



03-3040.30
December 13, 2007

Mr. David Horton, Project Manager
U.S. Army Joint Munitions Command
1 Rock Island Arsenal
Rock Island IL 61299-6000

RE: Backfill Authorization Request for Survey Unit No. 4

Dear Mr. Horton;

Cabrera Services, Inc. (CABRERA) requests authorization to backfill the open excavation in survey unit (SU) 4 within the DRMO area at the Naval Station Great Lakes. Results of the surveys and sampling performed within SU 4 have been shown to meet the criteria outlined in the *Public Private Venture Area Remediation, Addendum to Work Plan for the Remediation of the Recreation and Center Tank Areas and Site-Wide Final Status Survey (hereafter referred to as the Work Plan Addendum [WPA])*, dated May 2007. (CABRERA 2007a) as well as the recently developed derived concentration guideline level (DCGL) of 4 picocuries per gram (pCi/g) above background for thorium-232 (^{232}Th).

Summary of Results

The survey and sampling approach provided in the WPA was designed in accordance with the *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* for Class 1 final status surveys (FSS). Systematic soil samples on a specified grid, performance of a 100% gamma walkover survey (GWS), and collection of biased soil samples, as required, were all performed. Areas that were identified as suspected or confirmed as elevated in previous investigations at the site were test pitted, and surveyed. Excavation was directed using a 2x2 NaI detector. Those areas that exhibited readings of approximately 2x background were remediated. Following remediation the areas were re-surveyed and biased samples were collected to confirm successful remediation. None of the excavations in SU-4 contained systematic sample locations; as such the systematic data is provided to give an overall understanding of the survey unit and are not directly used to determine that the excavation is candidate for backfill.

A summary of all SU 4 soil sample results is attached, with summary statistics for the systematic and biased samples provided in



Table 1 and Table 2, respectively. All soil sample results were shown to be below the DCGL_W of 4 pCi/g for ²³²Th. Biased samples (Table 2) taken within the excavation did not identify ²³²Th activity above DCGL_W. Therefore, no DCGL_{EMC} concerns were identified.

Table 1. Systematic Sample Summary Statistics for SU 4.
(All values in pCi/g)

Survey Unit	Mean	Median	Max	Standard Deviation
SU-4	0.81	0.8	1.63	0.34

Table 2. Results of SU 4 Biased Samples

Sample ID	²³² Th (pCi/g)	2-σ Uncertainty (pCi/g)	Comments
SU4B-047 PR	1.08	0.16	Concentration below DCGL.
SU4B-053 PR	0.82	0.17	Concentration below DCGL.

Summary and Conclusion

The results of the data for SU 4 presented above have all been shown to be below the DCGL_W of 4 pCi/g for ²³²Th. As such, CABRERA requests authorization to backfill the open excavation to grade in SU 4.

This data serves as a partial FSS package and will be incorporated into the complete FSS data package for SU 4, which will be assembled after all excavation activities are complete.

Should you have questions or comments, please contact me at 314.703.6784

Sincerely,

//SIGNED//

John Eberlin, PMP
Project Manager
Cabrera Services, Inc.

Attachment
cc: Project File



ATTACHMENTS

Gamma Walkover Survey Results Maps for SU 4 Excavation

Onsite Gamma Spec Lab Data Summary



SU 4 Onsite Gamma Spec Lab Data Summary (all Results in pCi/g)

Filename	Sample Size	Units	Date Started	Time Started	²²⁸ Ac- (²³² Th)	2σ Uncert	MDA
Class 1 FSS Samples							
SU4-62-1	961	grams	8/2/2007	9:05	0.54	0.15	0.28
SU4-62-2	1004	grams	8/2/2007	9:23	0.45	0.14	0.20
SU4-64-1	1334	grams	8/3/2007	11:41	0.96	0.14	0.24
SU4-64-2	1100	grams	8/3/2007	11:57	1.63	0.20	0.29
SU4-65-1	841	grams	8/2/2007	9:40	1.11	0.18	0.25
SU4-65-3	1176	grams	8/2/2007	9:57	1.18	0.17	0.21
SU4-66-1	1144	grams	7/31/2007	17:11	0.50	0.11	0.24
SU4-66-3	1576	grams	7/31/2007	17:32	0.79	0.11	0.21
SU4-67-1	1448	grams	8/3/2007	17:48	0.94	0.15	0.25
SU4-67-2	1522	grams	8/3/2007	18:06	1.03	0.15	0.29
SU4-68-1	892	grams	8/4/2007	11:18	0.68	0.16	0.26
SU4-68-2	1215	grams	8/4/2007	11:34	1.04	0.17	0.28
SU4-69-1	1010	grams	8/3/2007	11:05	0.27	0.12	0.21
SU4-69-3	1383	grams	8/3/2007	11:23	0.71	0.15	0.24
SU4-70-1	1278	grams	8/2/2007	8:19	0.99	0.17	0.31
SU4-70-3	1424	grams	8/2/2007	8:47	1.27	0.16	0.22
SU4-71-1	1168	grams	8/2/2007	7:46	0.81	0.16	0.30
SU4-71-4	1599	grams	8/2/2007	8:03	0.74	0.12	0.22
SU4-72-1	1233	grams	8/1/2007	23:22	0.92	0.15	0.25
SU4-72-4	1328	grams	8/2/2007	7:28	1.04	0.18	0.30
SU4-73-1	879	grams	8/2/2007	13:27	0.78	0.17	0.33
SU4-73-3	1396	grams	8/2/2007	13:44	0.51	0.13	0.26
SU4-74-1	1194	grams	8/3/2007	9:23	0.59	0.14	0.28
SU4-74-3	863	grams	8/3/2007	9:40	0.95	0.19	0.33
SU4-75-1	807	grams	8/1/2007	17:53	<MDA	N/A	0.66
SU4-75-2	1212	grams	8/1/2007	18:10	0.75	0.14	0.22
SU4-76-1	1356	grams	8/1/2007	22:12	1.61	0.17	0.28
SU4-76-2	1339	grams	8/1/2007	22:29	0.92	0.13	0.28
SU4-77-1	1587	grams	8/1/2007	17:16	0.68	0.13	0.21
SU4-77-4	1575	grams	8/1/2007	17:36	0.97	0.13	0.29
SU4-78-1	1041	grams	8/1/2007	18:27	0.66	0.15	0.31
SU4-78-2	1560	grams	8/1/2007	18:50	0.94	0.12	0.24
SU4-79-1	1207	grams	8/2/2007	10:51	1.05	0.15	0.25
SU4-79-3	1405	grams	8/2/2007	11:12	1.24	0.16	0.29
SU4-80-1	1140	grams	8/1/2007	19:09	<MDA	N/A	0.48
SU4-80-4	1317	grams	8/1/2007	19:26	0.99	0.16	0.27
SU4-81-1	1225	grams	8/2/2007	11:33	0.45	0.15	0.26
SU4-81-4	1346	grams	8/2/2007	11:55	0.80	0.15	0.27
SU4-82-1	1366	grams	8/1/2007	21:13	0.69	0.12	0.22
SU4-82-3	1335	grams	8/1/2007	21:34	0.99	0.15	0.23
SU4-83-1	1218	grams	8/3/2007	12:15	0.34	0.13	0.22
SU4-83-4	1213	grams	8/3/2007	13:32	0.67	0.14	0.24



Filename	Sample Size	Units	Date Started	Time Started	^{228}Ac - (^{232}Th)	2 σ Uncert	MDA
Biased Samples							
SU4B-047 PR	1629	grams	12/3/2007	14:02	1.08	0.16	0.28
SU4B-053 PR	1669	grams	12/4/2007	7:56	0.82	0.17	0.35
Notes: 1. SU# = Survey Unit 2. PR = post-remediation 3. FD = field duplicate 4. B = bias MDA = Minimum Detectable Activity							