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NTC Great Lakes

FINAL

COAL ASH DETERMINATION SAMPLING REPORT

Naval Station Great Lakes
Great Lakes, Illinois

Navy Control Number 2006-009
Contract No. DAAA09-02-D-0024/30

Prepared for:

DEPARTMENT OF THE ARMY
HEADQUARTERS, JOINT MUNITIONS COMMAND
ROCK ISLAND, IL

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March 2007

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Letter of Transmittal

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Date: March 20, 2007

Subject: Submittal of the Final Ash Determination Report for the Navel Station Great Lakes PPV, IL, JMC Project USN 2006-009

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LIST OF ACRONYMS

AEC	U.S. Atomic Energy Commission
bgs	below ground surface
CA	known monazite sand contaminated area
CABRERA	Cabrera Services, Inc.
COC	chain of custody
DOE	U.S. Department of Energy
DRMO	Defense Reutilization and Marketing Office
EPA	U.S. Environmental Protection Agency
GPS	global positioning system
GWS	gamma walkover survey
HP	Health Physicist
m^2	square meters
NAD	normalized absolute difference
NaI	sodium iodide
NRC	U.S. Nuclear Regulatory Commission
pCi/g	picoCuries per gram
ppm	parts per million
PPV	Public Private Venture
QA	quality assurance
QC	quality control
RA	reference area
RCOC	radionuclide contaminant of concern
Site	Naval Station Great Lakes
SSHP	Site Safety and Health Plan
^{230}Th	thorium-230
^{232}Th	thorium-232
^{234}U	uranium-234
^{235}U	uranium-235
^{238}U	uranium-238
U.S.	United States
USGS	U.S. Geological Survey

EXECUTIVE SUMMARY

This report presents the results of the survey and data analysis conducted by Cabrera Services, Inc. (CABRERA) in Public Private Venture (PPV) areas of interest identified as 3A, 3B, 3C, 3D, 3E and 3F at the Naval Station Great Lakes in Great Lakes, Illinois. Previous surveys performed in these PPV areas using handheld instruments resulted in elevated gamma measurements in discrete locations. Therefore, it was necessary to perform additional sampling and analysis to further investigate the cause of the elevated gamma measurements.

The investigation performed required additional surveys, soil sampling and data analysis to determine if radioactive contamination present in these discrete soil locations is due to the presence of monazite sand or the result of other, non-licensed, material with similar naturally occurring radionuclides, such as coal ash. Through use of known naturally occurring radioactive material constituents in monazite sand, an expected ratio was established and a threshold for decisions regarding the presence of monazite sand in the areas of interest applied.

Soil sampling activities were performed within the six PPV areas of interest areas, as well as from a background reference area (RA) and the former monazite sand storage area (CA). Samples were analyzed by an offsite laboratory via alpha spectroscopy. Sufficient data was collected to establish radioactivity ratios for thorium-232 (^{232}Th) to uranium-238 (^{238}U) and select an appropriate activity ratio threshold above which the source can be concluded to be monazite sand.

It was concluded that activity ratios for ^{232}Th to ^{238}U above 1 indicated the presence of monazite sand, while ratios below 1 indicated the radioactivity was due to some other source, such as coal ash, building materials, or simply the natural radioactivity in soil. Activity ratios of ^{232}Th to ^{238}U in areas 3A, 3B, 3C, and 3F were all greater than 1, while the ratios for the same radionuclides in areas 3D and 3E were less than 1.

Based on the measured activity ratios for ^{232}Th to ^{238}U, verified using ratios for ^{232}Th to thorium-230 (^{230}Th), monazite sand is the most likely source of soil contamination in PPV areas 3A, 3B, 3C, and 3F. However, the ratios in soil from PPV areas 3D and 3E indicate the contaminant is not the result of presence of monazite sand.

1.0 INTRODUCTION

This report presents the results of the survey and data analysis conducted by Cabrera Services, Inc. (CABRERA) in Public Private Venture (PPV) areas of interest 3A, 3B, 3C, 3D, 3E and 3F, as shown in Figure 1-1, at the Naval Station Great Lakes (hereafter referred to as the 'Site') in Great Lakes, Illinois. The survey and data analysis was performed in January 2007 to determine if radioactive contamination present in discrete soil locations is due to the presence of monazite sand or the result of other, non-licensed material, with similar naturally occurring radionuclides, like coal ash. Activities described in this report were conducted in accordance with the *Sampling Plan For Task 3: Coal Ash Determination, Naval Station Great Lakes* (Sampling Plan) (CABRERA, 2006), which is presented in Appendix A. To accomplish this task, soil samples were obtained from the following locations:

- A non-impacted background reference area (RA);
- Former monazite sand storage area, Area 18 (CA); and
- PPV areas of interest 3A, 3B, 3C, 3D, 3E and 3F.

Soil samples collected were submitted to an off-site laboratory for analysis to determine the concentration of the naturally occurring radionuclides present in both the background soils as well as the soils in the areas of interest.

The sampling effort was intended to identify the concentrations of naturally occurring radioactivity in soil at the Site, specific to the locations in the following sections, and evaluate these concentrations in order to draw reasonable conclusions regarding the probable source of the contaminants (monazite sand or other source).

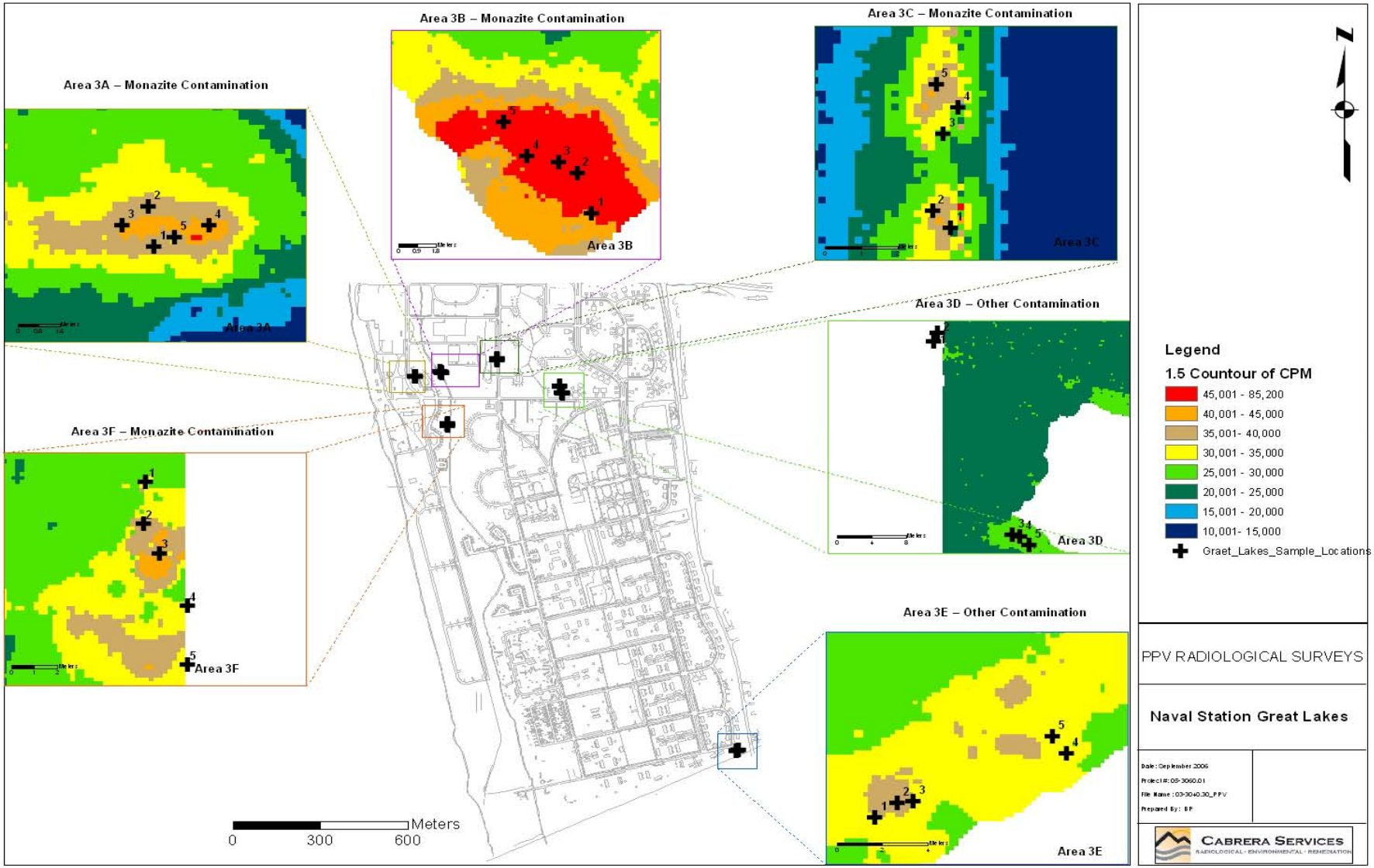

FIGURE 1-1: PPV SAMPLE LOCATIONS

The Sampling Plan provided for:

- Determination of the concentrations of natural radioactivity (natural thorium and natural uranium) in soil from non-impacted areas of the Site (RA background concentrations);
- Sufficient data to establish activity ratios for thorium-232 (^{232}Th) to uranium-238 (^{238}U) and ^{232}Th to natural uranium (which includes isotopes ^{238}U, uranium-235 [^{235}U], and uranium-234 [^{234}U]) in their natural relative abundances (see Table 1-21 and 1-2)] to select an appropriate activity ratio threshold above which the source can be concluded to be monazite sand;
- Analysis of soil samples obtained from an area of the Site known to contain or have previously contained monazite sand to verify appropriate selection of the threshold activity ratio(s); and
- Collection and analysis of soil samples from the six (6) PPV areas of interest and comparison of the analysis results, including activity ratios, to the activity ratio threshold established to determine the probable source of contaminants (monazite sand or other source).

1.1 Site History and Contaminants

1.1.1 Site History

In 1974 the United States (U.S.) Atomic Energy Commission (AEC) granted a license (license number STE-8179) to Engelhard Minerals & Chemicals to package and ship a strategic stockpile of monazite sand from the Site. This sand was reportedly shipped to Holland in 1974. In January 2000, the U.S. Nuclear Regulatory Commission (NRC) found residual monazite sand during a confirmatory survey of the previous AEC decommissioning of the Site. The NRC found elevated areas of gamma activity on the north side of the former monazite sand storage area along the fence near the Defense Reutilization and Marketing Office (DRMO) facility.

In the spring of 2000, Cabrera Services, Inc. (Cabrera) performed a detailed site characterization that confirmed the NRC findings and identified several other areas of elevated concentrations of ^{232}Th. Additional characterization and remediation activities were conducted through 2006.

In the form of a PPV, Forest City LLC is conducting renovation and development of the Forrestal Village housing area at the Site. This program will provide residential housing,

available on a priority basis, to Navy personnel as well as the public. Because of the proximity of the housing area to the former monazite sand storage area, radiological screening surveys were performed in the proposed area of the PPV. Based on the survey results, six areas with elevated activity were identified (MACTEC, 2006). These locations were later verified by CABRERA.

1.1.2 Radiological Contaminants of Concern

The radiological contaminants of concern (RCOCs) associated with monazite sand are natural thorium and natural uranium. Since the monazite sand was stored in its natural, unprocessed form at the Site, the decay products associated with natural thorium and natural uranium remain in the same concentrations as would be found in locations where these sands occur in nature. Therefore, the decay or daughter products for both natural thorium and natural uranium would remain in secular equilibrium with the parent radionuclides. Although the fraction of natural uranium in monazite sand has been determined to be minimal, with inconsequential exposure results, it was determined that the fractions of natural thorium and natural uranium would be reasonable indicators of the source of contaminants in the PPV areas.

The parent radionuclide in the natural thorium decay chain, ^{232}Th, and the parent radionuclides in the two decay chains that comprise natural uranium, ^{238}U and ^{235}U, emit alpha particles. The daughter products in the natural thorium and natural uranium decay chains decay by emission of alpha or beta particles, some with accompanying emission of gamma rays. The decay schemes for both natural thorium and the natural uranium decay chains are provided in Figure 1-2 through Figure 1-4.

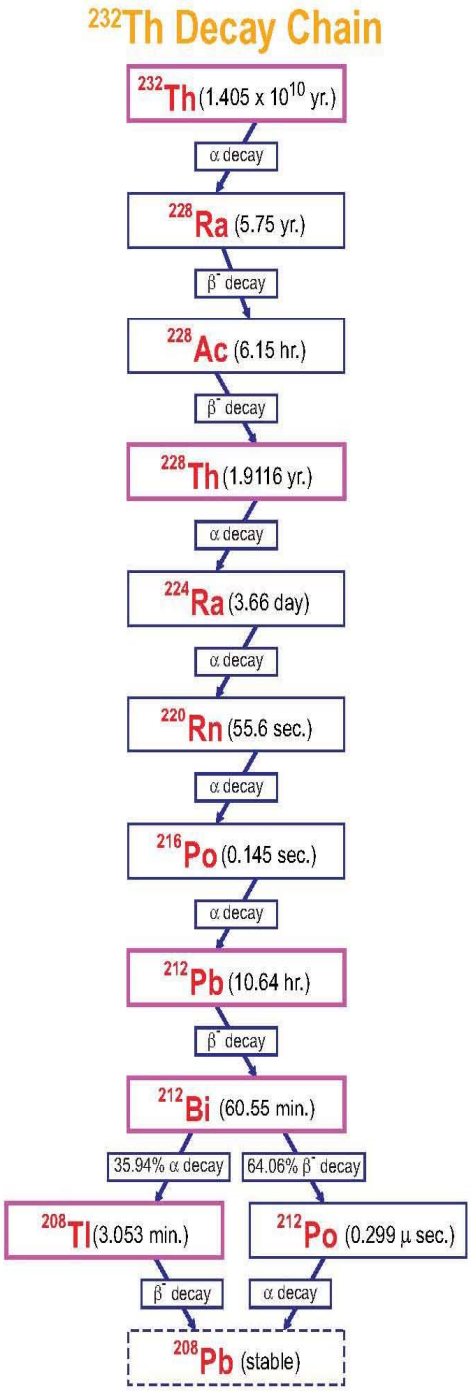

FIGURE 1-2: THORIUM-232 DECAY CHAIN

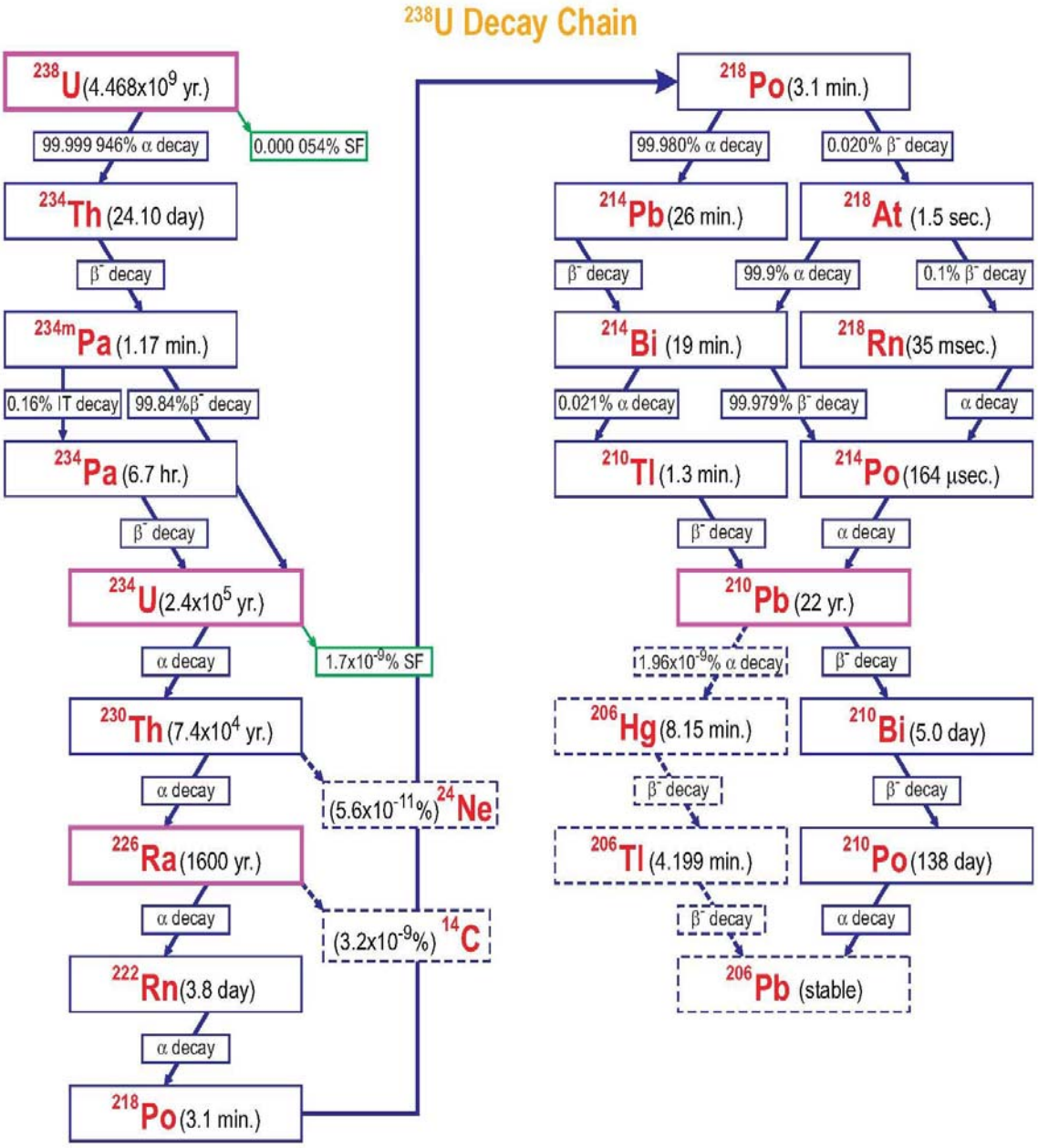

FIGURE 1-3: URANIUM-238 DECAY CHAIN

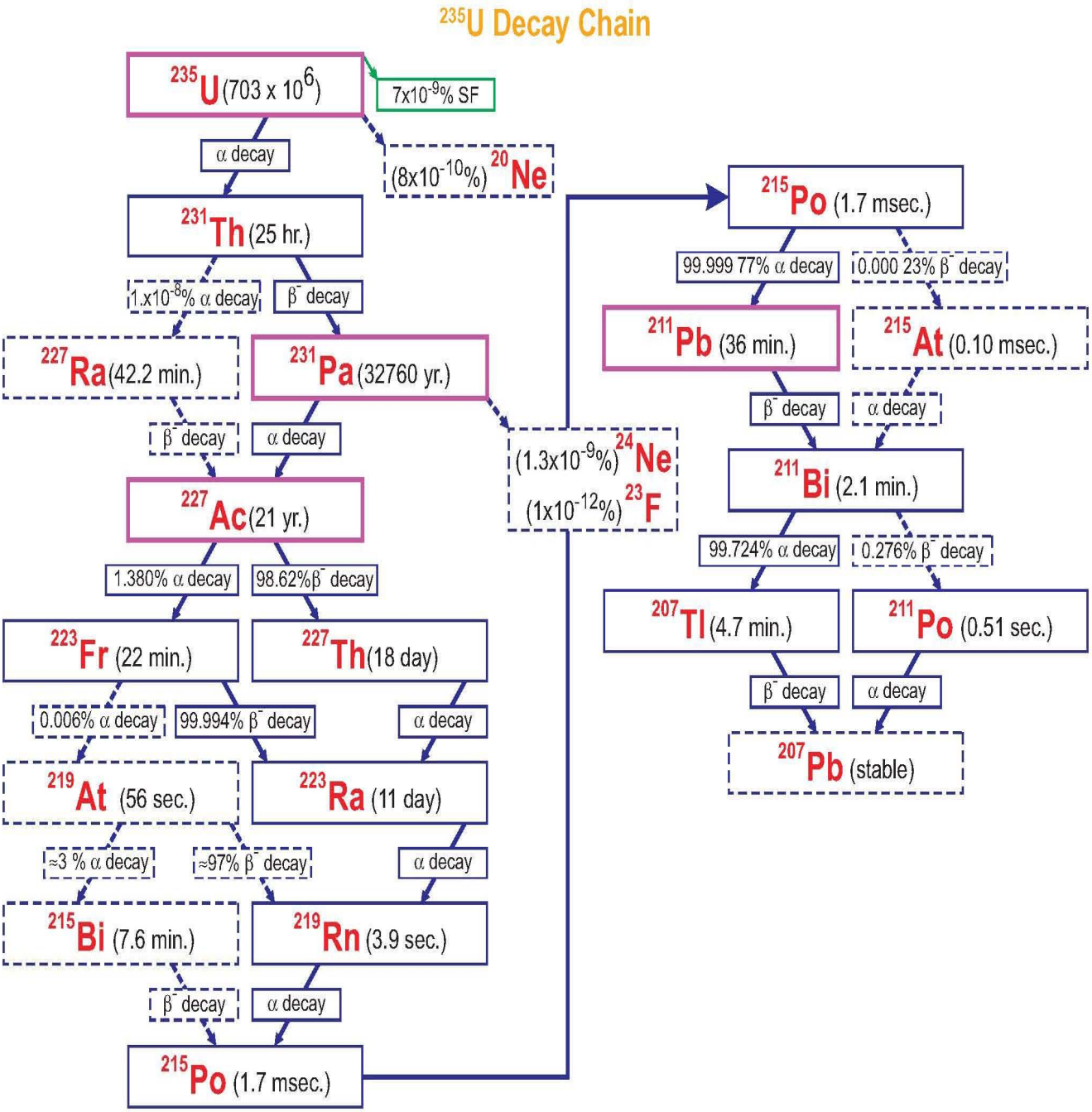

FIGURE 1-4: URANIUM-235 DECAY CHAIN

1.1.3 Determination of Natural Thorium Ratios[1]

Uranium and thorium are naturally occurring radioactive elements commonly found in small amounts in rocks, soil, sand, water, plants, and animals, including humans. The radioactivity of thorium and uranium in the environment is typically low and contributes to low levels of natural background radiation. A higher concentration of natural thorium (^{232}Th and decay progeny) is found in certain sands, such as monazite sand. Table 1-1 provides the specific activity and radiological half-life of ^{232}Th.

TABLE 1-1: THORIUM-232 RADIOLOGICAL INFORMATION

Specific Activity (Ci/g)	Half-life (years)
1.10E-07	1.405E10

Monazite sand also contains a small amount of natural uranium. The three primary uranium isotopes present in natural uranium are ^{238}U, ^{235}U, and ^{234}U. Table 1-2 provides the percentages of the uranium isotopes found in nature, as well as the specific activity and half-lives of the three isotopes of interest.

TABLE 1-2: NATURAL URANIUM RADIOLOGICAL INFORMATION

Radionuclide	Abundance (%)	Specific Activity (Ci/g)	Half-life (years)	Activity per Gram Natural Uranium (µCi/g)
U-238	99.28	3.30E-07	4.47E9	3.28E-1
U-235	0.72	2.10E-06	7.04E8	1.51E-2
U-234	0.0055	6.20E-03	2.44E5	3.41E-1

[1] Throughout this section, natural thorium refers to ^{232}Th, and natural uranium refers to the sum of the three uranium radionuclides (^{238}U, ^{235}U, and ^{234}U).

Monazite sand differs from most other environmental media in that it contains much higher concentrations of natural thorium, specifically ^{232}Th. The percentage of ^{232}Th in monazite sand has a range of 3 to 10 percent (%). The natural uranium content in the sand is typically much lower, in the range of 0.2 to 0.5 %. This higher concentration of ^{232}Th compared to natural uranium in monazite sand can be used as a mechanism to screen soil samples to determine if the radioactivity fractions are representative of this material. By comparing the ratio of ^{232}Th to natural uranium, or more simply comparing the ratio of ^{232}Th to ^{238}U, it can be determined whether the contaminants are due to monazite sand or another source of naturally occurring radioactivity. Table 1-3 and Table 1-4 provide examples of the ^{232}Th to natural uranium and ^{232}Th to ^{238}U activity ratios using the range of ^{232}Th and natural uranium abundance percentages provided above for monazite sands.

TABLE 1-3: MONAZITE SAND RADIOACTIVITY RATIOS (10% ^{232}Th, 0.2% NATURAL URANIUM)

Radionuclide	Radionuclide Activity per Gram Monazite Sand (µCi/g)	232Th : Radionuclide Ratio
Natural U	1.4E-03	8:1
U-238	6.5E-04	17:1
Th-232	1.1E-02	1:1

TABLE 1-4: MONAZITE SAND RADIOACTIVITY RATIOS (3% ^{232}Th, 0.5% NATURAL URANIUM)

Radionuclide	Radionuclide Activity per Gram Monazite Sand (µCi/g)	^{232}Th:Radionuclide Ratio
Natural U	3.4E-03	1:1
U-238	1.6E-03	2:1
Th-232	3.3E-03	1:1

For comparison, the average ^{232}Th to ^{238}U activity ratio in soil in the U.S. is 1:1 and the average ^{232}Th to natural uranium (includes ^{238}U, ^{235}U and ^{234}U) activity ratio is 0.5:1 (NRC, 1994).

If the ratios found were not representative of monazite or the natural radioactivity in soil, it may be beneficial to understand potential alternate sources of activity, such as coal ash, building materials, etc. The natural radioactivity in coal ash (fly ash) varies significantly (a direct result of the variability in constituents of the coal itself). Quoting figures provided by the U.S. Environmental Protection Agency (EPA), a 1993 report states that the concentrations of natural thorium and natural uranium in coal ash is 3.2 parts per million (ppm) and 1.3 ppm, respectively (Gabbard, 1993). This equates to 3.2E-06 grams of thorium per gram of ash and 1.3E-06 grams natural uranium per gram of ash, resulting in a ^{232}Th to ^{238}U activity ratio of 0.8:1 and a ^{232}Th to natural uranium activity ratio of 0.4:1. The U.S. Geological Survey (USGS) states that the concentration of thorium and natural uranium in coal is approximately equal (USGS, 1997). This report also indicates that the thorium and natural uranium concentrations in coal ash, although increased by a factor of ten from the concentrations in coal, are similar. This results in a ^{232}Th to ^{238}U activity ratio of 0.3:1 and a ^{232}Th to natural uranium activity ratio of 0.2:1. The NRC reports that the natural uranium concentration in coal ash exceeds the ^{232}Th concentration by a factor of two to three (NRC, 2001). The U.S. Department of Energy (DOE) also reports that the natural uranium concentration in coal ash exceeds the ^{232}Th concentration by a factor of three (DOE, 1996). To summarize the information provided in all of these reports, the uranium radioactivity in coal ash should exceed that of ^{232}Th, which results in activity ratios less than 1.

Additionally, many building materials may exhibit higher concentrations of naturally occurring radioactivity and these concentrations may vary greatly. For example, concrete contains natural thorium and natural uranium primarily due to the aggregate used in the concrete, of which sand is a primary component. The average ^{232}Th to ^{238}U activity ratio in concrete used in the Chicago, Illinois area is 0.4:1, with an average ^{232}Th to natural uranium activity ratio of 0.2:1 (NRC, 1994).

As indicated in the previous paragraphs, the natural thorium and natural uranium concentrations used in the determination of the ratios presented are based on averages. It is important to note that the natural radioactivity in these materials varies greatly within the U.S and around the world. However, the higher ^{232}Th concentrations found in monazite sand distinguish this material from most other environmental media, and the ratios of ^{232}Th to ^{238}U and/or ^{232}Th to

natural uranium may serve as a useful screening tool to determine if the radioactivity in soil at the Site is due to the presence of monazite sand or the result of other environmental media such as coal ash.

To minimize the impact of the variability of natural radioactivity concentrations in the media of interest (soil), the Sampling Plan (CABRERA, 2006) required collection of surface soil samples from a location within the Site that has no known history of containing monazite sand (i.e., background RA). Additional surface soil samples were collected from an area of the Site known to have contained monazite sand (previously impacted area). These samples were analyzed for natural thorium and natural uranium to determine the concentrations of the radionuclides of interest, as well as determine the ^{232}Th to ^{238}U and ^{232}Th to natural uranium activity ratios. The background concentrations of natural thorium and natural uranium in soil samples from the RA were used to correct the concentrations of these radionuclides in soil samples from the remaining six (6) areas of interest, as well as generate activity ratios of natural thorium to natural uranium in native, non-impacted soil. This information was then used to select an appropriate ratio threshold, above which can be concluded that the concentrations of natural radioactivity in soil are likely due to the presence of monazite sand.

Care must be exercised when evaluating soil sample results and resulting radioactivity ratios. This approach assumes the contaminant is homogenously distributed within the volume of soil sampled. Although a high ^{232}Th to ^{238}U or ^{232}Th to natural uranium activity ratio does provide reasonable assurance the contaminants are the result of monazite sand, analytical results with low ratios were evaluated as discussed in the following sections.

Additional activity ratios were also examined to verify preliminary conclusions using the ^{232}Th to ^{238}U ratios. Thorium-230 (^{230}Th) is in the decay chain of ^{238}U, as shown in Figure 1-3. The ^{232}Th to ^{230}Th ratios were investigated similar to the ^{232}Th to ^{238}U ratios. If the ratios were less than 1, the contamination was likely due to a source other than monazite sand. Conversely, if the ratio was more than one, the contamination was more likely due to the existence of monazite. The ^{232}Th to ^{230}Th ratio may provide more reliable results since both are determined using the same laboratory chemical extraction method, while ^{232}Th and ^{238}U are not.

2.0 SITE INSTRUMENTATION AND SURVEY TECHNIQUES

The purpose of this section is to describe sampling methodologies used for surface soil sample collection. Discrete surface soil sampling and offsite laboratory analyses were performed to measure concentrations of RCOCs in surface soil. The results were then used to determine the likely source of the contaminants (monazite sand or other). Chain of custody (COC) records for the samples sent offsite are presented in Appendix B. Project data was recorded in a field logbook and subsequently transferred to an electronic format, as presented in Appendix B.

2.1 Sampling Tasks

The sampling tasks performed in accordance with the Sampling Plan (CABRERA, 2006) included the following activities.

2.1.1 Gamma Surveys

Soil sample locations in each PPV area were determined based on the five most elevated gamma fluence measurements collected during previous gamma walkover surveys (GWS). Stationary gamma fluence measurements were performed during this field effort to confirm previous elevated locations and select appropriate sample locations.

Outdoor gamma fluence measurements were performed using a Ludlum Model 44-20, 3-inch by 3-inch, sodium iodide (NaI) detector coupled to a Ludlum 2221 rate meter. The detector was also coupled to a Trimble XR Pro global positioning system (GPS), when necessary, to record location coordinates and survey results simultaneously.

2.1.2 Volumetric Sample Collection

Soil samples were collected using hand auger and soil coring tools. Prior to the collection of each sample, the equipment was decontaminated by washing the surface with water and a brush to avoid cross-contamination between samples. During the collection of soil samples, large twigs, stones and other similar items were removed. Volumetric samples were collected from 0 to 30 centimeters below ground surface (bgs) and analyzed at an off-site laboratory.

3.0 RESULTS

Field sampling activities were performed within the Site areas specified in the following sections. Surface soil samples were collected from the background RA and the CA. Surface soil samples were also collected from the six (6) PPV areas of interest at biased locations identified from previous survey efforts (MACTEC, 2006).

To accomplish analytical data and ratio comparison, RA background concentrations were not subtracted from the sample results obtained from the CA or PPV areas. This is appropriate since the intent was to evaluate how close the results compare to expected ratios in the RA, as well as from pure monazite sand, to provide an indication of the most likely source of elevated radioactivity in soil.

Complete analytical results are presented in Appendix C. A summary of survey results is presented in Table 3-1. A summary of activity ratios is presented in Table 3-2.

TABLE 3-1: ANALYTICAL RESULTS SUMMARY

SU[1]	Number of samples	Thorium-232 Results			Uranium-238 Results			Thorium-230 Results		
		Average (pCi/g)	Standard Deviation	Max (pCi/g)	Average (pCi/g)	Standard Deviation	Max (pCi/g)	Average (pCi/g)	Standard Deviation	Max (pCi/g)
3A	5	4.33	1.43	6.70	1.32	0.17	1.59	1.63	0.19	1.90
3B	5	6.84	2.60	9.70	1.88	0.54	2.38	2.05	0.48	2.69
3C	5	6.95	1.78	9.10	1.62	0.38	2.02	1.95	0.23	2.29
3D	5	0.71	0.07	0.79	1.00	0.27	1.47	1.17	0.10	1.32
3E	5	1.52	0.05	1.57	2.52	0.22	2.83	2.50	0.22	2.79
3F	5	6.02	4.72	13.0	1.47	0.54	2.25	1.85	0.57	2.66
RA	5	1.00	0.14	1.20	1.03	0.09	1.15	1.45	0.16	1.64
CA	20	1.12	0.56	2.35	0.67	0.24	1.05	0.83	0.39	1.46

NOTES: 1. SU=Survey Unit; 3A~3F =Six PPV Areas of Interest; RA=Reference Area; CA=Known Monazite Sand Contaminated Area.

TABLE 3-2: ACTIVITY RATIOS SUMMARY

SU[1]	Number of samples	Th-232 to U-238 Ratio			Indicated Contaminant Source	Th-232 to Th-230 Ratio			Indicated Contaminant Source
		Average	Standard Deviation	Max		Average	Standard Deviation	Max	
3A	5	3.22	0.67	4.21	Monazite	2.62	0.58	3.53	Monazite
3B	5	3.54	0.69	4.13	Monazite	3.28	0.92	4.08	Monazite
3C	5	4.45	1.36	5.91	Monazite	3.52	0.55	4.09	Monazite
3D	5	0.74	0.15	0.87	Other[2]	0.60	0.04	0.66	Other[2]
3E	5	0.61	0.07	0.70	Other[2]	0.61	0.07	0.72	Other[2]
3F	5	3.63	1.60	5.78	Monazite	2.92	1.48	4.89	Monazite
RA	5	0.98	0.22	1.30	N/A[3]	0.69	0.06	0.75	N/A[3]
CA	20	1.68	0.63	2.94	Monazite	1.44	0.57	2.67	Monazite

NOTES: 1. SU=Survey Unit; 3A~3F =Six PPV Areas of Interest; RA=Reference Area; CA=Known Monazite Sand Contaminated Area.
2. May include coal ash, building materials, or other sources of natural radioactivity.
3. Reference areas are assumed to be free of contaminants.

3.1 Background Reference Area

The RA used during the Area 18 (CA) remediation was also used for this study. Five (5) surface soil samples [0 to 30 centimeters bgs] were obtained from random locations selected by the sampling team. These locations were selected from portions of the area that were relatively flat. Locations that were avoided include lower portions of downward sloping soil, as well as ditches and the base of creek banks where contaminants may concentrate.

The ^{232}Th results averaged 1.00 picocurie per gram (pCi/g), with a standard deviation of 0.14 pCi/g and a maximum of 1.20 pCi/g. The ^{238}U results averaged 1.03 pCi/g, with a standard deviation of 0.09 pCi/g and a maximum of 1.15 pCi/g.

The ^{232}Th to ^{238}U activity ratios averaged 0.98, with a standard deviation of 0.22 and a maximum of 1.30. The ^{232}Th to ^{230}Th ratios were slightly different, with an average of 0.69, standard deviation of 0.06 and maximum of 0.75.

3.2 Known Monazite Sand Contaminated Area

Monazite sand was previously stored at a location in the northwestern section of the Site (CA). The sampling team used handheld radiological instrumentation to identify locations within this area that exhibited elevated radioactivity for selection of 20 biased sample locations.

The ^{232}Th results averaged 1.12 pCi/g, with a standard deviation of 0.56 pCi/g and a maximum of 2.35 pCi/g. The ^{238}U results averaged 0.67 pCi/g, with a standard deviation of 0.24 pCi/g and a maximum of 1.05 pCi/g.

The ^{232}Th to ^{238}U activity ratios averaged 1.68, with a standard deviation of 0.63 and a maximum of 2.94. The ^{232}Th to ^{230}Th ratios were similar, with an average activity ratio of 1.44, standard deviation of 0.57 and maximum of 2.67.

Note: Of the 20 samples obtained in the CA, five had ^{232}Th to ^{238}U activity ratios less than 1, and seven had ^{232}Th to ^{230}Th ratios less than 1. This indicates that any remaining monazite contamination present may not be uniformly distributed. However, as a whole, the results are indicative of ratios expected from monazite sand.

3.3 Six Areas of Interest (PPV Areas)

3.3.1 Area 3A

This area is in the vicinity of a four- unit housing complex. The radiological contour map generated from a previous survey indicates two areas of elevated radioactivity in soil, one area of approximately 200 square meters (m^2) on the north side of the housing unit and a smaller area of approximately 100 m^2 on the east side of the same housing unit, in the vicinity of a carport. Soil samples could not be collected at the smaller area east of the housing unit because the elevated area was located under concrete pavement. Five (5) surface soil samples were collected from the area north of the housing unit in Area 3A (refer to Figure 1-1). Locations were selected using the five highest survey locations previously identified. During field activities, CABRERA personnel noted that the soil seemed to lack material consistent with coal ash or slag.

The ^{232}Th results averaged 4.33 pCi/g, with a standard deviation of 1.43 pCi/g and a maximum of 6.70 pCi/g. The ^{238}U results averaged 1.32 pCi/g with a standard deviation of 0.17 pCi/g and a maximum of 1.59 pCi/g.

The ^{232}Th to ^{238}U activity ratios averaged 3.22 with a standard deviation of 0.67 and a maximum of 4.21. The ^{232}Th to ^{230}Th ratios were also very similar, with an average of 2.62, standard deviation of 0.58 and maximum of 3.53. All of the five selected locations had ^{232}Th to ^{238}U and

^{232}Th to ^{230}Th activity ratios greater than 1. Therefore, the contaminant source at this location is monazite sand.

3.3.2 Area 3B

This area is in the vicinity of a ball field. The radiological contour map generated from a previous survey indicates a large area of approximately 1,500 m^2 with elevated radioactivity in soil. The most significant radioactivity was found on the northwest side of the ball field in an area where a creek borders the survey area. Five (5) surface soil samples were collected from Area 3B (refer to Figure 1-1). Locations were selected using the five highest survey locations previously identified. During field activities, CABRERA personnel noted the presence of slag material in the soil.

The ^{232}Th results averaged 6.84 pCi/g, with a standard deviation of 2.60 pCi/g and a maximum of 9.70 pCi/g. The ^{238}U results averaged 1.88 pCi/g, with a standard deviation of 0.54 pCi/g and a maximum of 2.38 pCi/g.

The ^{232}Th to ^{238}U activity ratios averaged 3.54, with a standard deviation of 0.69 and a maximum of 4.13. The ^{232}Th to ^{230}Th ratios were also very similar, with an average of 3.28, standard deviation of 0.92 and maximum of 4.08. All of the five selected locations had ^{232}Th to ^{238}U and ^{232}Th to ^{230}Th activity ratios greater than 1. Therefore, although there appeared to be slag like material in the soil at this location, analytical data indicates the contaminant source is monazite sand.

3.3.3 Area 3C

This area is on the east and west sides of Great Lakes Drive. The radiological contour map generated from a previous survey indicates three (3) locations of elevated radioactivity on the west side of Great Lakes Drive, between the pavement and sidewalk. Collectively, these areas cover approximately 100 m^2. A second, smaller area of elevated radioactivity, approximately 25 m^2, is found on the east side of the street. Five (5) surface soil samples were collected from Area 3C (refer to Figure 1-1). Locations were selected using the five highest survey locations previously identified. During field activities, CABRERA personnel noted that the soil consisted mostly of clay and lacked material consistent with coal ash or slag.

The ^{232}Th results averaged 6.95 pCi/g, with a standard deviation of 1.78 pCi/g and a maximum of 9.10 pCi/g. The ^{238}U results averaged 1.62 pCi/g, with a standard deviation of 0.38 pCi/g and a maximum of 2.02 pCi/g.

The ^{232}Th to ^{238}U activity ratios averaged 4.45, with a standard deviation of 1.36 and a maximum of 5.91. The ^{232}Th to ^{230}Th ratios were also very similar, with an average of 3.52, standard deviation of 0.55 and maximum of 4.09. All of the five selected locations had ^{232}Th to ^{238}U and ^{232}Th to ^{230}Th activity ratios greater than 1. Therefore, the contaminant source at this location is monazite sand.

3.3.4 Area 3D

This is an area surrounding a duplex housing unit. The radiological contour map generated from a previous survey indicates an area of elevated radioactivity exists on the southwest side of the structure, approximately 50 m^2 in size. Five (5) surface soil samples were collected from the location of elevated radioactivity in Area 3D (see Figure 1-1). Locations were selected using the five highest survey locations previously identified. During field activities, CABRERA personnel noted that the soil consisted mostly of clay and lacked visual indication of material consistent with coal ash or slag.

The ^{232}Th result averaged 0.71 pCi/g, with a standard deviation of 0.07 pCi/g and a maximum of 0.79 pCi/g. The ^{238}U result averaged 1.0 pCi/g, with a standard deviation of 0.27 pCi/g and a maximum of 1.47 pCi/g.

The ^{232}Th to ^{238}U activity ratio averaged 0.74, with a standard deviation of 0.15 and a maximum of 0.87. The ^{232}Th to ^{230}Th ratios were also very similar, with an average of 0.60, standard deviation of 0.04 and maximum of 0.66. All of the five selected locations had ^{232}Th to ^{238}U and ^{232}Th to ^{230}Th activity ratios less than 1. Therefore, monazite sand contamination is not present at this location. Although the ^{232}Th to ^{238}U ratios indicate the contaminant source may be coal ash or other material, such as building materials, the ^{232}Th to ^{230}Th ratios are not significantly different than the same ratios from the RA for natural radioactivity in soil.

3.3.5 Area 3E

This area is in the southeast corner of the housing area property boundary. The radiological contour map generated from a previous survey indicates an area of elevated radioactivity,

approximately 200 m^2 in size, exists on the downward slope of this area. Five (5) surface soil samples were collected from the location of elevated radioactivity in Area 3E (refer to Figure 1-1). Locations were selected using the five highest survey locations previously identified. During field activities, CABRERA personnel noted that the soil consisted entirely of material consistent with ash.

The ^{232}Th result averaged 1.52 pCi/g, with a standard deviation of 0.05 pCi/g and a maximum of 1.57 pCi/g. The ^{238}U result averaged 2.52 pCi/g, with a standard deviation of 0.22 pCi/g and a maximum of 2.83 pCi/g.

The ^{232}Th to ^{238}U activity ratio averaged 0.61, with a standard deviation of 0.67 and a maximum of 0.70. The ^{232}Th to ^{230}Th ratios were also very similar, with an average of 0.61, standard deviation of 0.07 and a maximum of 0.72. All of the five selected locations had ^{232}Th to ^{238}U and ^{232}Th to ^{230}Th activity ratios less than 1. Therefore, monazite sand contamination is not present at this location. Although the ^{232}Th to ^{238}U ratios indicate the contaminant source may be coal ash or other material, such as building materials, the ^{232}Th to ^{230}Th ratios are not significantly different than the same ratios from the RA for natural radioactivity in soil.

3.3.6 Area 3F

This area is on the west side of a creek, south of the area identified in Area 3B. The radiological contour map generated from a previous survey indicates this area of elevated radioactivity covers approximately 400 m^2. Five (5) surface soil samples were collected from the location of elevated radioactivity in Area 3F (refer to Figure 1-1). Locations were selected using the five highest survey locations previously identified. During field activities, CABRERA personnel noted that slag material was present in the soil.

The ^{232}Th result averaged 6.02 pCi/g, with a standard deviation of 4.72 pCi/g and a maximum of 13.0 pCi/g. The ^{238}U result averaged 1.47 pCi/g, with a standard deviation of 0.54 pCi/g and a maximum of 2.25 pCi/g.

The ^{232}Th to ^{238}U activity ratio averaged 3.63, with a standard deviation of 1.60 and a maximum of 5.78. The ^{232}Th to ^{230}Th ratios were also very similar, with an average of 2.92, standard deviation of 1.48 and maximum of 4.89. All of the five selected locations had ^{232}Th to ^{238}U and

^{232}Th to ^{230}Th activity ratios greater than 1. Therefore, although material in soil at this location appeared contain slag material, analytical data indicates the contaminant source is monazite sand.

3.3.7 Summary

During evaluation of sample results, potential sources of error were considered. Sample analytical results and radionuclide ratios from PPV areas 3A, 3B, 3C and 3F clearly indicate natural thorium predominates, as would be expected from soil contaminated with monazite sand. However, for PPV areas 3D and 3E, where these results are more indicative of other sources of contaminants, it becomes more important to assure error was not introduced in the sampling method, particularly via dilution of the sample with surrounding uncontaminated soil which may have skewed the results, resulting in ratios less than 1.

If error had been introduced due to dilution, it would be expected that the variation (standard deviation) in sample results, i.e., analytical results and radionuclide ratios, would be higher than those found in the other areas. However, the samples from PPV areas 3D and 3E exhibited the lowest variation of all PPV area samples, for both radionuclide concentrations and ratios, with the exception of ^{238}U and ^{230}Th concentrations in PPV area 3A which had a lower standard deviation than PPV area 3E.

One possible reason for such low distribution would have been the samples were not distributed far enough apart. However, from review of the distribution of sample locations in Figure 3-1 this does not appear to be the case. Therefore, it is concluded that the samples from these 2 PPV areas are representative of the radionuclide concentration and ratios, with dilution likely not a significant contributor to potential error in the conclusion.

4.0 SURVEY QUALITY ASSURANCE/QUALITY CONTROL

Activities associated with this Sampling Report were performed in accordance with written procedures and/or protocols in order to ensure consistent, repeatable results. Implementation of Quality Assurance (QA) measures for this report is described herein.

Only qualified and trained personnel operated the equipment and instrumentation used in the field activities specified in this report. Personnel were trained in the technical, quality control, and health and safety aspects of the project, as well as in the calibration, maintenance, and operating procedures for their assigned equipment.

4.1 Instrumentation Requirements

The CABRERA Project Health Physicist (HP) was responsible for determining the instrumentation required to complete the requirements of this characterization survey. Only instrumentation approved by the CABRERA Project HP was used to collect radiological data. The CABRERA Project HP was responsible for ensuring individuals were appropriately trained to use project instrumentation and other equipment, and that instrumentation met the required detection sensitivities. Survey instruments were operated in accordance with either a written procedure or manufacturers' manual, as determined by the CABRERA Project HP.

Instrument quality control (QC) checks were performed during the characterization survey as presented in the Sampling Plan (CABRERA, 2006; see Appendix A). Instruments used to obtain radiological data, including GPS equipment, were inspected for physical damage, current calibration and erroneous readings in accordance with applicable procedures and/or protocols. Calibration sheets for instruments used during field activities are presented in Appendix D. The individual performing these tasks documented the results in accordance with the associated instrument procedure and/or protocols. Any instrumentation not meeting the specified requirements of calibration, inspection, or response check required removal from operation (none needed to be removed). The instrumentation QC data results are presented in Appendix D.

4.1.1 Calibration Requirements

Instruments used during the characterization survey had current calibration and maintenance records onsite for review and inspection. The records included the following:

- Name of the equipment;

- Equipment identification (model and serial number);
- Manufacturer;
- Date of calibration; and
- Calibration due date.

Instrumentation was maintained and calibrated to manufacturers' specifications to ensure that required traceability, sensitivity, accuracy and precision of the equipment/instruments were maintained. Instruments were under current calibration.

4.1.2 Instrument QC Source Checks

Prior to daily use, project instrumentation was QC checked by comparing instrument response to a benchmark response. Prior to the commencement of field operations, reference locations were selected for performance of these checks; subsequent QC checks were performed at these locations. QC source checks consisted of a 1-minute integrated count with the designated source positioned in a reproducible geometry performed at the reference location. Prior to the start of initial surveys, this procedure was repeated at least ten times to establish average instrument response.

4.1.2.1 Direct Radiation Measurement Instrumentation QC

Detectors used for direct radiation measurements included the Ludlum 43-93, Ludlum 44-20 and Ludlum 44-9. Instrument responses to designated QC check sources were recorded and evaluated against the average established at the start of the field activities. An acceptance criterion of ± 20% was required for the Ludlum 44-20 and Ludlum 44-9, and ± 3σ for Ludlum 43-93. A QC count outside the respective acceptance criterion required informing the field lead, a detector evaluation and could have resulted in the detection system being removed from service for corrective action.

4.1.3 Duplicate Sample Analyses

CABRERA collected duplicate samples for 5% of all analytical samples, as presented in the Sampling Plan (CABRERA, 2006a). The samples were numbered using a unique identifier. Analyses of laboratory duplicates were compared to the initial analytical results by determining a Normalized Absolute Difference (NAD) value for each data set by the following equation:

$$\text{Normalized Absolute Difference}_{\text{Duplicate}} = \frac{\left|\text{Sample - Duplicate}\right|}{\sqrt{\sigma^2_{\text{Sample}} + \sigma^2_{\text{Duplicate}}}}$$

where:

Sample = first sample value (original),

Duplicate = second sample value (duplicate),

σ_{Sample} = counting uncertainty of the sample, and

$\sigma_{\text{Duplicate}}$ = counting uncertainty of the duplicate

The calculated NAD results were compared to a performance criteria of less than or equal to 1.96. Calculated NAD values less than or equal to 1.96 were considered acceptable and values greater than 1.96 were investigated for possible discrepancies in analytical precision, or for sources of disagreement with the following assumptions of the test:

- The sample measurement and duplicate or replicate measurement are of the same normally distributed population.
- The standard deviations, σ_{Sample} and $\sigma_{\text{Duplicate}}$, represent the true standard deviation of the measured population.

There were three laboratory samples, or approximately 5% of the total number of samples collected, analyzed as duplicates. All laboratory measurement passed the calculated NAD performance criteria of less than or equal to 1.96. The results are presented in Appendix D.

5.0 HEALTH AND SAFETY

Health and safety measures were employed during conduct of survey activities, in accordance with the project Site Safety and Health Plan (SSHP) (CABRERA, 2001).

Daily health and safety activities were performed in accordance with the project SSHP, including conducting Daily Tailgate Safety meetings, prior to the performance of survey activities each day. These daily safety meetings allowed for discussion of daily safety measures required based on the activities planned for each day. Daily Safety Tailgate Meeting records are provided in Appendix E. The SSHP was reviewed by CABRERA project and sub-contractor personnel prior to the performance of survey activities. CABRERA project and sub-contractor personnel signed a form acknowledging that they read and understood the SSHP; this form is provided in Appendix E. No reported injuries took place during the survey field effort.

6.0 SUMMARY OF RESULTS AND CONCLUSIONS

Field sampling activities were conducted at the Site to determine if radioactive contamination present in the areas of interest is due to the presence of monazite sand or simply the result of other, non-licensed material, with similar naturally occurring radionuclides.

Soil sampling activities were performed within the Site at the six (6) PPV areas of interest areas (3A through 3F), as well as from the RA and CA. Samples were analyzed by an offsite laboratory via alpha spectroscopy. Sufficient data was collected to establish radioactivity ratios for ^{232}Th to ^{238}U and select an appropriate activity ratio threshold above which the source can be concluded to be monazite sand.

It was concluded that activity ratios for ^{232}Th to ^{238}U above 1 indicated the presence of monazite sand, while ratios below 1 indicated the radioactivity was due to some other source, such as coal ash, building materials, or simply the natural radioactivity in soil. Activity ratios of ^{232}Th to ^{238}U in areas 3A, 3B, 3C, and 3F were all greater than 1 (3.22, 3.54, 4.45, and 3.63, respectively), while the ratios for the same radionuclides in areas 3D and 3E were less than 1 (0.74 and 0.61, respectively).

Based on the measured activity ratios for ^{232}Th to ^{238}U, verified using ratios for ^{232}Th to ^{230}Th, monazite sand is the source of soil contamination in PPV areas 3A, 3B, 3C, and 3F. However, the ratios in soil from PPV areas 3D and 3E indicate the contaminant is not the result of presence of monazite sand.

7.0 REFERENCES

(CABRERA, 2001) *"Site Safety and Health Plan, Naval Station Great Lakes, Great Lakes, Illinois*, Contract DAAA09-02-D-0024/30.

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(MACTEC, 2006) *Forrestal Village Phased-Approach Radiological Survey Report In Support of the Phase II Environmental Assessment, NAVSTA Great Lakes, Naval Region Midwest Family Housing Privatization*, MACTEC, dated February, 2006.

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(NRC, 2001) NRC SECY-01-0057, Policy Issue, *Partial Response to SRM COMEXM-00-0002 – "Expansion of NRC Statutory Authority Over Medical Use of Naturally Occurring and Accelerator-Produced Radioactive Material (NARM)"*, U.S. Nuclear Regulatory Commission, dated March, 2001.

(USGS, 1997) *Radioactive Elements in Coal and Fly Ash: Abundance, Forms, and Environmental Significance*, dated October, 1997.

APPENDIX A

SAMPLING PLAN FOR TASK 3: COAL ASH DETERMINATION

FINAL

SAMPLING PLAN
For
TASK 3: COAL ASH DETERMINATION

NAVAL STATION GREAT LAKES
RADIOLOGICAL REMEDIATION
GREAT LAKES, ILLINOIS

Navy Control Number 2006-009
Contract number DAAA09-02-D-0024/30

Prepared for:
DEPARTMENT OF THE ARMY
HEADQUARTERS, JOINT MUNITIONS COMMAND
ROCK ISLAND, IL

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December 2006

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LIST OF ACRONYMS

AEC	U.S. Atomic Energy Commission
Army	U.S. Army
bgs	below ground surface
CABRERA	Cabrera Services, Inc.
cm	centimeter
COC	chain of custody
CHSM	Corporate Health and Safety Manager
CRSM	Corporate Radiation Safety Manager
DCGL	derived concentration guideline level
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DRMO	Defense Reutilization and Marketing Office
EPA	U.S. Environmental Protection Agency
IDW	investigation-derived waste
JMC	Joint Munitions Command
m^2	square meters
MDC or MDC_{SCAN}	minimum detectable concentration
NRC	U.S. Nuclear Regulatory Commission
pCi/g	picocuries per gram
PM	project manager
POC	point of contact
PPE	personal protective equipment
ppm	parts per million
PPV	Public Private Venture
QA	Quality Assurance
QAC	Quality Assurance Coordinator
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCOPC	radionuclide contaminant of potential concern
SRSM	Site Radiation Safety Manager
USGS	U.S. Geological Survey
SSHP	Site Safety and Health Plan
^{232}Th	thorium-232
^{238}U	uranium-238
^{235}U	uranium-235
^{234}U	uranium-234

1.0 TASK 3 DESCRIPTION

The primary purpose of this task is to determine if radioactive contamination present in the areas of interest at Naval Station Great Lakes (hereafter referred to as the 'Site') is due to the presence of monazite sand or simply the result of other, non-licensed material, with similar naturally occurring radionuclides, such as coal fly ash. To accomplish this task, soil samples will be obtained from the following locations:

1. Non-Impacted Background Reference Area
2. Former Monazite Sand Storage Area (Area 18)
3. Public Private Venture Areas 3A, 3B, 3C, 3D, 3E and 3F

Soil samples collected will be submitted to an off-site laboratory for analysis to determine the concentration of the naturally occurring radionuclides present in both the background soils as well as the soils in the areas of interest.

1.1 Site History and Contaminants

1.1.1 Site History

In 1974 the Atomic Energy Commission (AEC) granted a license (license number STE-8179) to Engelhard Minerals & Chemicals to package and ship a strategic stockpile of monazite sand from the Site. This sand was reportedly shipped to Holland in 1974. In January 2000, the U.S. Nuclear Regulatory Commission (NRC) found residual monazite sand during a confirmatory survey of the previous AEC decommissioning of the Site. The NRC found elevated areas of gamma activity on the north side of the former monazite sand storage area along the fence near the Defense Reutilization and Marketing Office (DRMO) facility. In the spring of 2000, CABRERA Services, Inc. (CABRERA) performed a detailed site characterization that confirmed the NRC findings and identified several other areas of elevated concentrations of thorium-232 (^{232}Th). The final characterization report identified a monazite sand area of concern approximately 90,000 square meters in the tank farm area of the Site. The contractor also found a radium-containing device at the base of a large dirt pile in the northwest corner of the site. In the fall 2003, CABRERA remediated the large soil pile and the North fence area. As part of this effort, CABRERA collected some additional depth characterization data.

In the fall 2004, CABRERA performed an at depth characterization of the remainder of the site, with results published in a technical memorandum. It was estimated that an additional 1,526 cubic yards of material required remediation. As part of Phase III and Phase IV, CABRERA performed remediation in the North Fence Area, Recreation Area and Central Tank area of the monazite storage area. Final Status surveys by CABRERA and scoping surveys completed by the NRC showed additional areas of contamination above the current Derived Concentration Guideline Limit (DCGL) of 1 picocurie per gram (pCi/g) above background. These include some areas at the boundary of the original footprint remediated under Phase IV at a greater depth than anticipated, also a larger areal extent than previously identified. Additionally, the NRC identified contamination at the headwall of a drainage pipe that empties into Skokie ditch. The headwall is east of the site with the ditch running north and south in the area. Contamination detected in this area is 20 pCi/g.

In the form of a Public Private Venture (PPV), Forest City LLC is conducting renovation and development of the Forrestal Village housing area. This program will develop housing available on a priority basis to Navy personnel but also to the public. As part of this program, MACTEC conducted radiological screening surveys in the proposed area of the PPV. MACTEC found six areas with elevated thorium contamination. One of these areas also shows radium contamination (MACTEC, 2006).

1.1.2 Radiological Contaminants of Potential Concern

The radiological contaminants of potential concern (RCOPCs) associated with monazite sand are natural thorium and natural uranium. Since the monazite sand was stored in its natural, unprocessed form at the Site, the decay products associated with natural thorium and natural uranium remain in the same concentrations as would be found in locations where these sands occur in nature. Therefore, the decay or daughter products for both natural thorium and natural uranium would remain in secular equilibrium with the parent radionuclides.

The parent radionuclide in the natural thorium decay chain, ^{232}Th, and the parent radionuclides in the two decay chains that comprise natural uranium, uranium-238 (^{238}U) and uranium-235 (^{235}U), emit alpha particles. The daughter products in the natural thorium and natural uranium decay

chains decay by emission of alpha or beta particles, some with accompanying emission of gamma rays. The decay schemes for both natural thorium and the natural uranium decay chains are provided in Figures 1-1, 1-2 and 1-3.

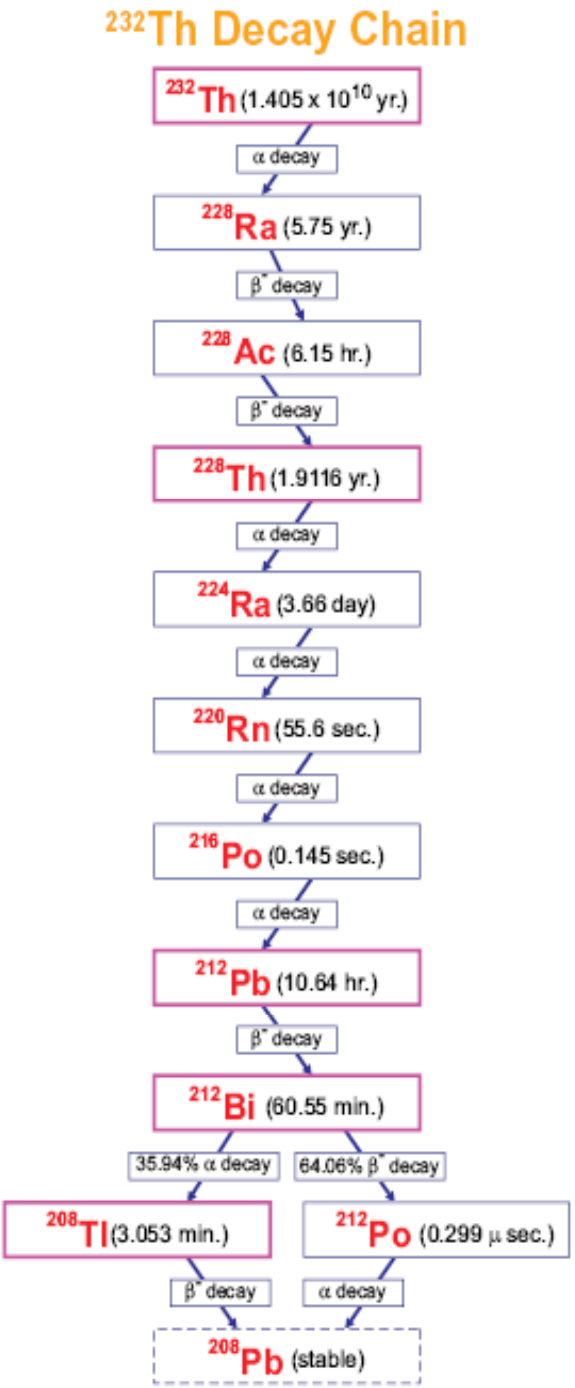

FIGURE 1-1: THORIUM 232 DECAY CHAIN

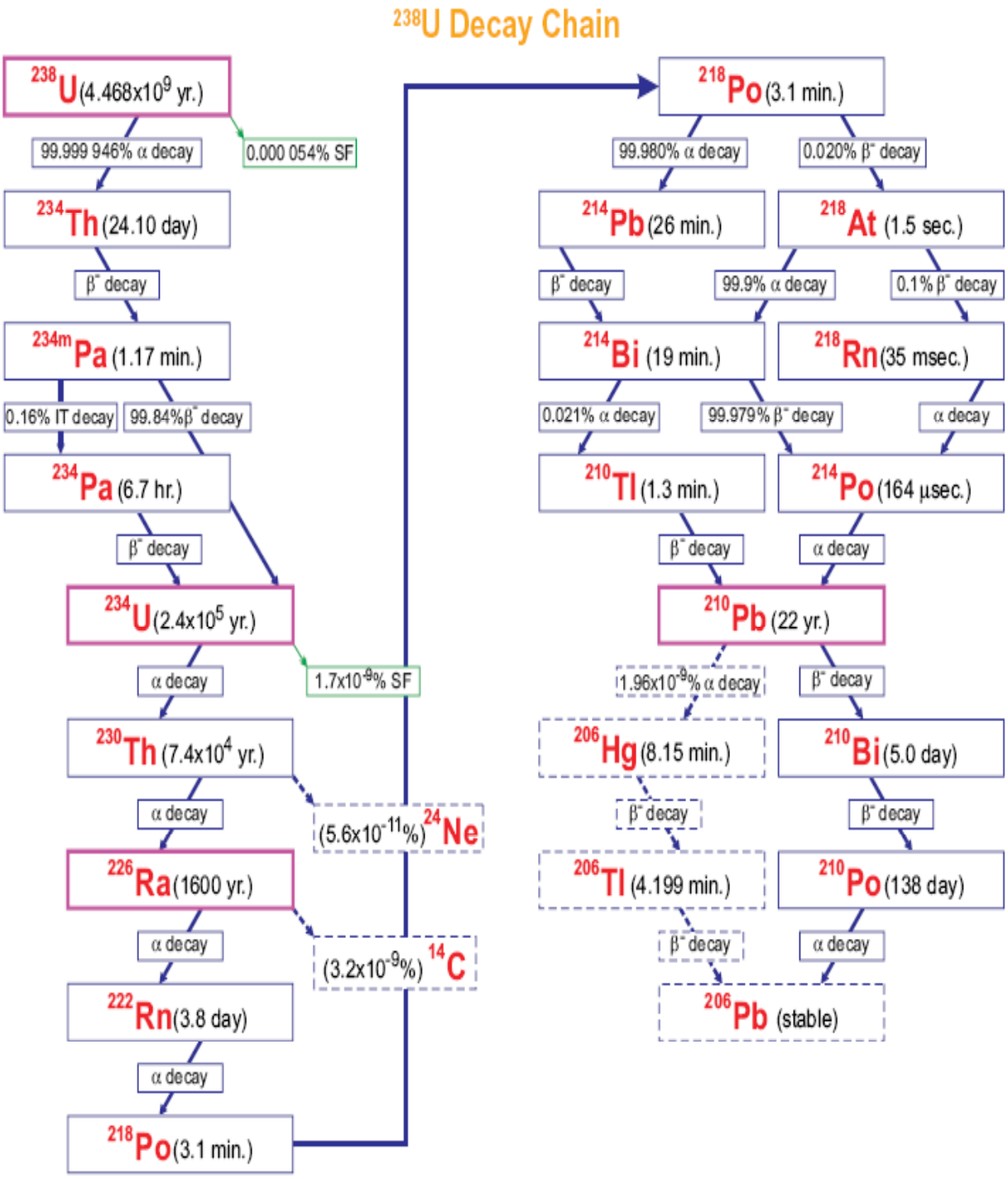

FIGURE 1-2: URANIUM 238 DECAY CHAIN

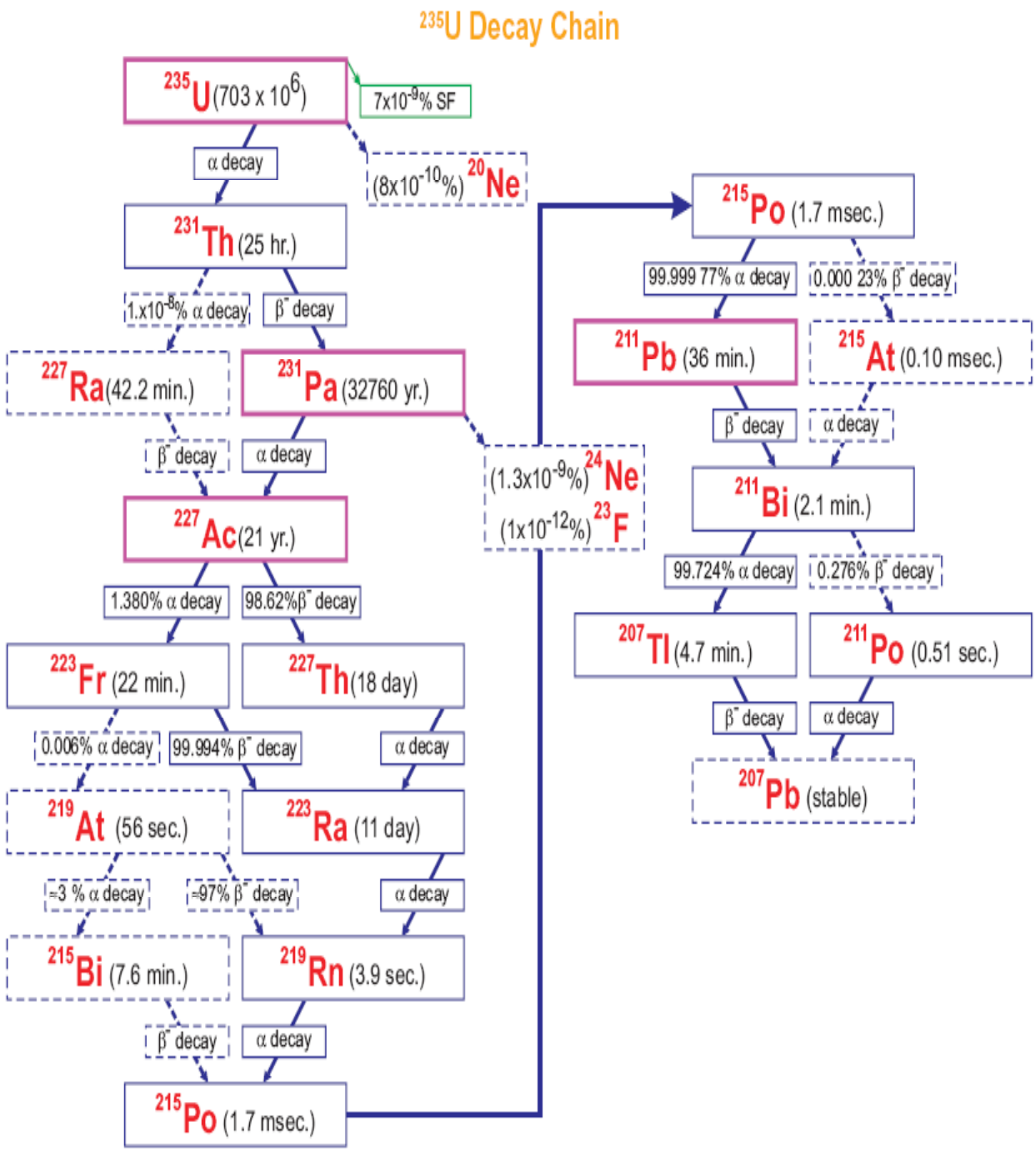

FIGURE 1-3: URANIUM 235 DECAY CHAIN

1.1.3 Determination of Natural Thorium Ratios[1]

Uranium and thorium are naturally occurring radioactive elements commonly found in very small amounts in rocks, soil, sand, water, plants and animals, including humans. The radioactivity of thorium and uranium in the environment is typically very low and contributes to low levels of natural background radiation. A higher concentration of natural thorium (^{232}Th) is found in certain sands, such as monazite sand. Table 1-1 provides the specific activity and radiological half-life of ^{232}Th.

TABLE 1-1: THORIUM 232 RADIOLOGICAL INFORMATION

Specific Activity (Ci/g)	Half-life (years)
1.10E-07	1.405E10

Monazite sand also contains a small amount of natural uranium. The three primary uranium isotopes present in natural uranium are ^{238}U, ^{235}U, and ^{234}U. Table 1-2 provides the percentages of the uranium isotopes found in nature, as well as the specific activity and half-lives of the three isotopes of interest.

TABLE 1-2: NATURAL URANIUM RADIOLOGICAL INFORMATION

Radionuclide	Abundance (%)	Specific Activity (Ci/g)	Half-life (years)	Activity per Gram Natural Uranium (µCi/g)
U-238	99.28	3.30E-07	4.47E9	3.28E-1
U-235	0.72	2.10E-06	7.04E8	1.51E-2
U-234	0.0055	6.20E-03	2.44E5	3.41E-1

[1] Throughout this section, natural thorium refers to ^{232}Th and natural uranium refers to the sum of the three uranium radionuclides (^{238}U, ^{235}U, and ^{234}U).

Monazite sand differs from most other environmental media in that it contains much higher concentrations of natural thorium, specifically ^{232}Th. The percentage of ^{232}Th in monazite sand has a range of 3 to 10%. The natural uranium content in the sand is typically much lower, in the range of 0.2 to 0.5 percent. This higher concentration of ^{232}Th compared to natural uranium in monazite sand can be used as a mechanism to screen soil samples to determine if the radioactivity fractions are representative of this material. By comparing the ratio of ^{232}Th to natural uranium, or more simply comparing the ratio of ^{232}Th to ^{238}U, it can be determined whether the contaminants are due to monazite sand or another source of naturally occurring radioactivity.

Tables 1-3 and 1-4 provide examples of the ^{232}Th to natural uranium and ^{232}Th to ^{238}U activity ratios using the range of ^{232}Th and natural uranium abundance percentages provided above for monazite sands.

TABLE 1-3: MONAZITE SAND RADIOACTIVITY RATIOS (10% ^{232}Th, 0.2% NATURAL URANIUM)

Radionuclide	Radionuclide Activity per Gram Monazite Sand (µCi/g)	^{232}Th:Radionuclide Ratio
Natural U	1.4E-03	8:1
U-238	6.5E-04	17:1
Th-232	1.1E-02	1:1

TABLE 1-4: MONAZITE SAND RADIOACTIVITY RATIOS (3% ^{232}Th, 0.5% NATURAL URANIUM)

Radionuclide	Radionuclide Activity per Gram Monazite Sand (µCi/g)	^{232}Th:Radionuclide Ratio
Natural U	3.4E-03	1:1
U-238	1.6E-03	2:1
Th-232	3.3E-03	1:1

For comparison, the average ^{232}Th to ^{238}U activity ratio in soil in the United States is 1:1 and the average ^{232}Th to natural uranium (includes ^{238}U, ^{235}U and ^{234}U) activity ratio is 0.5:1 (NRC, 1994).

The natural radioactivity in coal ash (fly ash) varies significantly (a direct result of the variability in coal). Quoting figures provided by the U.S. Environmental Protection Agency (EPA), a 1993 report states that the concentrations of natural thorium (^{232}Th) and natural uranium in coal ash is 3.2 parts per million (ppm) and 1.3 ppm, respectively (Gabbard, 1993). This equates to 3.2E-06 grams of thorium per gram of ash and 1.3E-06 grams natural uranium per gram of ash, resulting in a ^{232}Th to ^{238}U activity ratio of 0.8:1 and a ^{232}Th to natural uranium activity ratio of 0.4:1. The United States Geological Survey (USGS) states that the concentration of thorium and natural uranium in coal is approximately equal (USGS, 1997). This report also indicates that the thorium and natural uranium concentrations in coal ash, although increased by a factor of ten from the concentrations in coal, are similar. This results in a ^{232}Th to ^{238}U activity ratio of 0.3:1 and a ^{232}Th to natural uranium activity ratio of 0.2:1. The NRC reports that the natural uranium concentration in coal ash exceeds the ^{232}Th concentration by a factor of two to three (NRC,

2001). The U.S. Department of Energy (DOE) also reports that the natural uranium concentration in coal ash exceeds the ^{232}Th concentration by a factor of three (DOE, 1996). To summarize the information provided in these reports, the uranium radioactivity in coal ash exceeds that of ^{232}Th which results in activity ratios less than 1.

Additionally, many building materials may exhibit higher concentrations of naturally occurring radioactivity and these concentrations may vary greatly. For example, concrete contains natural thorium and natural uranium primarily due to the aggregate used in the concrete, of which sand is a primary component. The average ^{232}Th to ^{238}U activity ratio in concrete used in the Chicago, IL area is 0.4:1, with an average ^{232}Th to natural uranium activity ratio of 0.2:1 (NRC, 1994).

As indicated in the previous paragraphs, the natural thorium and natural uranium concentrations used in the determination of the ratios presented are based on averages. It is important to note that the natural radioactivity in these materials varies greatly within the U.S and around the world. However, the higher ^{232}Th concentration found in monazite sand distinguishes this material from most other environmental media and the ratios of ^{232}Th to ^{238}U and/or ^{232}Th to natural uranium may serve as a useful screening tool to determine if the radioactivity in soil at the Site is due to the presence of monazite sand or the result of other environmental (natural or a byproduct material, such as coal ash) media.

To minimize the impact of the variability of natural radioactivity concentrations in the media of interest (soil), this sampling plan requires collection of surface soil samples from a location within the Site that has no known history of containing monazite sand (reference area). Additional surface soil samples will also be collected from an area of the site known to have contained monazite sand (previously impacted area). These samples will be analyzed for natural thorium and natural uranium to determine the concentrations of the radionuclides of interest, as well as determine the ^{232}Th to ^{238}U and ^{232}Th to natural uranium activity ratios in non-impacted soil and soil samples obtained from a location known to contain monazite sand. The background concentrations of natural thorium and natural uranium in soil samples from the reference area will be used to correct the concentrations of these radionuclides in soil samples from the remaining six (6) areas of interest, as well as generate activity ratios of natural thorium to natural

uranium in native, non-impacted soil. This information will then be used to select an appropriate ratio threshold, above which can be concluded that the concentrations of natural radioactivity in soil is likely due to the presence of monazite sand or the result of these same radionuclides of concern in other environmental media.

Care must be exercised when evaluating soil sample results and resulting radioactivity ratios. This approach assumes the contaminant is homogenously distributed within the volume of soil sampled. Although a high ^{232}Th to ^{238}U or ^{232}Th to natural uranium activity ratio does provide reasonable assurance the contaminants are the result of monazite sand, low ratios need to be examined. For example, a low ratio may be the result of monazite sand deposited in a thin layer, with activity ratios more indicative of soil rather than monazite sand (resulting from dilution in the sample). This may be resolved by a simple visual examination of the soil sample as it's obtained, with examination results recorded in the field log book for each sample for future reference, if needed.

Following collection of samples and evaluation of analytical data, other methods for differentiating monazite sand from other sources may be proposed, if appropriate. These additional methods, if any, as well as the results of the soil sampling effort, activity ratio determination, conclusions and recommendations will be discussed in the sampling report provided by CABRERA.

2.0 CABRERA PROJECT ORGANIZATION AND RESPONSIBILITIES

The CABRERA Services, Inc. project organization with key responsibilities for each key position is presented below. Contact information is provided in Table 2-1.

- **CABRERA Managing Principal** – Dave Watters is responsible for overall project objectives, scope, budget, and quality of submittals. He will ensure that adequate corporate resources are made available to the Project Manager. Mr. Watters will also provide senior technical review and support.
- **CABRERA Project Manager** – John Eberlin is responsible for planning, coordinating, integrating, monitoring, and managing project activities. He is also responsible for day-to-day management and monitoring of the project budget, schedule, and scope. He will work with the CABRERA Quality Assurance Coordinator to ensure procedural compliance for all tasks. Mr. Eberlin is CABRERA'S primary point of contact (POC).
- **Corporate Health and Safety Manager (CHSM)** - Paul Schwartz is a Certified Industrial Hygienist and Certified Safety Professional. He is responsible for the development and overall implementation of the Site Safety and Health Plan (SSHP) (Cabrera, 2006), in accordance with CABRERA's Corporate Health and Safety Program and JMC's safety protocol. He is also responsible for implementing any appropriate medical monitoring programs for this project.
- **Corporate Radiation Safety Manager (CRSM)** - Henry Siegrist is responsible for the overall implementation of the SSHP with regard to radiological issues. He is also responsible for the implementation of CABRERA's Corporate Radiation Protection Program. He will work closely with the CHSM to ensure the adequacy and appropriateness of radiation safety measures during field activities.
- **Quality Assurance Coordinator** – Kim Nelson is the Quality Assurance Coordinator (QAC) for this project and is responsible for the overall implementation of quality control (QC) measures in sampling plan design and sampling activities, including the planning documents and the accuracy and precision of field-generated data.
- **Site Radiation Safety Manager (SRSM)** – The SRSM (TBD) is responsible for supervising all radiation safety and other safety protocols on this project. He/she is responsible for field implementation of any medical monitoring programs under the direction of the CHSM. He/she is also responsible for the calibration and operation of radiological safety monitoring equipment. He will work in concert with the CRSM, Project Health Physicist, and CHSM to

ensure that field activities are conducted in accordance with project plans and applicable procedures and regulations.

- **Field Site Manager** - The Field Site Manager (TBD) is responsible for organization, scheduling, and implementation of field activities for this project. He/she will be in frequent communication with the Project Manager and will be the Contractor's primary onsite POC for other Project Team personnel. He/she will be responsible for the activities of field sampling personnel, as well as working with other team members with Quality Assurance (QA) responsibility to ensure that all field activities are completed in a safe and efficient manner, in accordance with applicable procedures.
- **Project Health Physicist** – The project health physicist is responsible for all radiological field activities and has authority to direct such activities, to stop and restart work if necessary, and to take appropriate actions, as required, to address radiological emergency situations. He will work directly with the Field Site Manager, the CRSM, and the SRSM to ensure that radiological sampling procedures are properly implemented and followed.

TABLE 2-1: CABRERA CONTACT INFORMATION

Title	Name	Phone Number	E-mail address
Managing Principal	Dave Watters	860.569.0095	dwatters@cabreraservices.com
Project Manager	John Eberlin	314.703.6784	jeberlin@cabreraservices.com
Corporate H&S Manager	Paul Schwartz	860.569.0095	pschwartz@cabreraservices.com
Corporate Radiation Safety Manager	Henry Siegrist	860.569.0095	hsiegrist@cabreraservices.com
Quality Assurance Coordinator	Kim Nelson	410.332.8177	knelson@cabreraservices.com
Project Health Physicist	Mike Lambert	443.404.1687	mwljm@aol.com

3.0 SAMPLING DESIGN

The design of this sampling plan incorporates the methods and locations for the performance of sampling and direct measurements in order to assess the nature and extent of RCOPCs.

3.1 Sampling Tasks

Sampling and analysis will be performed to measure and quantify the RCOPCs present at the specified areas within the Site. Sampling and analysis of these media will provide the quantification of natural radioactivity in the media, used to determine the likely source of the contaminants (monazite sand or other) and the concentrations present. The sampling and analysis will include the following activities.

3.1.1 Task 1 - Mobilization

Mobilization includes preparation, travel to the site, and establishment of onsite support facilities, as necessary, for soil sample collection and analysis.

3.1.2 Task 2 – Sampling Activities

Soil sampling will be performed in a background reference area, an area known to contain (or previously contained) monazite sand, and six (6) areas of interest at the Site.

3.1.3 Task 3 – Investigation-Derived Waste Management/Disposal

This task involves packaging, removal, disposal, and general management of any investigation-derived waste generated during the sampling process, typically generated as a result of decontaminating sampling equipment prior to sampling and at the conclusion of all sampling.

3.1.4 Task 4 - Sampling Results

The results of the sampling effort will be compiled and presented by CABRERA. The sample results will be submitted in the form of a sampling report for this task. The report will detail the amount, type, and location of RCOPC found during the field effort, the likely source of the contaminants (monazite sand or other source), and the rationale for the decision.

3.2 Rationale

The sampling effort is intended to identify the concentrations of naturally occurring radioactivity in soil at the Site, specific to the locations in the following sections, and evaluate these concentrations to provide reasonable conclusions regarding the probable source of the contaminants (monazite sand or other source).

This sampling plan provides for:

- Determination of the concentrations of natural radioactivity (natural thorium and natural uranium) in soil from non-impacted areas of the Great Lakes Naval Station (reference area background concentrations),
- Sufficient data to establish activity ratios for ^{232}Th to ^{238}U and ^{232}Th to natural uranium to select an appropriate activity ratio threshold above which the source can be concluded to be monazite sand,
- Analysis of soil samples obtained from an area of the Site known to contain or have previously contained monazite sand to verify appropriate selection of the threshold activity ratio(s); and
- Collection and analysis of soil samples from the six (6) areas of interest and comparison of the analysis results, including activity ratios to the activity ratio threshold established to determine the probable source of contaminants (monazite sand or other source).

4.0 FIELD ACTIVITIES

Field sampling activities will be performed within the Site areas specified in the following sections. Surface soil samples from the six (6) PPV areas of interest will be collected at biased locations identified from previous survey efforts. Surface soil samples will typically be collected by hand.

4.1 Reference Background Area

The existing Reference Area used during the Area 18 remediation will be used for this study. Five (5) surface soil samples (0 to 30 centimeters below ground surface) will be obtained from the reference area collected from random locations selected by the sampling team. These locations should be selected from portions of the area that are relatively flat. Locations that should be avoided include lower portions of downward sloping soil, as well as ditches and the base of creek banks where contaminants typically concentrate.

4.2 Known Monazite Sand Contaminated Area

Monazite sand was previously stored at a location in the northwestern section of the Site (Area 18). Therefore, twenty (20) surface soil samples [0 to 30 centimeters below ground surface (bgs)] will be obtained from this area, collected from locations selected by the sampling team. The sampling team may use handheld radiological instrumentation to identify locations within this area that exhibit elevated radioactivity for selection of biased sample locations.

4.3 Six Areas of Interest (PPV Areas)

4.3.1 Area 3A

This area is in the vicinity of a 4 unit housing complex. The radiological contour map generated from a previous survey indicates two areas of elevated radioactivity in soil (refer to Figure 4-1), one area of approximately 200 square meters (m^2) on the north side of the housing unit and a smaller area of approximately 100 m^2 on the east side of the same housing unit, in the vicinity of a carport. Five (5) surface soil samples will be collected from these two locations in Area 3A. Locations may be selected using the five highest survey locations previously identified.

4.3.2 Area 3B

This area is in the vicinity of a ball field. The radiological contour map generated from a previous survey indicates a large area of approximately 1500 m^2 with elevated radioactivity in

soil (refer to Figure 4-1). The most significant radioactivity was found on the northwest side of the ball field in an area where a creek borders the survey area. Five (5) surface soil samples will be collected from Area 3B. Locations may be selected using the five highest survey locations previously identified.

4.3.3 Area 3C

This area is on the east and west sides of Great Lakes Drive. The radiological contour map generated from a previous survey indicates three (3) locations of elevated radioactivity on the west side of Great Lakes Drive, between the pavement and sidewalk (refer to Figure 4-1). Collectively, these areas cover approximately 100 m^2. A second, smaller area of elevated radioactivity, approximately 25 m^2, is found on the east side of the street. Five (5) surface soil samples will be collected from the three (3) locations of elevated radioactivity in Area 3C. Locations may be selected using the five highest survey locations previously identified.

4.3.4 Area 3D

This is an area surrounding a duplex housing unit. The radiological contour map generated from a previous survey indicates an area of elevated radioactivity exists on the southwest side of the structure, approximately 50 m^2 in size (refer to Figure 4-1). Five (5) surface soil samples will be collected from the location of elevated radioactivity in Area 3D. Locations may be selected using the five highest survey locations previously identified.

4.3.5 Area 3E

This area is in the southeast corner of the housing area property boundary. The radiological contour map generated from a previous survey indicates an area of elevated radioactivity, approximately 200 m^2 in size, exists on the downward slope of this area (refer to Figure 4-1). Five (5) surface soil samples will be collected from the location of elevated radioactivity in Area 3E. Locations may be selected using the five highest survey locations previously identified.

4.3.6 Area 3F

This area is on the west side of a creek, south of the area identified in Area 3B. The radiological contour map generated from a previous survey indicates this area of elevated radioactivity covers approximately 400 m^2 (refer to Figure 4-1). Five (5) surface soil samples will be collected from the location of elevated radioactivity in Area 3F. Locations may be selected using the five highest survey locations previously identified.

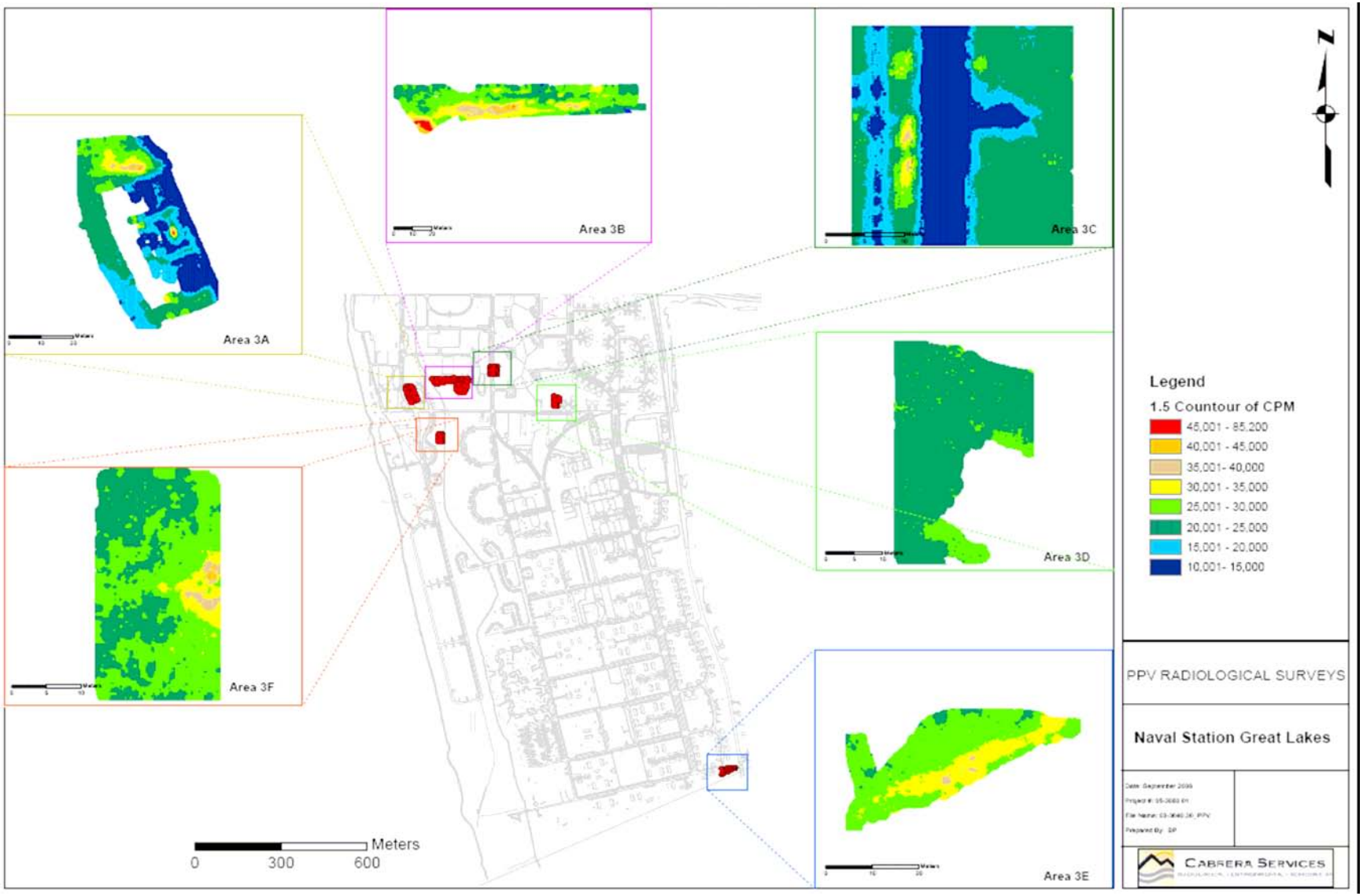

FIGURE 4-1: PPV AREAS OF INTEREST

5.0 SAMPLING PROTOCOL

The purpose of this section is to describe sampling methodologies to be used for surface soil sample collection. Specific sampling requirements are discussed in Section 4.0. Discrete surface soil sampling and offsite laboratory analyses will be performed to measure radioactivity concentrations of RCOPCs in surface soil. Soil sampling equipment will be decontaminated and/or surveyed to minimize cross-contamination of samples.

5.1 Volumetric Sample Collection and Analysis

Volumetric samples of soil will be collected and analyzed at an off-site laboratory. During the collection of soil samples, large twigs, stones and other similar items will be removed. Chain of custody (COC) forms will be maintained in accordance with CABRERA SOPs.

5.1.1 Volumetric Surface Soil for RCOPCs

Surface soil samples will be collected from 0 to 30 centimeters bgs. The following equipment (or equivalent) will be required for this task.

- Hand auger, hand trowel or other proper sampling method;
- Large stainless steel mixing bowl;
- Stainless steel utensil for removal of soil core from soil core rod or hand auger after sample is retrieved and for mixing and packaging samples in containers;
- Sample containers and COC forms/seals.

Sample results will be used to quantify surface soil contaminant concentrations at discrete locations. All surface soil samples will be analyzed for RCOPCs at an off-site laboratory. At approximately 5% of all sample locations, CABRERA will collect duplicate samples for QC considerations.

A minimum of 750 grams of soil will be obtained for each discrete sample. Personnel collecting samples will ensure each sample is placed into a clean, unused container. For each related batch of samples, a sample COC form will be filled out. The samples will be either individually listed or batch listed (by chain of custody form number) in the Project Logbook. Samples awaiting shipment to the contract offsite laboratory will be stored in a designated, secure location.

Soil samples will be prepared and packaged to meet laboratory requirements and, if Class 7 radioactive material, to meet U.S. Department of Transportation (DOT) regulations for transportation.

Soil samples will be analyzed by an off-site laboratory via alpha spectroscopy using an industry standard analytical method, e.g. HASL-300, or equivalent. Analytical parameters shall be sufficient to achieve a minimum detectable concentration (MDC) of 0.5 pCi/g or less.

5.2 Sample Chain of Custody/Documentation

5.2.1 Field Log

Project data will be recorded in a Field Data Logbook (or other equivalent method of data record) and subsequently transferred to an electronic format. Field Data Logbook records will be sufficient to allow data transactions to be reconstructed after the project is completed. The CABRERA project manager (PM), or designee, is responsible to ensure logbook(s) entries are completed appropriately. The CABRERA designee will review the Project Logbook periodically and will report significant issues to the CABRERA PM.

Field Data Logbooks will be permanently bound and the pages will be numbered. Pages may not be removed from logbooks under any circumstances. All entries are to be made in blue or black ink. Entries will be legible, factual, detailed, and complete and should be signed and dated by the individual(s) making the entries. If a mistake is made, the error will be denoted by placing a single line through the erroneous entry and initialing the deletion. Under no circumstances will any previously entered information be completely obliterated. Use of whiteout in data logbooks is not permitted for any reason.

5.2.2 Sample Documentation

When samples are collected for radiological analysis, documentation such as sample labels, COC forms (if they are to be sent offsite for analysis), and field logbooks will be completed. This information enables the maintenance of sample integrity from the time of the sample collection through transport to the laboratory. All documentation will be completed with indelible ink.

5.2.2.1 Sample Labels and/or Tags

Sample labels should include the following items:

- Client name
- Project name
- Sample location
- Date/time
- Sample collector
- Sample identification
- Preservation
- Analyses requested

5.2.2.2 Chain of Custody Records

A COC form will be completed and will accompany the samples being sent offsite. The following information should be provided on the COC:

- Site name
- Laboratory name and contact.
- Turnaround time (only if site-specific conditions require non-standard turnaround time).
- Sample ID, matrix, sample date, and collection time.
- Parameters, analytical methods, bottle type, bottle volume, sample type, and preservative.
- Signed release on bottom of COC.

5.2.2.3 Receipt for Sample Forms

The analytical services laboratories should analyze the condition of the samples upon receipt. This information will be recorded on a form. The form will include the date, client's name, cooler number, temperature of samples, etc. The laboratory sample custodian or manager will sign and date the form. The form should be returned to the Project Manager with the results package for each laboratory work order.

5.3 Sample Packaging and Shipping

5.3.1 Sample Handling

The Field Site Manager will arrange for delivery of all coolers, labels, and sample containers prior to conducting field sampling activities. Sample containers will be labeled using preprinted labels. The labels should include the project name and number, unique sample ID, sample date and time of collection, sample procedure (i.e., composite, grab), preservative used, analysis requested, and sampler's initials. All samples should be screened to determine if the

concentration and total activity in a conveyance requires shipment as Class 7 radioactive material. If so, the samples shall be packaged, labeled, if necessary, marked, and transported in accordance with U.S. DOT regulations.

5.3.2 Sample Transport

Samples should be shipped to the laboratory via overnight carrier, or, if possible, the laboratory may arrange for sample pickup at the site. The Field Site Manager will coordinate the transport of samples.

6.0 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) is expected to be minimal as a result of this investigation. IDW will be generated from the use of PPE, disposable sampling equipment, and decontamination fluids during field investigation activities, and possibly from excess soil during sampling activities. IDW will be containerized and staged at the site until sample results are received from the laboratory and the final disposition of the waste is determined. IDW will be stored in Type 7A steel drums placed on pallets (or other standard and appropriate containers). The containers will be labeled with the type and volume of the contents, date, and contact information. Depending on the constituents of concern, fencing or other special marking may be required. The containers will be inspected on a routine basis to ensure that they are properly sealed and intact, and that markings remain clearly visible.

IDW that has not come in contact with significant contamination such as paper towels, and packaging will be collected on an as-needed basis to maintain the site in a clean and orderly manner. This waste will be containerized and transported to a designated collection bin. Acceptable containers will be sealed boxes or plastic garbage bags.

7.0 REFERENCES

(DOE, 1996) *Naturally Occurring and Accelerator Produced Radioactive Material*, U.S. Department of Energy, Office of Environmental Management, dated 1996.

(Gabbard, 1993) Oak Ridge National Laboratory Review, *Coal Combustion: Nuclear Resource or Danger*, report by Mr. Alex Gabbard, dated July, 1993.

(MACTEC, 2006) *Forrestal Village Phased-Approach Radiological Survey Report In Support of the Phase II Environmental Assessment, NAVSTA Great Lakes, Naval Region Midwest Family Housing Privatization*, MACTEC, dated February, 2006.

(NRC, 1994) NUREG-1501, *Background as a Residual Radioactivity Criterion for Decommissioning, Draft Report*, U.S. Nuclear Regulatory Commission, dated August, 1994.

(NRC, 2001) NRC SECY-01-0057, Policy Issue, *Partial Response to SRM COMEXM-00-0002 – "Expansion of NRC Statutory Authority Over Medical Use of Naturally Occurring and Accelerator-Produced Radioactive Material (NARM)"*, U.S. Nuclear Regulatory Commission, dated March, 2001.

(USGS, 1997) *Radioactive Elements in Coal and Fly Ash: Abundance, Forms, and Environmental Significance*, dated October, 1997.

APPENDIX B

FIELD SURVEY SUPPORTING DOCUMENTATION

STL St. Louis Chain-of-Custody Record

13715 Rider Trial North
Earth City, MO 63045
Phone: 314-298-8566 Fax: 314-298-8757

Customer Information		Project Information		Analyses / Method Requested
Project Name	Great Lakes Ash Sampling	Purchase Order	07-279	A. Gamma spectroscopy
STL PM/ Quote#	J090706-01	Work Order	03-3040.30 Task 130	B. Alpha spectroscopy
Company	Cabrera Services, Inc	Bill To	Cabrera Services, Inc	C.
Send Report To:	Greg Bright	Invoice Attn	Accounting	D.
Address:	10 Kearney Road Suite 301	Address:	473 Silver Lane	E. F.
City/State/Zip	Needham/MA/02494	City/State/Zip	East Hartford/CT/06118	G.
Phone	781-455-8787	Phone	860-569-0095	H.
Fax	781-455-7171	Fax	860-569-0277	I.

Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	No. of Baggies	A	B	C	D	E	F	G	H	I	Comments
1	CA-SS-1-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
2	CA-SS-2-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
3	CA-SS-3-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
4	CA-SS-4-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
5	CA-SS-5-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
6	CA-SS-6-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
7	CA-SS-7-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
8	CA-SS-8-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
9	CA-SS-9-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
10	CA-SS-10-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								Please disregard sample times

	Shipment Method: Fed Ex	Airbill No.:	Required Turnaround: 30 days

Relinquished by:	Date 1/5/07	Relinquished by:	Date	Relinquished by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time
Received by:	Date	Received by:	Date	Received by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time

COC # 03-3040.30.01

STL St. Louis Chain-of-Custody Record

13715 Rider Trial North
Earth City, MO 63045
Phone: 314-298-8566 Fax: 314-298-8757

Customer Information		Project Information		Analyses / Method Requested
Project Name	Great Lakes Ash Sampling	Purchase Order	07-279	A. Gamma spectroscopy
STL PM/ Quote#	J090706-01	Work Order	03-3040.30 Task 130	B. Alpha spectroscopy
Company	Cabrera Services, Inc	Bill To	Cabrera Services, Inc	C.
Send Report To:	Greg Bright	Invoice Attn	Accounting	D.
Address:	10 Kearney Road Suite 301	Address:	473 Silver Lane	E. F.
City/State/Zip	Needham/MA/02494	City/State/Zip	East Hartford/CT/06118	G.
Phone	781-455-8787	Phone	860-569-0095	H.
Fax	781-455-7171	Fax	860-569-0277	I.

Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	No. of Baggies	A	B	C	D	E	F	G	H	I	Comments
1	CA-SS-11-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
2	CA-SS-12-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
3	CA-SS-13-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
4	CA-SS-14-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
5	CA-SS-15-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
6	CA-SS-16-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
7	CA-SS-17-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
8	CA-SS-18-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
9	CA-SS-19-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
10	CA-SS-20-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								Please disregard sample times

	Shipment Method: Fed Ex	Airbill No.:	Required Turnaround: 30 days

Relinquished by:	Date 1/5/07	Relinquished by:	Date	Relinquished by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time
Received by:	Date	Received by:	Date	Received by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time

COC # 03-3040.30.02

STL St. Louis Chain-of-Custody Record

13715 Rider Trial North
Earth City, MO 63045
Phone: 314-298-8566 Fax: 314-298-8757

Customer Information		Project Information		Analyses / Method Requested
Project Name	Great Lakes Ash Sampling	Purchase Order	07-279	A. Gamma spectroscopy
STL PM/ Quote#	J090706-01	Work Order	03-3040.30 Task 130	B. Alpha spectroscopy
Company	Cabrera Services, Inc	Bill To	Cabrera Services, Inc	C.
Send Report To:	Greg Bright	Invoice Attn	Accounting	D.
Address:	10 Kearney Road Suite 301	Address:	473 Silver Lane	E. F.
City/State/Zip	Needham/MA/02494	City/State/Zip	East Hartford/CT/06118	G.
Phone	781-455-8787	Phone	860-569-0095	H.
Fax	781-455-7171	Fax	860-569-0277	I.

Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	No. of Baggies	A	B	C	D	E	F	G	H	I	Comments
1	3A-SS-1-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
2	3A-SS-2-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
3	3A-SS-3-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
4	3A-SS-4-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
5	3A-SS-5-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
6	3B-SS-1-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
7	3B-SS-2-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
8	3B-SS-3-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
9	3B-SS-4-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
10	3B-SS-5-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								Please disregard sample times

Shipment Method:	Airbill No.:	Required Turnaround:
Fed Ex		30 days

Relinquished by:	Date 1/5/07	Relinquished by:	Date	Relinquished by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time
Received by:	Date	Received by:	Date	Received by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time

COC # 03-3040.30.03

STL St. Louis Chain-of-Custody Record

13715 Rider Trial North
Earth City, MO 63045
Phone: 314-298-8566 Fax: 314-298-8757

Customer Information		Project Information		Analyses / Method Requested
Project Name	Great Lakes Ash Sampling	Purchase Order	07-279	A. Gamma spectroscopy
STL PM/ Quote#	J090706-01	Work Order	03-3040.30 Task 130	B. Alpha spectroscopy
Company	Cabrera Services, Inc	Bill To	Cabrera Services, Inc	C.
Send Report To:	Greg Bright	Invoice Attn	Accounting	D.
Address:	10 Kearney Road Suite 301	Address:	473 Silver Lane	E. F.
City/State/Zip	Needham/MA/02494	City/State/Zip	East Hartford/CT/06118	G.
Phone	781-455-8787	Phone	860-569-0095	H.
Fax	781-455-7171	Fax	860-569-0277	I.

Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	No. of Baggies	A	B	C	D	E	F	G	H	I	Comments
1	3C-SS-1-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
2	3C-SS-2-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
3	3C-SS-3-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
4	3C-SS-4-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
5	3C-SS-5-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
6	3D-SS-1-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
7	3D-SS-2-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
8	3D-SS-3-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
9	3D-SS-4-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
10	3D-SS-5-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								Please disregard sample times

	Shipment Method: Fed Ex	Airbill No.:	Required Turnaround: 30 days

Relinquished by:	Date 1/5/07	Relinquished by:	Date	Relinquished by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time
Received by:	Date	Received by:	Date	Received by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time

COC # 03-3040.30.04

STL St. Louis Chain-of-Custody Record

13715 Rider Trial North
Earth City, MO 63045
Phone: 314-298-8566 Fax: 314-298-8757

Customer Information		Project Information		Analyses / Method Requested
Project Name	Great Lakes Ash Sampling	Purchase Order	07-279	A. Gamma spectroscopy
STL PM/ Quote#	J090706-01	Work Order	03-3040.30 Task 130	B. Alpha spectroscopy
Company	Cabrera Services, Inc	Bill To	Cabrera Services, Inc	C.
Send Report To:	Greg Bright	Invoice Attn	Accounting	D.
Address:	10 Kearney Road Suite 301	Address:	473 Silver Lane	E. F.
City/State/Zip	Needham/MA/02494	City/State/Zip	East Hartford/CT/06118	G.
Phone	781-455-8787	Phone	860-569-0095	H.
Fax	781-455-7171	Fax	860-569-0277	I.

Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	No. of Baggies	A	B	C	D	E	F	G	H	I	Comments
1	3E-SS-1-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
2	3E-SS-2-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
3	3E-SS-3-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
4	3E-SS-4-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
5	3E-SS-5-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
6	3F-SS-1-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
7	3F-SS-2-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
8	3F-SS-3-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
9	3F-SS-4-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
10	3F-SS-5-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								Please disregard sample times

Shipment Method:	Airbill No.:	Required Turnaround:
Fed Ex		30 days

Relinquished by:	Date 1/5/07	Relinquished by:	Date	Relinquished by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time
Received by:	Date	Received by:	Date	Received by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time

COC # 03-3040.30.05

STL St. Louis Chain-of-Custody Record

13715 Rider Trial North
Earth City, MO 63045
Phone: 314-298-8566 Fax: 314-298-8757

Customer Information		Project Information		Analyses / Method Requested
Project Name	Great Lakes Ash Sampling	Purchase Order	07-279	A. Gamma spectroscopy
STL PM/ Quote#	J090706-01	Work Order	03-3040.30 Task 130	B. Alpha spectroscopy
Company	Cabrera Services, Inc	Bill To	Cabrera Services, Inc	C.
Send Report To:	Greg Bright	Invoice Attn	Accounting	D.
Address:	10 Kearney Road Suite 301	Address:	473 Silver Lane	E. F.
City/State/Zip	Needham/MA/02494	City/State/Zip	East Hartford/CT/06118	G.
Phone	781-455-8787	Phone	860-569-0095	H.
Fax	781-455-7171	Fax	860-569-0277	I.

Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	No. of Baggies	A	B	C	D	E	F	G	H	I	Comments
1	RA-SS-1-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
2	RA-SS-2-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
3	RA-SS-3-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
4	RA-SS-4-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
5	RA-SS-5-0	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
6	3C-SS-1-1	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
7	3F-SS-2-1	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
8	CA-SS-20-1	N/A	N/A	soil	ziploc bag	N/A	1	X	X								
9																	
10																	Please disregard sample times

	Shipment Method: Fed Ex	Airbill No.:	Required Turnaround: 30 days

Relinquished by:	Date 1/5/07	Relinquished by:	Date	Relinquished by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time
Received by:	Date	Received by:	Date	Received by:	Date
Company Name:	Time	Company Name:	Time	Company Name:	Time

COC # 03-3040.30.06

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

HORIZONTAL LINE

All-Weather Spiral
No. 393N

Great Lakes Ash Sampling
03-3040.30 Task 130

4 5/8"

CONTENTS

PAGE	REFERENCE	DATE

1/3/07

1:00PM | After picking up equipment @ hotel, Greg, John, and Bob arrive at site and start process of obtaining badges for the week.

2:30PM | Obtain badges and begin QC of instruments and project setup in preparation of sampling on 1/4.

4:00PM | Greg and Bob finish up QC and leave site. John goes shopping for dispensible supplies for tomorrow's activities.

13) 2054285.2 / 1108338.72
14) 2054356.7 / 1108368.6
15) 2054251.2 / 1108406.8
16) 2054230.2 / 1108407.4
17) 2054236.6 / 1108426.5
18) 2054260.6 / 1108423.2
19) 2054287.6 / 1108385.8

Sample locations were changed late that day when more extensive contamination was found within the "contaminated area." The area is located north and northeast of the woodshop, Bldg 3214. This area has not been remediated yet.

1/4/07

6:30AM | Greg, John + Bob arrive onsite + begin morning QC. Greg + Bob start sampling in reference area.

GPS locs for reference area
N/E

1) 2054877.480 / 1108846.641
2) 2054839.121 / 1108848.462
3) 2054799.447 / 1108848.121
4) 2054756.257 / 1108848.370
5) 2054694.387 / 1108843.993

Remediation Area

1) 2054136.1 / ~~1108838~~ ~~1108390.4~~ 1108397.2
2) 2054209.1 / 1108433.01
3) 2054217.5 / 1108437.43
4) 2054276.5 / 1108416.9
5) 2054284.7 / 110~~8384~~ 8413.0
6) 2054288.0 / 1108399.0
7) 2054232.5 / 1108390.5
8) 2054215.7 / 1108398.9
9) 2054228.8 / 1108361.6
10) 2054249.2 / 1108351.2
11) 2054257.7 / 1108349.6
12) 2054258.1 / 1108340.4

1/5/07

700AM | Bob, John and Greg arrive onsite and begin morning QC and prep for sampling.

730AM | Start sampling, in 3B

1) 626128.1 338067.6
2) 626130.2, 338066.9
3) 626130.8 338066.0
4) 626131.1 338064.5
5) 626132.9 338063.4

3F

1) 625937.7, 338086.7
2) 625935.7, 338086.6
3) 625934.3 338087.3
4) 625931.8 338088.5
5) 625929.0 338088.5

3C

1) 626176.7 338259.3
2) 626177.2 338258.8
3) 626179.5 338259.1
4) 626180.3 338259.5
5) 626181.0 338258.9

3E
1) 624705.1, 339079.1
2) 624705.8 339080.1
3) 624705.9 339080.8
4) 624708.2 339087.5
5) 624709.0 339086.7

3D
1) 626077.0 338471.8 > MACTEC area
2) 626078.0 338472.2
3) 626052.5 338480.8
4) 626052.3 338481.7
5) 626051.3 338482.8

Duplicates
CA-SS-20-1
3C-SS-1-1
3F-SS-2-1

1130AM) Sampling is completed. Dispose of trash and leave site.
1230AM) Go back to hotel after lunch break and check out.
Begin cleaning up equipment and preparing for shipping out samples and equipment.

24

GPS locations for soil samples

Client Area

1. 2054444.4 / 1108959.2
2. 2054449.4 / 1108961.4
3. 2054452.3 / 1108956.8

Area 3A - units in meters

1. 626113.8 / 337975.8
2. 626115.5 / 337975.6
3. 626114.7 / 337974.6
4. 626114.7 / 337977.9

Remediation Area - meters

CA-SS-16-0 626113.0 / 337892.7
CA-SS-17-0 626111.6 / 337891.8
CA-SS-14-0 626107.039 / 337889.4
CA-SS-15-0 626108.6 / 337889.7
CA-SS-13-0 626106.1 / 337891.6
CA-SS-12-0 626106.5 / 337888.5
CA-SS-11-0 626105.6 / 337887.0
CA-SS-10-0 626104.81 337886.6
9 626107.0 337890.0
8 626106.3 337887.2
7 626105.3 337887.9
6 626104.6 337886.7
5 626109.3 337890.8

CA-SS-4-0 626132.2, 337874.1
3 626131.2, 337875.2
2 626134.2, 337840.2
1 626141.2, 337837.1

APPENDIX C

ANALYTICAL RESULTS

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	MATRIX	DATE SAMP	TIME SAMP	DATE ANAL	DATE PREP	SDG NUMBER	ANALYSIS METHOD	CAS NUMBER	COMPOUND NAME
STL St. Louis	F7A080149001	SO	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149001	SO	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149001	SO	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149001	SO	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149001	SO	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149001	SO	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149002	SO	CA-SS-2-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149002	SO	CA-SS-2-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149002	SO	CA-SS-2-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149002	SO	CA-SS-2-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149002	SO	CA-SS-2-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149002	SO	CA-SS-2-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149003	SO	CA-SS-3-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149003	SO	CA-SS-3-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149003	SO	CA-SS-3-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149003	SO	CA-SS-3-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149003	SO	CA-SS-3-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149003	SO	CA-SS-3-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149004	SO	CA-SS-4-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149004	SO	CA-SS-4-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149004	SO	CA-SS-4-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149004	SO	CA-SS-4-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149004	SO	CA-SS-4-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149004	SO	CA-SS-4-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149005	SO	CA-SS-5-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149005	SO	CA-SS-5-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149005	SO	CA-SS-5-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149005	SO	CA-SS-5-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149005	SO	CA-SS-5-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149005	SO	CA-SS-5-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149006	SO	CA-SS-6-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149006	SO	CA-SS-6-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149006	SO	CA-SS-6-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149006REA	SO	CA-SS-6-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149006REA	SO	CA-SS-6-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149006REA	SO	CA-SS-6-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149006XREA	DUP	CA-SS-6-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149006XREA	DUP	CA-SS-6-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149006XREA	DUP	CA-SS-6-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149007	SO	CA-SS-7-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149007	SO	CA-SS-7-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149007	SO	CA-SS-7-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149007	SO	CA-SS-7-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149007	SO	CA-SS-7-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	UNITS	RESULT	QUALIFIERS	TOTAL UNCERTAINTY	RPT LIMIT/MDC	DIL FACTOR	LTYPE	BATCH ID	PCT SOLID	TCLP EXT DATE	SPIKE AMOUNT	PERCENT RECOVERY	CONTROL LIMITS	RPD	RPD LIMIT
STL St. Louis	F7A080149001	SO	CA-SS-1-0	pCi/g	1.02		0.22	0.04	1		7011300	100						
STL St. Louis	F7A080149001	SO	CA-SS-1-0	pCi/g	1.27		0.26	0.03	1		7011300	100						
STL St. Louis	F7A080149001	SO	CA-SS-1-0	pCi/g	0.8		0.18	0.03	1		7011300	100						
STL St. Louis	F7A080149001	SO	CA-SS-1-0	pCi/g	0.77		0.17	0.03	1		7011301	100						
STL St. Louis	F7A080149001	SO	CA-SS-1-0	pCi/g	0.043	J	0.036	0.034	1		7011301	100						
STL St. Louis	F7A080149001	SO	CA-SS-1-0	pCi/g	0.98		0.2	0.02	1		7011301	100						
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	pCi/g	0.91		0.21	0.06	1		7011300	100					12	40
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	pCi/g	1.16		0.25	0.04	1		7011300	100					9	40
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	pCi/g	0.96		0.22	0.03	1		7011300	100					19	40
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	pCi/g	0.79		0.18	0.03	1		7011301	100					2	
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	pCi/g	0.033	J	0.033	0.018	1		7011301	100					27	
STL St. Louis	F7A080149001X	DUP	CA-SS-1-0	pCi/g	0.91		0.2	0.03	1		7011301	100					7	40
STL St. Louis	F7A080149002	SO	CA-SS-2-0	pCi/g	1.22		0.25	0.06	1		7011300	100						
STL St. Louis	F7A080149002	SO	CA-SS-2-0	pCi/g	1.33		0.27	0.03	1		7011300	100						
STL St. Louis	F7A080149002	SO	CA-SS-2-0	pCi/g	1.34		0.27	0.03	1		7011300	100						
STL St. Louis	F7A080149002	SO	CA-SS-2-0	pCi/g	0.99		0.21	0.02	1		7011301	100						
STL St. Louis	F7A080149002	SO	CA-SS-2-0	pCi/g	0.083	J	0.049	0.028	1		7011301	100						
STL St. Louis	F7A080149002	SO	CA-SS-2-0	pCi/g	0.97		0.2	0.02	1		7011301	100						
STL St. Louis	F7A080149003	SO	CA-SS-3-0	pCi/g	1.32		0.38	0.11	1		7011300	100						
STL St. Louis	F7A080149003	SO	CA-SS-3-0	pCi/g	1.4		0.4	0.07	1		7011300	100						
STL St. Louis	F7A080149003	SO	CA-SS-3-0	pCi/g	1.39		0.4	0.07	1		7011300	100						
STL St. Louis	F7A080149003	SO	CA-SS-3-0	pCi/g	0.94		0.2	0.03	1		7011301	100						
STL St. Louis	F7A080149003	SO	CA-SS-3-0	pCi/g	0.02	J	0.027	0.018	1		7011301	100						
STL St. Louis	F7A080149003	SO	CA-SS-3-0	pCi/g	1.05		0.22	0.03	1		7011301	100						
STL St. Louis	F7A080149004	SO	CA-SS-4-0	pCi/g	0.78		0.26	0.12	1		7011300	100						
STL St. Louis	F7A080149004	SO	CA-SS-4-0	pCi/g	0.49		0.18	0.06	1		7011300	100						
STL St. Louis	F7A080149004	SO	CA-SS-4-0	pCi/g	0.8		0.25	0.07	1		7011300	100						
STL St. Louis	F7A080149004	SO	CA-SS-4-0	pCi/g	0.48		0.13	0.04	1		7011301	100						
STL St. Louis	F7A080149004	SO	CA-SS-4-0	pCi/g	0.038	J	0.034	0.033	1		7011301	100						
STL St. Louis	F7A080149004	SO	CA-SS-4-0	pCi/g	0.51		0.13	0.01	1		7011301	100						
STL St. Louis	F7A080149005	SO	CA-SS-5-0	pCi/g	0.9		0.25	0.07	1		7011300	100						
STL St. Louis	F7A080149005	SO	CA-SS-5-0	pCi/g	0.8		0.23	0.06	1		7011300	100						
STL St. Louis	F7A080149005	SO	CA-SS-5-0	pCi/g	0.73		0.21	0.05	1		7011300	100						
STL St. Louis	F7A080149005	SO	CA-SS-5-0	pCi/g	0.68		0.16	0.04	1		7011301	100						
STL St. Louis	F7A080149005	SO	CA-SS-5-0	pCi/g	0.058	J	0.042	0.018	1		7011301	100						
STL St. Louis	F7A080149005	SO	CA-SS-5-0	pCi/g	0.74		0.17	0.03	1		7011301	100						
STL St. Louis	F7A080149006	SO	CA-SS-6-0	pCi/g	0.323		0.093	0.026	1		7011301	100						
STL St. Louis	F7A080149006	SO	CA-SS-6-0	pCi/g	-0	U	0.013	0.025	1		7011301	100						
STL St. Louis	F7A080149006	SO	CA-SS-6-0	pCi/g	0.37		0.1	0.01	1		7011301	100						
STL St. Louis	F7A080149006REA	SO	CA-SS-6-0	pCi/g	0.46		0.13	0.05	1		7019178	100						
STL St. Louis	F7A080149006REA	SO	CA-SS-6-0	pCi/g	0.46		0.13	0.03	1		7019178	100						
STL St. Louis	F7A080149006REA	SO	CA-SS-6-0	pCi/g	0.33		0.1	0.03	1		7019178	100						
STL St. Louis	F7A080149006XREA	DUP	CA-SS-6-0	pCi/g	0.35		0.12	0.06	1		7019178	100					29	40
STL St. Louis	F7A080149006XREA	DUP	CA-SS-6-0	pCi/g	0.45		0.13	0.05	1		7019178	100					2	40
STL St. Louis	F7A080149006XREA	DUP	CA-SS-6-0	pCi/g	0.42		0.12	0.03	1		7019178	100					24	40
STL St. Louis	F7A080149007	SO	CA-SS-7-0	pCi/g	1.21		0.37	0.11	1		7011300	100						
STL St. Louis	F7A080149007	SO	CA-SS-7-0	pCi/g	0.54		0.21	0.06	1		7011300	100						
STL St. Louis	F7A080149007	SO	CA-SS-7-0	pCi/g	0.88		0.29	0.06	1		7011300	100						
STL St. Louis	F7A080149007	SO	CA-SS-7-0	pCi/g	0.37		0.1	0.03	1		7011301	100						
STL St. Louis	F7A080149007	SO	CA-SS-7-0	pCi/g	0.016	U	0.023	0.03	1		7011301	100						

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	MATRIX	DATE SAMP	TIME SAMP	DATE ANAL	DATE PREP	SDG NUMBER	ANALYSIS METHOD	CAS NUMBER	COMPOUND NAME
STL St. Louis	F7A080149007	SO	CA-SS-7-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149008	SO	CA-SS-8-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149008	SO	CA-SS-8-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149008	SO	CA-SS-8-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149008	SO	CA-SS-8-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149008	SO	CA-SS-8-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149008	SO	CA-SS-8-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149009	SO	CA-SS-9-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149009	SO	CA-SS-9-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149009	SO	CA-SS-9-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149009	SO	CA-SS-9-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149009	SO	CA-SS-9-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149009	SO	CA-SS-9-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149010	SO	CA-SS-10-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149010	SO	CA-SS-10-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149010	SO	CA-SS-10-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149010	SO	CA-SS-10-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149010	SO	CA-SS-10-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149010	SO	CA-SS-10-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149011	SO	CA-SS-11-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149011	SO	CA-SS-11-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149011	SO	CA-SS-11-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149011	SO	CA-SS-11-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149011	SO	CA-SS-11-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149011	SO	CA-SS-11-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149012	SO	CA-SS-12-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149012	SO	CA-SS-12-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149012	SO	CA-SS-12-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149012	SO	CA-SS-12-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149012	SO	CA-SS-12-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149012	SO	CA-SS-12-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149013	SO	CA-SS-13-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149013	SO	CA-SS-13-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149013	SO	CA-SS-13-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149013REA	SO	CA-SS-13-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149013REA	SO	CA-SS-13-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149013REA	SO	CA-SS-13-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149014	SO	CA-SS-14-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149014	SO	CA-SS-14-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149014	SO	CA-SS-14-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149014	SO	CA-SS-14-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149014	SO	CA-SS-14-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149014	SO	CA-SS-14-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149015	SO	CA-SS-15-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149015	SO	CA-SS-15-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149015	SO	CA-SS-15-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149015	SO	CA-SS-15-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149015	SO	CA-SS-15-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149015	SO	CA-SS-15-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149016	SO	CA-SS-16-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	UNITS	RESULT	QUALIFIERS	TOTAL UNCERTAINTY	RPT LIMIT/MDC	DILFACTOR	LTYPE	BATCH ID	PCT SOLID	TCLP EXT DATE	SPIKE AMOUNT	PERCENT RECOVERY	CONTROL LIMITS	RPD	RPD LIMIT
STL St. Louis	F7A080149007	SO	CA-SS-7-0	pCi/g	0.44		0.12	0.03	1		7011301	100						
STL St. Louis	F7A080149008	SO	CA-SS-8-0	pCi/g	0.84		0.26	0.1	1		7011300	100						
STL St. Louis	F7A080149008	SO	CA-SS-8-0	pCi/g	0.72		0.23	0.06	1		7011300	100						
STL St. Louis	F7A080149008	SO	CA-SS-8-0	pCi/g	1.01		0.29	0.06	1		7011300	100						
STL St. Louis	F7A080149008	SO	CA-SS-8-0	pCi/g	0.45		0.12	0.04	1		7011301	100						
STL St. Louis	F7A080149008	SO	CA-SS-8-0	pCi/g	0.03	U	0.033	0.037	1		7011301	100						
STL St. Louis	F7A080149008	SO	CA-SS-8-0	pCi/g	0.46		0.12	0.03	1		7011301	100						
STL St. Louis	F7A080149009	SO	CA-SS-9-0	pCi/g	0.6		0.17	0.05	1		7011300	100						
STL St. Louis	F7A080149009	SO	CA-SS-9-0	pCi/g	0.53		0.15	0.03	1		7011300	100						
STL St. Louis	F7A080149009	SO	CA-SS-9-0	pCi/g	0.49		0.15	0.06	1		7011300	100						
STL St. Louis	F7A080149009	SO	CA-SS-9-0	pCi/g	0.49		0.13	0.03	1		7011301	100						
STL St. Louis	F7A080149009	SO	CA-SS-9-0	pCi/g	0.038	J	0.033	0.028	1		7011301	100						
STL St. Louis	F7A080149009	SO	CA-SS-9-0	pCi/g	0.55		0.14	0.01	1		7011301	100						
STL St. Louis	F7A080149010	SO	CA-SS-10-0	pCi/g	0.39		0.16	0.08	1		7011300	100						
STL St. Louis	F7A080149010	SO	CA-SS-10-0	pCi/g	0.33		0.14	0.07	1		7011300	100						
STL St. Louis	F7A080149010	SO	CA-SS-10-0	pCi/g	0.44		0.17	0.03	1		7011300	100						
STL St. Louis	F7A080149010	SO	CA-SS-10-0	pCi/g	0.36		0.11	0.04	1		7011301	100						
STL St. Louis	F7A080149010	SO	CA-SS-10-0	pCi/g	0.051	J	0.04	0.033	1		7011301	100						
STL St. Louis	F7A080149010	SO	CA-SS-10-0	pCi/g	0.46		0.12	0.04	1		7011301	100						
STL St. Louis	F7A080149011	SO	CA-SS-11-0	pCi/g	0.86		0.23	0.07	1		7011300	100						
STL St. Louis	F7A080149011	SO	CA-SS-11-0	pCi/g	0.5		0.16	0.05	1		7011300	100						
STL St. Louis	F7A080149011	SO	CA-SS-11-0	pCi/g	0.96		0.25	0.04	1		7011300	100						
STL St. Louis	F7A080149011	SO	CA-SS-11-0	pCi/g	0.42		0.11	0.03	1		7011301	100						
STL St. Louis	F7A080149011	SO	CA-SS-11-0	pCi/g	0.043	J	0.033	0.028	1		7011301	100						
STL St. Louis	F7A080149011	SO	CA-SS-11-0	pCi/g	0.5		0.12	0.03	1		7011301	100						
STL St. Louis	F7A080149012	SO	CA-SS-12-0	pCi/g	0.98		0.32	0.12	1		7011300	100						
STL St. Louis	F7A080149012	SO	CA-SS-12-0	pCi/g	0.44		0.18	0.08	1		7011300	100						
STL St. Louis	F7A080149012	SO	CA-SS-12-0	pCi/g	0.97		0.31	0.07	1		7011300	100						
STL St. Louis	F7A080149012	SO	CA-SS-12-0	pCi/g	0.56		0.14	0.03	1		7011301	100						
STL St. Louis	F7A080149012	SO	CA-SS-12-0	pCi/g	0.025	U	0.03	0.034	1		7011301	100						
STL St. Louis	F7A080149012	SO	CA-SS-12-0	pCi/g	0.5		0.13	0.03	1		7011301	100						
STL St. Louis	F7A080149013	SO	CA-SS-13-0	pCi/g	0.53		0.13	0.03	1		7011301	100						
STL St. Louis	F7A080149013	SO	CA-SS-13-0	pCi/g	0.017	U	0.022	0.026	1		7011301	100						
STL St. Louis	F7A080149013	SO	CA-SS-13-0	pCi/g	0.5		0.12	0.03	1		7011301	100						
STL St. Louis	F7A080149013REA	SO	CA-SS-13-0	pCi/g	0.77		0.19	0.06	1		7019178	100						
STL St. Louis	F7A080149013REA	SO	CA-SS-13-0	pCi/g	0.83		0.2	0.04	1		7019178	100						
STL St. Louis	F7A080149013REA	SO	CA-SS-13-0	pCi/g	0.82		0.2	0.03	1		7019178	100						
STL St. Louis	F7A080149014	SO	CA-SS-14-0	pCi/g	2.02		0.54	0.07	1		7011300	100						
STL St. Louis	F7A080149014	SO	CA-SS-14-0	pCi/g	0.73		0.25	0.06	1		7011300	100						
STL St. Louis	F7A080149014	SO	CA-SS-14-0	pCi/g	1.95		0.53	0.08	1		7011300	100						
STL St. Louis	F7A080149014	SO	CA-SS-14-0	pCi/g	0.68		0.16	0.04	1		7011301	100						
STL St. Louis	F7A080149014	SO	CA-SS-14-0	pCi/g	0.018	U	0.023	0.027	1		7011301	100						
STL St. Louis	F7A080149014	SO	CA-SS-14-0	pCi/g	0.7		0.16	0.03	1		7011301	100						
STL St. Louis	F7A080149015	SO	CA-SS-15-0	pCi/g	1.43		0.32	0.11	1		7011300	100						
STL St. Louis	F7A080149015	SO	CA-SS-15-0	pCi/g	0.77		0.2	0.05	1		7011300	100						
STL St. Louis	F7A080149015	SO	CA-SS-15-0	pCi/g	1.32		0.3	0.05	1		7011300	100						
STL St. Louis	F7A080149015	SO	CA-SS-15-0	pCi/g	0.55		0.14	0.02	1		7011301	100						
STL St. Louis	F7A080149015	SO	CA-SS-15-0	pCi/g	0.004	U	0.015	0.031	1		7011301	100						
STL St. Louis	F7A080149015	SO	CA-SS-15-0	pCi/g	0.7		0.16	0.03	1		7011301	100						
STL St. Louis	F7A080149016	SO	CA-SS-16-0	pCi/g	0.5		0.12	0.03	1		7011301	100						

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	MATRIX	DATE SAMP	TIME SAMP	DATE ANAL	DATE PREP	SDG NUMBER	ANALYSIS METHOD	CAS NUMBER	COMPOUND NAME
STL St. Louis	F7A080149016	SO	CA-SS-16-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149016	SO	CA-SS-16-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149016REA	SO	CA-SS-16-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149016REA	SO	CA-SS-16-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149016REA	SO	CA-SS-16-0	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149017	SO	CA-SS-17-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149017	SO	CA-SS-17-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149017	SO	CA-SS-17-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149017	SO	CA-SS-17-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149017	SO	CA-SS-17-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149017	SO	CA-SS-17-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149018	SO	CA-SS-18-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149018	SO	CA-SS-18-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149018	SO	CA-SS-18-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149018	SO	CA-SS-18-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149018	SO	CA-SS-18-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149018	SO	CA-SS-18-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149019	SO	CA-SS-19-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149019	SO	CA-SS-19-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149019	SO	CA-SS-19-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149019	SO	CA-SS-19-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149019	SO	CA-SS-19-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149019	SO	CA-SS-19-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149020	SO	CA-SS-20-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149020	SO	CA-SS-20-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149020	SO	CA-SS-20-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149020	SO	CA-SS-20-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149020	SO	CA-SS-20-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149020	SO	CA-SS-20-0	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149021	SO	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149021	SO	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149021	SO	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149021	SO	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149021	SO	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149021	SO	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149022	SO	3A-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149022	SO	3A-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149022	SO	3A-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149022	SO	3A-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149022	SO	3A-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149022	SO	3A-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149023	SO	3A-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149023	SO	3A-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149023	SO	3A-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	UNITS	RESULT	QUALIFIERS	TOTAL UNCERTAINTY	RPT LIMIT/MDC	DILFACTOR	LTYPE	BATCH ID	PCT SOLID	TCLP EXT DATE	SPIKE AMOUNT	PERCENT RECOVERY	CONTROL LIMITS	RPD	RPD LIMIT
STL St. Louis	F7A080149016	SO	CA-SS-16-0	pCi/g	0.027	U	0.028	0.029	1		7011301	100						
STL St. Louis	F7A080149016	SO	CA-SS-16-0	pCi/g	0.49		0.12	0.01	1		7011301	100						
STL St. Louis	F7A080149016REA	SO	CA-SS-16-0	pCi/g	0.77		0.21	0.04	1		7019178	100						
STL St. Louis	F7A080149016REA	SO	CA-SS-16-0	pCi/g	0.53		0.17	0.05	1		7019178	100						
STL St. Louis	F7A080149016REA	SO	CA-SS-16-0	pCi/g	0.81		0.22	0.04	1		7019178	100						
STL St. Louis	F7A080149017	SO	CA-SS-17-0	pCi/g	1.54		0.37	0.09	1		7011300	100						
STL St. Louis	F7A080149017	SO	CA-SS-17-0	pCi/g	0.61		0.19	0.05	1		7011300	100						
STL St. Louis	F7A080149017	SO	CA-SS-17-0	pCi/g	1.53		0.37	0.04	1		7011300	100						
STL St. Louis	F7A080149017	SO	CA-SS-17-0	pCi/g	0.53		0.13	0.03	1		7011301	100						
STL St. Louis	F7A080149017	SO	CA-SS-17-0	pCi/g	-0	U	0.014	0.027	1		7011301	100						
STL St. Louis	F7A080149017	SO	CA-SS-17-0	pCi/g	0.52		0.13	0.02	1		7011301	100						
STL St. Louis	F7A080149018	SO	CA-SS-18-0	pCi/g	2.58		0.49	0.06	1		7011300	100						
STL St. Louis	F7A080149018	SO	CA-SS-18-0	pCi/g	1.46		0.3	0.04	1		7011300	100						
STL St. Louis	F7A080149018	SO	CA-SS-18-0	pCi/g	2.35		0.45	0.03	1		7011300	100						
STL St. Louis	F7A080149018	SO	CA-SS-18-0	pCi/g	0.88		0.18	0.03	1		7011301	100						
STL St. Louis	F7A080149018	SO	CA-SS-18-0	pCi/g	0.066	J	0.042	0.016	1		7011301	100						
STL St. Louis	F7A080149018	SO	CA-SS-18-0	pCi/g	0.95		0.19	0.02	1		7011301	100						
STL St. Louis	F7A080149019	SO	CA-SS-19-0	pCi/g	2.05		0.4	0.05	1		7011300	100						
STL St. Louis	F7A080149019	SO	CA-SS-19-0	pCi/g	1.4		0.29	0.03	1		7011300	100						
STL St. Louis	F7A080149019	SO	CA-SS-19-0	pCi/g	2.23		0.42	0.03	1		7011300	100						
STL St. Louis	F7A080149019	SO	CA-SS-19-0	pCi/g	1.13		0.23	0.03	1		7011301	100						
STL St. Louis	F7A080149019	SO	CA-SS-19-0	pCi/g	0.03	U	0.031	0.032	1		7011301	100						
STL St. Louis	F7A080149019	SO	CA-SS-19-0	pCi/g	1.05		0.22	0.01	1		7011301	100						
STL St. Louis	F7A080149020	SO	CA-SS-20-0	pCi/g	1.35		0.29	0.07	1		7011300	100						
STL St. Louis	F7A080149020	SO	CA-SS-20-0	pCi/g	1.41		0.3	0.03	1		7011300	100						
STL St. Louis	F7A080149020	SO	CA-SS-20-0	pCi/g	1.33		0.28	0.04	1		7011300	100						
STL St. Louis	F7A080149020	SO	CA-SS-20-0	pCi/g	1.11		0.23	0.02	1		7011301	100						
STL St. Louis	F7A080149020	SO	CA-SS-20-0	pCi/g	0.071	J	0.048	0.019	1		7011301	100						
STL St. Louis	F7A080149020	SO	CA-SS-20-0	pCi/g	1.02		0.22	0.04	1		7011301	100						
STL St. Louis	F7A080149021	SO	3A-SS-1-0	pCi/g	4.19		0.68	0.04	1		7011382	100						
STL St. Louis	F7A080149021	SO	3A-SS-1-0	pCi/g	1.56		0.29	0.03	1		7011382	100						
STL St. Louis	F7A080149021	SO	3A-SS-1-0	pCi/g	4.28		0.69	0.03	1		7011382	100						
STL St. Louis	F7A080149021	SO	3A-SS-1-0	pCi/g	1.22		0.23	0.03	1		7011385	100						
STL St. Louis	F7A080149021	SO	3A-SS-1-0	pCi/g	0.05	J	0.036	0.028	1		7011385	100						
STL St. Louis	F7A080149021	SO	3A-SS-1-0	pCi/g	1.22		0.23	0.01	1		7011385	100						
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	pCi/g	3.8		0.65	0.05	1		7011382	100					10	40
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	pCi/g	1.5		0.29	0.03	1		7011382	100					4	40
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	pCi/g	3.64		0.63	0.03	1		7011382	100					16	40
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	pCi/g	1.35		0.26	0.03	1		7011385	100					10	
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	pCi/g	0.035	J	0.031	0.026	1		7011385	100					34	
STL St. Louis	F7A080149021X	DUP	3A-SS-1-0	pCi/g	1.41		0.27	0.02	1		7011385	100					15	40
STL St. Louis	F7A080149022	SO	3A-SS-2-0	pCi/g	3.09		0.55	0.06	1		7011382	100						
STL St. Louis	F7A080149022	SO	3A-SS-2-0	pCi/g	1.38		0.28	0.03	1		7011382	100						
STL St. Louis	F7A080149022	SO	3A-SS-2-0	pCi/g	2.93		0.52	0.03	1		7011382	100						
STL St. Louis	F7A080149022	SO	3A-SS-2-0	pCi/g	1.2		0.24	0.03	1		7011385	100						
STL St. Louis	F7A080149022	SO	3A-SS-2-0	pCi/g	0.078	J	0.049	0.018	1		7011385	100						
STL St. Louis	F7A080149022	SO	3A-SS-2-0	pCi/g	1.15		0.23	0.03	1		7011385	100						
STL St. Louis	F7A080149023	SO	3A-SS-3-0	pCi/g	3.69		0.63	0.04	1		7011382	100						
STL St. Louis	F7A080149023	SO	3A-SS-3-0	pCi/g	1.68		0.32	0.03	1		7011382	100						
STL St. Louis	F7A080149023	SO	3A-SS-3-0	pCi/g	3.57		0.61	0.03	1		7011382	100						

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	MATRIX	DATE SAMP	TIME SAMP	DATE ANAL	DATE PREP	SDG NUMBER	ANALYSIS METHOD	CAS NUMBER	COMPOUND NAME
STL St. Louis	F7A080149023	SO	3A-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149023	SO	3A-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149023	SO	3A-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149024	SO	3A-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149024	SO	3A-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149024	SO	3A-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149024	SO	3A-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149024	SO	3A-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149024	SO	3A-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149025	SO	3A-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149025	SO	3A-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149025	SO	3A-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149025	SO	3A-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149025	SO	3A-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149025	SO	3A-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149026	SO	3B-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149026	SO	3B-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149026	SO	3B-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149026	SO	3B-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149026	SO	3B-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149026	SO	3B-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149027	SO	3B-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149027	SO	3B-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149027	SO	3B-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149027	SO	3B-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149027	SO	3B-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149027	SO	3B-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149028	SO	3B-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149028	SO	3B-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149028	SO	3B-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149028	SO	3B-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149028	SO	3B-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149028	SO	3B-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149029	SO	3B-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149029	SO	3B-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149029	SO	3B-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149029	SO	3B-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149029	SO	3B-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149029	SO	3B-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149030	SO	3B-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149030	SO	3B-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149030	SO	3B-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149030	SO	3B-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149030	SO	3B-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149030	SO	3B-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149031	SO	3C-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149031	SO	3C-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149031	SO	3C-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149031	SO	3C-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149031	SO	3C-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	UNITS	RESULT	QUALIFIERS	TOTAL UNCERTAINTY	RPT LIMIT/MDC	DILFACTOR	LTYPE	BATCH ID	PCT SOLID	TCLP EXT DATE	SPIKE AMOUNT	PERCENT RECOVERY	CONTROL LIMITS	RPD	RPD LIMIT
STL St. Louis	F7A080149023	SO	3A-SS-3-0	pCi/g	1.01		0.2	0.02	1		7011385	100						
STL St. Louis	F7A080149023	SO	3A-SS-3-0	pCi/g	0.05	J	0.036	0.028	1		7011385	100						
STL St. Louis	F7A080149023	SO	3A-SS-3-0	pCi/g	1.32		0.25	0.01	1		7011385	100						
STL St. Louis	F7A080149024	SO	3A-SS-4-0	pCi/g	4.15		0.7	0.05	1		7011382	100						
STL St. Louis	F7A080149024	SO	3A-SS-4-0	pCi/g	1.61		0.31	0.03	1		7011382	100						
STL St. Louis	F7A080149024	SO	3A-SS-4-0	pCi/g	4.18		0.7	0.03	1		7011382	100						
STL St. Louis	F7A080149024	SO	3A-SS-4-0	pCi/g	1.24		0.24	0.01	1		7011385	100						
STL St. Louis	F7A080149024	SO	3A-SS-4-0	pCi/g	0.03	J	0.03	0.016	1		7011385	100						
STL St. Louis	F7A080149024	SO	3A-SS-4-0	pCi/g	1.34		0.25	0.03	1		7011385	100						
STL St. Louis	F7A080149025	SO	3A-SS-5-0	pCi/g	6.9		1.1	0.04	1		7011382	100						
STL St. Louis	F7A080149025	SO	3A-SS-5-0	pCi/g	1.9		0.36	0.03	1		7011382	100						
STL St. Louis	F7A080149025	SO	3A-SS-5-0	pCi/g	6.7		1.1	0.03	1		7011382	100						
STL St. Louis	F7A080149025	SO	3A-SS-5-0	pCi/g	1.48		0.28	0.02	1		7011385	100						
STL St. Louis	F7A080149025	SO	3A-SS-5-0	pCi/g	0.07	J	0.044	0.03	1		7011385	100						
STL St. Louis	F7A080149025	SO	3A-SS-5-0	pCi/g	1.59		0.29	0.03	1		7011385	100						
STL St. Louis	F7A080149026	SO	3B-SS-1-0	pCi/g	9.9		1.5	0.05	1		7011382	100						
STL St. Louis	F7A080149026	SO	3B-SS-1-0	pCi/g	2.69		0.47	0.03	1		7011382	100						
STL St. Louis	F7A080149026	SO	3B-SS-1-0	pCi/g	9.7		1.5	0.03	1		7011382	100						
STL St. Louis	F7A080149026	SO	3B-SS-1-0	pCi/g	2.25		0.4	0.03	1		7011385	100						
STL St. Louis	F7A080149026	SO	3B-SS-1-0	pCi/g	0.087	J	0.051	0.035	1		7011385	100						
STL St. Louis	F7A080149026	SO	3B-SS-1-0	pCi/g	2.38		0.42	0.02	1		7011385	100						
STL St. Louis	F7A080149027	SO	3B-SS-2-0	pCi/g	7.8		1.2	0.04	1		7011382	100						
STL St. Louis	F7A080149027	SO	3B-SS-2-0	pCi/g	2.14		0.38	0.02	1		7011382	100						
STL St. Louis	F7A080149027	SO	3B-SS-2-0	pCi/g	7.8		1.2	0.02	1		7011382	100						
STL St. Louis	F7A080149027	SO	3B-SS-2-0	pCi/g	2.05		0.37	0.04	1		7011385	100						
STL St. Louis	F7A080149027	SO	3B-SS-2-0	pCi/g	0.182		0.074	0.027	1		7011385	100						
STL St. Louis	F7A080149027	SO	3B-SS-2-0	pCi/g	2.27		0.4	0.01	1		7011385	100						
STL St. Louis	F7A080149028	SO	3B-SS-3-0	pCi/g	6.3		1	0.05	1		7011382	100						
STL St. Louis	F7A080149028	SO	3B-SS-3-0	pCi/g	1.57		0.3	0.03	1		7011382	100						
STL St. Louis	F7A080149028	SO	3B-SS-3-0	pCi/g	6.4		1	0.03	1		7011382	100						
STL St. Louis	F7A080149028	SO	3B-SS-3-0	pCi/g	1.47		0.28	0.02	1		7011385	100						
STL St. Louis	F7A080149028	SO	3B-SS-3-0	pCi/g	0.097	J	0.052	0.031	1		7011385	100						
STL St. Louis	F7A080149028	SO	3B-SS-3-0	pCi/g	1.55		0.29	0.03	1		7011385	100						
STL St. Louis	F7A080149029	SO	3B-SS-4-0	pCi/g	2.63		0.47	0.05	1		7011382	100						
STL St. Louis	F7A080149029	SO	3B-SS-4-0	pCi/g	1.58		0.3	0.04	1		7011382	100						
STL St. Louis	F7A080149029	SO	3B-SS-4-0	pCi/g	2.69		0.48	0.03	1		7011382	100						
STL St. Louis	F7A080149029	SO	3B-SS-4-0	pCi/g	0.97		0.19	0.02	1		7011385	100						
STL St. Louis	F7A080149029	SO	3B-SS-4-0	pCi/g	0.074	J	0.044	0.015	1		7011385	100						
STL St. Louis	F7A080149029	SO	3B-SS-4-0	pCi/g	1.11		0.22	0.02	1		7011385	100						
STL St. Louis	F7A080149030	SO	3B-SS-5-0	pCi/g	7.6		1.2	0.05	1		7011382	100						
STL St. Louis	F7A080149030	SO	3B-SS-5-0	pCi/g	2.25		0.4	0.03	1		7011382	100						
STL St. Louis	F7A080149030	SO	3B-SS-5-0	pCi/g	7.6		1.2	0.02	1		7011382	100						
STL St. Louis	F7A080149030	SO	3B-SS-5-0	pCi/g	2.09		0.38	0.03	1		7011385	100						
STL St. Louis	F7A080149030	SO	3B-SS-5-0	pCi/g	0.132		0.064	0.038	1		7011385	100						
STL St. Louis	F7A080149030	SO	3B-SS-5-0	pCi/g	2.09		0.38	0.03	1		7011385	100						
STL St. Louis	F7A080149031	SO	3C-SS-1-0	pCi/g	8.1		1.3	0.03	1		7011382	100						
STL St. Louis	F7A080149031	SO	3C-SS-1-0	pCi/g	2.08		0.36	0.02	1		7011382	100						
STL St. Louis	F7A080149031	SO	3C-SS-1-0	pCi/g	8.5		1.3	0.02	1		7011382	100						
STL St. Louis	F7A080149031	SO	3C-SS-1-0	pCi/g	1.99		0.38	0.03	1		7011385	100						
STL St. Louis	F7A080149031	SO	3C-SS-1-0	pCi/g	0.168		0.076	0.02	1		7011385	100						

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	MATRIX	DATE SAMP	TIME SAMP	DATE ANAL	DATE PREP	SDG NUMBER	ANALYSIS METHOD	CAS NUMBER	COMPOUND NAME
STL St. Louis	F7A080149031	SO	3C-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149032	SO	3C-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149032	SO	3C-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149032	SO	3C-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149032	SO	3C-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149032	SO	3C-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149032	SO	3C-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149033	SO	3C-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149033	SO	3C-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149033	SO	3C-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149033	SO	3C-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149033	SO	3C-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149033	SO	3C-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149034	SO	3C-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149034	SO	3C-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149034	SO	3C-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149034	SO	3C-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149034	SO	3C-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149034	SO	3C-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149035	SO	3C-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149035	SO	3C-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149035	SO	3C-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149035	SO	3C-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149035	SO	3C-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149035	SO	3C-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149036	SO	3D-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149036	SO	3D-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149036	SO	3D-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149036	SO	3D-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149036	SO	3D-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149036	SO	3D-SS-1-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149037	SO	3D-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149037	SO	3D-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149037	SO	3D-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149037	SO	3D-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149037	SO	3D-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149037	SO	3D-SS-2-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149038	SO	3D-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149038	SO	3D-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149038	SO	3D-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149038	SO	3D-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149038	SO	3D-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149038	SO	3D-SS-3-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149039	SO	3D-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149039	SO	3D-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149039	SO	3D-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149039	SO	3D-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149039	SO	3D-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149039	SO	3D-SS-4-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149040	SO	3D-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	UNITS	RESULT	QUALIFIERS	TOTAL UNCERTAINTY	RPT LIMIT/MDC	DIL FACTOR	LTYPE	BATCH ID	PCT SOLID	TCLP EXT DATE	SPIKE AMOUNT	PERCENT RECOVERY	CONTROL LIMITS	RPD	RPD LIMIT
STL St. Louis	F7A080149031	SO	3C-SS-1-0	pCi/g	2.02		0.38	0.04	1		7011385	100						
STL St. Louis	F7A080149032	SO	3C-SS-2-0	pCi/g	6.5		1	0.04	1		7011382	100						
STL St. Louis	F7A080149032	SO	3C-SS-2-0	pCi/g	1.74		0.31	0.03	1		7011382	100						
STL St. Louis	F7A080149032	SO	3C-SS-2-0	pCi/g	6.32		0.99	0.02	1		7011382	100						
STL St. Louis	F7A080149032	SO	3C-SS-2-0	pCi/g	1.45		0.27	0.02	1		7011385	100						
STL St. Louis	F7A080149032	SO	3C-SS-2-0	pCi/g	0.158		0.067	0.026	1		7011385	100						
STL St. Louis	F7A080149032	SO	3C-SS-2-0	pCi/g	1.61		0.3	0.02	1		7011385	100						
STL St. Louis	F7A080149033	SO	3C-SS-3-0	pCi/g	5.05		0.8	0.07	1		7011382	100						
STL St. Louis	F7A080149033	SO	3C-SS-3-0	pCi/g	1.76		0.31	0.03	1		7011382	100						
STL St. Louis	F7A080149033	SO	3C-SS-3-0	pCi/g	4.91		0.78	0.03	1		7011382	100						
STL St. Louis	F7A080149033	SO	3C-SS-3-0	pCi/g	2.08		0.37	0.03	1		7011385	100						
STL St. Louis	F7A080149033	SO	3C-SS-3-0	pCi/g	0.073	J	0.045	0.016	1		7011385	100						
STL St. Louis	F7A080149033	SO	3C-SS-3-0	pCi/g	1.9		0.34	0.03	1		7011385	100						
STL St. Louis	F7A080149034	SO	3C-SS-4-0	pCi/g	9.5		1.5	0.04	1		7011382	100						
STL St. Louis	F7A080149034	SO	3C-SS-4-0	pCi/g	2.29		0.41	0.03	1		7011382	100						
STL St. Louis	F7A080149034	SO	3C-SS-4-0	pCi/g	9.1		1.5	0.03	1		7011382	100						
STL St. Louis	F7A080149034	SO	3C-SS-4-0	pCi/g	1.63		0.31	0.04	1		7011385	100						
STL St. Louis	F7A080149034	SO	3C-SS-4-0	pCi/g	0.076	J	0.047	0.032	1		7011385	100						
STL St. Louis	F7A080149034	SO	3C-SS-4-0	pCi/g	1.54		0.29	0.01	1		7011385	100						
STL St. Louis	F7A080149035	SO	3C-SS-5-0	pCi/g	6.2		1	0.05	1		7011382	100						
STL St. Louis	F7A080149035	SO	3C-SS-5-0	pCi/g	1.89		0.35	0.04	1		7011382	100						
STL St. Louis	F7A080149035	SO	3C-SS-5-0	pCi/g	5.93		0.97	0.03	1		7011382	100						
STL St. Louis	F7A080149035	SO	3C-SS-5-0	pCi/g	0.86		0.19	0.04	1		7011385	100						
STL St. Louis	F7A080149035	SO	3C-SS-5-0	pCi/g	0.02	J	0.026	0.018	1		7011385	100						
STL St. Louis	F7A080149035	SO	3C-SS-5-0	pCi/g	1.05		0.22	0.03	1		7011385	100						
STL St. Louis	F7A080149036	SO	3D-SS-1-0	pCi/g	0.72		0.16	0.04	1		7011382	100						
STL St. Louis	F7A080149036	SO	3D-SS-1-0	pCi/g	1.2		0.23	0.03	1		7011382	100						
STL St. Louis	F7A080149036	SO	3D-SS-1-0	pCi/g	0.79		0.17	0.02	1		7011382	100						
STL St. Louis	F7A080149036	SO	3D-SS-1-0	pCi/g	0.85		0.18	0.03	1		7011385	100						
STL St. Louis	F7A080149036	SO	3D-SS-1-0	pCi/g	0.03	J	0.029	0.026	1		7011385	100						
STL St. Louis	F7A080149036	SO	3D-SS-1-0	pCi/g	0.97		0.2	0.01	1		7011385	100						
STL St. Louis	F7A080149037	SO	3D-SS-2-0	pCi/g	0.76		0.18	0.03	1		7011382	100						
STL St. Louis	F7A080149037	SO	3D-SS-2-0	pCi/g	1.11		0.23	0.03	1		7011382	100						
STL St. Louis	F7A080149037	SO	3D-SS-2-0	pCi/g	0.68		0.16	0.02	1		7011382	100						
STL St. Louis	F7A080149037	SO	3D-SS-2-0	pCi/g	0.66		0.14	0.03	1		7011385	100						
STL St. Louis	F7A080149037	SO	3D-SS-2-0	pCi/g	0.048	J	0.034	0.027	1		7011385	100						
STL St. Louis	F7A080149037	SO	3D-SS-2-0	pCi/g	0.86		0.17	0.02	1		7011385	100						
STL St. Louis	F7A080149038	SO	3D-SS-3-0	pCi/g	0.87		0.19	0.05	1		7011382	100						
STL St. Louis	F7A080149038	SO	3D-SS-3-0	pCi/g	1.32		0.26	0.03	1		7011382	100						
STL St. Louis	F7A080149038	SO	3D-SS-3-0	pCi/g	0.73		0.17	0.03	1		7011382	100						
STL St. Louis	F7A080149038	SO	3D-SS-3-0	pCi/g	0.67		0.15	0.03	1		7011385	100						
STL St. Louis	F7A080149038	SO	3D-SS-3-0	pCi/g	0.033	J	0.032	0.033	1		7011385	100						
STL St. Louis	F7A080149038	SO	3D-SS-3-0	pCi/g	0.84		0.18	0.03	1		7011385	100						
STL St. Louis	F7A080149039	SO	3D-SS-4-0	pCi/g	0.64		0.15	0.04	1		7011382	100						
STL St. Louis	F7A080149039	SO	3D-SS-4-0	pCi/g	1.07		0.21	0.03	1		7011382	100						
STL St. Louis	F7A080149039	SO	3D-SS-4-0	pCi/g	0.61		0.14	0.03	1		7011382	100						
STL St. Louis	F7A080149039	SO	3D-SS-4-0	pCi/g	0.81		0.18	0.03	1		7011385	100						
STL St. Louis	F7A080149039	SO	3D-SS-4-0	pCi/g	0.031	J	0.029	0.027	1		7011385	100						
STL St. Louis	F7A080149039	SO	3D-SS-4-0	pCi/g	0.85		0.18	0.01	1		7011385	100						
STL St. Louis	F7A080149040	SO	3D-SS-5-0	pCi/g	0.69		0.15	0.03	1		7011382	100						

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	MATRIX	DATE SAMP	TIME SAMP	DATE ANAL	DATE PREP	SDG NUMBER	ANALYSIS METHOD	CAS NUMBER	COMPOUND NAME
STL St. Louis	F7A080149040	SO	3D-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149040	SO	3D-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149040	SO	3D-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149040	SO	3D-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149040	SO	3D-SS-5-0	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149041	SO	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149041	SO	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149041	SO	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149041	SO	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149041	SO	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149041	SO	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149042	SO	3E-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149042	SO	3E-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149042	SO	3E-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149042	SO	3E-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149042	SO	3E-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149042	SO	3E-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149043	SO	3E-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149043	SO	3E-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149043	SO	3E-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149043	SO	3E-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149043	SO	3E-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149043	SO	3E-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149044	SO	3E-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149044	SO	3E-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149044	SO	3E-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149044	SO	3E-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149044	SO	3E-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149044	SO	3E-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149045	SO	3E-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149045	SO	3E-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149045	SO	3E-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149045	SO	3E-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149045	SO	3E-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149045	SO	3E-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149046	SO	3F-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149046	SO	3F-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149046	SO	3F-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149046	SO	3F-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149046	SO	3F-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149046	SO	3F-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149047	SO	3F-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149047	SO	3F-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149047	SO	3F-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	UNITS	RESULT	QUALIFIERS	TOTAL UNCERTAINTY	RPT LIMIT/MDC	DILFACTOR	LTYPE	BATCH ID	PCT SOLID	TCLP EXT DATE	SPIKE AMOUNT	PERCENT RECOVERY	CONTROL LIMITS	RPD	RPD LIMIT
STL St. Louis	F7A080149040	SO	3D-SS-5-0	pCi/g	1.15		0.22	0.02	1		7011382	100						
STL St. Louis	F7A080149040	SO	3D-SS-5-0	pCi/g	0.72		0.16	0.04	1		7011382	100						
STL St. Louis	F7A080149040	SO	3D-SS-5-0	pCi/g	1.49		0.27	0.04	1		7011385	100						
STL St. Louis	F7A080149040	SO	3D-SS-5-0	pCi/g	0.113		0.055	0.028	1		7011385	100						
STL St. Louis	F7A080149040	SO	3D-SS-5-0	pCi/g	1.47		0.27	0.03	1		7011385	100						
STL St. Louis	F7A080149041	SO	3E-SS-1-0	pCi/g	1.5		0.29	0.04	1		7013048	100						
STL St. Louis	F7A080149041	SO	3E-SS-1-0	pCi/g	2.18		0.39	0.03	1		7013048	100						
STL St. Louis	F7A080149041	SO	3E-SS-1-0	pCi/g	1.57		0.3	0.03	1		7013048	100						
STL St. Louis	F7A080149041	SO	3E-SS-1-0	pCi/g	2.23		0.4	0.02	1		7013049	100						
STL St. Louis	F7A080149041	SO	3E-SS-1-0	pCi/g	0.145		0.066	0.031	1		7013049	100						
STL St. Louis	F7A080149041	SO	3E-SS-1-0	pCi/g	2.25		0.4	0.03	1		7013049	100						
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	pCi/g	1.54		0.31	0.05	1		7013048	100					2	40
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	pCi/g	2.79		0.51	0.04	1		7013048	100					25	40
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	pCi/g	1.78		0.35	0.03	1		7013048	100					12	40
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	pCi/g	2.49		0.43	0.03	1		7013049	100					11	
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	pCi/g	0.132		0.06	0.029	1		7013049	100					9	
STL St. Louis	F7A080149041X	DUP	3E-SS-1-0	pCi/g	2.41		0.41	0.01	1		7013049	100					7	40
STL St. Louis	F7A080149042	SO	3E-SS-2-0	pCi/g	1.52		0.31	0.06	1		7013048	100						
STL St. Louis	F7A080149042	SO	3E-SS-2-0	pCi/g	2.79		0.52	0.04	1		7013048	100						
STL St. Louis	F7A080149042	SO	3E-SS-2-0	pCi/g	1.51		0.31	0.03	1		7013048	100						
STL St. Louis	F7A080149042	SO	3E-SS-2-0	pCi/g	2.52		0.43	0.03	1		7013049	100						
STL St. Louis	F7A080149042	SO	3E-SS-2-0	pCi/g	0.128		0.058	0.025	1		7013049	100						
STL St. Louis	F7A080149042	SO	3E-SS-2-0	pCi/g	2.43		0.42	0.02	1		7013049	100						
STL St. Louis	F7A080149043	SO	3E-SS-3-0	pCi/g	1.52		0.29	0.04	1		7013048	100						
STL St. Louis	F7A080149043	SO	3E-SS-3-0	pCi/g	2.52		0.44	0.03	1		7013048	100						
STL St. Louis	F7A080149043	SO	3E-SS-3-0	pCi/g	1.45		0.28	0.03	1		7013048	100						
STL St. Louis	F7A080149043	SO	3E-SS-3-0	pCi/g	2.76		0.49	0.03	1		7013049	100						
STL St. Louis	F7A080149043	SO	3E-SS-3-0	pCi/g	0.211		0.083	0.018	1		7013049	100						
STL St. Louis	F7A080149043	SO	3E-SS-3-0	pCi/g	2.83		0.5	0.03	1		7013049	100						
STL St. Louis	F7A080149044	SO	3E-SS-4-0	pCi/g	1.53		0.3	0.06	1		7013048	100						
STL St. Louis	F7A080149044	SO	3E-SS-4-0	pCi/g	2.57		0.46	0.03	1		7013048	100						
STL St. Louis	F7A080149044	SO	3E-SS-4-0	pCi/g	1.56		0.3	0.03	1		7013048	100						
STL St. Louis	F7A080149044	SO	3E-SS-4-0	pCi/g	2.57		0.45	0.02	1		7013049	100						
STL St. Louis	F7A080149044	SO	3E-SS-4-0	pCi/g	0.154		0.067	0.031	1		7013049	100						
STL St. Louis	F7A080149044	SO	3E-SS-4-0	pCi/g	2.63		0.45	0.01	1		7013049	100						
STL St. Louis	F7A080149045	SO	3E-SS-5-0	pCi/g	1.69		0.31	0.03	1		7013048	100						
STL St. Louis	F7A080149045	SO	3E-SS-5-0	pCi/g	2.46		0.43	0.03	1		7013048	100						
STL St. Louis	F7A080149045	SO	3E-SS-5-0	pCi/g	1.52		0.28	0.02	1		7013048	100						
STL St. Louis	F7A080149045	SO	3E-SS-5-0	pCi/g	2.49		0.45	0.01	1		7013049	100						
STL St. Louis	F7A080149045	SO	3E-SS-5-0	pCi/g	0.115		0.06	0.018	1		7013049	100						
STL St. Louis	F7A080149045	SO	3E-SS-5-0	pCi/g	2.45		0.44	0.03	1		7013049	100						
STL St. Louis	F7A080149046	SO	3F-SS-1-0	pCi/g	13.2		2.3	0.06	1		7013048	100						
STL St. Louis	F7A080149046	SO	3F-SS-1-0	pCi/g	2.66		0.52	0.04	1		7013048	100						
STL St. Louis	F7A080149046	SO	3F-SS-1-0	pCi/g	13		2.2	0.04	1		7013048	100						
STL St. Louis	F7A080149046	SO	3F-SS-1-0	pCi/g	2.24		0.4	0.02	1		7013049	100						
STL St. Louis	F7A080149046	SO	3F-SS-1-0	pCi/g	0.116		0.057	0.03	1		7013049	100						
STL St. Louis	F7A080149046	SO	3F-SS-1-0	pCi/g	2.25		0.4	0.03	1		7013049	100						
STL St. Louis	F7A080149047	SO	3F-SS-2-0	pCi/g	9.8		1.6	0.04	1		7013048	100						
STL St. Louis	F7A080149047	SO	3F-SS-2-0	pCi/g	2.14		0.39	0.02	1		7013048	100						
STL St. Louis	F7A080149047	SO	3F-SS-2-0	pCi/g	8.8		1.4	0.02	1		7013048	100						

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	MATRIX	DATE SAMP	TIME SAMP	DATE ANAL	DATE PREP	SDG NUMBER	ANALYSIS METHOD	CAS NUMBER	COMPOUND NAME
STL St. Louis	F7A080149047	SO	3F-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149047	SO	3F-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149047	SO	3F-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149048	SO	3F-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149048	SO	3F-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149048	SO	3F-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149048	SO	3F-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149048	SO	3F-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149048	SO	3F-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149049	SO	3F-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149049	SO	3F-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149049	SO	3F-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149049	SO	3F-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149049	SO	3F-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149049	SO	3F-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149050	SO	3F-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149050	SO	3F-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149050	SO	3F-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149050	SO	3F-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149050	SO	3F-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149050	SO	3F-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149051	SO	RA-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149051	SO	RA-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149051	SO	RA-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149051	SO	RA-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149051	SO	RA-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149051	SO	RA-SS-1-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149052	SO	RA-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149052	SO	RA-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149052	SO	RA-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149052	SO	RA-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149052	SO	RA-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149052	SO	RA-SS-2-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149053	SO	RA-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149053	SO	RA-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149053	SO	RA-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149053	SO	RA-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149053	SO	RA-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149053	SO	RA-SS-3-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149054	SO	RA-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149054	SO	RA-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149054	SO	RA-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149054	SO	RA-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149054	SO	RA-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149054	SO	RA-SS-4-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149055	SO	RA-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149055	SO	RA-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149055	SO	RA-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149055	SO	RA-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149055	SO	RA-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	UNITS	RESULT	QUALIFIERS	TOTAL UNCERTAINTY	RPT LIMIT/MDC	DILFACTOR	LTYPE	BATCH ID	PCT SOLID	TCLP EXT DATE	SPIKE AMOUNT	PERCENT RECOVERY	CONTROL LIMITS	RPD	RPD LIMIT
STL St. Louis	F7A080149047	SO	3F-SS-2-0	pCi/g	1.95		0.34	0.03	1		7013049	100						
STL St. Louis	F7A080149047	SO	3F-SS-2-0	pCi/g	0.101		0.052	0.031	1		7013049	100						
STL St. Louis	F7A080149047	SO	3F-SS-2-0	pCi/g	1.84		0.33	0.02	1		7013049	100						
STL St. Louis	F7A080149048	SO	3F-SS-3-0	pCi/g	2.75		0.5	0.05	1		7013048	100						
STL St. Louis	F7A080149048	SO	3F-SS-3-0	pCi/g	1.41		0.28	0.03	1		7013048	100						
STL St. Louis	F7A080149048	SO	3F-SS-3-0	pCi/g	2.67		0.48	0.03	1		7013048	100						
STL St. Louis	F7A080149048	SO	3F-SS-3-0	pCi/g	1.09		0.22	0.04	1		7013049	100						
STL St. Louis	F7A080149048	SO	3F-SS-3-0	pCi/g	0.07	J	0.044	0.027	1		7013049	100						
STL St. Louis	F7A080149048	SO	3F-SS-3-0	pCi/g	1.13		0.23	0.01	1		7013049	100						
STL St. Louis	F7A080149049	SO	3F-SS-4-0	pCi/g	1.99		0.38	0.05	1		7013048	100						
STL St. Louis	F7A080149049	SO	3F-SS-4-0	pCi/g	1.27		0.27	0.04	1		7013048	100						
STL St. Louis	F7A080149049	SO	3F-SS-4-0	pCi/g	2.16		0.41	0.03	1		7013048	100						
STL St. Louis	F7A080149049	SO	3F-SS-4-0	pCi/g	1.05		0.21	0.02	1		7013049	100						
STL St. Louis	F7A080149049	SO	3F-SS-4-0	pCi/g	0.028	U	0.029	0.03	1		7013049	100						
STL St. Louis	F7A080149049	SO	3F-SS-4-0	pCi/g	1.06		0.21	0.03	1		7013049	100						
STL St. Louis	F7A080149050	SO	3F-SS-5-0	pCi/g	3.79		0.69	0.06	1		7013048	100						
STL St. Louis	F7A080149050	SO	3F-SS-5-0	pCi/g	1.76		0.36	0.05	1		7013048	100						
STL St. Louis	F7A080149050	SO	3F-SS-5-0	pCi/g	3.49		0.64	0.03	1		7013048	100						
STL St. Louis	F7A080149050	SO	3F-SS-5-0	pCi/g	1.25		0.24	0.03	1		7013049	100						
STL St. Louis	F7A080149050	SO	3F-SS-5-0	pCi/g	0.048	J	0.036	0.016	1		7013049	100						
STL St. Louis	F7A080149050	SO	3F-SS-5-0	pCi/g	1.09		0.22	0.03	1		7013049	100						
STL St. Louis	F7A080149051	SO	RA-SS-1-0	pCi/g	1.25		0.25	0.03	1		7013048	100						
STL St. Louis	F7A080149051	SO	RA-SS-1-0	pCi/g	1.64		0.31	0.03	1		7013048	100						
STL St. Louis	F7A080149051	SO	RA-SS-1-0	pCi/g	1.2		0.24	0.02	1		7013048	100						
STL St. Louis	F7A080149051	SO	RA-SS-1-0	pCi/g	0.86		0.18	0.03	1		7013049	100						
STL St. Louis	F7A080149051	SO	RA-SS-1-0	pCi/g	0.04	J	0.033	0.032	1		7013049	100						
STL St. Louis	F7A080149051	SO	RA-SS-1-0	pCi/g	0.92		0.18	0.02	1		7013049	100						
STL St. Louis	F7A080149052	SO	RA-SS-2-0	pCi/g	0.98		0.2	0.05	1		7013048	100						
STL St. Louis	F7A080149052	SO	RA-SS-2-0	pCi/g	1.36		0.26	0.03	1		7013048	100						
STL St. Louis	F7A080149052	SO	RA-SS-2-0	pCi/g	0.94		0.2	0.02	1		7013048	100						
STL St. Louis	F7A080149052	SO	RA-SS-2-0	pCi/g	1.01		0.21	0.03	1		7013049	100						
STL St. Louis	F7A080149052	SO	RA-SS-2-0	pCi/g	0.043	J	0.035	0.017	1		7013049	100						
STL St. Louis	F7A080149052	SO	RA-SS-2-0	pCi/g	1.05		0.21	0.03	1		7013049	100						
STL St. Louis	F7A080149053	SO	RA-SS-3-0	pCi/g	0.95		0.22	0.09	1		7013048	100						
STL St. Louis	F7A080149053	SO	RA-SS-3-0	pCi/g	1.33		0.27	0.04	1		7013048	100						
STL St. Louis	F7A080149053	SO	RA-SS-3-0	pCi/g	1		0.22	0.04	1		7013048	100						
STL St. Louis	F7A080149053	SO	RA-SS-3-0	pCi/g	0.96		0.19	0.02	1		7013049	100						
STL St. Louis	F7A080149053	SO	RA-SS-3-0	pCi/g	0.094	J	0.048	0.024	1		7013049	100						
STL St. Louis	F7A080149053	SO	RA-SS-3-0	pCi/g	1.07		0.21	0.02	1		7013049	100						
STL St. Louis	F7A080149054	SO	RA-SS-4-0	pCi/g	0.79		0.18	0.05	1		7013048	100						
STL St. Louis	F7A080149054	SO	RA-SS-4-0	pCi/g	1.32		0.27	0.03	1		7013048	100						
STL St. Louis	F7A080149054	SO	RA-SS-4-0	pCi/g	0.83		0.19	0.03	1		7013048	100						
STL St. Louis	F7A080149054	SO	RA-SS-4-0	pCi/g	1.09		0.22	0.03	1		7013049	100						
STL St. Louis	F7A080149054	SO	RA-SS-4-0	pCi/g	0.037	J	0.033	0.017	1		7013049	100						
STL St. Louis	F7A080149054	SO	RA-SS-4-0	pCi/g	1.15		0.23	0.03	1		7013049	100						
STL St. Louis	F7A080149055	SO	RA-SS-5-0	pCi/g	0.96		0.22	0.06	1		7013048	100						
STL St. Louis	F7A080149055	SO	RA-SS-5-0	pCi/g	1.6		0.33	0.05	1		7013048	100						
STL St. Louis	F7A080149055	SO	RA-SS-5-0	pCi/g	1.01		0.23	0.03	1		7013048	100						
STL St. Louis	F7A080149055	SO	RA-SS-5-0	pCi/g	0.93		0.19	0.03	1		7013049	100						
STL St. Louis	F7A080149055	SO	RA-SS-5-0	pCi/g	0.065	J	0.04	0.027	1		7013049	100						

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	MATRIX	DATE SAMP	TIME SAMP	DATE ANAL	DATE PREP	SDG NUMBER	ANALYSIS METHOD	CAS NUMBER	COMPOUND NAME
STL St. Louis	F7A080149055	SO	RA-SS-5-0	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149056	SO	3C-SS-1-1	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149056	SO	3C-SS-1-1	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149056	SO	3C-SS-1-1	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149056	SO	3C-SS-1-1	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149056	SO	3C-SS-1-1	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149056	SO	3C-SS-1-1	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149057	SO	3F-SS-2-1	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149057	SO	3F-SS-2-1	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149057	SO	3F-SS-2-1	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149057	SO	3F-SS-2-1	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149057	SO	3F-SS-2-1	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149057	SO	3F-SS-2-1	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A080149058	SO	CA-SS-20-1	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A080149058	SO	CA-SS-20-1	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A080149058	SO	CA-SS-20-1	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A080149058	SO	CA-SS-20-1	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A080149058	SO	CA-SS-20-1	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A080149058	SO	CA-SS-20-1	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A110000300B	BM	LABQC	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A110000300B	BM	LABQC	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A110000300B	BM	LABQC	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A110000300C	LCS	LABQC	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A110000301B	BM	LABQC	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A110000301B	BM	LABQC	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A110000301B	BM	LABQC	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A110000301C	LCS	LABQC	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A110000301C	LCS	LABQC	SO	1/5/2007	0:00	1/18/2007	1/11/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A110000382B	BM	LABQC	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A110000382B	BM	LABQC	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A110000382B	BM	LABQC	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A110000382C	LCS	LABQC	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A110000385B	BM	LABQC	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A110000385B	BM	LABQC	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A110000385B	BM	LABQC	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A110000385C	LCS	LABQC	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A110000385C	LCS	LABQC	SO	1/5/2007	0:00	1/22/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A130000048B	BM	LABQC	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A130000048B	BM	LABQC	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A130000048B	BM	LABQC	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A130000048C	LCS	LABQC	SO	1/5/2007	0:00	1/23/2007	1/13/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A130000049B	BM	LABQC	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A130000049B	BM	LABQC	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	15117-96-1	Uranium 235/236
STL St. Louis	F7A130000049B	BM	LABQC	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A130000049C	LCS	LABQC	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	13966-29-5	Uranium 233/234
STL St. Louis	F7A130000049C	LCS	LABQC	SO	1/5/2007	0:00	1/23/2007	1/12/2007	F7A080149	A-01-R MOD	Q1567	Uranium 238
STL St. Louis	F7A190000178B	BM	LABQC	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	14274-82-9	Thorium 228
STL St. Louis	F7A190000178B	BM	LABQC	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230
STL St. Louis	F7A190000178B	BM	LABQC	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	7440-29-1	Thorium 232
STL St. Louis	F7A190000178C	LCS	LABQC	SO	1/5/2007	0:00	1/24/2007	1/19/2007	F7A080149	A-01-R MOD	14269-63-7	Thorium 230

LAB NAME	LAB SAMPLE ID	STYPE	CLIENT SAMPLE DESCRIPTION	UNITS	RESULT	QUALIFIERS	TOTAL UNCERTAINTY	RPT LIMIT/MDC	DILFACTOR	LTYPE	BATCH ID	PCT SOLID	TCLP EXT DATE	SPIKE AMOUNT	PERCENT RECOVERY	CONTROL LIMITS	RPD	RPD LIMIT
STL St. Louis	F7A080149055	SO	RA-SS-5-0	pCi/g	0.95		0.19	0.01	1		7013049	100						
STL St. Louis	F7A080149056	SO	3C-SS-1-1	pCi/g	14.9		2.5	0.06	1		7013048	100						
STL St. Louis	F7A080149056	SO	3C-SS-1-1	pCi/g	3.14		0.59	0.04	1		7013048	100						
STL St. Louis	F7A080149056	SO	3C-SS-1-1	pCi/g	14.6		2.5	0.03	1		7013048	100						
STL St. Louis	F7A080149056	SO	3C-SS-1-1	pCi/g	2		0.35	0.04	1		7013049	100						
STL St. Louis	F7A080149056	SO	3C-SS-1-1	pCi/g	0.099	J	0.051	0.016	1		7013049	100						
STL St. Louis	F7A080149056	SO	3C-SS-1-1	pCi/g	2.2		0.38	0.03	1		7013049	100						
STL St. Louis	F7A080149057	SO	3F-SS-2-1	pCi/g	7.1		1.3	0.03	1		7013048	100						
STL St. Louis	F7A080149057	SO	3F-SS-2-1	pCi/g	2.14		0.44	0.04	1		7013048	100						
STL St. Louis	F7A080149057	SO	3F-SS-2-1	pCi/g	7.5		1.4	0.03	1		7013048	100						
STL St. Louis	F7A080149057	SO	3F-SS-2-1	pCi/g	1.45		0.27	0.03	1		7013049	100						
STL St. Louis	F7A080149057	SO	3F-SS-2-1	pCi/g	0.071	J	0.043	0.026	1		7013049	100						
STL St. Louis	F7A080149057	SO	3F-SS-2-1	pCi/g	1.73		0.31	0.01	1		7013049	100						
STL St. Louis	F7A080149058	SO	CA-SS-20-1	pCi/g	1.46		0.33	0.07	1		7013048	100						
STL St. Louis	F7A080149058	SO	CA-SS-20-1	pCi/g	1.26		0.3	0.04	1		7013048	100						
STL St. Louis	F7A080149058	SO	CA-SS-20-1	pCi/g	1.34		0.31	0.04	1		7013048	100						
STL St. Louis	F7A080149058	SO	CA-SS-20-1	pCi/g	0.83		0.18	0.03	1		7013049	100						
STL St. Louis	F7A080149058	SO	CA-SS-20-1	pCi/g	0.072	J	0.045	0.03	1		7013049	100						
STL St. Louis	F7A080149058	SO	CA-SS-20-1	pCi/g	1.08		0.22	0.03	1		7013049	100						
STL St. Louis	F7A110000300B	BM	LABQC	pCi/g	0.017	U	0.019	0.019	1		7011300	100						
STL St. Louis	F7A110000300B	BM	LABQC	pCi/g	0.032	J	0.026	0.012	1		7011300	100						
STL St. Louis	F7A110000300B	BM	LABQC	pCi/g	-0	U	0.0099	0.019	1		7011300	100						
STL St. Louis	F7A110000300C	LCS	LABQC	pCi/g	56.7		9.3	0.4	1		7011300	100		57.4	99	81-124		
STL St. Louis	F7A110000301B	BM	LABQC	pCi/g	0	U	0	0.01	1		7011301	100						
STL St. Louis	F7A110000301B	BM	LABQC	pCi/g	0	U	0	0.02	1		7011301	100						
STL St. Louis	F7A110000301B	BM	LABQC	pCi/g	-0	U	0.011	0.022	1		7011301	100						
STL St. Louis	F7A110000301C	LCS	LABQC	pCi/g	16.9		3.4	0.4	1		7011301	100		19.2	88	78-125		
STL St. Louis	F7A110000301C	LCS	LABQC	pCi/g	19.9		3.8	0.4	1		7011301	100		19.2	103	76-122		
STL St. Louis	F7A110000382B	BM	LABQC	pCi/g	0.004	U	0.01	0.02	1		7011382	100						
STL St. Louis	F7A110000382B	BM	LABQC	pCi/g	0.032	J	0.026	0.012	1		7011382	100						
STL St. Louis	F7A110000382B	BM	LABQC	pCi/g	-0	U	0.00998	0.019	1		7011382	100						
STL St. Louis	F7A110000382C	LCS	LABQC	pCi/g	53.8		8.8	0.3	1		7011382	100		58.5	92	81-124		
STL St. Louis	F7A110000385B	BM	LABQC	pCi/g	0.001	U	0.012	0.025	1		7011385	100						
STL St. Louis	F7A110000385B	BM	LABQC	pCi/g	0.011	U	0.019	0.015	1		7011385	100						
STL St. Louis	F7A110000385B	BM	LABQC	pCi/g	0.004	U	0.012	0.012	1		7011385	100						
STL St. Louis	F7A110000385C	LCS	LABQC	pCi/g	16.8		3.2	0.4	1		7011385	100		19.6	86	78-125		
STL St. Louis	F7A110000385C	LCS	LABQC	pCi/g	16.1		3.1	0.2	1		7011385	100		19.6	82	76-122		
STL St. Louis	F7A130000048B	BM	LABQC	pCi/g	0.021	U	0.03	0.041	1		7013048	100						
STL St. Louis	F7A130000048B	BM	LABQC	pCi/g	0.033	J	0.029	0.031	1		7013048	100						
STL St. Louis	F7A130000048B	BM	LABQC	pCi/g	-0.01	U	0.014	0.031	1		7013048	100						
STL St. Louis	F7A130000048C	LCS	LABQC	pCi/g	51.6		8.3	0.3	1		7013048	100		58.5	88	81-124		
STL St. Louis	F7A130000049B	BM	LABQC	pCi/g	0.008	U	0.02	0.033	1		7013049	100						
STL St. Louis	F7A130000049B	BM	LABQC	pCi/g	-0	U	0.015	0.033	1		7013049	100						
STL St. Louis	F7A130000049B	BM	LABQC	pCi/g	0.006	U	0.016	0.028	1		7013049	100						
STL St. Louis	F7A130000049C	LCS	LABQC	pCi/g	18.4		3.6	0.4	1		7013049	100		19.6	94	78-125		
STL St. Louis	F7A130000049C	LCS	LABQC	pCi/g	19		3.7	0.2	1		7013049	100		19.6	97	76-122		
STL St. Louis	F7A190000178B	BM	LABQC	pCi/g	-0	U	0.024	0.044	1		7019178	100						
STL St. Louis	F7A190000178B	BM	LABQC	pCi/g	0.024	U	0.025	0.03	1		7019178	100						
STL St. Louis	F7A190000178B	BM	LABQC	pCi/g	0.003	U	0.011	0.023	1		7019178	100						
STL St. Louis	F7A190000178C	LCS	LABQC	pCi/g	58.7		9.97	0.53	1		7019178	100		57.4	102	81-124		

Coal Ash Determination, Sorted Data

	Thorium 228					Thorium 230					Thorium 232					Uranium 233/234					Uranium 235/236					Uranium 238				
FIELD ID	RESULT		TOTAL UNCERTAINTY		Flag	RESULT		TOTAL UNCERTAINTY		Flag	RESULT		TOTAL UNCERTAINTY		Flag	RESULT		TOTAL UNCERTAINTY		Flag	RESULT		TOTAL UNCERTAINTY		Flag	RESULT		TOTAL UNCERTAINTY		Flag
CA-SS-1-0	1.02	+/-	0.22			1.27	+/-	0.26			0.8	+/-	0.18			0.77	+/-	0.17			0.043	+/-	0.036		J	0.98	+/-	0.2		
CA-SS-2-0	1.22	+/-	0.25			1.33	+/-	0.27			1.34	+/-	0.27			0.99	+/-	0.21			0.083	+/-	0.049		J	0.97	+/-	0.2		
CA-SS-3-0	1.32	+/-	0.38			1.4	+/-	0.4			1.39	+/-	0.4			0.94	+/-	0.2			0.02	+/-	0.027		J	1.05	+/-	0.22		
CA-SS-4-0	0.78	+/-	0.26			0.49	+/-	0.18			0.8	+/-	0.25			0.48	+/-	0.13			0.038	+/-	0.034		J	0.51	+/-	0.13		
CA-SS-5-0	0.9	+/-	0.25			0.8	+/-	0.23			0.73	+/-	0.21			0.68	+/-	0.16			0.058	+/-	0.042		J	0.74	+/-	0.17		
CA-SS-6-0	0.46	+/-	0.13			0.46	+/-	0.13			0.33	+/-	0.1			0.323	+/-	0.093			-0.001	+/-	0.013		U	0.37	+/-	0.1		
CA-SS-7-0	1.21	+/-	0.37			0.54	+/-	0.21			0.88	+/-	0.29			0.37	+/-	0.1			0.016	+/-	0.023		U	0.44	+/-	0.12		
CA-SS-8-0	0.84	+/-	0.26			0.72	+/-	0.23			1.01	+/-	0.29			0.45	+/-	0.12			0.03	+/-	0.033		U	0.46	+/-	0.12		
CA-SS-9-0	0.6	+/-	0.17			0.53	+/-	0.15			0.49	+/-	0.15			0.49	+/-	0.13			0.038	+/-	0.033		J	0.55	+/-	0.14		
CA-SS-10-0	0.39	+/-	0.16			0.33	+/-	0.14			0.44	+/-	0.17			0.36	+/-	0.11			0.051	+/-	0.04		J	0.46	+/-	0.12		
CA-SS-11-0	0.86	+/-	0.23			0.5	+/-	0.16			0.96	+/-	0.25			0.42	+/-	0.11			0.043	+/-	0.033		J	0.5	+/-	0.12		
CA-SS-12-0	0.98	+/-	0.32			0.44	+/-	0.18			0.97	+/-	0.31			0.56	+/-	0.14			0.025	+/-	0.03		U	0.5	+/-	0.13		
CA-SS-13-0	0.77	+/-	0.19			0.83	+/-	0.2			0.82	+/-	0.2			0.53	+/-	0.13			0.017	+/-	0.022		U	0.5	+/-	0.12		
CA-SS-14-0	2.02	+/-	0.54			0.73	+/-	0.25			1.95	+/-	0.53			0.68	+/-	0.16			0.018	+/-	0.023		U	0.7	+/-	0.16		
CA-SS-15-0	1.43	+/-	0.32			0.77	+/-	0.2			1.32	+/-	0.3			0.55	+/-	0.14			0.004	+/-	0.015		U	0.7	+/-	0.16		
CA-SS-16-0	0.77	+/-	0.21			0.53	+/-	0.17			0.81	+/-	0.22			0.5	+/-	0.12			0.027	+/-	0.028		U	0.49	+/-	0.12		
CA-SS-17-0	1.54	+/-	0.37			0.61	+/-	0.19			1.53	+/-	0.37			0.53	+/-	0.13			-0.001	+/-	0.014		U	0.52	+/-	0.13		
CA-SS-18-0	2.58	+/-	0.49			1.46	+/-	0.3			2.35	+/-	0.45			0.88	+/-	0.18			0.066	+/-	0.042		J	0.95	+/-	0.19		
CA-SS-19-0	2.05	+/-	0.4			1.4	+/-	0.29			2.23	+/-	0.42			1.13	+/-	0.23			0.03	+/-	0.031		U	1.05	+/-	0.22		
CA-SS-20-0	1.35	+/-	0.29			1.41	+/-	0.3			1.33	+/-	0.28			1.11	+/-	0.23			0.071	+/-	0.048		J	1.02	+/-	0.22		
3A-SS-1-0	4.19	+/-	0.68			1.56	+/-	0.29			4.28	+/-	0.69			1.22	+/-	0.23			0.05	+/-	0.036		J	1.22	+/-	0.23		
3A-SS-2-0	3.09	+/-	0.55			1.38	+/-	0.28			2.93	+/-	0.52			1.2	+/-	0.24			0.078	+/-	0.049		J	1.15	+/-	0.23		
3A-SS-3-0	3.69	+/-	0.63			1.68	+/-	0.32			3.57	+/-	0.61			1.01	+/-	0.2			0.05	+/-	0.036		J	1.32	+/-	0.25		
3A-SS-4-0	4.15	+/-	0.7			1.61	+/-	0.31			4.18	+/-	0.7			1.24	+/-	0.24			0.03	+/-	0.03		J	1.34	+/-	0.25		
3A-SS-5-0	6.9	+/-	1.1			1.9	+/-	0.36			6.7	+/-	1.1			1.48	+/-	0.28			0.07	+/-	0.044		J	1.59	+/-	0.29		
3B-SS-1-0	9.9	+/-	1.5			2.69	+/-	0.47			9.7	+/-	1.5			2.25	+/-	0.4			0.087	+/-	0.051		J	2.38	+/-	0.42		
3B-SS-2-0	7.8	+/-	1.2			2.14	+/-	0.38			7.8	+/-	1.2			2.05	+/-	0.37			0.182	+/-	0.074			2.27	+/-	0.4		
3B-SS-3-0	6.3	+/-	1			1.57	+/-	0.3			6.4	+/-	1			1.47	+/-	0.28			0.097	+/-	0.052		J	1.55	+/-	0.29		
3B-SS-4-0	2.63	+/-	0.47			1.58	+/-	0.3			2.69	+/-	0.48			0.97	+/-	0.19			0.074	+/-	0.044		J	1.11	+/-	0.22		
3B-SS-5-0	7.6	+/-	1.2			2.25	+/-	0.4			7.6	+/-	1.2			2.09	+/-	0.38			0.132	+/-	0.064			2.09	+/-	0.38		
3C-SS-1-0	8.1	+/-	1.3			2.08	+/-	0.36			8.5	+/-	1.3			1.99	+/-	0.38			0.168	+/-	0.076			2.02	+/-	0.38		
3C-SS-2-0	6.5	+/-	1			1.74	+/-	0.31			6.32	+/-	0.99			1.45	+/-	0.27			0.158	+/-	0.067			1.61	+/-	0.3		
3C-SS-3-0	5.05	+/-	0.8			1.76	+/-	0.31			4.91	+/-	0.78			2.08	+/-	0.37			0.073	+/-	0.045		J	1.9	+/-	0.34		
3C-SS-4-0	9.5	+/-	1.5			2.29	+/-	0.41			9.1	+/-	1.5			1.63	+/-	0.31			0.076	+/-	0.047		J	1.54	+/-	0.29		
3C-SS-5-0	6.2	+/-	1			1.89	+/-	0.35			5.93	+/-	0.97			0.86	+/-	0.19			0.02	+/-	0.026		J	1.05	+/-	0.22		
3D-SS-1-0	0.72	+/-	0.16			1.2	+/-	0.23			0.79	+/-	0.17			0.85	+/-	0.18			0.03	+/-	0.029		J	0.97	+/-	0.2		
3D-SS-2-0	0.76	+/-	0.18			1.11	+/-	0.23			0.68	+/-	0.16			0.66	+/-	0.14			0.048	+/-	0.034		J	0.86	+/-	0.17		
3D-SS-3-0	0.87	+/-	0.19			1.32	+/-	0.26			0.73	+/-	0.17			0.67	+/-	0.15			0.033	+/-	0.032		J	0.84	+/-	0.18		
3D-SS-4-0	0.64	+/-	0.15			1.07	+/-	0.21			0.61	+/-	0.14			0.81	+/-	0.18			0.031	+/-	0.029		J	0.85	+/-	0.18		
3D-SS-5-0	0.69	+/-	0.15			1.15	+/-	0.22			0.72	+/-	0.16			1.49	+/-	0.27			0.113	+/-	0.055			1.47	+/-	0.27		

Coal Ash Determination, Sorted Data

	Thorium 228					Thorium 230					Thorium 232					Uranium 233/234					Uranium 235/236					Uranium 238				
FIELD ID	RESULT		TOTAL UNCERTAINTY		Flag	RESULT		TOTAL UNCERTAINTY		Flag	RESULT		TOTAL UNCERTAINTY		Flag	RESULT		TOTAL UNCERTAINTY		Flag	RESULT		TOTAL UNCERTAINTY		Flag	RESULT		TOTAL UNCERTAINTY		Flag
3E-SS-1-0	1.5	+/-	0.29			2.18	+/-	0.39			1.57	+/-	0.3			2.23	+/-	0.4			0.145	+/-	0.066			2.25	+/-	0.4		
3E-SS-2-0	1.52	+/-	0.31			2.79	+/-	0.52			1.51	+/-	0.31			2.52	+/-	0.43			0.128	+/-	0.058			2.43	+/-	0.42		
3E-SS-3-0	1.52	+/-	0.29			2.52	+/-	0.44			1.45	+/-	0.28			2.76	+/-	0.49			0.211	+/-	0.083			2.83	+/-	0.5		
3E-SS-4-0	1.53	+/-	0.3			2.57	+/-	0.46			1.56	+/-	0.3			2.57	+/-	0.45			0.154	+/-	0.067			2.63	+/-	0.45		
3E-SS-5-0	1.69	+/-	0.31			2.46	+/-	0.43			1.52	+/-	0.28			2.49	+/-	0.45			0.115	+/-	0.06			2.45	+/-	0.44		
3F-SS-1-0	13.2	+/-	2.3			2.66	+/-	0.52			13	+/-	2.2			2.24	+/-	0.4			0.116	+/-	0.057			2.25	+/-	0.4		
3F-SS-2-0	9.8	+/-	1.6			2.14	+/-	0.39			8.8	+/-	1.4			1.95	+/-	0.34			0.101	+/-	0.052			1.84	+/-	0.33		
3F-SS-3-0	2.75	+/-	0.5			1.41	+/-	0.28			2.67	+/-	0.48			1.09	+/-	0.22			0.07	+/-	0.044		J	1.13	+/-	0.23		
3F-SS-4-0	1.99	+/-	0.38			1.27	+/-	0.27			2.16	+/-	0.41			1.05	+/-	0.21			0.028	+/-	0.029		U	1.06	+/-	0.21		
3F-SS-5-0	3.79	+/-	0.69			1.76	+/-	0.36			3.49	+/-	0.64			1.25	+/-	0.24			0.048	+/-	0.036		J	1.09	+/-	0.22		
RA-SS-1-0	1.25	+/-	0.25			1.64	+/-	0.31			1.2	+/-	0.24			0.86	+/-	0.18			0.04	+/-	0.033		J	0.92	+/-	0.18		
RA-SS-2-0	0.98	+/-	0.2			1.36	+/-	0.26			0.94	+/-	0.2			1.01	+/-	0.21			0.043	+/-	0.035		J	1.05	+/-	0.21		
RA-SS-3-0	0.95	+/-	0.22			1.33	+/-	0.27			1	+/-	0.22			0.96	+/-	0.19			0.094	+/-	0.048		J	1.07	+/-	0.21		
RA-SS-4-0	0.79	+/-	0.18			1.32	+/-	0.27			0.83	+/-	0.19			1.09	+/-	0.22			0.037	+/-	0.033		J	1.15	+/-	0.23		
RA-SS-5-0	0.96	+/-	0.22			1.6	+/-	0.33			1.01	+/-	0.23			0.93	+/-	0.19			0.065	+/-	0.04		J	0.95	+/-	0.19		
3C-SS-1-1	14.9	+/-	2.5			3.14	+/-	0.59			14.6	+/-	2.5			2	+/-	0.35			0.099	+/-	0.051		J	2.2	+/-	0.38		
3F-SS-2-1	7.1	+/-	1.3			2.14	+/-	0.44			7.5	+/-	1.4			1.45	+/-	0.27			0.071	+/-	0.043		J	1.73	+/-	0.31		
CA-SS-20-1	1.46	+/-	0.33			1.26	+/-	0.3			1.34	+/-	0.31			0.83	+/-	0.18			0.072	+/-	0.045		J	1.08	+/-	0.22		

FIELD ID	Thorium 232 RESULT		TOTAL UNCERTAINTY	Flag	Uranium 238 RESULT		TOTAL UNCERTAINTY	Flag	Thorium 230 RESULT		TOTAL UNCERTAINTY	Flag
RA-SS-1-0	1.2000	+/-	0.24		0.9200	+/-	0.18		1.6400	+/-	0.31	
RA-SS-2-0	0.9400	+/-	0.2		1.0500	+/-	0.21		1.3600	+/-	0.26	
RA-SS-3-0	1.0000	+/-	0.22		1.0700	+/-	0.21		1.3300	+/-	0.27	
RA-SS-4-0	0.8300	+/-	0.19		1.1500	+/-	0.23		1.3200	+/-	0.27	
RA-SS-5-0	1.0100	+/-	0.23		0.9500	+/-	0.19		1.6000	+/-	0.33	
Mean	0.9960		0.216		1.0280		0.204		1.4500		0.288	
Stdev	0.1346		0.0207		0.0934		0.0195		0.1565		0.0303	
Max	1.2000		0.24		1.1500		0.23		1.6400		0.33	
Min	0.8300		0.19		0.9200		0.18		1.3200		0.26	
Median	1.0000		0.22		1.0500		0.21		1.3600		0.27	

FIELD ID	Thorium 232 RESULT		TOTAL UNCERTAINTY	Flag	Uranium 238 RESULT		TOTAL UNCERTAINTY	Flag	Thorium 230 RESULT		TOTAL UNCERTAINTY	Flag	Th232 / U238 RESULT	Contaminants Coal Ash / Monazite sand?	Th232 / Th230 RESULT	Contaminants Coal Ash / Monazite sand?	Th232 net RESULT	Flag	U238 net RESULT	Flag	Th230 net RESULT	Flag
CA-SS-1-0	0.800	+/-	0.18		0.980	+/-	0.2		1.270	+/-	0.26		0.816	Coal	0.630	Coal	-0.196		-0.048		-0.180	
CA-SS-2-0	1.340	+/-	0.27		0.970	+/-	0.2		1.330	+/-	0.27		1.381	Monazite	1.008	Monazite	0.344		-0.058		-0.120	
CA-SS-3-0	1.390	+/-	0.4		1.050	+/-	0.22		1.400	+/-	0.4		1.324	Monazite	0.993	Coal	0.394		0.022		-0.050	
CA-SS-4-0	0.800	+/-	0.25		0.510	+/-	0.13		0.490	+/-	0.18		1.569	Monazite	1.633	Monazite	-0.196		-0.518		-0.960	
CA-SS-5-0	0.730	+/-	0.21		0.740	+/-	0.17		0.800	+/-	0.23		0.986	Coal	0.913	Coal	-0.266		-0.288		-0.650	
CA-SS-6-0	0.330	+/-	0.1		0.370	+/-	0.1		0.460	+/-	0.13		0.892	Coal	0.717	Coal	-0.666		-0.658		-0.990	
CA-SS-7-0	0.880	+/-	0.29		0.440	+/-	0.12		0.540	+/-	0.21		2.000	Monazite	1.630	Monazite	-0.116		-0.588		-0.910	
CA-SS-8-0	1.010	+/-	0.29		0.460	+/-	0.12		0.720	+/-	0.23		2.196	Monazite	1.403	Monazite	0.014		-0.568		-0.730	
CA-SS-9-0	0.490	+/-	0.15		0.550	+/-	0.14		0.530	+/-	0.15		0.891	Coal	0.925	Coal	-0.506		-0.478		-0.920	
CA-SS-10-0	0.440	+/-	0.17		0.460	+/-	0.12		0.330	+/-	0.14		0.957	Coal	1.333	Monazite	-0.556		-0.568		-1.120	
CA-SS-11-0	0.960	+/-	0.25		0.500	+/-	0.12		0.500	+/-	0.16		1.920	Monazite	1.920	Monazite	-0.036		-0.528		-0.950	
CA-SS-12-0	0.970	+/-	0.31		0.500	+/-	0.13		0.440	+/-	0.18		1.940	Monazite	2.205	Monazite	-0.026		-0.528		-1.010	
CA-SS-13-0	0.820	+/-	0.2		0.500	+/-	0.12		0.830	+/-	0.2		1.640	Monazite	0.988	Coal	-0.176		-0.528		-0.620	
CA-SS-14-0	1.950	+/-	0.53		0.700	+/-	0.16		0.730	+/-	0.25		2.786	Monazite	2.671	Monazite	0.954		-0.328		-0.720	
CA-SS-15-0	1.320	+/-	0.3		0.700	+/-	0.16		0.770	+/-	0.2		1.886	Monazite	1.714	Monazite	0.324		-0.328		-0.680	
CA-SS-16-0	0.810	+/-	0.22		0.490	+/-	0.12		0.530	+/-	0.17		1.653	Monazite	1.528	Monazite	-0.186		-0.538		-0.920	
CA-SS-17-0	1.530	+/-	0.37		0.520	+/-	0.13		0.610	+/-	0.19		2.942	Monazite	2.508	Monazite	0.534		-0.508		-0.840	
CA-SS-18-0	2.350	+/-	0.45		0.950	+/-	0.19		1.460	+/-	0.3		2.474	Monazite	1.610	Monazite	1.354		-0.078		0.010	
CA-SS-19-0	2.230	+/-	0.42		1.050	+/-	0.22		1.400	+/-	0.29		2.124	Monazite	1.593	Monazite	1.234		0.022		-0.050	
CA-SS-20-0	1.330	+/-	0.28		1.020	+/-	0.22		1.410	+/-	0.3		1.304	Monazite	0.943	Coal	0.334		-0.008		-0.040	
Mean	1.124				0.673				0.828				**1.684**		**1.443**		0.128		-0.355		-0.623	
Stdev	0.560				0.240				0.393				0.630		0.574		0.560		0.240		0.393	
Max	2.350				1.050				1.460				2.942		2.671		1.354		0.0220		0.0100	
Min	0.330				0.370				0.330				0.816		0.630		-0.666		-0.658		-1.120	
Median	0.965				0.535				0.725				1.647		1.466		-0.031		-0.493		-0.725	
3A-SS-1-0	4.280	+/-	0.69		1.220	+/-	0.23		1.560	+/-	0.29		3.508	Monazite	2.744	Monazite	3.284		0.192		0.110	
3A-SS-2-0	2.930	+/-	0.52		1.150	+/-	0.23		1.380	+/-	0.28		2.548	Monazite	2.123	Monazite	1.934		0.122		-0.070	
3A-SS-3-0	3.570	+/-	0.61		1.320	+/-	0.25		1.680	+/-	0.32		2.705	Monazite	2.125	Monazite	2.574		0.292		0.230	
3A-SS-4-0	4.180	+/-	0.7		1.340	+/-	0.25		1.610	+/-	0.31		3.119	Monazite	2.596	Monazite	3.184		0.312		0.160	
3A-SS-5-0	6.700	+/-	1.1		1.590	+/-	0.29		1.900	+/-	0.36		4.214	Monazite	3.526	Monazite	5.704		0.562		0.450	
Mean	4.332				1.324				1.626				**3.219**		**2.623**		3.336		0.296		0.176	
Stdev	1.430				0.167				0.189				0.671		0.576		1.430		0.167		0.189	
Max	6.700				1.590				1.900				4.214		3.526		5.704		0.562		0.450	
Min	2.930				1.150				1.380				2.548		2.123		1.934		0.122		-0.070	
Median	4.180				1.320				1.610				3.119		2.596		3.184		0.292		0.160	
3B-SS-1-0	9.700	+/-	1.5		2.380	+/-	0.42		2.690	+/-	0.47		4.076	Monazite	3.606	Monazite	8.704		1.352		1.240	
3B-SS-2-0	7.800	+/-	1.2		2.270	+/-	0.4		2.140	+/-	0.38		3.436	Monazite	3.645	Monazite	6.804		1.242		0.690	
3B-SS-3-0	6.400	+/-	1		1.550	+/-	0.29		1.570	+/-	0.3		4.129	Monazite	4.076	Monazite	5.404		0.522		0.120	
3B-SS-4-0	2.690	+/-	0.48		1.110	+/-	0.22		1.580	+/-	0.3		2.423	Monazite	1.703	Monazite	1.694		0.082		0.130	
3B-SS-5-0	7.600	+/-	1.2		2.090	+/-	0.38		2.250	+/-	0.4		3.636	Monazite	3.378	Monazite	6.604		1.062		0.800	
Mean	6.838				1.880				2.046				**3.540**		**3.282**		5.842		0.852		0.596	
Stdev	2.603				0.536				0.477				0.689		0.918		2.603		0.536		0.477	
Max	9.700				2.380				2.690				4.129		4.076		8.704		1.352		1.240	
Min	2.690				1.110				1.570				2.423		1.703		1.694		0.082		0.120	
Median	7.600				2.090				2.140				3.636		3.606		6.604		1.062		0.690	

FIELD ID	Thorium 232 RESULT	Thorium 232 TOTAL UNCERTAINTY	Thorium 232 Flag	Uranium 238 RESULT	Uranium 238 TOTAL UNCERTAINTY	Uranium 238 Flag	Thorium 230 RESULT	Thorium 230 TOTAL UNCERTAINTY	Thorium 230 Flag	Th232 / U238 RESULT	Contaminants Coal Ash / Monazite sand?	Th232 / Th230 RESULT	Contaminants Coal Ash / Monazite sand?	Th232 net RESULT	Th232 net Flag	U238 net RESULT	U238 net Flag	Th230 net RESULT	Th230 net Flag
3C-SS-1-0	8.500	+/- 1.3		2.020	+/- 0.38		2.080	+/- 0.36		4.208	Monazite	4.087	Monazite	7.504		0.992		0.630	
3C-SS-2-0	6.320	+/- 0.99		1.610	+/- 0.3		1.740	+/- 0.31		3.925	Monazite	3.632	Monazite	5.324		0.582		0.290	
3C-SS-3-0	4.910	+/- 0.78		1.900	+/- 0.34		1.760	+/- 0.31		2.584	Monazite	2.790	Monazite	3.914		0.872		0.310	
3C-SS-4-0	9.100	+/- 1.5		1.540	+/- 0.29		2.290	+/- 0.41		5.909	Monazite	3.974	Monazite	8.104		0.512		0.840	
3C-SS-5-0	5.930	+/- 0.97		1.050	+/- 0.22		1.890	+/- 0.35		5.648	Monazite	3.138	Monazite	4.934		0.022		0.440	
Mean	6.952			1.624			1.952			**4.455**		**3.524**		5.956		0.596		0.502	
Stdev	1.777			0.377			0.233			1.358		0.552		1.777		0.377		0.233	
Max	9.100			2.020			2.290			5.909		4.087		8.104		0.992		0.840	
Min	4.910			1.050			1.740			2.584		2.790		3.914		0.022		0.290	
Median	6.320			1.610			1.890			4.208		3.632		5.324		0.582		0.440	
3D-SS-1-0	0.790	+/- 0.17		0.970	+/- 0.2		1.200	+/- 0.23		0.814	Coal	0.658	Coal	-0.206		-0.058		-0.250	
3D-SS-2-0	0.680	+/- 0.16		0.860	+/- 0.17		1.110	+/- 0.23		0.791	Coal	0.613	Coal	-0.316		-0.168		-0.340	
3D-SS-3-0	0.730	+/- 0.17		0.840	+/- 0.18		1.320	+/- 0.26		0.869	Coal	0.553	Coal	-0.266		-0.188		-0.130	
3D-SS-4-0	0.610	+/- 0.14		0.850	+/- 0.18		1.070	+/- 0.21		0.718	Coal	0.570	Coal	-0.386		-0.178		-0.380	
3D-SS-5-0	0.720	+/- 0.16		1.470	+/- 0.27		1.150	+/- 0.22		0.490	Coal	0.626	Coal	-0.276		0.442		-0.300	
Mean	0.706			0.998			1.170			**0.736**		**0.604**		-0.290		-0.0300		-0.2800	
Stdev	0.067			0.269			0.097			0.148		0.043		0.0666		0.269		0.097	
Max	0.790			1.470			1.320			0.869		0.658		-0.206		0.442		-0.130	
Min	0.610			0.840			1.070			0.490		0.553		-0.386		-0.188		-0.380	
Median	0.720			0.860			1.150			0.791		0.613		-0.276		-0.168		-0.300	
3E-SS-1-0	1.570	+/- 0.3		2.250	+/- 0.4		2.180	+/- 0.39		0.698	Coal	0.720	Coal	0.574		1.222		0.730	
3E-SS-2-0	1.510	+/- 0.31		2.430	+/- 0.42		2.790	+/- 0.52		0.621	Coal	0.541	Coal	0.514		1.402		1.340	
3E-SS-3-0	1.450	+/- 0.28		2.830	+/- 0.5		2.520	+/- 0.44		0.512	Coal	0.575	Coal	0.454		1.802		1.070	
3E-SS-4-0	1.560	+/- 0.3		2.630	+/- 0.45		2.570	+/- 0.46		0.593	Coal	0.607	Coal	0.564		1.602		1.120	
3E-SS-5-0	1.520	+/- 0.28		2.450	+/- 0.44		2.460	+/- 0.43		0.620	Coal	0.618	Coal	0.524		1.422		1.010	
Mean	1.522			2.518			2.504			**0.609**		**0.612**		0.526		1.490		1.054	
Stdev	0.048			0.220			0.220			0.0666		0.0673		0.0476		0.220		0.220	
Max	1.570			2.830			2.790			0.698		0.720		0.574		1.802		1.340	
Min	1.450			2.250			2.180			0.512		0.541		0.454		1.222		0.730	
Median	1.520			2.450			2.520			0.620		0.607		0.524		1.422		1.070	
3F-SS-1-0	13.000	+/- 2.2		2.250	+/- 0.4		2.660	+/- 0.52		5.778	Monazite	4.887	Monazite	12.004		1.222		1.210	
3F-SS-2-0	8.800	+/- 1.4		1.840	+/- 0.33		2.140	+/- 0.39		4.783	Monazite	4.112	Monazite	7.804		0.812		0.690	
3F-SS-3-0	2.670	+/- 0.48		1.130	+/- 0.23		1.410	+/- 0.28		2.363	Monazite	1.894	Monazite	1.674		0.102		-0.040	
3F-SS-4-0	2.160	+/- 0.41		1.060	+/- 0.21		1.270	+/- 0.27		2.038	Monazite	1.701	Monazite	1.164		0.032		-0.180	
3F-SS-5-0	3.490	+/- 0.64		1.090	+/- 0.22		1.760	+/- 0.36		3.202	Monazite	1.983	Monazite	2.494		0.062		0.310	
Mean	6.024			1.474			1.848			**3.633**		**2.915**		5.028		0.446		0.398	
Stdev	4.716			0.542			0.565			1.602		1.476		4.716		0.542		0.565	
Max	13.000			2.250			2.660			5.778		4.887		12.004		1.222		1.210	
Min	2.160			1.060			1.270			2.038		1.701		1.164		0.032		-0.180	
Median	3.490			1.130			1.760			3.202		1.983		2.494		0.102		0.310	
3C-SS-1-1	14.600	+/- 2.5		2.200	+/- 0.38		3.140	+/- 0.59		6.636	Monazite	4.650	Monazite	13.604		1.172		1.690	
3F-SS-2-1	7.500	+/- 1.4		1.730	+/- 0.31		2.140	+/- 0.44		4.335	Monazite	3.505	Monazite	6.504		0.702		0.690	
CA-SS-20-1	1.340	+/- 0.31		1.080	+/- 0.22		1.260	+/- 0.3		1.241	Monazite	1.063	Monazite	0.344		0.052		-0.190	

Analytical Sample result																		
		Thorium-232 Result			Uranium-238 Result			Thorium-230 Result			Th-232 to U-238 Ratio[3]				Th-232 to Th-230 Ratio[3]			
SU[1]	# samples	Average (pCi/g)	Standard Deviation	Max (pCi/g)	Average (pCi/g)	Standard Deviation	Max (pCi/g)	e (pCi/g)	Standard Deviation	Max (pCi/g)	Average (pCi/g)	d Deviatio	Max (pCi/g)	Contaminants	Average (pCi/g)	Standard Deviation	Max (pCi/g)	Contaminants
3A	5	4.33	1.43	6.70	1.32	0.167	1.59	1.63	0.189	1.90	3.22	0.671	4.21	Monazite	2.62	0.576	3.53	Monazite
3B	5	6.84	2.60	9.70	1.88	0.536	2.38	2.05	0.477	2.69	3.54	0.689	4.13	Monazite	3.28	0.918	4.08	Monazite
3C	5	6.95	1.78	9.10	1.62	0.377	2.02	1.95	0.233	2.29	4.45	1.36	5.91	Monazite	3.52	0.55	4.09	Monazite
3D	5	0.706	0.0666	0.790	0.998	0.269	1.47	1.17	0.0967	1.32	0.736	0.148	0.869	Coal Ash	0.604	0.043	0.658	Coal Ash
3E	5	1.52	0.0476	1.57	2.52	0.220	2.83	2.50	0.220	2.79	0.609	0.0666	0.698	Coal Ash	0.612	0.0673	0.720	Coal Ash
3F	5	6.02	4.72	13.0	1.47	0.542	2.25	1.85	0.565	2.66	3.63	1.60	5.78	Monazite	2.92	1.48	4.89	Monazite
RA	5	1.00	0.135	1.20	1.03	0.0934	1.15	1.45	0.157	1.64		N/A[2]		N/A[2]		N/A[2]		N/A[2]
CA	20	1.12	0.560	2.35	0.673	0.240	1.05	0.828	0.393	1.46	1.68	0.63	2.94	Monazite	1.44	0.57	2.67	Monazite

NOTES:
1. SU=Survey Unit, 3A~3F are the six areas of interest, RA=Reference Area, CA=Known Monazite Sand Contaminated Area.
2. Reference areas are assumed to be free of contaminants, therefore Th-232 to U-238 Ratio is not to be performed.
3. Ratio is not based on net nanlytical result, but gross result before subtracting background.

APPENDIX D

QA/QC RECORDS

Inst.#2221 218557 BKGD		
QC Daily Source		
Date	Result (cpm)	P/F
1/4/2007	8916	Pass
1/5/2007	9015	Pass

Inst.#2221 218557 BKGD		Source Ser. #	1161
Initial Source Readings		Nuclide	Cs-137
Date	Result (cpm)		
1/3/2007	8726		
1/3/2007	8678		
1/3/2007	8623		
1/3/2007	9147		
1/3/2007	8643		
1/3/2007	8434		
1/3/2007	8629		
1/3/2007	8496		
1/3/2007	8451		
1/3/2007	8301		
	Average		
	8613		

Inst.#2221 218557 Gamma		
QC Daily Source		
Date	Result (cpm)	P/F
1/4/2007	213287	Pass
1/5/2007	216974	Pass

Inst.#2221 218557 Gamma		Source Ser. #	1161
Initial Source Readings		Nuclide	Cs-137
Date	Result (cpm)		
1/3/2007	209383		
1/3/2007	214368		
1/3/2007	211499		
1/3/2007	213125		
1/3/2007	214297		
1/3/2007	214585		
1/3/2007	218134		
1/3/2007	217334		
1/3/2007	220453		
1/3/2007	227306		
	Average		
	216048		

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 5)

Counting Instrument:			2360		Detector:	43-93		Calibration Date:		6/25/2006								
Serial #:			202398		Serial #:	PR211706		12 month calibration:		OK								
Detector Active Area or Area Covered by Smear (cm^2):						125		NRC 6 Mo Cal. Due Date?		WARNING								
	Efficiency (fraction)	Source Nuclide	Source Number	Original Source Activity (DPM)	Source Creation Date	$T_{1/2}$ (yr)	Source Decayed Activity	Required MDA ($DPM/100cm^2$)	Control Chart & Daily Bkg Count Time	Control Chart & Daily Source-Sample Count Time	Control Chart bkg Average α/β cpm	Control Chart bkg 1 sigma, cpm	Control Chart Source-bkg Average α/β cpm	Control Chart source 1 sigma, cpm				
Alpha	0.2001	Th-230	3973-02	17,500	4/29/2002	7.54E+04	17,499	100	1	1	1.30	1.49	3501.7	84.48				
Beta	0.1151	Tc-99	3975-02	17,500	4/29/2002	2.13E+05	17,500	1000	1	1	107.00	7.38	2013.7	61.71				

Date	Daily Bkg Counts		Daily Check Source Counts		Daily Bkg Rate (cpm)		Net Daily Source Rate (cpm)		Bkg QC Pass/Fail		Source QC Pass/Fail				α MDA OK?	β MDA OK?	H.P. Technician	Technician Initials
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	MDA α (dpm)	MDA β (dpm)				
1/4/2007	1	100	3605	2163	1.0	100.0	3604.0	2063.0	PASS	PASS	PASS	PASS	30.59	344	Yes	Yes	Gbright	GB
1/5/2007	0	108	3405	2125	0.0	108.0	3405.0	2017.0	PASS	PASS	PASS	PASS	11.99	357	Yes	Yes	Gbright	GB

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 5)

Initial Background and Source Counts for Control Chart

#	Initial bkg counts				Initial source plus bkg counts			
	Alpha	cpm	Beta	cpm	Alpha	cpm	Beta	cpm
1	0	0	98	98	3539	3539	2114	2114
2	5	5	95	95	3505	3505	2181	2181
3	1	1	102	102	3470	3470	2087	2087
4	0	0	110	110	3669	3669	2082	2082
5	0	0	105	105	3577	3577	2065	2065
6	2	2	112	112	3445	3445	2213	2213
7	1	1	111	111	3368	3368	2029	2029
8	1	1	106	106	3542	3542	2198	2198
9	1	1	111	111	3437	3437	2130	2130
10	2	2	120	120	3478	3478	2108	2108
Mean		1.30		107.0		3503.0		2120.7
$S_{(n-1)}$		1.49		7.38		84.01		60.16
-3 sigma		-3.18		84.86		3250.98		1940.23
+3 sigma		5.78		129.14		3755.02		2301.17
-2 sigma		-1.69		92.24		3334.99		2000.39
+2 sigma		4.29		121.76		3671.01		2241.01
					Mean-bkg	3501.7		2013.7
					$S_{(n-1)}$	84.48		61.71
				Mean-bkg	-3 sigma	3248.26		1828.56
				Mean-bkg	+3 sigma	3755.14		2198.84
				Mean-bkg	-2 sigma	3332.74		1890.27
				Mean-bkg	+2 sigma	3670.66		2137.13
						3539		2016
						3500		2086
						3469		1985
						3669		1972
						3577		1960
						3443		2101
						3367		1918
						3541		2092
						3436		2019
						3476		1988

Trial MDA Calculator	α	β
Sample Count Time (min)	1	
Bkg Count Rate (cpm)	0.1	
Bkg Count Time (min)	1	
Counter Efficiency	0.200106	0.11507
MDCR (cpm)	4.471333	#DIV/0!
MDA (dpm)	22.34485	#DIV/0!

Cabrera Services, Inc.

Instrumentation Logbook

Great Lakes Ash Sampling

Project #03-3040.30

Jan 2007

Instrument Inventory Log

Vendor	Make	Model / Probe	S/N	Cal Cert	Date Rec'd	Date Ret'd	Comments
Cabrera	Ludlum	2360/4393	202398/ PR211706	Y	1/3/07	1/5/07	
Cabrera	Ludlum	3/44-9	79517/PR137500	Y	1/3/07	1/5/07	
Cabrera	Ludlum	2221/44-20	218559/PR215448	Y	1/3/07	1/5/07	

Source Data Page

Source	Activity	S/N	Half Life (years)	Generation Date	Vendor
Th-230	17,500 dpm	3973-02	75,400	4-29-2002	Eberline
Tc-99	17,700 dpm	3975-02	211,000	4-25-2002	Eberline
Cs-137		1161	30.07		

DAILY F D LOG
Instrument QC

units are cpm ur/hr

Make	Model	S/N	Probe	S/N	DOC
Ludlum	2360	202398	43-93	PR211706	6/25/06
Bkgd Count	**Source Count**	**Source #1 ID**	**Source #2 ID**	**Source #3 ID**	**CDD**
1	1	DNS-11	PNS-12		

Date	1/3/0										
Intial QC's	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Tech**
Bkgd	0/98	5/95	1/102	0/110	0/105	2/112	1/111	1/106	1/111	2/120	GB
Source #1	3539	3505	3480	3669	3577	3445	3368	3542	3437	3478	GB
Source #2	2114	2181	2087	2082	2065	2213	2029	2198	2130	2108	GB
Source #3											

Daily QC's

Date	Bkgd	Source #1 (Th-230) α / β / γ	Source #2 ( ) α / β / γ	Source #3 ( ) α / β / γ	Battery OK	Tech
1/4/07	1/100	3605	2163		Yes / No	GB
1/5/07	0/108	3405	2125		Yes / No	GB
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	

DAILY F[illegible]D LOG
Instrument QC

units are cpm [illegible]ur/hr

Make	Model	S/N	Probe	S/N	DOC
Ludlum	2221	218357	44-20	215468	8/19/06
Bkgd Count	**Source Count**	**Source #1 ID**	**Source #2 ID**	**Source #3 ID**	**CDD**
1	1				

Date	1/3/07										
Intial QC's	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Tech**
Bkgd	8726	8678	8623	9147	8643	8434	8629	8496	8451	8301	GB
Source #1	209383	214368	211499	213125	214297	214585	218034	217334	220453	227306	GB
Source #2											
Source #3											

Daily QC's

Date	Bkgd	Source #1 (Cs-137) α / β / γ	Source #2 ( ) α / β / γ	Source #3 ( ) α / β / γ	Battery OK	Tech
1/4/07	8916	213287			Yes / No	GB
1/5/07	9015	216974			Yes / No	GB
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	

DAILY F D LOG
Instrument QC

units are cpm ur/hr

Make	Model	S/N	Probe	S/N	DOC
Ludlum	3	79517	44-9	PR137500	5/23/06
Bkgd Count	**Source Count**	**Source #1 ID**	**Source #2 ID**	**Source #3 ID**	**CDD**
1	1	DNS-12			

Date	1/3/07										
Intial QC's	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Tech**
Bkgd	30 GB	30	20	20	30	30	30	50	40	40	GB
Source #1	~~3539~~										GB
Source #2	2700	2800	3100	3200	3300	3100	3000	3200	3000	3100	
Source #3											

Daily QC's

Date	Bkgd	Source #1 ( ) α / β / γ	Source #2 ( ) α / β / γ	Source #3 ( ) α / β / γ	Battery OK	Tech
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	

EBERLINE SERVICES

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# 3863
P.O.# 02-055

Description of Standard:

Model No. DNS-11 Serial No. 3973-02 Isotope Th-230

Electroplated on polished SS disc, 0.79 mm thick.

Total diameter of 4.77 cm and an active diameter of 4.45 cm.

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the active surface.

Measurement Method:

The 2pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolute counting of alpha particles emitted in the hemisphere above the active surface was verified by counting above, below, and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrated alpha source S/N 2393/91.

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration date was:

8,860 ± 265

The total disintegration rate (dpm) assuming 1.5% backscatter of alpha particles from the surface of the disc, was:

17,500 ± 523 (0.00786 μCi)

The uncertainty of the measurement is 3 %, which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: ART REUST Reviewed by: [signature]

Calibration Technician: [signature] Q.A. Representative [signature]

Calibration Date: 4-29-2002 Reviewed Date: 4-29-02

Analytical Services
7021 Pan American Freeway NE
Albuquerque, New Mexico 87109-4238
(505) 345-3461 Fax (505) 761-5416
Toll Free (866) RAD-LABS (723-5227)
www.eberlineservices.com

EBERLINE SERVICES

CERTIFICATE OF CALIBRATION

Electroplated Beta Standard

S.O.# 3863
P.O.# 02-055

Description of Standard:

Model No. DNS-12 Serial No. 3975-02 Isotope Tc-99

Electroplated on polished SS disc, 0.79 mm thick.

Total diameter of 4.77 cm and an active diameter of 4.45 cm.

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the active surface.

Measurement Method:

The 2pi beta emission rate was measured using an internal gas flow proportional chamber. Absolute counting of beta particles emitted in the hemisphere above the active surface was verified by counting above, below, and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrated beta source S/N 2148/90.

Measurement Result:

The observed beta count rate from the surface of the disc per minute (cpm) on the calibration date was:

11,000 ± 441

The total disintegration rate (dpm) assuming 25 % backscatter of beta particles from the surface of the disc, was:

17,700 ± 706 (0.00796 μCi)

The uncertainty of the measurement is 4 %, which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: ART REUST Reviewed by:

Calibration Technician: Q.A. Representati

Calibration Date: 4-25-2002 Reviewed Date: 4-29-02

Analytical Services
7021 Pan American Freeway NE
Albuquerque, New Mexico 87109-4238
(505) 345-3461 Fax (505) 761-5416
Toll Free (866) RAD-LABS (723-5227)
www.eberlineservices.com

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER CABRERA SERVICES ORDER NO. 257191/303228

Mfg. Ludlum Measurements, Inc. Model 2360 Serial No. 202398

Mfg. Ludlum Measurements, Inc. Model 43-93 Serial No. PR 211706

Cal. Date 25-Jun-06 Cal Due Date 25-Jun-07 Cal. Interval 1 Year Meterface 202-855

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 76 °F RH 42 % Alt 700.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☐ F/S Resp. ck ☑ Reset ck. ☑ Window Operation ☑ Geotropism
☑ Audio ck. ☐ Alarm Setting ck. ☑ Batt. ck. (Min. Volt) 2.2 VDC
☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 02/07/97.

nstrument Volt Set 725 V

☑ HV Readout (2 points) Ref./Inst. 500 / 503 V Ref./Inst. 1500 / 1510 V

Firmware Version: 39010n25
Alpha Threshold: 120 mV
Beta Threshold: 3.5mV
Beta Window: 30 mV
Overload SET TO SIMULATE LIGHT LEAK
Instrument calibrated with a 5' cable.
High voltage set with detector CONNECTED

(EEPROM Settings)
User Time: 1.0
Alpha Alarm: 50000
Beta Alarm: 50000
A/B Alarm: 50000
Model 2360 Date: 6/25/~~07~~ 06
Calibration Date Due: 6/25/07

COMMENTS:

Efficiency Formula:
Source Count - Bkgrd=? /source size (dpm)=? x100 = %
4 pi efficiencies for Th230, Tc99, Sr90Y90, and Ni63 are as follows:
Th230≈20%,Tc99≈16%,Sr90Y90≈25%,Ni63≈0.06%

* SEE PLATEAU SHEETS FOR ALL *

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
x1000	400kcpm	400	400
x1000	100kcpm	100	100
x100	40kcpm	400	400
x100	10kcpm	100	100
x10	4kcpm	400	400
x10	1kcpm	100	100
x1	400kcpm	400	400
x1	100kcpm	100	100

*Uncertainty within ± 10% C.F. within ± 20% ALL Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout	400kcpm	39993(0)	39993(0)	Log Scale			
	40kcpm	3995	3995				
	4kcpm	400	400				
	400cpm	40	40				
	40cpm	4	4				

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques.
The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323-1978 State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources: ☐ S-394 ☐ 1122 ☐ 781
Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ 720 ☐ 734 ☐ 1616 ☐ Neutron Am-241 Be S/N T-304

☑ Alpha S/N Th230/E121495 ☑ Beta S/N Tc99/NI-EV,Sr90Y90/4016,Ni63/4017 ☐ Other

☑ m 500 S/N 189496 ☐ Oscilloscope S/N ☑ Multimeter S/N 83750186

Calibrated By: Michael Jones Date 25 June 06

Reviewed By: W Robins Date 26 June 06

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.
FORM C22S 06/02/2006

AC Inst. Only ☐ Passed Dielectric (Hi-Pot) and Continuity Test ☐ Failed:

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 43-93 Serial No. PR 211706 Order #. 257191/303228

Customer CABRERA SERVICES Alpha Input Sensitivity 120 mV

Counter 2360 Serial No. 202398 Beta Input Sensitivity 3.5 mV

Count Time 1Minute Beta Window 30 mV

Other Distance Source to Detector Surface

High Voltage	Background		Isotope Th230 Size ≈19800 dpm		Isotope Size		Isotope Size	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
700	1	124	3918	505				
725	1	213	4047	568				
750	0	554	4132	1153				

☐ Gas Proportional detector count rate decreased ≤ 10% after 15 hour static test using 39" cable.

☐ Gas proportional detector count rate decreased ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter.

Signature Michael Torres Date 25 June 06

FORM C4B 04/09/2003

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 43-93 Serial No. PR 211706 Order #. 257191/303228

Customer CABRERA SERVICES Alpha Input Sensitivity 120 mV

Counter 2360 Serial No. 202398 Beta Input Sensitivity 3.5 mV

Count Time 1Minute Beta Window 30 mV

Other Distance Source to Detector surface

High Voltage	Background		Isotope Tc 99 Size ≈ 22600 dpm		Isotope Sr90/90 Size ≈ 59077 dpm		Isotope Ni 63 Size ≈ 290696 dpm	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
700	1	124	2	2969	5	11583	1	141
725	1	213	4	3829	4	15130	3	391
750	0	554	6	5266	4	18207	1	1634

☐ Gas Proportional detector count rate decreased ≤ 10% after 15 hour static test using 39" cable.

☐ Gas proportional detector count rate decreased ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter.

Signature Michael Torres Date 25 June 06

FORM C4B 04/09/2003

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER CABRERA SERVICES ORDER NO. 252136/300508

Mfg. Ludlum Measurements, Inc. Model 3 Serial No. 79517

Mfg. Ludlum Measurements, Inc. Model 44-9 Serial No. PR-137500

Cal. Date 23-Mar-06 Cal Due Date 23-Mar-07 Cal. Interval 1 Year Meterface 202-002

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 74 °F RH 20 % Alt 705.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☑ F/S Resp. ck ☑ Reset ck. ☐ Window Operation ☑ Geotropism
☑ Audio ck. ☐ Alarm Setting ck. ☑ Batt. ck. (Min. Volt) 2.2 VDC

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 02/07/97.

nstrument Volt Set 900 V Input Sens. 28 mV Det. Oper. 900 V at 28 mV Threshold Dial Ratio = mV

☐ HV Readout (2 points) Ref./Inst. / V Ref./Inst. / V

COMMENTS:

Efficiency readings(4pi using 44-9)
Th230sn:5020-03, Act=5730dpm, background≈30cpm, Source count≈1100cpm, Eff≈18.6%
Ni-63sn:4017, Act=291364dpm, background≈30cpm, Source count≈2000cpm, Eff≈0.6%
Tc99sn:5279-04, Act=28800dpm, background≈30cpm, Source count≈8000cpm, Eff≈27.7%
Sr90Y90sn:4016, Act=59453dpm, background≈30cpm, Source count≈24000cpm, Eff≈40.3%

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
X 100	400 K cpm	4K	4K
X 100	100 K cpm	1K	1K
X 10	40 K cpm	4K	4K
X 10	10 K cpm	1.1K	1.1K
X 1	4 K cpm	4K	4K
X 1	1 K cpm	1.1K	1.1K
X 0.1	400 cpm	4K	4K
X 0.1	100 cpm	1K	1K

*Uncertainty within ± 10% C.F. within ± 20% ALL **Range(s) Calibrated Electronically**

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout				Log Scale			

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323-1978 State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☑ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☑ E552 ☐ E551 ☐ 720 ☐ 734 ☐ 1616 ☐ Neutron Am-241 Be S/N T-304

☐ Alpha S/N ☐ Beta S/N ☐ Other

☑ m 500 S/N 50800 ☐ Oscilloscope S/N ☑ Multimeter S/N 83990502

Calibrated By: Charles Dick Date 23 Mar 06

Reviewed By: Michael J Shu Date 24-Mar-06

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.
FORM C22A 11/26/2003

AC Inst. Only ☐ Passed Dielectric (Hi-Pot) and Continuity Test ☐ Failed:

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CONVERSION CHART

Customer CABRERA SERVICES Date 23-Mar-06 Order #. 252136/300508

Model 3 Serial No. 79517 Detector Model 44-9 Serial No. PR-137500

Source Cs-137 150 mCi Cs-137 21 mCi High Voltage 900 V

Input Sensitivity 28 mV

	"As Found" Readings (CPM):		After Adjustment Readings (CPM):	
Reference Point	Meter Reading	Range/Scale	Meter Reading	Range/Scale
150 mR/hr	3K	x 100	3K	x 100
50 mR/hr	1.5K	x 100	1.5K	x 100
15 mR/hr	0.6K	x 100	0.6K	x 100
5 mR/hr	1.9K	x 10	1.9K	x 10
1.5 mR/hr	0.6K	x 10	0.6K	x 10
1.0 mR/hr	3.2K	x 1	3.2K	x 1

Signature: Charles Dick Date 23 Mar 06

FORM C17-1A 04/09/2003

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER CABRERA SERVICES ORDER NO. 257115/303187

Mfg. Ludlum Measurements, Inc. Model 2221 Serial No. 218559

Mfg. Ludlum Measurements, Inc. Model 44-20 Serial No. PR215468

Cal. Date 19-Aug-06 Cal Due Date 19-Aug-07 Cal. Interval 1 Year Meterface 202-159

Check mark ✓ applies to applicable instr. and/or detector IAW mfg. spec. T. 73 °F RH 43 % Alt 700.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☑ Input Sens. Linearity
☑ F/S Resp. ck ☑ Reset ck. ☑ Window Operation ☑ Geotropism
☑ Audio ck. ☐ Alarm Setting ck. ☑ Batt. ck. (Min. Volt) 4.4 VDC

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 02/07/97.

Instrument Volt Set Comments V Input Sens Comments mV Det. Oper Comments V at Comments mV Threshold Dial Ratio 100 = 10 mV

☑ HV Readout (2 points) Ref./Inst. 500 / 500 V Ref./Inst. 2000 / 2008 V

COMMENTS:

	Peak settings	Gross Counts
High Voltage:	687V	1050V
Threshold dial:	642	100(10mv)
Window dial:	40	n/a
Window Position:	"IN"	"OUT"
Resolution for Cs137:	≈8.7%	n/a

Model 2221 currently set for Gross Counts
High voltage set with detector connected.

Firmware: 261028 ~~8~~ TT

Calibrated with 5foot cable.

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
X 1K	400kcpm	400	400
X 1K	100kcpm	100	100
X 100	40kcpm	400	400
X 100	10kcpm	100	100
X 10	4kcpm	400	400
X 10	1kcpm	100	100
X 1	400cpm	400	400
X 1	100cpm	100	100

*Uncertainty within ± 10% C.F. within ± 20% ALL Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout	400kcpm	40215(0)	40215(0)	Log Scale	500kcpm	450 K	450K
	40kcpm	4013(0)	4013(0)		50kcpm	50 K	50K
	4kcpm	402(0)	402(0)		5kcpm	5 K	5K
	400cpm	40(0)	40(0)		500cpm	500	500
	40cpm	4(0)	4(0)		50cpm	55	55

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques.
The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323-1978 State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ 720 ☐ 734 ☐ 1616 ☐ Neutron Am-241 Be S/N T-304

☐ Alpha S/N ☐ Beta S/N ☐ Other

☑ m 500 S/N 57881 ☐ Oscilloscope S/N ☑ Multimeter S/N 56110559R

Calibrated By: Michael J Thomas Date 19-Aug-06

Reviewed By: [illegible] Date 21 Aug 06

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.
FORM C22A 11/26/2003

AC Inst. Only ☐ Passed Dielectric (Hi-Pot) and Continuity Test ☐ Failed:

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 44-20 Serial No. PR 215468

Customer CABRERA SERVICES Order #. 257115/303187

Counter 2221 Serial No. 218559 Counter Input Sensitivity 10 mV

Count Time 6 sec Distance Source to Detector Surface

Other

High Voltage	Background	Isotope Am-241 Size ≈0.79uCi	Isotope Size	Isotope Size	Isotope Size
700	1704	1745			
750	1823	14477			
800	2019	16053			
850	2008	18828			
900	2046	19983			
950	2024	21056			
1000	2020	20841			
→ 1050	2137	20868			
1100	2043	20941			
1150	2160	20636			
1200	2249	20971			
1250	2651	21456			

Signature Michael T Thomas Date 19-Aug-06

FORM C4A 04/09/2003

APPENDIX E

HEALTH AND SAFETY RECORDS

Appendix E - Health and Safety Records

CABRERA SERVICES
RADIOLOGICAL · ENVIRONMENTAL · REMEDIATION

DAILY SAFETY TOOLBOX MEETING

Project Name: Great Lakes Ash Sampling	Project #: 03-3040.56 Task 130
Location: Great Lakes Naval Center	Date/Time: 1/4/07
General Scope of Work: Soil Sampling to Determine Characteristics of Soil at Several areas around GLNC	

Emergency Telephone Numbers

Police: 911	Fire: 911	Ambulance: 911

Other (UXO, Facility, etc.):

Name:	Phone # :
Name:	Phone # :
Name:	Phone # :

Days Work Tasks

Task 1: Soil Sampling	Task 2: GWS
Task 3:	Task 4:
Task 5:	Task 6:
Training Requirements:	

SAFETY AND HEALTH INFORMATION

Job Safety Analysis completed for this work?	[✓] Yes	[ ] No
Permits Required: RWP [ ]Yes[X]No;RWP # _____	Confined Space [ ] Yes[✓]No; # _____	

Radiation Hazards:

Chemical Hazards (Incld marking paint, deconagents, etc.):

Physical Hazards: Cold weather slips, trips & falls ergonomics, traffic

Work Control Methods (JHA, Work Plan, monitroing, etc.):

PPE: Nitrile gloves, boot covers (possibly)

Special Equipment (Generators, backhoes, ISOCS, etc.): hand auger

Types of Communications: Cell phone

Special Topics:

Appendix E - Health and Safety Records

Lessons Learned from Previous Day:

Questions & Feedback from Attendees:

Meeting Conducted by	Print Name	Sign Name	Company
Cabrera Field Lead:	Greg Bright		Cabrera
Radiolgical Lead:			
Safety and Health Rep.:			

MEETING ATTENDEES

Print Name	Signature	Company
John Eberlin		CSI
Greg Bright		Cabrera
Robert L Shoemaker		Cabrera

Signature indicates that the employee understands the content of the breifing, has been given the opportunity to ask questions, provide feedback or raise concerns, and has completed the specified training requirements.

2/14/2002

Appendix E - Health and Safety Records

CABRERA SERVICES
RADIOLOGICAL · ENVIRONMENTAL · REMEDIATION

DAILY SAFETY TOOLBOX MEETING

Project Name: Great Lakes Ash Sampling	Project #: 03-3040.30 Task 130
Location: Great Lakes Naval Center	Date/Time: 1/5/07
General Scope of Work: Soil Sampling to Determine Characteristics of Soil at Several areas around GLNC	

Emergency Telephone Numbers

Police: 911	Fire: 911	Ambulance: 911

Other (UXO, Facility, etc.):

Name:	Phone # :
Name:	Phone # :
Name:	Phone # :

Days Work Tasks

Task 1: Soil Sampling	Task 2: GWS
Task 3:	Task 4:
Task 5:	Task 6:
Training Requirements:	

SAFETY AND HEALTH INFORMATION

Job Safety Analysis completed for this work?	[✓] Yes	[ ] No
Permits Required: RWP [ ]Yes[✓]No;RWP # _____	Confined Space [ ] Yes[✓]No; # _____	

Radiation Hazards:

Chemical Hazards (Incld marking paint, deconagents, etc.):

Physical Hazards: Cold weather, slips trips falls

Work Control Methods (JHA, Work Plan, monitroing, etc.):

PPE: Nitrile gloves, boot covers (possibly)

Special Equipment (Generators, backhoes, ISOCS, etc.): hand auger

Types of Communications: Cell phone

Special Topics:

Appendix E - Health and Safety Records

Lessons Learned from Previous Day:

Questions & Feedback from Attendees:

Meeting Conducted by	Print Name	Sign Name	Company
Cabrera Field Lead:	Grey Bright	[illegible]	Cabrera
Radiolgical Lead:	↓	↓	↓
Safety and Health Rep.:			

MEETING ATTENDEES		
Print Name	**Signature**	**Company**
Robert L Shoemaker	[illegible]	Cabrera
John Eberlin	[illegible]	CSI
Grey Bright	[illegible]	Cabrera

Signature indicates that the employee understands the content of the breifing, has been given the opportunity to ask questions, provide feedback or raise concerns, and has completed the specified training requirements.

2/14/2002

Appendix E - Health and Safety Records

GREAT LAKES NAVAL TRAINING CENTER

ASH SAMPLING PLAN

STATEMENT OF ACKNOWLEDGMENT

SITE SAFETY AND HEALTH PLAN

1.0 INTRODUCTION .....

2.0 SITE HEALTH AND SAFETY ORGANIZATION.....

3.0 TASK DESCRIPTION/HAZARD ANALYSIS/RISK ASSESSMENT.....

4.0 TRAINING REQUIREMENTS.....

5.0 MEDICAL SURVEILLANCE PROGRAM.....

6.0 SITE CONTROL AND LAYOUT.....

7.0 AIR MONITORING PLAN.....

8.0 PERSONAL PROTECTIVE EQUIPMENT .....

9.0 DECONTAMINATION .....

10.0 GENERAL SITE SAFETY PROCEDURES.....

11.0 EMERGENCY RESPONSE AND EQUIPMENT .....

12.0 RECORD KEEPING .....

I have read the "Great Lakes Naval Training Center Ash Sampling Plan - Site Safety and Health Plan" outlined above and understand the material presented. I have been given the opportunity to ask questions and have had them answered to my satisfaction. I understand I may continue to ask questions as they relate to this document as necessary.

PRINTED NAME Greg Bright

SIGNATURE [signature] DATE 1/2/07

COMPANY Cabrera Services

Appendix E - Health and Safety Records

GREAT LAKES NAVAL TRAINING CENTER

ASH SAMPLING PLAN

STATEMENT OF ACKNOWLEDGMENT

SITE SAFETY AND HEALTH PLAN

1.0 INTRODUCTION .....

2.0 SITE HEALTH AND SAFETY ORGANIZATION.....

3.0 TASK DESCRIPTION/HAZARD ANALYSIS/RISK ASSESSMENT.....

4.0 TRAINING REQUIREMENTS.....

5.0 MEDICAL SURVEILLANCE PROGRAM.....

6.0 SITE CONTROL AND LAYOUT.....

7.0 AIR MONITORING PLAN.....

8.0 PERSONAL PROTECTIVE EQUIPMENT .....

9.0 DECONTAMINATION .....

10.0 GENERAL SITE SAFETY PROCEDURES.....

11.0 EMERGENCY RESPONSE AND EQUIPMENT .....

12.0 RECORD KEEPING .....

I have read the "Great Lakes Naval Training Center Ash Sampling Plan - Site Safety and Health Plan" outlined above and understand the material presented. I have been given the opportunity to ask questions and have had them answered to my satisfaction. I understand I may continue to ask questions as they relate to this document as necessary.

PRINTED NAME Robert L Shoemaker

SIGNATURE _____ DATE 1/3/07

COMPANY Cabrera Services