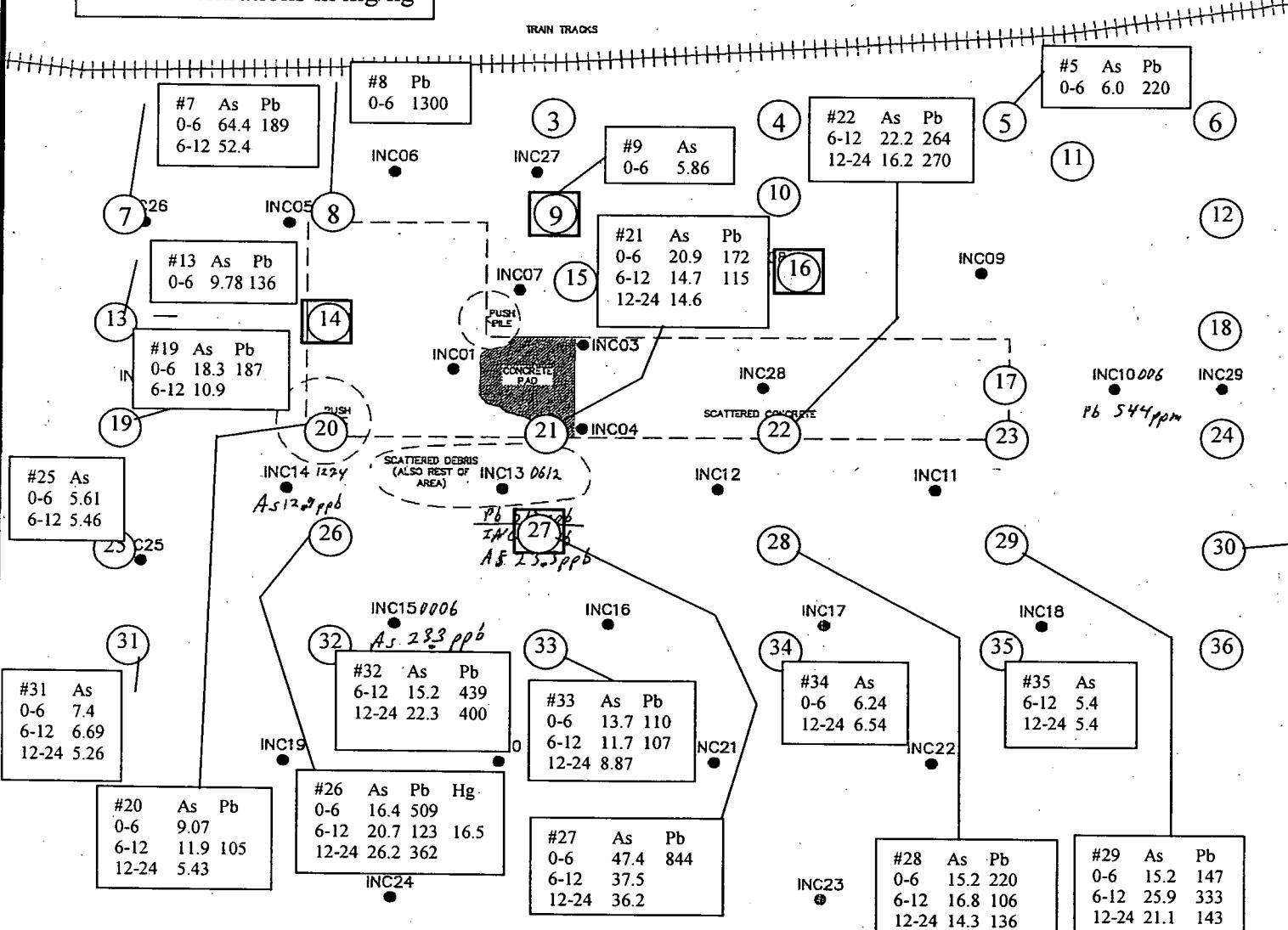
CLIENT: FORT RILEY DES

LOCATION: FORT RILEY, KANSAS

Figure 2

Metals Detected above Non-Residential RSKs

All Concentrations in mg/kg



LEGEND

INC29 • SAMPLE LOCATIONS

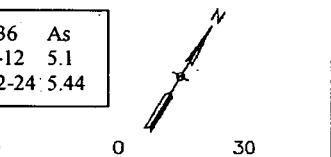
— APPROXIMATE LIMITS OF FOR
FOUNDATION BASED ON VISU
OBSERVATION OF CONCRETE/
REMNANTS

NOTE:

- 1. FOUNDATION LIMITS AND SAMPLE LOCATION ARE APPROXIMATE.**

TCLP Sample

Sample



— 1 —

SCALE IS APPROXIMATE
NW Camp Funston Irrigation

Arrowhead Contracting Inc.
Overland Park, Kansas 66213

CLIENT: FORT RILEY DES

LOCATION: FORT RILEY, KANSAS

Figure 3

Metals Detected As>5, Pb>100