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REMOVAL SUPPORT TEAM 3
EPA CONTRACT EP-S2-14-01

November 9, 2016

Mr. Daniel Gaughan, On-Scene Coordinator
U.S. Environmental Protection Agency, Region II
Removal Action Branch
2890 Woodbridge Avenue
Edison, New Jersey 08837

EPA CONTRACT NO: EP-S2-14-01
TDD No: TO-0007-0023
DC No: RST3-03-D-0296
SUBJECT: PHASE II REMOVAL ASSESSMENT TRIP REPORT – CANADIAN RADIUM AND URANIUM CORP. SITE, MOUNT KISCO, WESTCHESTER COUNTY, NEW YORK

Dear Mr. Gaughan,

Enclosed please find the Phase II Removal Assessment Trip Report for the on-site activities conducted at the Canadian Radium and Uranium Corp. Site located in Mount Kisco, Westchester County, New York. This phase of the Removal Assessment was conducted on April 4 through 6, 2016.

If you have any questions or comments, please contact me at (732) 585-4413.

Sincerely,

WESTON SOLUTIONS, INC.

Bernard Nwosu
RST 3 Site Project Manager

Enclosure
cc: TDD File: TO-0007-0023

REMOVAL ASSESSMENT TRIP REPORT

SITE NAME: Canadian Radium and Uranium Corp. Site
DC No.: RST3-03-D-0296
TDD No.: 0007-0023
CERCLIS ID: NYD987001468
EPA ID: A23P
EVENT DATES: April 4 through 6, 2016

1.0 Site Location: 103-105 Kisco Avenue
Mount Kisco, Westchester, New York
(Refer to Attachment A, Figure 1: Site Location Map)

2.0 Site History and Conditions

From 1943 until approximately 1966, the Canadian Radium and Uranium (CRU) facility operations at the Canadian Radium and Uranium Corporation Site (the Site) included the recovery of uranium and other radioactive elements from uranium-bearing sludge, old instrumentation, and watch dials. This work began as part of the federal government's Manhattan Engineering District (Manhattan Project). From 1943 to the 1950s, the primary product was uranium; subsequently, radium became the principal product until the facility's closure. According to a Village of Mount Kisco memorandum, in 1957, CRU pleaded guilty to charges of allowing three employees to be overexposed to radiation. From March 5, 1958, until sometime after May 19, 1961, decontamination procedures and expectations were established for the CRU facility.

In November and December 1966, the facility buildings (a two-story concrete block building and two smaller one-story concrete block buildings) were decontaminated and demolished. Removal of radioactive dirt to a depth of 12 inches was required on the CRU premises. The most contaminated demolition materials were disposed of by Nuclear Diagnostic Laboratories located in Peekskill, New York, while the less contaminated materials were disposed of at Croton Point Sanitary Landfill located in Croton-on-Hudson, New York. After demolition and decontamination, a post-operation survey was conducted by Isotopes, Inc. Two locations on the Haggerty Millwork wall, which originally shared a wall with the CRU facility that was demolished during the 1966 demolition and decontamination process, were found above specifications. One contaminated location was removed by chiseling out the masonry of a wall. The second was a result of tailings from a leaking waste drum, which CRU had stored on the second floor fire escape. Since contamination was low here, the area was sealed with 1 to 2 inches of mortar. Railroad Avenue was constructed where the main CRU building once stood and was put in place by the urban renewal efforts in the area. Between 1964 (pre-demolition/decontamination) and 1971 (post-demolition/decontamination), the building layout of the Site completely changed and it is believed that none of the original CRU facility buildings remained after the year 1971.

On April 5, 1979, a local newspaper reported the 1957 death of the CRU plant manager due to leukemia from high radioactivity levels found in his body. On April 20, 1979, a survey was performed by the Assistant Commissioner of Health for Environmental Quality, Westchester Department of Health. Based on the surveys, the highest dose rates were found in a small portion of a locked, chain-link fenced area south of the old wood freight station on Railroad Avenue and east of the L. B. Richard's Lumber yard (*i.e.*, an area located adjacent to the railroad). All other

elevated dose rates were found in areas covered by soil and vegetative growth. The 1979 investigation reported that the high readings were obtained from an area covering approximately one square yard of the property within an area not being used by the public. In addition, the report indicated that the dose rates found did not pose a public health hazard to persons passing the fenced area, to persons working in buildings adjacent to the area, or to persons living across the railroad tracks to the east.

In a memorandum dated February 7, 1980, the Westchester County Health Department described investigation findings in more detail. The area in question was approximately 78 feet by 60 feet, enclosed by a chain-link fence located between the railroad tracks and a concrete paved area. The most significant contaminated area was a strip 15 feet by 5 feet, containing two separate "hot spots". A surface reading using an alpha probe survey meter measured 50 disintegrations per minute (dpm). Elevated readings several times above background were reported for an area extending about 50 feet south from the chain-link fence. The memorandum stated that the origin of this contamination was unknown and that it was not discovered in previous surveys.

In September 1993, the Bureau of Environmental Radiation Protection of the New York State Department of Health (NYSDOH) completed a survey of the Site; indoor radon measurements were collected (*i.e.*, office, show room, storage/sale floor) which documented a maximum concentration of 9.8 picocuries per liter (pCi/L), and the average of the different detectors was approximately 8.1 pCi/L. The NYSDOH also identified two outdoor areas where presence of radioactive materials were indicated at the back of Richard's Lumber, and the road that runs next to the railroad tracks and adjacent to a fence post inside the fenced portion of what appeared to be Richard's Lumber property on the south side of Railroad Avenue.

In 1994, the U.S. Environmental Protection Agency (EPA) conducted an on-site inspection to measure radon levels, collect air and soil samples, and measure exposure rates. The purpose of the investigation was to determine if conditions required immediate action and if the Site was eligible for long-term remediation under the federal Superfund Program. Elevated exposure rate measurements were observed on both the northern [10–700 microroentgens per hour (μR/hr)] and southern (10 –240 μR/hr) portions of the Site property. Radium-226 (Ra-226) concentrations in soil samples taken from the top 1.5 feet ranged from 3 to 150 picocuries per gram (pCi/g). All of the radon measurements were below EPA's guideline (*i.e.*, 4 pCi/L) and the air samples collected at the Site did not detect any radioactive contamination. The EPA concluded that the Site was not a potential candidate for inclusion in the National Priorities List (NPL) and, therefore, was not eligible for long-term remediation.

In July 1998, a complete radiological survey of the Village of Mt. Kisco and Richard's Lumber (former CRU) was conducted by New York State Department of Environmental Conservation (NYSDEC). The property owned by the Village of Mount Kisco (103 Kisco Avenue) was found to have contamination over one large unpaved area [about 4,000 to 5,000 square feet (sq. ft.)] and a few smaller areas. The July 1998 report stated that, on the Mt. Kisco property, the highest concentrations of radium observed were a few hundred pCi/g and that most of the contamination was in the top one foot of soil. The report stated that the distribution suggests that uranium-containing material was placed on the surface and then the area was leveled. A new road (Railroad Avenue) had been built where the CRU facility once stood; soil sampling completed near the road showed elevated levels of radium a few feet below the surface. The NYSDEC reported that the

distribution of radioactive material near the road appeared to be consistent with movement of soil as part of the building demolition and subsequent construction of the road. Sampling beneath the road surface was not performed. There is no documentation of shielding or other control measures implemented on the 103 Kisco Avenue property, though current conditions suggest that the property was recently paved with asphalt (of an unknown depth) or other cover materials.

The 1998 report further stated that the survey of the Richard's Lumber (105 Kisco Avenue) property indicated that radioactive materials were present under the parking lot, but no samples were taken beneath the asphalt. The highest concentration of radium at the Site was found just north of Railroad Avenue (about 6,000 pCi/g). A large part of the main outside storage area was reported to be contaminated with radium near the surface as well as within some soil profiles to depths of about 4 feet. Survey data suggested that the contamination stopped abruptly at the edges of the paved areas. Railroad Avenue showed count rates that were lower than background soils; NYSDEC attributed these results to absorption by the road surface material (*i.e.*, shielding). The July 1998 report indicated that radiation doses to workers or visitors to the Site as it was used at the time were not significant. The Site location where the dose rate was highest was a small area near Richard's Lumber, just north of Railroad Avenue. Time spent at this location was small; therefore, the accumulated dose was also estimated to be small. The July 1998 report suggested that significant radium contamination was present on both Mt. Kisco and Richard's Lumber properties. The NYSDEC did not consider the Site to be fully characterized at the completion of the survey.

In September 2013, Weston Solutions, Inc., Site Assessment Team (SAT), performed an on-site reconnaissance and gamma radiation screening of the historic CRU property and other possible areas of contamination. Based upon SAT's *Final Site Reassessment Summary Letter Report,* dated June 11, 2014, background readings taken north and northeast of the Site in the right-of-way (ROW) area alongside Kisco Avenue showed background gamma radiation levels of approximately 7,500 counts per minute (cpm). The highest reading of 73,637 cpm was located on the 105 Kisco Avenue property. Most readings were below 2 times (2x) background. There were three areas with readings that exceeded 2x background, ranging from 30,000 cpm to 73,637 cpm. All three areas above 2x background were located in the back portion of the 105 Kisco Avenue property, east of the historic CRU facility. No signs of ground discoloration were observed.

Site conditions during SAT's radiological reconnaissance of the 105 Kisco Avenue property, New York Stone and Masonry Supply, were typical for a stone, masonry, and landscaping business and had not changed significantly since the 1998 report. In the back portion of the property, surplus materials were stored in corrals, separating different materials such as gravel, sand, wood chips, etc. The most southeastern portion of the property consisted of a newly paved asphalt parking area for customers. Although historical redevelopment activities at the Site were unclear, it is believed that none of the current buildings are part of the original CRU facility. Materials and heavy machinery were present throughout the property, including the concrete corrals for materials. Many areas were not accessible for screening due to obstructions (*e.g.*, wood piles, heavy machinery, roll-offs). The property owner did not allow SAT to perform gamma screenings inside the main building; however, the owner allowed SAT to perform screenings in outdoor sheds and other storage warehouse-type buildings.

Site conditions during SAT's radiological reconnaissance of the 103 Kisco Avenue property, Hickory Homes and Properties, Inc., were typical for a landscaping supply and material storage facility. The property was semi-paved (during the 1998 report, the property was not paved), and completely fenced with an access gate. The access gate was closed and locked when employees were not on site. There was one small work trailer located at the northernmost portion of the property which included an employee break room, office, and reception area. Trucks, forklifts, and other heavy machinery were parked on the property. Various on-site roll-offs were filled with debris and materials. Cement corrals for materials were also located on-site. A manhole was located at the northeast corner of the Site, although no elevated gamma screenings were detected. Many areas were not accessible for screening due to obstructions (*e.g.*, wood piles, heavy machinery, roll-offs). No elevated gamma radiation was observed on the 103 Kisco Avenue property. Gamma screenings of Railroad Avenue and the ROW area bordering Railroad Avenue showed gamma screening readings ranging from background (~7,500 cpm) to 15,000 cpm, with one elevated area located at the corner of the 105 Kisco Avenue property, which had readings ranging from 15,000 cpm to 30,000 cpm.

In November 2013, SAT conducted a soil screening and sampling event. Eight boreholes were advanced to depth of 10 feet at the Site. During the event a gamma scintillation meter (Ludlum-2221 Scaler Ratemeter) was utilized for field gamma screening. Field screening data was collected to document the gamma exposure rates at 6-inch depth intervals vertically down each sample location borehole. The soil samples collected represent the highest levels of gamma radiation recorded for each borehole. All the soil samples were analyzed for radionuclides and target analyte list (TAL) metals.

Based upon SAT's June 2014 report of the November 2013 event, all analytical results for the thorium-232 (Th-232) decay series (Th-232, Th-228, and Ra-228) ranged from 0.6 to 1.2 pCi/g, and were therefore considered to be at background levels. In addition, all of the individual radioisotopes in this decay series were observed to be in equilibrium in each sample. Analytical results reported for the uranium-238 (U-238) decay series (U-238, U-234, Th-230, and Ra-226) did not appear to be in equilibrium. Concentrations of the parent isotopes U-238 and U-234 were at background levels ranging from 0.4 pCi/g to 0.8 pCi/g. The Th-230 concentrations in three of the samples [S01(24-36), S07(12-24), and S08(24-36)] were at background concentrations. The Th-230 concentrations in samples S02(0-12), S03(0-12), S04(36-48), S06(0-12), and S09(36-48) exhibited significantly elevated levels ranging from 4.6 to 83.3 pCi/g. It was also reported that the Th-230 analytical results for sample S05(0-12) may or may not be elevated, as the measured result was 1.8 +/- 0.3 pCi/g. Based upon the above, SAT concluded that the contaminants represent residual contamination from processed material and not uranium ore.

In addition, SAT reported that Ra-226 analytical results in samples S01(24-36), S02(0-12), S03(0-12), S04(36-48), S05(0-12), S06(0-12), and S09(36-48) were all significantly elevated, ranging from 15.4 pCi/g to 135 pCi/g. Sample location S07(12-24) was, as expected, at a background level of 0.9 pCi/g. Sample S08(24-36), which was collected at an assumed background location near the northeast corner of the 105 Kisco Avenue property, showed a Ra-226 concentration of 3.4 pCi/g, which is slightly elevated above the background level. In all instances, when an elevated concentration of Th-230 was detected in a sample, the Ra-226 was also elevated.

Lead and thallium isotopes are a result of the decay chain of U-238 and Th-232. SAT reported that sample location S04(36-48)/S09(36-48) [duplicate] exhibited greater than 3x times the highest background level of lead with concentrations at 1,000 milligrams per kilogram (mg/kg) and 440 mg/kg, respectively; and that it is unknown if this exceedance is linked to the residual radioactive contamination on the CRU site. There were no detections of thallium at the Site. Mercury concentrations greater than 3x the highest background level were also documented at locations S01, S03, and S04. It is unknown if this elevated concentration of mercury can be linked to the former CRU site operations; however, all the analytical data from this event suggested that there is measureable residual contamination remaining at the CRU site.

In August 2015, Weston Solutions, Inc., Removal Support Team 3 (RST 3) was tasked by EPA to provide support for a Removal Assessment of the Site and on-site properties, including Metropolitan Transit Authority (MTA), Milepost 136, 103 Kisco Avenue (Property C001), Hickory Homes and Properties, Inc., 103 Kisco Avenue (Property C002), New York Stone and Building Supply, 105 Kisco Avenue (Property C003), and a background location (comprising a strip mall), 145-159 Kisco Avenue (Property C004). As part of the Removal Assessment, EPA and RST 3 conducted radiological surveys within living spaces of on-site buildings, exterior areas throughout the Site, and specifically, soil sample locations selected by the EPA On-Scene Coordinator (OSC). Gamma survey was conducted using a Ludlum Model 2241 (Ludlum-2241), Fluke Pressurized Ionization Chamber (FPIC) Model 451P, and Reuter-Stokes RSS-131ER High Pressure Ion Chamber (HPIC) gamma survey meter. Specific radioisotopes were identified using a Berkeley Nucleonics Corporation (BNC) SAM 940™ (SAM 940) portable radioisotope identification system. Radon/thoron survey was conducted using RAD7 radon/thoron detectors.

Based upon the results of the radiological survey conducted with Ludlum-2241, above-background gamma readings ranging from 12,000 – 15,000 cpm were identified at the southeast corner of one on-site warehouse (Warehouse-2) located further northeast in Property C003. More than 2x background gamma values were identified at soil sample locations throughout the Site with concentrations ranging from 20,000 – 180,000 cpm). It is suspected that the elevated gamma readings (20,000 – 22,000 cpm) observed at one location next to the shared perimeter fence on Property C001 side of the fence, may have be due to leaching from bagged contaminated soil staged on Property C002 side of the fence which had a gamma reading of 80,000 – 120,000 cpm. According to the tenant of Property C002 at the time of this event, the bagged soils were removed from a previous 3-feet deep excavation across Railroad Avenue (where the CRU main building once stood) created to allow for the installation of an electrical line to provide power supply to Property C002. The highest gamma readings (140,000 – 180,000 cpm) were observed at a soil sample location at the northwest corner of Warehouse-2. Survey was not conducted with the FPIC inside any buildings at Properties C001 and C002 and at any exterior locations throughout the Site. However, at Property C003, FPIC gamma survey conducted in the main building and two warehouses (Warehouses 1 & 2) located on the northeast portion indicated above-background gamma values in the Electrical Room of the main building and at the southeast corner of Warehouse-2 which is located further northeast from Warehouse-1. Survey conducted with the HPIC in the Electrical Room of the main building at Property C003 and at all the soil sample locations throughout the Site indicated above-background gamma values in the Electrical Room, the location of the bagged contaminated soil on Property C002, the location on the opposite side of the fence at Property C001 next to the bagged contaminated soil, one location along the ROW area northwest of Property C002, and all three soil sample locations on Property C003. Survey

conducted with the SAM-940 identified Ra-226 and potassium-40 (K-40) at the location on the opposite side of the fence on Property C001 next to the bagged contaminated soil. Ra-226 was also identified in jarred soil samples collected from Property C002 and Property C003. Radon/thoron survey indicated normal levels inside the office and storage trailer at Property C002. Radon and/or thoron concentrations were above background values in nine of the 13 locations surveyed in the main building of Property C003.

During the August 2015 Removal Assessment event, RST 3 utilized the services of a National Radon Proficiency Program (NRPP)-certified company to conduct radon sampling within living spaces of on-site properties. Radon sampling was conducted in Building B36 at Property C001, in the office and storage trailers at Property C002, and in the main building, Warehouse-1 and Warehouse-2 at Property C003. On August 3, 2015, a total of 33 activated charcoal canisters (radon canisters), including two field duplicates and two field blanks, were deployed in on-site buildings at Property C003. On August 4, 2015, five radon canisters were deployed in Property C001 and six radon canisters were deployed in Property C002. Analytical results were compared with the EPA Site-Specific Action Level (SSAL) of 4 pCi/L. Analytical results indicated normal radon levels in all the living spaces sampled at Properties C001, C002, and Warehouse-1 in Property C003. Analytical results were above the EPA SSAL in 11 of the 13 samples, including one field duplicate, collected from the main building at Property C003 with concentrations as high as 19.5 pCi/L in sample C003-AA024-01 collected from a location in the southwest area of a lobby located on the second floor. Analytical results were above EPA SSAL in two of the four samples collected in Warehouse-2 at Property C003 with concentrations as high as 4.6 pCi/L in C003-AA001-01 and 5.2 pCi/L in C003-AA007-01. Both samples were collected at locations in proximity of each other at the southeast corner of the warehouse where prior radiological survey also indicated elevated gamma readings. Following the installation of a radon mitigation system in the main building of Property C003, on October 23, 2015, a post-remedial radon sampling event was conducted by a NRPP-certified company under RST 3 and EPA oversight. A total of 27 radon canisters, including two field duplicates and two field blanks were deployed in the main building. Analytical results indicated normal levels of radon in the main building of Property C003.

On August 5, 2015, utilizing Geoprobe® technology, RST 3 collected four soil samples from Property C002, four soil samples, including one field duplicate from Property C003, and one aqueous rinsate blank. On August 7, 2015, utilizing a post digger and shovel, RST 3 collected one soil sample from a background location at Property C004. On August 18, 2015, following a limited access agreement between MTA and EPA, MTA's subcontractor provided soil sampling support to RST 3. A total of four soil samples, including one field duplicate, and one aqueous rinsate blank were collected from Property C001. All the soil sample locations were selected by the EPA OSC based on information from prior SAT site investigation and from radiological survey measurements collected during the event. Locations exhibiting elevated radioactivity measurements were selected for soil sampling. All the soil samples were analyzed for TAL metals and total mercury in accordance with EPA SW846 Methods 6010C and 7471B, respectively; isotopic thorium and isotopic uranium, in accordance with U.S. Department of Energy (DOE) alpha spectroscopy Health and Safety Laboratory (HASL)-300 Method A-01-R; Ra-226 (21-day ingrowth), Ra-228, and other gamma emitting radioisotopes, in accordance with DOE gamma spectroscopy HASL-300 Method GA-01-R. Aqueous rinsate blanks, collected to demonstrate adequate decontamination of non-dedicated sampling equipment (*i.e.* Geoprobe® cutting shoe), were analyzed for TAL metals, total mercury, isotopic thorium and isotopic uranium, and other

gamma emitting radioisotopes by the same methods as the soil samples. In addition, aqueous rinsate blanks were analyzed for Ra-226 in accordance with EPA SW-846 Method 9315 and Ra-228 by Gas Flow Proportional Counter (GFPC), in accordance with EPA SW-846 Method 9320. The soil analytical results for radioisotopes were compared with the respective EPA SSALs. The analytical results for TAL metals and mercury were compared with the EPA Removal Management Levels (RMLs).

Based upon validated analytical results, Ra-226 was detected above the EPA SSAL of 2.52 pCi/g in one of the four soil samples, C001-SS001-0012-01 (3.43 J (estimated result) pCi/g) and its field duplicate, C001-SS001-0012-02 (3.64 J pCi/g), both collected from Property C001. Ra-226 was detected above the EPA SSAL in two of the four soil samples, C002-SS003-2448-01 (9.84 J pCi/g) and C002-TRENCH-0036-01 (10.4 J pCi/g), collected from Property C002. Ra-226 was detected above the EPA SSAL in all four soil samples, C003-SS001-2448-01 (10.3 J pCi/g), C003-SS001-2448-02 (11.3 J pCi/g), C003-SS002-0024-01 (129 J pCi/g), and C003-SS003-2448-01 (15.1 J pCi/g), collected from Property C003. No radioisotope was detected above the EPA SSAL in soil samples collected from the background location at Property C004. Although no SSAL was provided by EPA for the aqueous samples, based on the analytical results, radioisotope concentrations were generally not detected. At the request of EPA, the analytical results of nine soil samples collected by SAT during the November 2013 site investigation were compared against the EPA SSAL. It is noteworthy that the laboratory analyses of SAT's soil samples, specifically for Ra-226, was not performed by 21-days ingrowth method; however, with the exception of the background soil sample collected from S07, Ra-226 was detected at concentrations above the EPA SSAL in the remaining eight soils samples collected during the sampling event. Soil sample S08(24-36), which was collected by SAT at an assumed background location near the northeast corner of Property C003 indicated concentration of Ra-226 at 3.44 pCi/g which exceeds the EPA SSAL. Based on analytical results, the concentration of TAL metals were below the respective EPA RMLs except for lead which exceeded the EPA RML of 400 mg/kg in C002-SS003-2448-01 (510 mg/kg).

On August 18, 2015, EPA collected three wipe samples, including one field blank, from Property C001, one wipe sample from Property C002, and four wipe samples from Property C003. The wipe samples were collected from locations biased towards floor cracks and entryways. All the wipe samples were analyzed by EPA's Radiation Health Physicist (RHP) for the presence of radioactivity using a Ludlum-3030. Based on the analytical results of the wipe samples for the selected counting durations, the minimum detectable activity (MDA) for 100 square centimeters (cm^2) was determined as 0.80 dpm and 29.50 dpm, respectively for alpha and beta particle counts. These levels were below 100 dpm and 1,000 dpm, respectively for alpha and beta counts as outlined in New York City Department of Health and Mental Hygiene (NYC DOHMH) Article 175 of the NYC Health Code, "Radiation Control", §175.03 - Release of Materials or Facilities, which was adopted by EPA as the SSAL for alpha and beta counts. Alpha and beta counts for all the wipe samples were at the natural background level conservatively estimated by counting a blank wipe.

3.0 Removal Assessment Objectives

As part of the Phase II Removal Assessment of the Site, RST 3 was tasked with providing support to EPA for additional ground radiological survey and providing a drilling subcontractor to advance 20 soil borings at locations throughout the Site for soil sample collection. In addition, RST 3 was

tasked with utilizing Global Positioning System (GPS) technology to record soil sample locations, utilizing VIPER technology to document mobile radiological survey data, performing photographic documentation, and maintaining a site logbook to document all site activities throughout the Removal Assessment. The radiological survey and soil sampling event was conducted in order to identify additional source areas and to further delineate on-site radioactive contamination. The results obtained from this event would assist EPA in determining the extent of the radiological contamination and to ascertain if a Removal Action would be necessary in the future.

4.0 On-Site Personnel

Name	Affiliation	Duties On-Site
Daniel Gaughan	U.S. EPA, Region II	On-Scene Coordinator
Lyndsey Nguyen	U.S. EPA, Region II	Radiation Health Physicist
Bernard Nwosu	RST 3, Region II	Team Lead, Site Health & Safety, Written and Photographic Documentation
Joel Siegel	RST 3, Region II	Field Support
Lionel Montanez	RST 3, Region II	Field Support
John Rush	TPI Environmental, Inc.	Geoprobe® Operator
Nicholas Lippincott	TPI Environmental, Inc.	GPR Operator

5.0 Radiological Survey and Screening Methodology

On April 4 through 6, 2016, EPA and RST 3 with remote support from EPA's Emergency Response Team (ERT), conducted radiological survey throughout the Site, including on-site Property C002, Property C003, and a new offsite background location, Mt. Kisco Truck and Auto Parts, 123-135 Kisco Avenue (Property C005). It is noteworthy that during this event, RST 3 inadvertently reported the sample numbers for this property with a leading C004 instead of C005.

Mobile gamma survey was conducted using a Ludlum-2241 with a sodium iodide (NaI) 3x3 scintillator. Static gamma screening for soil sample locations was conducted using a HPIC. Static gamma screening for soil borings and soil samples was conducted using a Ludlum-2241 with a NaI 2x2 scintillator.

Refer to Attachment A, Figure 2: Site Overview Map and Attachment C: Photographic Documentation of Site Activities.

5.1 Radiological Survey

The radiological survey instrument setup comprised of a Ludlum-2241 [Serial Number (No.): 198269] Scaler Ratemeter with a NaI 3x3 scintillator [Model: 44-20 (Serial No.: PR330005)] attached. A baby buggy stroller was utilized to provide mobility for the survey instrumentation setup. A Life-line Interoperable Network Communicator (LINC) was attached and connected to the Ludlum-2241 which was placed on a wooden platform fitted to the sitting area of the buggy. The Ludlum-2241 was connected via data cable to the NaI 3x3 scintillator which was placed in a sagging position approximately 6 inches above the ground surface in the bottom storage

compartment of the buggy. A Trimble® GPS unit, laptop computer, and Gateway (internet source) were placed on a wooden platform constructed above the buggy's hood. The LINC, GPS unit, and laptop computer were connected to the internet via the Gateway. Gamma readings in µR/hr generated by the Ludlum-2241 setup was transmitted through the LINC via the Gateway to the VIPER system (a wireless network-based communication system). VIPER provided instantaneous gamma readings through a computer server [Viper Deployment Manager (VDM)]. The GPS unit provided geographical reference of the gamma readings by transmitting the locational data of the Ludlum-2241 setup through the Gateway and VIPER to VDM. The instantaneous gamma readings along with the geographical locations were viewed online on the VDM webpage via the laptop computer screen. Based on the background gamma reading (9 µR/hr) obtained with the Ludlum-2241 setup, alarms were set up by ERT on VIPER and programed to send electronic mail (email) alerts to the mobile phones of the OSC, RHP, and RST 3 Site Project Manager (SPM) when gamma readings exceeded background levels. With this mobile setup, RST 3 conducted radiological survey throughout the Site, walking along predetermined paths with the buggy as directed by the RHP and OSC.

5.2 Radiological Screening

A HPIC [Model S131-110-ER2500 (Serial No.: 11J01SDW)] was utilized to collect more precise gamma measurements at locations where elevated gamma readings were identified when using the Ludlum-2241. Prior to utilizing the HPIC for radiological screening, the instrument was turned on and allowed to warmup for approximately 60 minutes at the offsite background location. The instrument was then connected to a computer which was used to run the RSS-131 utility program in order to configure the desired settings for the field screening. At least three of the known radioactive source options provided with the equipment, including cesium-137 (Cs-137), cobalt-60 (Co-60), europium-152 (Eu-152), Th-232, and americium-241 (Am-241), with known gamma values, were utilized to calibrate the instrument daily. When the known radioactive source was placed next to the HPIC, the gamma reading displayed on the computer monitor was noted and compared with the known gamma value of that radioactive source. The instrument was turned off after calibration. When a location was selected for screening, the HPIC was turned on with the computer still connected. Instantaneous gamma readings were recorded every 60 seconds for the duration of each screening. The HPIC is normally uncollimated (*i.e.*, it measures cosmic, terrestrial, and foreign source contributions without discrimination); however, it is highly sensitive, precise, and accurate to vast changes in exposure rate, but it lacks the ability to distinguish either energy spectral characteristics or source type. For these reasons, the first two readings recorded by the HPIC at the beginning of each screening were not utilized in calculating the average gamma reading at that location. At least five data points were collected for each screening duration. When the data was downloaded unto a computer, the gamma reading in µR/hr was determined by calculating the average of the five data points collected at each specific location. The HPIC was utilized by RST 3 to collect and document gamma readings at all the soil sample locations selected by EPA for screening. The average gamma reading collected at each soil sample location was compared with the background gamma value measured by the instrument.

A Ludlum-2241 (Serial No.: 149408) Scaler Ratemeter and NaI 2x2 scintillator [Model: 44-10 (Serial No.: PR199131)] equipped with a 15 feet data cable was utilized by EPA with support from RST 3 to conduct gamma screening vertically down each sample location borehole. After soil sample locations were selected, a Geoprobe® was utilized to advance boreholes to desired depths.

A polyvinyl chloride (PVC) pipe was inserted into the borehole to prevent it from collapsing and to prevent residual potentially radioactive material from contaminating the scintillator. The NaI 2x2 scintillator was lowered into each borehole via a PVC pipe, and static gamma measurements in cpm were documented by RST 3 every 6-inch interval up to the total depth of the boring. The PVC pipe was extracted from the borehole after screening.

A Ludlum-2241 (Serial No.: 207757) Scaler Ratemeter and NaI 2x2 scintillator [Model: 44-10 (Serial No.: PR277919)] equipped with a standard (3 feet) data cable was utilized by RST 3 to conduct gamma screening of soil samples. After soil samples were collected and placed in laboratory glassware, static gamma measurements in cpm were collected by placing the scintillator next to each jarred soil sample. Gamma measurements were documented by RST 3 for all the soil samples collected during this event.

6.0 Soil Sampling Methodology

Soil sampling was conducted in accordance with EPA ERT/Scientific, Engineering, Response & Analytical Services (SERAS) contractor's Standard Operating Procedure (SOP) 2012: *Soil Sampling*. Soil sampling locations were selected by the EPA OSC based on information from prior site investigation and Removal Assessment, and from radiological data collected during this Phase II Removal Assessment of the Site, including Ludlum-2241 and HPIC gamma measurements.

Prior to mobilizing to the Site, at the request of RST 3, Dig Safely New York conducted a subsurface utilities mark-out to clear the locations within the ROW areas. RST 3 subcontractor, Environmental Field Services (EFS), located in Marlton, New Jersey utilized a ground-penetrating radar (GPR) to conduct subsurface utilities mark-out around all the proposed soil sampling locations within the Site, including the offsite background location. EFS utilized a Geoprobe® in accordance with SERAS SOP 2050: *Geoprobe Operation*, to facilitate soil sample collection by extracting soil cores from borings advanced to depths 4 feet below ground surface (bgs) at 15 locations and up to 8 feet bgs at five locations. MacroCore® sampling tubes lined with new, clean acetate sleeves were utilized for each soil boring. Upon completion of each sample location borehole, gamma screening data was obtained with a Ludlum-2241 and NaI 2x2 scintillator at 6 inch intervals vertically down to the bottom of the hole. After borehole screening and soil sample collection was completed, the borehole was backfilled in reverse order with the leftover soil, topped off with bagged garden soil, tamped down, and sealed with bentonite.

Decontamination of non-dedicated sampling equipment (*i.e.* Geoprobe® cutting shoe) was conducted in accordance with SERAS SOP 2006: *Sampling Equipment Decontamination* and was performed before and after the sampling event and between soil sample locations, and it consisted of an industrial soap (Alconox®) solution scrub, tap water rinse, steam-clean with deionized water, air dry, and screening with Ludlum-2241 for residual radiological contamination. In order to confine potential surface runoff to areas of contamination, the decontamination fluid was discarded on-site at the location indicating the highest levels of contamination based on radiological screening data.

At each sample location, EFS utilized new acetate sleeves to extract the soil cores. The physical characteristics and description of the soils in each core were documented in boring logs prior to sample collection. Soil samples were collected every 12 inch interval of each sample sleeve. All

the soil samples were collected by RST 3 using dedicated disposable plastic scoops, placed directly into re-sealable plastic bags, homogenized in the plastic bags, and then placed into glass sample jars. RST 3 utilized the Ludlum-2241 with a NaI 2x2 scintillator to collect and document the highest instantaneous gamma exposure rate measurement in cpm for each jarred soil sample. Fresh nitrile gloves were donned between sampling intervals and locations. Rinsate blanks were collected daily to demonstrate adequate decontamination of non-dedicated sampling equipment. The soil and aqueous samples were collected for definitive data and quality assurance/quality control (QA/QC) objectives. Field duplicates and matrix spike/matrix spike duplicate (MS/MSD) samples were collected at the rate of 1 per 20 field samples. All sample information was transcribed into EPA's SCRIBE database, an environmental data management system, from which the sample labels and chain of custody (COC) records were generated. All samples were stored on ice in a cooler.

Refer to Attachment B: Table 2: Soil Sample Location (HPIC) Screening Results and Soil Boring Logs Summary Table

At the discretion of the OSC, the soil and aqueous samples were spilt between two laboratories for analysis. Some of the soil samples and all of the aqueous samples were submitted to an RST 3-procured laboratory, Pace Analytical Services (PACE) located in Greensburg Pennsylvania for analyses. The remaining soil samples were submitted to EPA's National Analytical Radiation Environmental Laboratory (NAREL) located in Montgomery Alabama for analysis.

7.0 Laboratory Receiving Samples

The following laboratories were utilized during the April 2016 sampling event:

Sample Matrix	Analysis	Laboratory
Soil	Isotopic thorium, isotopic uranium, and other alpha emitting actinides via alpha spectroscopy HASL-300 Method U-02. Radium-226, radium-226 (in-growth), radium-228, and other gamma emitting radioisotopes via gamma spectroscopy EPA Method 901.1 modified	Pace Analytical Services 1638 Roseytown Road, Suite 2,3,4 Greensburg PA 15601
Aqueous	Isotopic thorium and isotopic uranium via HASL-300 Method U-02. Radium-226 via EPA Method 903.1 and radium-228 via EPA Method 904.0	
Soil	Isotopic thorium and isotopic uranium via sodium hydroxide fusion. Radium-226 (21-day ingrowth), radium-228, and other gamma emitting radioisotopes via gamma spectroscopy	National Analytical Radiation Environmental Laboratory (NAREL) 540 South Morris Avenue, Montgomery, AL 36115

8.0 Sample Collection and Dispatch

On April 5 through 6, 2016, RST 3 collected a total of 71 soil samples, including three field duplicates and three MS/MSD samples from 16 soil boring location at Property C003. On April 6, 2016, RST 3 collected 25 soil samples, including one field duplicate and one MS/MSD sample from three soil boring location at Property C002. On April 6, 2016, RST 3 collected seven soil samples, including one field duplicate and one MS/MSD sample from a background soil boring location at Property C005. One aqueous rinsate blank sample was collected each day of the sampling event.

Refer to Attachment A, Figure 4: Soil Boring Location Map and Attachment B, Table 1: Sample Collection Summary Table.

On April 7, 2016, RST 3 shipped a total of 52 soil samples and two aqueous rinsate blank samples under COC record number (No.): 2-040716-155816-0006 via Fedex Airbill No.: 8037-9662-5485 to PACE for laboratory analyses. All the soil samples were analyzed for isotopic thorium, isotopic uranium, and other alpha emitting actinides via alpha spectroscopy HASL-300 Method U-02; radium-226 (21-day ingrowth), radium-228, and other gamma emitting radioisotopes via gamma spectroscopy EPA Method 901.1 modified. The aqueous rinsate samples were analyzed for isotopic thorium and isotopic uranium via HASL-300 Method U-02; radium-226 via EPA Method 903.1 and radium-228 via EPA Method 904.0.

On April 18, 2016, RST 3 shipped a total of 51 soil samples under COC record No: 2-041816-105138-0008 via Fedex Airbill No.: 8022-3572-1333 to NAREL for laboratory analyses. The soil samples were analyzed for isotopic thorium and isotopic uranium via sodium hydroxide fusion, an in-house Method, and radium-226 (21-day ingrowth), radium-228, and other gamma emitting radioisotopes via gamma spectroscopy.

Refer to Attachment B, Table 1: Sample Collection Summary Table and Attachment C: Chain of Custody Record and FedEx Airbill.

9.0 Radiological Survey and Screening Results

For reference purposes, Chart 1 (Background Gamma Reading) below provides the background gamma readings collected with each field instrument at the selected offsite background location. Results of the mobile radiological survey and static screening were compared with the background readings obtained with the survey or screening instrument.

Chart 1: Background Gamma Reading

Field Instrument	Radiological Parameter	Background Values
Ludlum-2241 with 3x3 scintillator	Gamma (Survey)	9 µR/hr
High Pressure Ion Chamber (HPIC)	Gamma (Screening)	9.12 µR/hr
Ludlum-2241 with 2x2 scintillator	Gamma (Screening)	7,500 - 9,500 cpm

9.1 Radiological Survey Results

A mobile radiological survey was conducted in order to identify additional source areas on-site and to provide additional information to assist EPA in determining the horizontally extent of the contamination. Radiological survey within Property C002 was minimally hindered by parked vehicles and supplies in outside storage areas, however, at Property C003, the presence of large quantities of merchandize in outside storage areas throughout the property grounds was a great hindrance for the survey equipment setup. Specifically, the northeast area of Property C003, near the “former old depot”, which was not surveyed during prior site investigations due to presence of obstacles, could not be surveyed during this event due to obstruction from piles of stored merchandize.

Based upon the radiological survey results, most areas throughout the Site were generally within the background value of 9 µR/hr. However, several on-site locations were identified with gamma

readings exceeding 2x background, 3x background, and more than 3x background. At Property C002, one location along the northeast fence line near the staging location of five bags of contaminated soils which were identified during the Phase I Removal Assessment conducted in August 2015 indicated gamma readings that were greater than 3x background (>24 µR/hr). Other areas around Property C002 with elevated gamma readings include a location along the northwest ROW area, the ROW area north of Property C002, and the entire south portion of Railroad Avenue. These areas indicated elevated gamma reading that were 2 to 3 times background (>16 - 24 µR/hr). At Property C003, one area around the northwest corner of Warehouse-2 and an asphalt-paved area immediately south of Warehouse-2, indicated gamma readings exceeding 3x background (>24 µR/hr). Some northwest locations of Property C003, between merchandize stored outside, indicated gamma readings that were more than 2x background. Other "hotspots" (locations with gamma readings exceeding 24 µR/hr) identified at Property C003 include, a location by the south access gate to Property C003 next to the customer parking lot, the southeast corner of the perimeter fence by the "former dumpster location" near a utility pole, a location in the center of the customer parking lot, and a location near the west entrance to the main building.

Refer to Attachment A, Figure 3: Gamma Survey Results Map.

9.2 Soil Sample Location Screening Results

Soil sample location screening results provided surface gamma readings which were part of the decision-making information utilized in the field by EPA to select boring locations for soil sample collection. Screening data was collected each day of the sampling event at the background sample location. Based on soil sample location screening results, all three soil sample locations selected at Property C002 and 12 of the 16 soil sample locations selected at Property C003 were within background gamma values. Elevated gamma readings were observed at the remaining four soil sample locations [C003-SB010 (11.48 µR/hr), C003-SB011 (10.94 µR/hr), C003-SB015 (11.88 µR/hr), and C003-SB016 (9.88 µR/hr)] selected at Property C003.

Refer to Attachment B, Table 2: Soil Sample Location (HPIC) Screening Results and Soil Boring Logs Summary Table.

9.3 Borehole and Soil Sample Screening Results

Subsurface borehole screening was conducted to determine the depth intervals with the highest gamma reading in order to vertically delineate the extent of the radiological contamination. Soil sample screening was conducted in order to determine if a correlation exists between borehole screening measurements and individual soil sample measurements collected at corresponding borehole screening and soil sample depth intervals.

Chart 2 (Borehole/Soil Sample Screening Exceedance Graph) below, shows that generally, at all the selected soil boring locations, subsurface borehole screening results were significantly elevated; however, soil sample screening results were generally within background values. The highest borehole and soil sample screening results were observed at C003-SB010 approximately 36 to 48 inches bgs. The highest borehole screening results at C003-SB010 exceeded the maximum detection limit (999,000 µR/hr) of the Ludlum-2241 unit at depths 42 to 48 inches bgs. At the corresponding depths (42 to 48 inches bgs), the soil sample screening result was 24,300 µR/hr.

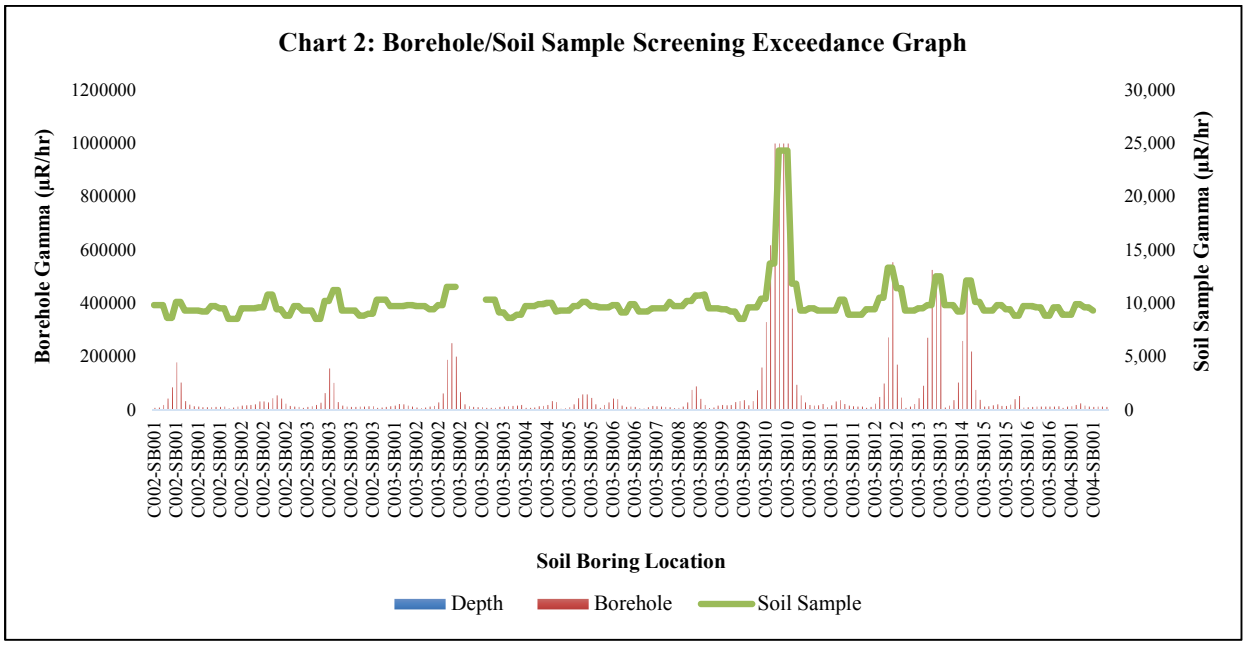
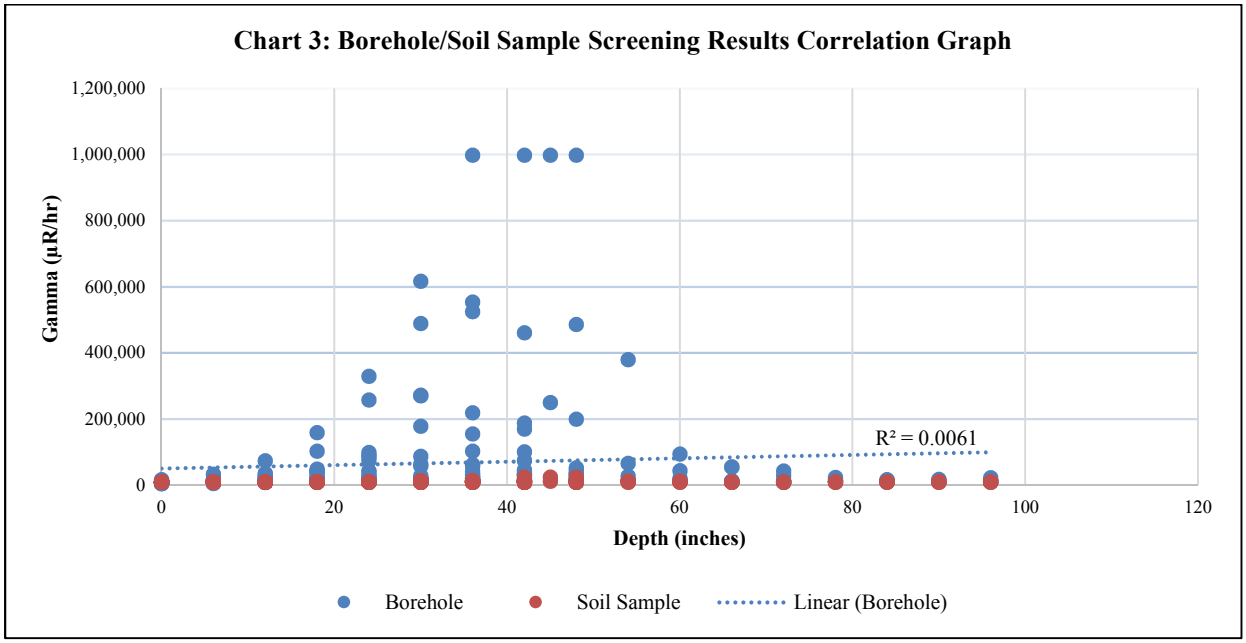


Chart 3 (Borehole/Soil Sample Screening Correlation Graph) below, shows that the gamma values for borehole and soil sample screening results have no correlation as indicated by the correlation coefficient $R^2 = 0.0061$. It is therefore suspected that potential subsurface interference exists from other gamma emitting sources which may have biased the borehole screening results.



Refer to Attachment B, Table 3: Borehole and Soil Sample (Ludlum-2241) Screening Results Summary Table.

10.0 Analytical Results Summary

The validated analytical results of all the soil samples collected during this sampling event were compared with the EPA SSALs for the target radioisotopes. Based upon the validated analytical results, Ra-226 was detected above the EPA SSAL of 2.52 pCi/g in eight of the 25 soil samples collected from three soil sample locations at Property C002. Ra-226 exceedance ranged from 2.57 pCi/g (C002-SB002-2436-01 collected 24 to 36 inches bgs) to 89.391 pCi/g (C002-SB001-2436-01 collected 24 to 36 inches bgs). In all three soil sample locations, the concentration of Ra-226 was below the EPA SSAL in soil samples collected at 0 to 12 inches bgs.

Based upon the validated analytical results, Ra-226 was detected above the EPA SSAL of 2.52 pCi/g in 32 of the 71 soil samples collected from 16 locations at Property C003. Ra-226 exceedance ranged from 2.79 pCi/g (C003-SB013-1224-01 collected 12 to 24 inches bgs) to 926.1 pCi/g (C003-SB010-3648-01 collected 36 to 48 inches bgs). C003-SB010 was the only location at Property C003 sampled to depths 84 to 96 inches bgs. Analytical results indicated exceedance of Ra-226 in C003-SB010-7284-01 (5.16 pCi/g) collected 72 to 84 inches bgs at C003-SB010. Except at C003-SB003 and C003-SB016, concentrations of Ra-226 exceeded the EPA SSAL in at least one 6 inch interval sampled at depths 0 and 48 inches bgs in the remaining 14 soil sample locations. Except at C003-SB007, Ra-226 was not detected above the EPA SSAL in soil samples collected 0 to 12 inches bgs in the remaining 15 soil sample locations. Lead-210 (Pb-210) was detected above the EPA SSAL of 418 pCi/g in one sample C003-SB010-3648-01 (810.09 pCi/g), collected 36 to 48 inches bgs.

Based upon the analytical results, Ra-226 was detected above the EPA SSAL of 2.52 pCi/g in three of the seven soil samples collected from a presumed offsite background location at Property C005. The highest concentration of Ra-226 was detected in C004-SB001-8496-01 (11.04 pCi/g) collected 84 to 96 inches bgs. It is noteworthy that due to poor soil recovery, samples were not collected at intervals 48 to 60 inches bgs. Ra-226 was not detected above the EPA SSAL in C004-SB001-0012-01 collected at depths 0 to 12 inches bgs.

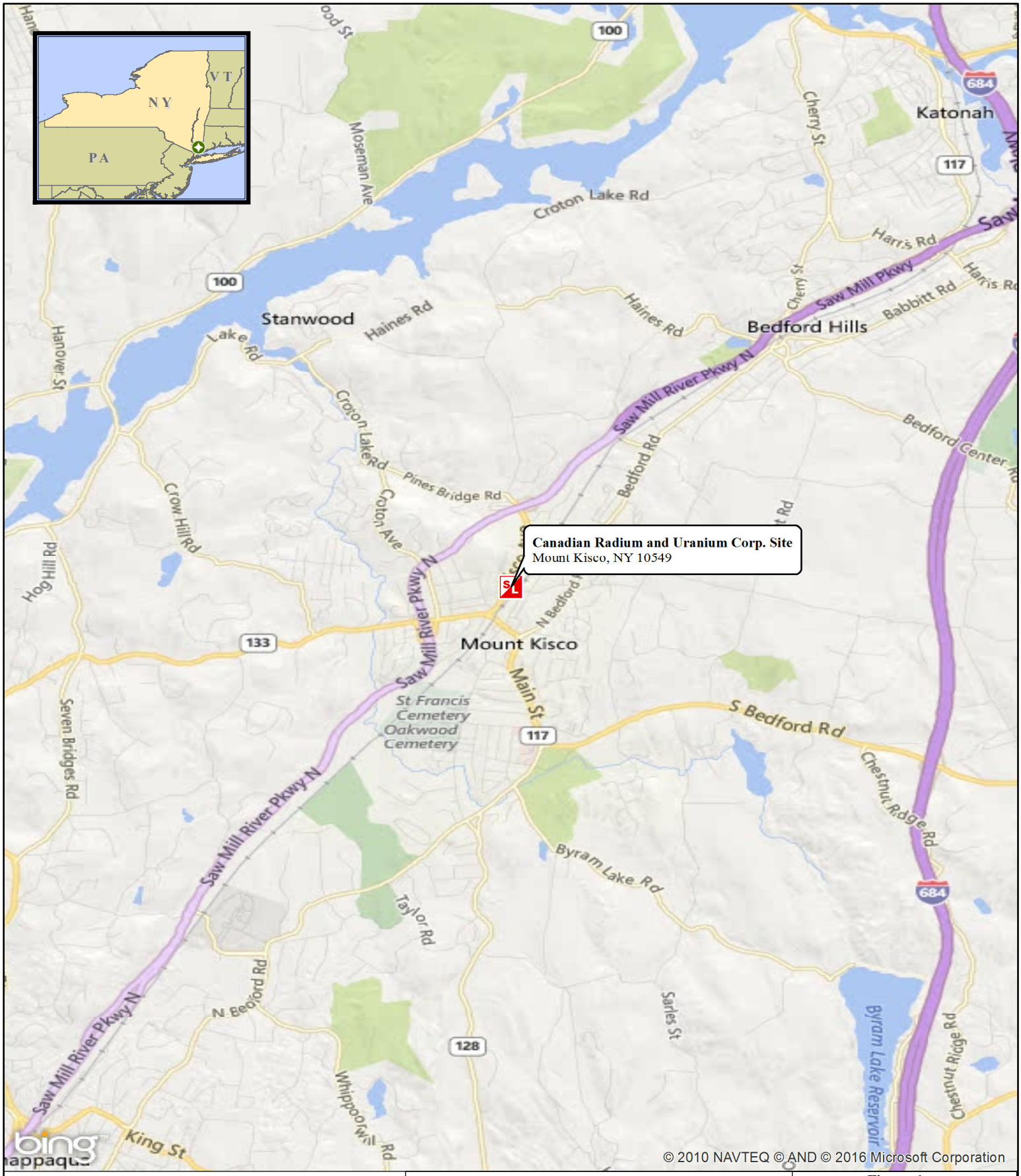
Refer to Attachment A, Figure 5: Soil Analytical Results Map (Radium Only), Attachment B, Table 4: Validated Soil Analytical Results Summary Table - Radioisotopes, and Attachment E: Data Validation Memo - Soil Analytical Results (Radioisotopes).

Report prepared by: _____ 11/9/2016
Bernard Nwosu Date
RST 3 Site Project Manager

Report reviewed by: _____ 11/9/2016
Timothy Benton Date
RST 3 Operations Leader

ATTACHMENT A

Figure 1: Site Location Map
Figure 2: Site Overview Map
Figure 3: Gamma Survey Results Map
Figure 4: Soil Boring Locations Map
Figure 5: Soil Analytical Results Map (Radium-226)



Legend

Site Location

N

0 0.3 0.6 1.2 1.8 2.4 Miles

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Environmental Compliance Consultants, Inc.,
Avatar Environmental, LLC, On-Site Environmental,
Inc.and Sovereign Consulting, Inc

Figure 1:
Site Location Map

Canadian Radium and Uranium Corp. Site
Mount Kisco, New York

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL SUPPORT TEAM 3
CONTRACT # EP-S2-14-01

DATE MODIFIED: 9/21/2016

GIS ANALYST:	T. Benton
EPA OSC:	D. Gaughan
RST SPM:	B. Nwosu
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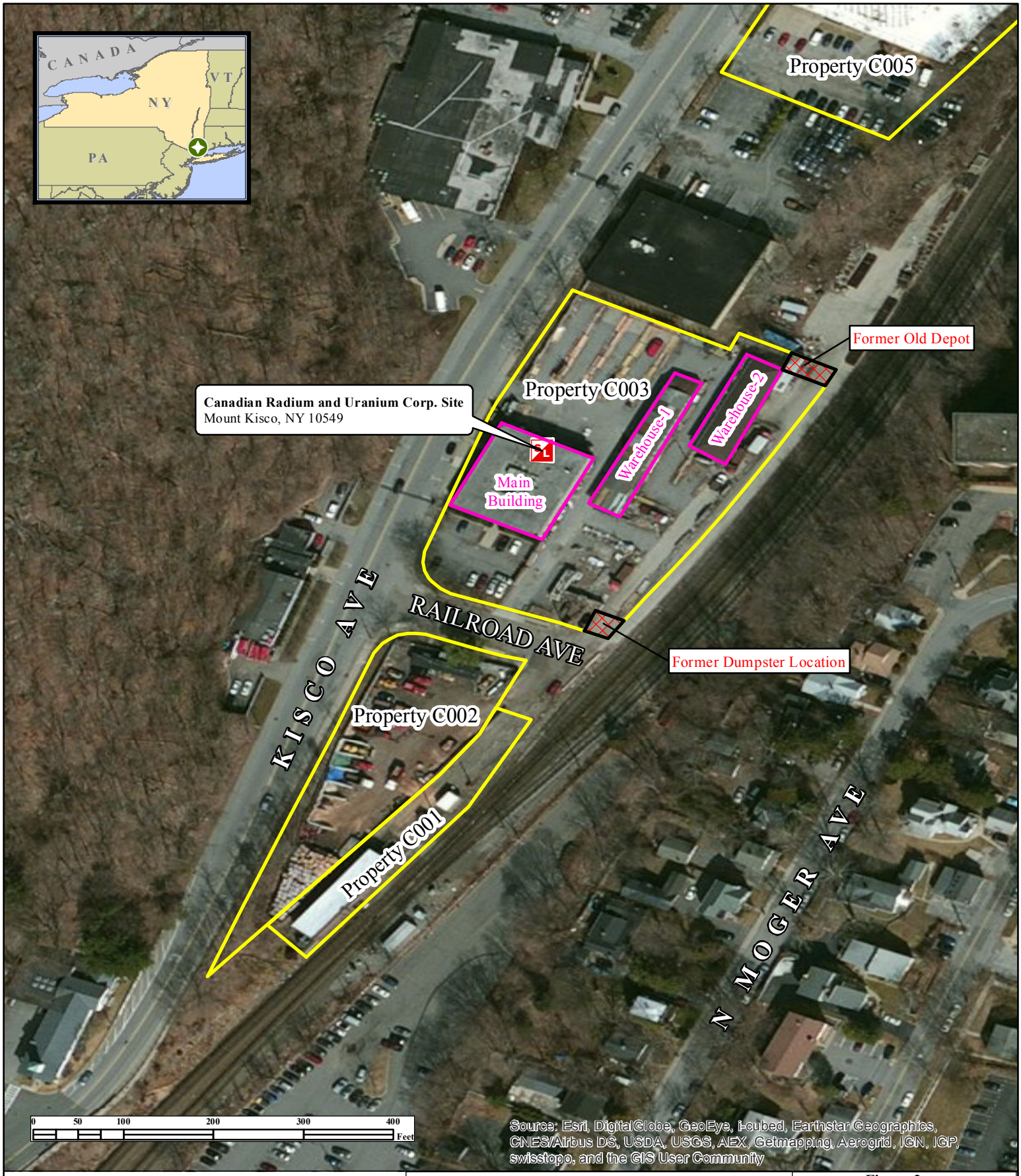

Legend

- Site Boundary
- Site Location

Site Feature

- On-Site Structure
- Former Documented Area

N

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Avatar Environmental, LLC, On-Site Environmental,
Inc.and Sovereign Consulting, Inc

Figure 2:
Site Overview Map

Canadian Radium and Uranium Corp. Site
Mount Kisco, New York

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL SUPPORT TEAM 3
CONTRACT # EP-S2-14-01

DATE MODIFIED: 11/7/2016

GIS ANALYST:	T. BENTON
EPA OSC:	D. GAUGHAN
RST SPM:	B. NWOSU
PROJECT #:	30400.031.007.3023

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Legend

Gamma Survey

- 0 - 9
- 9 - 16
- 16 - 24
- >24

Soil Boring Location

Gamma Survey – Results presented in microroentgens per hour (µR/hr)

N

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Inc.and Sovereign Consulting, Inc

Figure 3: Gamma Survey Results Map

Canadian Radium & Uranium Corp Site
Mount Kisco, New York

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL SUPPORT TEAM 3
CONTRACT # EP-S2-14-01

DATE MODIFIED: 11/7/2016

GIS ANALYST:	P. Lisichenko
EPA OSC:	D. Gaughan
RST SPM:	B. Nwosu
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Legend

- Soil Boring Location
- Site Boundary

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Inc.and Sovereign Consulting, Inc

Figure 4: Soil Boring Location Map

Canadian Radium and Uranium Corp. Site
Mount Kisco, New York

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL SUPPORT TEAM 3
CONTRACT # EP-S2-14-01

DATE MODIFIED: 11/7/2016

GIS ANALYST:	T. BENTON
EPA OSC:	D. GAUGHAN
RST SPM:	B. NWOSU
PROJECT #:	30400.031.007.3023

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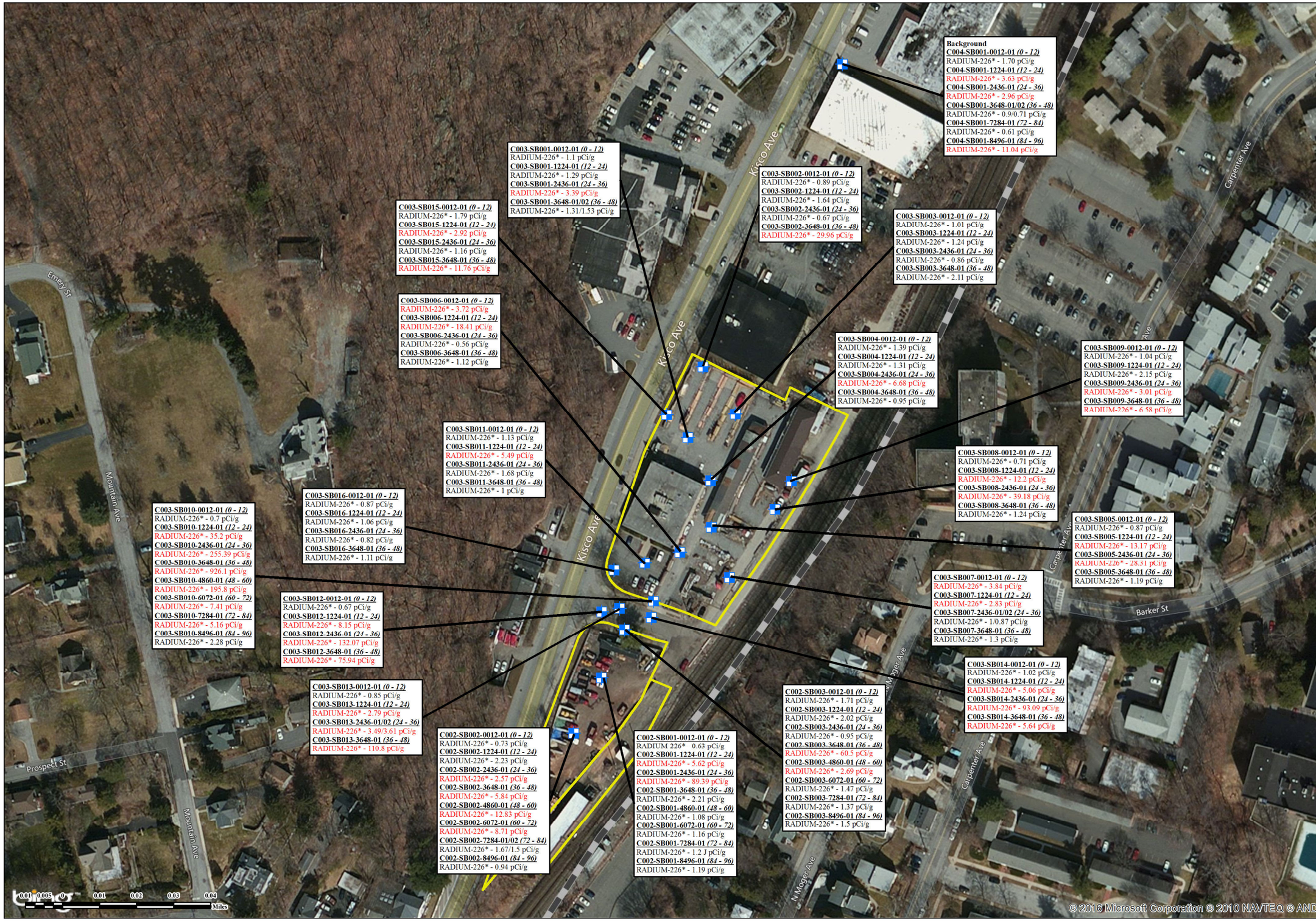

SCALE

1:1,580

LEGEND

April 2016 Soil Sample Location

Site Boundary

Notes:

1.) All results presented in picocuries per gram (pCi/g).
2.) Depth of sample collection is presented in parenthesis next to sample number.
3.) * Represents a Radium-226 value that was analyzed via the 21-day ingrowth method.
4.) Values highlighted red indicate an exceedance of the EPA Site-Specific Action Level for the specific radionuclide.
5.) EPA Site-Specific Action Levels: Ra-226 = 2.52 pCi/g.

Figure 5: Soil Analytical Results Map (Radium-226)

Canadian Radium and Uranium Corp. Site
Mount Kisco, New York

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REMOVAL SUPPORT TEAM 3
CONTRACT # EP-S2-14-01

Weston Solutions, Inc.

In Association With
Scientific and Environmental Associates, Inc., Environmental Compliance Consultants, Inc., Avatar Environmental, LLC, On-Site Environmental, Inc., and Sovereign Consulting, Inc.

GIS ANALYST:	T. BENTON
EPA OSC:	D. GAUGHAN
RST 3 SPM:	B. NWOSU
FILENAME:	150929_SampleLocationMap.mxd
FIGURE	5
REVISION	1
DATE MODIFIED	9/14/2016

WESTON SOLUTIONS

ATTACHMENT B

Table 1: Sample Collection Summary Table
Table 2: Soil Sample Location (HPIC) Screening Results and Soil Boring Logs Summary Table
Table 3: Borehole and Soil Sample (Ludlum-2241) Screening Results Summary Table
Table 4: Validated Soil Analytical Results Summary Table - Radioisotopes

Table 1
Sample Collection Summary Table
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

Property Number	Sample Location	Sample Date	RST 3 Sample Number	Depth Interval	Sample Type	Sample Matrix	Receiving Laboratory
C002	C002-SB001	4/6/2016	C002-SB001-0012-01	0 - 12	Field Sample	Soil	NAREL
			C002-SB001-1224-01	12 - 24	Field Sample	Soil	PACE
			C002-SB001-2436-01	24 - 36	Field Sample	Soil	
			C002-SB001-3648-01	36 - 48	Field Sample	Soil	
			C002-SB001-4860-01	48 - 60	Field Sample	Soil	NAREL
			C002-SB001-6072-01	60 - 72	Field Sample	Soil	
			C002-SB001-7284-01	72 - 84	Field Sample	Soil	
			C002-SB001-8496-01	84 -96	Field Sample	Soil	
	C002-SB002	4/6/2016	C002-SB002-0012-01	0 - 12	Field Sample	Soil	NAREL
			C002-SB002-1224-01	12 - 24	Field Sample	Soil	
			C002-SB002-2436-01	24 - 36	Field Sample	Soil	
			C002-SB002-3648-01	36 - 48	Field Sample	Soil	
			C002-SB002-4860-01	48 - 60	Field Sample	Soil	PACE
			C002-SB002-6072-01	60 - 72	Field Sample	Soil	
			C002-SB002-7284-01	72 - 84	Field Sample	Soil	NAREL
			C002-SB002-7284-02		Field Duplicate	Soil	
			C002-SB002-8496-01*	84 - 96	Field Sample	Soil	
	C002-SB003	4/6/2016	C002-SB003-0012-01	0 - 12	Field Sample	Soil	NAREL
			C002-SB003-1224-01	12 - 24	Field Sample	Soil	
			C002-SB003-2436-01	24 - 36	Field Sample	Soil	PACE
			C002-SB003-3648-01	36 - 48	Field Sample	Soil	
			C002-SB003-4860-01	48 - 60	Field Sample	Soil	NAREL
			C002-SB003-6072-01	60 - 72	Field Sample	Soil	
			C002-SB003-7284-01	72 - 84	Field Sample	Soil	
			C002-SB003-8496-01	84 -96	Field Sample	Soil	
C003	C003-SB001	4/5/2016	C003-SB001-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB001-1224-01	12 - 24	Field Sample	Soil	PACE
			C003-SB001-2436-01*	24 - 36	Field Sample	Soil	
			C003-SB001-3648-01	36 - 48	Field Sample	Soil	NAREL
			C003-SB001-3648-02		Field Duplicate	Soil	
	C003-SB002	4/5/2016	C003-SB002-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB002-1224-01	12 - 24	Field Sample	Soil	
			C003-SB002-2436-01	24 - 36	Field Sample	Soil	PACE
			C003-SB002-3648-01	36 - 48	Field Sample	Soil	
	C003-SB003	4/5/2016	C003-SB003-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB003-1224-01	12 - 24	Field Sample	Soil	
			C003-SB003-2436-01	24 - 36	Field Sample	Soil	PACE
			C003-SB003-3648-01	36 - 48	Field Sample	Soil	
	C003-SB004	4/5/2016	C003-SB004-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB004-1224-01	12 - 24	Field Sample	Soil	
			C003-SB004-2436-01	24 - 36	Field Sample	Soil	PACE
			C003-SB004-3648-01	36 - 48	Field Sample	Soil	
	C003-SB005	4/5/2016	C003-SB005-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB005-1224-01	12 - 24	Field Sample	Soil	PACE
			C003-SB005-2436-01	24 - 36	Field Sample	Soil	
			C003-SB005-3648-01	36 - 48	Field Sample	Soil	
	C003-SB006	4/5/2016	C003-SB006-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB006-1224-01	12 - 24	Field Sample	Soil	PACE
			C003-SB006-2436-01	24 - 36	Field Sample	Soil	
			C003-SB006-3648-01	36 - 48	Field Sample	Soil	NAREL
	C003-SB007	4/5/2016	C003-SB007-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB007-1224-01	12 - 24	Field Sample	Soil	PACE
			C003-SB007-2436-01	24 - 36	Field Sample	Soil	
			C003-SB007-2436-02		Field Duplicate	Soil	
			C003-SB007-3648-01	36 - 48	Field Sample	Soil	NAREL

Notes:
RST 3 - Removal Support Team 3.
*Quality control (Q/C) samples analyzed for matrix spike/matrix spike duplicate (MS/MSD).
All soil and aqueous samples were analyzed for isotopic thorium and isotopic uranium by alpha spectroscopy via HASL-300 Method U-02.
All soil samples were analyzed for Radium-226 (21-day ingrowth), Radium 228, and other gama emitting radioisotopes by gamma spectroscopy via EPA Method 901.1.
All aqueous samples were analyzed for Radium-226 via EPA Method 903.1 and Radium-228 via EPA Method 904.0.
PACE - Pace Analytical Services.
NAREL - National Analytical Radiation Environmental Laboratory.

Table 1
Sample Collection Summary Table
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

Property Number	Sample Location	Sample Date	RST 3 Sample Number	Depth Interval	Sample Type	Sample Matrix	Receiving Laboratory
C003	C003-SB008	4/5/2016	C003-SB008-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB008-1224-01*	12 - 24	Field Sample	Soil	
			C003-SB008-2436-01	24 - 36	Field Sample	Soil	PACE
			C003-SB008-3648-01	36 - 48	Field Sample	Soil	
	C003-SB009	4/5/2016	C003-SB009-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB009-1224-01	12 - 24	Field Sample	Soil	
			C003-SB009-2436-01	24 - 36	Field Sample	Soil	PACE
			C003-SB009-3648-01	36 - 48	Field Sample	Soil	
	C003-SB010	4/5/2016	C003-SB010-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB010-1224-01	12 - 24	Field Sample	Soil	
			C003-SB010-2436-01	24 - 36	Field Sample	Soil	PACE
			C003-SB010-3648-01	36 - 48	Field Sample	Soil	
			C003-SB010-4860-01	48 - 60	Field Sample	Soil	
			C003-SB010-6072-01	60 - 72	Field Sample	Soil	NAREL
			C003-SB010-7284-01	72 - 84	Field Sample	Soil	
			C003-SB010-8496-01	84 -96	Field Sample	Soil	
	C003-SB011	4/6/2016	C003-SB011-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB011-1224-01	12 - 24	Field Sample	Soil	PACE
			C003-SB011-2436-01	24 - 36	Field Sample	Soil	
			C003-SB011-3648-01	36 - 48	Field Sample	Soil	NAREL
	C003-SB012	4/6/2016	C003-SB012-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB012-1224-01	12 - 24	Field Sample	Soil	PACE
			C003-SB012-2436-01	24 - 36	Field Sample	Soil	
			C003-SB012-3648-01	36 - 48	Field Sample	Soil	
	C003-SB013	4/6/2016	C003-SB013-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB013-1224-01	12 - 24	Field Sample	Soil	
			C003-SB013-2436-01	24 - 36	Field Sample	Soil	PACE
			C003-SB013-2436-02		Field Duplicate	Soil	
			C003-SB013-3648-01*	36 - 48	Field Sample	Soil	
	C003-SB014	4/6/2016	C003-SB014-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB014-1224-01	12 - 24	Field Sample	Soil	PACE
			C003-SB014-2436-01	24 - 36	Field Sample	Soil	
			C003-SB014-3648-01	36 - 48	Field Sample	Soil	
	C003-SB015	4/6/2016	C003-SB015-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB015-1224-01	12 - 24	Field Sample	Soil	PACE
			C003-SB015-2436-01	24 - 36	Field Sample	Soil	NAREL
			C003-SB015-3648-01	36 - 48	Field Sample	Soil	PACE
	C003-SB016	4/6/2016	C003-SB016-0012-01	0 - 12	Field Sample	Soil	NAREL
			C003-SB016-1224-01	12 - 24	Field Sample	Soil	PACE
			C003-SB016-2436-01	24 - 36	Field Sample	Soil	
			C003-SB016-3648-01	36 - 48	Field Sample	Soil	NAREL
[1]C005	[1]C004-SB001	4/6/2016	[1]C004-SB001-0012-01	0 -12	Field Sample	Soil	PACE
			[1]C004-SB001-1224-01	12 - 24	Field Sample	Soil	
			[1]C004-SB001-2436-01	24 - 36	Field Sample	Soil	
			[1]C004-SB001-3648-01	36 - 48	Field Sample	Soil	
			[1]C004-SB001-3648-02		Field Duplicate	Soil	
			[1]C004-SB001-7284-01	72 - 84	Field Sample	Soil	
			[1]C004-SB001-8496-01*	84 - 96	Field Sample	Soil	
NA	NA	4/5/2016	RB-040516	NA	Rinsate Blank	Aqueous	PACE
		4/6/2016	RB-040616				

Notes:
RST 3 - Removal Support Team 3.
*Quality control (Q/C) samples analyzed for matrix spike/matrix spike duplicate (MS/MSD).
[1]Background samples were collected from Property C005; however, RST 3 inadvertently reported the sample numbers for this property with a lead C004 instead of C005.
All soil and aqueous samples were analyzed for isotopic thorium and isotopic uranium by alpha spectroscopy via HASL-300 Method U-02.
All soil samples were analyzed for Radium-226 (21-day ingrowth), Radium 228, and other gama emitting radioisotopes by gamma spectroscopy via EPA Method 901.1.
All aqueous samples were analyzed for Radium-226 via EPA Method 903.1 and Radium-228 via EPA Method 904.0.
PACE - Pace Analytical Services.
NAREL - National Analytical Radiation Environmental Laboratory.

Table 2
Soil Sample Location (HPIC) Screening Results and Soil Boring Logs Summary Table
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

Property Number	Sample Location	Sample Location Screening Data		Soil Boring Logs			
		Screening Date	Average Gamma Reading (µR/hr)	Sample Date	Depth From (in.)	Depth To (in.)	Soil Description
C002	C002-SB001	4/5/2016	**8.56**	4/6/2016	0	48	Black medium SAND/GRAVEL mixture with concrete pieces, micaceous appearance.
					48	70	Dark grey SAND with medium to fine gravel.
					70	76	Black medium SAND.
					76	96	Brown fine silty SAND, some gravel.
	C002-SB002	4/5/2016	**7.9**	4/6/2016	0	30	Black medium with concrete and gravel.
					30	33	Green medium SAND.
					33	68	Black SAND and gravel and fill mixture.
					68	76	Dark brown fine silty SAND with gravel.
					76	96	Brown silty clayey SAND, moist.
	C002-SB003	4/6/2016	**8.6**	4/6/2016	0	16	Soil horizon.
					16	17	Concrete.
					17	31	Brown medium sand.
					31	42	Brown silty SILT with medium gravel.
					42	56	Light grey SAND, rock, mica euros appearance.
					56	70	Light grey silty clayey SAND with fine to medium gravel.
					70	96	Olive grey sandy SILT.
C003	C003-SB001	4/5/2016	**9.14**	4/5/2016	0	15	Black SAND and gravel fill.
					15	23	Brown SAND with medium to gravel.
					23	26	broken pegmatite pieces.
					26	33	Black medium SAND with mica.
					33	48	Light grey fine silty SAND.
	C003-SB002	4/5/2016	**8.74**	4/5/2016	0	16	Black gravelly sandy fill.
					16	29	Brown medium SAND, some fine to gravel.
					29	33	Brown fine SAND, moist, with silt.
					33	48	Black cinders, ash, sand with shiny small pieces, micaceous appearance.
	C003-SB003	4/5/2016	**8.54**	4/5/2016	0	17	Black GRAVEL and sand fill.
					17	29	Brown medium silty SAND.
					29	35	Brown fine silty SAND, some medium gravel.
					35	48	Black fine to medium GRAVEL, wet at base.
	C003-SB004	4/5/2016	**9.54**	4/5/2016	0	10	Black SAND with gravel fill.
					10	14	Brown medium SAND.
					14	19	Broken granite.
					19	32	Brown medium sandy SAND with medium coarse gravel.
					32	43	SAND, brick, gravel, fill.
					43	48	Light grey medium SAND, micaceous.
	C003-SB005	4/5/2016	**8.3**	4/5/2016	0	20	Broken concrete pieces
					20	28	Brown medium SAND with to medium gravel.
					28	48	Dark brown fine silty SAND, some gravel.
	C003-SB006	4/5/2016	**9.3**	4/5/2016	0	19	Broken concrete and sand.
					19	23	Light grey medium SAND with gravel and silt.
					23	26	Brown fine silty SAND with gravel.
					26	48	Dark brown silty CLAY sand with gravel.
	C003-SB007	4/5/2016	**7.8**	4/5/2016	0	13	Broken concrete.
					13	21	Brown medium SAND with gravel.
					21	31	Dark grey, black fine SAND with gravel.
					31	48	Black fine GRAVEL, moist.

Notes:
Soil sample location screening was conducted using High Pressure Ion Chamber (HPIC).
µR/hr - microroentgen per hour; in. - inches.
Values in red indicate elevated gamma readings.
Soil borings were installed using Geoprobe® Model 7811DT.

Table 2
Soil Sample Location (HPIC) Screening Results and Soil Boring Logs Summary Table
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

Property Number	Sample Location	Sample Location Screening Data		Soil Boring Logs			
		Screening Date	Average Gamma Reading (µR/hr)	Sample Date	Depth From (in.)	Depth To (in.)	Soil Description
C003	C003-SB008	4/5/2016	**7.98**	4/5/2016	0	16	Broken concrete.
					16	21	Brown medium SAND.
					21	36	Black GRAVEL, sand, ash, cinders
					36	48	Black GRAVEL, slag, ash, cinders some clay at base.
	C003-SB009	4/5/2016	**7.46**	4/5/2016	0	18	Broken concrete.
					18	23	Yellowish-orange with medium GRAVEL.
					23	36	Black silty SAND with gravel.
					36	48	Black fine to medium GRAVEL and fill.
	C003-SB010	4/5/2016	**11.48**	4/5/2016	0	10	Broke asphalt.
					10	16	GRAVEL, sand, concrete.
					16	21	Broken concrete.
					21	32	Brown medium SAND with gravel and concrete.
					32	48	Brown fine SAND with silt and medium gravel, and wood.
					48	73	GRAVEL, concrete, sand.
					73	82	Black SAND silt and medium gravel.
					82	96	Black silty SAND.
	C003-SB011	4/6/2016	**10.94**	4/6/2016	0	17	Broken asphalt, some sand.
					17	36	Brown medium SAND with fine to medium coarse gravel.
					36	48	Brown silty SAND some clay. Wet at 43 inches.
	C003-SB012	4/6/2016	**8.5**	4/6/2016	0	12	Gravel and asphalt.
					12	21	Brown medium SAND with concrete.
					21	43	Black medium SAND with medium to coarse gravel, wood at 37 inches.
					43	48	Light grey medium SAND.
	C003-SB013	4/5/2016	**8.48**	4/6/2016	0	16	Asphalt and gravel.
					16	25	Brown medium to coarse SAND with fine gravel.
					25	31	Light brown medium SAND with fine gravel.
					31	37	Light brown medium.
					37	48	Black SILT and Clay with wood.
	C003-SB014	4/5/2016	**8.28**	4/6/2016	0	8	GRAVEL.
					8	16	Brown medium SAND with fine gravel.
					16	30	Dark grey medium SAND.
					30	32	Brick.
					32	48	Dark brown fine to medium SAND, some silt.
	C003-SB015	4/6/2016	**11.88**	4/6/2016	0	42	Brown SAND with fine to medium to coarse gravel.
					42	48	Black medium SAND with medium to coarse gravel
	C003-SB016	4/5/2016	**9.88**	4/6/2016	0	12	Broken asphalt and sand.
					12	36	Brown medium SAND with medium to gravel.
					36	48	Brown medium SAND, some silt and medium to fine gravel.
[1]C005	[1]C004-SB001	4/5/2016	**9.24**	4/6/2016	0	20	Brown medium SAND silt, rooted, some concrete
					20	36	Brown medium SAND with silt and gravel.
					36	43	Light grey fine to SAND with silt and medium gravel. Wet at 36 inches.
					43	48	Light grey silty SAND and medium to coarse gravel.
		4/6/2016	**9.06**		48	64	No recovery.
					64	71	Broken rock.
					71	73	Light grey medium coarse SAND.
					73	96	Light grey silty SILT medium sand and some clay.

Notes:
Soil sample location screening was conducted using High Pressure Ion Chamber (HPIC).
µR/hr - microroentgen per hour; in. - inches.
[1]Background samples were collected from Property C005; however, RST 3 inadvertently reported the sample numbers for this property with a lead C004 instead of C005.
Values in red indicate elevated gamma readings.
Soil borings were installed using Geoprobe® Model 7811DT.

Table 3
Borehole and Soil Sample (Ludlum-2241) Screening Results Summary Table
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

Property Number	Sample Location	Borehole Screening		RST 3 Sample Number	Soil Sample Screening	
		Depth	Result (cpm)		Depth	Result (cpm)
C002	C002-SB001	0	7,400	C002-SB001-0012-01	0 - 12	9,800
		6	8,600			
		12	18,300	C002-SB001-1224-01	12 - 24	8,600
		18	42,200			
		24	85,000	C002-SB001-2436-01	24 - 36	10,100
		30	178,000			
		36	103,000	C002-SB001-3648-01	36 - 48	9,300
		42	32,800			
		48	19,100	C002-SB001-4860-01	48 - 60	9,300
		54	13,100			
		60	12,300	C002-SB001-6072-01	60 - 72	9,200
		66	10,600			
		72	9,600	C002-SB001-7284-01	72 - 84	9,700
		78	10,300			
		84	11,700	C002-SB001-8496-01	84 - 96	9,500
		90	11,400			
		96	12,700			
	C002-SB002	0	5,600	C002-SB002-0012-01	0 - 12	8,500
		6	8,400			
		12	12,600	C002-SB002-1224-01	12 - 24	9,500
		18	15,700			
		24	17,500	C002-SB002-2436-01	24 - 36	9,500
		30	18,200			
		36	21,300	C002-SB002-3648-01	36 - 48	9,600
		42	31,200			
		48	31,500	C002-SB002-4860-01	48 - 60	10,800
		54	27,600			
		60	43,600	C002-SB002-6072-01	60 - 72	9,400
		66	54,300			
		72	43,000	C002-SB002-7284-01	72 - 84	8,800
		78	23,300			
		84	14,900	C002-SB002-8496-01	84 - 96	9,700
		90	12,200			
		96	10,900			
	C002-SB003	0	7,900	C002-SB003-0012-01	0 - 12	9,300
		6	11,000			
		12	14,200	C002-SB003-1224-01	12 - 24	8,500
		18	18,600			
		24	27,400	C002-SB003-2436-01	24 - 36	10,200
		30	63,000			
		36	155,000	C002-SB003-3648-01	36 - 48	11,200
		42	101,000			
		48	28,900	C002-SB003-4860-01	48 - 60	9,300
		54	15,700			
		60	12,800	C002-SB003-6072-01	60 - 72	9,300
		66	11,000			
		72	11,100	C002-SB003-7284-01	72 - 84	8,800
		78	12,400			
		84	12,900	C002-SB003-8496-01	84 - 96	9,000
		90	13,900			
		96	13,900			
		102	13,700	NS	96 - 102	NC
C003	C003-SB001	0	8,000	C003-SB001-0012-01	0 - 12	10,300
		6	9,400			
		12	11,300			
		18	13,200	C003-SB001-1224-01	12 - 24	9,700
		24	15,800			
		30	22,300	C003-SB001-2436-01	24 - 36	9,700
		36	20,400			
		42	16,600	C003-SB001-3648-01	36 - 48	9,800
		48	12,700			

Notes:
NC - Not collected; NS - Not sampled.
cpm - counts per minute.

Table 3
Borehole and Soil Sample (Ludlum-2241) Screening Results Summary Table
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

Property Number	Sample Location	Borehole Screening		RST 3 Sample Number	Soil Sample Screening	
		Depth	Result (cpm)		Depth	Result (cpm)
C003	C003-SB002	0	8,700	C003-SB002-0012-01	0 - 12	9,700
		6	7,000			
		12	9,000			
		18	12,000	C003-SB002-1224-01	12 - 24	9,400
		24	15,000			
		30	28,000	C003-SB002-2436-01	24 - 36	9,800
		36	62,000			
		42	188,000	C003-SB002-3648-01	36 - 48	11,500
		45	250,000			
		48	200,000			
		54	66,000	NS	48 - 96	NC
		60	21,000			
		66	13,800			
		72	10,800			
		78	10,400			
		84	10,000			
		90	NC			
		96	NC			
	C003-SB003	0	7,500	C003-SB003-0012-01	0 - 12	10,300
		6	7,500			
		12	8,000			
		18	11,700	C003-SB003-1224-01	12 - 24	9,100
		24	12,500			
		30	13,500	C003-SB003-2436-01	24 - 36	8,600
		36	14,500			
		42	16,500	C003-SB003-3648-01	36 - 48	8,900
		48	17,900			
	C003-SB004	0	7,100	C003-SB004-0012-01	0 - 12	9,700
		6	7,100			
		12	9,400			
		18	14,200	C003-SB004-1224-01	12 - 24	9,900
		24	15,200			
		30	18,300	C003-SB004-2436-01	24 - 36	10,000
		36	32,500			
		42	29,000	C003-SB004-3648-01	36 - 48	9,200
		48	NC			
	C003-SB005	0	4,300	C003-SB005-0012-01	0 - 12	9,300
		6	5,200			
		12	9,800			
		18	20,600	C003-SB005-1224-01	12 - 24	9,700
		24	43,100			
		30	58,500	C003-SB005-2436-01	24 - 36	10,100
		36	58,500			
		42	45,400	C003-SB005-3648-01	36 - 48	9,700
		48	21,000			
	C003-SB006	0	7,100	C003-SB006-0012-01	0 - 12	9,600
		6	18,400			
		12	28,300			
		18	42,100	C003-SB006-1224-01	12 - 24	9,800
		24	40,000			
		30	15,900	C003-SB006-2436-01	24 - 36	9,100
		36	10,700			
		42	12,400	C003-SB006-3648-01	36 - 48	9,900
		48	11,600			
	C003-SB007	0	5,100	C003-SB007-0012-01	0 - 12	9,200
		6	5,600			
		12	9,700			
		18	15,000	C003-SB007-1224-01	12 - 24	9,500
		24	13,200			
		30	12,500	C003-SB007-2436-01	24 - 36	9,500
		36	11,300			
		42	10,500	C003-SB007-3648-01	36 - 48	10,100
		48	NC			

Notes:
NC - Not collected; NS - Not sampled.
cpm - counts per minute.

Table 3
Borehole and Soil Sample (Ludlum-2241) Screening Results Summary Table
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

Property Number	Sample Location	Borehole Screening		RST 3 Sample Number	Soil Sample Screening	
		Depth	Result (cpm)		Depth	Result (cpm)
C003	C003-SB008	0	6,400	C003-SB008-0012-01	0 - 12	9,700
		6	7,600			
		12	12,500			
		18	28,300	C003-SB008-1224-01	12 - 24	10,200
		24	75,200			
		30	87,700	C003-SB008-2436-01	24 - 36	10,700
		36	41,800			
		42	19,000	C003-SB008-3648-01	36 - 48	10,800
		48	NC			
	C003-SB009	0	6,900	C003-SB009-0012-01	0 - 12	9,500
		6	8,700			
		12	15,800			
		18	18,700	C003-SB009-1224-01	12 - 24	9,400
		24	16,700			
		30	18,500	C003-SB009-2436-01	24 - 36	9,200
		36	28,800			
		42	32,700	C003-SB009-3648-01	36 - 48	8,500
		48	36,000			
	C003-SB010	0	17,000	C003-SB010-0012-01	0 - 12	9,600
		6	33,000			
		12	73,500			
		18	159,000	C003-SB010-1224-01	12 - 24	10,400
		24	329,000			
		30	617,000	C003-SB010-2436-01	24 - 36	13,700
		36	>999,000			
		42	>999,000	C003-SB010-3648-01	36 - 48	24,300
		45	>999,000			
		48	>999,000			
		54	380,000	C002-SB010-4860-01	48 - 60	11,800
		60	94,000			
		66	55,000	C002-SB010-6072-01	60 - 72	9,300
		72	28,000			
		78	18,100	C002-SB010-7284-01	72 - 84	9,500
		84	16,500			
		90	17,500	C002-SB010-8496-01	84 - 96	9,300
		96	22,300			
	C003-SB011	0	9,600	C003-SB011-0012-01	0 - 12	9,300
		6	17,000			
		12	31,200			
		18	36,400	C003-SB011-1224-01	12 - 24	10,300
		24	22,400			
		30	15,900	C003-SB011-2436-01	24 - 36	8,900
		36	13,400			
		42	12,600	C003-SB011-3648-01	36 - 48	8,900
		48	12,800			
	C003-SB012	0	7,600	C003-SB012-0012-01	0 - 12	9,400
		6	11,700			
		12	23,400			
		18	48,400	C003-SB012-1224-01	12 - 24	10,500
		24	99,000			
		30	272,000	C003-SB012-2436-01	24 - 36	13,300
		36	554,000			
		42	170,000	C003-SB012-3648-01	36 - 48	11,400
		48	45,800			
	C003-SB013	0	8,000	C003-SB013-0012-01	0 - 12	9,300
		6	12,300			
		12	22,600			
		18	43,100	C003-SB013-1224-01	12 - 24	9,500
		24	90,000			
		30	270,000	C003-SB013-2436-01	24 - 36	9,800
		36	525,000			
		42	461,000	C003-SB013-3648-01	36 - 48	12,500
		48	486,000			

Notes:
NC - Not collected; NS - Not sampled.
cpm - counts per minute.

Table 3
Borehole and Soil Sample (Ludlum-2241) Screening Results Summary Table
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

Property Number	Sample Location	Borehole Screening		RST 3 Sample Number	Soil Sample Screening	
		Depth	Result (cpm)		Depth	Result (cpm)
C003	C003-SB014	0	8,300	C003-SB014-0012-01	0 - 12	9,800
		6	15,500			
		12	36,500			
		18	103,000	C003-SB014-1224-01	12 - 24	9,200
		24	258,000			
		30	489,000	C003-SB014-2436-01	24 - 36	12,100
		36	219,000			
		42	75,000	C003-SB014-3648-01	36 - 48	10,100
		48	37,200			
	C003-SB015	0	12,800	C003-SB015-0012-01	0 - 12	9,300
		6	13,400			
		12	17,800			
		18	20,800	C003-SB015-1224-01	12 - 24	9,800
		24	14,800			
		30	15,000	C003-SB015-2436-01	24 - 36	9,400
		36	20,200			
		42	40,000	C003-SB015-3648-01	36 - 48	8,800
		48	52,200			
	C003-SB016	0	8,600	C003-SB016-0012-01	0 - 12	9,700
		6	9,700			
		12	11,600			
		18	12,700	C003-SB016-1224-01	12 - 24	9,600
		24	12,700			
		30	12,900	C003-SB016-2436-01	24 - 36	8,800
		36	12,800			
		42	12,500	C003-SB016-3648-01	36 - 48	9,600
		48	13,200			
[1]C005	[1]C004-SB001	0	7,900	C004-SB001-0012-01	0 - 12	8,900
		6	12,000			
		12	14,000	C004-SB001-1224-01	12 - 24	9,900
		18	19,000			
		24	24,000	C004-SB001-2436-01	24 - 36	9,600
		30	16,300			
		36	12,500	C004-SB001-3648-01	36 - 48	9,300
		42	11,800			
		48	NC	NS	48 - 60	NC
		54	12,600			
		60	12,500	NS	60 - 72	NC
		66	11,000			
		72	NC	C004-SB001-7284-01	72 - 84	9,200
		78	NC			
		84	NC	C004-SB001-8496-01	84 - 96	8,400
		96	NC			

Notes:
NC - Not collected; NS - Not sampled.
cpm - counts per minute.
[1]Background data was collected from Property C005; however, RST 3 inadvertently reported the sample location number for this property with a lead C004 instead of C005.

Table 4
Validated Soil Analytical Results Summary Table - Radioisotopes
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

	Location No.	C002-SB001																								C002-SB002		
	RST 3 Sample No.	C002-SB001-0012-01			CB002-SB001-1224-01			CB002-SB001-2436-01			CB002-SB001-3648-01			C002-SB001-4860-01			C002-SB001-6072-01			C002-SB001-7284-01			C002-SB001-8496-01			C002-SB002-0012-01		
	Sample Depth (inches)	0-12			12-24			24-36			36-48			48-60			60-72			72-84			84-96			0-12		
	Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
	Sample Date	4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																											
Bismuth-212 (Bi-212)	6,440,000	0.41		0.14	0.745	J	1.274	1.821	UJ	6.026	1.551	J	1.686	0.66		0.13	0.63		0.1	0.93		0.16	0.92		0.13	0.42		0.12
Bismuth-214 (Bi-214)	1,310,000	0.3	J	0.04	NA			NA			NA			0.67	J	0.08	0.77	J	0.09	0.53	J	0.06	0.48	J	0.05	0.36	J	0.04
Cesium-137 (Cs-137)	11.20	ND			NA			NA			NA			ND			ND			ND			ND			0.01		0.01
[2]Lead-210 (Pb-210)	418	0.43		0.15	7.903	J	13.005	120.52		77.6	5.782	J	2.996	0.76		0.2	0.85		0.18	0.29		0.1	0.28		0.09	0.48		0.12
Lead-212 (Pb-212)	657,000	0.36		0.04	0.693		0.16	1.127		0.564	1.095		0.276	0.55		0.06	0.52		0.06	0.79		0.09	0.81		0.09	0.44		0.05
Lead-214 (Pb-214)	7,330,000	0.36	J	0.04	ND			ND			ND			0.75	J	0.09	0.88	J	0.1	0.6	J	0.07	0.56	J	0.07	0.42	J	0.05
Potassium-40 (K-40)	26.7	7.46	J	0.85	11.609		2.179	10.158		6.089	11.212		3.006	11.3	J	1.26	12	J	1.32	11.4	J	1.27	12	J	1.33	9.98	J	1.12
Radium-226* (Ra-226)	2.52	0.63		0.17	**5.624**		0.803	**89.391**		11.931	2.207		0.386	1.08		0.2	1.16		0.18	1.2	J	0.21	1.19		0.18	0.73		0.18
Radium-228 (Ra-228)	16.2	0.34		0.05	0.921		0.279	0.518	U	1.642	0.948		0.496	0.55		0.07	0.53		0.06	0.8		0.09	0.81		0.09	0.46		0.06
Thallium-208 (Tl-208)	3,400,000	0.1	J	0.01	0.295		0.098	0	UJ	0.328	0.535		0.159	0.18	J	0.02	0.16	J	0.02	0.26	J	0.03	0.24	J	0.03	0.14	J	0.02
Thorium-227 (Th-227)	NS	0.08		0.07	NA			NA			NA			0.07		0.04	0.07		0.04	0.12		0.06	0.1		0.05	0.12		0.06
Thorium-228 (Th-228)	13,300	0.6		0.16	0.65		0.334	1.17		0.501	1.34		0.579	0.5		0.09	0.63		0.11	0.75		0.12	0.74		0.12	0.54		0.11
Thorium-230 (Th-230)	2,060	0.45		0.13	1.89		0.579	10.3		2.09	0.598		0.338	0.48		0.1	0.5		0.1	0.62		0.11	0.54		0.1	0.55		0.12
Thorium-232 Th-232)	5	0.45		0.13	0.812		0.35	1.29		0.509	1.1		0.468	0.52		0.1	0.59		0.11	0.71		0.12	0.71		0.11	0.42		0.09
Thorium-234 Th-234)	47,500	0.28		0.14	0	U	0.991	3.66	U	5.035	1.215	U	1.415	0.58		0.15	0.43		0.14	0.58		0.14	0.78		0.13	0.27		0.13
Uranium-233/234 (U-233/234)	3,260	NA			0.519		0.187	0.74		0.273	0.37		0.194	NA			NA			NA			NA			NA		
Uranium-235/236 (U-235/236)	37.7	NA			0.067	J	0.072	0.08	J	0.097	0.082	J	0.107	NA			NA			NA			NA			NA		
Uranium-234 (U-234)	3,260	0.53		0.1	NA			NA			NA			0.5		0.09	0.31		0.07	0.64		0.11	0.89		0.14	0.38		0.08
Uranium-235 (U-235)	37.7	0.02	J	0.02	0.284	R	0.145	6.563	R	1.291	0.292	R	0.136	0.02	J	0.02	ND			0.03		0.03	0.05		0.03	ND		
Uranium-238 (U-238)	158	0.55	J	0.1	0.594		0.201	0.915		0.312	0.604		0.255	0.46	J	0.09	0.38	J	0.08	0.64	J	0.11	0.92	J	0.14	0.4	J	0.08

	Location No.	C002-SB002																								C002-SB003		
	RST 3 Sample No.	C002-SB002-1224-01			C002-SB002-2436-01			C002-SB002-3648-01			CB002-SB002-4860-01			CB002-SB002-6072-01			C002-SB002-7284-01			C002-SB002-7284-02			C002-SB002-8496-01			C002-SB003-0012-01		
	Sample Depth (inches)	12-24			24-36			36-48			48-60			60-72			72-84			72-84			84-96			0-12		
	Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
	Sample Date	4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																											
Bismuth-212 (Bi-212)	6,440,000	1.32		0.27	0.79		0.16	0.97		0.16	1.842	J	2.635	2.365		2.212	1.09		0.19	0.97		0.15	0.93		0.15	0.78		0.17
Bismuth-214 (Bi-214)	1,310,000	1.29	J	0.15	1.64	J	0.18	4.5	J	0.49	NA			NA			0.77	J	0.09	0.71	J	0.08	0.51	J	0.06	0.97	J	0.11
Cesium-137 (Cs-137)	11.20	0.05		0.01	0.04		0.01	0.07		0.01	NA			NA			ND			ND			ND			0.16		0.02
[2]Lead-210 (Pb-210)	418	0.97		0.17	2.11		0.31	8.99		1.1	14.252	J	5.308	3.558	J	5.406	0.84		0.18	0.77		0.22	0.51		0.17	1.34		0.19
Lead-212 (Pb-212)	657,000	1.31		0.15	0.73		0.08	0.9		0.1	1.335		0.355	1.503		0.347	1.02		0.11	0.94		0.11	0.8		0.09	0.76		0.09
Lead-214 (Pb-214)	7,330,000	1.47	J	0.16	1.89	J	0.21	5.07	J	0.56	ND			ND			0.88	J	0.1	0.83	J	0.09	0.57	J	0.07	1.11	J	0.13
Potassium-40 (K-40)	26.7	15.5	J	1.73	13.2	J	1.46	12.2	J	1.35	8.462		3.884	12.566		3.845	14.1	J	1.56	13.4	J	1.48	11.9	J	1.32	11	J	1.23
Radium-226* (Ra-226)	2.52	2.23		0.34	**2.57**		0.34	**5.84**		0.7	**12.829**		1.827	**8.709**		1.299	1.67		0.25	1.5		0.23	0.94		0.18	1.71		0.29
Radium-228 (Ra-228)	16.2	1.32		0.15	0.73		0.09	0.91		0.11	1.69		0.558	1.788		0.581	0.99		0.12	0.98		0.11	0.79		0.09	0.7		0.09
Thallium-208 (Tl-208)	3,400,000	0.41	J	0.05	0.22	J	0.03	0.28	J	0.03	0.645		0.239	0.626		0.215	0.32	J	0.04	0.3	J	0.03	0.26	J	0.03	0.22	J	0.03
Thorium-227 (Th-227)	NS	0.12		0.05	0.11		0.05	0.14		0.06	NA			NA			0.08		0.05	0.15		0.06	0.1		0.05	0.12		0.05
Thorium-228 (Th-228)	13,300	0.99		0.14	0.56		0.1	0.89		0.14	1.06	J	0.561	1.5	J	0.687	1.11	J	0.17	1.09	J	0.16	0.76	J	0.12	3.73	J	0.42
Thorium-230 (Th-230)	2,060	1.08		0.15	0.93		0.15	1.57		0.21	2.02	J	0.749	0.852	J	0.472	0.68		0.12	0.64		0.12	0.61		0.11	1.08		0.16
Thorium-232 Th-232)	5	0.85		0.13	0.62		0.11	0.76		0.12	0.805	J	0.452	1.36	J	0.598	1.01	J	0.16	1.12	J	0.16	0.74	J	0.12	3.83	J	0.43
Thorium-234 Th-234)	47,500	0.68		0.18	0.72		0.18	0.61		0.27	0.206	U	3.935	0.998	U	3.437	0.81		0.18	0.87		0.21	0.52		0.17	0.68		0.17
Uranium-233/234 (U-233/234)	3,260	NA			NA			NA			1.02		0.355	1.03		0.237	NA			NA			NA			NA		
Uranium-235/236 (U-235/236)	37.7	NA			NA			NA			0.119	J	0.126	0.037	J	0.046	NA			NA			NA			NA		
Uranium-234 (U-234)	3,260	0.74		0.12	0.53		0.1	0.57		0.1	NA			NA			0.71	J	0.15	0.78	J	0.14	0.62	J	0.14	0.79	J	0.14
Uranium-235 (U-235)	37.7	ND			0.04		0.03	0.03		0.03	0.902	R	0.297	0.668	R	0.284	0.04		0.04	0.03	J	0.03	ND			0.05		0.04
Uranium-238 (U-238)	158	0.71	J	0.12	0.64	J	0.11	0.64	J	0.11	0.909		0.334	0.875		0.211	0.64		0.14	0.73		0.14	0.62		0.14	0.8		0.14

Notes:

RST 3 - Removal Support Team 3.

No. - Number; U - Not detected; J - An estimated result; R - A rejected result.

pCi/g - picocuries per gram; NA - Not analyzed; NS - Not specified.

[1]U.S. Environmental Protection Agency (EPA) Site-Specific Action Levels (SSAL) are presented in pCi/g.

Samples analyzed by EPA's National Analytical Radiation Environmental Laboratory (NAREL).

Samples analyzed by RST 3-procured laboratory, Pace Analytical Services (PACE).

Values in red equal or exceed the EPA SSAL for the respective radioisotope.

Radium-226* (21-day ingrowth) analyzed by gamma spectroscopy via EPA 901.1 modified (soil only).

[2]For samples analyzed by PACE, the detection limit for lead-210 by EPA Method 901.1 is not low enough, therefore, a negative result is generated by the laboratory instrument if the sample contains low or no detection of lead-210.

Table 4
Validated Soil Analytical Results Summary Table - Radioisotopes
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

	Location No.	C002-SB003																					C003-SB001					
	RST 3 Sample No.	C002-SB003-1224-01			CB002-SB003-2436-01			CB002-SB003-3648-01			C002-SB003-4860-01			C002-SB003-6072-01			C002-SB003-7284-01			C002-SB003-8496-01			C003-SB001-0012-01			C003-SB001-1224-01		
	Sample Depth (inches)	12-24			24-36			36-48			48-60			60-72			72-84			84-96			0-12			12-24		
	Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
	Sample Date	4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/5/2016			4/5/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																											
Bismuth-212 (Bi-212)	6,440,000	0.96		0.14	1.078		0.732	3.637	J	4.258	0.85		0.18	1.12		0.17	0.94		0.15	1.13		0.19	1.2		0.24	0.43	U	1.58
Bismuth-214 (Bi-214)	1,310,000	1.3	J	0.14	NA			NA			1.78	J	0.2	0.59	J	0.07	0.56	J	0.06	0.71		0.08	0.53		0.07	NA		
Cesium-137 (Cs-137)	11.20	0.09	J	0.01	NA			NA			ND			ND			ND			ND			ND			NA		
[2]Lead-210 (Pb-210)	418	1.27		0.24	1.561	U	10.873	51.323		13.99	1.84		0.23	0.55		0.13	0.32		0.1	0.48		0.11	0.59		0.22	0	U	4.361
Lead-212 (Pb-212)	657,000	0.85		0.1	0.636		0.145	0.907		0.413	0.78		0.09	1.04		0.12	0.85		0.09	1.01		0.11	1.18		0.13	0.861		0.197
Lead-214 (Pb-214)	7,330,000	1.46	J	0.16	ND			ND			2.03	J	0.22	0.74	J	0.08	0.6	J	0.07	0.82		0.09	0.65		0.08	ND		
Potassium-40 (K-40)	26.7	12.9		1.42	13.028		2.489	19.625		4.97	10.8	J	1.21	9.5	J	1.06	14.3	J	1.58	15		1.66	13.6		1.53	12.818		2.594
Radium-226* (Ra-226)	2.52	2.02		0.28	0.947		0.213	**60.495**		8.113	**2.69**		0.36	1.47		0.24	1.37		0.21	1.5		0.23	1.1		0.27	1.289		0.24
Radium-228 (Ra-228)	16.2	0.82		0.09	0.686	J	0.255	1.293	J	1.371	0.79		0.1	0.99		0.11	0.93		0.11	1.02		0.12	1.16		0.14	0.915		0.336
Thallium-208 (Tl-208)	3,400,000	0.26	J	0.03	0.195		0.066	0.414		0.246	0.24	J	0.03	0.31	J	0.04	0.27	J	0.03	0.32		0.04	0.34		0.04	0.267		0.094
Thorium-227 (Th-227)	NS	0.11		0.05	NA			NA			0.15		0.06	0.09		0.04	0.16		0.06	0.06	J	0.04	0.05	J	0.04	NA		
Thorium-228 (Th-228)	13,300	0.75	J	0.12	0.741		0.405	0.954		0.469	0.85	J	0.13	0.86	J	0.12	0.82	J	0.13	1.03	J	0.15	0.98	J	0.16	0.925		0.396
Thorium-230 (Th-230)	2,060	1		0.15	0.683		0.363	44.8		7.63	1.32		0.18	0.72		0.11	0.74		0.12	0.77	J	0.13	0.5	J	0.11	0.902		0.369
Thorium-232 Th-232)	5	0.88	J	0.14	0.352		0.25	0.847		0.404	0.77	J	0.12	0.94	J	0.13	0.73	J	0.12	0.91	J	0.14	0.99	J	0.16	0.334		0.214
Thorium-234 Th-234)	47,500	0.68		0.18	0.466	U	2.708	0.651	U	6.709	0.53		0.13	0.82		0.18	0.55		0.14	0.6		0.14	0.54		0.22	1.161	U	1.121
Uranium-233/234 (U-233/234)	3,260	NA			0.551		0.225	1.03		0.309	NA			NA			NA			NA			NA			0.435		0.166
Uranium-235/236 (U-235/236)	37.7	NA			0.045	J	0.092	0.09	J	0.089	NA			NA			NA			NA			NA			0.106	J	0.088
Uranium-234 (U-234)	3,260	0.56	J	0.11	NA			NA			0.67	J	0.13	0.96	J	0.16	1	J	0.17	0.82		0.15	0.64		0.11	NA		
Uranium-235 (U-235)	37.7	0.03		0.03	0.107	R	0.125	4.294	R	0.827	0.03	J	0.03	0.04		0.04	ND			0.04		0.03	0.04		0.03	0.107	R	0.104
Uranium-238 (U-238)	158	0.6		0.12	0.406		0.188	1.2		0.339	0.70		0.13	0.81	J	0.14	0.87		0.16	0.84		0.15	0.62		0.11	0.415		0.163

	Location No.	C003-SB001									C003-SB002												C003-SB003					
	RST 3 Sample No.	C003-SB001-2436-01			C003-SB001-3648-01			C003-SB001-3648-02			C003-SB002-0012-01			C003-SB002-1224-01			C003-SB002-2436-01			C003-SB002-3648-01			C003-SB003-0012-01			C003-SB003-1224-01		
	Sample Depth (inches)	24-36			36-48			36-48			0-12			12-24			24-36			36-48			0-12			12-24		
	Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
	Sample Date	4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/216			4/5/2016			4/5/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																											
Bismuth-212 (Bi-212)	6,440,000	0.285	U	2.132	0.77		0.13	0.79		0.13	0.62		0.16	1.02		0.14	0.858	J	1.244	2.33	J	2.817	0.83		0.17	0.88		0.18
Bismuth-214 (Bi-214)	1,310,000	NA			0.78		0.09	0.9		0.1	0.43		0.06	0.88		0.1	NA			NA			0.51		0.06	0.63		0.07
Cesium-137 (Cs-137)	11.20	NA			ND			ND			ND			0.01	J	0.01	NA			NA			ND			0.01		0.01
[2]Lead-210 (Pb-210)	418	1.976	U	3.342	0.73		0.16	0.74		0.2	0.8		0.2	0.85		0.2	2.336	U	12.72	60.996		41.09	0.32		0.12	0.65		0.16
Lead-212 (Pb-212)	657,000	0.943		0.226	0.74		0.08	0.72		0.08	0.56		0.06	0.91		0.1	0.997		0.21	0.841		0.335	0.76		0.09	0.79		0.09
Lead-214 (Pb-214)	7,330,000	ND			0.9		0.1	1.01		0.11	0.49		0.06	1.01		0.11	ND			ND			0.58		0.07	0.71		0.08
Potassium-40 (K-40)	26.7	13.81		2.86	13.6		1.5	13.6		1.5	12.7		1.42	13		1.44	14.618		2.534	11.657		2.492	16.5		1.83	13.2		1.47
Radium-226* (Ra-226)	2.52	**3.393**		0.553	1.31		0.2	1.53		0.23	0.89		0.22	1.64		0.24	0.668		0.164	**29.964**		4.05	1.01		0.2	1.24		0.2
Radium-228 (Ra-228)	16.2	1.311		0.397	0.75		0.09	0.74		0.08	0.52		0.07	0.91		0.1	1.224		0.297	1.24		0.883	0.78		0.09	0.84		0.1
Thallium-208 (Tl-208)	3,400,000	0.4		0.122	0.24		0.03	0.23		0.03	0.16		0.02	0.29		0.03	0.384		0.111	0.216	J	0.25	0.24		0.03	0.27		0.03
Thorium-227 (Th-227)	NS	NA			0.06	J	0.04	0.04	J	0.04	0.08	J	0.06	0.05	J	0.05	NA			NA			0.06	J	0.04	0.07	J	0.04
Thorium-228 (Th-228)	13,300	0.715		0.356	0.65	J	0.12	0.8	J	0.14	0.62	J	0.15	0.81	J	0.17	1.09		0.457	0.704		0.305	0.67	J	0.11	0.86	J	0.14
Thorium-230 (Th-230)	2,060	0.633		0.319	0.62	J	0.12	0.63	J	0.13	0.61	J	0.15	0.72	J	0.16	0.257		0.202	10.2		1.9	0.47	J	0.09	0.8	J	0.13
Thorium-232 Th-232)	5	0.629		0.315	0.58	J	0.11	0.83	J	0.15	0.5	J	0.13	0.66	J	0.15	0.756		0.347	0.845		0.32	0.69	J	0.12	0.88	J	0.14
Thorium-234 Th-234)	47,500	0	U	1.148	0.51		0.15	0.55		0.18	0.52		0.25	0.55		0.17	0.642	U	2.61	1.587	U	9.519	0.41		0.14	0.56		0.16
Uranium-233/234 (U-233/234)	3,260	0.458		0.217	NA			NA			NA			NA			0.615		0.171	0.564		0.24	NA			NA		
Uranium-235/236 (U-235/236)	37.7	0.053	J	0.109	NA			NA			NA			NA			0.097	J	0.074	0.057	J	0.102	NA			NA		
Uranium-234 (U-234)	3,260	NA			0.51		0.1	0.53		0.10	0.5		0.09	0.43		0.09	NA			NA			0.57		0.12	0.61		0.11
Uranium-235 (U-235)	37.7	0.345	R	0.151	0.05		0.03	0.03	J	0.03	0.02	J	0.02	0.04	J	0.03	0.013	R	0.088	1.88	R	0.464	ND			0.02	J	0.02
Uranium-238 (U-238)	158	0.523		0.235	0.62		0.12	0.56		0.11	0.46		0.09	0.47		0.09	0.546		0.157	0.304		0.173	0.57		0.12	0.60		0.11

Notes:

RST 3 - Removal Support Team 3.

No. - Number; U - Not detected; J - An estimated result; R - A rejected result.

pCi/g - picocuries per gram; NA - Not analyzed; NS - Not specified.

[1]U.S. Environmental Protection Agency (EPA) Site-Specific Action Levels (SSAL) are presented in pCi/g.

Samples analyzed by EPA's National Analytical Radiation Environmental Laboratory (NAREL).

Samples analyzed by RST 3-procured laboratory, Pace Analytical Services (PACE).

Values in red equal or exceed the EPA SSAL for the respective radioisotope.

Radium-226* (21-day ingrowth) analyzed by gamma spectroscopy via EPA 901.1 modified (soil only).

[2]For samples analyzed by PACE, the detection limit for lead-210 by EPA Method 901.1 is not low enough, therefore, a negative result is generated by the laboratory instrument if the sample contains low or no detection of lead-210.

Table 4
Validated Soil Analytical Results Summary Table - Radioisotopes
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

	Location No.	C003-SB003						C003-SB004												C003-SB005								
	RST 3 Sample No.	C003-SB003-2436-01			C003-SB003-3648-01			C003-SB004-0012-01			C003-SB004-1224-01			C003-SB004-2436-01			C003-SB004-3648-01			C003-SB005-0012-01			C003-SB005-1224-01			C003-SB005-2436-01		
	Sample Depth (inches)	24-36			36-48			0-12			12-24			24-36			36-48			0-12			12-24			24-36		
	Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
	Sample Date	4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																											
Bismuth-212 (Bi-212)	6,440,000	1.582		1.132	-0.533	U	2.354	0.82		0.16	1.11		0.19	2.478		1.245	1.205		0.823	0.42		0.18	0	U	0.978	0.463	U	4.694
Bismuth-214 (Bi-214)	1,310,000	NA			NA			0.78		0.09	0.63		0.07	NA			NA			0.36		0.05	NA			NA		
Cesium-137 (Cs-137)	11.20	NA			NA			0.01		0.01	ND			NA			NA			ND			NA			NA		
[2]Lead-210 (Pb-210)	418	-2.011	U	13.632	8.169	U	20.834	0.77		0.2	0.64		0.16	2.978	J	4.262	4.749	U	10.085	0.65		0.18	11.702		6.301	33.665		11.499
Lead-212 (Pb-212)	657,000	0.892		0.204	0.729		0.226	0.63		0.07	1		0.11	0.964		0.254	0.653		0.159	0.31		0.04	1.001		0.288	1.156		0.4
Lead-214 (Pb-214)	7,330,000	ND			ND			0.92		0.1	0.74		0.08	ND			ND			0.44		0.06	ND			ND		
Potassium-40 (K-40)	26.7	14.779		2.696	5.763		1.604	13.1		1.46	13.3		1.48	15.18		3.144	12.645		2.199	4.78		0.57	15.208		3.362	29.801		5.684
Radium-226* (Ra-226)	2.52	0.855		0.204	2.108		0.436	1.39		0.24	1.31		0.2	**6.679**		1.031	0.952		0.206	0.87		0.24	**13.168**		1.864	**28.307**		3.901
Radium-228 (Ra-228)	16.2	0.721		0.377	1.019		0.36	0.68		0.08	0.99		0.11	1.971		0.53	0.8		0.247	0.29		0.06	1.082		0.795	0.971	J	0.843
Thallium-208 (Tl-208)	3,400,000	0.471		0.105	0.146	J	0.176	0.19		0.02	0.3		0.04	0.414		0.137	0.239		0.09	0.1		0.02	0.277		0.279	0.167	U	0.392
Thorium-227 (Th-227)	NS	NA			NA			0.07	J	0.04	0.07	J	0.04	NA			NA			0.13	J	0.07	NA			NA		
Thorium-228 (Th-228)	13,300	1.54		0.619	0.525		0.247	0.51	J	0.09	0.78	J	0.13	1.12		0.533	0.806	J	0.463	0.3		0.09	0.438		0.284	0.946		0.464
Thorium-230 (Th-230)	2,060	0.346		0.272	0.639		0.257	0.56	J	0.1	0.58	J	0.11	1.47		0.585	0.443	J	0.325	0.31		0.1	3.92		0.917	2.97		0.859
Thorium-232 Th-232)	5	1.43		0.577	0.548		0.236	0.52	J	0.09	0.72	J	0.12	0.586		0.352	0.723	J	0.41	0.27		0.08	0.536		0.263	0.607		0.344
Thorium-234 Th-234)	47,500	0.626	U	2.884	1.144	U	4.054	0.33		0.17	0.58		0.16	0	U	1.573	0.627	U	2.546	0.47		0.25	1.739	U	1.842	5.245	J	3.337
Uranium-233/234 (U-233/234)	3,260	0.632		0.211	0.577		0.209	NA			NA			0.644		0.182	0.539		0.173	NA			0.464		0.18	1.08		0.266
Uranium-235/236 (U-235/236)	37.7	0.103	J	0.083	0.041	J	0.074	NA			NA			0.083	J	0.063	0.097	J	0.074	NA			0.072	J	0.076	0.097	J	0.073
Uranium-234 (U-234)	3,260	NA			NA			0.6		0.11	0.59		0.12	NA			NA			0.39		0.1	NA			NA		
Uranium-235 (U-235)	37.7	0.129	R	0.109	0.106	R	0.157	0.04		0.03	ND			0.506	R	0.21	0.135	R	0.107	0.02		0.02	1.241	R	0.324	2.342	R	0.59
Uranium-238 (U-238)	158	0.746		0.223	0.612		0.216	0.6		0.11	0.64		0.12	0.693		0.19	0.553		0.175	0.48		0.11	0.588		0.205	1.2		0.285

	Location No.	C003-SB005			C003-SB006												C003-SB007											
	RST 3 Sample No.	C003-SB005-3648-01			C003-SB006-0012-01			C003-SB006-1224-01			C003-SB006-2436-01			C003-SB006-3648-01			C003-SB007-0012-01			C003-SB007-1224-01			C003-SB007-2436-01			C003-SS007-2436-02		
	Sample Depth (inches)	36-48			0-12			12-24			24-36			36-48			0-12			12-24			24-36			24-36		
	Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
	Sample Date	4/5/2016			4/5/2016			4/8/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																											
Bismuth-212 (Bi-212)	6,440,000	0.76	U	1.69	0.56		0.18	1.939	J	2.859	1.586		1.267	1.02		0.15	0.45		0.11	1.003	J	1.424	2.321		1.073	1.75		0.94
Bismuth-214 (Bi-214)	1,310,000	NA			2.24		0.25	NA			NA			0.48		0.06	2.78		0.31	NA			NA			NA		
Cesium-137 (Cs-137)	11.20	NA			0.02		0.01	NA			NA			ND			ND			NA			NA			NA		
[2]Lead-210 (Pb-210)	418	0	U	1.823	2.79		0.4	25.154		8.053	0.248	U	2.393	0.36		0.1	2.65		0.37	-8.479	U	18.826	0	U	1.697	-4.407	U	16.096
Lead-212 (Pb-212)	657,000	0.814		0.206	0.57		0.07	0.819		0.311	0.809		0.204	0.87		0.1	0.42		0.05	0.672		0.187	0.888		0.231	0.793		0.194
Lead-214 (Pb-214)	7,330,000	ND			2.65		0.29	ND			ND			0.58		0.07	3.19		0.35	ND			ND			ND		
Potassium-40 (K-40)	26.7	11.608		2.548	10.1		1.14	16.311		3.546	12.504		2.718	13.8		1.52	10.6		1.18	12.173		2.262	13.642		2.958	12.225		2.359
Radium-226* (Ra-226)	2.52	1.187		0.274	**3.72**		0.49	**18.408**		2.571	0.555		0.181	1.12		0.18	**3.84**		0.47	**2.826**		0.453	1.002		0.22	0.869		0.232
Radium-228 (Ra-228)	16.2	0.662	J	0.27	0.57		0.08	1.736		0.672	1.017		0.36	0.92		0.1	0.45		0.06	1.009		0.264	1.529		0.398	1.089		0.308
Thallium-208 (Tl-208)	3,400,000	0.31		0.11	0.17		0.02	0.117	U	0.278	0.312		0.109	0.28		0.03	0.14		0.02	0.344		0.122	0.398		0.133	0.266		0.089
Thorium-227 (Th-227)	NS	NA			0.04	J	0.04	NA			NA			ND			0.11	J	0.08	NA			NA			NA		
Thorium-228 (Th-228)	13,300	0.63		0.335	0.59		0.13	0.722	J	0.336	0.769	J	0.401	0.63	J	0.1	0.5		0.13	0.677	J	0.355	0.964	J	0.449	0.949	J	0.465
Thorium-230 (Th-230)	2,060	0.374		0.232	0.73		0.15	3.17		0.758	0.426	J	0.279	0.43	J	0.08	1.67		0.27	0.812	J	0.365	0.567	J	0.32	0.491	J	0.301
Thorium-232 Th-232)	5	0.757		0.332	0.51		0.12	0.884		0.333	0.824	J	0.394	0.57	J	0.09	0.41		0.11	0.438	J	0.258	0.657	J	0.338	0.935	J	0.42
Thorium-234 Th-234)	47,500	1.775	J	1.519	0.07		0.24	1.547	U	2.052	0.458	U	1.532	0.58		0.13	0.56		0.16	1.616	U	3.298	0.171	U	1.928	0	U	1.779
Uranium-233/234 (U-233/234)	3,260	0.473		0.219	NA			0.538		0.195	0.416	J	0.188	NA			NA			0.436	J	0.17	0.349	J	0.183	0.607	J	0.242
Uranium-235/236 (U-235/236)	37.7	0.08	J	0.105	NA			-0.005	J	0.071	0.013	UJ	0.088	NA			NA			0.034	J	0.067	0.015	UJ	0.101	0.078	J	0.094
Uranium-234 (U-234)	3,260	NA			ND			NA			NA			0.6		0.12	0.41		0.09	NA			NA			NA		
Uranium-235 (U-235)	37.7	0.207	R	0.1	0.02	J	0.02	1.509	R	0.396	0.127	R	0.142	0.04		0.03	0		0.02	0.23	R	0.133	0.175	R	0.102	0.044	R	0.104
Uranium-238 (U-238)	158	0.36		0.191	0.39		0.08	0.459		0.179	0.406	J	0.184	0.53		0.11	0.41		0.09	0.54	J	0.192	0.488	J	0.217	0.494	J	0.21

Notes:

RST 3 - Removal Support Team 3.

No. - Number; U - Not detected; J - An estimated result; R - A rejected result.

pCi/g - picocuries per gram; NA - Not analyzed; NS - Not specified.

[1]U.S. Environmental Protection Agency (EPA) Site-Specific Action Levels (SSAL) are presented in pCi/g.

Samples analyzed by EPA's National Analytical Radiation Environmental Laboratory (NAREL).

Samples analyzed by RST 3-procured laboratory, Pace Analytical Services (PACE).

Values in red equal or exceed the EPA SSAL for the respective radioisotope.

Radium-226* (21-day ingrowth) analyzed by gamma spectroscopy via EPA 901.1 modified (soil only).

[2]For samples analyzed by PACE, the detection limit for lead-210 by EPA Method 901.1 is not low enough, therefore, a negative result is generated by the laboratory instrument if the sample contains low or no detection of lead-210.

Table 4
Validated Soil Analytical Results Summary Table - Radioisotopes
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

	Location No.	C003-SB007			C003-SB008												C003-SB009									C003-SB009		
	RST 3 Sample No.	C003-SB007-3648-01			C003-SB008-0012-01			C003-SB008-1224-01			C003-SB008-2436-01			C003-SB008-3648-01			C003-SB009-0012-01			C003-SB009-1224-01			C003-SB009-2436-01			C003-SB009-3648-01		
	Sample Depth (inches)	36-48			0-12			12-24			24-36			36-48			0-12			12-24			24-36			36-48		
	Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
	Sample Date	4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																											
Bismuth-212 (Bi-212)	6,440,000	0.77		0.18	0.31		0.14	0.75		0.14	2.729	J	3.165	0.966	J	1.2	0.31		0.17	0.66		0.17	0.548	U	0.723	7.565		2.698
Bismuth-214 (Bi-214)	1,310,000	0.73		0.09	ND			9.46		1.04	NA			NA			0.66		0.08	1.46		0.16	NA			NA		
Cesium-137 (Cs-137)	11.20	ND			0		0.01	ND			NA			NA			ND			ND			NA			NA		
[2]Lead-210 (Pb-210)	418	0.45		0.15	0.45		0.17	12		1.43	49.489		9.419	3.546		1.996	0.55	J	0.2	1.45	J	0.22	2.2	U	3.849	4.188	J	5.628
Lead-212 (Pb-212)	657,000	0.69		0.08	0.44		0.05	0.68		0.08	1.094		0.295	1.099		0.218	0.38		0.04	0.53		0.06	1.021		0.272	3.887		0.691
Lead-214 (Pb-214)	7,330,000	0.88		0.1	0.49		0.06	10.8		1.19	ND			ND			0.79		0.09	1.66		0.19	ND			ND		
Potassium-40 (K-40)	26.7	9		1.01	9.27		1.05	12.4		1.38	11.298		3.279	9.025		2.048	9.17		1.04	12		1.34	10.563		2.656	15.827		3.739
Radium-226* (Ra-226)	2.52	1.3		0.23	0.71		0.21	**12.2**		1.41	**39.184**		4.354	1.238		0.29	1.04		0.26	2.15		0.29	**3.014**		0.514	**6.583**		1.07
Radium-228 (Ra-228)	16.2	0.68		0.08	0.44		0.06	0.66		0.08	2.117		0.908	1.385		0.331	0.4		0.06	0.57		0.08	1.078		0.399	4.622		0.924
Thallium-208 (Tl-208)	3,400,000	0.21		0.03	0.12		0.02	0.21		0.03	0.234	J	0.276	0.398		0.116	0.1		0.02	0.17		0.02	0.459		0.161	1.614		0.331
Thorium-227 (Th-227)	NS	ND			0.18	J	0.09	0.23	J	0.08	NA			NA			0.07	J	0.05	ND			NA			NA		
Thorium-228 (Th-228)	13,300	0.76	J	0.12	0.36		0.1	0.68	J	0.12	1.06	J	0.373	0.944	J	0.439	0.38		0.08	0.46		0.09	0.849	J	0.422	3.23	J	0.875
Thorium-230 (Th-230)	2,060	0.6	J	0.1	0.56		0.13	3.64	J	0.44	12.8	J	2.32	1.11	J	0.465	0.55	J	0.11	0.95	J	0.14	1.19	J	0.444	2.6	J	0.745
Thorium-232 Th-232)	5	0.7	J	0.11	0.34		0.09	0.58	J	0.11	0.95	J	0.338	0.903	J	0.412	0.32		0.07	0.5		0.09	0.686	J	0.328	2.62	J	0.748
Thorium-234 Th-234)	47,500	0.61		0.19	0.3		0.16	ND			1.978	U	4.062	1.253	J	1.293	0.18	J	0.2	0.41		0.17	1.253	U	2.658	4.806	J	1.937
Uranium-233/234 (U-233/234)	3,260	NA			NA			NA			0.691	J	0.243	0.711	J	0.216	NA			NA			0.818	J	0.296	2.55	J	0.567
Uranium-235/236 (U-235/236)	37.7	NA			NA			NA			0.045	J	0.081	0.083	J	0.074	NA			NA			0	J	0.102	0.147	J	0.115
Uranium-234 (U-234)	3,260	0.56		0.11	0.48		0.11	0.54		0.10	NA			NA			0.37	J	0.09	0.46	J	0.08	NA			NA		
Uranium-235 (U-235)	37.7	0.03		0.03	0.04		0.03	0.02	J	0.02	2.837	R	0.496	0.198	R	0.131	0.02	J	0.02	0.02	J	0.02	0.233	R	0.17	0.635	R	0.233
Uranium-238 (U-238)	158	0.54		0.11	0.41		0.1	0.48	J	0.09	0.781	J	0.261	0.821	J	0.237	0.37	J	0.08	0.54	J	0.09	0.366	J	0.186	2.77	J	0.602

	Location No.	C003-SB010																								C003-SB011		
	RST 3 Sample No.	C003-SB010-0012-01			C003-SB010-1224-01			C003-SB010-2436-01			C003-SB010-3648-01			C003-SB010-4860-01			C003-SB010-6072-01			C003-SB010-7284-01			C003-SB010-8496-01			C003-SB011-0012-01		
	Sample Depth (inches)	0-12			12-24			24-36			36-48			48-60			60-72			72-84			84-96			0-12		
	Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
	Sample Date	4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/5/2016			4/6/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																											
Bismuth-212 (Bi-212)	6,440,000	0.57		0.11	1.09		0.26	8.627		10.22	0	U	8.86	1.186	U	7.386	1.89		0.3	3.48		0.49	1.17		0.16	0.99		0.21
Bismuth-214 (Bi-214)	1,310,000	0.36		0.04	26.5		2.9	NA			NA			NA			5.03		0.55	3.21		0.36	0.98		0.11	0.58		0.07
Cesium-137 (Cs-137)	11.20	0.01	J	0.01	0.07		0.02	NA			NA			NA			ND			ND			ND			ND		
[2]Lead-210 (Pb-210)	418	1.48	J	0.23	32.7	J	3.81	184.76		91.79	**810.09**		128.76	230.53		124.28	4.27	J	0.51	2.84	J	0.37	0.63	J	0.13	0.58	J	0.19
Lead-212 (Pb-212)	657,000	0.52		0.06	0.85		0.1	2.352		0.893	0.058	U	3.064	0	U	0.507	1.6		0.18	3.42		0.38	1.16		0.13	1.03		0.12
Lead-214 (Pb-214)	7,330,000	0.43		0.05	30		3.29	ND			ND		19.15	ND			5.85		0.64	3.81		0.42	1.13		0.13	0.68		0.08
Potassium-40 (K-40)	26.7	9.23		1.03	13.1		1.48	21.543		6.301	10.296	J	19.15	18.202		5.706	11.3		1.27	9.59		1.09	13.4		1.49	20.8		2.31
Radium-226* (Ra-226)	2.52	0.7		0.13	**35.2**		3.92	**255.39**		33.81	**926.1**		122.85	**195.8**		26.002	**7.41**		0.88	**5.16**		0.68	2.28		0.31	1.13		0.25
Radium-228 (Ra-228)	16.2	0.55		0.06	0.87		0.12	2.669		2.317	3.296	U	3.311	0	UJ	1.422	1.61		0.18	3.28		0.36	1.16		0.13	0.98		0.12
Thallium-208 (Tl-208)	3,400,000	0.17		0.02	0.26		0.03	0	U	0.338	2.386		2.326	0	U	0.257	0.49		0.06	0.99		0.11	0.36		0.04	0.3		0.04
Thorium-227 (Th-227)	NS	0.08	J	0.04	0.70	J	0.15	NA			NA			NA			0.25	J	0.07	0.26	J	0.09	0.13	J	0.06	0.15		0.09
Thorium-228 (Th-228)	13,300	0.46		0.08	0.86		0.13	1.45	J	0.653	1.91	J	1.03	1.17	J	0.476	1.79		0.21	2.35		0.32	1.06		0.16	1.04		0.21
Thorium-230 (Th-230)	2,060	0.44	J	0.08	15	J	1.52	128	J	21	546	J	88.2	116	J	18.9	4.46	J	0.46	3.98	J	0.5	1.13	J	0.16	0.79		0.18
Thorium-232 Th-232)	5	0.54		0.09	0.91		0.14	1.72	J	0.658	2.93	J	1.27	0.949	J	0.411	1.67		0.2	2.38		0.32	1.22		0.17	0.85		0.19
Thorium-234 Th-234)	47,500	0.46		0.13	0.78		0.43	21.573	J	12.072	3.823	U	33.453	0	U	11.725	0.9		0.22	1.79		0.39	1.28		0.18	0.73		0.21
Uranium-233/234 (U-233/234)	3,260	NA			NA			1.21	J	0.368	1.76	J	0.461	0.98	J	0.328	NA			NA			NA			NA		
Uranium-235/236 (U-235/236)	37.7	NA			NA			0.148	J	0.132	0.119	J	0.109	0.139	J	0.124	NA			NA			NA			NA		
Uranium-234 (U-234)	3,260	0.39	J	0.07	0.63	J	0.1	NA			NA			NA			1.34	J	0.17	1.74	J	0.2	1.41	J	0.18	0.84		0.14
Uranium-235 (U-235)	37.7	0.01	J	0.02	0.04		0.02	18.785	R	2.784	62.472	R	8.882	4.484	R	0.957	0.07		0.03	0.08		0.03	0.08		0.04	0.02	J	0.02
Uranium-238 (U-238)	158	0.49	J	0.08	0.72	J	0.11	1.46	J	0.413	1.31	J	0.377	1.13	J	0.358	1.35	J	0.17	1.85	J	0.22	1.44	J	0.18	0.81		0.14

Notes:

RST 3 - Removal Support Team 3.

No. - Number; U - Not detected; J - An estimated result; R - A rejected result.

pCi/g - picocuries per gram; NA - Not analyzed; NS - Not specified.

[1]U.S. Environmental Protection Agency (EPA) Site-Specific Action Levels (SSAL) are presented in pCi/g.

Samples analyzed by EPA's National Analytical Radiation Environmental Laboratory (NAREL).

Samples analyzed by RST 3-procured laboratory, Pace Analytical Services (PACE).

Values in red equal or exceed the EPA SSAL for the respective radioisotope.

Radium-226* (21-day ingrowth) analyzed by gamma spectroscopy via EPA 901.1 modified (soil only).

[2]For samples analyzed by PACE, the detection limit for lead-210 by EPA Method 901.1 is not low enough, therefore, a negative result is generated by the laboratory instrument if the sample contains low or no detection of lead-210.

Table 4
Validated Soil Analytical Results Summary Table - Radioisotopes
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

	Location No.	C003-SB011									C003-SB012												C003-SB013					
	RST 3 Sample No.	C003-SB011-1224-01			C003-SB011-2436-01			C003-SB011-3648-01			C003-SB012-0012-01			C003-SB012-1224-01			C003-SB012-2436-01			C003-SB012-3648-01			C003-SB013-0012-01			C003-SB013-1224-01		
	Sample Depth (inches)	12-24			24-36			36-48			0-12			12-24			24-36			36-48			0-12			12-24		
	Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
	Sample Date	4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																											
Bismuth-212 (Bi-212)	6,440,000	1.942	J	1.891	0	U	0.334	0.95		0.17	0.47		0.19	2.026		1.546	5.952		3.718	7.031		6.018	0.61		0.19	0.95		0.18
Bismuth-214 (Bi-214)	1,310,000	NA			NA			0.44		0.05	0.35		0.05	NA			NA			NA			0.43		0.06	1.8		0.2
Cesium-137 (Cs-137)	11.20	NA			NA			ND			ND			NA			NA			NA			ND			ND		
[2]Lead-210 (Pb-210)	418	11.287	J	5.291	0.424	UJ	16.114	0.69	J	0.18	0.43	J	0.13	8.64	J	5.157	205.99		96.837	73.896		17.078	0.44	J	0.22	2.01	J	0.29
Lead-212 (Pb-212)	657,000	0.678		0.221	0.851		0.203	0.84		0.1	0.47		0.06	0.911		0.265	0	U	0.433	0.594	J	0.457	0.5		0.06	0.74		0.08
Lead-214 (Pb-214)	7,330,000	ND			ND			0.51		0.06	0.4		0.06	ND			ND			ND			0.47		0.06	2.05		0.23
Potassium-40 (K-40)	26.7	13.393		2.976	16.599		3.02	14.6		1.62	11.1		1.25	15.026		3.142	14.755		5.406	22.578		5.318	12.6		1.42	12.3		1.36
Radium-226* (Ra-226)	2.52	**5.492**		0.871	1.675		0.286	1		0.19	0.67		0.23	**8.152**		1.19	**132.07**		17.536	**75.935**		10.175	0.85		0.08	**2.79**		0.36
Radium-228 (Ra-228)	16.2	0.599	J	0.668	0.838		0.415	0.88		0.1	0.45		0.07	1.007		0.618	2.206		0.934	1.037	J	1.502	0.54		0.21	0.82		0.1
Thallium-208 (Tl-208)	3,400,000	0.339		0.145	0.334		0.102	0.26		0.03	0.14		0.02	0.505		0.153	0.238	U	0.446	0.323	J	0.397	0.16		0.04	0.22		0.03
Thorium-227 (Th-227)	NS	NA			NA			0.1		0.05	0.13		0.05	NA			NA			NA			0.06		0.04	0.12		0.05
Thorium-228 (Th-228)	13,300	0.867	J	0.436	1.02	J	0.46	0.69		0.11	0.4		0.08	0.721	J	0.376	0.598	J	0.375	0.808	J	0.372	0.51		0.11	0.66		0.11
Thorium-230 (Th-230)	2,060	1.1	J	0.456	0.939	J	0.42	0.44		0.09	0.36		0.08	8.42	J	1.74	84.8	J	14	21	J	3.74	0.53		0.12	1.24		0.18
Thorium-232 Th-232)	5	0.739	J	0.36	0.79	J	0.377	0.7		0.11	0.46		0.08	0.633	J	0.32	1.06	J	0.461	0.712	J	0.332	0.58		0.12	0.5		0.09
Thorium-234 Th-234)	47,500	1.288	U	2.545	0	U	2.257	0.54		0.17	0.51		0.22	0.417	U	3.147	10	U	19.794	0	U	4.993	0.46		0.02	0.55		0.16
Uranium-233/234 (U-233/234)	3,260	0.244	J	0.134	0.361	J	0.163	NA			NA			0.395	J	0.186	0.796	J	0.258	4.38	J	0.885	NA			NA		
Uranium-235/236 (U-235/236)	37.7	0.044	J	0.079	-0.005	UJ	0.074	NA			NA			0.035	J	0.09	0.038	J	0.077	0.253	J	0.158	NA			NA		
Uranium-234 (U-234)	3,260	NA			NA			0.48		0.11	0.37		0.07	NA			NA			NA			0.41		0.09	0.35		0.09
Uranium-235 (U-235)	37.7	0.468	R	0.177	0.072	R	0.13	0.03		0.03	ND			0.919	R	0.289	9.273	R	1.471	5.507	R	1.046	0.03	J	0.03	0.02	J	0.02
Uranium-238 (U-238)	158	0.383	J	0.169	0.572	J	0.209	0.49		0.11	0.34		0.07	0.374	J	0.183	0.671	J	0.233	3.07	J	0.67	0.41		0.09	0.44		0.1

	Location No.	C003-SB013									C003-SB014												C003-SB015					
	RST 3 Sample No.	C003-SB013-2436-01			C003-SB013-2436-02			C003-SB013-3648-01			C003-SB014-0012-01			C003-SB014-1224-01			C003-SB014-2436-01			C003-SB014-3648-01			C003-SB015-0012-01			C003-SB015-1224-01		
	Sample Depth (inches)	24-36			24-36			36-48			0-12			12-24			24-36			36-48			0-12			12-24		
	Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
	Sample Date	4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																											
Bismuth-212 (Bi-212)	6,440,000	0.721	J	1.23	0	U	0.63	1.112	U	5.339	0.59		0.14	0.767	U	1.893	2.847	J	4.251	2.324		1.242	1.04		0.18	1.128	J	1.327
Bismuth-214 (Bi-214)	1,310,000	NA			NA			NA			0.58		0.07	NA			NA			NA			0.87		0.1	NA		
Cesium-137 (Cs-137)	11.20	NA			NA			NA			0.01	J	0.01	NA			NA			NA			0.07		0.01	NA		
[2]Lead-210 (Pb-210)	418	2.784	UJ	15.717	3.54	J	3.307	129.86		65.094	0.59	J	0.19	10.944	J	3.618	123.07		66.319	6.835	J	4.362	1.38	J	0.28	-2.152	UJ	17.964
Lead-212 (Pb-212)	657,000	0.493		0.151	0.558		0.165	0	U	0.473	0.55		0.06	0.612		0.189	0.994		0.502	0.916		0.233	0.86		0.1	0.836		0.2
Lead-214 (Pb-214)	7,330,000	ND			ND			ND			0.66		0.08	ND			ND			ND			1.05		0.12	ND		
Potassium-40 (K-40)	26.7	12.381		2.328	12.774		2.594	16.945		4.821	11.5		1.29	13.807		2.847	18.577		4.684	12.645		3.034	13.5		1.51	14.352		2.514
Radium-226* (Ra-226)	2.52	**3.49**		0.53	**3.611**		0.566	**110.8**		14.723	1.02		0.2	**5.061**		0.746	**93.089**		12.376	**5.636**		0.838	1.79		0.29	**2.918**		0.537
Radium-228 (Ra-228)	16.2	0.757		0.261	0.915		0.35	0	UJ	0.856	0.56		0.07	0.595	J	0.426	1.943		1.157	1.232		0.452	0.86		0.11	1.075		0.325
Thallium-208 (Tl-208)	3,400,000	0.285		0.1	0.248		0.081	0	U	0.271	0.17		0.02	0.136	J	0.169	0	U	0.185	0.382		0.145	0.26		0.03	0.371		0.113
Thorium-227 (Th-227)	NS	NA			NA			NA			0.08		0.05	NA			NA			NA			0.12		0.06	NA		
Thorium-228 (Th-228)	13,300	0.545	J	0.314	1.06	J	0.451	0.69	J	0.382	0.47		0.09	0.425	J	0.304	0.941		0.383	0.656	J	0.287	0.92		0.14	1.08		0.419
Thorium-230 (Th-230)	2,060	1.74	J	0.561	2.02	J	0.63	34.5		5.95	0.65		0.12	5.21		1.21	33.2		5.63	2.28		0.598	0.78		0.13	0.424		0.24
Thorium-232 Th-232)	5	0.515	J	0.276	0.485	J	0.275	0.966		0.424	0.47		0.09	0.501		0.284	0.904		0.355	0.491		0.234	0.84		0.14	0.721		0.316
Thorium-234 Th-234)	47,500	1.066	U	3.291	0.391	U	1.965	3.979	U	5.134	0.37		0.15	1.664	J	2.037	6.556	U	15.461	1.802	J	1.707	0.79		0.27	1.393	U	1.458
Uranium-233/234 (U-233/234)	3,260	0.439	J	0.179	0.455	J	0.2	0.907		0.285	NA			0.398		0.195	0.966		0.286	0.718		0.23	NA			0.446		0.178
Uranium-235/236 (U-235/236)	37.7	0.082	J	0.081	0.057	J	0.093	0.022	U	0.08	NA			0	U	0.101	0.067	J	0.077	0.13		0.1	NA			0.034	U	0.07
Uranium-234 (U-234)	3,260	NA			NA			NA			0.4		0.09	NA			NA			NA			0.53		0.11	NA		
Uranium-235 (U-235)	37.7	0.396	R	0.155	0.357	R	0.142	8.314	R	1.442	0.04		0.03	0.448	R	0.178	6.585	R	1.088	0.414	R	0.159	0.03	J	0.03	0.356	R	0.159
Uranium-238 (U-238)	158	0.46	J	0.181	0.332	J	0.169	0.634		0.23	0.44		0.09	0.381		0.189	1.01		0.294	0.57		0.2	0.6		0.11	0.543		0.197

Notes:

RST 3 - Removal Support Team 3.

No. - Number; U - Not detected; J - An estimated result; R - A rejected result.

pCi/g - picocuries per gram; NA - Not analyzed; NS - Not specified.

[1]U.S. Environmental Protection Agency (EPA) Site-Specific Action Levels (SSAL) are presented in pCi/g.

Samples analyzed by EPA's National Analytical Radiation Environmental Laboratory (NAREL).

Samples analyzed by RST 3-procured laboratory, Pace Analytical Services (PACE).

Values in red equal or exceed the EPA SSAL for the respective radioisotope.

Radium-226* (21-day ingrowth) analyzed by gamma spectroscopy via EPA 901.1 modified (soil only).

[2]For samples analyzed by PACE, the detection limit for lead-210 by EPA Method 901.1 is not low enough, therefore, a negative result is generated by the laboratory instrument if the sample contains low or no detection of lead-210.

Table 4
Validated Soil Analytical Results Summary Table - Radioisotopes
Canadian Radium and Uranium Corp. Site
Mount Kisco, New York
April 2016

	Location No.	C003-SB015						C003-SB016												[3]C004-SB001								
	RST 3 Sample No.	C003-SB015-2436-01			C003-SB015-3648-01			C003-SB016-0012-01			C003-SB016-1224-01			C003-SB016-2436-01			C003-SB016-3648-01			C004-SB001-0012-01			C004-SB001-1224-01			C004-SB001-2436-01		
	Sample Depth (inches)	24-36			36-48			0-12			12-24			24-36			36-48			0-12			12-24			24-36		
	Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
	Sample Date	4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/6/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																											
Bismuth-212 (Bi-212)	6,440,000	1.03		0.14	0.046	U	3.005	0.97		0.19	1.332		0.999	1.52		1.18	0.99		0.14	1.749		0.998	1.441	J	1.604	0.116	U	1.488
Bismuth-214 (Bi-214)	1,310,000	0.55		0.06	NA			0.39		0.05	NA			NA			0.54		0.06	NA			NA			NA		
Cesium-137 (Cs-137)	11.20	0.01		0	NA			ND			NA			NA			ND			NA			NA			NA		
[2]Lead-210 (Pb-210)	418	0.56	J	0.16	12.479	J	5.911	0.62	J	0.18	-0.708	UJ	14.296	0.306	UJ	2.68	0.55	J	0.17	8.123	UJ	15.244	2.429	J	2.535	-1.201	U	15.893
Lead-212 (Pb-212)	657,000	0.88		0.1	0.98		0.279	0.77		0.09	0.86		0.201	0.893		0.218	0.9		0.1	0.864		0.21	0.873		0.223	0.73		0.18
Lead-214 (Pb-214)	7,330,000	0.65		0.07	ND			0.48		0.06	ND			ND			0.62		0.07	ND			ND			ND		
Potassium-40 (K-40)	26.7	12.9		1.42	14.738		3.346	16.9		1.88	11.902		2.794	14.109		2.98	13		1.44	14.147		2.631	13.325		3.325	13.714		2.451
Radium-226* (Ra-226)	2.52	1.16		0.18	**11.757**		1.683	0.87		0.22	1.057		0.261	0.821		0.235	1.11		0.18	1.705		0.325	**3.634**		0.579	**2.965**		0.447
Radium-228 (Ra-228)	16.2	0.9		0.1	0.046	UJ	0.993	0.8		0.1	1.244		0.318	1.267		0.373	0.94		0.11	1.282		0.342	1.122		0.437	1.096		0.33
Thallium-208 (Tl-208)	3,400,000	0.28		0.03	0.506		0.162	0.22		0.03	0.36		0.114	0.329		0.104	0.29		0.03	0.305		0.086	0.336		0.116	0.284		0.087
Thorium-227 (Th-227)	NS	0.09		0.05	NA			0.11		0.06	NA			NA			0.12		0.06	NA			NA			NA		
Thorium-228 (Th-228)	13,300	0.81		0.13	0.758	J	0.327	0.67		0.12	1.35		0.516	0.885		0.362	0.81		0.13	0.798	J	0.356	1.09		0.392	1.23		0.39
Thorium-230 (Th-230)	2,060	0.54		0.1	1.33		0.432	0.49		0.1	0.408		0.255	0.158	J	0.141	0.7		0.12	0.324		0.213	1.02		0.349	0.657		0.261
Thorium-232 Th-232)	5	0.85		0.13	0.603		0.27	0.6		0.11	1.16		0.445	0.567		0.267	0.86		0.14	0.528		0.273	1.06		0.358	0.773		0.286
Thorium-234 Th-234)	47,500	0.6		0.16	0	U	2.248	0.69		0.27	1.205	U	2.002	0.18	U	1.782	0.61		0.17	1.193	U	3.356	0.105	U	2.222	3.298	J	3.371
Uranium-233/234 (U-233/234)	3,260	NA			0.61		0.216	NA			0.439		0.178	0.317		0.146	NA			0.453		0.185	0.762		0.244	0.649		0.229
Uranium-235/236 (U-235/236)	37.7	NA			0.077	J	0.081	NA			0.096	J	0.09	0.034	U	0.069	NA			0.021	U	0.076	0.102		0.09	0.038	U	0.079
Uranium-234 (U-234)	3,260	0.52		0.1	NA			0.49		0.1	NA			NA			0.59		0.13	NA			NA			NA		
Uranium-235 (U-235)	37.7	0.03	J	0.03	0.975	R	0.291	ND			0.193	R	0.167	0.002	R	0.123	ND			0.168	R	0.169	0.363	R	0.178	0.264	R	0.159
Uranium-238 (U-238)	158	0.46		0.1	0.462		0.186	0.48		0.1	0.421		0.174	0.379		0.159	0.51		0.12	0.452		0.182	0.51		0.192	0.66		0.232

	Location No.	[3]C004-SB001												Rinsate Blank					
	RST 3 Sample No.	C004-SB001-3648-01			C004-SB001-3648-02			C004-SB001-7284-01			C004-SB001-8496-01			RB-040516			RB-040616		
	Sample Depth (inches)	36-48			36-48			72-84			84-96			NA			NA		
	Sample Matrix	Soil			Soil			Soil			Soil			Aqueous			Aqueous		
	Sample Date	4/6/2016			4/6/2016			4/6/2016			4/6/2016			4/5/2016			4/6/2016		
	Sample Result	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/g)	Qualifier	Total Uncertainty	Value (pCi/L)	Qualifier	Total Uncertainty	Value (pCi/L)	Qualifier	Total Uncertainty
Radioisotope	**[1]EPA SSAL**																		
Bismuth-212 (Bi-212)	6,440,000	2.023		0.915	0.948	J	0.612	2.043		1.695	0.901	U	1.053	NA			NA		
Bismuth-214 (Bi-214)	1,310,000	NA			NA			NA			NA			NA			NA		
Cesium-137 (Cs-137)	11.2	NA			NA			NA			NA			NA			NA		
[2]Lead-210 (Pb-210)	418	0	U	1.806	-4.986	U	14.443	1.29	U	2.575	2.426	U	27.587	NA			NA		
Lead-212 (Pb-212)	657,000	1.264		0.268	1.049		0.214	0.894		0.213	0.954		0.252	NA			NA		
Lead-214 (Pb-214)	7,330,000	ND			ND			ND			ND			NA			NA		
Potassium-40 (K-40)	26.7	15.916		3.205	17.198		2.98	12.418		2.693	15.751		3.172	NA			NA		
Radium-226* (Ra-226)	2.52	0.895		0.244	0.712		0.188	0.611		0.185	**11.042**		1.546	NA			NA		
Radium-228 (Ra-228)	16.2	1.627		0.419	1.166		0.349	1.053		0.321	1.367		0.425	NA			NA		
Thallium-208 (Tl-208)	3,400,000	0.469		0.135	0.37		0.102	0.37		0.119	0.167	J	0.174	NA			NA		
Thorium-227 (Th-227)	NS	NA			NA			NA			NA			NA			NA		
Thorium-228 (Th-228)	13,300	0.896		0.361	0.875		0.342	0.682	J	0.306	1.1		0.379	0.101	J	0.091	0.186		0.104
Thorium-230 (Th-230)	2,060	0.267		0.185	0.471		0.222	0.48		0.238	2.9		0.69	0.043	J	0.039	0.031	J	0.041
Thorium-232 Th-232)	5.11	0.561		0.268	0.726		0.282	0.762		0.309	0.493		0.225	0	J	0.038	0.019	J	0.041
Thorium-234 Th-234)	47,500	0.949	U	1.599	0	U	1.98	0	U	1.143	0	U	3.981	NA			NA		
Uranium-233/234 (U-233/234)	3,260	0.409		0.172	0.382		0.157	0.394		0.175	0.443		0.175	0.059	U	0.087	0.078	J	0.086
Uranium-235/236 (U-235/236)	37.7	0.079	J	0.082	0.01	J	0.066	0.048	U	0.078	0	U	0.069	0.047	U	0.101	0.017	U	0.091
Uranium-234 (U-234)	3,260	NA			NA			NA			NA			NA			NA		
Uranium-235 (U-235)	37.7	0.069	R	0.126	0.132	R	0.137	0.119	R	0.155	0.773	R	0.261	NA			NA		
Uranium-238 (U-238)	158	0.47		0.185	0.459		0.173	0.245		0.131	0.472		0.182	0.046	UJ	0.088	0.015	UJ	0.07
Radium-226** (Ra-226)	NS	NA			NA			NA			NA			0.992		0.717	0.161	U	0.35
Radium-228*** (Ra-228)	NS													0.725	J	0.409	0.454	J	0.406

Notes:

RST 3 - Removal Support Team 3.

No. - Number; U - Not detected; J - An estimated result; R - A rejected result.

pCi/g - picocuries per gram; µg/L - micrograms per liter; NA - Not analyzed; NS - Not specified.

[1]U.S. Environmental Protection Agency (EPA) Site-Specific Action Levels (SSAL) are presented in pCi/g.

Samples analyzed by EPA's National Analytical Radiation Environmental Laboratory (NAREL).

Samples analyzed by RST 3-procured laboratory, Pace Analytical Services (PACE).

Values in red equal or exceed the EPA SSAL for the respective radioisotope.

Radium-226* (21-day ingrowth) analyzed by gamma spectroscopy via EPA 901.1 modified (soil only).

Radium-226** analyzed via EPA Method 903.1 (aqueous only).

Radium-228*** - analyzed via EPA Method 904.0 (aqueous only).

[2]For samples analyzed by PACE, the detection limit for lead-210 by EPA Method 901.1 is not low enough, therefore, a negative result is generated by the laboratory instrument if the sample contains low or no detection of lead-210.

[3]Background samples were collected from Property C005; however, RST 3 inadvertently reported the sample numbers for this property with a lead C004 instead of C005.

ATTACHMENT C

Chain of Custody Record and FedEx Airbills

USEPA
DateShipped: 4/7/2016
CarrierName: FedEx
AirbillNo: 8037-9662-5485

CHAIN OF CUSTODY RECORD
Case #: 373
Contact Name: Bernard Nwosu
Contact Phone: 908-565-2980

No: 2-040716-155816-0006
Lab: PACE Analytical Services
Lab Contact: Justin Hensley
Lab Phone: 724-850-5600

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container	Analytical_Method
	C002-SB001-1224-01	4/6/2016	13:56	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB001-1224-01	4/6/2016	13:56	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB001-1224-01	4/6/2016	13:56	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C002-SB001-2436-01	4/6/2016	13:56	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB001-2436-01	4/6/2016	13:56	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB001-2436-01	4/6/2016	13:56	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C002-SB001-3648-01	4/6/2016	13:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB001-3648-01	4/6/2016	13:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB001-3648-01	4/6/2016	13:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C002-SB002-4860-01	4/6/2016	14:32	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB002-4860-01	4/6/2016	14:32	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB002-4860-01	4/6/2016	14:32	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C002-SB002-6072-01	4/6/2016	14:33	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB002-6072-01	4/6/2016	14:33	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB002-6072-01	4/6/2016	14:33	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C002-SB003-2436-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB003-2436-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB003-2436-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C002-SB003-3648-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3	04/07/16			

USEPA
DateShipped: 4/7/2016
CarrierName: FedEx
AirbillNo: 8037-9662-5485

CHAIN OF CUSTODY RECORD
Case #: 373
Contact Name: Bernard Nwosu
Contact Phone: 908-565-2980

No: 2-040716-155816-0006
Lab: PACE Analytical Services
Lab Contact: Justin Hensley
Lab Phone: 724-850-5600

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container	Analytical_Method
	C002-SB003-3648-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C002-SB003-3648-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB001-1224-01	4/5/2016	12:19	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB001-1224-01	4/5/2016	12:19	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB001-1224-01	4/5/2016	12:19	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB001-2436-01	4/5/2016	12:20	Isotopic Thorium	Soil	4 C	Y	2	8 oz glass jar	HASL-300 A-01-R
	C003-SB001-2436-01	4/5/2016	12:20	Isotopic Uranium	Soil	4 C	Y	2	8 oz glass jar	HASL-300 A-01-R
	C003-SB001-2436-01	4/5/2016	12:20	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB002-2436-01	4/5/2016	11:05	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB002-2436-01	4/5/2016	11:05	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB002-2436-01	4/5/2016	11:05	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB002-3648-01	4/5/2016	11:05	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB002-3648-01	4/5/2016	11:05	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB002-3648-01	4/5/2016	11:05	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB003-2436-01	4/5/2016	13:21	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB003-2436-01	4/5/2016	13:21	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB003-2436-01	4/5/2016	13:21	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB003-3648-01	4/5/2016	13:21	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB003-3648-01	4/5/2016	13:21	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3	04/01/16			

USEPA
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CarrierName: FedEx
AirbillNo: 8037-9662-5485

CHAIN OF CUSTODY RECORD
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Contact Name: Bernard Nwosu
Contact Phone: 908-565-2980

No: 2-040716-155816-0006
Lab: PACE Analytical Services
Lab Contact: Justin Hensley
Lab Phone: 724-850-5600

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container	Analytical_Method
	C003-SB003-3648-01	4/5/2016	13:21	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB004-2436-01	4/5/2016	13:49	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB004-2436-01	4/5/2016	13:49	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB004-2436-01	4/5/2016	13:49	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB004-3648-01	4/5/2016	13:49	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB004-3648-01	4/5/2016	13:49	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB004-3648-01	4/5/2016	13:49	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB005-1224-01	4/5/2016	14:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB005-1224-01	4/5/2016	14:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB005-1224-01	4/5/2016	14:23	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB005-2436-01	4/5/2016	14:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB005-2436-01	4/5/2016	14:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB005-2436-01	4/5/2016	14:23	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB005-3648-01	4/5/2016	14:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB005-3648-01	4/5/2016	14:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB005-3648-01	4/5/2016	14:23	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB006-1224-01	4/5/2016	14:50	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB006-1224-01	4/5/2016	14:50	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB006-1224-01	4/5/2016	14:50	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3	04/07/16			

USEPA
DateShipped: 4/7/2016
CarrierName: FedEx
AirbillNo: 8037-9662-5485

CHAIN OF CUSTODY RECORD
Case #: 373
Contact Name: Bernard Nwosu
Contact Phone: 908-565-2980

No: 2-040716-155816-0006
Lab: PACE Analytical Services
Lab Contact: Justin Hensley
Lab Phone: 724-850-5600

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container	Analytical_Method
	C003-SB006-2436-01	4/5/2016	14:50	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB006-2436-01	4/5/2016	14:50	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB006-2436-01	4/5/2016	14:50	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB007-1224-01	4/5/2016	16:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB007-1224-01	4/5/2016	16:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB007-1224-01	4/5/2016	16:23	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB007-2436-01	4/5/2016	16:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB007-2436-01	4/5/2016	16:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB007-2436-01	4/5/2016	16:23	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB007-2436-02	4/5/2016	16:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB007-2436-02	4/5/2016	16:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB007-2436-02	4/5/2016	16:23	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB008-2436-01	4/5/2016	17:00	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB008-2436-01	4/5/2016	17:00	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB008-2436-01	4/5/2016	17:00	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB008-3648-01	4/5/2016	17:00	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB008-3648-01	4/5/2016	17:00	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB008-3648-01	4/5/2016	17:00	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB009-2436-01	4/5/2016	18:03	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

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CHAIN OF CUSTODY #

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	Bernard Nwosu RST3	04/07/16			

USEPA
DateShipped: 4/7/2016
CarrierName: FedEx
AirbillNo: 8037-9662-5485

CHAIN OF CUSTODY RECORD
Case #: 373
Contact Name: Bernard Nwosu
Contact Phone: 908-565-2980

No: 2-040716-155816-0006
Lab: PACE Analytical Services
Lab Contact: Justin Hensley
Lab Phone: 724-850-5600

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container	Analytical_Method
	C003-SB009-2436-01	4/5/2016	18:03	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB009-2436-01	4/5/2016	18:03	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB009-3648-01	4/5/2016	18:03	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB009-3648-01	4/5/2016	18:03	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB009-3648-01	4/5/2016	18:03	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB010-2436-01	4/5/2016	15:52	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB010-2436-01	4/5/2016	15:52	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB010-2436-01	4/5/2016	15:52	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB010-3648-01	4/5/2016	15:52	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB010-3648-01	4/5/2016	15:52	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB010-3648-01	4/5/2016	15:52	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB010-4860-01	4/5/2016	15:52	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB010-4860-01	4/5/2016	15:52	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB010-4860-01	4/5/2016	15:52	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB011-1224-01	4/6/2016	11:13	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB011-1224-01	4/6/2016	11:13	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB011-1224-01	4/6/2016	11:13	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB011-2436-01	4/6/2016	11:13	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB011-2436-01	4/6/2016	11:13	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

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CHAIN OF CUSTODY #

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	Bernard Nwosu RST3	04/07/16			

USEPA
DateShipped: 4/7/2016
CarrierName: FedEx
AirbillNo: 8037-9662-5485

CHAIN OF CUSTODY RECORD
Case #: 373
Contact Name: Bernard Nwosu
Contact Phone: 908-565-2980

No: 2-040716-155816-0006
Lab: PACE Analytical Services
Lab Contact: Justin Hensley
Lab Phone: 724-850-5600

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container	Analytical_Method
	C003-SB011-2436-01	4/6/2016	11:13	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB012-1224-01	4/6/2016	11:35	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB012-1224-01	4/6/2016	11:35	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB012-1224-01	4/6/2016	11:35	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB012-2436-01	4/6/2016	11:35	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB012-2436-01	4/6/2016	11:35	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB012-2436-01	4/6/2016	11:35	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB012-3648-01	4/6/2016	11:35	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB012-3648-01	4/6/2016	11:35	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB012-3648-01	4/6/2016	11:35	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB013-2436-01	4/6/2016	12:01	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB013-2436-01	4/6/2016	12:01	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB013-2436-01	4/6/2016	12:01	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB013-2436-02	4/6/2016	12:01	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB013-2436-02	4/6/2016	12:01	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB013-2436-02	4/6/2016	12:01	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB013-3648-01	4/6/2016	12:01	Isotopic Thorium	Soil	4 C	Y	2	8 oz glass jar	HASL-300 A-01-R
	C003-SB013-3648-01	4/6/2016	12:01	Isotopic Uranium	Soil	4 C	Y	2	8 oz glass jar	HASL-300 A-01-R
	C003-SB013-3648-01	4/6/2016	12:01	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (In-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

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CHAIN OF CUSTODY #

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	[signature] RST 3	04/07/16			

USEPA
DateShipped: 4/7/2016
CarrierName: FedEx
AirbillNo: 8037-9662-5485

CHAIN OF CUSTODY RECORD
Case #: 373
Contact Name: Bernard Nwosu
Contact Phone: 908-565-2980

No: 2-040716-155816-0006
Lab: PACE Analytical Services
Lab Contact: Justin Hensley
Lab Phone: 724-850-5600

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container	Analytical_Method
	C003-SB014-1224-01	4/6/2016	12:28	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB014-1224-01	4/6/2016	12:28	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB014-1224-01	4/6/2016	12:28	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB014-2436-01	4/6/2016	12:28	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB014-2436-01	4/6/2016	12:28	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB014-2436-01	4/6/2016	12:28	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB014-3648-01	4/6/2016	12:28	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB014-3648-01	4/6/2016	12:28	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB014-3648-01	4/6/2016	12:28	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB015-1224-01	4/6/2016	10:43	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB015-1224-01	4/6/2016	10:43	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB015-1224-01	4/6/2016	10:43	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB015-3648-01	4/6/2016	10:44	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB015-3648-01	4/6/2016	10:44	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB015-3648-01	4/6/2016	10:44	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB016-1224-01	4/6/2016	08:36	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB016-1224-01	4/6/2016	08:36	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB016-1224-01	4/6/2016	08:36	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C003-SB016-2436-01	4/6/2016	08:36	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

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CHAIN OF CUSTODY #

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	Bernard Nwosu RST3	04/07/16			

USEPA
DateShipped: 4/7/2016
CarrierName: FedEx
AirbillNo: 8037-9662-5485

CHAIN OF CUSTODY RECORD
Case #: 373
Contact Name: Bernard Nwosu
Contact Phone: 908-565-2980

No: 2-040716-155816-0006
Lab: PACE Analytical Services
Lab Contact: Justin Hensley
Lab Phone: 724-850-5600

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container	Analytical_Method
	C003-SB016-2436-01	4/6/2016	08:36	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C003-SB016-2436-01	4/6/2016	08:36	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C004-SB001-0012-01	4/6/2016	09:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-0012-01	4/6/2016	09:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-0012-01	4/6/2016	09:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C004-SB001-1224-01	4/6/2016	09:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-1224-01	4/6/2016	09:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-1224-01	4/6/2016	09:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C004-SB001-2436-01	4/6/2016	09:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-2436-01	4/6/2016	09:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-2436-01	4/6/2016	09:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C004-SB001-3648-01	4/6/2016	09:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jarh	HASL-300 A-01-R
	C004-SB001-3648-01	4/6/2016	09:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-3648-01	4/6/2016	09:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C004-SB001-3648-02	4/6/2016	09:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-3648-02	4/6/2016	09:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-3648-02	4/6/2016	09:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C004-SB001-7284-01	4/6/2016	09:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-7284-01	4/6/2016	09:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar	HASL-300 A-01-R

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

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CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3	04/07/16			

USEPA
DateShipped: 4/7/2016
CarrierName: FedEx
AirbillNo: 8037-9662-5485

CHAIN OF CUSTODY RECORD
Case #: 373
Contact Name: Bernard Nwosu
Contact Phone: 908-565-2980

No: 2-040716-155816-0006
Lab: PACE Analytical Services
Lab Contact: Justin Hensley
Lab Phone: 724-850-5600

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container	Analytical_Method
	C004-SB001-7284-01	4/6/2016	09:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	C004-SB001-8496-01	4/6/2016	10:00	Isotopic Thorium	Soil	4 C	Y	2	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-8496-01	4/6/2016	10:00	Isotopic Uranium	Soil	4 C	Y	2	8 oz glass jar	HASL-300 A-01-R
	C004-SB001-8496-01	4/6/2016	10:00	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar	EPA 901.1M
	RB-040516	4/5/2016	11:45	Isotopic Thorium and Uranium	Aqueous	HNO3 pH<2	N	1	1 L poly bottle	HASL-300 A-01-R
	RB-040516	4/5/2016	11:45	Radium-226	Aqueous	HNO3 pH<2	N	1	1 L poly bottle	SW846 9315
	RB-040516	4/5/2016	11:45	Radium-228	Aqueous	HNO3 pH<2	N	1	1 L poly bottle	SW846 9320
	RB-040616	4/5/2016	15:15	Isotopic Thorium and Uranium	Aqueous	HNO3 pH<2	N	1	1 L poly bottle	HASL-300 A-01-R
	RB-040616	4/5/2016	15:15	Radium-226	Aqueous	HNO3 pH<2	N	1	1 L poly bottle	SW846 9315
	RB-040616	4/5/2016	15:15	Radium-228	Aqueous	HNO3 pH<2	N	1	1 L poly bottle	SW846 9320

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3	04/07/16			

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
X	C002-SB001-0012-01	4/6/2016	13:56	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB001-0012-01	4/6/2016	13:56	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB001-0012-01	4/6/2016	13:56	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C002-SB001-4860-01	4/6/2016	13:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB001-4860-01	4/6/2016	13:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB001-4860-01	4/6/2016	13:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C002-SB001-6072-01	4/6/2016	13:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB001-6072-01	4/6/2016	13:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB001-6072-01	4/6/2016	13:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C002-SB001-7284-01	4/6/2016	13:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB001-7284-01	4/6/2016	13:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB001-7284-01	4/6/2016	13:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C002-SB001-8496-01	4/6/2016	13:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB001-8496-01	4/6/2016	13:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB001-8496-01	4/6/2016	13:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C002-SB002-0012-01	4/6/2016	14:31	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB002-0012-01	4/6/2016	14:31	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB002-0012-01	4/6/2016	14:31	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C002-SB002-1224-01	4/6/2016	14:31	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3				

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

	Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
5	X	C002-SB002-1224-01	4/6/2016	14:31	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
5	X	C002-SB002-1224-01	4/6/2016	14:31	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
5	X	C002-SB002-2436-01	4/6/2016	14:32	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
5	X	C002-SB002-2436-01	4/6/2016	14:32	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
5	X	C002-SB002-2436-01	4/6/2016	14:32	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
5	X	C002-SB002-3648-01	4/6/2016	14:32	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
5	X	C002-SB002-3648-01	4/6/2016	14:32	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
5	X	C002-SB002-3648-01	4/6/2016	14:32	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
5	X	C002-SB002-7284-01	4/6/2016	14:33	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
5	X	C002-SB002-7284-01	4/6/2016	14:33	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
5	X	C002-SB002-7284-01	4/6/2016	14:33	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
☆ 5	X	C002-SB002-7284-02	4/6/2016	14:33	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
5	X	C002-SB002-7284-02	4/6/2016	14:33	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
5	X	C002-SB002-7284-02	4/6/2016	14:33	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
4	✓X	C002-SB002-8496-01	4/6/2016	14:33	Isotopic Thorium	Soil	4 C	Y	2	8 oz glass jar
4	✓X	C002-SB002-8496-01	4/6/2016	14:33	Isotopic Uranium	Soil	4 C	Y	2	8 oz glass jar
4	X	C002-SB002-8496-01	4/6/2016	14:33	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
2	X	C002-SB003-0012-01	4/6/2016	13:17	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
2	X	C002-SB003-0012-01	4/6/2016	13:17	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3				

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
X	C002-SB003-0012-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB003-1224-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB003-4860-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB003-6072-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C002-SB003-7284-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB003-7284-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB003-7284-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C002-SB003-8496-01	4/6/2016	13:19	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB003-8496-01	4/6/2016	13:19	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C002-SB003-8496-01	4/6/2016	13:19	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB001-0012-01	4/5/2016	12:19	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3				

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

	Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
1	X	C003-SB001-3648-01	4/5/2016	12:21	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
1	X	C003-SB001-3648-01	4/5/2016	12:21	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB001-3648-01	4/5/2016	12:21	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
1	X	C003-SB001-3648-02	4/5/2016	12:21	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
1	X	C003-SB001-3648-02	4/5/2016	12:21	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB001-3648-02	4/5/2016	12:21	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	X	C003-SB002-0012-01	4/5/2016	11:10	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB002-0012-01	4/5/2016	11:10	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB002-0012-01	4/5/2016	11:10	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	X	C003-SB002-1224-01	4/5/2016	11:05	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
1	X	C003-SB002-1224-01	4/5/2016	11:05	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB002-1224-01	4/5/2016	11:05	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	X	C003-SB003-0012-01	4/5/2016	13:20	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB003-0012-01	4/5/2016	13:20	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB003-0012-01	4/5/2016	13:20	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
2	X	C003-SB003-1224-01	4/5/2016	13:20	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
2	X	C003-SB003-1224-01	4/5/2016	13:20	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
2	X	C003-SB003-1224-01	4/5/2016	13:20	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
2	X	C003-SB004-0012-01	4/5/2016	13:48	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	RST3				

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	C003-SB004-0012-01	4/5/2016	13:48	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-0012-01	4/5/2016	13:48	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB007-0012-01	4/5/2016	16:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB007-0012-01	4/5/2016	16:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB007-0012-01	4/5/2016	16:23	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Isotopic Thorium~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~8 oz glass jar~~
	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Isotopic Uranium~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~8 oz glass jar~~

JS 4/14/16
JS 4/18/16

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3				

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
~~C003-SB007-2496-02~~		~~4/5/2016~~	~~16:23~~	~~Gamma Spec (Modified)~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~16 oz glass jar~~
X	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB007-3648-01	4/5/2016	16:23	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB008-0012-01	4/5/2016	16:58	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB008-0012-01	4/5/2016	16:58	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB008-0012-01	4/5/2016	16:58	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB008-1224-01	4/5/2016	16:59	Isotopic Thorium	Soil	4 C	Y	2	8 oz glass jar
X	C003-SB008-1224-01	4/5/2016	16:59	Isotopic Uranium	Soil	4 C	Y	2	8 oz glass jar
X	C003-SB008-1224-01	4/5/2016	16:59	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB009-0012-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB009-1224-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB010-0012-01	4/5/2016	15:52	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB010-0012-01	4/5/2016	15:52	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB010-0012-01	4/5/2016	15:52	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3				

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
X	C003-SB010-1224-01	4/5/2016	15:52	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB010-1224-01	4/5/2016	15:52	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB010-1224-01	4/5/2016	15:52	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB010-6072-01	4/5/2016	15:52	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB010-6072-01	4/5/2016	15:52	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB010-6072-01	4/5/2016	15:52	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB010-7284-01	4/5/2016	15:52	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB010-7284-01	4/5/2016	15:52	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB010-7284-01	4/5/2016	15:52	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB010-8496-01	4/5/2016	15:52	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB010-8496-01	4/5/2016	15:52	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB010-8496-01	4/5/2016	15:52	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB011-0012-01	4/6/2016	11:13	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB011-0012-01	4/6/2016	11:13	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB011-0012-01	4/6/2016	11:13	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB011-3648-01	4/6/2016	11:13	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB011-3648-01	4/6/2016	11:13	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
X	C003-SB011-3648-01	4/6/2016	11:13	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
X	C003-SB012-0012-01	4/6/2016	11:35	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3				

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

	Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
1	X	C003-SB012-0012-01	4/6/2016	11:35	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
2	X	C003-SB012-0012-01	4/6/2016	11:35	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
2	X	C003-SB013-0012-01	4/6/2016	12:00	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
2	X	C003-SB013-0012-01	4/6/2016	12:00	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
2	X	C003-SB013-0012-01	4/6/2016	12:00	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
2	X	C003-SB013-1224-01	4/6/2016	12:01	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
2	X	C003-SB013-1224-01	4/6/2016	12:01	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
2	X	C003-SB013-1224-01	4/6/2016	12:01	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
2	X	C003-SB014-0012-01	4/6/2016	12:28	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
2	X	C003-SB014-0012-01	4/6/2016	12:28	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
2	X	C003-SB014-0012-01	4/6/2016	12:28	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	X	C003-SB015-0012-01	4/6/2016	10:43	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB015-0012-01	4/6/2016	10:43	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB015-0012-01	4/6/2016	10:43	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	X	C003-SB015-2436-01	4/6/2016	10:43	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB015-2436-01	4/6/2016	10:43	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB015-2436-01	4/6/2016	10:43	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	X	C003-SB016-0012-01	4/6/2016	08:35	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB016-0012-01	4/6/2016	08:35	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3				

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

	Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
3	X	C003-SB016-0012-01	4/6/2016	08:35	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	X	C003-SB016-3648-01	4/6/2016	08:36	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB016-3648-01	4/6/2016	08:36	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	X	C003-SB016-3648-01	4/6/2016	08:36	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3				

FedEx Express **NEW** Package US Airbill

FedEx Tracking Number 8022 3572 1333

Form ID No. 0200

Sender's Copy

1 From *Please print and press hard.*

Date 4-18-2016 Sender's FedEx Account Number

Sender's Name BERNARD NWOSU Phone (908) 565-2980

Company WESTON SOLUTIONS INC

Address 1090 KING GEORGES POST RD Dept./Floor/Suite/Room

City EDISON State NJ ZIP 08837

2 Your Internal Billing Reference First 24 characters will appear on invoice. 30400.021.006.2053

3 To

Recipient's Name TONYA HUDSON Phone (343) 220-3433

Company NANEL LABORATORY

Address 540 SOUTH MORIS AVE Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City MONTGOMERY State AL ZIP 36115

☐ HOLD Weekday — FedEx location address REQUIRED. NOT available for FedEx First Overnight.

☐ HOLD Saturday — FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Easy new Peel-and-Stick airbill. No pouch needed.
Apply airbill directly to your package. See directions on back.

4 Express Package Service * To most locations.
NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs. *For packages over 150 lbs., use the new FedEx Express Freight US Airbill.*

Next Business Day

- ☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☑ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

- ☐ FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
- ☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging * Declared value limit $500.

☐ FedEx Envelope* ☐ FedEx Pak* ☐ FedEx Box ☐ FedEx Tube ☑ Other

6 Special Handling and Delivery Signature Options

☐ SATURDAY Delivery — NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

☐ No Signature Required — Package may be left without obtaining a signature for delivery.

☑ Direct Signature — Someone at recipient's address may sign for delivery. Fee applies.

☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods?

One box must be checked.

☑ No ☐ Yes — As per attached Shipper's Declaration. ☐ Yes — Shipper's Declaration not required. ☐ Dry Ice — Dry ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.

☐ Cargo Aircraft Only

7 Payment *Bill to:*

Enter FedEx Acct. No. or Credit Card No. below.

☐ Sender — Acct. No. in Section 1 will be billed. ☐ Recipient ☑ Third Party ☐ Credit Card ☐ Cash/Check

FedEx Acct. No. / Credit Card No. 402356103 Exp. Date

Total Packages ____ Total Weight ____ lbs. Total Declared Value† $ ____ .00

†Our liability is limited to US$100 unless you declare a higher value. See back for details. By using this Airbill you agree to the service conditions on the back of this Airbill and in the current FedEx Service Guide, including terms that limit our liability.

644

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ATTACHMENT D

Photographic Documentation of Site Activities

Attachment D
Photographic Documentation of Site Activities
Canadian Radium and Uranium Corp. Site
April 4 through 6, 2016

Photograph 1: A view of Weston Solutions, Inc., Removal Support Team 3 (RST 3) personnel conducting radiological survey at the Site using a Ludlum-2241 Scaler Ratemeter with sodium iodide (NaI) 3x3 scintillator attachment. A baby buggy stroller was utilized to provide mobility for the survey instrumentation setup. A GPS unit provided geographical reference of the gamma readings which were transmitted via a Life-line Interoperable Network Communicator (LINC). GPS locational data and gamma readings were streamed through a Gateway (internet source) to VIPER (a wireless network-based communication system). VIPER provided instantaneous gamma readings through a computer server [Viper Deployment Manager (VDM)] from which data was viewed on a laptop computer.

Photograph 2: A view of Property C003 facing south. Note the use of the property grounds as outside storage.

Photograph 3: Radiological survey at Property C003 was hindered in many areas by the presence of merchandize stored outside throughout the property grounds as seen in the view above.

Photograph 4: A view of the northeast area of Property C003, near the "former old depot", which was not surveyed during prior site investigations due to presence of obstacles. This area could not be surveyed during this event due to obstruction from piles of stored merchandize.

Photograph 5: A view of the south side of Warehouse-2 located on Property C003. Survey data suggests that contamination exists beneath the asphalt paved area and stopped abruptly at the edges of the concrete paved areas. Gamma readings at this location were elevated and more than 2 times (2x) above the background value.

Photograph 6: A view of the southeast corner of the perimeter fence around Property C003 near the "former dumpster location" which is to the right of the utility pole. Gamma readings at this location were elevated and more than 2x above the background value.

Photograph 7: A view of RST 3 subcontractor, Environmental Field Services (EFS) personnel utilizing a Geoprobe® to facilitate soil sample collection by extracting soil cores from borings advanced to depths 4 feet below ground surface (bgs) at 15 locations and up to 8 feet bgs at five locations throughout the Site. MacroCore® sampling tubes lined with new, clean acetate sleeves were utilized for each soil boring.

Photograph 8: A view of RST 3 personnel collecting soil samples from MacroCore® tubes while using dedicated disposable plastic scoops and donning fresh nitrile gloves between sampling intervals. Soil samples were placed directly into re-sealable plastic bags, homogenized, and then placed into glass sample jars.

Photograph 9: A view of the U.S. Environmental Protection Agency's (EPA) On-Scene Coordinator (OSC) using a Ludlum-2241 Scaler Ratemeter with a NaI 2x2 scintillator to screen a soil boring vertically down. A polyvinyl chloride (PVC) pipe was inserted into each borehole to prevent it from collapsing and to protect the scintillator from contamination. Gamma measurements were recorded by RST 3 every 6-inch interval up to the total depth of each boring.

Photograph 10: A view of the offsite background location C004-SB001 at Property C005. Background gamma readings were collected here with each field instrument utilized during this event. Background readings were compared with survey and screening data. Background soil samples were also collected at this location.

Photograph 11: A view of the background location (C004-SB001) at Property C005 while facing the previous background location (C004-SS001) at Property C004. RST 3 inadvertently reported the new background sample location number with a lead C004 instead of C005.

Photograph 12: A view of EFS personnel decontaminating a non-dedicated sampling equipment (Geoprobe® cutting shoe). This procedure was performed before and after the sampling event and between soil sample locations, and it consisted of an industrial soap (Alconox®) solution scrub, tap water rinse, steam-clean with deionized water, air dry, and screening with Ludlum-2241 for residual radiological contamination.

Attachment E

Data Validation Memo Soil Analytical Results - NAREL (Radioisotopes)
Data Validation Memo Soil Analytical Results – PACE (Radioisotopes)

DATE: August 31, 2016

SUBJECT: Radiochemical data validation for National Air and Radiation Environmental Laboratory (NAREL), data packages 1600015, 1600016, and 1600017 in regards to Canadian Radium Site, Mount Kisco, West Chester County, New York.

FROM: Rick Haaker; CHP, CIH, Chemist

RF Haaker

TO: Eric Daly USEPA On-Scene Coordinator

Bernard Nwosu, Weston Solutions RST 3 Site Project Manager

DCN: RST3-03-F-0013

Associated TDD: TO-0006-0053

1. Overview

This report addresses the above referenced data packages that were analyzed by NAREL at their Montgomery, AL facility. The analytes (isotopes) that were reported and methods are provided in the following table.

Table of Isotopes and Analytical Methods.

Method	Description	Isotopes
NAREL ACT-02F-TH	Alpha Spectroscopy (Isotopic Thorium)	Th227, Th228, Th230, Th232
NAREL ACT-02F-U	Alpha Spectroscopy (Isotopic Uranium)	U234, U235, U238
NAREL GAM-01-RA	Gamma Spectroscopy	Bi207, Bi212, Bi214, Cs137, Eu155, K40, Pb210, Pb212, Pb214, Ra226, Ra228, Th234, Tl208, U235

2. INTRODUCTION

Fifty-one (51) soil samples were collected during the time period April 5, 2016 and April 6, 2016. The following table provides a list of these field samples. The samples were submitted under one nine page long Chain of Custody form (No. 2-041816-105138-0008). The sample condition upon receipt is

documented by notations made on the chain of custody form. The samples on the chain of custody were subdivided into three "sample data groups," 1600015, 1600016, and 1600017. Three reports were issued for each sample data group, one for isotopic thorium by alpha spectroscopy, one for isotopic uranium by alpha spectroscopy, and one for gamma spectroscopy results. The lab reports package included a summary report, results, chain of custody, case narrative and some quality-related data. Nine electronic data deliverables (EDD) were provided, which contained much, but not all, of the quality data and results in a readily accessible format.

The lab reports plus EDD were missing several items that would normally be provided in a CLP level 4 data package. It is notable that no information was provided on:

- NIST traceability of standards,
- Instrument calibrations,
- Concentrations in method blanks in units (pCi/g),
- Dilution factors,
- The tracers or carriers used for alpha spectroscopy,
- Actual spectral data (counts per channel) in tabular or graphic form.

The radio-analytical data were validated to Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP) *Chapter 8 - Radiochemical Data Verification and Validation*[1]and the requirements of the quality assurance project plan (QAPP) to the degree feasible.[2] Since the data package is not a Level 4 CLP-equivalent style document, it cannot be validated to those standards. In validating a level 4 equivalent package a reviewer expects to find abundant objective evidence supporting a conclusion that an analysis is acceptable and may qualify results if such evidence is not provided. In validating this package the reviewer didn't have that option. By and large qualifiers were assigned optimistically based on what information was provided.

DATA VALIDATION PRECAUTIONS AND LIMITATIONS

It should be noted that this technical report describes method validation and is not intended to provide guidance for validation of overall program/project objectives and requirements. Project validation is generally performed by project management personnel and involves a comprehensive review of all aspects (and objectives) of a sampling and analysis project.

[1] Multi-Agency Radiological Laboratory Analytical Protocols Manual, Volume I, NUREG-1576, EPA 402-B-04-001A, NTIS PB2004-105421, July 2004.

[2] SITE-SPECIFIC UFP QUALITY ASSURANCE PROJECT PLAN CANADIAN RADIUM AND URANIUM CORPORATION SITE, MOUNT KISCO, WESTCHESTER COUNTY, NEW YORK, DC No.: RST3-02-D-0010, TDD No.: TO-0006-0053. July 2015.

Table of Sample IDs and Analytical Methods.

Client ID	NAREL ID	QC type	Method
C2-SB1-0012-01	B6.04104Y		NAREL ACT-02F-TH
C2-SB1-0012-01	B6.04104Y	DUP	NAREL ACT-02F-TH
C2-SB1-0012-01	B6.04104Y		NAREL ACT-02F-U
C2-SB1-0012-01	B6.04104Y	DUP	NAREL ACT-02F-U
C2-SB1-0012-01	B6.04104Y		NAREL GAM-01-RA
C2-SB1-4860-01	B6.04105Z		NAREL ACT-02F-TH
C2-SB1-4860-01	B6.04105Z		NAREL ACT-02F-U
C2-SB1-4860-01	B6.04105Z		NAREL GAM-01-RA
C2-SB1-6072-01	B6.04106A		NAREL ACT-02F-TH
C2-SB1-6072-01	B6.04106A		NAREL ACT-02F-U
C2-SB1-6072-01	B6.04106A		NAREL GAM-01-RA
C2-SB1-6072-01	B6.04106A	DUP	NAREL GAM-01-RA
C2-SB1-7284-01	B6.04107B		NAREL ACT-02F-TH
C2-SB1-7284-01	B6.04107B		NAREL ACT-02F-U
C2-SB1-7284-01	B6.04107B		NAREL GAM-01-RA
C2-SB1-8496-01	B6.04108C		NAREL ACT-02F-TH
C2-SB1-8496-01	B6.04108C		NAREL ACT-02F-U
C2-SB1-8496-01	B6.04108C		NAREL GAM-01-RA
C2-SB2-0012-01	B6.04109D		NAREL ACT-02F-TH
C2-SB2-0012-01	B6.04109D		NAREL ACT-02F-U
C2-SB2-0012-01	B6.04109D		NAREL GAM-01-RA
C2-SB2-1224-01	B6.04110W		NAREL ACT-02F-TH
C2-SB2-1224-01	B6.04110W		NAREL ACT-02F-U

Client ID	NAREL ID	QC type	Method
C2-SB2-1224-01	B6.04110W		NAREL GAM-01-RA
C2-SB2-2436-01	B6.04111X		NAREL ACT-02F-TH
C2-SB2-2436-01	B6.04111X		NAREL ACT-02F-U
C2-SB2-2436-01	B6.04111X		NAREL GAM-01-RA
C2-SB2-3648-01	B6.04112Y		NAREL ACT-02F-TH
C2-SB2-3648-01	B6.04112Y		NAREL ACT-02F-U
C2-SB2-3648-01	B6.04112Y		NAREL GAM-01-RA
C2-SB2-7284-01	B6.04113Z		NAREL ACT-02F-TH
C2-SB2-7284-01	B6.04113Z	DUP	NAREL ACT-02F-TH
C2-SB2-7284-01	B6.04113Z		NAREL ACT-02F-U
C2-SB2-7284-01	B6.04113Z	DUP	NAREL ACT-02F-U
C2-SB2-7284-01	B6.04113Z		NAREL GAM-01-RA
C2-SB2-7284-02	B6.04114A		NAREL ACT-02F-TH
C2-SB2-7284-02	B6.04114A		NAREL ACT-02F-U
C2-SB2-7284-02	B6.04114A		NAREL GAM-01-RA
C2-SB2-8496-01	B6.04115B		NAREL ACT-02F-TH
C2-SB2-8496-01	B6.04115B		NAREL ACT-02F-U
C2-SB2-8496-01	B6.04115B		NAREL GAM-01-RA
C2-SB3-0012-01	B6.04116C		NAREL ACT-02F-TH
C2-SB3-0012-01	B6.04116C		NAREL ACT-02F-U
C2-SB3-0012-01	B6.04116C		NAREL GAM-01-RA
C2-SB3-1224-01	B6.04117D		NAREL ACT-02F-TH
C2-SB3-1224-01	B6.04117D		NAREL ACT-02F-U
C2-SB3-1224-01	B6.04117D		NAREL GAM-01-RA

Client ID	NAREL ID	QC type	Method
C2-SB3-4860-01	B6.04118E		NAREL ACT-02F-TH
C2-SB3-4860-01	B6.04118E		NAREL ACT-02F-U
C2-SB3-4860-01	B6.04118E		NAREL GAM-01-RA
C2-SB3-6072-01	B6.04119F		NAREL ACT-02F-TH
C2-SB3-6072-01	B6.04119F		NAREL ACT-02F-U
C2-SB3-6072-01	B6.04119F		NAREL GAM-01-RA
C2-SB3-7284-01	B6.04120Y		NAREL ACT-02F-TH
C2-SB3-7284-01	B6.04120Y		NAREL ACT-02F-U
C2-SB3-7284-01	B6.04120Y		NAREL GAM-01-RA
C2-SB3-8496-01	B6.04121Z		NAREL ACT-02F-TH
C2-SB3-8496-01	B6.04121Z	DUP	NAREL ACT-02F-TH
C2-SB3-8496-01	B6.04121Z		NAREL ACT-02F-U
C2-SB3-8496-01	B6.04121Z	DUP	NAREL ACT-02F-U
C2-SB3-8496-01	B6.04121Z		NAREL GAM-01-RA
C3-SB10-0012-01	B6.04140C		NAREL ACT-02F-TH
C3-SB10-0012-01	B6.04140C		NAREL ACT-02F-U
C3-SB10-0012-01	B6.04140C		NAREL GAM-01-RA
C3-SB1-0012-01	B6.04122A		NAREL ACT-02F-TH
C3-SB1-0012-01	B6.04122A		NAREL ACT-02F-U
C3-SB1-0012-01	B6.04122A		NAREL GAM-01-RA
C3-SB10-1224-01	B6.04141D		NAREL ACT-02F-TH
C3-SB10-1224-01	B6.04141D		NAREL ACT-02F-U
C3-SB10-1224-01	B6.04141D		NAREL GAM-01-RA
C3-SB10-6072-01	B6.04142E		NAREL ACT-02F-TH
C3-SB10-6072-01	B6.04142E	DUP	NAREL ACT-02F-TH
C3-SB10-6072-01	B6.04142E		NAREL ACT-02F-U
C3-SB10-6072-01	B6.04142E	DUP	NAREL ACT-02F-U

Client ID	NAREL ID	QC type	Method
C3-SB10-6072-01	B6.04142E		NAREL GAM-01-RA
C3-SB10-7284-01	B6.04143F		NAREL ACT-02F-TH
C3-SB10-7284-01	B6.04143F		NAREL ACT-02F-U
C3-SB10-7284-01	B6.04143F		NAREL GAM-01-RA
C3-SB10-8496-01	B6.04144G		NAREL ACT-02F-TH
C3-SB10-8496-01	B6.04144G		NAREL ACT-02F-U
C3-SB10-8496-01	B6.04144G		NAREL GAM-01-RA
C3-SB11-0012-01	B6.04145H		NAREL ACT-02F-TH
C3-SB11-0012-01	B6.04145H		NAREL ACT-02F-U
C3-SB11-0012-01	B6.04145H		NAREL GAM-01-RA
C3-SB11-3648-01	B6.04146J		NAREL ACT-02F-TH
C3-SB11-3648-01	B6.04146J		NAREL ACT-02F-U
C3-SB11-3648-01	B6.04146J		NAREL GAM-01-RA
C3-SB11-3648-01	B6.04146J	DUP	NAREL GAM-01-RA
C3-SB12-0012-01	B6.04147K		NAREL ACT-02F-TH
C3-SB12-0012-01	B6.04147K		NAREL ACT-02F-U
C3-SB12-0012-01	B6.04147K		NAREL GAM-01-RA
C3-SB13-0012-01	B6.04148L		NAREL ACT-02F-TH
C3-SB13-0012-01	B6.04148L		NAREL ACT-02F-U
C3-SB13-0012-01	B6.04148L		NAREL GAM-01-RA
C3-SB13-1224-01	B6.04149M		NAREL ACT-02F-TH
C3-SB13-1224-01	B6.04149M		NAREL ACT-02F-U
C3-SB13-1224-01	B6.04149M		NAREL GAM-01-RA
C3-SB1-3648-01	B6.04123B		NAREL ACT-02F-TH
C3-SB1-3648-01	B6.04123B		NAREL ACT-02F-U
C3-SB1-3648-01	B6.04123B		NAREL GAM-01-RA
C3-SB1-3648-02	B6.04124C		NAREL ACT-02F-TH

Client ID	NAREL ID	QC type	Method
C3-SB1-3648-02	B6.04124C		NAREL ACT-02F-U
C3-SB1-3648-02	B6.04124C		NAREL GAM-01-RA
C3-SB1-3648-02	B6.04124C	DUP	NAREL GAM-01-RA
C3-SB14-0012-01	B6.04150E		NAREL ACT-02F-TH
C3-SB14-0012-01	B6.04150E		NAREL ACT-02F-U
C3-SB14-0012-01	B6.04150E		NAREL GAM-01-RA
C3-SB15-0012-01	B6.04151F		NAREL ACT-02F-TH
C3-SB15-0012-01	B6.04151F		NAREL ACT-02F-U
C3-SB15-0012-01	B6.04151F		NAREL GAM-01-RA
C3-SB15-2436-01	B6.04152G		NAREL ACT-02F-TH
C3-SB15-2436-01	B6.04152G		NAREL ACT-02F-U
C3-SB15-2436-01	B6.04152G		NAREL GAM-01-RA
C3-SB16-0012-01	B6.04153H		NAREL ACT-02F-TH
C3-SB16-0012-01	B6.04153H		NAREL ACT-02F-U
C3-SB16-0012-01	B6.04153H		NAREL GAM-01-RA
C3-SB16-3648-01	B6.04154J		NAREL ACT-02F-TH
C3-SB16-3648-01	B6.04154J		NAREL ACT-02F-U
C3-SB16-3648-01	B6.04154J		NAREL GAM-01-RA
C3-SB2-0012-01	B6.04125D		NAREL ACT-02F-TH
C3-SB2-0012-01	B6.04125D		NAREL ACT-02F-U
C3-SB2-0012-01	B6.04125D		NAREL GAM-01-RA
C3-SB2-1224-01	B6.04126E		NAREL ACT-02F-TH
C3-SB2-1224-01	B6.04126E		NAREL ACT-02F-U
C3-SB2-1224-01	B6.04126E		NAREL GAM-01-RA
C3-SB3-0012-01	B6.04127F		NAREL ACT-02F-TH
C3-SB3-0012-01	B6.04127F		NAREL ACT-02F-U
C3-SB3-0012-01	B6.04127F		NAREL GAM-01-RA

Client ID	NAREL ID	QC type	Method
C3-SB3-1224-01	B6.04128G		NAREL ACT-02F-TH
C3-SB3-1224-01	B6.04128G		NAREL ACT-02F-U
C3-SB3-1224-01	B6.04128G		NAREL GAM-01-RA
C3-SB4-0012-01	B6.04129H		NAREL ACT-02F-TH
C3-SB4-0012-01	B6.04129H		NAREL ACT-02F-U
C3-SB4-0012-01	B6.04129H		NAREL GAM-01-RA
C3-SB4-1224-01	B6.04130A		NAREL ACT-02F-TH
C3-SB4-1224-01	B6.04130A		NAREL ACT-02F-U
C3-SB4-1224-01	B6.04130A		NAREL GAM-01-RA
C3-SB5-0012-01	B6.04131B		NAREL ACT-02F-TH
C3-SB5-0012-01	B6.04131B		NAREL ACT-02F-U
C3-SB5-0012-01	B6.04131B		NAREL GAM-01-RA
C3-SB6-0012-01	B6.04132C		NAREL ACT-02F-TH
C3-SB6-0012-01	B6.04132C	DUP	NAREL ACT-02F-TH
C3-SB6-0012-01	B6.04132C		NAREL ACT-02F-U
C3-SB6-0012-01	B6.04132C		NAREL GAM-01-RA
C3-SB6-3648-01	B6.04133D		NAREL ACT-02F-TH
C3-SB6-3648-01	B6.04133D		NAREL ACT-02F-U
C3-SB6-3648-01	B6.04133D		NAREL GAM-01-RA
C3-SB7-0012-01	B6.04134E		NAREL ACT-02F-TH
C3-SB7-0012-01	B6.04134E		NAREL ACT-02F-U
C3-SB7-0012-01	B6.04134E		NAREL GAM-01-RA
C3-SB7-3648-01	B6.04135F		NAREL ACT-02F-TH
C3-SB7-3648-01	B6.04135F		NAREL ACT-02F-U
C3-SB7-3648-01	B6.04135F		NAREL GAM-01-RA
C3-SB8-0012-01	B6.04136G		NAREL ACT-02F-TH
C3-SB8-0012-01	B6.04136G		NAREL ACT-02F-U

Client ID	NAREL ID	QC type	Method
C3-SB8-0012-01	B6.04136G		NAREL GAM-01-RA
C3-SB8-1224-01	B6.04137H		NAREL ACT-02F-TH
C3-SB8-1224-01	B6.04137H		NAREL ACT-02F-U
C3-SB8-1224-01	B6.04137H		NAREL GAM-01-RA
C3-SB9-0012-01	B6.04138J		NAREL ACT-02F-TH

Client ID	NAREL ID	QC type	Method
C3-SB9-0012-01	B6.04138J		NAREL ACT-02F-U
C3-SB9-0012-01	B6.04138J		NAREL GAM-01-RA
C3-SB9-1224-01	B6.04139K		NAREL ACT-02F-TH
C3-SB9-1224-01	B6.04139K		NAREL ACT-02F-U
C3-SB9-1224-01	B6.04139K		NAREL GAM-01-RA

3. DATA QUALIFIERS

Final Data qualifiers are codes placed on an analytical result that alerts data users to the validator's concern about the result. These qualifiers may be summarized as U, J, R, or Q in the final validation report.

None the analysis was performed and radioactivity was detected. The result is statistically positive at the 95% confidence level, above the critical level and above the MDC. The radionuclide is considered to be present in the sample.

U A normal, not detected (< critical value) result.

UJ The analyte was not detected, but the required MDA was not attained. A number of specific problems also resulted in assignment of a J qualifier where results were more uncertain than usual.

Q A reported combined standard uncertainty, which exceeds the project's required method uncertainty. (In this report Q was only used as an intermediate or preliminary qualifier.)

J An unusually uncertain or estimated result.

R A rejected result: the problems (quantitative or qualitative) are so severe that the data cannot be used.

The data validator should be aware that a data qualifier or a set of qualifiers does not apply to all similar data. The data validator should incorporate the project MQOs into the testing and qualifying decision-making process.

During the data validation process the data validator may use additional qualifiers based on QC sample results and acceptance criteria. The final validation reports should also include a summary of QC sample performance for use by the data assessor. Intermediate or preliminary qualifiers, such as 'S', 'B' or 'P' are assigned on the basis of QC sample performance and these are taken into consideration in assignment of a final qualifier to an analytical result.

J1+ A result for a sample whose associated blank contained detected activity above the critical level and the result for the sample was less than 5 times the result for the blank.

S A result with a related spike result (laboratory control sample [LCS], matrix spike [MS] or matrix spike duplicate [MSD]) that is outside the control limit for recovery (%R); S+ or S- used to indicate high or low recovery.

P A result with an associated a pair of poorly performing laboratory replicates (DER > 1.96).

PP A result with an associated a pair of very poorly performing laboratory replicates (DER > 2.58). No samples were rejected for having a PP intermediate qualifier.

P1 A result for a particular analyte and sample that has associated with it a poorly performing pair of field replicates (DER > 1.96).

P**P1** A result for a particular analyte and sample that has associated with it a very poorly performing pair of field replicates (DER > 2.58). No samples were rejected for having a 'PP1' intermediate qualifier.

B A result with associated blank result, which is outside the control limit, B+ or B-.used to indicate high or low results.

The logic for mapping preliminary data qualifiers to final data qualifiers is provided in the following

table (next page). Each sample result has only one final data qualifier, but may have several preliminary or intermediate data qualifiers.

4. Equations

The following equations are frequently used to compare the performance of pairs of aliquots that were drawn from the same sample.

A. Duplicate error ratio

The duplicate error ratio is the relative error in a pair of measurements and takes into account the measurement results, Ma and Mb, as well as the standard errors associated with the measurements, 2Sa and 2Sb.

By convention, laboratories report analytical errors as 2 times the standard deviation, 2 Sa and 2 Sb. If Ma and Mb are results from duplicate aliquots that were taken from a homogeneous sample, then ninety-five percent of the time the DER is expected to be less than 1.96. Ninety-nine percent of the time it is expected to be less than 2.58.

$$DER = 2 \times \frac{Abs(Ma - Mb)}{\sqrt{(2\,Sa)^2 + (2\,Sb)^2}}$$

B. Relative Percent Difference

The relative percent difference (RPctD) is a measure of consistency of measured concentration between two aliquots of a sample.

$$RPctD = 200\% \times \frac{Abs(Ma - Mb)}{Ma + Mb}$$

C. Matrix Spike Percent Difference

$$MSPctD = 100\% \times \frac{Spike\ Result - Unspiked\ Result}{Spike}$$

D. Matrix Spike Normalized Difference

$$MSND = 2 \times \frac{Spike\ Result - Unspiked\ Result - Spike}{((2\,S_{Spike\ Result})^2 + (2\,S_{UnSpike\ Result})^2 + (2\,S_{Spike\ Result})^2)^{0.5}}$$

Ninety-five percent of the time the absolute value of the matrix spike normalized difference is expected to be less than 1.96, and ninety-nine percent of the time it should be less than 2.58.

Table of preliminary and final data qualifiers for this dataset.

Interim Qualifiers	Final Qualifier
B+,	J
B+, S+,	J
J,	J
J, P, B+,	J
J, R	R
J, S+,	J
P, B+,	J
P1,	J
PP,	J
PP, B+,	J
PP1,	J
PP1, S+,	J
R	R
S+,	J
U,	U
U, B+,	UJ
U, P1,	UJ
U, PP1,	UJ
U, PP1, S+,	UJ
U, S+,	UJ

5. SAMPLE HANDLING AND ANALYSIS EVALUATION

This section contains the technical review comments describing the findings and observations for each of the main verification and validation parameters described in MARLAP Chapter 8 - Radiochemical Data Verification and Validation.

A. Sample Descriptors (MARLAP 8.5.1.1)

Each sample should have a unique identification code that can be cross-referenced to a unique laboratory identification number.

Discussion

Each field sample has laboratory different identification numbers (NAREL ID) for each of the three analytical methods employed. Laboratory duplicate sample pairs share the same NAREL ID and CLIENT ID, however one member of each duplicate pair has the QC TYPE designation of "DUP."

B. Aliquot Size (MARLAP 8.5.1.2)

The aliquot or sample size used for analysis should be documented so that it can be checked when reviewing calculations, examining dilution factors or analyzing any data that requires aliquant as an

input. It is also imperative that the appropriate unit (liter, kilogram, etc.) is assigned to the aliquant.

Discussion

Each sample in the data package had an aliquot size associated with each result. However no information was provided on the dilution factors that were employed in the alpha spectroscopy methods (NAREL ACT-02F-TH and NAREL ACT-02F-U). This information would ordinarily be provided in a CLP Level 4 equivalent data package.

No qualifiers were assigned on this basis.

C. Dates of Sample Collection, Preparation, and Analysis (MARLAP 8.5.1.3)

The analytical data package should report date of sampling, preparation, and analysis. These data are used to calculate radiological holding times, some of which may be specified in the Field Sampling Plan.

Discussion

Data were provided and the holding times ranged from 49 to 92 days. All holding times were well below the 6 month limit. No qualifiers were assigned on that basis.

D. Preservation (MARLAP 8.5.1.4)

Appropriate preservation is dependent upon analyte and matrix and should be defined in sampling and analysis documentation.

Discussion

Soil samples for these analytes do not require any special preservation. The hand written notations on the Chain of Custody Record document the condition of the samples upon arrival at the laboratory. There are notations on the Chain of Custody Record that six of the glass sample containers were cracked or broken upon receipt. There is no indication on the Chain of Custody Record that these samples should be considered spoiled.

No data qualifiers were assigned on this basis.

E. Tracking (MARLAP 8.5.1.5)

Each analytical result should be linked to the instrument or detector on which it was counted.

Discussion

Each analytical result in the data package was linked to a specific detector. Thus no issues of this type were recognized and no qualifiers were assigned on this basis.

F. Traceability (MARLAP 8.5.1.6)

The traceability of standards and reference materials to be used during the analysis should be specified in the Field Sampling Plan.

Discussion

The Field Sampling Plan did not provide specific requirements for traceability. CLP level 4 equivalent packages typically provide information on the standards so that their traceability to NIST is established. These data packages did not provide this type of traceability information.

No qualifiers were assigned on this basis because it is not a stated requirement of the QAPP.

G. QC Types and Linkages (MARLAP 8.5.1.7)

The type and quantity of QC samples should be identified and listed in the SOW and the results provided by the laboratory in a summary report. Replicates and matrix spike results should be linked to the original sample results.

The information obtained from the analysis of laboratory-generated duplicates is useful to evaluate analytical variability and laboratory precision. Results from the analysis of laboratory-generated duplicate samples can also reflect the homogeneity or inhomogeneity of individual samples or groups of samples of the same matrices.

Discussion

The QAPP requires matrix spike (MS) and matrix spike duplicates (MSD) for soil samples, but it is ambiguous about the number of MS and MSD that are required per QA batch. Typically, analytical laboratories do not provide MS or MSD for gamma spectroscopy analyses. In these NAREL data packages there were apparently no MS or MSD samples in connection with any of the analytical methods.

For most types of radiochemical analyses, analytical laboratories typically report the results of method blanks in units of pCi/g in their Level 4 CLP equivalent packages. Instead, NAREL took backgrounds and reported the results units of pCi, which are less useful for comparative purposes. The QAPP does not specify the reporting units for method blanks or background samples.

The QAPP required laboratory control standards (LCS), but not laboratory control standard duplicates (LCSD). Each of the data packages provide results for LCS as required by the QAPP.

The lack of method blanks *per se*, MS and MSD in a Level 4 CLP equivalent data package would normally result in qualifying the associated samples as “more uncertain than usual.” However the NAREL data packages are not typical Level 4 packages, thus no qualifiers were assigned based on QC types and linkages.

H. Chemical Separation (Yield) (MARLAP 8.5.1.8)

Yield assesses the effects of the sample matrix and the chemical separation steps on the analytical result and estimates the analyte loss throughout the total analytical process.

The evaluation of an analytical yield serves to evaluate the efficiency of radiochemical separations utilized when preparing samples for measurement or analysis. The use of a tracer is conducted when a known amount of a chemical tracer is added to unknown samples; during analysis, a yield or recovery of the tracer material is used to determine the efficiency of the entire analytical process. The tracer that is chosen is used because it mimics the properties of one or more target radionuclides. A tracer refers to a radioactive isotope, while a carrier is a non-radioactive substance.

Discussion

The analyses that employed a tracer or carrier include:

- Isotopic thorium by alpha spectroscopy (NAREL ACT-02F-TH)

- Isotopic uranium by alpha spectroscopy (NAREL ACT-02F-U).

The tracers or carriers employed are not stated in the reports, although the chemical yields are provided. No results exhibited high or low tracer recovery, thus no samples were qualified on this basis.

I. Self-Absorption (MARLAP 8.5.1.9)

For some radiochemical analytical methods, the SOW may specify the generation of a self-absorption curve, which correlates mass of sample deposited in a known geometry to detector efficiency.

Discussion

No information was provided in the data packages to judge the sufficiency of self-absorption correction curves or whether such corrections were applied.

No qualifiers were assigned on this basis.

J. Efficiency, Calibration Curves, and Instrument Background (MARLAP 8.5.1.10)

The determination of detector efficiency is a detailed process that is best checked during an audit of the laboratory's capabilities and is usually not part of the verification and validation process.

Discussion

Instrument backgrounds in units of pCi were provided but data on instrument efficiency and calibration curves were not. Usually level 4 CLP equivalent packages provide information on instrument backgrounds and also the results of a method blank in units of pCi/g.

No qualifiers were assigned on this basis.

K. Spectrometry Resolution (MARLAP 8.5.1.11)

The measured resolution of alpha and gamma spectrometers, and spectral information should be provided in the data package to evaluate if proper peak identification and separation was made.

Discussion

Spectra were not provided in tabular or graphic form. In addition, the spectral resolution and peak width data were not provided.

It is notable that both uranium-235 and radium-226 have gamma emissions at 186 KeV and the gamma spectrometer resolution of modern equipment is insufficient to avoid problems. The result was a substantial positive bias in the reported concentrations of uranium-235 by method NAREL GAM-01-RA compared to uranium-235 results by NAREL ACT-02F-U. All uranium-235 results reported by gamma spectroscopy were rejected (i.e. assigned a data qualifier of 'R'). This is a common difficulty with using gamma spectroscopy to estimate environmental uranium-235 concentrations in samples that contain radium-226.

L. Dilution and Correction Factors (MARLAP 8.5.1.12)

Samples for radiochemistry are usually not diluted. If required, dilution and correction factors (i.e., dry weight correction, ashed weight correction) should be provided in the data package so that the final

calculations of all data affected by dilution factors can be recalculated and confirmed.

Discussion

Dilutions of the standard solutions are not addressed in the data packages. Aliquot sizes, wet weights and dry weights are provided in the data package for each sample and method of analysis. No qualifiers were assigned on this basis.

M. Counts and Count Time (Duration) (MARLAP 8.5.1.13)

The count time for each sample, QC analysis, and instrument background should be recorded in the data package. The ability to detect radionuclides is directly related to the count time.

Discussion

Count times, QC analyses, and backgrounds are documented in the data package. Count times were nearly always sufficient for results to have the required MDC. No issues with missing data of these types were recognized.

N. Result of Measurement, Uncertainty, Minimum Detectable Concentration, and Units (MARLAP 8.5.1.14)

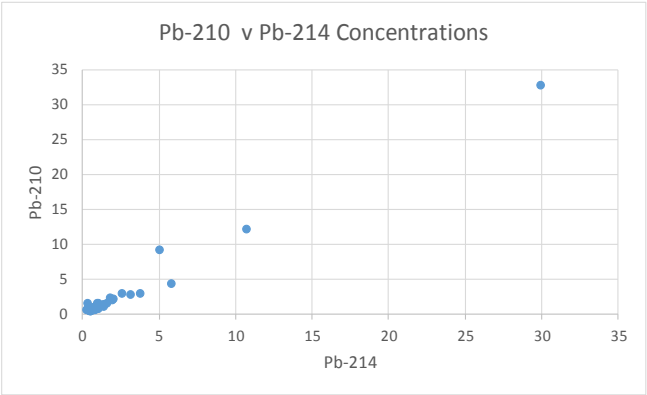
The result of each measurement, its expanded measurement uncertainty, and the estimated sample- or analyte-specific MDC should be reported for each sample in the appropriate units.

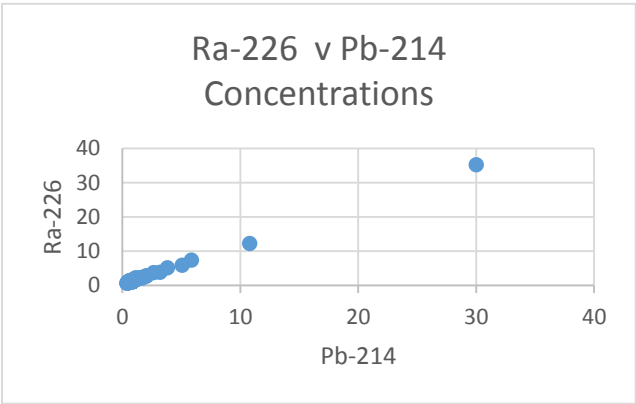
Discussion

No issues with these factors were recognized and no qualifiers were assigned on this basis.

Three isotopes that were requested by gamma spectroscopy require discussion: bismuth-210, lead-210 and uranium-235. Bismuth-210 is a pure beta emitter, so it cannot be determined by gamma spectroscopy.

Lead-210 emits a low-energy 46 KeVgamma ray with a low (4%) abundance. It can be detected by gamma spectroscopy at relatively low levels provided that the sample geometry is optimized for low energy gamma emitters and there are not elevated concentrations of other gamma emitting isotopes in the sample. The sample geometry and detector used by NAREL appeared to give good performance as evidenced by the plots of lead-210 versus lead-214 and radium-226 versus lead-214.





The reported ratio of radium-226 to its lead-214 daughter is also consistent.

One is left with the impression that the radium-226 and lead-210 results are reasonably reliable.

Frequently this is not the case in gamma spectroscopy results where the detector and sample geometry have not been optimized for low energy gamma emitters. NAREL's recommendation that radium-226 concentrations should be estimated from lead-214 or bismuth-214 daughters is a good one, particularly if a project schedule permits a 21 day ingrowth time between sample preparation and gamma counting.

As stated in section 5K, method NAREL GAM-01-RA is not suitable for quantitating uranium-235 concentrations and those results should not be used. Those results are rejected because no sound decision can be based on them.

6. QUALITY CONTROL SAMPLES TECHNICAL REVIEW

A. Method Blanks (MARLAP 8.5.2.1)

Method blank results are usually provided in level 4 CLP equivalent data packages. The requirement for a method blank is usually established in the SOW and appropriate plan documents. Check to see if a method blank was analyzed and no detected concentration/activity found in the results.

Discussion

Method blank results were not provided in the data package. The following background results were elevated. Those that exceeded the critical level were flagged with a 'J' while those that exceeded the minimum detectable activity were not specifically flagged in the table below.

NAREL ID	Prep batch	Analyte	Background Qualifier
RBK-00735409G	0013448P	Pb210	J
RBK-00735457Q	0013451J	Th228	
RBK-00735460K	0013452K	U234	J
RBK-00735460K	0013452K	U238	
RBK-00735845Z	0013471N	Th227	
RBK-00736017Y	0013480P	Th227	
RBK-00736017Y	0013480P	Th230	J
RBK-00736020T	0013481Q	U234	J
RBK-00736020T	0013481Q	U238	J
RBK-00734849Z	0013404B	Bi214	J
RBK-00734849Z	0013404B	K40	J
RBK-00734849Z	0013404B	Pb214	J
RBK-00734849Z	0013404B	Tl208	J
RBK-00735179M	0013431E	U238	J
RBK-00735294P	0013438M	Th228	J

The results for field samples that were associated with these background results were assigned an intermediate qualifier of 'B+,' as summarized below.

Method	Analyte	Number Assigned a 'B+'
NAREL ACT-02F-TH	Th227	13
NAREL ACT-02F-TH	Th228	17
NAREL ACT-02F-TH	Th230	8

NAREL ACT-02F-U	U234	16
NAREL ACT-02F-U	U238	26
NAREL GAM-01-RA	Bi214	18
NAREL GAM-01-RA	K40	18
NAREL GAM-01-RA	Pb210	18
NAREL GAM-01-RA	Pb214	18
NAREL GAM-01-RA	Tl208	18

B. Laboratory Control Samples (MARLAP 8.5.2.2)

Laboratory control sample duplicates (LCSD) were not run. Laboratory control samples (LCS) were run for each batch and analysis type, and all spike and recovery results for LCS samples were acceptable, based on QAPP requirements, except for those isotopic thorium results in preparation batch # 0013451J. The thorium-230 spike for that preparation batch exhibited a 122% recovery. An intermediate qualifier of 'S+' was assigned to the 56 isotopic thorium field sample results in this batch.

Table showing spike-qualified samples.

Client ID	NAREL ID	Method	QC type	SDG	Spike Qualifier
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-TH		1600016	S+
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-TH	DUP	1600016	S+
C3-SB1-0012-01	B6.04122A	NAREL ACT-02F-TH		1600016	S+
C3-SB1-3648-01	B6.04123B	NAREL ACT-02F-TH		1600016	S+
C3-SB1-3648-02	B6.04124C	NAREL ACT-02F-TH		1600016	S+
C3-SB2-0012-01	B6.04125D	NAREL ACT-02F-TH		1600016	S+
C3-SB2-1224-01	B6.04126E	NAREL ACT-02F-TH		1600016	S+
C3-SB3-0012-01	B6.04127F	NAREL ACT-02F-TH		1600016	S+
C3-SB3-1224-01	B6.04128G	NAREL ACT-02F-TH		1600016	S+
C3-SB4-0012-01	B6.04129H	NAREL ACT-02F-TH		1600016	S+
C3-SB4-1224-01	B6.04130A	NAREL ACT-02F-TH		1600016	S+
C3-SB6-3648-01	B6.04133D	NAREL ACT-02F-TH		1600016	S+
C3-SB7-3648-01	B6.04135F	NAREL ACT-02F-TH		1600016	S+
C3-SB8-1224-01	B6.04137H	NAREL ACT-02F-TH		1600016	S+

C. Laboratory Replicates (MARLAP 8.5.2.3)

The objective of replicate analyses is to measure laboratory precision based on each sample matrix. Check to see if laboratory replicate was analyzed and within control limits.

Discussion

One laboratory replicate sample for uranium-238 exhibited a duplicate error ratio (DER) greater than 2.58. The uranium-238 analyses of all associated samples in its prep batch were assigned an intermediate qualifier of 'PP', and those uranium-238 results were rejected. One thorium-227 and one uranium-238 laboratory replicate each had DERs between 1.96 and 2.58. Associated samples were assigned intermediate lab qualifers of 'P' and those results are considered more uncertain than usual.

Method	Prep Batch	Matrix	Client ID	NAREL ID	Analyte	Rel Diff (%)	Dup Error Ratio
NAREL ACT-02F-TH	0013447N	SOIL	C2-SB1-0012-01	B6.04104Y	Th227	24.9	0.53
NAREL ACT-02F-TH	0013447N	SOIL	C2-SB1-0012-01	B6.04104Y	Th228	24.2	1.45
NAREL ACT-02F-TH	0013447N	SOIL	C2-SB1-0012-01	B6.04104Y	Th230	5.6	0.32
NAREL ACT-02F-TH	0013447N	SOIL	C2-SB1-0012-01	B6.04104Y	Th232	12.9	0.78
NAREL ACT-02F-TH	0013438 M	SOIL	C2-SB2-7284-01	B6.04113Z	Th227	25.7	0.68
NAREL ACT-02F-TH	0013438 M	SOIL	C2-SB2-7284-01	B6.04113Z	Th228	15	1.4
NAREL ACT-02F-TH	0013438 M	SOIL	C2-SB2-7284-01	B6.04113Z	Th230	8.2	0.66
NAREL ACT-02F-TH	0013438 M	SOIL	C2-SB2-7284-01	B6.04113Z	Th232	14.7	1.34
NAREL ACT-02F-TH	0013451J	SOIL	C2-SB3-8496-01	B6.04121Z	Th227	13.8	0.3
NAREL ACT-02F-TH	0013451J	SOIL	C2-SB3-8496-01	B6.04121Z	Th228	4.7	0.46
NAREL ACT-02F-TH	0013451J	SOIL	C2-SB3-8496-01	B6.04121Z	Th230	20.5	1.84
NAREL ACT-02F-TH	0013451J	SOIL	C2-SB3-8496-01	B6.04121Z	Th232	12.7	1.22
NAREL ACT-02F-TH	0013480P	SOIL	C3-SB10-6072-01	B6.04142E	Th227	10.7	0.5
NAREL ACT-02F-TH	0013480P	SOIL	C3-SB10-6072-01	B6.04142E	Th228	6.9	0.8
NAREL ACT-02F-TH	0013480P	SOIL	C3-SB10-6072-01	B6.04142E	Th230	5.1	0.67
NAREL ACT-02F-TH	0013480P	SOIL	C3-SB10-6072-01	B6.04142E	Th232	6.8	0.78
NAREL ACT-02F-TH	0013471N	SOIL	C3-SB6-0012-01	B6.04132C	Th227	115.5	2.22
NAREL ACT-02F-TH	0013471N	SOIL	C3-SB6-0012-01	B6.04132C	Th228	15.3	0.96
NAREL ACT-02F-TH	0013471N	SOIL	C3-SB6-0012-01	B6.04132C	Th230	1.9	0.13
NAREL ACT-02F-TH	0013471N	SOIL	C3-SB6-0012-01	B6.04132C	Th232	11.6	0.7
NAREL ACT-02F-U	0013431E	SOIL	C2-SB1-0012-01	B6.04104Y	U234	15.5	1.15
NAREL ACT-02F-U	0013431E	SOIL	C2-SB1-0012-01	B6.04104Y	U235	76.2	1.44
NAREL ACT-02F-U	0013431E	SOIL	C2-SB1-0012-01	B6.04104Y	U238	28.5	2.09
NAREL ACT-02F-U	0013439N	SOIL	C2-SB2-7284-01	B6.04113Z	U234	29.2	1.93
NAREL ACT-02F-U	0013439N	SOIL	C2-SB2-7284-01	B6.04113Z	U235	17.6	0.29
NAREL ACT-02F-U	0013439N	SOIL	C2-SB2-7284-01	B6.04113Z	U238	0.5	0.03
NAREL ACT-02F-U	0013488Y	SOIL	C2-SB3-8496-01	B6.04121Z	U234	0.7	0.05
NAREL ACT-02F-U	0013488Y	SOIL	C2-SB3-8496-01	B6.04121Z	U234	9.4	0.73
NAREL ACT-02F-U	0013452K	SOIL	C2-SB3-8496-01	B6.04121Z	U235	27.3	0.53
NAREL ACT-02F-U	0013452K	SOIL	C2-SB3-8496-01	B6.04121Z	U235	117.2	1.91
NAREL ACT-02F-U	0013452K	SOIL	C2-SB3-8496-01	B6.04121Z	U238	13.6	1.15
NAREL ACT-02F-U	0013452K	SOIL	C2-SB3-8496-01	B6.04121Z	U238	39.3	3.25
NAREL ACT-02F-U	0013481Q	SOIL	C3-SB10-6072-01	B6.04142E	U234	2.9	0.33
NAREL ACT-02F-U	0013481Q	SOIL	C3-SB10-6072-01	B6.04142E	U235	25.2	0.74
NAREL ACT-02F-U	0013481Q	SOIL	C3-SB10-6072-01	B6.04142E	U238	1.5	0.17
NAREL GAM-01-RA	0013404B	SOIL	C2-SB1-6072-01	B6.04106A	Bi212	10.6	0.81

Method	Prep Batch	Matrix	Client ID	NAREL ID	Analyte	Rel Diff (%)	Dup Error Ratio
NAREL GAM-01-RA	0013404B	SOIL	C2-SB1-6072-01	B6.04106A	Bi214	0.7	0.08
NAREL GAM-01-RA	0013404B	SOIL	C2-SB1-6072-01	B6.04106A	Cs137	45.9	0.42
NAREL GAM-01-RA	0013404B	SOIL	C2-SB1-6072-01	B6.04106A	K40	0.8	0.11
NAREL GAM-01-RA	0013404B	SOIL	C2-SB1-6072-01	B6.04106A	Pb210	6.2	0.37
NAREL GAM-01-RA	0013404B	SOIL	C2-SB1-6072-01	B6.04106A	Pb212	0.6	0.07
NAREL GAM-01-RA	0013404B	SOIL	C2-SB1-6072-01	B6.04106A	Pb214	0.7	0.09
NAREL GAM-01-RA	0013404B	SOIL	C2-SB1-6072-01	B6.04106A	Ra226	4.2	0.36
NAREL GAM-01-RA	0013404B	SOIL	C2-SB1-6072-01	B6.04106A	Ra228	0.9	0.11
NAREL GAM-01-RA	0013404B	SOIL	C2-SB1-6072-01	B6.04106A	Th234	22.7	1.03
NAREL GAM-01-RA	0013404B	SOIL	C2-SB1-6072-01	B6.04106A	Tl208	0.6	0.07
NAREL GAM-01-RA	0013448P	SOIL	C3-SB11-3648-01	B6.04146J	Bi212	6.6	0.53
NAREL GAM-01-RA	0013448P	SOIL	C3-SB11-3648-01	B6.04146J	Bi214	1.6	0.19
NAREL GAM-01-RA	0013448P	SOIL	C3-SB11-3648-01	B6.04146J	Cs137	142.8	0.79
NAREL GAM-01-RA	0013448P	SOIL	C3-SB11-3648-01	B6.04146J	K40	0.7	0.09
NAREL GAM-01-RA	0013448P	SOIL	C3-SB11-3648-01	B6.04146J	Pb210	0.7	0.04
NAREL GAM-01-RA	0013448P	SOIL	C3-SB11-3648-01	B6.04146J	Pb212	2.3	0.28
NAREL GAM-01-RA	0013448P	SOIL	C3-SB11-3648-01	B6.04146J	Pb214	2.2	0.26
NAREL GAM-01-RA	0013448P	SOIL	C3-SB11-3648-01	B6.04146J	Ra226	18	1.33
NAREL GAM-01-RA	0013448P	SOIL	C3-SB11-3648-01	B6.04146J	Ra228	5.2	0.62
NAREL GAM-01-RA	0013448P	SOIL	C3-SB11-3648-01	B6.04146J	Th234	4.8	0.25
NAREL GAM-01-RA	0013448P	SOIL	C3-SB11-3648-01	B6.04146J	Tl208	0.8	0.09
NAREL GAM-01-RA	0013426H	SOIL	C3-SB1-3648-02	B6.04124C	Bi212	1	0.09
NAREL GAM-01-RA	0013426H	SOIL	C3-SB1-3648-02	B6.04124C	Bi214	0.6	0.07
NAREL GAM-01-RA	0013426H	SOIL	C3-SB1-3648-02	B6.04124C	Cs137	561.7	1.18
NAREL GAM-01-RA	0013426H	SOIL	C3-SB1-3648-02	B6.04124C	K40	2.2	0.28
NAREL GAM-01-RA	0013426H	SOIL	C3-SB1-3648-02	B6.04124C	Pb210	1.6	0.08
NAREL GAM-01-RA	0013426H	SOIL	C3-SB1-3648-02	B6.04124C	Pb212	4.1	0.51
NAREL GAM-01-RA	0013426H	SOIL	C3-SB1-3648-02	B6.04124C	Pb214	2	0.25
NAREL GAM-01-RA	0013426H	SOIL	C3-SB1-3648-02	B6.04124C	Ra226	3.8	0.35
NAREL GAM-01-RA	0013426H	SOIL	C3-SB1-3648-02	B6.04124C	Ra228	1.1	0.13
NAREL GAM-01-RA	0013426H	SOIL	C3-SB1-3648-02	B6.04124C	Th234	7.2	0.3
NAREL GAM-01-RA	0013426H	SOIL	C3-SB1-3648-02	B6.04124C	Tl208	0	0

The associated samples which were qualified due to their association with poorly performing laboratory replicates are provided in the following table.

Client ID	NAREL ID	SDG	Method	Analyte	Lab Dup Qualifier
C3-SB5-0012-01	B6.04131B	1600016	NAREL ACT-02F-TH	Th227	P,
C3-SB6-0012-01	B6.04132C	1600016	NAREL ACT-02F-TH	Th227	P,

Client ID	NAREL ID	SDG	Method	Analyte	Lab Dup Qualifier
C3-SB6-0012-01	B6.04132C	1600016	NAREL ACT-02F-TH	Th227	P,
C3-SB7-0012-01	B6.04134E	1600016	NAREL ACT-02F-TH	Th227	P,
C3-SB8-0012-01	B6.04136G	1600016	NAREL ACT-02F-TH	Th227	P,
C2-SB1-0012-01	B6.04104Y	1600015	NAREL ACT-02F-U	U238	P,
C2-SB1-0012-01	B6.04104Y	1600015	NAREL ACT-02F-U	U238	P,
C2-SB1-4860-01	B6.04105Z	1600015	NAREL ACT-02F-U	U238	P,
C2-SB1-6072-01	B6.04106A	1600015	NAREL ACT-02F-U	U238	P,
C2-SB1-7284-01	B6.04107B	1600015	NAREL ACT-02F-U	U238	P,
C2-SB1-8496-01	B6.04108C	1600015	NAREL ACT-02F-U	U238	P,
C2-SB2-0012-01	B6.04109D	1600015	NAREL ACT-02F-U	U238	P,
C2-SB2-1224-01	B6.04110W	1600015	NAREL ACT-02F-U	U238	P,
C2-SB2-2436-01	B6.04111X	1600015	NAREL ACT-02F-U	U238	P,
C2-SB2-3648-01	B6.04112Y	1600015	NAREL ACT-02F-U	U238	P,
C2-SB3-8496-01	B6.04121Z	1600016	NAREL ACT-02F-U	U238	PP,
C2-SB3-8496-01	B6.04121Z	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB1-0012-01	B6.04122A	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB1-3648-01	B6.04123B	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB1-3648-02	B6.04124C	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB2-0012-01	B6.04125D	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB2-1224-01	B6.04126E	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB3-0012-01	B6.04127F	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB3-1224-01	B6.04128G	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB4-0012-01	B6.04129H	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB4-1224-01	B6.04130A	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB5-0012-01	B6.04131B	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB6-0012-01	B6.04132C	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB6-3648-01	B6.04133D	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB7-0012-01	B6.04134E	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB7-3648-01	B6.04135F	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB8-0012-01	B6.04136G	1600016	NAREL ACT-02F-U	U238	PP,
C3-SB8-1224-01	B6.04137H	1600016	NAREL ACT-02F-U	U238	PP,

D. Matrix Spikes and Matrix Spike Duplicates (MARLAP 8.5.2.4)

Matrix spike samples provide information about the effect of each sample matrix on the preparation and measurement methodology. The test uncovers the possible existence of recovery problems, based on either a statistical test or a specified fixed control limit.

Discussion

There were no matrix spikes and matrix spike duplicate samples in the data package.

No qualifiers were assigned on this basis.

E. Field Replicate Sample Performance

Field replicates are given in the following table.

Table of field duplicate samples.

Client ID 1	Client ID 2	NAREL ID	Prep batch	SDG	QC type	Method
C2-SB2-7284-01	C2-SB2-7284-02	B6.04113Z	0013438M	1600015		NAREL ACT-02F-TH
C2-SB2-7284-01	C2-SB2-7284-02	B6.04113Z	0013438M	1600015	DUP	NAREL ACT-02F-TH
C2-SB2-7284-01	C2-SB2-7284-02	B6.04113Z	0013439N	1600015		NAREL ACT-02F-U
C2-SB2-7284-01	C2-SB2-7284-02	B6.04113Z	0013439N	1600015	DUP	NAREL ACT-02F-U
C2-SB2-7284-01	C2-SB2-7284-02	B6.04113Z	0013404B	1600015		NAREL GAM-01-RA
C3-SB1-3648-01	C3-SB1-3648-02	B6.04123B	0013451J	1600016		NAREL ACT-02F-TH
C3-SB1-3648-01	C3-SB1-3648-02	B6.04123B	0013452K	1600016		NAREL ACT-02F-U
C3-SB1-3648-01	C3-SB1-3648-02	B6.04123B	0013488Y	1600016		NAREL ACT-02F-U
C3-SB1-3648-01	C3-SB1-3648-02	B6.04123B	0013426H	1600016		NAREL GAM-01-RA

No criteria for field duplicates are given in the QAPP other than Worksheet 35, which states “Compare results of field duplicate (or replicate) analyses with RPD criteria.”

The relative percent differences (R%D) and duplicate error ratio (DER) were calculated for the field duplicate pairs of samples. The duplicate error ratio (DER) for the samples given below is high, suggesting that the soil may have been a difficult media to representatively sample in the field. An intermediate data qualifiers were assigned to regular samples / analytes associated with these field duplicate QA sample pair results A ‘P1” was assigned to associated samples if the field duplicate DER exceeded 1.96, but was less than 2.58. A “PP1” was assigned to associated samples if the DER exceeded 2.58. No sample results were rejected because of a high DER for an associated field duplicate, but such samples tended to be assigned a “J” final qualifier.

Table of relatively discrepant field replicate results.

Client ID 1	Client ID 2	Method	Analyte	Rel Diff (%)	DER
C2-SB2-7284-01	C2-SB2-7284-02	NAREL ACT-02F-TH	Th232	24.9	2.33

C2-SB2-7284-01	C2-SB2-7284-02	NAREL ACT-02F-U	U234	38.2	2.68
C3-SB1-3648-01	C3-SB1-3648-02	NAREL ACT-02F-TH	Th232	36.2	2.81

F. Rinse Blank Sample Performance

No rinse blank samples were submitted with this data package.

7. TEST OF DETECTION AND UNUSUAL UNCERTAINTY EVALUATION

A. Detection (MARLAP 8.5.3.1)

Detection qualifiers were assigned following the rationale described in Section 3.

Discussion

The following field samples carry an intermediate qualifier.

Table of field samples that carry a result qualifier.

Client ID	NAREL ID	Method	QC type	Analyte	Interim Qualifiers	Final Qualifier
C2-SB1-0012-01	B6.04104Y	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB1-0012-01	B6.04104Y	NAREL GAM-01-RA		Cs137	U,	U
C2-SB1-0012-01	B6.04104Y	NAREL GAM-01-RA		K40	B+,	J
C2-SB1-0012-01	B6.04104Y	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB1-0012-01	B6.04104Y	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB1-0012-01	B6.04104Y	NAREL ACT-02F-U		U235	J,	J
C2-SB1-0012-01	B6.04104Y	NAREL ACT-02F-U		U238	P, B+,	J
C2-SB1-0012-01	B6.04104Y	NAREL ACT-02F-U	DUP	U238	P, B+,	J
C2-SB1-4860-01	B6.04105Z	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB1-4860-01	B6.04105Z	NAREL GAM-01-RA		Cs137	U,	U
C2-SB1-4860-01	B6.04105Z	NAREL GAM-01-RA		K40	B+,	J
C2-SB1-4860-01	B6.04105Z	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB1-4860-01	B6.04105Z	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB1-4860-01	B6.04105Z	NAREL ACT-02F-U		U235	J,	J
C2-SB1-4860-01	B6.04105Z	NAREL ACT-02F-U		U238	P, B+,	J
C2-SB1-6072-01	B6.04106A	NAREL GAM-01-RA	DUP	Bi214	B+,	J
C2-SB1-6072-01	B6.04106A	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB1-6072-01	B6.04106A	NAREL GAM-01-RA		Cs137	U,	U
C2-SB1-6072-01	B6.04106A	NAREL GAM-01-RA	DUP	Cs137	U,	U
C2-SB1-6072-01	B6.04106A	NAREL GAM-01-RA		K40	B+,	J
C2-SB1-6072-01	B6.04106A	NAREL GAM-01-RA	DUP	K40	B+,	J
C2-SB1-6072-01	B6.04106A	NAREL GAM-01-RA	DUP	Pb214	B+,	J
C2-SB1-6072-01	B6.04106A	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB1-6072-01	B6.04106A	NAREL GAM-01-RA	DUP	Tl208	B+,	J
C2-SB1-6072-01	B6.04106A	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB1-6072-01	B6.04106A	NAREL ACT-02F-U		U235	U,	U
C2-SB1-6072-01	B6.04106A	NAREL ACT-02F-U		U238	P, B+,	J
C2-SB1-7284-01	B6.04107B	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB1-7284-01	B6.04107B	NAREL GAM-01-RA		Cs137	U,	U
C2-SB1-7284-01	B6.04107B	NAREL GAM-01-RA		K40	B+,	J
C2-SB1-7284-01	B6.04107B	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB1-7284-01	B6.04107B	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB1-7284-01	B6.04107B	NAREL ACT-02F-U		U238	P, B+,	J
C2-SB1-8496-01	B6.04108C	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB1-8496-01	B6.04108C	NAREL GAM-01-RA		Cs137	U,	U
C2-SB1-8496-01	B6.04108C	NAREL GAM-01-RA		K40	B+,	J

Client ID	NAREL ID	Method	QC type	Analyte	Interim Qualifiers	Final Qualifier
C2-SB1-8496-01	B6.04108C	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB1-8496-01	B6.04108C	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB1-8496-01	B6.04108C	NAREL ACT-02F-U		U238	P, B+,	J
C2-SB2-0012-01	B6.04109D	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB2-0012-01	B6.04109D	NAREL GAM-01-RA		K40	B+,	J
C2-SB2-0012-01	B6.04109D	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB2-0012-01	B6.04109D	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB2-0012-01	B6.04109D	NAREL ACT-02F-U		U235	U,	U
C2-SB2-0012-01	B6.04109D	NAREL ACT-02F-U		U238	P, B+,	J
C2-SB2-1224-01	B6.04110W	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB2-1224-01	B6.04110W	NAREL GAM-01-RA		K40	B+,	J
C2-SB2-1224-01	B6.04110W	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB2-1224-01	B6.04110W	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB2-1224-01	B6.04110W	NAREL ACT-02F-U		U235	U,	U
C2-SB2-1224-01	B6.04110W	NAREL ACT-02F-U		U238	P, B+,	J
C2-SB2-2436-01	B6.04111X	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB2-2436-01	B6.04111X	NAREL GAM-01-RA		K40	B+,	J
C2-SB2-2436-01	B6.04111X	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB2-2436-01	B6.04111X	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB2-2436-01	B6.04111X	NAREL ACT-02F-U		U238	P, B+,	J
C2-SB2-3648-01	B6.04112Y	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB2-3648-01	B6.04112Y	NAREL GAM-01-RA		K40	B+,	J
C2-SB2-3648-01	B6.04112Y	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB2-3648-01	B6.04112Y	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB2-3648-01	B6.04112Y	NAREL GAM-01-RA		U235	R	R
C2-SB2-3648-01	B6.04112Y	NAREL ACT-02F-U		U238	P, B+,	J
C2-SB2-7284-01	B6.04113Z	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB2-7284-01	B6.04113Z	NAREL GAM-01-RA		Cs137	U,	U
C2-SB2-7284-01	B6.04113Z	NAREL GAM-01-RA		K40	B+,	J
C2-SB2-7284-01	B6.04113Z	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB2-7284-01	B6.04113Z	NAREL ACT-02F-TH		Th228	B+,	J
C2-SB2-7284-01	B6.04113Z	NAREL ACT-02F-TH	DUP	Th228	B+,	J
C2-SB2-7284-01	B6.04113Z	NAREL ACT-02F-TH	DUP	Th232	P1,	J
C2-SB2-7284-01	B6.04113Z	NAREL ACT-02F-TH		Th232	P1,	J
C2-SB2-7284-01	B6.04113Z	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB2-7284-01	B6.04113Z	NAREL ACT-02F-U	DUP	U234	PP1,	J
C2-SB2-7284-01	B6.04113Z	NAREL ACT-02F-U		U234	PP1,	J
C2-SB2-7284-01	B6.04113Z	NAREL GAM-01-RA		U235	R	R
C2-SB2-7284-02	B6.04114A	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB2-7284-02	B6.04114A	NAREL GAM-01-RA		Cs137	U,	U
C2-SB2-7284-02	B6.04114A	NAREL GAM-01-RA		K40	B+,	J

Client ID	NAREL ID	Method	QC type	Analyte	Interim Qualifiers	Final Qualifier
C2-SB2-7284-02	B6.04114A	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB2-7284-02	B6.04114A	NAREL ACT-02F-TH		Th228	B+,	J
C2-SB2-7284-02	B6.04114A	NAREL ACT-02F-TH		Th232	P1,	J
C2-SB2-7284-02	B6.04114A	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB2-7284-02	B6.04114A	NAREL ACT-02F-U		U234	PP1,	J
C2-SB2-7284-02	B6.04114A	NAREL ACT-02F-U		U235	J,	J
C2-SB2-8496-01	B6.04115B	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB2-8496-01	B6.04115B	NAREL GAM-01-RA		Cs137	U,	U
C2-SB2-8496-01	B6.04115B	NAREL GAM-01-RA		K40	B+,	J
C2-SB2-8496-01	B6.04115B	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB2-8496-01	B6.04115B	NAREL ACT-02F-TH		Th228	B+,	J
C2-SB2-8496-01	B6.04115B	NAREL ACT-02F-TH		Th232	P1,	J
C2-SB2-8496-01	B6.04115B	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB2-8496-01	B6.04115B	NAREL ACT-02F-U		U234	PP1,	J
C2-SB2-8496-01	B6.04115B	NAREL ACT-02F-U		U235	U,	U
C2-SB3-0012-01	B6.04116C	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB3-0012-01	B6.04116C	NAREL GAM-01-RA		K40	B+,	J
C2-SB3-0012-01	B6.04116C	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB3-0012-01	B6.04116C	NAREL ACT-02F-TH		Th228	B+,	J
C2-SB3-0012-01	B6.04116C	NAREL ACT-02F-TH		Th232	P1,	J
C2-SB3-0012-01	B6.04116C	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB3-0012-01	B6.04116C	NAREL ACT-02F-U		U234	PP1,	J
C2-SB3-1224-01	B6.04117D	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB3-1224-01	B6.04117D	NAREL GAM-01-RA		K40	B+,	J
C2-SB3-1224-01	B6.04117D	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB3-1224-01	B6.04117D	NAREL ACT-02F-TH		Th228	B+,	J
C2-SB3-1224-01	B6.04117D	NAREL ACT-02F-TH		Th232	P1,	J
C2-SB3-1224-01	B6.04117D	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB3-1224-01	B6.04117D	NAREL ACT-02F-U		U234	PP1,	J
C2-SB3-4860-01	B6.04118E	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB3-4860-01	B6.04118E	NAREL GAM-01-RA		Cs137	U,	U
C2-SB3-4860-01	B6.04118E	NAREL GAM-01-RA		K40	B+,	J
C2-SB3-4860-01	B6.04118E	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB3-4860-01	B6.04118E	NAREL ACT-02F-TH		Th228	B+,	J
C2-SB3-4860-01	B6.04118E	NAREL ACT-02F-TH		Th232	P1,	J
C2-SB3-4860-01	B6.04118E	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB3-4860-01	B6.04118E	NAREL ACT-02F-U		U234	PP1,	J
C2-SB3-4860-01	B6.04118E	NAREL ACT-02F-U		U235	J,	J
C2-SB3-6072-01	B6.04119F	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB3-6072-01	B6.04119F	NAREL GAM-01-RA		Cs137	U,	U
C2-SB3-6072-01	B6.04119F	NAREL GAM-01-RA		K40	B+,	J

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C2-SB3-6072-01	B6.04119F	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB3-6072-01	B6.04119F	NAREL ACT-02F-TH		Th228	B+,	J
C2-SB3-6072-01	B6.04119F	NAREL ACT-02F-TH		Th232	P1,	J
C2-SB3-6072-01	B6.04119F	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB3-6072-01	B6.04119F	NAREL ACT-02F-U		U234	PP1,	J
C2-SB3-6072-01	B6.04119F	NAREL ACT-02F-U		U235	J,	J
C2-SB3-6072-01	B6.04119F	NAREL GAM-01-RA		U235	J, R	R
C2-SB3-7284-01	B6.04120Y	NAREL GAM-01-RA		Bi214	B+,	J
C2-SB3-7284-01	B6.04120Y	NAREL GAM-01-RA		Cs137	U,	U
C2-SB3-7284-01	B6.04120Y	NAREL GAM-01-RA		K40	B+,	J
C2-SB3-7284-01	B6.04120Y	NAREL GAM-01-RA		Pb214	B+,	J
C2-SB3-7284-01	B6.04120Y	NAREL ACT-02F-TH		Th228	B+,	J
C2-SB3-7284-01	B6.04120Y	NAREL ACT-02F-TH		Th232	P1,	J
C2-SB3-7284-01	B6.04120Y	NAREL GAM-01-RA		Tl208	B+,	J
C2-SB3-7284-01	B6.04120Y	NAREL ACT-02F-U		U234	PP1,	J
C2-SB3-7284-01	B6.04120Y	NAREL ACT-02F-U		U235	U,	U
C2-SB3-8496-01	B6.04121Z	NAREL GAM-01-RA		Cs137	U,	U
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-TH		Th227	S+,	J
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-TH	DUP	Th227	S+,	J
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-TH	DUP	Th228	B+, S+,	J
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-TH		Th228	B+, S+,	J
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-TH	DUP	Th230	S+,	J
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-TH		Th230	S+,	J
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-TH	DUP	Th232	PP1, S+,	J
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-U	DUP	U234	B+,	J
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-U		U234	B+,	J
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-U		U235	U,	U
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-U	DUP	U235	U,	U
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-U		U238	PP, B+,	J
C2-SB3-8496-01	B6.04121Z	NAREL ACT-02F-U	DUP	U238	PP, B+,	J
C3-SB10-0012-01	B6.04140C	NAREL GAM-01-RA		Cs137	J,	J
C3-SB10-0012-01	B6.04140C	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB10-0012-01	B6.04140C	NAREL ACT-02F-TH		Th227	B+,	J
C3-SB10-0012-01	B6.04140C	NAREL ACT-02F-TH		Th230	B+,	J
C3-SB10-0012-01	B6.04140C	NAREL ACT-02F-U		U234	B+,	J
C3-SB10-0012-01	B6.04140C	NAREL ACT-02F-U		U235	J,	J
C3-SB10-0012-01	B6.04140C	NAREL ACT-02F-U		U238	B+,	J
C3-SB1-0012-01	B6.04122A	NAREL GAM-01-RA		Cs137	U,	U
C3-SB1-0012-01	B6.04122A	NAREL ACT-02F-TH		Th227	S+,	J
C3-SB1-0012-01	B6.04122A	NAREL ACT-02F-TH		Th228	B+, S+,	J

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C3-SB1-0012-01	B6.04122A	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB1-0012-01	B6.04122A	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB1-0012-01	B6.04122A	NAREL ACT-02F-U		U234	B+,	J
C3-SB1-0012-01	B6.04122A	NAREL ACT-02F-U		U235	J,	J
C3-SB1-0012-01	B6.04122A	NAREL ACT-02F-U		U238	PP, B+,	J
C3-SB10-1224-01	B6.04141D	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB10-1224-01	B6.04141D	NAREL ACT-02F-TH		Th227	B+,	J
C3-SB10-1224-01	B6.04141D	NAREL ACT-02F-TH		Th230	B+,	J
C3-SB10-1224-01	B6.04141D	NAREL ACT-02F-U		U234	B+,	J
C3-SB10-1224-01	B6.04141D	NAREL GAM-01-RA		U235	R	R
C3-SB10-1224-01	B6.04141D	NAREL ACT-02F-U		U238	B+,	J
C3-SB10-6072-01	B6.04142E	NAREL GAM-01-RA		Cs137	U,	U
C3-SB10-6072-01	B6.04142E	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB10-6072-01	B6.04142E	NAREL ACT-02F-TH	DUP	Th227	B+,	J
C3-SB10-6072-01	B6.04142E	NAREL ACT-02F-TH		Th227	B+,	J
C3-SB10-6072-01	B6.04142E	NAREL ACT-02F-TH		Th230	B+,	J
C3-SB10-6072-01	B6.04142E	NAREL ACT-02F-TH	DUP	Th230	B+,	J
C3-SB10-6072-01	B6.04142E	NAREL ACT-02F-U	DUP	U234	B+,	J
C3-SB10-6072-01	B6.04142E	NAREL ACT-02F-U		U234	B+,	J
C3-SB10-6072-01	B6.04142E	NAREL GAM-01-RA		U235	R	R
C3-SB10-6072-01	B6.04142E	NAREL ACT-02F-U		U238	B+,	J
C3-SB10-6072-01	B6.04142E	NAREL ACT-02F-U	DUP	U238	B+,	J
C3-SB10-7284-01	B6.04143F	NAREL GAM-01-RA		Cs137	U,	U
C3-SB10-7284-01	B6.04143F	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB10-7284-01	B6.04143F	NAREL ACT-02F-TH		Th227	B+,	J
C3-SB10-7284-01	B6.04143F	NAREL ACT-02F-TH		Th230	B+,	J
C3-SB10-7284-01	B6.04143F	NAREL ACT-02F-U		U234	B+,	J
C3-SB10-7284-01	B6.04143F	NAREL GAM-01-RA		U235	R	R
C3-SB10-7284-01	B6.04143F	NAREL ACT-02F-U		U238	B+,	J
C3-SB10-8496-01	B6.04144G	NAREL GAM-01-RA		Cs137	U,	U
C3-SB10-8496-01	B6.04144G	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB10-8496-01	B6.04144G	NAREL ACT-02F-TH		Th227	B+,	J
C3-SB10-8496-01	B6.04144G	NAREL ACT-02F-TH		Th230	B+,	J
C3-SB10-8496-01	B6.04144G	NAREL ACT-02F-U		U234	B+,	J
C3-SB10-8496-01	B6.04144G	NAREL GAM-01-RA		U235	R	R
C3-SB10-8496-01	B6.04144G	NAREL ACT-02F-U		U238	B+,	J
C3-SB11-0012-01	B6.04145H	NAREL GAM-01-RA		Cs137	U,	U
C3-SB11-0012-01	B6.04145H	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB11-0012-01	B6.04145H	NAREL ACT-02F-U		U235	J,	J
C3-SB11-3648-01	B6.04146J	NAREL GAM-01-RA		Cs137	U,	U
C3-SB11-3648-01	B6.04146J	NAREL GAM-01-RA	DUP	Cs137	U,	U

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C3-SB11-3648-01	B6.04146J	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB11-3648-01	B6.04146J	NAREL GAM-01-RA	DUP	Pb210	B+,	J
C3-SB12-0012-01	B6.04147K	NAREL GAM-01-RA		Cs137	U,	U
C3-SB12-0012-01	B6.04147K	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB12-0012-01	B6.04147K	NAREL ACT-02F-U		U235	U,	U
C3-SB13-0012-01	B6.04148L	NAREL GAM-01-RA		Cs137	U,	U
C3-SB13-0012-01	B6.04148L	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB13-0012-01	B6.04148L	NAREL GAM-01-RA		U235	R	R
C3-SB13-0012-01	B6.04148L	NAREL ACT-02F-U		U235	J,	J
C3-SB13-1224-01	B6.04149M	NAREL GAM-01-RA		Cs137	U,	U
C3-SB13-1224-01	B6.04149M	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB13-1224-01	B6.04149M	NAREL ACT-02F-U		U235	J,	J
C3-SB1-3648-01	B6.04123B	NAREL GAM-01-RA		Cs137	U,	U
C3-SB1-3648-01	B6.04123B	NAREL ACT-02F-TH		Th227	S+,	J
C3-SB1-3648-01	B6.04123B	NAREL ACT-02F-TH		Th228	B+, S+,	J
C3-SB1-3648-01	B6.04123B	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB1-3648-01	B6.04123B	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB1-3648-01	B6.04123B	NAREL ACT-02F-U		U234	B+,	J
C3-SB1-3648-01	B6.04123B	NAREL ACT-02F-U		U235	J,	J
C3-SB1-3648-01	B6.04123B	NAREL ACT-02F-U		U238	PP, B+,	J
C3-SB1-3648-02	B6.04124C	NAREL GAM-01-RA	DUP	Cs137	U,	U
C3-SB1-3648-02	B6.04124C	NAREL GAM-01-RA		Cs137	U,	U
C3-SB1-3648-02	B6.04124C	NAREL ACT-02F-TH		Th227	J, S+,	J
C3-SB1-3648-02	B6.04124C	NAREL ACT-02F-TH		Th228	B+, S+,	J
C3-SB1-3648-02	B6.04124C	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB1-3648-02	B6.04124C	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB1-3648-02	B6.04124C	NAREL ACT-02F-U		U234	B+,	J
C3-SB1-3648-02	B6.04124C	NAREL ACT-02F-U		U235	J,	J
C3-SB1-3648-02	B6.04124C	NAREL ACT-02F-U		U235	J,	J
C3-SB1-3648-02	B6.04124C	NAREL ACT-02F-U		U238	PP, B+,	J
C3-SB14-0012-01	B6.04150E	NAREL GAM-01-RA		Cs137	J,	J
C3-SB14-0012-01	B6.04150E	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB14-0012-01	B6.04150E	NAREL GAM-01-RA		U235	J, R	R
C3-SB15-0012-01	B6.04151F	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB15-0012-01	B6.04151F	NAREL ACT-02F-U		U235	J,	J
C3-SB15-2436-01	B6.04152G	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB15-2436-01	B6.04152G	NAREL ACT-02F-U		U235	J,	J
C3-SB16-0012-01	B6.04153H	NAREL GAM-01-RA		Cs137	U,	U
C3-SB16-0012-01	B6.04153H	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB16-0012-01	B6.04153H	NAREL ACT-02F-U		U235	U,	U
C3-SB16-3648-01	B6.04154J	NAREL GAM-01-RA		Cs137	U,	U

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C3-SB16-3648-01	B6.04154J	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB16-3648-01	B6.04154J	NAREL ACT-02F-U		U235	U,	U
C3-SB2-0012-01	B6.04125D	NAREL GAM-01-RA		Cs137	U,	U
C3-SB2-0012-01	B6.04125D	NAREL ACT-02F-TH		Th227	S+,	J
C3-SB2-0012-01	B6.04125D	NAREL ACT-02F-TH		Th228	B+, S+,	J
C3-SB2-0012-01	B6.04125D	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB2-0012-01	B6.04125D	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB2-0012-01	B6.04125D	NAREL ACT-02F-U		U234	B+,	J
C3-SB2-0012-01	B6.04125D	NAREL ACT-02F-U		U235	J,	J
C3-SB2-0012-01	B6.04125D	NAREL ACT-02F-U		U238	PP, B+,	J
C3-SB2-1224-01	B6.04126E	NAREL GAM-01-RA		Cs137	J,	J
C3-SB2-1224-01	B6.04126E	NAREL ACT-02F-TH		Th227	J, S+,	J
C3-SB2-1224-01	B6.04126E	NAREL ACT-02F-TH		Th228	B+, S+,	J
C3-SB2-1224-01	B6.04126E	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB2-1224-01	B6.04126E	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB2-1224-01	B6.04126E	NAREL ACT-02F-U		U234	B+,	J
C3-SB2-1224-01	B6.04126E	NAREL ACT-02F-U		U235	J,	J
C3-SB2-1224-01	B6.04126E	NAREL ACT-02F-U		U235	J,	J
C3-SB2-1224-01	B6.04126E	NAREL ACT-02F-U		U238	PP, B+,	J
C3-SB3-0012-01	B6.04127F	NAREL GAM-01-RA		Cs137	U,	U
C3-SB3-0012-01	B6.04127F	NAREL ACT-02F-TH		Th227	S+,	J
C3-SB3-0012-01	B6.04127F	NAREL ACT-02F-TH		Th228	B+, S+,	J
C3-SB3-0012-01	B6.04127F	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB3-0012-01	B6.04127F	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB3-0012-01	B6.04127F	NAREL ACT-02F-U		U234	B+,	J
C3-SB3-0012-01	B6.04127F	NAREL ACT-02F-U		U235	U,	U
C3-SB3-0012-01	B6.04127F	NAREL ACT-02F-U		U235	U,	U
C3-SB3-0012-01	B6.04127F	NAREL ACT-02F-U		U238	PP, B+,	J
C3-SB3-1224-01	B6.04128G	NAREL ACT-02F-TH		Th227	S+,	J
C3-SB3-1224-01	B6.04128G	NAREL ACT-02F-TH		Th228	S+,	J
C3-SB3-1224-01	B6.04128G	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB3-1224-01	B6.04128G	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB3-1224-01	B6.04128G	NAREL ACT-02F-U		U235	J,	J
C3-SB3-1224-01	B6.04128G	NAREL ACT-02F-U		U235	J,	J
C3-SB3-1224-01	B6.04128G	NAREL ACT-02F-U		U238	PP,	J
C3-SB4-0012-01	B6.04129H	NAREL ACT-02F-TH		Th227	S+,	J
C3-SB4-0012-01	B6.04129H	NAREL ACT-02F-TH		Th228	S+,	J
C3-SB4-0012-01	B6.04129H	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB4-0012-01	B6.04129H	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB4-0012-01	B6.04129H	NAREL GAM-01-RA		U235	J, R	R
C3-SB4-0012-01	B6.04129H	NAREL ACT-02F-U		U238	PP,	J

Client ID	NAREL ID	Method	QC type	Analyte	Interim Qualifiers	Final Qualifier
C3-SB4-1224-01	B6.04130A	NAREL GAM-01-RA		Cs137	U,	U
C3-SB4-1224-01	B6.04130A	NAREL ACT-02F-TH		Th227	S+,	J
C3-SB4-1224-01	B6.04130A	NAREL ACT-02F-TH		Th228	S+,	J
C3-SB4-1224-01	B6.04130A	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB4-1224-01	B6.04130A	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB4-1224-01	B6.04130A	NAREL ACT-02F-U		U235	U,	U
C3-SB4-1224-01	B6.04130A	NAREL GAM-01-RA		U235	R	R
C3-SB4-1224-01	B6.04130A	NAREL ACT-02F-U		U235	U,	U
C3-SB4-1224-01	B6.04130A	NAREL ACT-02F-U		U238	PP,	J
C3-SB5-0012-01	B6.04131B	NAREL GAM-01-RA		Cs137	U,	U
C3-SB5-0012-01	B6.04131B	NAREL ACT-02F-TH		Th227	P, B+,	J
C3-SB5-0012-01	B6.04131B	NAREL ACT-02F-U		U235	U,	U
C3-SB5-0012-01	B6.04131B	NAREL ACT-02F-U		U238	PP,	J
C3-SB6-0012-01	B6.04132C	NAREL ACT-02F-TH		Th227	J, P, B+,	J
C3-SB6-0012-01	B6.04132C	NAREL ACT-02F-TH	DUP	Th227	P, B+,	J
C3-SB6-0012-01	B6.04132C	NAREL GAM-01-RA		Th234	U,	U
C3-SB6-0012-01	B6.04132C	NAREL ACT-02F-U		U235	U,	U
C3-SB6-0012-01	B6.04132C	NAREL ACT-02F-U		U235	J,	J
C3-SB6-0012-01	B6.04132C	NAREL ACT-02F-U		U238	PP,	J
C3-SB6-3648-01	B6.04133D	NAREL GAM-01-RA		Cs137	U,	U
C3-SB6-3648-01	B6.04133D	NAREL ACT-02F-TH		Th227	U, S+,	UJ
C3-SB6-3648-01	B6.04133D	NAREL ACT-02F-TH		Th228	S+,	J
C3-SB6-3648-01	B6.04133D	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB6-3648-01	B6.04133D	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB6-3648-01	B6.04133D	NAREL ACT-02F-U		U235	U,	U
C3-SB6-3648-01	B6.04133D	NAREL ACT-02F-U		U238	PP,	J
C3-SB7-0012-01	B6.04134E	NAREL GAM-01-RA		Cs137	U,	U
C3-SB7-0012-01	B6.04134E	NAREL ACT-02F-TH		Th227	P, B+,	J
C3-SB7-0012-01	B6.04134E	NAREL ACT-02F-U		U235	U,	U
C3-SB7-0012-01	B6.04134E	NAREL ACT-02F-U		U238	PP,	J
C3-SB7-3648-01	B6.04135F	NAREL GAM-01-RA		Cs137	U,	U
C3-SB7-3648-01	B6.04135F	NAREL ACT-02F-TH		Th227	U, S+,	UJ
C3-SB7-3648-01	B6.04135F	NAREL ACT-02F-TH		Th228	S+,	J
C3-SB7-3648-01	B6.04135F	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB7-3648-01	B6.04135F	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB7-3648-01	B6.04135F	NAREL ACT-02F-U		U238	PP,	J
C3-SB8-0012-01	B6.04136G	NAREL GAM-01-RA		Cs137	U,	U
C3-SB8-0012-01	B6.04136G	NAREL ACT-02F-TH		Th227	P, B+,	J
C3-SB8-0012-01	B6.04136G	NAREL ACT-02F-U		U235	J,	J
C3-SB8-0012-01	B6.04136G	NAREL ACT-02F-U		U238	PP,	J
C3-SB8-1224-01	B6.04137H	NAREL GAM-01-RA		Cs137	U,	U

Client ID	NAREL ID	Method	QC type	Analyte	Interim Qualifiers	Final Qualifier
C3-SB8-1224-01	B6.04137H	NAREL ACT-02F-TH		Th227	S+,	J
C3-SB8-1224-01	B6.04137H	NAREL ACT-02F-TH		Th228	S+,	J
C3-SB8-1224-01	B6.04137H	NAREL ACT-02F-TH		Th230	S+,	J
C3-SB8-1224-01	B6.04137H	NAREL ACT-02F-TH		Th232	PP1, S+,	J
C3-SB8-1224-01	B6.04137H	NAREL GAM-01-RA		Th234	U,	U
C3-SB8-1224-01	B6.04137H	NAREL ACT-02F-U		U235	J,	J
C3-SB8-1224-01	B6.04137H	NAREL ACT-02F-U		U238	PP,	J
C3-SB9-0012-01	B6.04138J	NAREL GAM-01-RA		Cs137	U,	U
C3-SB9-0012-01	B6.04138J	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB9-0012-01	B6.04138J	NAREL ACT-02F-TH		Th227	B+,	J
C3-SB9-0012-01	B6.04138J	NAREL ACT-02F-TH		Th230	B+,	J
C3-SB9-0012-01	B6.04138J	NAREL GAM-01-RA		Th234	J,	J
C3-SB9-0012-01	B6.04138J	NAREL ACT-02F-U		U234	B+,	J
C3-SB9-0012-01	B6.04138J	NAREL ACT-02F-U		U235	J,	J
C3-SB9-0012-01	B6.04138J	NAREL ACT-02F-U		U238	B+,	J
C3-SB9-1224-01	B6.04139K	NAREL GAM-01-RA		Cs137	U,	U
C3-SB9-1224-01	B6.04139K	NAREL GAM-01-RA		Pb210	B+,	J
C3-SB9-1224-01	B6.04139K	NAREL ACT-02F-TH		Th227	U, B+,	UJ
C3-SB9-1224-01	B6.04139K	NAREL ACT-02F-TH		Th230	B+,	J
C3-SB9-1224-01	B6.04139K	NAREL ACT-02F-U		U234	B+,	J
C3-SB9-1224-01	B6.04139K	NAREL ACT-02F-U		U235	J,	J
C3-SB9-1224-01	B6.04139K	NAREL ACT-02F-U		U238	B+,	J

B. Detection Capability (MARLAP 8.5.3.2)

If the project requires a certain detection capability, the requirement should be expressed as a required minimum detectable concentration (RMDC). A failure to meet the RMDC is more often an important issue when the analyte is not detected.

The RMDC is usually specified in the QAPP and is compared to the sample-specific MDC achieved by the method. Required detection limits are provided in the QAPP. Samples are qualified "UJ" where no activity was detected in a sample but the required detection limit was not attained.

Discussion

In practice the required MDC was sufficiently high that the actual detection limit was well below the required detection limit.

C. Large or Unusual Uncertainty (MARLAP 8.5.3.3)

The reported combined standard uncertainty is compared to the maximum allowable standard uncertainty. Either absolute (in concentration units) or relative uncertainties (expressed as a percent) are used in the comparison, depending on the reported concentration.

Discussion

No specific requirement in the project QAPP was recognized for qualifying results based on maximum allowable uncertainty**.** .

Samples were qualified as '***J***' if activity was found in the corresponding background or if the sample result was more than 1.645 times the total propagated uncertainty at one standard deviation, but less than the minimum detectable concentration. If the analytical result for a sample was greater than minimum detectable concentration, then no qualifier was ordinarily assigned unless some specific problem was identified. Samples were qualified as '***U***' if the sample result was less than 1.645 times the total propagated uncertainty at one standard deviation.

8. SUMMARY OF DATA USABILITY

There were a total of 1048 radionuclide results for field samples in this dataset. The meaning of each qualifier is described in section 3 of this report. The count of each final qualifier type for field samples is provided in the following table.

Table of the number of each of the various final data qualifiers.

Final Qualifier	Count Of Final Qualifier
	703
J	272
R	11
U	59
UJ	3

The distribution of qualifiers among field samples is further broken down in the following table.

Table of counts of various qualifiers by counting technique

Method	Description	Final Qualifier	Count Of Final Qualifier
NAREL ACT-02F-TH	Alpha Spectroscopy (Isotopic Thorium)		129
NAREL ACT-02F-TH	Alpha Spectroscopy (Isotopic Thorium)	J	92
NAREL ACT-02F-TH	Alpha Spectroscopy (Isotopic Thorium)	UJ	3
NAREL ACT-02F-U	Alpha Spectroscopy (Isotopic Uranium)		115
NAREL ACT-02F-U	Alpha Spectroscopy (Isotopic Uranium)	J	86
NAREL ACT-02F-U	Alpha Spectroscopy (Isotopic Uranium)	U	18
NAREL GAM-01-RA	Gamma Spectroscopy		459
NAREL GAM-01-RA	Gamma Spectroscopy	J	94
NAREL GAM-01-RA	Gamma Spectroscopy	R	11
NAREL GAM-01-RA	Gamma Spectroscopy	U	41

9. REFERENCES

SITE-SPECIFIC UFP QUALITY ASSURANCE PROJECT PLAN CANADIAN RADIUM AND URANIUM CORPORATION SITE, MOUNT KISCO, WESTCHESTER COUNTY, NEW YORK, DC No.: RST3-02-D-0010, TDD No.: TO-0006-0053. July 2015.

Multi-Agency Radiological Laboratory Analytical Protocols Manual, Volume I, NUREG-1576, EPA 402-B-04-001A, NTIS PB2004-105421, July 2004.

10. APPENDED DOCUMENTS

- Consolidated table of field analytical results with qualifiers (41 pages).
- Radiological Data Verification/Validation Checklist (2 pages).
- NAREL Data Reports and Transmittals (270 pages).

Canadian Radium Site

DCN RST3-03F-0013

NAREL data packages 1600015, 1600016, and 160001

Client Sample ID

Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
C2-SB1-0012-01								
NAREL ACT-02F-TH	Th227	1600015: B6.04104Y	0.1	0.05	0.02			PCI/GDRY
NAREL ACT-02F-TH	Th227	1600015: B6.04104Y	0.08	0.07	0.07			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600015: B6.04104Y	0.6	0.16	0.05			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600015: B6.04104Y	0.47	0.09	0.02			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600015: B6.04104Y	0.47	0.09	0.05			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600015: B6.04104Y	0.45	0.13	0.07			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600015: B6.04104Y	0.51	0.09	0.02			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600015: B6.04104Y	0.45	0.13	0.04			PCI/GDRY
NAREL ACT-02F-U	U234	1600015: B6.04104Y	0.53	0.1	0.02			PCI/GDRY
NAREL ACT-02F-U	U234	1600015: B6.04104Y	0.45	0.09	0.02			PCI/GDRY
NAREL ACT-02F-U	U235	1600015: B6.04104Y	0.04	0.03	0.02			PCI/GDRY
NAREL ACT-02F-U	U235	1600015: B6.04104Y	0.02	0.02	0.02	J,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600015: B6.04104Y	0.55	0.1	0.02	P, B+,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600015: B6.04104Y	0.41	0.08	0.02	P, B+,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600015: B6.04104Y	0.41	0.14	0.15			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600015: B6.04104Y	0.3	0.04	0.02	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Cs137	1600015: B6.04104Y	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600015: B6.04104Y	7.46	0.85	0.12	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb210	1600015: B6.04104Y	0.43	0.15	0.19			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600015: B6.04104Y	0.36	0.04	0.01			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600015: B6.04104Y	0.36	0.04	0.02	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Ra226	1600015: B6.04104Y	0.63	0.17	0.19			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600015: B6.04104Y	0.34	0.05	0.04			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Th234	1600015: B6.04104Y	0.28	0.14	0.19			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04104Y	0.1	0.01	0.01	B+,	J	PCI/GDRY
C2-SB1-4860-01									
	NAREL ACT-02F-TH	Th227	1600015: B6.04105Z	0.07	0.04	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04105Z	0.5	0.09	0.02			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600015: B6.04105Z	0.48	0.1	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600015: B6.04105Z	0.52	0.1	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04105Z	0.5	0.09	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600015: B6.04105Z	0.02	0.02	0.03	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04105Z	0.46	0.09	0.03	P, B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04105Z	0.66	0.13	0.12			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04105Z	0.67	0.08	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04105Z	-0.01	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04105Z	11.3	1.26	0.1	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04105Z	0.76	0.2	0.22			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04105Z	0.55	0.06	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04105Z	0.75	0.09	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04105Z	1.08	0.2	0.19			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600015: B6.04105Z	0.55	0.07	0.04			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04105Z	0.58	0.15	0.19			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04105Z	0.18	0.02	0.01	B+,	J	PCI/GDRY
C2-SB1-6072-01									
	NAREL ACT-02F-TH	Th227	1600015: B6.04106A	0.07	0.04	0.04			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04106A	0.63	0.11	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600015: B6.04106A	0.5	0.1	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600015: B6.04106A	0.59	0.11	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04106A	0.31	0.07	0.02			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL ACT-02F-U	U235	1600015: B6.04106A	0.01	0.02	0.03	U,	U	PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04106A	0.38	0.08	0.02	P, B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04106A	0.56	0.11	0.1			PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04106A	0.63	0.1	0.09			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04106A	0.76	0.09	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04106A	0.76	0.09	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04106A	-0.01	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04106A	0	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04106A	11.9	1.32	0.08	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04106A	12	1.32	0.06	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04106A	0.8	0.21	0.24			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04106A	0.85	0.18	0.2			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04106A	0.52	0.06	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04106A	0.52	0.06	0.01			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04106A	0.88	0.1	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04106A	0.88	0.1	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04106A	1.21	0.21	0.18			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04106A	1.16	0.18	0.16			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600015: B6.04106A	0.53	0.07	0.03			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600015: B6.04106A	0.53	0.06	0.02			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04106A	0.54	0.16	0.21			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04106A	0.43	0.14	0.2			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04106A	0.16	0.02	0.01	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04106A	0.16	0.02	0.01	B+,	J	PCI/GDRY
C2-SB1-7284-01									
	NAREL ACT-02F-TH	Th227	1600015: B6.04107B	0.12	0.06	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04107B	0.75	0.12	0.02			PCI/GDRY

Client Sample ID									
	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL ACT-02F-TH	Th230	1600015: B6.04107B	0.62	0.11	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600015: B6.04107B	0.71	0.12	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04107B	0.64	0.11	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600015: B6.04107B	0.03	0.03	0.03			PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04107B	0.64	0.11	0.02	P, B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04107B	0.93	0.16	0.12			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04107B	0.53	0.06	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04107B	-0.01	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04107B	11.4	1.27	0.08	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04107B	0.29	0.1	0.14			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04107B	0.79	0.09	0.01			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04107B	0.6	0.07	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04107B	1.2	0.21	0.19			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600015: B6.04107B	0.8	0.09	0.04			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04107B	0.58	0.14	0.18			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04107B	0.26	0.03	0.01	B+,	J	PCI/GDRY
C2-SB1-8496-01									
	NAREL ACT-02F-TH	Th227	1600015: B6.04108C	0.1	0.05	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04108C	0.74	0.12	0.02			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600015: B6.04108C	0.54	0.1	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600015: B6.04108C	0.71	0.11	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04108C	0.89	0.14	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600015: B6.04108C	0.05	0.03	0.02			PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04108C	0.92	0.14	0.02	P, B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04108C	0.92	0.13	0.09			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04108C	0.48	0.05	0.01	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04108C	0	0.01	0.01	U,	U	PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	K40	1600015: B6.04108C	12	1.33	0.06	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04108C	0.28	0.09	0.11			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04108C	0.81	0.09	0.01			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04108C	0.56	0.07	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04108C	1.19	0.18	0.16			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600015: B6.04108C	0.81	0.09	0.03			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04108C	0.78	0.13	0.15			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04108C	0.24	0.03	0.01	B+,	J	PCI/GDRY
C2-SB2-0012-01									
	NAREL ACT-02F-TH	Th227	1600015: B6.04109D	0.12	0.06	0.04			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04109D	0.54	0.11	0.04			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600015: B6.04109D	0.55	0.12	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600015: B6.04109D	0.42	0.09	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04109D	0.38	0.08	0.02			PCI/GDRY
	NAREL ACT-02F-U	U235	1600015: B6.04109D	0.01	0.01	0.02	U,	U	PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04109D	0.4	0.08	0.02	P, B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04109D	0.42	0.12	0.12			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04109D	0.36	0.04	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04109D	0.01	0.01	0.01			PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04109D	9.98	1.12	0.1	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04109D	0.48	0.12	0.15			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04109D	0.44	0.05	0.01			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04109D	0.42	0.05	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04109D	0.73	0.18	0.2			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600015: B6.04109D	0.46	0.06	0.04			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04109D	0.27	0.13	0.17			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04109D	0.14	0.02	0.01	B+,	J	PCI/GDRY

Client Sample ID / Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
C2-SB2-1224-01								
NAREL ACT-02F-TH	Th227	1600015: B6.04110W	0.12	0.05	0.02			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600015: B6.04110W	0.99	0.14	0.02			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600015: B6.04110W	1.08	0.15	0.05			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600015: B6.04110W	0.85	0.13	0.02			PCI/GDRY
NAREL ACT-02F-U	U234	1600015: B6.04110W	0.74	0.12	0.04			PCI/GDRY
NAREL ACT-02F-U	U235	1600015: B6.04110W	0.02	0.03	0.05	U,	U	PCI/GDRY
NAREL ACT-02F-U	U238	1600015: B6.04110W	0.71	0.12	0.04	P, B+,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600015: B6.04110W	1.32	0.27	0.23			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600015: B6.04110W	1.29	0.15	0.03	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Cs137	1600015: B6.04110W	0.05	0.01	0.01			PCI/GDRY
NAREL GAM-01-RA	K40	1600015: B6.04110W	15.5	1.73	0.14	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb210	1600015: B6.04110W	0.97	0.17	0.18			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600015: B6.04110W	1.31	0.15	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600015: B6.04110W	1.47	0.16	0.03	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Ra226	1600015: B6.04110W	2.23	0.34	0.29			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600015: B6.04110W	1.32	0.15	0.07			PCI/GDRY
NAREL GAM-01-RA	Th234	1600015: B6.04110W	0.68	0.18	0.24			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600015: B6.04110W	0.41	0.05	0.02	B+,	J	PCI/GDRY
C2-SB2-2436-01								
NAREL ACT-02F-TH	Th227	1600015: B6.04111X	0.11	0.05	0.03			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600015: B6.04111X	0.56	0.1	0.03			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600015: B6.04111X	0.93	0.15	0.06			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600015: B6.04111X	0.62	0.11	0.02			PCI/GDRY
NAREL ACT-02F-U	U234	1600015: B6.04111X	0.53	0.1	0.02			PCI/GDRY
NAREL ACT-02F-U	U235	1600015: B6.04111X	0.04	0.03	0.03			PCI/GDRY
NAREL ACT-02F-U	U238	1600015: B6.04111X	0.64	0.11	0.02	P, B+,	J	PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Bi212	1600015: B6.04111X	0.79	0.16	0.15			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04111X	1.64	0.18	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04111X	0.04	0.01	0.01			PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04111X	13.2	1.46	0.1	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04111X	2.11	0.31	0.27			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04111X	0.73	0.08	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04111X	1.89	0.21	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04111X	2.57	0.34	0.23			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600015: B6.04111X	0.73	0.09	0.05			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04111X	0.72	0.18	0.26			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04111X	0.22	0.03	0.01	B+,	J	PCI/GDRY
C2-SB2-3648-01									
	NAREL ACT-02F-TH	Th227	1600015: B6.04112Y	0.14	0.06	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04112Y	0.89	0.14	0.02			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600015: B6.04112Y	1.57	0.21	0.05			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600015: B6.04112Y	0.76	0.12	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04112Y	0.57	0.1	0.02			PCI/GDRY
	NAREL ACT-02F-U	U235	1600015: B6.04112Y	0.03	0.03	0.03			PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04112Y	0.64	0.11	0.02	P, B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04112Y	0.97	0.16	0.15			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04112Y	4.5	0.49	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04112Y	0.07	0.01	0.01			PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04112Y	12.2	1.35	0.13	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04112Y	8.99	1.1	0.44			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04112Y	0.9	0.1	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04112Y	5.07	0.56	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04112Y	5.84	0.7	0.32			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Ra228	1600015: B6.04112Y	0.91	0.11	0.05			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04112Y	0.61	0.27	0.39			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04112Y	0.28	0.03	0.01	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	U235	1600015: B6.04112Y	0.09	0.05	0.08	R	R	PCI/GDRY
C2-SB2-7284-01									
	NAREL ACT-02F-TH	Th227	1600015: B6.04113Z	0.1	0.05	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th227	1600015: B6.04113Z	0.08	0.05	0.04			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04113Z	1.11	0.17	0.03	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04113Z	0.96	0.14	0.03	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600015: B6.04113Z	0.74	0.12	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600015: B6.04113Z	0.68	0.12	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600015: B6.04113Z	1.01	0.16	0.02	P1,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600015: B6.04113Z	0.87	0.14	0.02	P1,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04113Z	0.71	0.15	0.03	PP1,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04113Z	0.53	0.12	0.04	PP1,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600015: B6.04113Z	0.04	0.03	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600015: B6.04113Z	0.04	0.04	0.03			PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04113Z	0.64	0.14	0.04			PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04113Z	0.64	0.13	0.03			PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04113Z	1.09	0.19	0.16			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04113Z	0.77	0.09	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04113Z	0	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04113Z	14.1	1.56	0.1	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04113Z	0.84	0.18	0.23			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04113Z	1.02	0.11	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04113Z	0.88	0.1	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04113Z	1.67	0.25	0.21			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Ra228	1600015: B6.04113Z	0.99	0.12	0.05			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04113Z	0.81	0.18	0.24			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04113Z	0.32	0.04	0.01	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	U235	1600015: B6.04113Z	0.06	0.04	0.06	R	R	PCI/GDRY
C2-SB2-7284-02									
	NAREL ACT-02F-TH	Th227	1600015: B6.04114A	0.15	0.06	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04114A	1.09	0.16	0.02	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600015: B6.04114A	0.64	0.12	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600015: B6.04114A	1.12	0.16	0.02	P1,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04114A	0.78	0.14	0.04	PP1,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600015: B6.04114A	0.03	0.03	0.04	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04114A	0.73	0.14	0.04			PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04114A	0.97	0.15	0.12			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04114A	0.71	0.08	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04114A	0	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04114A	13.4	1.48	0.09	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04114A	0.77	0.22	0.28			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04114A	0.94	0.11	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04114A	0.83	0.09	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04114A	1.5	0.23	0.2			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600015: B6.04114A	0.98	0.11	0.03			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04114A	0.87	0.21	0.27			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04114A	0.3	0.03	0.01	B+,	J	PCI/GDRY
C2-SB2-8496-01									
	NAREL ACT-02F-TH	Th227	1600015: B6.04115B	0.1	0.05	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04115B	0.76	0.12	0.03	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600015: B6.04115B	0.61	0.11	0.06			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL ACT-02F-TH	Th232	1600015: B6.04115B	0.74	0.12	0.02	P1,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04115B	0.62	0.14	0.04	PP1,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600015: B6.04115B	0.01	0.03	0.06	U,	U	PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04115B	0.62	0.14	0.03			PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04115B	0.93	0.15	0.11			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04115B	0.51	0.06	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04115B	0	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04115B	11.9	1.32	0.08	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04115B	0.51	0.17	0.23			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04115B	0.8	0.09	0.01			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04115B	0.57	0.07	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04115B	0.94	0.18	0.18			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600015: B6.04115B	0.79	0.09	0.03			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04115B	0.52	0.17	0.23			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04115B	0.26	0.03	0.01	B+,	J	PCI/GDRY
C2-SB3-0012-01									
	NAREL ACT-02F-TH	Th227	1600015: B6.04116C	0.12	0.05	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04116C	3.73	0.42	0.03	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600015: B6.04116C	1.08	0.16	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600015: B6.04116C	3.83	0.43	0.02	P1,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04116C	0.79	0.14	0.04	PP1,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600015: B6.04116C	0.05	0.04	0.04			PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04116C	0.8	0.14	0.03			PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04116C	0.78	0.17	0.14			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04116C	0.97	0.11	0.03	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04116C	0.16	0.02	0.01			PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04116C	11	1.23	0.12	B+,	J	PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Pb210	1600015: B6.04116C	1.34	0.19	0.16			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04116C	0.76	0.09	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04116C	1.11	0.13	0.03	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04116C	1.71	0.29	0.24			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600015: B6.04116C	0.7	0.09	0.05			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04116C	0.68	0.17	0.2			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04116C	0.22	0.03	0.01	B+,	J	PCI/GDRY
C2-SB3-1224-01									
	NAREL ACT-02F-TH	Th227	1600015: B6.04117D	0.11	0.05	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600015: B6.04117D	0.75	0.12	0.03	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600015: B6.04117D	1	0.15	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600015: B6.04117D	0.88	0.14	0.02	P1,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600015: B6.04117D	0.56	0.11	0.03	PP1,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600015: B6.04117D	0.03	0.03	0.03			PCI/GDRY
	NAREL ACT-02F-U	U238	1600015: B6.04117D	0.6	0.12	0.03			PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600015: B6.04117D	0.96	0.14	0.1			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600015: B6.04117D	1.3	0.14	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600015: B6.04117D	0.09	0.01	0.01			PCI/GDRY
	NAREL GAM-01-RA	K40	1600015: B6.04117D	12.9	1.42	0.06	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600015: B6.04117D	1.27	0.24	0.25			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600015: B6.04117D	0.85	0.1	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600015: B6.04117D	1.46	0.16	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600015: B6.04117D	2.02	0.28	0.21			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600015: B6.04117D	0.82	0.09	0.03			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04117D	0.68	0.18	0.25			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04117D	0.26	0.03	0.01	B+,	J	PCI/GDRY
C2-SB3-4860-01									

Client Sample ID								
Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL ACT-02F-TH	Th227	1600015: B6.04118E	0.15	0.06	0.03			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600015: B6.04118E	0.85	0.13	0.03	B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th230	1600015: B6.04118E	1.32	0.18	0.05			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600015: B6.04118E	0.77	0.12	0.01	P1,	J	PCI/GDRY
NAREL ACT-02F-U	U234	1600015: B6.04118E	0.67	0.13	0.03	PP1,	J	PCI/GDRY
NAREL ACT-02F-U	U235	1600015: B6.04118E	0.03	0.03	0.03	J,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600015: B6.04118E	0.7	0.13	0.03			PCI/GDRY
NAREL GAM-01-RA	Bi212	1600015: B6.04118E	0.85	0.18	0.17			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600015: B6.04118E	1.78	0.2	0.02	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Cs137	1600015: B6.04118E	-0.01	0.01	0.02	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600015: B6.04118E	10.8	1.21	0.12	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb210	1600015: B6.04118E	1.84	0.23	0.14			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600015: B6.04118E	0.78	0.09	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600015: B6.04118E	2.03	0.22	0.03	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Ra226	1600015: B6.04118E	2.69	0.36	0.25			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600015: B6.04118E	0.79	0.1	0.05			PCI/GDRY
NAREL GAM-01-RA	Th234	1600015: B6.04118E	0.53	0.13	0.19			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600015: B6.04118E	0.24	0.03	0.01	B+,	J	PCI/GDRY
C2-SB3-6072-01								
NAREL ACT-02F-TH	Th227	1600015: B6.04119F	0.09	0.04	0.02			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600015: B6.04119F	0.86	0.12	0.02	B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th230	1600015: B6.04119F	0.72	0.11	0.05			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600015: B6.04119F	0.94	0.13	0.01	P1,	J	PCI/GDRY
NAREL ACT-02F-U	U234	1600015: B6.04119F	0.96	0.16	0.04	PP1,	J	PCI/GDRY
NAREL ACT-02F-U	U235	1600015: B6.04119F	0.04	0.04	0.06	J,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600015: B6.04119F	0.81	0.14	0.05			PCI/GDRY
NAREL GAM-01-RA	Bi212	1600015: B6.04119F	1.12	0.17	0.13			PCI/GDRY

Client Sample ID								
Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL GAM-01-RA	Bi214	1600015: B6.04119F	0.59	0.07	0.02	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Cs137	1600015: B6.04119F	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600015: B6.04119F	9.5	1.06	0.1	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb210	1600015: B6.04119F	0.55	0.13	0.16			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600015: B6.04119F	1.04	0.12	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600015: B6.04119F	0.74	0.08	0.02	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Ra226	1600015: B6.04119F	1.47	0.24	0.22			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600015: B6.04119F	0.99	0.11	0.03			PCI/GDRY
NAREL GAM-01-RA	Th234	1600015: B6.04119F	0.82	0.18	0.21			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600015: B6.04119F	0.31	0.04	0.01	B+,	J	PCI/GDRY
NAREL GAM-01-RA	U235	1600015: B6.04119F	0.04	0.04	0.06	J, R	R	PCI/GDRY
C2-SB3-7284-01								
NAREL ACT-02F-TH	Th227	1600015: B6.04120Y	0.16	0.06	0.03			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600015: B6.04120Y	0.82	0.13	0.03	B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th230	1600015: B6.04120Y	0.74	0.12	0.06			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600015: B6.04120Y	0.73	0.12	0.02	P1,	J	PCI/GDRY
NAREL ACT-02F-U	U234	1600015: B6.04120Y	1	0.17	0.02	PP1,	J	PCI/GDRY
NAREL ACT-02F-U	U235	1600015: B6.04120Y	0.01	0.02	0.04	U,	U	PCI/GDRY
NAREL ACT-02F-U	U238	1600015: B6.04120Y	0.87	0.16	0.02			PCI/GDRY
NAREL GAM-01-RA	Bi212	1600015: B6.04120Y	0.94	0.15	0.12			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600015: B6.04120Y	0.56	0.06	0.02	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Cs137	1600015: B6.04120Y	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600015: B6.04120Y	14.3	1.58	0.09	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb210	1600015: B6.04120Y	0.32	0.1	0.13			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600015: B6.04120Y	0.85	0.09	0.01			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600015: B6.04120Y	0.6	0.07	0.02	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Ra226	1600015: B6.04120Y	1.37	0.21	0.19			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Ra228	1600015: B6.04120Y	0.93	0.11	0.03			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600015: B6.04120Y	0.55	0.14	0.18			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600015: B6.04120Y	0.27	0.03	0.01	B+,	J	PCI/GDRY
C2-SB3-8496-01									
	NAREL ACT-02F-TH	Th227	1600016: B6.04121Z	0.06	0.04	0.03	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th227	1600016: B6.04121Z	0.05	0.04	0.03	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04121Z	1.08	0.16	0.02	B+, S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04121Z	1.03	0.15	0.02	B+, S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04121Z	0.77	0.13	0.05	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04121Z	0.95	0.14	0.06	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04121Z	0.91	0.14	0.02	PP1, S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04121Z	1.03	0.15	0.02	PP1, S+,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04121Z	0.75	0.14	0.03			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04121Z	0.82	0.15	0.03			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04121Z	0.76	0.13	0.04	B+,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04121Z	0.75	0.14	0.02	B+,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04121Z	0.04	0.03	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04121Z	0.05	0.03	0.04			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04121Z	0.01	0.02	0.03	U,	U	PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04121Z	0.02	0.02	0.03	U,	U	PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04121Z	0.84	0.15	0.03			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04121Z	0.8	0.14	0.03			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04121Z	0.96	0.15	0.03	PP, B+,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04121Z	0.65	0.12	0.03	PP, B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600016: B6.04121Z	1.13	0.19	0.16			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600016: B6.04121Z	0.71	0.08	0.02			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600016: B6.04121Z	0	0.01	0.01	U,	U	PCI/GDRY

Client Sample ID

Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL GAM-01-RA	K40	1600016: B6.04121Z	15	1.66	0.1			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600016: B6.04121Z	0.48	0.11	0.14			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600016: B6.04121Z	1.01	0.11	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600016: B6.04121Z	0.82	0.09	0.02			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600016: B6.04121Z	1.5	0.23	0.22			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600016: B6.04121Z	1.02	0.12	0.05			PCI/GDRY
NAREL GAM-01-RA	Th234	1600016: B6.04121Z	0.6	0.14	0.19			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600016: B6.04121Z	0.32	0.04	0.02			PCI/GDRY
C3-SB10-0012-01								
NAREL ACT-02F-TH	Th227	1600017: B6.04140C	0.08	0.04	0.03	B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th228	1600017: B6.04140C	0.46	0.08	0.03			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600017: B6.04140C	0.44	0.08	0.05	B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th232	1600017: B6.04140C	0.54	0.09	0.02			PCI/GDRY
NAREL ACT-02F-U	U234	1600017: B6.04140C	0.39	0.07	0.02	B+,	J	PCI/GDRY
NAREL ACT-02F-U	U235	1600017: B6.04140C	0.01	0.02	0.02	J,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600017: B6.04140C	0.49	0.08	0.02	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600017: B6.04140C	0.57	0.11	0.1			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600017: B6.04140C	0.36	0.04	0.02			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600017: B6.04140C	0.01	0.01	0.01	J,	J	PCI/GDRY
NAREL GAM-01-RA	K40	1600017: B6.04140C	9.23	1.03	0.06			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600017: B6.04140C	1.48	0.23	0.19	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb212	1600017: B6.04140C	0.52	0.06	0.01			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600017: B6.04140C	0.43	0.05	0.02			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600017: B6.04140C	0.7	0.13	0.14			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600017: B6.04140C	0.55	0.06	0.03			PCI/GDRY
NAREL GAM-01-RA	Th234	1600017: B6.04140C	0.46	0.13	0.17			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600017: B6.04140C	0.17	0.02	0.01			PCI/GDRY

Client Sample ID / Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
C3-SB1-0012-01								
NAREL ACT-02F-TH	Th227	1600016: B6.04122A	0.05	0.04	0.03	S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th228	1600016: B6.04122A	0.98	0.16	0.02	B+, S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th230	1600016: B6.04122A	0.5	0.11	0.06	S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th232	1600016: B6.04122A	0.99	0.16	0.02	PP1, S+,	J	PCI/GDRY
NAREL ACT-02F-U	U234	1600016: B6.04122A	0.64	0.11	0.02			PCI/GDRY
NAREL ACT-02F-U	U234	1600016: B6.04122A	0.6	0.12	0.05	B+,	J	PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04122A	0.04	0.03	0.02			PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04122A	0.04	0.03	0.04	J,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04122A	0.62	0.11	0.02			PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04122A	0.63	0.12	0.04	PP, B+,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600016: B6.04122A	1.2	0.24	0.2			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600016: B6.04122A	0.53	0.07	0.03			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600016: B6.04122A	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600016: B6.04122A	13.6	1.53	0.16			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600016: B6.04122A	0.59	0.22	0.27			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600016: B6.04122A	1.18	0.13	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600016: B6.04122A	0.65	0.08	0.03			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600016: B6.04122A	1.1	0.27	0.28			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600016: B6.04122A	1.16	0.14	0.05			PCI/GDRY
NAREL GAM-01-RA	Th234	1600016: B6.04122A	0.54	0.22	0.3			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600016: B6.04122A	0.34	0.04	0.01			PCI/GDRY
C3-SB10-1224-01								
NAREL ACT-02F-TH	Th227	1600017: B6.04141D	0.7	0.15	0.03	B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th228	1600017: B6.04141D	0.86	0.13	0.02			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600017: B6.04141D	15	1.52	0.05	B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th232	1600017: B6.04141D	0.91	0.14	0.02			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL ACT-02F-U	U234	1600017: B6.04141D	0.63	0.1	0.02	B+,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600017: B6.04141D	0.04	0.02	0.02			PCI/GDRY
	NAREL ACT-02F-U	U238	1600017: B6.04141D	0.72	0.11	0.02	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600017: B6.04141D	1.09	0.26	0.3			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600017: B6.04141D	26.5	2.9	0.04			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600017: B6.04141D	0.07	0.02	0.02			PCI/GDRY
	NAREL GAM-01-RA	K40	1600017: B6.04141D	13.1	1.48	0.29			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600017: B6.04141D	32.7	3.81	0.58	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600017: B6.04141D	0.85	0.1	0.05			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600017: B6.04141D	30	3.29	0.05			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600017: B6.04141D	35.2	3.92	0.69			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600017: B6.04141D	0.87	0.12	0.12			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600017: B6.04141D	0.78	0.43	0.67			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600017: B6.04141D	0.26	0.03	0.03			PCI/GDRY
	NAREL GAM-01-RA	U235	1600017: B6.04141D	0.3	0.12	0.18	R	R	PCI/GDRY
C3-SB10-6072-01									
	NAREL ACT-02F-TH	Th227	1600017: B6.04142E	0.28	0.08	0.03	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th227	1600017: B6.04142E	0.25	0.07	0.03	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600017: B6.04142E	1.79	0.21	0.02			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600017: B6.04142E	1.67	0.22	0.02			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600017: B6.04142E	4.24	0.47	0.05	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600017: B6.04142E	4.46	0.46	0.05	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600017: B6.04142E	1.56	0.2	0.02			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600017: B6.04142E	1.67	0.2	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600017: B6.04142E	1.34	0.17	0.02	B+,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600017: B6.04142E	1.38	0.17	0.02	B+,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600017: B6.04142E	0.07	0.03	0.02			PCI/GDRY

Client Sample ID								
Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL ACT-02F-U	U235	1600017: B6.04142E	0.05	0.03	0.02			PCI/GDRY
NAREL ACT-02F-U	U238	1600017: B6.04142E	1.35	0.17	0.02	B+,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600017: B6.04142E	1.33	0.17	0.02	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600017: B6.04142E	1.89	0.3	0.23			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600017: B6.04142E	5.03	0.55	0.03			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600017: B6.04142E	0.01	0.01	0.02	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600017: B6.04142E	11.3	1.27	0.18			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600017: B6.04142E	4.27	0.51	0.2	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb212	1600017: B6.04142E	1.6	0.18	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600017: B6.04142E	5.85	0.64	0.04			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600017: B6.04142E	7.41	0.88	0.36			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600017: B6.04142E	1.61	0.18	0.06			PCI/GDRY
NAREL GAM-01-RA	Th234	1600017: B6.04142E	0.9	0.22	0.29			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600017: B6.04142E	0.49	0.06	0.02			PCI/GDRY
NAREL GAM-01-RA	U235	1600017: B6.04142E	0.14	0.06	0.08	R	R	PCI/GDRY
C3-SB10-7284-01								
NAREL ACT-02F-TH	Th227	1600017: B6.04143F	0.26	0.09	0.04	B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th228	1600017: B6.04143F	2.35	0.32	0.03			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600017: B6.04143F	3.98	0.5	0.05	B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th232	1600017: B6.04143F	2.38	0.32	0.03			PCI/GDRY
NAREL ACT-02F-U	U234	1600017: B6.04143F	1.74	0.2	0.02	B+,	J	PCI/GDRY
NAREL ACT-02F-U	U235	1600017: B6.04143F	0.08	0.03	0.02			PCI/GDRY
NAREL ACT-02F-U	U238	1600017: B6.04143F	1.85	0.22	0.02	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600017: B6.04143F	3.48	0.49	0.28			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600017: B6.04143F	3.21	0.36	0.04			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600017: B6.04143F	-0.01	0.02	0.02	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600017: B6.04143F	9.59	1.09	0.19			PCI/GDRY

Client Sample ID								
Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL GAM-01-RA	Pb210	1600017: B6.04143F	2.84	0.37	0.27	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb212	1600017: B6.04143F	3.42	0.38	0.04			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600017: B6.04143F	3.81	0.42	0.05			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600017: B6.04143F	5.16	0.68	0.41			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600017: B6.04143F	3.28	0.36	0.06			PCI/GDRY
NAREL GAM-01-RA	Th234	1600017: B6.04143F	1.79	0.39	0.41			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600017: B6.04143F	0.99	0.11	0.02			PCI/GDRY
NAREL GAM-01-RA	U235	1600017: B6.04143F	0.18	0.07	0.1	R	R	PCI/GDRY
C3-SB10-8496-01								
NAREL ACT-02F-TH	Th227	1600017: B6.04144G	0.13	0.06	0.04	B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th228	1600017: B6.04144G	1.06	0.16	0.02			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600017: B6.04144G	1.13	0.16	0.06	B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th232	1600017: B6.04144G	1.22	0.17	0.02			PCI/GDRY
NAREL ACT-02F-U	U234	1600017: B6.04144G	1.41	0.18	0.02	B+,	J	PCI/GDRY
NAREL ACT-02F-U	U235	1600017: B6.04144G	0.08	0.04	0.02			PCI/GDRY
NAREL ACT-02F-U	U238	1600017: B6.04144G	1.44	0.18	0.01	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600017: B6.04144G	1.17	0.16	0.1			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600017: B6.04144G	0.98	0.11	0.02			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600017: B6.04144G	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600017: B6.04144G	13.4	1.49	0.07			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600017: B6.04144G	0.63	0.13	0.14	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb212	1600017: B6.04144G	1.16	0.13	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600017: B6.04144G	1.13	0.13	0.02			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600017: B6.04144G	2.28	0.31	0.21			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600017: B6.04144G	1.16	0.13	0.03			PCI/GDRY
NAREL GAM-01-RA	Th234	1600017: B6.04144G	1.28	0.18	0.18			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600017: B6.04144G	0.36	0.04	0.01			PCI/GDRY

Client Sample ID								
Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL GAM-01-RA	U235	1600017: B6.04144G	0.1	0.04	0.06	R	R	PCI/GDRY
C3-SB11-0012-01								
NAREL ACT-02F-TH	Th227	1600017: B6.04145H	0.15	0.09	0.06			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600017: B6.04145H	1.04	0.21	0.04			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600017: B6.04145H	0.79	0.18	0.08			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600017: B6.04145H	0.85	0.19	0.04			PCI/GDRY
NAREL ACT-02F-U	U234	1600017: B6.04145H	0.84	0.14	0.02			PCI/GDRY
NAREL ACT-02F-U	U235	1600017: B6.04145H	0.02	0.02	0.03	J,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600017: B6.04145H	0.81	0.14	0.03			PCI/GDRY
NAREL GAM-01-RA	Bi212	1600017: B6.04145H	0.99	0.21	0.18			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600017: B6.04145H	0.58	0.07	0.03			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600017: B6.04145H	-0.01	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600017: B6.04145H	20.8	2.31	0.14			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600017: B6.04145H	0.58	0.19	0.24	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb212	1600017: B6.04145H	1.03	0.12	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600017: B6.04145H	0.68	0.08	0.03			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600017: B6.04145H	1.13	0.25	0.25			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600017: B6.04145H	0.98	0.12	0.05			PCI/GDRY
NAREL GAM-01-RA	Th234	1600017: B6.04145H	0.73	0.21	0.28			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600017: B6.04145H	0.3	0.04	0.01			PCI/GDRY
C3-SB11-3648-01								
NAREL ACT-02F-TH	Th227	1600017: B6.04146J	0.1	0.05	0.03			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600017: B6.04146J	0.69	0.11	0.02			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600017: B6.04146J	0.44	0.09	0.06			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600017: B6.04146J	0.7	0.11	0.02			PCI/GDRY
NAREL ACT-02F-U	U234	1600017: B6.04146J	0.48	0.11	0.03			PCI/GDRY
NAREL ACT-02F-U	U235	1600017: B6.04146J	0.03	0.03	0.03			PCI/GDRY

Client Sample ID

Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL ACT-02F-U	U238	1600017: B6.04146J	0.48	0.11	0.04			PCI/GDRY
NAREL GAM-01-RA	Bi212	1600017: B6.04146J	0.94	0.17	0.15			PCI/GDRY
NAREL GAM-01-RA	Bi212	1600017: B6.04146J	1.01	0.17	0.14			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600017: B6.04146J	0.43	0.05	0.02			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600017: B6.04146J	0.44	0.05	0.02			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600017: B6.04146J	-0.01	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	Cs137	1600017: B6.04146J	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600017: B6.04146J	14.6	1.62	0.11			PCI/GDRY
NAREL GAM-01-RA	K40	1600017: B6.04146J	14.7	1.63	0.09			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600017: B6.04146J	0.69	0.18	0.24	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb210	1600017: B6.04146J	0.69	0.16	0.21	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb212	1600017: B6.04146J	0.84	0.1	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600017: B6.04146J	0.83	0.09	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600017: B6.04146J	0.51	0.06	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600017: B6.04146J	0.5	0.06	0.02			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600017: B6.04146J	0.84	0.16	0.18			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600017: B6.04146J	1	0.19	0.2			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600017: B6.04146J	0.88	0.1	0.05			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600017: B6.04146J	0.84	0.1	0.05			PCI/GDRY
NAREL GAM-01-RA	Th234	1600017: B6.04146J	0.54	0.17	0.24			PCI/GDRY
NAREL GAM-01-RA	Th234	1600017: B6.04146J	0.57	0.14	0.2			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600017: B6.04146J	0.27	0.03	0.01			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600017: B6.04146J	0.26	0.03	0.01			PCI/GDRY
C3-SB12-0012-01								
NAREL ACT-02F-TH	Th227	1600017: B6.04147K	0.13	0.05	0.03			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600017: B6.04147K	0.4	0.08	0.02			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600017: B6.04147K	0.36	0.08	0.05			PCI/GDRY

Client Sample ID								
Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL ACT-02F-TH	Th232	1600017: B6.04147K	0.46	0.08	0.02			PCI/GDRY
NAREL ACT-02F-U	U234	1600017: B6.04147K	0.37	0.07	0.02			PCI/GDRY
NAREL ACT-02F-U	U235	1600017: B6.04147K	0.01	0.01	0.02	U,	U	PCI/GDRY
NAREL ACT-02F-U	U238	1600017: B6.04147K	0.34	0.07	0.01			PCI/GDRY
NAREL GAM-01-RA	Bi212	1600017: B6.04147K	0.47	0.19	0.2			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600017: B6.04147K	0.35	0.05	0.03			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600017: B6.04147K	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600017: B6.04147K	11.1	1.25	0.16			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600017: B6.04147K	0.43	0.13	0.17	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb212	1600017: B6.04147K	0.47	0.06	0.03			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600017: B6.04147K	0.4	0.06	0.03			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600017: B6.04147K	0.67	0.23	0.24			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600017: B6.04147K	0.45	0.07	0.06			PCI/GDRY
NAREL GAM-01-RA	Th234	1600017: B6.04147K	0.51	0.22	0.24			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600017: B6.04147K	0.14	0.02	0.02			PCI/GDRY
C3-SB13-0012-01								
NAREL ACT-02F-TH	Th227	1600017: B6.04148L	0.06	0.04	0.04			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600017: B6.04148L	0.51	0.11	0.03			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600017: B6.04148L	0.53	0.12	0.06			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600017: B6.04148L	0.58	0.12	0.03			PCI/GDRY
NAREL ACT-02F-U	U234	1600017: B6.04148L	0.41	0.09	0.03			PCI/GDRY
NAREL ACT-02F-U	U235	1600017: B6.04148L	0.03	0.03	0.03	J,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600017: B6.04148L	0.41	0.09	0.03			PCI/GDRY
NAREL GAM-01-RA	Bi212	1600017: B6.04148L	0.61	0.19	0.19			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600017: B6.04148L	0.43	0.06	0.03			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600017: B6.04148L	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600017: B6.04148L	12.6	1.42	0.15			PCI/GDRY

Client Sample ID

Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL GAM-01-RA	Pb210	1600017: B6.04148L	0.44	0.22	0.27	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb212	1600017: B6.04148L	0.5	0.06	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600017: B6.04148L	0.47	0.06	0.03			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600017: B6.04148L	0.85	0.22	0.25			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600017: B6.04148L	0.54	0.08	0.06			PCI/GDRY
NAREL GAM-01-RA	Th234	1600017: B6.04148L	0.46	0.21	0.28			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600017: B6.04148L	0.16	0.02	0.01			PCI/GDRY
NAREL GAM-01-RA	U235	1600017: B6.04148L	0.07	0.04	0.05	R	R	PCI/GDRY
C3-SB13-1224-01								
NAREL ACT-02F-TH	Th227	1600017: B6.04149M	0.12	0.05	0.03			PCI/GDRY
NAREL ACT-02F-TH	Th228	1600017: B6.04149M	0.66	0.11	0.02			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600017: B6.04149M	1.24	0.18	0.06			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600017: B6.04149M	0.5	0.09	0.02			PCI/GDRY
NAREL ACT-02F-U	U234	1600017: B6.04149M	0.35	0.09	0.03			PCI/GDRY
NAREL ACT-02F-U	U235	1600017: B6.04149M	0.02	0.02	0.03	J,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600017: B6.04149M	0.44	0.1	0.03			PCI/GDRY
NAREL GAM-01-RA	Bi212	1600017: B6.04149M	0.95	0.18	0.16			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600017: B6.04149M	1.8	0.2	0.02			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600017: B6.04149M	0	0.01	0.02	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600017: B6.04149M	12.3	1.36	0.11			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600017: B6.04149M	2.01	0.29	0.24	B+,	J	PCI/GDRY
NAREL GAM-01-RA	Pb212	1600017: B6.04149M	0.74	0.08	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600017: B6.04149M	2.05	0.23	0.02			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600017: B6.04149M	2.79	0.36	0.22			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600017: B6.04149M	0.82	0.1	0.06			PCI/GDRY
NAREL GAM-01-RA	Th234	1600017: B6.04149M	0.55	0.16	0.22			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600017: B6.04149M	0.22	0.03	0.02			PCI/GDRY

Client Sample ID / Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
C3-SB1-3648-01								
NAREL ACT-02F-TH	Th227	1600016: B6.04123B	0.06	0.04	0.04	S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th228	1600016: B6.04123B	0.65	0.12	0.03	B+, S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th230	1600016: B6.04123B	0.62	0.12	0.06	S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th232	1600016: B6.04123B	0.58	0.11	0.02	PP1, S+,	J	PCI/GDRY
NAREL ACT-02F-U	U234	1600016: B6.04123B	0.51	0.1	0.03			PCI/GDRY
NAREL ACT-02F-U	U234	1600016: B6.04123B	0.54	0.1	0.03	B+,	J	PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04123B	0.05	0.03	0.03			PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04123B	0.02	0.02	0.02	J,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04123B	0.62	0.12	0.03			PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04123B	0.53	0.1	0.03	PP, B+,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600016: B6.04123B	0.77	0.13	0.12			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600016: B6.04123B	0.78	0.09	0.02			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600016: B6.04123B	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600016: B6.04123B	13.6	1.5	0.08			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600016: B6.04123B	0.73	0.16	0.2			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600016: B6.04123B	0.74	0.08	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600016: B6.04123B	0.9	0.1	0.02			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600016: B6.04123B	1.31	0.2	0.18			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600016: B6.04123B	0.75	0.09	0.04			PCI/GDRY
NAREL GAM-01-RA	Th234	1600016: B6.04123B	0.51	0.15	0.22			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600016: B6.04123B	0.24	0.03	0.01			PCI/GDRY
C3-SB1-3648-02								
NAREL ACT-02F-TH	Th227	1600016: B6.04124C	0.04	0.04	0.04	J, S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th228	1600016: B6.04124C	0.8	0.14	0.03	B+, S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th230	1600016: B6.04124C	0.63	0.13	0.06	S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th232	1600016: B6.04124C	0.83	0.15	0.02	PP1, S+,	J	PCI/GDRY

Client Sample ID

Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL ACT-02F-U	U234	1600016: B6.04124C	0.53	0.1	0.03			PCI/GDRY
NAREL ACT-02F-U	U234	1600016: B6.04124C	0.64	0.11	0.02	B+,	J	PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04124C	0.02	0.02	0.03	J,	J	PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04124C	0.03	0.03	0.03	J,	J	PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04124C	0.56	0.11	0.03			PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04124C	0.55	0.1	0.02	PP, B+,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600016: B6.04124C	0.78	0.12	0.1			PCI/GDRY
NAREL GAM-01-RA	Bi212	1600016: B6.04124C	0.79	0.13	0.11			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600016: B6.04124C	0.9	0.1	0.02			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600016: B6.04124C	0.91	0.1	0.02			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600016: B6.04124C	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	Cs137	1600016: B6.04124C	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600016: B6.04124C	13.9	1.53	0.09			PCI/GDRY
NAREL GAM-01-RA	K40	1600016: B6.04124C	13.6	1.5	0.08			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600016: B6.04124C	0.73	0.22	0.27			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600016: B6.04124C	0.74	0.2	0.26			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600016: B6.04124C	0.75	0.08	0.01			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600016: B6.04124C	0.72	0.08	0.01			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600016: B6.04124C	1.01	0.11	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600016: B6.04124C	1.03	0.12	0.02			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600016: B6.04124C	1.59	0.25	0.21			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600016: B6.04124C	1.53	0.23	0.2			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600016: B6.04124C	0.74	0.09	0.04			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600016: B6.04124C	0.74	0.08	0.03			PCI/GDRY
NAREL GAM-01-RA	Th234	1600016: B6.04124C	0.55	0.18	0.25			PCI/GDRY
NAREL GAM-01-RA	Th234	1600016: B6.04124C	0.51	0.18	0.25			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600016: B6.04124C	0.23	0.03	0.01			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
C3-SB14-0012-01	NAREL GAM-01-RA	Tl208	1600016: B6.04124C	0.23	0.03	0.01			PCI/GDRY
	NAREL ACT-02F-TH	Th227	1600017: B6.04150E	0.08	0.05	0.04			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600017: B6.04150E	0.47	0.09	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600017: B6.04150E	0.65	0.12	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600017: B6.04150E	0.47	0.09	0.03			PCI/GDRY
	NAREL ACT-02F-U	U234	1600017: B6.04150E	0.4	0.09	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600017: B6.04150E	0.04	0.03	0.03			PCI/GDRY
	NAREL ACT-02F-U	U238	1600017: B6.04150E	0.44	0.09	0.03			PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600017: B6.04150E	0.59	0.14	0.13			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600017: B6.04150E	0.58	0.07	0.02			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600017: B6.04150E	0.01	0.01	0.01	J,	J	PCI/GDRY
	NAREL GAM-01-RA	K40	1600017: B6.04150E	11.5	1.29	0.09			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600017: B6.04150E	0.59	0.19	0.23	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600017: B6.04150E	0.55	0.06	0.01			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600017: B6.04150E	0.66	0.08	0.02			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600017: B6.04150E	1.02	0.2	0.2			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600017: B6.04150E	0.56	0.07	0.04			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600017: B6.04150E	0.37	0.15	0.22			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600017: B6.04150E	0.17	0.02	0.01			PCI/GDRY
	NAREL GAM-01-RA	U235	1600017: B6.04150E	0.04	0.04	0.05	J, R	R	PCI/GDRY
C3-SB15-0012-01									
	NAREL ACT-02F-TH	Th227	1600017: B6.04151F	0.12	0.06	0.04			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600017: B6.04151F	0.92	0.14	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600017: B6.04151F	0.78	0.13	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600017: B6.04151F	0.84	0.14	0.03			PCI/GDRY
	NAREL ACT-02F-U	U234	1600017: B6.04151F	0.53	0.1	0.05			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL ACT-02F-U	U235	1600017: B6.04151F	0.03	0.03	0.04	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600017: B6.04151F	0.6	0.11	0.04			PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600017: B6.04151F	1.04	0.18	0.14			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600017: B6.04151F	0.87	0.1	0.03			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600017: B6.04151F	0.07	0.01	0.01			PCI/GDRY
	NAREL GAM-01-RA	K40	1600017: B6.04151F	13.5	1.51	0.12			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600017: B6.04151F	1.38	0.28	0.28	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600017: B6.04151F	0.86	0.1	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600017: B6.04151F	1.05	0.12	0.03			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600017: B6.04151F	1.79	0.29	0.24			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600017: B6.04151F	0.86	0.11	0.05			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600017: B6.04151F	0.79	0.27	0.3			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600017: B6.04151F	0.26	0.03	0.01			PCI/GDRY
C3-SB15-2436-01									
	NAREL ACT-02F-TH	Th227	1600017: B6.04152G	0.09	0.05	0.04			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600017: B6.04152G	0.81	0.13	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600017: B6.04152G	0.54	0.1	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600017: B6.04152G	0.85	0.13	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600017: B6.04152G	0.52	0.1	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600017: B6.04152G	0.03	0.03	0.03	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600017: B6.04152G	0.46	0.1	0.02			PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600017: B6.04152G	1.03	0.14	0.09			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600017: B6.04152G	0.55	0.06	0.02			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600017: B6.04152G	0.01	0	0.01			PCI/GDRY
	NAREL GAM-01-RA	K40	1600017: B6.04152G	12.9	1.42	0.06			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600017: B6.04152G	0.56	0.16	0.2	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600017: B6.04152G	0.88	0.1	0.01			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Pb214	1600017: B6.04152G	0.65	0.07	0.02			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600017: B6.04152G	1.16	0.18	0.16			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600017: B6.04152G	0.9	0.1	0.03			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600017: B6.04152G	0.6	0.16	0.21			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600017: B6.04152G	0.28	0.03	0.01			PCI/GDRY
C3-SB16-0012-01									
	NAREL ACT-02F-TH	Th227	1600017: B6.04153H	0.11	0.06	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600017: B6.04153H	0.67	0.12	0.02			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600017: B6.04153H	0.49	0.1	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600017: B6.04153H	0.6	0.11	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600017: B6.04153H	0.49	0.1	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600017: B6.04153H	0	0.01	0.03	U,	U	PCI/GDRY
	NAREL ACT-02F-U	U238	1600017: B6.04153H	0.48	0.1	0.03			PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600017: B6.04153H	0.97	0.19	0.16			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600017: B6.04153H	0.39	0.05	0.03			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600017: B6.04153H	0	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600017: B6.04153H	16.9	1.88	0.14			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600017: B6.04153H	0.62	0.18	0.22	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600017: B6.04153H	0.77	0.09	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600017: B6.04153H	0.48	0.06	0.03			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600017: B6.04153H	0.87	0.22	0.22			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600017: B6.04153H	0.8	0.1	0.05			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600017: B6.04153H	0.69	0.27	0.28			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600017: B6.04153H	0.22	0.03	0.01			PCI/GDRY
C3-SB16-3648-01									
	NAREL ACT-02F-TH	Th227	1600017: B6.04154J	0.12	0.06	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600017: B6.04154J	0.81	0.13	0.03			PCI/GDRY

Client Sample ID									
	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL ACT-02F-TH	Th230	1600017: B6.04154J	0.7	0.12	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600017: B6.04154J	0.86	0.14	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600017: B6.04154J	0.59	0.13	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600017: B6.04154J	0.02	0.03	0.04	U,	U	PCI/GDRY
	NAREL ACT-02F-U	U238	1600017: B6.04154J	0.51	0.12	0.03			PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600017: B6.04154J	0.99	0.14	0.09			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600017: B6.04154J	0.54	0.06	0.02			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600017: B6.04154J	0	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600017: B6.04154J	13	1.44	0.06			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600017: B6.04154J	0.55	0.17	0.21	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600017: B6.04154J	0.9	0.1	0.01			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600017: B6.04154J	0.62	0.07	0.02			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600017: B6.04154J	1.11	0.18	0.17			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600017: B6.04154J	0.94	0.11	0.02			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600017: B6.04154J	0.61	0.17	0.23			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600017: B6.04154J	0.29	0.03	0.01			PCI/GDRY
C3-SB2-0012-01									
	NAREL ACT-02F-TH	Th227	1600016: B6.04125D	0.08	0.06	0.06	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04125D	0.62	0.15	0.05	B+, S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04125D	0.61	0.15	0.08	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04125D	0.5	0.13	0.04	PP1, S+,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04125D	0.5	0.09	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04125D	0.4	0.09	0.02	B+,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04125D	0.04	0.03	0.04			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04125D	0.02	0.02	0.03	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04125D	0.46	0.09	0.02			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04125D	0.42	0.1	0.02	PP, B+,	J	PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Bi212	1600016: B6.04125D	0.62	0.16	0.16			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600016: B6.04125D	0.43	0.06	0.03			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600016: B6.04125D	-0.01	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600016: B6.04125D	12.7	1.42	0.13			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600016: B6.04125D	0.8	0.2	0.22			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600016: B6.04125D	0.56	0.06	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600016: B6.04125D	0.49	0.06	0.03			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600016: B6.04125D	0.89	0.22	0.22			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600016: B6.04125D	0.52	0.07	0.05			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600016: B6.04125D	0.52	0.25	0.28			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600016: B6.04125D	0.16	0.02	0.01			PCI/GDRY
C3-SB2-1224-01									
	NAREL ACT-02F-TH	Th227	1600016: B6.04126E	0.05	0.05	0.06	J, S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04126E	0.81	0.17	0.06	B+, S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04126E	0.72	0.16	0.07	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04126E	0.66	0.15	0.03	PP1, S+,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04126E	0.43	0.09	0.04			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04126E	0.55	0.12	0.05	B+,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04126E	0.03	0.04	0.06	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04126E	0.04	0.03	0.05	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04126E	0.47	0.09	0.04			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04126E	0.55	0.12	0.06	PP, B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600016: B6.04126E	1.02	0.14	0.1			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600016: B6.04126E	0.88	0.1	0.02			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600016: B6.04126E	0.01	0.01	0.01	J,	J	PCI/GDRY
	NAREL GAM-01-RA	K40	1600016: B6.04126E	13	1.44	0.07			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600016: B6.04126E	0.85	0.2	0.24			PCI/GDRY

Client Sample ID								
Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL GAM-01-RA	Pb212	1600016: B6.04126E	0.91	0.1	0.01			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600016: B6.04126E	1.01	0.11	0.02			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600016: B6.04126E	1.64	0.24	0.19			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600016: B6.04126E	0.91	0.1	0.03			PCI/GDRY
NAREL GAM-01-RA	Th234	1600016: B6.04126E	0.55	0.17	0.24			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600016: B6.04126E	0.29	0.03	0.01			PCI/GDRY
C3-SB3-0012-01								
NAREL ACT-02F-TH	Th227	1600016: B6.04127F	0.06	0.04	0.03	S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th228	1600016: B6.04127F	0.67	0.11	0.02	B+, S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th230	1600016: B6.04127F	0.47	0.09	0.05	S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th232	1600016: B6.04127F	0.69	0.12	0.02	PP1, S+,	J	PCI/GDRY
NAREL ACT-02F-U	U234	1600016: B6.04127F	0.57	0.12	0.02			PCI/GDRY
NAREL ACT-02F-U	U234	1600016: B6.04127F	0.5	0.11	0.04	B+,	J	PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04127F	0.02	0.03	0.04	U,	U	PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04127F	0.01	0.02	0.04	U,	U	PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04127F	0.57	0.12	0.03			PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04127F	0.48	0.11	0.03	PP, B+,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600016: B6.04127F	0.83	0.17	0.15			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600016: B6.04127F	0.51	0.06	0.02			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600016: B6.04127F	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600016: B6.04127F	16.5	1.83	0.1			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600016: B6.04127F	0.32	0.12	0.15			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600016: B6.04127F	0.76	0.09	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600016: B6.04127F	0.58	0.07	0.02			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600016: B6.04127F	1.01	0.2	0.2			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600016: B6.04127F	0.78	0.09	0.05			PCI/GDRY
NAREL GAM-01-RA	Th234	1600016: B6.04127F	0.41	0.14	0.19			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Tl208	1600016: B6.04127F	0.24	0.03	0.01			PCI/GDRY
C3-SB3-1224-01									
	NAREL ACT-02F-TH	Th227	1600016: B6.04128G	0.07	0.04	0.04	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04128G	0.86	0.14	0.03	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04128G	0.8	0.13	0.06	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04128G	0.88	0.14	0.02	PP1, S+,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04128G	0.58	0.12	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04128G	0.61	0.11	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04128G	0.03	0.03	0.03	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04128G	0.02	0.02	0.03	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04128G	0.6	0.11	0.03			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04128G	0.66	0.13	0.02	PP,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600016: B6.04128G	0.88	0.18	0.16			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600016: B6.04128G	0.63	0.07	0.02			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600016: B6.04128G	0.01	0.01	0.01			PCI/GDRY
	NAREL GAM-01-RA	K40	1600016: B6.04128G	13.2	1.47	0.12			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600016: B6.04128G	0.65	0.16	0.21			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600016: B6.04128G	0.79	0.09	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600016: B6.04128G	0.71	0.08	0.03			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600016: B6.04128G	1.24	0.2	0.2			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600016: B6.04128G	0.84	0.1	0.06			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600016: B6.04128G	0.56	0.16	0.22			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600016: B6.04128G	0.27	0.03	0.02			PCI/GDRY
C3-SB4-0012-01									
	NAREL ACT-02F-TH	Th227	1600016: B6.04129H	0.07	0.04	0.03	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04129H	0.51	0.09	0.02	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04129H	0.56	0.1	0.05	S+,	J	PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL ACT-02F-TH	Th232	1600016: B6.04129H	0.52	0.09	0.01	PP1, S+,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04129H	0.6	0.11	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04129H	0.47	0.09	0.02			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04129H	0.04	0.03	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04129H	0.04	0.03	0.02			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04129H	0.6	0.11	0.02			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04129H	0.52	0.1	0.02	PP,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600016: B6.04129H	0.82	0.16	0.15			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600016: B6.04129H	0.78	0.09	0.02			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600016: B6.04129H	0.01	0.01	0.01			PCI/GDRY
	NAREL GAM-01-RA	K40	1600016: B6.04129H	13.1	1.46	0.13			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600016: B6.04129H	0.77	0.2	0.25			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600016: B6.04129H	0.63	0.07	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600016: B6.04129H	0.92	0.1	0.03			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600016: B6.04129H	1.39	0.24	0.23			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600016: B6.04129H	0.68	0.08	0.04			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600016: B6.04129H	0.33	0.17	0.25			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600016: B6.04129H	0.19	0.02	0.01			PCI/GDRY
	NAREL GAM-01-RA	U235	1600016: B6.04129H	0.06	0.04	0.06	J, R	R	PCI/GDRY
C3-SB4-1224-01									
	NAREL ACT-02F-TH	Th227	1600016: B6.04130A	0.07	0.04	0.04	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04130A	0.78	0.13	0.03	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04130A	0.58	0.11	0.06	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04130A	0.72	0.12	0.02	PP1, S+,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04130A	0.67	0.13	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04130A	0.59	0.12	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04130A	0.02	0.02	0.04	U,	U	PCI/GDRY

Client Sample ID								
Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL ACT-02F-U	U235	1600016: B6.04130A	0.02	0.02	0.03	U,	U	PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04130A	0.64	0.12	0.03			PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04130A	0.64	0.12	0.02	PP,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600016: B6.04130A	1.11	0.19	0.15			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600016: B6.04130A	0.63	0.07	0.02			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600016: B6.04130A	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600016: B6.04130A	13.3	1.48	0.08			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600016: B6.04130A	0.64	0.16	0.21			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600016: B6.04130A	1	0.11	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600016: B6.04130A	0.74	0.08	0.02			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600016: B6.04130A	1.31	0.2	0.19			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600016: B6.04130A	0.99	0.11	0.05			PCI/GDRY
NAREL GAM-01-RA	Th234	1600016: B6.04130A	0.58	0.16	0.23			PCI/GDRY
NAREL GAM-01-RA	Tl208	1600016: B6.04130A	0.3	0.04	0.01			PCI/GDRY
NAREL GAM-01-RA	U235	1600016: B6.04130A	0.06	0.04	0.06	R	R	PCI/GDRY
C3-SB5-0012-01								
NAREL ACT-02F-TH	Th227	1600016: B6.04131B	0.13	0.07	0.04	P, B+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th228	1600016: B6.04131B	0.3	0.09	0.06			PCI/GDRY
NAREL ACT-02F-TH	Th230	1600016: B6.04131B	0.31	0.1	0.09			PCI/GDRY
NAREL ACT-02F-TH	Th232	1600016: B6.04131B	0.27	0.08	0.04			PCI/GDRY
NAREL ACT-02F-U	U234	1600016: B6.04131B	0.39	0.1	0.05			PCI/GDRY
NAREL ACT-02F-U	U234	1600016: B6.04131B	0.34	0.07	0.02			PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04131B	0.02	0.02	0.02			PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04131B	0.02	0.02	0.04	U,	U	PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04131B	0.48	0.11	0.03			PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04131B	0.32	0.07	0.01	PP,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600016: B6.04131B	0.42	0.18	0.18			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Bi214	1600016: B6.04131B	0.36	0.05	0.03			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600016: B6.04131B	0	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600016: B6.04131B	4.78	0.57	0.15			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600016: B6.04131B	0.65	0.18	0.21			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600016: B6.04131B	0.31	0.04	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600016: B6.04131B	0.44	0.06	0.03			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600016: B6.04131B	0.87	0.24	0.24			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600016: B6.04131B	0.29	0.06	0.06			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600016: B6.04131B	0.47	0.25	0.27			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600016: B6.04131B	0.1	0.02	0.02			PCI/GDRY
C3-SB6-0012-01									
	NAREL ACT-02F-TH	Th227	1600016: B6.04132C	0.04	0.04	0.05	J, P, B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th227	1600016: B6.04132C	0.13	0.08	0.06	P, B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04132C	0.51	0.12	0.05			PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04132C	0.59	0.13	0.06			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04132C	0.72	0.16	0.1			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04132C	0.73	0.15	0.1			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04132C	0.51	0.12	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04132C	0.45	0.11	0.04			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04132C	0.44	0.09	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04132C	0.48	0.1	0.02			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04132C	0.02	0.02	0.03	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04132C	0.01	0.02	0.02	U,	U	PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04132C	0.39	0.08	0.02			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04132C	0.42	0.09	0.02	PP,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600016: B6.04132C	0.56	0.18	0.17			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600016: B6.04132C	2.24	0.25	0.03			PCI/GDRY

Client Sample ID

Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
NAREL GAM-01-RA	Cs137	1600016: B6.04132C	0.02	0.01	0.01			PCI/GDRY
NAREL GAM-01-RA	K40	1600016: B6.04132C	10.1	1.14	0.17			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600016: B6.04132C	2.79	0.4	0.29			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600016: B6.04132C	0.57	0.07	0.02			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600016: B6.04132C	2.65	0.29	0.03			PCI/GDRY
NAREL GAM-01-RA	Ra226	1600016: B6.04132C	3.72	0.49	0.3			PCI/GDRY
NAREL GAM-01-RA	Ra228	1600016: B6.04132C	0.57	0.08	0.05			PCI/GDRY
NAREL GAM-01-RA	Th234	1600016: B6.04132C	0.07	0.24	0.34	U,	U	PCI/GDRY
NAREL GAM-01-RA	Tl208	1600016: B6.04132C	0.17	0.02	0.01			PCI/GDRY
C3-SB6-3648-01								
NAREL ACT-02F-TH	Th227	1600016: B6.04133D	0	0.01	0.02	U, S+,	UJ	PCI/GDRY
NAREL ACT-02F-TH	Th228	1600016: B6.04133D	0.63	0.1	0.02	S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th230	1600016: B6.04133D	0.43	0.08	0.04	S+,	J	PCI/GDRY
NAREL ACT-02F-TH	Th232	1600016: B6.04133D	0.57	0.09	0.01	PP1, S+,	J	PCI/GDRY
NAREL ACT-02F-U	U234	1600016: B6.04133D	0.6	0.12	0.02			PCI/GDRY
NAREL ACT-02F-U	U234	1600016: B6.04133D	0.6	0.12	0.02			PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04133D	0.04	0.03	0.02			PCI/GDRY
NAREL ACT-02F-U	U235	1600016: B6.04133D	0.01	0.02	0.03	U,	U	PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04133D	0.53	0.11	0.02			PCI/GDRY
NAREL ACT-02F-U	U238	1600016: B6.04133D	0.57	0.11	0.02	PP,	J	PCI/GDRY
NAREL GAM-01-RA	Bi212	1600016: B6.04133D	1.02	0.15	0.11			PCI/GDRY
NAREL GAM-01-RA	Bi214	1600016: B6.04133D	0.48	0.06	0.02			PCI/GDRY
NAREL GAM-01-RA	Cs137	1600016: B6.04133D	0	0.01	0.01	U,	U	PCI/GDRY
NAREL GAM-01-RA	K40	1600016: B6.04133D	13.8	1.52	0.06			PCI/GDRY
NAREL GAM-01-RA	Pb210	1600016: B6.04133D	0.36	0.1	0.12			PCI/GDRY
NAREL GAM-01-RA	Pb212	1600016: B6.04133D	0.87	0.1	0.01			PCI/GDRY
NAREL GAM-01-RA	Pb214	1600016: B6.04133D	0.58	0.07	0.02			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Ra226	1600016: B6.04133D	1.12	0.18	0.16			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600016: B6.04133D	0.92	0.1	0.03			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600016: B6.04133D	0.58	0.13	0.16			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600016: B6.04133D	0.28	0.03	0.01			PCI/GDRY
C3-SB7-0012-01									
	NAREL ACT-02F-TH	Th227	1600016: B6.04134E	0.11	0.08	0.08	P, B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04134E	0.5	0.12	0.07			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04134E	1.67	0.27	0.11			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04134E	0.41	0.11	0.04			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04134E	0.41	0.09	0.05			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04134E	0.5	0.1	0.02			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04134E	0.03	0.02	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04134E	0	0.02	0.04	U,	U	PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04134E	0.41	0.09	0.03			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04134E	0.42	0.09	0.02	PP,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600016: B6.04134E	0.45	0.1	0.12			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600016: B6.04134E	2.78	0.31	0.02			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600016: B6.04134E	-0.01	0.01	0.02	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600016: B6.04134E	10.6	1.18	0.11			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600016: B6.04134E	2.65	0.37	0.26			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600016: B6.04134E	0.42	0.05	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600016: B6.04134E	3.19	0.35	0.03			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600016: B6.04134E	3.84	0.47	0.24			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600016: B6.04134E	0.45	0.06	0.04			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600016: B6.04134E	0.56	0.16	0.24			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600016: B6.04134E	0.14	0.02	0.01			PCI/GDRY
C3-SB7-3648-01									

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL ACT-02F-TH	Th227	1600016: B6.04135F	0	0.01	0.03	U, S+,	UJ	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04135F	0.76	0.12	0.03	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04135F	0.6	0.1	0.05	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04135F	0.7	0.11	0.02	PP1, S+,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04135F	0.61	0.12	0.03			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04135F	0.56	0.11	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04135F	0.03	0.03	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04135F	0.03	0.03	0.02			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04135F	0.54	0.11	0.02			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04135F	0.62	0.12	0.03	PP,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600016: B6.04135F	0.77	0.18	0.16			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600016: B6.04135F	0.73	0.09	0.02			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600016: B6.04135F	-0.01	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600016: B6.04135F	9	1.01	0.11			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600016: B6.04135F	0.45	0.15	0.16			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600016: B6.04135F	0.69	0.08	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600016: B6.04135F	0.88	0.1	0.03			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600016: B6.04135F	1.3	0.23	0.2			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600016: B6.04135F	0.68	0.08	0.04			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600016: B6.04135F	0.61	0.19	0.21			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600016: B6.04135F	0.21	0.03	0.01			PCI/GDRY
C3-SB8-0012-01									
	NAREL ACT-02F-TH	Th227	1600016: B6.04136G	0.18	0.09	0.04	P, B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04136G	0.36	0.1	0.05			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04136G	0.56	0.13	0.09			PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04136G	0.34	0.09	0.03			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04136G	0.37	0.08	0.02			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL ACT-02F-U	U234	1600016: B6.04136G	0.48	0.11	0.03			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04136G	0.04	0.03	0.04			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04136G	0.02	0.02	0.02	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04136G	0.41	0.1	0.04			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04136G	0.38	0.08	0.02	PP,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600016: B6.04136G	0.31	0.14	0.14			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600016: B6.04136G	0.47	0.06	0.02			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600016: B6.04136G	0	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600016: B6.04136G	9.27	1.05	0.15			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600016: B6.04136G	0.45	0.17	0.21			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600016: B6.04136G	0.44	0.05	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600016: B6.04136G	0.49	0.06	0.02			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600016: B6.04136G	0.71	0.21	0.22			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600016: B6.04136G	0.44	0.06	0.05			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600016: B6.04136G	0.3	0.16	0.23			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600016: B6.04136G	0.12	0.02	0.01			PCI/GDRY
C3-SB8-1224-01									
	NAREL ACT-02F-TH	Th227	1600016: B6.04137H	0.23	0.08	0.04	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600016: B6.04137H	0.68	0.12	0.03	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600016: B6.04137H	3.64	0.44	0.06	S+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600016: B6.04137H	0.58	0.11	0.02	PP1, S+,	J	PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04137H	0.54	0.1	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600016: B6.04137H	0.48	0.1	0.02			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04137H	0.03	0.03	0.02			PCI/GDRY
	NAREL ACT-02F-U	U235	1600016: B6.04137H	0.02	0.02	0.03	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04137H	0.48	0.09	0.02			PCI/GDRY
	NAREL ACT-02F-U	U238	1600016: B6.04137H	0.57	0.11	0.02	PP,	J	PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Bi212	1600016: B6.04137H	0.75	0.14	0.16			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600016: B6.04137H	9.46	1.04	0.03			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600016: B6.04137H	0	0.01	0.02	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600016: B6.04137H	12.4	1.38	0.15			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600016: B6.04137H	12	1.43	0.47			PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600016: B6.04137H	0.68	0.08	0.04			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600016: B6.04137H	10.8	1.19	0.04			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600016: B6.04137H	12.2	1.41	0.46			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600016: B6.04137H	0.66	0.08	0.06			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600016: B6.04137H	0.26	0.48	0.57	U,	U	PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600016: B6.04137H	0.21	0.03	0.01			PCI/GDRY
C3-SB9-0012-01									
	NAREL ACT-02F-TH	Th227	1600017: B6.04138J	0.07	0.05	0.04	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600017: B6.04138J	0.38	0.08	0.04			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600017: B6.04138J	0.55	0.11	0.07	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600017: B6.04138J	0.32	0.07	0.02			PCI/GDRY
	NAREL ACT-02F-U	U234	1600017: B6.04138J	0.37	0.09	0.03	B+,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600017: B6.04138J	0.02	0.02	0.03	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600017: B6.04138J	0.37	0.08	0.03	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600017: B6.04138J	0.31	0.17	0.17			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600017: B6.04138J	0.66	0.08	0.03			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600017: B6.04138J	0	0.01	0.01	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600017: B6.04138J	9.17	1.04	0.15			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600017: B6.04138J	0.55	0.2	0.23	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600017: B6.04138J	0.38	0.04	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600017: B6.04138J	0.79	0.09	0.03			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600017: B6.04138J	1.04	0.26	0.26			PCI/GDRY

Client Sample ID	Method	Isotope	S D G : Lab Sample ID	Conc	2 S	M D C	Interim Qualifiers	Final Qualifier	Units
	NAREL GAM-01-RA	Ra228	1600017: B6.04138J	0.4	0.06	0.04			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600017: B6.04138J	0.18	0.2	0.28	J,	J	PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600017: B6.04138J	0.1	0.02	0.01			PCI/GDRY
C3-SB9-1224-01									
	NAREL ACT-02F-TH	Th227	1600017: B6.04139K	0	0.01	0.04	U, B+,	UJ	PCI/GDRY
	NAREL ACT-02F-TH	Th228	1600017: B6.04139K	0.46	0.09	0.03			PCI/GDRY
	NAREL ACT-02F-TH	Th230	1600017: B6.04139K	0.95	0.14	0.06	B+,	J	PCI/GDRY
	NAREL ACT-02F-TH	Th232	1600017: B6.04139K	0.5	0.09	0.01			PCI/GDRY
	NAREL ACT-02F-U	U234	1600017: B6.04139K	0.46	0.08	0.02	B+,	J	PCI/GDRY
	NAREL ACT-02F-U	U235	1600017: B6.04139K	0.02	0.02	0.02	J,	J	PCI/GDRY
	NAREL ACT-02F-U	U238	1600017: B6.04139K	0.54	0.09	0.01	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Bi212	1600017: B6.04139K	0.66	0.17	0.17			PCI/GDRY
	NAREL GAM-01-RA	Bi214	1600017: B6.04139K	1.46	0.16	0.03			PCI/GDRY
	NAREL GAM-01-RA	Cs137	1600017: B6.04139K	-0.01	0.01	0.02	U,	U	PCI/GDRY
	NAREL GAM-01-RA	K40	1600017: B6.04139K	12	1.34	0.12			PCI/GDRY
	NAREL GAM-01-RA	Pb210	1600017: B6.04139K	1.45	0.22	0.2	B+,	J	PCI/GDRY
	NAREL GAM-01-RA	Pb212	1600017: B6.04139K	0.53	0.06	0.02			PCI/GDRY
	NAREL GAM-01-RA	Pb214	1600017: B6.04139K	1.66	0.19	0.03			PCI/GDRY
	NAREL GAM-01-RA	Ra226	1600017: B6.04139K	2.15	0.29	0.22			PCI/GDRY
	NAREL GAM-01-RA	Ra228	1600017: B6.04139K	0.57	0.08	0.06			PCI/GDRY
	NAREL GAM-01-RA	Th234	1600017: B6.04139K	0.41	0.17	0.24			PCI/GDRY
	NAREL GAM-01-RA	Tl208	1600017: B6.04139K	0.17	0.02	0.02			PCI/GDRY

Qualifier Explanation: See section 3 of the memo DCN: RST-03F-0013

Conc	Concentratio
2 S	Total propagated Uncertainty at 2 standard deviatio
M D C	Minimum detectable concentration
S D G	Sample data group

Radiological Data Verification/Validation Checklist

Site Name:_Canadain Uranium and Radium Corporation Site ____ Analytical Laboratory: National Air and Radiation Environmental Laboratory (NAREL)

Case Number_____TDD: TO-0006-0053 _____ Reviewer _____Rick Haaker, CHP, CIH__ Date _____Aug 31, 2016

RF Haaker

Part 1 - Sample Handling and Analysis Evaluation

MARLAP Ref.	Criteria	Yes	No	NA	Comments
8.5.1.1	Sample Descriptors - Each sample has a unique ID code which is cross-reference to unique Lab ID	X			
8.5.1.2	Aliquant Size - amount of sample used in analysis provided	X			
8.5.1.3	Dates of sample collection, sample prep and sample analysis provided	X			
8.5.1.4	Samples properly preserved	X			
8.5.1.5	Each analytical result linked to instrument/detector	X			
8.5.1.6	Traceability of standards and reference materials provided		X		Documentation not provided in the packages
8.5.1.7	QC samples analyzed	X	X		Not a complete set of QA samples. Apparently there were no method blanks no field samples were handled as matrix spikes or matrix spike duplicates.
8.5.1.8	Yield (chemical separation, carrier and/or radiotracer) within acceptable ranges	X			Tracer / carrier performance was acceptable. The identity of the tracer or carrier is not evident from the reports provided by NAREL however.
8.5.1.9	Self-absorption curve provided		X		Curves not provided in the reports.
8.5.1.10	Efficiency, calibration curves and instrument background information provided	X	X		Only backgrounds were provided
8.5.1.11	Spectrometry resolution data provided		X		
8.5.1.12	Dilution factors and corrections factors addressed and documentation provided.		X		Not provided in data packages.
8.5.1.13	Count Time for each sample, QC analysis and instrument background provided	X			
8.5.1.14	For each measurement: 1) Measurement uncertainty reported 2) Analyte MDC reported 3) Appropriate units used	 X X X			

*** Covers NAREL data packages** 1600015, 1600016, and 1600017 .

Part 2 - Quality Control

MARLAP Ref.	Criteria	Yes	No	NA	Comments
8.5.2.1	Method Blanks analyzed and no detected concentration/activity found		X		Backgrounds provided but no method blanks results provided.
8.5.2.2	Laboratory Control Samples analyzed and within acceptable ranges	X			Except where noted in the memo to which this checklist is attached
8.5.2.3	Laboratory replicates analyzed and within control limits	X			Except where noted in the memo to which this checklist is attached
8.5.2.4	Matrix Spikes/Matrix Spike Duplicate analyzed and within established criteria		X		Matrix spikes were apparently not analyzed.
8.5.3.1	Test of detection information (critical value) provided.		X	X	The MDC was provided but it was not based on alpha = beta = 0.05. The critical value was not required by QAPP and not provided in all cases. The critical level was approximated as 1.645 times the TPU.
8.5.3.2	Detection Capability: Required Minimum Detectable Concentration (RMDC) less than the Minimum Detectable Concentration (MDC) for each analyte	X			
8.5.3.3	Uncertainty 1. Laboratory's combined standard uncertainty at concentrations lower that the action level less than required method uncertainty (expressed in concentration units) 2. Laboratory's relative combined standard uncertainty at concentrations above the action level less than required relative method uncertainty (express as a percent)			X X	No precision criteria was recognized in the QAPP for individual analytical results. Such samples would have received a final qualifier of J or U, depending on whether the critical level was exceeded, however.

Additional Comments: These data packages were missing much of the information that should normally be in CLP Level 4 equivalent data package.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RADIATION AND INDOOR AIR
National Analytical Radiation Environmental Laboratory
540 South Morris Avenue, Montgomery, AL 36115-2600
334-270-3400

June 22, 2016

MEMORANDUM

SUBJECT: Radiochemical Results for
Canadian Radium & Uranium Samples

FROM: Cynthia White, Director
Center for Environmental Radioanalytical Laboratory Science

TO: Daniel Gaughan, OSC
Region 2

Attached is a data package for gamma analysis of samples collected from Canadian Radium and Uranium Site in Mt. Kisco, NY. The samples constitute NAREL batch number 1600017. Also attached are data packages for isotopic uranium and thorium analysis of batch number 1600015.

Specific information concerning all aspects of the radiological analysis of the samples is contained in the batch case narratives of the data packages. If you have any questions concerning the analytical results, please contact me at (334)270-7052.

Due to a reorganization within the Office of Radiation and Indoor Air, the National Air and Radiation Environmental Laboratory is now called the National Analytical Radiation Environmental Laboratory (acronym remains the same, NAREL).

Attachments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RADIATION AND INDOOR AIR
National Analytical Radiation Environmental Laboratory
540 South Morris Avenue, Montgomery, AL 36115-2600
334-270-3400

July 7, 2016

MEMORANDUM

SUBJECT: Radiochemical Results for
Canadian Radium & Uranium Samples

FROM: Cynthia White, Director
Center for Environmental Radioanalytical Laboratory Science

TO: Daniel Gaughan, OSC
Region 2

Attached is a data package for isotopic uranium analysis of samples collected from Canadian Radium and Uranium Site in Mt. Kisco, NY. The samples constitute NAREL batch number 1600016.

Specific information concerning all aspects of the radiological analysis of the samples is contained in the batch case narratives of the data packages. If you have any questions concerning the analytical results, please contact me at (334)270-7052.

Due to a reorganization within the Office of Radiation and Indoor Air, the National Air and Radiation Environmental Laboratory is now called the National Analytical Radiation Environmental Laboratory (acronym remains the same, NAREL).

Attachments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RADIATION AND INDOOR AIR
National Analytical Radiation Environmental Laboratory
540 South Morris Avenue, Montgomery, AL 36115-2600
334-270-3400

June 30, 2016

MEMORANDUM

SUBJECT: Radiochemical Results for
Canadian Radium & Uranium Samples

FROM: Cynthia White, Director
Center for Environmental Radioanalytical Laboratory Science

TO: Daniel Gaughan, OSC
Region 2

Attached is a data package for isotopic thorium analysis of samples collected from Canadian Radium and Uranium Site in Mt. Kisco, NY. The samples constitute NAREL batch number 1600016. Also attached are data packages for isotopic uranium and thorium analysis of batch number 1600017.

Specific information concerning all aspects of the radiological analysis of the samples is contained in the batch case narratives of the data packages. If you have any questions concerning the analytical results, please contact me at (334)270-7052.

Due to a reorganization within the Office of Radiation and Indoor Air, the National Air and Radiation Environmental Laboratory is now called the National Analytical Radiation Environmental Laboratory (acronym remains the same, NAREL).

Attachments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RADIATION AND INDOOR AIR
National Analytical Radiation Environmental Laboratory
540 South Morris Avenue, Montgomery, AL 36115-2600
334-270-3400

June 16, 2016

MEMORANDUM

SUBJECT: Radiochemical Results for
Canadian Radium & Uranium Samples

FROM: Cynthia White, Director
Center for Environmental Radioanalytical Laboratory Science

TO: Daniel Gaughan, OSC
Region 2

Attached are data packages for gamma analysis of samples collected from Canadian Radium and Uranium Site in Mt. Kisco, NY. The samples constitute NAREL batch numbers 1600015 and 1600016.

Specific information concerning all aspects of the radiological analysis of the samples is contained in the batch case narratives of the data packages. If you have any questions concerning the analytical results, please contact me at (334)270-7052.

Due to a reorganization within the Office of Radiation and Indoor Air, the National Air and Radiation Environmental Laboratory is now called the National Analytical Radiation Environmental Laboratory (acronym remains the same, NAREL).

Attachments

U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
GAMMA ANALYSES

REPORT OF SAMPLE DELIVERY GROUP #1600015

Project:	Canadian Radium & Uranium, Mt. Kisco, NY
Analysis method:	Gamma-ray Spectrometry - Sealed Radium Cans
Report ID:	1600015-GAMMA-RA
Report type:	Original
Date reported:	06/08/2016
Total pages in report:	30

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B6.04104Y	C2-SB1-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04105Z	C2-SB1-4860-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04106A	C2-SB1-6072-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04107B	C2-SB1-7284-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04108C	C2-SB1-8496-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04109D	C2-SB2-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04110W	C2-SB2-1224-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04111X	C2-SB2-2436-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04112Y	C2-SB2-3648-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04113Z	C2-SB2-7284-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04114A	C2-SB2-7284-02	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04115B	C2-SB2-8496-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04116C	C2-SB3-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04117D	C2-SB3-1224-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04118E	C2-SB3-4860-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04119F	C2-SB3-6072-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04120Y	C2-SB3-7284-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016

EXCEPTIONS

1. **Packaging and shipping** – No problems were observed.
2. **Documentation** – No problems were observed.
3. **Sample preparation** – No problems were encountered.
4. **Analysis** – Samples were held for 21 days to allow for ingrowth. Client requested that NAREL report the following: Cs-137, Th-234, Tl-208, Ra-228, Ac-228, Bi-210, Ra-226, Pb-214, Bi-214, Bi-212, Pb-212, Pb-210, and K-40. Client was informed that NAREL does not provide Ac-228 or Bi-210 results by gamma analysis. Also, client requested specific methods to be used, but NAREL uses in-house methods. Client agreed NAREL methods were acceptable. Please see page 4 of this report with regards to exceptions for reporting of some of the nuclides in this list. For Pb-210 in soil samples, NAREL flags the results because of the larger uncertainty associated with gamma-ray attenuation in uncharacterized materials at low energies (46.5 keV).
5. **Holding times** – No holding times were specified.

ACCREDITATION

All analyses included in this data package are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard.

CERTIFICATION

I certify that this data report complies with the terms and conditions of the Project Acceptance Form and/or the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

Velinda Herbert 6/14/16

Velinda Herbert — Date
Quality Assurance Manager, NAREL

Cynthia White 6-16-16

Cynthia White — Date
Director, Center for Environmental Radioanalytical Laboratory Science

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample, or blank spike
MS	Matrix spike
MSD	Matrix spike duplicate (not currently analyzed)
RBK	Method blank
STD	External standard (used for ^{228}Ra yield determination)

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "*Z* scores." A *Z* score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The *Z* score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The *Z* score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of %R in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either $|Z| \leq 3$ or $60 \leq \%R \leq 110$.

GENERAL INFORMATION (CONTINUED)

GAMMA ANALYSIS

The reporting format lists the gamma emitters in alphabetical order. The activity, 2-sigma uncertainty, and a sample-specific estimate of the MDC for radionuclides measured by gamma spectroscopy are reported only if the nuclide is detected above background with the exception of client requested nuclides of interest. The activity for each of the requested nuclides is reported whether negative, positive, or zero along with the associated 2-sigma uncertainty and the sample-specific estimate of the MDC.

Due to potential spectral interferences and other possible problems associated with the determination of the activity of certain radionuclides, the activities for ^{214}Bi, ^{214}Pb, ^{234}Th, ^{234m}Pa, ^{226}Ra, ^{231}Th, and ^{235}U are subject to greater uncertainty than other commonly reported radionuclides. It should be noted that this potential uncertainty is not included in the two-sigma expanded uncertainty that is reported with each result. Although in this report we do provide the calculated activities for these radionuclides, we recommend that the results be used only as a qualitative means of indicating the presence of these radionuclides and not as a quantitative measure of their concentration. The results for these nuclides are not used in the evaluation of quality control samples. Furthermore, because of mutual interference between ^{226}Ra and ^{235}U, NAREL's gamma analysis software tends to overestimate the amounts of these nuclides whenever both are present in a sample. Lower estimates for ^{226}Ra activities can be obtained from the reported activities of its decay products, ^{214}Pb and ^{214}Bi, which are likely to be somewhat less than the ^{226}Ra activity because of the potential escape of radon gas.

NAREL's gamma-ray spectrometry software corrects activities and MDCs for decay between collection and analysis, but only up to a limit of twelve half-lives. If the decay time for a sample exceeds twelve half-lives of a radionuclide, that radionuclide is not reported. This software feature may affect results for short-lived radionuclides, such as ^{131}I and ^{140}Ba, when there is a long delay between collection and analysis.

Chain of Custody Forms

Page 1 of 9

53 original COC

From cooler #4

4.20.16

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
5	C002-SB001-0012-01	4/6/2016	13:56	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
5	C002-SB001-0012-01	4/6/2016	13:56	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
5	C002-SB001-0012-01	4/6/2016	13:56	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
5	C002-SB001-4860-01	4/6/2016	13:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
5	C002-SB001-4860-01	4/6/2016	13:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
5	C002-SB001-4860-01	4/6/2016	13:57	Gamma Spec (Modified)	Soil	4 C	N	Broken 1	16 oz glass jar
5	C002-SB001-6072-01	4/6/2016	13:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
5	C002-SB001-6072-01	4/6/2016	13:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
5	C002-SB001-6072-01	4/6/2016	13:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
5	C002-SB001-7284-01	4/6/2016	13:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
5	C002-SB001-7284-01	4/6/2016	13:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
5	C002-SB001-7284-01	4/6/2016	13:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
5	C002-SB001-8496-01	4/6/2016	13:57	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
5	C002-SB001-8496-01	4/6/2016	13:57	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
5	C002-SB001-8496-01	4/6/2016	13:57	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB002-0012-01	4/6/2016	14:31	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB002-0012-01	4/6/2016	14:31	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB002-0012-01	4/6/2016	14:31	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
4	C002-SB002-1224-01	4/6/2016	14:31	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		NAREL	04/19/16@115	Good

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

cooler #4

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

	Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
cooler 4		C002-SB002-1224-01 ✓	4/6/2016	14:31	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-1224-01 ✓	4/6/2016	14:31	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4		C002-SB002-2436-01 ✓	4/6/2016	14:32	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-2436-01 ✓	4/6/2016	14:32	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-2436-01 ✓	4/6/2016	14:32	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4		C002-SB002-3648-01 ✓	4/6/2016	14:32	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-3648-01 ✓	4/6/2016	14:32	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-3648-01 ✓	4/6/2016	14:32	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4		C002-SB002-7284-01 ✓	4/6/2016	14:33	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-7284-01 ✓	4/6/2016	14:33	Isotopic Uranium ✓ OK	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-7284-01 ✓	4/6/2016	14:33	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4		C002-SB002-7284-02 ✓	4/6/2016	14:33	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-7284-02 ✓	4/6/2016	14:33	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-7284-02 ✓	4/6/2016	14:33	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
5		C002-SB002-8496-01 ✓	4/6/2016	14:33 ✓	Isotopic Thorium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
5		C002-SB002-8496-01 ✓	4/6/2016	14:33 ✓	Isotopic Uranium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
5		C002-SB002-8496-01	4/6/2016	14:33 ✓	~~Gamma Spec (Modified)~~ ✓✓	Soil	4 C	N	OK 16oz ~~8 oz~~ 1	~~16~~ oz glass jar
		C002-SB003-0012-01	4/6/2016	13:17	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
		C002-SB003-0012-01	4/6/2016	13:17	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar

5 TOTAL

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		NAREL	04/19/16 @1115	Good

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	C002-SB003-0012-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
4	C003-SB001-0012-01 ✓	4/5/2016 ✓	12:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	✓6 oz glass jar

Crushed Jar NU LOS

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		NAREL	04/19/16 @ 1115	Good Crushed Sample 16oz ice

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

ANALYSIS SUMMARY

Analysis method: NAREL GAM-01-RA
Title: Gamma-ray Spectrometry - Sealed Radium Cans

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B6.04104Y	C2-SB1-0012-01		05/25/2016	0013404B	0020877K
B6.04105Z	C2-SB1-4860-01		05/25/2016	0013404B	0020877K
B6.04106A	C2-SB1-6072-01		05/25/2016	0013404B	0020877K
B6.04106A	C2-SB1-6072-01	DUP	05/26/2016	0013404B	0020877K
B6.04107B	C2-SB1-7284-01		05/26/2016	0013404B	0020877K
B6.04108C	C2-SB1-8496-01		05/26/2016	0013404B	0020877K
B6.04109D	C2-SB2-0012-01		05/26/2016	0013404B	0020877K
B6.04110W	C2-SB2-1224-01		05/26/2016	0013404B	0020877K
B6.04111X	C2-SB2-2436-01		05/26/2016	0013404B	0020877K
B6.04112Y	C2-SB2-3648-01		05/26/2016	0013404B	0020877K
B6.04113Z	C2-SB2-7284-01		05/27/2016	0013404B	0020877K
B6.04114A	C2-SB2-7284-02		05/27/2016	0013404B	0020877K
B6.04115B	C2-SB2-8496-01		05/27/2016	0013404B	0020877K
B6.04116C	C2-SB3-0012-01		05/27/2016	0013404B	0020877K
B6.04117D	C2-SB3-1224-01		05/27/2016	0013404B	0020877K
B6.04118E	C2-SB3-4860-01		05/27/2016	0013404B	0020877K
B6.04119F	C2-SB3-6072-01		05/27/2016	0013404B	0020877K
B6.04120Y	C2-SB3-7284-01		06/01/2016	0013404B	0020877K
LCS-00734848Y *		LCS	06/01/2016	0013404B	0020877K
RBK-00734849Z *		RBK	06/01/2016	0013404B	0020877K

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04104Y	Amount analyzed:	1.920e+02 GDRY
Client sample ID:	C2-SB1-0012-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 13:56 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	95.75 %	Analyst:	MO
Ash/dry weight:	88.99 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/24/2016 14:26	1000.0	GE04	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	4.07e-01	1.4e-01	1.5e-01	PCI/GDRY	04/06/2016 13:56 EDT
Bi214	J	3.00e-01	4.1e-02	2.2e-02	PCI/GDRY	04/06/2016 13:56 EDT
Cs137		-8.23e-04	7.7e-03	9.7e-03	PCI/GDRY	04/06/2016 13:56 EDT
K40		7.46e+00	8.5e-01	1.2e-01	PCI/GDRY	04/06/2016 13:56 EDT
Pb210	J	4.27e-01	1.5e-01	1.9e-01	PCI/GDRY	04/06/2016 13:56 EDT
Pb212	J	3.58e-01	4.2e-02	1.5e-02	PCI/GDRY	04/06/2016 13:56 EDT
Pb214	J	3.55e-01	4.4e-02	1.9e-02	PCI/GDRY	04/06/2016 13:56 EDT
Ra226	J	6.30e-01	1.7e-01	1.9e-01	PCI/GDRY	04/06/2016 13:56 EDT
Ra228		3.36e-01	5.2e-02	3.9e-02	PCI/GDRY	04/06/2016 13:56 EDT
Th234	J	2.75e-01	1.4e-01	1.9e-01	PCI/GDRY	04/06/2016 13:56 EDT
Tl208	J	1.01e-01	1.5e-02	1.0e-02	PCI/GDRY	04/06/2016 13:56 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04105Z	Amount analyzed:	3.260e+02 GDRY
Client sample ID:	C2-SB1-4860-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	94.41 %	Analyst:	MO
Ash/dry weight:	97.26 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/24/2016 14:27	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	6.61e-01	1.3e-01	1.2e-01	PCI/GDRY	04/06/2016 13:57 EDT
Bi214	J	6.68e-01	7.7e-02	2.2e-02	PCI/GDRY	04/06/2016 13:57 EDT
Cs137		-5.02e-03	7.8e-03	9.0e-03	PCI/GDRY	04/06/2016 13:57 EDT
K40		1.13e+01	1.3e+00	9.5e-02	PCI/GDRY	04/06/2016 13:57 EDT
Pb210	J	7.58e-01	2.0e-01	2.2e-01	PCI/GDRY	04/06/2016 13:57 EDT
Pb212	J	5.54e-01	6.3e-02	1.8e-02	PCI/GDRY	04/06/2016 13:57 EDT
Pb214	J	7.47e-01	8.5e-02	2.2e-02	PCI/GDRY	04/06/2016 13:57 EDT
Ra226	J	1.08e+00	2.0e-01	1.9e-01	PCI/GDRY	04/06/2016 13:57 EDT
Ra228		5.48e-01	7.2e-02	3.6e-02	PCI/GDRY	04/06/2016 13:57 EDT
Th234	J	5.83e-01	1.5e-01	1.9e-01	PCI/GDRY	04/06/2016 13:57 EDT
Tl208	J	1.81e-01	2.4e-02	1.2e-02	PCI/GDRY	04/06/2016 13:57 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04106A	Amount analyzed:	6.450e+02 GDRY
Client sample ID:	C2-SB1-6072-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	91.38 %	Analyst:	MO
Ash/dry weight:	98.14 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/24/2016 14:29	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	6.27e-01	1.0e-01	8.8e-02	PCI/GDRY	04/06/2016 13:57 EDT
Bi214	J	7.65e-01	8.6e-02	1.6e-02	PCI/GDRY	04/06/2016 13:57 EDT
Cs137		-3.37e-03	5.8e-03	9.6e-03	PCI/GDRY	04/06/2016 13:57 EDT
K40		1.20e+01	1.3e+00	6.0e-02	PCI/GDRY	04/06/2016 13:57 EDT
Pb210	J	8.47e-01	1.8e-01	2.0e-01	PCI/GDRY	04/06/2016 13:57 EDT
Pb212	J	5.24e-01	6.0e-02	1.2e-02	PCI/GDRY	04/06/2016 13:57 EDT
Pb214	J	8.75e-01	9.9e-02	1.7e-02	PCI/GDRY	04/06/2016 13:57 EDT
Ra226	J	1.16e+00	1.8e-01	1.6e-01	PCI/GDRY	04/06/2016 13:57 EDT
Ra228		5.26e-01	6.2e-02	2.5e-02	PCI/GDRY	04/06/2016 13:57 EDT
Th234	J	4.29e-01	1.4e-01	2.0e-01	PCI/GDRY	04/06/2016 13:57 EDT
Tl208	J	1.64e-01	2.0e-02	8.3e-03	PCI/GDRY	04/06/2016 13:57 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04106A	Amount analyzed:	6.450e+02 GDRY
Client sample ID:	C2-SB1-6072-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	91.38 %	Analyst:	MO
Ash/dry weight:	98.14 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/25/2016 14:25	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	5.64e-01	1.1e-01	1.0e-01	PCI/GDRY	04/06/2016 13:57 EDT
Bi214	J	7.60e-01	8.6e-02	1.8e-02	PCI/GDRY	04/06/2016 13:57 EDT
Cs137		-5.38e-03	7.6e-03	8.7e-03	PCI/GDRY	04/06/2016 13:57 EDT
K40		1.19e+01	1.3e+00	7.5e-02	PCI/GDRY	04/06/2016 13:57 EDT
Pb210	J	7.96e-01	2.1e-01	2.4e-01	PCI/GDRY	04/06/2016 13:57 EDT
Pb212	J	5.21e-01	5.9e-02	1.7e-02	PCI/GDRY	04/06/2016 13:57 EDT
Pb214	J	8.81e-01	1.0e-01	2.2e-02	PCI/GDRY	04/06/2016 13:57 EDT
Ra226	J	1.21e+00	2.1e-01	1.8e-01	PCI/GDRY	04/06/2016 13:57 EDT
Ra228		5.31e-01	6.6e-02	3.0e-02	PCI/GDRY	04/06/2016 13:57 EDT
Th234	J	5.39e-01	1.6e-01	2.1e-01	PCI/GDRY	04/06/2016 13:57 EDT
Tl208	J	1.63e-01	2.1e-02	9.6e-03	PCI/GDRY	04/06/2016 13:57 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04107B	Amount analyzed:	4.920e+02 GDRY
Client sample ID:	C2-SB1-7284-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	80.06 %	Analyst:	MO
Ash/dry weight:	94.96 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/25/2016 14:26	1000.0	GE04	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.30e-01	1.6e-01	1.2e-01	PCI/GDRY	04/06/2016 13:57 EDT
Bi214	J	5.31e-01	6.1e-02	1.6e-02	PCI/GDRY	04/06/2016 13:57 EDT
Cs137		-5.04e-03	7.3e-03	9.1e-03	PCI/GDRY	04/06/2016 13:57 EDT
K40		1.14e+01	1.3e+00	8.3e-02	PCI/GDRY	04/06/2016 13:57 EDT
Pb210	J	2.94e-01	1.1e-01	1.4e-01	PCI/GDRY	04/06/2016 13:57 EDT
Pb212	J	7.88e-01	8.8e-02	1.3e-02	PCI/GDRY	04/06/2016 13:57 EDT
Pb214	J	6.00e-01	7.3e-02	2.0e-02	PCI/GDRY	04/06/2016 13:57 EDT
Ra226	J	1.20e+00	2.1e-01	1.9e-01	PCI/GDRY	04/06/2016 13:57 EDT
Ra228		8.01e-01	9.4e-02	3.6e-02	PCI/GDRY	04/06/2016 13:57 EDT
Th234	J	5.77e-01	1.4e-01	1.8e-01	PCI/GDRY	04/06/2016 13:57 EDT
Tl208	J	2.57e-01	3.0e-02	1.0e-02	PCI/GDRY	04/06/2016 13:57 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04108C	Amount analyzed:	5.090e+02 GDRY
Client sample ID:	C2-SB1-8496-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	81.74 %	Analyst:	MO
Ash/dry weight:	96.75 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/25/2016 14:27	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.23e-01	1.3e-01	9.3e-02	PCI/GDRY	04/06/2016 13:57 EDT
Bi214	J	4.78e-01	5.5e-02	1.4e-02	PCI/GDRY	04/06/2016 13:57 EDT
Cs137		-8.01e-04	6.5e-03	7.8e-03	PCI/GDRY	04/06/2016 13:57 EDT
K40		1.20e+01	1.3e+00	6.5e-02	PCI/GDRY	04/06/2016 13:57 EDT
Pb210	J	2.77e-01	8.8e-02	1.1e-01	PCI/GDRY	04/06/2016 13:57 EDT
Pb212	J	8.06e-01	9.0e-02	1.2e-02	PCI/GDRY	04/06/2016 13:57 EDT
Pb214	J	5.65e-01	6.5e-02	1.8e-02	PCI/GDRY	04/06/2016 13:57 EDT
Ra226	J	1.19e+00	1.8e-01	1.6e-01	PCI/GDRY	04/06/2016 13:57 EDT
Ra228		8.07e-01	9.2e-02	2.6e-02	PCI/GDRY	04/06/2016 13:57 EDT
Th234	J	7.80e-01	1.3e-01	1.5e-01	PCI/GDRY	04/06/2016 13:57 EDT
Tl208	J	2.38e-01	2.8e-02	7.7e-03	PCI/GDRY	04/06/2016 13:57 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04109D	Amount analyzed:	2.520e+02 GDRY
Client sample ID:	C2-SB2-0012-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 14:31 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	95.55 %	Analyst:	MO
Ash/dry weight:	85.26 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/25/2016 14:28	1000.0	GE12	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	4.22e-01	1.2e-01	1.2e-01	PCI/GDRY	04/06/2016 14:31 EDT
Bi214	J	3.58e-01	4.4e-02	2.0e-02	PCI/GDRY	04/06/2016 14:31 EDT
Cs137		9.43e-03	6.0e-03	8.2e-03	PCI/GDRY	04/06/2016 14:31 EDT
K40		9.98e+00	1.1e+00	1.0e-01	PCI/GDRY	04/06/2016 14:31 EDT
Pb210	J	4.77e-01	1.2e-01	1.5e-01	PCI/GDRY	04/06/2016 14:31 EDT
Pb212	J	4.35e-01	5.0e-02	1.5e-02	PCI/GDRY	04/06/2016 14:31 EDT
Pb214	J	4.16e-01	5.0e-02	2.1e-02	PCI/GDRY	04/06/2016 14:31 EDT
Ra226	J	7.32e-01	1.8e-01	2.0e-01	PCI/GDRY	04/06/2016 14:31 EDT
Ra228		4.63e-01	6.0e-02	4.0e-02	PCI/GDRY	04/06/2016 14:31 EDT
Th234	J	2.71e-01	1.3e-01	1.7e-01	PCI/GDRY	04/06/2016 14:31 EDT
Tl208	J	1.38e-01	1.9e-02	1.1e-02	PCI/GDRY	04/06/2016 14:31 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04110W	Amount analyzed:	3.990e+02 GDRY
Client sample ID:	C2-SB2-1224-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 14:31 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	83.51 %	Analyst:	MO
Ash/dry weight:	89.80 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/25/2016 14:43	1000.0	GE17	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.32e+00	2.7e-01	2.3e-01	PCI/GDRY	04/06/2016 14:31 EDT
Bi214	J	1.29e+00	1.5e-01	2.8e-02	PCI/GDRY	04/06/2016 14:31 EDT
Cs137		4.64e-02	9.4e-03	1.2e-02	PCI/GDRY	04/06/2016 14:31 EDT
K40		1.55e+01	1.7e+00	1.4e-01	PCI/GDRY	04/06/2016 14:31 EDT
Pb210	J	9.70e-01	1.7e-01	1.8e-01	PCI/GDRY	04/06/2016 14:31 EDT
Pb212	J	1.31e+00	1.5e-01	2.4e-02	PCI/GDRY	04/06/2016 14:31 EDT
Pb214	J	1.47e+00	1.6e-01	3.0e-02	PCI/GDRY	04/06/2016 14:31 EDT
Ra226	J	2.23e+00	3.4e-01	2.9e-01	PCI/GDRY	04/06/2016 14:31 EDT
Ra228		1.32e+00	1.5e-01	7.2e-02	PCI/GDRY	04/06/2016 14:31 EDT
Th234	J	6.85e-01	1.8e-01	2.5e-01	PCI/GDRY	04/06/2016 14:31 EDT
Tl208	J	4.12e-01	4.9e-02	1.9e-02	PCI/GDRY	04/06/2016 14:31 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04111X	Amount analyzed:	5.780e+02 GDRY
Client sample ID:	C2-SB2-2436-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 14:32 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	89.06 %	Analyst:	MO
Ash/dry weight:	97.20 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/25/2016 14:30	1000.0	GE18	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	7.90e-01	1.6e-01	1.5e-01	PCI/GDRY	04/06/2016 14:32 EDT
Bi214	J	1.64e+00	1.8e-01	2.1e-02	PCI/GDRY	04/06/2016 14:32 EDT
Cs137		3.65e-02	7.0e-03	8.5e-03	PCI/GDRY	04/06/2016 14:32 EDT
K40		1.32e+01	1.5e+00	9.5e-02	PCI/GDRY	04/06/2016 14:32 EDT
Pb210	J	2.11e+00	3.1e-01	2.7e-01	PCI/GDRY	04/06/2016 14:32 EDT
Pb212	J	7.28e-01	8.2e-02	1.8e-02	PCI/GDRY	04/06/2016 14:32 EDT
Pb214	J	1.89e+00	2.1e-01	2.5e-02	PCI/GDRY	04/06/2016 14:32 EDT
Ra226	J	2.57e+00	3.4e-01	2.3e-01	PCI/GDRY	04/06/2016 14:32 EDT
Ra228		7.27e-01	8.7e-02	5.3e-02	PCI/GDRY	04/06/2016 14:32 EDT
Th234	J	7.19e-01	1.8e-01	2.6e-01	PCI/GDRY	04/06/2016 14:32 EDT
Tl208	J	2.21e-01	2.7e-02	1.3e-02	PCI/GDRY	04/06/2016 14:32 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04112Y	Amount analyzed:	5.620e+02 GDRY
Client sample ID:	C2-SB2-3648-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 14:32 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	90.76 %	Analyst:	MO
Ash/dry weight:	91.79 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/25/2016 14:31	1000.0	GE23	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.68e-01	1.7e-01	1.5e-01	PCI/GDRY	04/06/2016 14:32 EDT
Bi214	J	4.50e+00	4.9e-01	2.5e-02	PCI/GDRY	04/06/2016 14:32 EDT
Cs137		7.11e-02	1.1e-02	1.0e-02	PCI/GDRY	04/06/2016 14:32 EDT
K40		1.22e+01	1.4e+00	1.3e-01	PCI/GDRY	04/06/2016 14:32 EDT
Pb210	J	8.99e+00	1.1e+00	4.4e-01	PCI/GDRY	04/06/2016 14:32 EDT
Pb212	J	9.01e-01	1.0e-01	2.0e-02	PCI/GDRY	04/06/2016 14:32 EDT
Pb214	J	5.07e+00	5.6e-01	2.3e-02	PCI/GDRY	04/06/2016 14:32 EDT
Ra226	J	5.84e+00	7.0e-01	3.2e-01	PCI/GDRY	04/06/2016 14:32 EDT
Ra228		9.12e-01	1.1e-01	4.7e-02	PCI/GDRY	04/06/2016 14:32 EDT
Th234	J	6.06e-01	2.7e-01	3.9e-01	PCI/GDRY	04/06/2016 14:32 EDT
Tl208	J	2.79e-01	3.2e-02	1.0e-02	PCI/GDRY	04/06/2016 14:32 EDT
U235	J	8.66e-02	4.9e-02	7.7e-02	PCI/GDRY	04/06/2016 14:32 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04113Z	Amount analyzed:	5.810e+02 GDRY
Client sample ID:	C2-SB2-7284-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 14:33 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	84.35 %	Analyst:	MO
Ash/dry weight:	95.90 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/26/2016 15:32	1000.0	GE18	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.09e+00	1.9e-01	1.6e-01	PCI/GDRY	04/06/2016 14:33 EDT
Bi214	J	7.72e-01	8.8e-02	2.1e-02	PCI/GDRY	04/06/2016 14:33 EDT
Cs137		4.85e-03	7.8e-03	1.3e-02	PCI/GDRY	04/06/2016 14:33 EDT
K40		1.41e+01	1.6e+00	9.7e-02	PCI/GDRY	04/06/2016 14:33 EDT
Pb210	J	8.36e-01	1.8e-01	2.3e-01	PCI/GDRY	04/06/2016 14:33 EDT
Pb212	J	1.02e+00	1.1e-01	1.6e-02	PCI/GDRY	04/06/2016 14:33 EDT
Pb214	J	8.82e-01	1.0e-01	2.4e-02	PCI/GDRY	04/06/2016 14:33 EDT
Ra226	J	1.67e+00	2.5e-01	2.1e-01	PCI/GDRY	04/06/2016 14:33 EDT
Ra228		9.92e-01	1.1e-01	5.0e-02	PCI/GDRY	04/06/2016 14:33 EDT
Th234	J	8.07e-01	1.8e-01	2.4e-01	PCI/GDRY	04/06/2016 14:33 EDT
Tl208	J	3.18e-01	3.7e-02	1.4e-02	PCI/GDRY	04/06/2016 14:33 EDT
U235	J	5.98e-02	3.8e-02	5.8e-02	PCI/GDRY	04/06/2016 14:33 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04114A	Amount analyzed:	6.010e+02 GDRY
Client sample ID:	C2-SB2-7284-02	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 14:33 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	83.99 %	Analyst:	MO
Ash/dry weight:	95.93 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/26/2016 15:33	1000.0	GE04	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.68e-01	1.5e-01	1.2e-01	PCI/GDRY	04/06/2016 14:33 EDT
Bi214	J	7.13e-01	8.1e-02	2.0e-02	PCI/GDRY	04/06/2016 14:33 EDT
Cs137		4.42e-03	6.4e-03	8.0e-03	PCI/GDRY	04/06/2016 14:33 EDT
K40		1.34e+01	1.5e+00	8.7e-02	PCI/GDRY	04/06/2016 14:33 EDT
Pb210	J	7.67e-01	2.2e-01	2.8e-01	PCI/GDRY	04/06/2016 14:33 EDT
Pb212	J	9.43e-01	1.1e-01	1.6e-02	PCI/GDRY	04/06/2016 14:33 EDT
Pb214	J	8.31e-01	9.4e-02	2.1e-02	PCI/GDRY	04/06/2016 14:33 EDT
Ra226	J	1.50e+00	2.3e-01	2.0e-01	PCI/GDRY	04/06/2016 14:33 EDT
Ra228		9.82e-01	1.1e-01	3.2e-02	PCI/GDRY	04/06/2016 14:33 EDT
Th234	J	8.69e-01	2.1e-01	2.7e-01	PCI/GDRY	04/06/2016 14:33 EDT
Tl208	J	3.01e-01	3.5e-02	9.4e-03	PCI/GDRY	04/06/2016 14:33 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04115B	Amount analyzed:	6.110e+02 GDRY
Client sample ID:	C2-SB2-8496-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 14:33 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	80.48 %	Analyst:	MO
Ash/dry weight:	96.73 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/26/2016 15:35	1000.0	GE12	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.31e-01	1.5e-01	1.1e-01	PCI/GDRY	04/06/2016 14:33 EDT
Bi214	J	5.10e-01	5.9e-02	1.7e-02	PCI/GDRY	04/06/2016 14:33 EDT
Cs137		4.03e-03	6.1e-03	7.7e-03	PCI/GDRY	04/06/2016 14:33 EDT
K40		1.19e+01	1.3e+00	7.7e-02	PCI/GDRY	04/06/2016 14:33 EDT
Pb210	J	5.12e-01	1.7e-01	2.3e-01	PCI/GDRY	04/06/2016 14:33 EDT
Pb212	J	8.02e-01	9.0e-02	1.3e-02	PCI/GDRY	04/06/2016 14:33 EDT
Pb214	J	5.73e-01	6.6e-02	2.0e-02	PCI/GDRY	04/06/2016 14:33 EDT
Ra226	J	9.37e-01	1.8e-01	1.8e-01	PCI/GDRY	04/06/2016 14:33 EDT
Ra228		7.91e-01	9.1e-02	3.3e-02	PCI/GDRY	04/06/2016 14:33 EDT
Th234	J	5.17e-01	1.7e-01	2.3e-01	PCI/GDRY	04/06/2016 14:33 EDT
Tl208	J	2.56e-01	3.0e-02	9.4e-03	PCI/GDRY	04/06/2016 14:33 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04116C	Amount analyzed:	2.600e+02 GDRY
Client sample ID:	C2-SB3-0012-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 13:17 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	78.00 %	Analyst:	MO
Ash/dry weight:	92.46 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/26/2016 15:38	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	7.83e-01	1.7e-01	1.5e-01	PCI/GDRY	04/06/2016 13:17 EDT
Bi214	J	9.69e-01	1.1e-01	2.7e-02	PCI/GDRY	04/06/2016 13:17 EDT
Cs137		1.60e-01	2.2e-02	1.3e-02	PCI/GDRY	04/06/2016 13:17 EDT
K40		1.10e+01	1.2e+00	1.1e-01	PCI/GDRY	04/06/2016 13:17 EDT
Pb210	J	1.34e+00	1.9e-01	1.6e-01	PCI/GDRY	04/06/2016 13:17 EDT
Pb212	J	7.64e-01	8.6e-02	2.2e-02	PCI/GDRY	04/06/2016 13:17 EDT
Pb214	J	1.11e+00	1.3e-01	2.7e-02	PCI/GDRY	04/06/2016 13:17 EDT
Ra226	J	1.71e+00	2.9e-01	2.5e-01	PCI/GDRY	04/06/2016 13:17 EDT
Ra228		6.98e-01	9.0e-02	4.7e-02	PCI/GDRY	04/06/2016 13:17 EDT
Th234	J	6.83e-01	1.7e-01	2.0e-01	PCI/GDRY	04/06/2016 13:17 EDT
Tl208	J	2.23e-01	2.9e-02	1.4e-02	PCI/GDRY	04/06/2016 13:17 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04117D	Amount analyzed:	5.880e+02 GDRY
Client sample ID:	C2-SB3-1224-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 13:17 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	86.91 %	Analyst:	MO
Ash/dry weight:	96.78 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/26/2016 15:40	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.56e-01	1.4e-01	1.0e-01	PCI/GDRY	04/06/2016 13:17 EDT
Bi214	J	1.30e+00	1.4e-01	1.9e-02	PCI/GDRY	04/06/2016 13:17 EDT
Cs137		8.75e-02	1.1e-02	7.2e-03	PCI/GDRY	04/06/2016 13:17 EDT
K40		1.29e+01	1.4e+00	6.4e-02	PCI/GDRY	04/06/2016 13:17 EDT
Pb210	J	1.27e+00	2.4e-01	2.5e-01	PCI/GDRY	04/06/2016 13:17 EDT
Pb212	J	8.49e-01	9.6e-02	1.5e-02	PCI/GDRY	04/06/2016 13:17 EDT
Pb214	J	1.46e+00	1.6e-01	2.2e-02	PCI/GDRY	04/06/2016 13:17 EDT
Ra226	J	2.02e+00	2.8e-01	2.1e-01	PCI/GDRY	04/06/2016 13:17 EDT
Ra228		8.17e-01	9.4e-02	3.1e-02	PCI/GDRY	04/06/2016 13:17 EDT
Th234	J	6.81e-01	1.8e-01	2.5e-01	PCI/GDRY	04/06/2016 13:17 EDT
Tl208	J	2.64e-01	3.1e-02	9.7e-03	PCI/GDRY	04/06/2016 13:17 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04118E	Amount analyzed:	5.430e+02 GDRY
Client sample ID:	C2-SB3-4860-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 13:18 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	79.16 %	Analyst:	MO
Ash/dry weight:	86.50 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/26/2016 15:42	1000.0	GE17	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	8.52e-01	1.8e-01	1.7e-01	PCI/GDRY	04/06/2016 13:18 EDT
Bi214	J	1.78e+00	2.0e-01	2.3e-02	PCI/GDRY	04/06/2016 13:18 EDT
Cs137		-5.90e-03	9.5e-03	1.6e-02	PCI/GDRY	04/06/2016 13:18 EDT
K40		1.08e+01	1.2e+00	1.1e-01	PCI/GDRY	04/06/2016 13:18 EDT
Pb210	J	1.84e+00	2.3e-01	1.4e-01	PCI/GDRY	04/06/2016 13:18 EDT
Pb212	J	7.80e-01	8.8e-02	2.0e-02	PCI/GDRY	04/06/2016 13:18 EDT
Pb214	J	2.03e+00	2.3e-01	2.8e-02	PCI/GDRY	04/06/2016 13:18 EDT
Ra226	J	2.69e+00	3.6e-01	2.5e-01	PCI/GDRY	04/06/2016 13:18 EDT
Ra228		7.94e-01	9.5e-02	5.4e-02	PCI/GDRY	04/06/2016 13:18 EDT
Th234	J	5.32e-01	1.3e-01	1.9e-01	PCI/GDRY	04/06/2016 13:18 EDT
Tl208	J	2.45e-01	3.0e-02	1.4e-02	PCI/GDRY	04/06/2016 13:18 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04119F	Amount analyzed:	4.010e+02 GDRY
Client sample ID:	C2-SB3-6072-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 13:18 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	60.06 %	Analyst:	MO
Ash/dry weight:	87.01 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/26/2016 15:43	1000.0	GE23	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.12e+00	1.7e-01	1.3e-01	PCI/GDRY	04/06/2016 13:18 EDT
Bi214	J	5.91e-01	6.8e-02	1.9e-02	PCI/GDRY	04/06/2016 13:18 EDT
Cs137		-3.71e-03	7.8e-03	9.8e-03	PCI/GDRY	04/06/2016 13:18 EDT
K40		9.50e+00	1.1e+00	1.0e-01	PCI/GDRY	04/06/2016 13:18 EDT
Pb210	J	5.51e-01	1.3e-01	1.6e-01	PCI/GDRY	04/06/2016 13:18 EDT
Pb212	J	1.04e+00	1.2e-01	1.5e-02	PCI/GDRY	04/06/2016 13:18 EDT
Pb214	J	7.37e-01	8.4e-02	2.1e-02	PCI/GDRY	04/06/2016 13:18 EDT
Ra226	J	1.47e+00	2.4e-01	2.2e-01	PCI/GDRY	04/06/2016 13:18 EDT
Ra228		9.87e-01	1.1e-01	2.9e-02	PCI/GDRY	04/06/2016 13:18 EDT
Th234	J	8.17e-01	1.7e-01	2.1e-01	PCI/GDRY	04/06/2016 13:18 EDT
Tl208	J	3.11e-01	3.6e-02	9.7e-03	PCI/GDRY	04/06/2016 13:18 EDT
U235	J	4.45e-02	4.3e-02	6.1e-02	PCI/GDRY	04/06/2016 13:18 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04120Y	Amount analyzed:	5.550e+02 GDRY
Client sample ID:	C2-SB3-7284-01	Preparation batch #:	0013404B
Matrix:	SOIL	Assay batch #:	0020877K
Collected:	2016-04-06 13:18 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	83.07 %	Analyst:	MO
Ash/dry weight:	98.05 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/31/2016 14:06	1000.0	GE04	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.44e-01	1.5e-01	1.2e-01	PCI/GDRY	04/06/2016 13:18 EDT
Bi214	J	5.61e-01	6.5e-02	1.6e-02	PCI/GDRY	04/06/2016 13:18 EDT
Cs137		-4.70e-03	6.8e-03	8.5e-03	PCI/GDRY	04/06/2016 13:18 EDT
K40		1.43e+01	1.6e+00	8.6e-02	PCI/GDRY	04/06/2016 13:18 EDT
Pb210	J	3.19e-01	9.9e-02	1.3e-01	PCI/GDRY	04/06/2016 13:18 EDT
Pb212	J	8.46e-01	9.4e-02	1.3e-02	PCI/GDRY	04/06/2016 13:18 EDT
Pb214	J	5.98e-01	7.2e-02	1.8e-02	PCI/GDRY	04/06/2016 13:18 EDT
Ra226	J	1.37e+00	2.1e-01	1.9e-01	PCI/GDRY	04/06/2016 13:18 EDT
Ra228		9.31e-01	1.1e-01	3.3e-02	PCI/GDRY	04/06/2016 13:18 EDT
Th234	J	5.49e-01	1.4e-01	1.8e-01	PCI/GDRY	04/06/2016 13:18 EDT
Tl208	J	2.73e-01	3.2e-02	9.7e-03	PCI/GDRY	04/06/2016 13:18 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00734848Y	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013404B
Matrix:	N/A	Assay batch #:	0020877K
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	N/A	Analyst:	MO
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/31/2016 14:07	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi207		6.77e+03	7.3e+02	1.1e+02	PCI	12/15/2010 11:00 CDT
Bi212	J	7.31e+02	2.2e+02	2.4e+02	PCI	12/15/2010 11:00 CDT
Bi214	J	2.59e+02	3.3e+01	1.8e+01	PCI	12/15/2010 11:00 CDT
Eu155		1.65e+03	1.9e+02	7.2e+01	PCI	12/15/2010 11:00 CDT
Pb212	J	7.34e+02	8.5e+01	3.6e+01	PCI	12/15/2010 11:00 CDT
Pb214	J	2.85e+02	4.0e+01	2.8e+01	PCI	12/15/2010 11:00 CDT
Ra226	J	5.12e+02	2.1e+02	2.4e+02	PCI	12/15/2010 11:00 CDT
Ra228		7.21e+02	8.9e+01	6.4e+01	PCI	12/15/2010 11:00 CDT
Tl208	J	2.37e+02	3.2e+01	1.9e+01	PCI	12/15/2010 11:00 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00734849Z	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013404B
Matrix:	N/A	Assay batch #:	0020877K
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	N/A	Analyst:	MO
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
05/31/2016 14:08	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	6.23e-01	2.1e+01	3.6e+01	PCI	05/24/2016 07:00 CDT
Bi214	J	4.14e+00	3.8e+00	4.9e+00	PCI	05/24/2016 07:00 CDT
Cs137		4.21e-01	1.6e+00	2.7e+00	PCI	05/24/2016 07:00 CDT
K40		1.42e+01	1.2e+01	1.9e+01	PCI	05/24/2016 07:00 CDT
Pb210	J	1.95e+01	5.2e+01	6.6e+01	PCI	05/24/2016 07:00 CDT
Pb212	J	-8.13e-01	4.2e+00	4.8e+00	PCI	05/24/2016 07:00 CDT
Pb214	J	4.62e+00	3.6e+00	5.8e+00	PCI	05/24/2016 07:00 CDT
Ra226	J	1.46e+01	3.4e+01	5.6e+01	PCI	05/24/2016 07:00 CDT
Ra228		1.77e+00	5.4e+00	9.0e+00	PCI	05/24/2016 07:00 CDT
Th234	J	9.84e+00	3.6e+01	6.1e+01	PCI	05/24/2016 07:00 CDT
Tl208	J	1.93e+00	1.6e+00	2.5e+00	PCI	05/24/2016 07:00 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG 1600015

PREPARATION BATCH SUMMARY

Preparation batch #: 0013404B
Analysis method: NAREL GAM-01-RA
Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	± 2 σ Uncertainty	Analyst
B6.04104Y	C2-SB1-0012-01	00733634F		N/A		MO
B6.04105Z	C2-SB1-4860-01	00733637J		N/A		MO
B6.04106A	C2-SB1-6072-01	00733640D		N/A		MO
B6.04106A	C2-SB1-6072-01	00734847X	DUP	N/A		MO
B6.04107B	C2-SB1-7284-01	00733643G		N/A		MO
B6.04108C	C2-SB1-8496-01	00733646K		N/A		MO
B6.04109D	C2-SB2-0012-01	00733649N		N/A		MO
B6.04110W	C2-SB2-1224-01	00733652H		N/A		MO
B6.04111X	C2-SB2-2436-01	00733655L		N/A		MO
B6.04112Y	C2-SB2-3648-01	00733658P		N/A		MO
B6.04113Z	C2-SB2-7284-01	00733661J		N/A		MO
B6.04114A	C2-SB2-7284-02	00733664M		N/A		MO
B6.04115B	C2-SB2-8496-01	00733667Q		N/A		MO
B6.04116C	C2-SB3-0012-01	00733670K		N/A		MO
B6.04117D	C2-SB3-1224-01	00733673N		N/A		MO
B6.04118E	C2-SB3-4860-01	00733676R		N/A		MO
B6.04119F	C2-SB3-6072-01	00733679V		N/A		MO
B6.04120Y	C2-SB3-7284-01	00733682P		N/A		MO
LCS-00734848Y *		00734848Y	LCS	N/A		MO
RBK-00734849Z *		00734849Z	RBK	N/A		MO

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013404B

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04106A	00734847X	DUP	BI212		10.6	-0.82	PASS-J
B6.04106A	00734847X	DUP	BI214		0.7	-0.08	PASS-J
B6.04106A	00734847X	DUP	CS137		-46.1	-0.42	PASS
B6.04106A	00734847X	DUP	K40		0.5	-0.06	PASS
B6.04106A	00734847X	DUP	PB210		6.2	-0.37	PASS-J
B6.04106A	00734847X	DUP	PB212		0.5	-0.06	PASS-J
B6.04106A	00734847X	DUP	PB214		0.7	0.09	PASS-J
B6.04106A	00734847X	DUP	RA226		3.9	0.34	PASS-J
B6.04106A	00734847X	DUP	RA228		0.9	0.10	PASS
B6.04106A	00734847X	DUP	TH234		22.6	1.02	PASS-J
B6.04106A	00734847X	DUP	TL208		0.4	-0.04	PASS-J
LCS-00734848Y	00734848Y	LCS	BI207	100.6		0.10	PASS
LCS-00734848Y	00734848Y	LCS	EU155	112.7		1.77	PASS
RBK-00734849Z	00734849Z	RBK	BI212				PASS-J
RBK-00734849Z	00734849Z	RBK	BI214				WARN-J
RBK-00734849Z	00734849Z	RBK	CS137				PASS
RBK-00734849Z	00734849Z	RBK	K40				WARN
RBK-00734849Z	00734849Z	RBK	PB210				PASS-J
RBK-00734849Z	00734849Z	RBK	PB212				PASS-J
RBK-00734849Z	00734849Z	RBK	PB214				WARN-J
RBK-00734849Z	00734849Z	RBK	RA226				PASS-J
RBK-00734849Z	00734849Z	RBK	RA228				PASS
RBK-00734849Z	00734849Z	RBK	TH234				PASS-J
RBK-00734849Z	00734849Z	RBK	TL208				WARN-J

Note: Results qualified with -J may be significantly under or over-estimated and are not evaluated for QC purposes.

U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
TH ANALYSES

REPORT OF SAMPLE DELIVERY GROUP #1600015

Project:	Canadian Radium & Uranium, Mt. Kisco, NY
Analysis method:	Isotopic Thorium Using NaOH Fusion
Report ID:	1600015-TH
Report type:	Original
Date reported:	06/16/2016
Total pages in report:	32

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B6.04104Y	C2-SB1-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04105Z	C2-SB1-4860-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04106A	C2-SB1-6072-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04107B	C2-SB1-7284-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04108C	C2-SB1-8496-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04109D	C2-SB2-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04110W	C2-SB2-1224-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04111X	C2-SB2-2436-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04112Y	C2-SB2-3648-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04113Z	C2-SB2-7284-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04114A	C2-SB2-7284-02	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04115B	C2-SB2-8496-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04116C	C2-SB3-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04117D	C2-SB3-1224-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04118E	C2-SB3-4860-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04119F	C2-SB3-6072-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04120Y	C2-SB3-7284-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016

EXCEPTIONS

1. **Packaging and shipping** – No problems were observed.
2. **Documentation** – No problems were observed.
3. **Sample preparation** – No problems were encountered.
4. **Analysis** – Samples B6.04104 through B6.04112 were reanalyzed as a result of a Th-228 duplicate failure during the original analysis. The results of the reanalyses are reported in this data package. During the reanalysis of those samples, sample B6.04104 has a yield that was below NAREL's lower acceptance criterion. The QA officer for the center determined that it met the uncertainty requirement and approved the analysis.
5. **Holding times** – No holding times were specified.

QUALITY CONTROL

1. **QC samples** – All QC analysis results met NAREL acceptance criteria.
2. **Yields** – All chemical yields were within acceptance limits except the yield for sample B6.04104 which has a yield that was below NAREL's lower acceptance criterion. The QA officer for the center determined that it met the uncertainty requirement that the relative standard uncertainty of the measured yield does not exceed 7.5 % and approved the analysis.
3. **Instruments** – Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

ACCREDITATION

All analyses included in this data package are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard.

CERTIFICATION

I certify that this data report complies with the terms and conditions of the Project Acceptance Form and/or the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

Velinda Herbert — 6/22/16
Velinda Herbert — Date
Quality Assurance Manager, NAREL

Cynthia White — 6-22-16
Cynthia White — Date
Director, Center for Environmental Radioanalytical Laboratory Science

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample, or blank spike
MS	Matrix spike
MSD	Matrix spike duplicate (not currently analyzed)
RBK	Method blank
STD	External standard (used for ^{228}Ra yield determination)

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "*Z* scores." A *Z* score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The *Z* score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The *Z* score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of %R in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either $|Z| \leq 3$ or $60 \leq \%R \leq 110$.

Chain of Custody Forms

Page 1 of 9

53 original COC

From cooler #4

4.20.16

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
5	C002-SB001-0012-01 ✓	4/6/2016	13:56 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C002-SB001-0012-01 ✓	4/6/2016	13:56 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C002-SB001-0012-01 ✓	4/6/2016 ✓	13:56 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
5	C002-SB001-4860-01 ✓	4/6/2016	13:57 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C002-SB001-4860-01 ✓	4/6/2016	13:57 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C002-SB001-4860-01 ✓	4/6/2016	13:57 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	Broken 1	16 oz glass jar ✓
5	C002-SB001-6072-01 ✓	4/6/2016	13:57 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C002-SB001-6072-01 ✓	4/6/2016	13:57 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C002-SB001-6072-01 ✓	4/6/2016	13:57 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
5	C002-SB001-7284-01 ✓	4/6/2016	13:57 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C002-SB001-7284-01 ✓	4/6/2016	13:57 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C002-SB001-7284-01 ✓	4/6/2016	13:57 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
5	C002-SB001-8496-01 ✓	4/6/2016	13:57 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C002-SB001-8496-01 ✓	4/6/2016	13:57 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C002-SB001-8496-01 ✓	4/6/2016	13:57 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C002-SB002-0012-01	4/6/2016	14:31	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB002-0012-01	4/6/2016	14:31	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB002-0012-01	4/6/2016	14:31	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
4	C002-SB002-1224-01 ✓	4/6/2016	14:31 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RSTS		NAREL	04/19/16@115	Good

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

cooler #4

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

	Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
cooler 4		C002-SB002-1224-01 ✓	4/6/2016	14:31	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-1224-01 ✓	4/6/2016	14:31	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4		C002-SB002-2436-01 ✓	4/6/2016	14:32	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-2436-01 ✓	4/6/2016	14:32	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-2436-01 ✓	4/6/2016	14:32	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4		C002-SB002-3648-01 ✓	4/6/2016	14:32	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-3648-01 ✓	4/6/2016	14:32	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-3648-01 ✓	4/6/2016	14:32	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4		C002-SB002-7284-01 ✓	4/6/2016	14:33	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-7284-01 ✓	4/6/2016	14:33	Isotopic Uranium ✓ OK	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-7284-01 ✓	4/6/2016	14:33	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4		C002-SB002-7284-02 ✓	4/6/2016	14:33	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-7284-02 ✓	4/6/2016	14:33	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4		C002-SB002-7284-02 ✓	4/6/2016	14:33	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
5		C002-SB002-8496-01 ✓	4/6/2016	14:33 ✓	Isotopic Thorium ✓	Soil	4 C	Y	2	8 oz glass jar ✓
5		C002-SB002-8496-01 ✓	4/6/2016	14:33 ✓	Isotopic Uranium ✓	Soil	4 C	Y	2	8 oz glass jar ✓
5		C002-SB002-8496-01	4/6/2016	14:33 ✓	~~Gamma Spec (Modified)~~ ✓	Soil	4 C	N	OK 1602 8 oz 1	~~16~~ oz glass jar
		C002-SB003-0012-01	4/6/2016	13:17	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
		C002-SB003-0012-01	4/6/2016	13:17	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar

5 TOTAL

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		NAREL	04/19/16 @1115	Good

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	C002-SB003-0012-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
4	C003-SB001-0012-01 ✓	4/5/2016 ✓	12:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	✓16 oz glass jar

cracked Jar NU LOST

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CHCP NAREL	04/19/16 @1115	Good ① Cracked Sample 16oz ICC

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

ANALYSIS SUMMARY

Analysis method: NAREL ACT-02F-TH
Title: Isotopic Thorium Using NaOH Fusion

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B6.04104Y	C2-SB1-0012-01		06/11/2016	0013447N	0020924Z
B6.04104Y	C2-SB1-0012-01	DUP	06/11/2016	0013447N	0020924Z
B6.04105Z	C2-SB1-4860-01		06/11/2016	0013447N	0020924Z
B6.04106A	C2-SB1-6072-01		06/11/2016	0013447N	0020924Z
B6.04107B	C2-SB1-7284-01		06/11/2016	0013447N	0020924Z
B6.04108C	C2-SB1-8496-01		06/11/2016	0013447N	0020924Z
B6.04109D	C2-SB2-0012-01		06/11/2016	0013447N	0020924Z
B6.04110W	C2-SB2-1224-01		06/11/2016	0013447N	0020924Z
B6.04111X	C2-SB2-2436-01		06/11/2016	0013447N	0020924Z
B6.04112Y	C2-SB2-3648-01		06/11/2016	0013447N	0020924Z
B6.04113Z	C2-SB2-7284-01		06/08/2016	0013438M	0020914X
B6.04113Z	C2-SB2-7284-01	DUP	06/08/2016	0013438M	0020914X
B6.04114A	C2-SB2-7284-02		06/08/2016	0013438M	0020914X
B6.04115B	C2-SB2-8496-01		06/08/2016	0013438M	0020914X
B6.04116C	C2-SB3-0012-01		06/08/2016	0013438M	0020914X
B6.04117D	C2-SB3-1224-01		06/08/2016	0013438M	0020914X
B6.04118E	C2-SB3-4860-01		06/08/2016	0013438M	0020914X
B6.04119F	C2-SB3-6072-01		06/08/2016	0013438M	0020914X
B6.04120Y	C2-SB3-7284-01		06/08/2016	0013438M	0020914X
LCS-00735295Q *		LCS	06/08/2016	0013438M	0020914X
RBK-00735294P *		RBK	06/08/2016	0013438M	0020914X
LCS-00735406D *		LCS	06/11/2016	0013447N	0020924Z
RBK-00735405C *		RBK	06/11/2016	0013447N	0020924Z

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04104Y	Amount analyzed:	1.094e+00 GASH
Client sample ID:	C2-SB1-0012-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:56 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	95.75 %	Analyst:	SPK
Ash/dry weight:	88.99 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS97	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	8.10e-02	7.1e-02	7.5e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	5.97e-01	1.6e-01	5.2e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	4.48e-01	1.3e-01	7.1e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	4.50e-01	1.3e-01	4.2e-02	PCI/GDRY	06/10/2016 15:38 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04104Y	Amount analyzed:	9.600e-01 GASH
Client sample ID:	C2-SB1-0012-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:56 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	95.75 %	Analyst:	SPK
Ash/dry weight:	88.99 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS98	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.04e-01	4.9e-02	2.5e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	4.68e-01	8.6e-02	2.3e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	4.74e-01	9.1e-02	5.4e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	5.12e-01	9.1e-02	1.9e-02	PCI/GDRY	06/10/2016 15:38 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04105Z	Amount analyzed:	9.818e-01 GASH
Client sample ID:	C2-SB1-4860-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	94.41 %	Analyst:	SPK
Ash/dry weight:	97.26 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS99	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	6.71e-02	4.1e-02	2.8e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	5.04e-01	9.4e-02	1.9e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	4.84e-01	9.7e-02	5.8e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	5.18e-01	9.6e-02	1.6e-02	PCI/GDRY	06/10/2016 15:38 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04106A	Amount analyzed:	9.944e-01 GASH
Client sample ID:	C2-SB1-6072-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	91.38 %	Analyst:	SPK
Ash/dry weight:	98.14 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS100	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	7.06e-02	4.5e-02	3.7e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	6.30e-01	1.1e-01	2.9e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	5.03e-01	1.0e-01	6.1e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	5.89e-01	1.1e-01	2.4e-02	PCI/GDRY	06/10/2016 15:38 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04107B	Amount analyzed:	1.009e+00 GASH
Client sample ID:	C2-SB1-7284-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	80.06 %	Analyst:	SPK
Ash/dry weight:	94.96 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS101	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	J	1.23e-01	5.6e-02	3.3e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228		7.50e-01	1.2e-01	2.1e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230		6.18e-01	1.1e-01	5.6e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232		7.09e-01	1.2e-01	1.5e-02	PCI/GDRY	06/10/2016 15:38 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04108C	Amount analyzed:	1.005e+00 GASH
Client sample ID:	C2-SB1-8496-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	81.74 %	Analyst:	SPK
Ash/dry weight:	96.75 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS103	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	9.79e-02	4.8e-02	2.6e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	7.43e-01	1.2e-01	2.5e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	5.42e-01	1.0e-01	5.7e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	7.11e-01	1.1e-01	2.0e-02	PCI/GDRY	06/10/2016 15:38 CDT

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04109D	Amount analyzed:	9.756e-01 GASH
Client sample ID:	C2-SB2-0012-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 14:31 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	95.55 %	Analyst:	SPK
Ash/dry weight:	85.26 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS104	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.15e-01	6.1e-02	4.3e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	5.37e-01	1.1e-01	4.1e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	5.54e-01	1.2e-01	5.9e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	4.17e-01	9.3e-02	2.0e-02	PCI/GDRY	06/10/2016 15:38 CDT

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04110W	Amount analyzed:	1.016e+00 GASH
Client sample ID:	C2-SB2-1224-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 14:31 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	83.51 %	Analyst:	SPK
Ash/dry weight:	89.80 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS105	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.25e-01	5.3e-02	2.4e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	9.90e-01	1.4e-01	1.7e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	1.08e+00	1.5e-01	5.2e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	8.48e-01	1.3e-01	1.7e-02	PCI/GDRY	06/10/2016 15:38 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04111X	Amount analyzed:	9.908e-01 GASH
Client sample ID:	C2-SB2-2436-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 14:32 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	89.06 %	Analyst:	SPK
Ash/dry weight:	97.20 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS106	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	J	1.13e-01	5.4e-02	2.8e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228		5.62e-01	1.0e-01	2.9e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230		9.32e-01	1.5e-01	5.9e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232		6.17e-01	1.1e-01	2.2e-02	PCI/GDRY	06/10/2016 15:38 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04112Y	Amount analyzed:	1.005e+00 GASH
Client sample ID:	C2-SB2-3648-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 14:32 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	90.76 %	Analyst:	SPK
Ash/dry weight:	91.79 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS107	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.38e-01	5.8e-02	3.2e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	8.93e-01	1.3e-01	2.0e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	1.57e+00	2.1e-01	5.4e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	7.59e-01	1.2e-01	2.0e-02	PCI/GDRY	06/10/2016 15:38 CDT

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04113Z	Amount analyzed:	1.001e+00 GASH
Client sample ID:	C2-SB2-7284-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 14:33 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	84.35 %	Analyst:	SPK
Ash/dry weight:	95.90 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS97	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	8.11e-02	4.8e-02	3.7e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	1.11e+00	1.7e-01	2.5e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	6.80e-01	1.2e-01	5.8e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	1.01e+00	1.6e-01	2.1e-02	PCI/GDRY	06/07/2016 16:23 CDT

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04113Z	Amount analyzed:	9.982e-01 GASH
Client sample ID:	C2-SB2-7284-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 14:33 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	84.35 %	Analyst:	SPK
Ash/dry weight:	95.90 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS98	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.05e-01	5.2e-02	2.8e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	9.55e-01	1.4e-01	2.5e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	7.38e-01	1.2e-01	5.7e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	8.72e-01	1.4e-01	2.2e-02	PCI/GDRY	06/07/2016 16:23 CDT

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04114A	Amount analyzed:	1.011e+00 GASH
Client sample ID:	C2-SB2-7284-02	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 14:33 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	83.99 %	Analyst:	SPK
Ash/dry weight:	95.93 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:22	1000.0	AS99	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.47e-01	6.2e-02	2.8e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th228	1.09e+00	1.6e-01	2.0e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th230	6.44e-01	1.2e-01	5.7e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th232	1.12e+00	1.6e-01	1.6e-02	PCI/GDRY	06/07/2016 16:22 CDT

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04115B	Amount analyzed:	1.011e+00 GASH
Client sample ID:	C2-SB2-8496-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 14:33 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	80.48 %	Analyst:	SPK
Ash/dry weight:	96.73 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:22	1000.0	AS100	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.00e-01	5.0e-02	3.3e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th228	7.64e-01	1.2e-01	2.6e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th230	6.07e-01	1.1e-01	5.7e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th232	7.36e-01	1.2e-01	2.1e-02	PCI/GDRY	06/07/2016 16:22 CDT

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04116C	Amount analyzed:	1.003e+00 GASH
Client sample ID:	C2-SB3-0012-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 13:17 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	78.00 %	Analyst:	SPK
Ash/dry weight:	92.46 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:22	1000.0	AS102	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.20e-01	5.4e-02	3.3e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th228	3.73e+00	4.2e-01	2.9e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th230	1.08e+00	1.6e-01	5.7e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th232	3.83e+00	4.3e-01	1.8e-02	PCI/GDRY	06/07/2016 16:22 CDT

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04117D	Amount analyzed:	1.005e+00 GASH
Client sample ID:	C2-SB3-1224-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 13:17 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	86.91 %	Analyst:	SPK
Ash/dry weight:	96.78 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS103	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.06e-01	5.2e-02	2.8e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	7.49e-01	1.2e-01	2.7e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	1.00e+00	1.5e-01	5.9e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	8.81e-01	1.4e-01	2.2e-02	PCI/GDRY	06/07/2016 16:23 CDT

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04118E	Amount analyzed:	9.998e-01 GASH
Client sample ID:	C2-SB3-4860-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 13:18 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	79.16 %	Analyst:	SPK
Ash/dry weight:	86.50 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS104	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.50e-01	6.0e-02	3.1e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	8.47e-01	1.3e-01	3.0e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	1.32e+00	1.8e-01	5.2e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	7.67e-01	1.2e-01	1.4e-02	PCI/GDRY	06/07/2016 16:23 CDT

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04119F	Amount analyzed:	1.003e+00 GASH
Client sample ID:	C2-SB3-6072-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 13:18 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	60.06 %	Analyst:	SPK
Ash/dry weight:	87.01 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS121	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	8.66e-02	4.2e-02	2.3e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	8.65e-01	1.3e-01	1.8e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	7.20e-01	1.1e-01	5.0e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	9.44e-01	1.3e-01	1.3e-02	PCI/GDRY	06/07/2016 16:23 CDT

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04120Y	Amount analyzed:	1.009e+00 GASH
Client sample ID:	C2-SB3-7284-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 13:18 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	83.07 %	Analyst:	SPK
Ash/dry weight:	98.05 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS122	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.56e-01	6.1e-02	2.6e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	8.15e-01	1.3e-01	2.8e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	7.35e-01	1.2e-01	5.6e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	7.30e-01	1.2e-01	1.8e-02	PCI/GDRY	06/07/2016 16:23 CDT

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SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00735295Q	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013438M
Matrix:	N/A	Assay batch #:	0020914X
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS123	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	6.40e-02	4.6e-02	4.8e-02	PCI	06/07/2016 16:23 CDT
Th228	1.20e-02	1.9e-02	3.1e-02	PCI	06/07/2016 16:23 CDT
Th230	1.90e+00	2.4e-01	6.2e-02	PCI	06/07/2016 16:23 CDT
Th232	6.02e-03	1.5e-02	2.9e-02	PCI	06/07/2016 16:23 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00735294P	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013438M
Matrix:	N/A	Assay batch #:	0020914X
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS124	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.06e-02	2.3e-02	3.9e-02	PCI	06/07/2016 16:23 CDT
Th228	1.80e-02	2.0e-02	2.7e-02	PCI	06/07/2016 16:23 CDT
Th230	2.67e-02	3.7e-02	6.2e-02	PCI	06/07/2016 16:23 CDT
Th232	6.01e-03	1.3e-02	2.2e-02	PCI	06/07/2016 16:23 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00735406D	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013447N
Matrix:	N/A	Assay batch #:	0020924Z
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS108	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	7.62e-03	2.1e-02	4.0e-02	PCI	06/10/2016 15:38 CDT
Th228	3.23e-03	1.4e-02	2.9e-02	PCI	06/10/2016 15:38 CDT
Th230	2.32e+00	2.7e-01	6.0e-02	PCI	06/10/2016 15:38 CDT
Th232	9.68e-03	1.3e-02	1.6e-02	PCI	06/10/2016 15:38 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600015

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00735405C	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013447N
Matrix:	N/A	Assay batch #:	0020924Z
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS109	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	-1.94e-03	1.3e-02	3.6e-02	PCI	06/10/2016 15:38 CDT
Th228	5.48e-03	1.4e-02	2.7e-02	PCI	06/10/2016 15:38 CDT
Th230	9.87e-03	3.2e-02	6.0e-02	PCI	06/10/2016 15:38 CDT
Th232	6.58e-03	1.2e-02	1.6e-02	PCI	06/10/2016 15:38 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG 1600015

PREPARATION BATCH SUMMARY

Preparation batch #: 0013438M
Analysis method: NAREL ACT-02F-TH
Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	± 2 σ Uncertainty	Analyst
B6.04113Z	C2-SB2-7284-01	00733660H		77.80 %	7.35 %	SPK
B6.04113Z	C2-SB2-7284-01	00735330A	DUP	84.96 %	7.77 %	SPK
B6.04114A	C2-SB2-7284-02	00733663L		82.92 %	7.69 %	SPK
B6.04115B	C2-SB2-8496-01	00733666P		90.62 %	8.22 %	SPK
B6.04116C	C2-SB3-0012-01	00733669T		85.11 %	7.78 %	SPK
B6.04117D	C2-SB3-1224-01	00733672M		86.68 %	7.94 %	SPK
B6.04118E	C2-SB3-4860-01	00733675Q		83.33 %	7.68 %	SPK
B6.04119F	C2-SB3-6072-01	00733678U		96.53 %	8.49 %	SPK
B6.04120Y	C2-SB3-7284-01	00733681N		92.11 %	8.16 %	SPK
LCS-00735295Q *		00735295Q	LCS	77.40 %	7.41 %	SPK
RBK-00735294P *		00735294P	RBK	76.89 %	7.36 %	SPK

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013438M

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04113Z	00735330A	DUP	TH227		25.8	0.68	PASS
B6.04113Z	00735330A	DUP	TH228		15.3	-1.43	PASS
B6.04113Z	00735330A	DUP	TH230		8.2	0.67	PASS
B6.04113Z	00735330A	DUP	TH232		14.7	-1.34	PASS
LCS-00735295Q	00735295Q	LCS	TH230	95.0		-0.81	PASS
RBK-00735294P	00735294P	RBK	TH227				PASS
RBK-00735294P	00735294P	RBK	TH228				PASS
RBK-00735294P	00735294P	RBK	TH230				PASS
RBK-00735294P	00735294P	RBK	TH232				PASS

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG 1600015

PREPARATION BATCH SUMMARY

Preparation batch #: 0013447N
Analysis method: NAREL ACT-02F-TH
Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	± 2 σ Uncertainty	Analyst
B6.04104Y	C2-SB1-0012-01	00735395U		32.30 %	4.57 %	SPK
B6.04104Y	C2-SB1-0012-01	00735404B	DUP	91.23 %	8.09 %	SPK
B6.04105Z	C2-SB1-4860-01	00735396V		87.55 %	7.94 %	SPK
B6.04106A	C2-SB1-6072-01	00735397W		83.13 %	7.83 %	SPK
B6.04107B	C2-SB1-7284-01	00735398X		85.07 %	7.78 %	SPK
B6.04108C	C2-SB1-8496-01	00735399Y		93.56 %	8.30 %	SPK
B6.04109D	C2-SB2-0012-01	00735400X		61.81 %	6.51 %	SPK
B6.04110W	C2-SB2-1224-01	00735401Y		88.83 %	7.94 %	SPK
B6.04111X	C2-SB2-2436-01	00735402Z		87.38 %	8.00 %	SPK
B6.04112Y	C2-SB2-3648-01	00735403A		84.07 %	7.62 %	SPK
LCS-00735406D *		00735406D	LCS	84.44 %	7.70 %	SPK
RBK-00735405C *		00735405C	RBK	84.83 %	7.80 %	SPK

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013447N

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04104Y	00735404B	DUP	TH227		25.3	0.54	PASS
B6.04104Y	00735404B	DUP	TH228		24.2	-1.45	PASS
B6.04104Y	00735404B	DUP	TH230		5.7	0.33	PASS
B6.04104Y	00735404B	DUP	TH232		12.8	0.77	PASS
LCS-00735406D	00735406D	LCS	TH230	115.8		2.32	WARN
RBK-00735405C	00735405C	RBK	TH227				PASS
RBK-00735405C	00735405C	RBK	TH228				PASS
RBK-00735405C	00735405C	RBK	TH230				PASS
RBK-00735405C	00735405C	RBK	TH232				PASS

U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
GAMMA ANALYSES

REPORT OF SAMPLE DELIVERY GROUP #1600016

Project:	Canadian Radium & Uranium, Mt. Kisco, NY
Analysis method:	Gamma-ray Spectrometry - Sealed Radium Cans
Report ID:	1600016-GAMMA
Report type:	Original
Date reported:	06/13/2016
Total pages in report:	31

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B6.04121Z	C2-SB3-8496-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04122A	C3-SB1-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04123B	C3-SB1-3648-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04124C	C3-SB1-3648-02	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04125D	C3-SB2-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04126E	C3-SB2-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04127F	C3-SB3-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04128G	C3-SB3-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04129H	C3-SB4-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04130A	C3-SB4-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04131B	C3-SB5-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04132C	C3-SB6-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04133D	C3-SB6-3648-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04134E	C3-SB7-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04135F	C3-SB7-3648-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04136G	C3-SB8-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04137H	C3-SB8-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016

EXCEPTIONS

1. **Packaging and shipping** – No problems were observed.
2. **Documentation** – No problems were observed.
3. **Sample preparation** – No problems were encountered.
4. **Analysis** – Samples were held for 21 days to allow for ingrowth. Client requested that NAREL report the following: Cs-137, Th-234, Tl-208, Ra-228, Ac-228, Bi-210, Ra-226, Pb-214, Bi-214, Bi-212, Pb-212, Pb-210, and K-40. Client was informed that NAREL does not provide Ac-228 or Bi-210 results by gamma analysis. Also, client requested specific methods to be used, but NAREL uses in-house methods. Client agreed NAREL methods were acceptable. Please see page 4 of this report with regards to exceptions for reporting of some of the nuclides in this list. For Pb-210 in soil samples, NAREL flags the results because of the larger uncertainty associated with gamma-ray attenuation in uncharacterized materials at low energies (46.5 keV).
5. **Holding times** – No holding times were specified.

QUALITY CONTROL

1. **QC samples** – All QC analysis results met NAREL acceptance criteria.
2. **Instruments** – Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

ACCREDITATION

All analyses included in this data package are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard.

CERTIFICATION

I certify that this data report complies with the terms and conditions of the Project Acceptance Form and/or the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

Velinda Herbert 6/15/16

Velinda Herbert — Date
Quality Assurance Manager, NAREL

Cynthia White 6-16-16

Cynthia White — Date
Director, Center for Environmental Radioanalytical Laboratory Science

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample, or blank spike
MS	Matrix spike
MSD	Matrix spike duplicate (not currently analyzed)
RBK	Method blank
STD	External standard (used for ^{228}Ra yield determination)

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "*Z* scores." A *Z* score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The *Z* score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The *Z* score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of %R in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either $|Z| \leq 3$ or $60 \leq \%R \leq 110$.

GENERAL INFORMATION (CONTINUED)

GAMMA ANALYSIS

The reporting format lists the gamma emitters in alphabetical order. The activity, 2-sigma uncertainty, and a sample-specific estimate of the MDC for radionuclides measured by gamma spectroscopy are reported only if the nuclide is detected above background with the exception of client requested nuclides of interest. The activity for each of the requested nuclides is reported whether negative, positive, or zero along with the associated 2-sigma uncertainty and the sample-specific estimate of the MDC.

Due to potential spectral interferences and other possible problems associated with the determination of the activity of certain radionuclides, the activities for ^{214}Bi, ^{214}Pb, ^{234}Th, ^{234m}Pa, ^{226}Ra, ^{231}Th, and ^{235}U are subject to greater uncertainty than other commonly reported radionuclides. It should be noted that this potential uncertainty is not included in the two-sigma expanded uncertainty that is reported with each result. Although in this report we do provide the calculated activities for these radionuclides, we recommend that the results be used only as a qualitative means of indicating the presence of these radionuclides and not as a quantitative measure of their concentration. The results for these nuclides are not used in the evaluation of quality control samples. Furthermore, because of mutual interference between ^{226}Ra and ^{235}U, NAREL's gamma analysis software tends to overestimate the amounts of these nuclides whenever both are present in a sample. Lower estimates for ^{226}Ra activities can be obtained from the reported activities of its decay products, ^{214}Pb and ^{214}Bi, which are likely to be somewhat less than the ^{226}Ra activity because of the potential escape of radon gas.

NAREL's gamma-ray spectrometry software corrects activities and MDCs for decay between collection and analysis, but only up to a limit of twelve half-lives. If the decay time for a sample exceeds twelve half-lives of a radionuclide, that radionuclide is not reported. This software feature may affect results for short-lived radionuclides, such as ^{131}I and ^{140}Ba, when there is a long delay between collection and analysis.

Chain of Custody Forms

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	C002-SB003-0012-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
4	C003-SB001-0012-01 ✓	4/5/2016 ✓	12:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	✓16 oz glass jar

Cracked Jar NO LOST

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CH NAREL	04/19/16 @1115	Good ① Cracked Sample 16oz ICC

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
3	C003-SB001-3648-01 ✓	4/5/2016	12:21 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
	C003-SB001-3648-01	4/5/2016	12:21	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB001-3648-01	4/5/2016	12:21	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB001-3648-02 ✓	4/5/2016	12:21	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB001-3648-02 ✓	4/5/2016	12:21 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB001-3648-02 ✓	4/5/2016	12:21 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB002-0012-01	4/5/2016	11:10	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-0012-01	4/5/2016	11:10	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-0012-01	4/5/2016	11:10	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB002-1224-01	4/5/2016	11:05	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-1224-01	4/5/2016	11:05	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-1224-01	4/5/2016	11:05	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB003-0012-01	4/5/2016	13:20	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB003-0012-01	4/5/2016	13:20	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB003-0012-01	4/5/2016	13:20	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB003-1224-01	4/5/2016	13:20	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
3	C003-SB003-1224-01 ✓	4/5/2016	13:20 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB003-1224-01 ✓	4/5/2016	13:20 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓ ?
	C003-SB004-0012-01	4/5/2016	13:48	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	RST3		CHAIN NAREL	04/19/16 0111	

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	C003-SB004-0012-01	4/5/2016	13:48	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-0012-01	4/5/2016	13:48	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB007-0012-01 ✓	4/5/2016	16:23 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB007-0012-01 ✓	4/5/2016	16:23 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB007-0012-01 ✓	4/5/2016	16:23 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4/12/16	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Isotopic Thorium~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~8 oz glass jar~~
4/12/16	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Isotopic Uranium~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~8 oz glass jar~~
6									

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CH NAREL	4/19/16 0115	Good

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
Dist Pre	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Gamma Spec (Modified)~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~16 oz glass jar~~
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	C003-SB007-3648-01 ✓	4/5/2016	16:23	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Thorium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Uranium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	LABLE ISSUE	16 oz glass jar ✓
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓

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Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		[signature] NAREL	04/19/16 @ 11:15	Good

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

ANALYSIS SUMMARY

Analysis method: NAREL GAM-01-RA
Title: Gamma-ray Spectrometry - Sealed Radium Cans

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B6.04121Z	C2-SB3-8496-01		06/03/2016	0013426H	0020905W
B6.04122A	C3-SB1-0012-01		06/03/2016	0013426H	0020905W
B6.04123B	C3-SB1-3648-01		06/03/2016	0013426H	0020905W
B6.04124C	C3-SB1-3648-02		06/03/2016	0013426H	0020905W
B6.04124C	C3-SB1-3648-02	DUP	06/04/2016	0013426H	0020905W
B6.04125D	C3-SB2-0012-01		06/03/2016	0013426H	0020905W
B6.04126E	C3-SB2-1224-01		06/03/2016	0013426H	0020905W
B6.04127F	C3-SB3-0012-01		06/04/2016	0013426H	0020905W
B6.04128G	C3-SB3-1224-01		06/04/2016	0013426H	0020905W
B6.04129H	C3-SB4-0012-01		06/04/2016	0013426H	0020905W
B6.04130A	C3-SB4-1224-01		06/04/2016	0013426H	0020905W
B6.04131B	C3-SB5-0012-01		06/04/2016	0013426H	0020905W
B6.04132C	C3-SB6-0012-01		06/07/2016	0013426H	0020905W
B6.04133D	C3-SB6-3648-01		06/04/2016	0013426H	0020905W
B6.04134E	C3-SB7-0012-01		06/07/2016	0013426H	0020905W
B6.04135F	C3-SB7-3648-01		06/07/2016	0013426H	0020905W
B6.04136G	C3-SB8-0012-01		06/08/2016	0013426H	0020905W
B6.04137H	C3-SB8-1224-01		06/08/2016	0013426H	0020905W
LCS-00735157F *		LCS	06/08/2016	0013426H	0020905W
RBK-00735158G *		RBK	06/08/2016	0013426H	0020905W

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

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NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04121Z	Amount analyzed:	5.260e+02 GDRY
Client sample ID:	C2-SB3-8496-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-06 13:19 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	84.48 %	Analyst:	MO
Ash/dry weight:	98.41 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/02/2016 15:00	1000.0	GE17	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.13e+00	1.9e-01	1.6e-01	PCI/GDRY	04/06/2016 13:19 EDT
Bi214	J	7.13e-01	8.2e-02	2.2e-02	PCI/GDRY	04/06/2016 13:19 EDT
Cs137		-5.51e-04	8.7e-03	1.1e-02	PCI/GDRY	04/06/2016 13:19 EDT
K40		1.50e+01	1.7e+00	1.0e-01	PCI/GDRY	04/06/2016 13:19 EDT
Pb210	J	4.78e-01	1.1e-01	1.4e-01	PCI/GDRY	04/06/2016 13:19 EDT
Pb212	J	1.01e+00	1.1e-01	1.9e-02	PCI/GDRY	04/06/2016 13:19 EDT
Pb214	J	8.15e-01	9.3e-02	2.4e-02	PCI/GDRY	04/06/2016 13:19 EDT
Ra226	J	1.50e+00	2.3e-01	2.1e-01	PCI/GDRY	04/06/2016 13:19 EDT
Ra228		1.02e+00	1.2e-01	5.3e-02	PCI/GDRY	04/06/2016 13:19 EDT
Th234	J	5.95e-01	1.4e-01	1.9e-01	PCI/GDRY	04/06/2016 13:19 EDT
Tl208	J	3.24e-01	3.9e-02	1.5e-02	PCI/GDRY	04/06/2016 13:19 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04122A	Amount analyzed:	1.600e+02 GDRY
Client sample ID:	C3-SB1-0012-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 12:19 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	98.90 %	Analyst:	MO
Ash/dry weight:	90.07 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/02/2016 15:01	1000.0	GE04	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.20e+00	2.4e-01	2.0e-01	PCI/GDRY	04/05/2016 12:19 EDT
Bi214	J	5.33e-01	6.7e-02	2.8e-02	PCI/GDRY	04/05/2016 12:19 EDT
Cs137		-4.94e-03	1.1e-02	1.4e-02	PCI/GDRY	04/05/2016 12:19 EDT
K40		1.36e+01	1.5e+00	1.6e-01	PCI/GDRY	04/05/2016 12:19 EDT
Pb210	J	5.94e-01	2.2e-01	2.7e-01	PCI/GDRY	04/05/2016 12:19 EDT
Pb212	J	1.18e+00	1.3e-01	2.0e-02	PCI/GDRY	04/05/2016 12:19 EDT
Pb214	J	6.54e-01	7.7e-02	2.7e-02	PCI/GDRY	04/05/2016 12:19 EDT
Ra226	J	1.10e+00	2.7e-01	2.8e-01	PCI/GDRY	04/05/2016 12:19 EDT
Ra228		1.16e+00	1.4e-01	5.2e-02	PCI/GDRY	04/05/2016 12:19 EDT
Th234	J	5.43e-01	2.2e-01	3.0e-01	PCI/GDRY	04/05/2016 12:19 EDT
Tl208	J	3.43e-01	4.1e-02	1.4e-02	PCI/GDRY	04/05/2016 12:19 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04123B	Amount analyzed:	6.490e+02 GDRY
Client sample ID:	C3-SB1-3648-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 12:21 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	85.94 %	Analyst:	MO
Ash/dry weight:	99.22 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/02/2016 15:02	1000.0	GE18	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	7.70e-01	1.3e-01	1.2e-01	PCI/GDRY	04/05/2016 12:21 EDT
Bi214	J	7.85e-01	8.9e-02	1.8e-02	PCI/GDRY	04/05/2016 12:21 EDT
Cs137		-4.61e-03	7.1e-03	1.2e-02	PCI/GDRY	04/05/2016 12:21 EDT
K40		1.36e+01	1.5e+00	7.8e-02	PCI/GDRY	04/05/2016 12:21 EDT
Pb210	J	7.29e-01	1.6e-01	2.0e-01	PCI/GDRY	04/05/2016 12:21 EDT
Pb212	J	7.41e-01	8.3e-02	1.6e-02	PCI/GDRY	04/05/2016 12:21 EDT
Pb214	J	9.00e-01	1.0e-01	1.9e-02	PCI/GDRY	04/05/2016 12:21 EDT
Ra226	J	1.31e+00	2.0e-01	1.8e-01	PCI/GDRY	04/05/2016 12:21 EDT
Ra228		7.46e-01	8.8e-02	4.5e-02	PCI/GDRY	04/05/2016 12:21 EDT
Th234	J	5.08e-01	1.5e-01	2.2e-01	PCI/GDRY	04/05/2016 12:21 EDT
Tl208	J	2.35e-01	2.8e-02	1.2e-02	PCI/GDRY	04/05/2016 12:21 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04124C	Amount analyzed:	6.340e+02 GDRY
Client sample ID:	C3-SB1-3648-02	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 12:21 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	86.13 %	Analyst:	MO
Ash/dry weight:	99.19 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/02/2016 15:03	1000.0	GE23	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	7.79e-01	1.2e-01	1.0e-01	PCI/GDRY	04/05/2016 12:21 EDT
Bi214	J	9.04e-01	1.0e-01	1.7e-02	PCI/GDRY	04/05/2016 12:21 EDT
Cs137		3.98e-03	6.8e-03	1.1e-02	PCI/GDRY	04/05/2016 12:21 EDT
K40		1.36e+01	1.5e+00	8.2e-02	PCI/GDRY	04/05/2016 12:21 EDT
Pb210	J	7.42e-01	2.0e-01	2.6e-01	PCI/GDRY	04/05/2016 12:21 EDT
Pb212	J	7.22e-01	8.1e-02	1.4e-02	PCI/GDRY	04/05/2016 12:21 EDT
Pb214	J	1.01e+00	1.1e-01	1.8e-02	PCI/GDRY	04/05/2016 12:21 EDT
Ra226	J	1.53e+00	2.3e-01	2.0e-01	PCI/GDRY	04/05/2016 12:21 EDT
Ra228		7.35e-01	8.5e-02	2.8e-02	PCI/GDRY	04/05/2016 12:21 EDT
Th234	J	5.47e-01	1.8e-01	2.5e-01	PCI/GDRY	04/05/2016 12:21 EDT
Tl208	J	2.28e-01	2.7e-02	9.3e-03	PCI/GDRY	04/05/2016 12:21 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04124C	Amount analyzed:	6.340e+02 GDRY
Client sample ID:	C3-SB1-3648-02	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 12:21 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	86.13 %	Analyst:	MO
Ash/dry weight:	99.19 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/03/2016 16:02	1000.0	GE04	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	7.87e-01	1.3e-01	1.1e-01	PCI/GDRY	04/05/2016 12:21 EDT
Bi214	J	9.09e-01	1.0e-01	1.8e-02	PCI/GDRY	04/05/2016 12:21 EDT
Cs137		-1.89e-03	7.3e-03	1.2e-02	PCI/GDRY	04/05/2016 12:21 EDT
K40		1.39e+01	1.5e+00	8.7e-02	PCI/GDRY	04/05/2016 12:21 EDT
Pb210	J	7.30e-01	2.1e-01	2.7e-01	PCI/GDRY	04/05/2016 12:21 EDT
Pb212	J	7.52e-01	8.4e-02	1.5e-02	PCI/GDRY	04/05/2016 12:21 EDT
Pb214	J	1.03e+00	1.1e-01	2.0e-02	PCI/GDRY	04/05/2016 12:21 EDT
Ra226	J	1.59e+00	2.5e-01	2.1e-01	PCI/GDRY	04/05/2016 12:21 EDT
Ra228		7.43e-01	8.7e-02	3.6e-02	PCI/GDRY	04/05/2016 12:21 EDT
Th234	J	5.09e-01	1.8e-01	2.5e-01	PCI/GDRY	04/05/2016 12:21 EDT
Tl208	J	2.28e-01	2.7e-02	9.7e-03	PCI/GDRY	04/05/2016 12:21 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04125D	Amount analyzed:	1.700e+02 GDRY
Client sample ID:	C3-SB2-0012-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 11:10 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	97.78 %	Analyst:	MO
Ash/dry weight:	87.91 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/02/2016 15:04	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	6.22e-01	1.6e-01	1.6e-01	PCI/GDRY	04/05/2016 11:10 EDT
Bi214	J	4.27e-01	5.6e-02	2.8e-02	PCI/GDRY	04/05/2016 11:10 EDT
Cs137		-7.59e-03	1.1e-02	1.3e-02	PCI/GDRY	04/05/2016 11:10 EDT
K40		1.27e+01	1.4e+00	1.3e-01	PCI/GDRY	04/05/2016 11:10 EDT
Pb210	J	7.97e-01	2.0e-01	2.2e-01	PCI/GDRY	04/05/2016 11:10 EDT
Pb212	J	5.56e-01	6.4e-02	2.2e-02	PCI/GDRY	04/05/2016 11:10 EDT
Pb214	J	4.89e-01	6.3e-02	3.1e-02	PCI/GDRY	04/05/2016 11:10 EDT
Ra226	J	8.94e-01	2.2e-01	2.2e-01	PCI/GDRY	04/05/2016 11:10 EDT
Ra228		5.25e-01	6.9e-02	4.9e-02	PCI/GDRY	04/05/2016 11:10 EDT
Th234	J	5.24e-01	2.5e-01	2.8e-01	PCI/GDRY	04/05/2016 11:10 EDT
Tl208	J	1.63e-01	2.2e-02	1.4e-02	PCI/GDRY	04/05/2016 11:10 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04126E	Amount analyzed:	5.760e+02 GDRY
Client sample ID:	C3-SB2-1224-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 11:05 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	91.36 %	Analyst:	MO
Ash/dry weight:	97.64 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/02/2016 15:06	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.02e+00	1.4e-01	9.7e-02	PCI/GDRY	04/05/2016 11:05 EDT
Bi214	J	8.84e-01	1.0e-01	1.8e-02	PCI/GDRY	04/05/2016 11:05 EDT
Cs137		7.94e-03	7.1e-03	8.4e-03	PCI/GDRY	04/05/2016 11:05 EDT
K40		1.30e+01	1.4e+00	6.8e-02	PCI/GDRY	04/05/2016 11:05 EDT
Pb210	J	8.53e-01	2.1e-01	2.4e-01	PCI/GDRY	04/05/2016 11:05 EDT
Pb212	J	9.09e-01	1.0e-01	1.5e-02	PCI/GDRY	04/05/2016 11:05 EDT
Pb214	J	1.01e+00	1.1e-01	2.1e-02	PCI/GDRY	04/05/2016 11:05 EDT
Ra226	J	1.64e+00	2.4e-01	1.9e-01	PCI/GDRY	04/05/2016 11:05 EDT
Ra228		9.09e-01	1.0e-01	2.9e-02	PCI/GDRY	04/05/2016 11:05 EDT
Th234	J	5.50e-01	1.7e-01	2.4e-01	PCI/GDRY	04/05/2016 11:05 EDT
Tl208	J	2.89e-01	3.4e-02	9.7e-03	PCI/GDRY	04/05/2016 11:05 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04127F	Amount analyzed:	2.730e+02 GDRY
Client sample ID:	C3-SB3-0012-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 13:20 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	99.30 %	Analyst:	MO
Ash/dry weight:	86.10 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/03/2016 16:04	1000.0	GE12	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	8.29e-01	1.7e-01	1.5e-01	PCI/GDRY	04/05/2016 13:20 EDT
Bi214	J	5.09e-01	6.2e-02	2.4e-02	PCI/GDRY	04/05/2016 13:20 EDT
Cs137		3.77e-04	7.7e-03	9.7e-03	PCI/GDRY	04/05/2016 13:20 EDT
K40		1.65e+01	1.8e+00	1.0e-01	PCI/GDRY	04/05/2016 13:20 EDT
Pb210	J	3.20e-01	1.2e-01	1.5e-01	PCI/GDRY	04/05/2016 13:20 EDT
Pb212	J	7.64e-01	8.6e-02	1.6e-02	PCI/GDRY	04/05/2016 13:20 EDT
Pb214	J	5.84e-01	6.8e-02	2.1e-02	PCI/GDRY	04/05/2016 13:20 EDT
Ra226	J	1.01e+00	2.0e-01	2.0e-01	PCI/GDRY	04/05/2016 13:20 EDT
Ra228		7.80e-01	9.3e-02	4.7e-02	PCI/GDRY	04/05/2016 13:20 EDT
Th234	J	4.14e-01	1.4e-01	1.9e-01	PCI/GDRY	04/05/2016 13:20 EDT
Tl208	J	2.38e-01	2.9e-02	1.2e-02	PCI/GDRY	04/05/2016 13:20 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04128G	Amount analyzed:	3.320e+02 GDRY
Client sample ID:	C3-SB3-1224-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 13:20 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	93.08 %	Analyst:	MO
Ash/dry weight:	96.01 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/03/2016 16:06	1000.0	GE17	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	8.81e-01	1.8e-01	1.7e-01	PCI/GDRY	04/05/2016 13:20 EDT
Bi214	J	6.32e-01	7.4e-02	2.4e-02	PCI/GDRY	04/05/2016 13:20 EDT
Cs137		1.41e-02	6.3e-03	9.7e-03	PCI/GDRY	04/05/2016 13:20 EDT
K40		1.32e+01	1.5e+00	1.2e-01	PCI/GDRY	04/05/2016 13:20 EDT
Pb210	J	6.50e-01	1.6e-01	2.1e-01	PCI/GDRY	04/05/2016 13:20 EDT
Pb212	J	7.86e-01	9.0e-02	1.9e-02	PCI/GDRY	04/05/2016 13:20 EDT
Pb214	J	7.12e-01	8.4e-02	2.7e-02	PCI/GDRY	04/05/2016 13:20 EDT
Ra226	J	1.24e+00	2.0e-01	1.9e-01	PCI/GDRY	04/05/2016 13:20 EDT
Ra228		8.44e-01	1.0e-01	6.3e-02	PCI/GDRY	04/05/2016 13:20 EDT
Th234	J	5.61e-01	1.6e-01	2.2e-01	PCI/GDRY	04/05/2016 13:20 EDT
Tl208	J	2.69e-01	3.3e-02	1.6e-02	PCI/GDRY	04/05/2016 13:20 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04129H	Amount analyzed:	1.770e+02 GDRY
Client sample ID:	C3-SB4-0012-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 13:48 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	96.57 %	Analyst:	MO
Ash/dry weight:	93.52 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/03/2016 16:08	1000.0	GE23	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	8.17e-01	1.6e-01	1.5e-01	PCI/GDRY	04/05/2016 13:48 EDT
Bi214	J	7.85e-01	9.1e-02	2.3e-02	PCI/GDRY	04/05/2016 13:48 EDT
Cs137		1.05e-02	7.0e-03	9.6e-03	PCI/GDRY	04/05/2016 13:48 EDT
K40		1.31e+01	1.5e+00	1.3e-01	PCI/GDRY	04/05/2016 13:48 EDT
Pb210	J	7.70e-01	2.0e-01	2.5e-01	PCI/GDRY	04/05/2016 13:48 EDT
Pb212	J	6.34e-01	7.2e-02	1.6e-02	PCI/GDRY	04/05/2016 13:48 EDT
Pb214	J	9.20e-01	1.0e-01	2.5e-02	PCI/GDRY	04/05/2016 13:48 EDT
Ra226	J	1.39e+00	2.4e-01	2.3e-01	PCI/GDRY	04/05/2016 13:48 EDT
Ra228		6.79e-01	8.3e-02	4.2e-02	PCI/GDRY	04/05/2016 13:48 EDT
Th234	J	3.34e-01	1.7e-01	2.5e-01	PCI/GDRY	04/05/2016 13:48 EDT
Tl208	J	1.92e-01	2.5e-02	1.2e-02	PCI/GDRY	04/05/2016 13:48 EDT
U235	J	6.14e-02	4.5e-02	6.2e-02	PCI/GDRY	04/05/2016 13:48 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04130A	Amount analyzed:	6.160e+02 GDRY
Client sample ID:	C3-SB4-1224-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 13:49 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	91.41 %	Analyst:	MO
Ash/dry weight:	98.01 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/03/2016 16:10	1000.0	GE18	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.11e+00	1.9e-01	1.5e-01	PCI/GDRY	04/05/2016 13:49 EDT
Bi214	J	6.30e-01	7.2e-02	1.9e-02	PCI/GDRY	04/05/2016 13:49 EDT
Cs137		-1.77e-03	7.2e-03	9.1e-03	PCI/GDRY	04/05/2016 13:49 EDT
K40		1.33e+01	1.5e+00	8.3e-02	PCI/GDRY	04/05/2016 13:49 EDT
Pb210	J	6.44e-01	1.6e-01	2.1e-01	PCI/GDRY	04/05/2016 13:49 EDT
Pb212	J	9.95e-01	1.1e-01	1.6e-02	PCI/GDRY	04/05/2016 13:49 EDT
Pb214	J	7.43e-01	8.4e-02	2.1e-02	PCI/GDRY	04/05/2016 13:49 EDT
Ra226	J	1.31e+00	2.0e-01	1.9e-01	PCI/GDRY	04/05/2016 13:49 EDT
Ra228		9.86e-01	1.1e-01	4.9e-02	PCI/GDRY	04/05/2016 13:49 EDT
Th234	J	5.85e-01	1.6e-01	2.3e-01	PCI/GDRY	04/05/2016 13:49 EDT
Tl208	J	3.00e-01	3.5e-02	1.3e-02	PCI/GDRY	04/05/2016 13:49 EDT
U235	J	5.87e-02	3.8e-02	5.8e-02	PCI/GDRY	04/05/2016 13:49 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04131B	Amount analyzed:	1.450e+02 GDRY
Client sample ID:	C3-SB5-0012-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 14:22 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	95.68 %	Analyst:	MO
Ash/dry weight:	86.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/03/2016 16:12	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	4.15e-01	1.8e-01	1.8e-01	PCI/GDRY	04/05/2016 14:22 EDT
Bi214	J	3.63e-01	5.4e-02	3.4e-02	PCI/GDRY	04/05/2016 14:22 EDT
Cs137		-1.38e-03	1.0e-02	1.2e-02	PCI/GDRY	04/05/2016 14:22 EDT
K40		4.78e+00	5.7e-01	1.5e-01	PCI/GDRY	04/05/2016 14:22 EDT
Pb210	J	6.50e-01	1.7e-01	2.1e-01	PCI/GDRY	04/05/2016 14:22 EDT
Pb212	J	3.07e-01	3.9e-02	2.5e-02	PCI/GDRY	04/05/2016 14:22 EDT
Pb214	J	4.37e-01	5.9e-02	3.3e-02	PCI/GDRY	04/05/2016 14:22 EDT
Ra226	J	8.68e-01	2.4e-01	2.4e-01	PCI/GDRY	04/05/2016 14:22 EDT
Ra228		2.95e-01	6.0e-02	5.7e-02	PCI/GDRY	04/05/2016 14:22 EDT
Th234	J	4.68e-01	2.5e-01	2.7e-01	PCI/GDRY	04/05/2016 14:22 EDT
Tl208	J	9.64e-02	1.9e-02	1.7e-02	PCI/GDRY	04/05/2016 14:22 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04132C	Amount analyzed:	1.820e+02 GDRY
Client sample ID:	C3-SB6-0012-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 14:49 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	94.80 %	Analyst:	MO
Ash/dry weight:	95.66 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/06/2016 12:21	1000.0	GE04	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	5.55e-01	1.8e-01	1.7e-01	PCI/GDRY	04/05/2016 14:49 EDT
Bi214	J	2.24e+00	2.5e-01	2.8e-02	PCI/GDRY	04/05/2016 14:49 EDT
Cs137		1.92e-02	7.6e-03	1.1e-02	PCI/GDRY	04/05/2016 14:49 EDT
K40		1.01e+01	1.1e+00	1.7e-01	PCI/GDRY	04/05/2016 14:49 EDT
Pb210	J	2.79e+00	4.0e-01	2.9e-01	PCI/GDRY	04/05/2016 14:49 EDT
Pb212	J	5.70e-01	6.5e-02	2.1e-02	PCI/GDRY	04/05/2016 14:49 EDT
Pb214	J	2.65e+00	2.9e-01	2.9e-02	PCI/GDRY	04/05/2016 14:49 EDT
Ra226	J	3.72e+00	4.9e-01	3.0e-01	PCI/GDRY	04/05/2016 14:49 EDT
Ra228		5.73e-01	7.9e-02	5.3e-02	PCI/GDRY	04/05/2016 14:49 EDT
Th234	J	7.40e-02	2.4e-01	3.4e-01	PCI/GDRY	04/05/2016 14:49 EDT
Tl208	J	1.69e-01	2.2e-02	1.2e-02	PCI/GDRY	04/05/2016 14:49 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04133D	Amount analyzed:	4.820e+02 GDRY
Client sample ID:	C3-SB6-3648-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 14:50 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	95.09 %	Analyst:	MO
Ash/dry weight:	75.18 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/03/2016 16:14	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.02e+00	1.5e-01	1.1e-01	PCI/GDRY	04/05/2016 14:50 EDT
Bi214	J	4.84e-01	5.6e-02	1.7e-02	PCI/GDRY	04/05/2016 14:50 EDT
Cs137		3.04e-03	6.8e-03	8.1e-03	PCI/GDRY	04/05/2016 14:50 EDT
K40		1.38e+01	1.5e+00	6.5e-02	PCI/GDRY	04/05/2016 14:50 EDT
Pb210	J	3.59e-01	1.0e-01	1.2e-01	PCI/GDRY	04/05/2016 14:50 EDT
Pb212	J	8.71e-01	9.7e-02	1.4e-02	PCI/GDRY	04/05/2016 14:50 EDT
Pb214	J	5.75e-01	6.6e-02	1.8e-02	PCI/GDRY	04/05/2016 14:50 EDT
Ra226	J	1.12e+00	1.8e-01	1.6e-01	PCI/GDRY	04/05/2016 14:50 EDT
Ra228		9.22e-01	1.0e-01	3.2e-02	PCI/GDRY	04/05/2016 14:50 EDT
Th234	J	5.77e-01	1.3e-01	1.6e-01	PCI/GDRY	04/05/2016 14:50 EDT
Tl208	J	2.79e-01	3.2e-02	8.5e-03	PCI/GDRY	04/05/2016 14:50 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04134E	Amount analyzed:	3.100e+02 GDRY
Client sample ID:	C3-SB7-0012-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 16:23 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	95.07 %	Analyst:	MO
Ash/dry weight:	93.71 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/06/2016 12:22	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	4.50e-01	1.1e-01	1.2e-01	PCI/GDRY	04/05/2016 16:23 EDT
Bi214	J	2.78e+00	3.1e-01	2.3e-02	PCI/GDRY	04/05/2016 16:23 EDT
Cs137		-5.70e-03	9.4e-03	1.6e-02	PCI/GDRY	04/05/2016 16:23 EDT
K40		1.06e+01	1.2e+00	1.1e-01	PCI/GDRY	04/05/2016 16:23 EDT
Pb210	J	2.65e+00	3.7e-01	2.6e-01	PCI/GDRY	04/05/2016 16:23 EDT
Pb212	J	4.24e-01	5.0e-02	1.9e-02	PCI/GDRY	04/05/2016 16:23 EDT
Pb214	J	3.19e+00	3.5e-01	2.6e-02	PCI/GDRY	04/05/2016 16:23 EDT
Ra226	J	3.84e+00	4.7e-01	2.4e-01	PCI/GDRY	04/05/2016 16:23 EDT
Ra228		4.49e-01	5.7e-02	3.8e-02	PCI/GDRY	04/05/2016 16:23 EDT
Th234	J	5.59e-01	1.6e-01	2.4e-01	PCI/GDRY	04/05/2016 16:23 EDT
Tl208	J	1.38e-01	1.9e-02	1.1e-02	PCI/GDRY	04/05/2016 16:23 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04135F	Amount analyzed:	2.770e+02 GDRY
Client sample ID:	C3-SB7-3648-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 16:23 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	76.42 %	Analyst:	MO
Ash/dry weight:	74.56 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/06/2016 12:24	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	7.74e-01	1.8e-01	1.6e-01	PCI/GDRY	04/05/2016 16:23 EDT
Bi214	J	7.34e-01	8.5e-02	2.4e-02	PCI/GDRY	04/05/2016 16:23 EDT
Cs137		-6.22e-03	8.6e-03	9.8e-03	PCI/GDRY	04/05/2016 16:23 EDT
K40		9.00e+00	1.0e+00	1.1e-01	PCI/GDRY	04/05/2016 16:23 EDT
Pb210	J	4.52e-01	1.5e-01	1.6e-01	PCI/GDRY	04/05/2016 16:23 EDT
Pb212	J	6.88e-01	7.7e-02	1.9e-02	PCI/GDRY	04/05/2016 16:23 EDT
Pb214	J	8.77e-01	1.0e-01	2.5e-02	PCI/GDRY	04/05/2016 16:23 EDT
Ra226	J	1.30e+00	2.3e-01	2.0e-01	PCI/GDRY	04/05/2016 16:23 EDT
Ra228		6.81e-01	8.1e-02	3.8e-02	PCI/GDRY	04/05/2016 16:23 EDT
Th234	J	6.06e-01	1.9e-01	2.1e-01	PCI/GDRY	04/05/2016 16:23 EDT
Tl208	J	2.09e-01	2.6e-02	1.2e-02	PCI/GDRY	04/05/2016 16:23 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04136G	Amount analyzed:	1.810e+02 GDRY
Client sample ID:	C3-SB8-0012-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 16:58 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	97.15 %	Analyst:	MO
Ash/dry weight:	93.40 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:44	1000.0	GE04	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	3.09e-01	1.4e-01	1.4e-01	PCI/GDRY	04/05/2016 16:58 EDT
Bi214	J	4.67e-01	5.8e-02	2.2e-02	PCI/GDRY	04/05/2016 16:58 EDT
Cs137		3.71e-03	8.0e-03	1.0e-02	PCI/GDRY	04/05/2016 16:58 EDT
K40		9.27e+00	1.1e+00	1.5e-01	PCI/GDRY	04/05/2016 16:58 EDT
Pb210	J	4.53e-01	1.7e-01	2.1e-01	PCI/GDRY	04/05/2016 16:58 EDT
Pb212	J	4.41e-01	5.1e-02	1.7e-02	PCI/GDRY	04/05/2016 16:58 EDT
Pb214	J	4.94e-01	5.9e-02	2.3e-02	PCI/GDRY	04/05/2016 16:58 EDT
Ra226	J	7.07e-01	2.1e-01	2.2e-01	PCI/GDRY	04/05/2016 16:58 EDT
Ra228		4.41e-01	6.3e-02	4.8e-02	PCI/GDRY	04/05/2016 16:58 EDT
Th234	J	2.97e-01	1.6e-01	2.3e-01	PCI/GDRY	04/05/2016 16:58 EDT
Tl208	J	1.24e-01	1.9e-02	1.2e-02	PCI/GDRY	04/05/2016 16:58 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04137H	Amount analyzed:	6.070e+02 GDRY
Client sample ID:	C3-SB8-1224-01	Preparation batch #:	0013426H
Matrix:	SOIL	Assay batch #:	0020905W
Collected:	2016-04-05 16:59 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	95.02 %	Analyst:	MO
Ash/dry weight:	92.62 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:46	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	7.47e-01	1.4e-01	1.6e-01	PCI/GDRY	04/05/2016 16:59 EDT
Bi214	J	9.46e+00	1.0e+00	3.4e-02	PCI/GDRY	04/05/2016 16:59 EDT
Cs137		-8.32e-04	1.3e-02	2.1e-02	PCI/GDRY	04/05/2016 16:59 EDT
K40		1.24e+01	1.4e+00	1.5e-01	PCI/GDRY	04/05/2016 16:59 EDT
Pb210	J	1.20e+01	1.4e+00	4.7e-01	PCI/GDRY	04/05/2016 16:59 EDT
Pb212	J	6.77e-01	7.9e-02	3.7e-02	PCI/GDRY	04/05/2016 16:59 EDT
Pb214	J	1.08e+01	1.2e+00	4.4e-02	PCI/GDRY	04/05/2016 16:59 EDT
Ra226	J	1.22e+01	1.4e+00	4.6e-01	PCI/GDRY	04/05/2016 16:59 EDT
Ra228		6.61e-01	8.3e-02	5.8e-02	PCI/GDRY	04/05/2016 16:59 EDT
Th234	J	2.63e-01	4.8e-01	5.7e-01	PCI/GDRY	04/05/2016 16:59 EDT
Tl208	J	2.11e-01	2.5e-02	1.5e-02	PCI/GDRY	04/05/2016 16:59 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00735157F	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013426H
Matrix:	N/A	Assay batch #:	0020905W
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	N/A	Analyst:	MO
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:47	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi207	5.01e+03	5.4e+02	4.4e+01	PCI	12/15/2010 11:00 CDT
Eu155	1.13e+03	1.3e+02	4.2e+01	PCI	12/15/2010 11:00 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00735158G	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013426H
Matrix:	N/A	Assay batch #:	0020905W
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	N/A	Analyst:	MO
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:48	1000.0	GE17	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	-1.20e+01	5.0e+01	6.1e+01	PCI	06/02/2016 07:00 CDT
Cs137		-2.26e+00	3.6e+00	4.3e+00	PCI	06/02/2016 07:00 CDT
K40		-1.75e+00	3.1e+01	3.4e+01	PCI	06/02/2016 07:00 CDT
Pb210	J	-1.72e+01	4.9e+01	7.2e+01	PCI	06/02/2016 07:00 CDT
Pb212	J	1.12e+00	6.0e+00	7.4e+00	PCI	06/02/2016 07:00 CDT
Pb214	J	-6.37e-01	7.3e+00	8.3e+00	PCI	06/02/2016 07:00 CDT
Ra226	J	2.68e+01	4.4e+01	6.2e+01	PCI	06/02/2016 07:00 CDT
Ra228		9.56e+00	1.9e+01	2.5e+01	PCI	06/02/2016 07:00 CDT
Th234	J	-1.58e+01	4.3e+01	6.4e+01	PCI	06/02/2016 07:00 CDT
Tl208	J	3.19e+00	4.6e+00	6.4e+00	PCI	06/02/2016 07:00 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG 1600016

PREPARATION BATCH SUMMARY

Preparation batch #: 0013426H
Analysis method: NAREL GAM-01-RA
Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	± 2 σ Uncertainty	Analyst
B6.04121Z	C2-SB3-8496-01	00733685T		N/A		MO
B6.04122A	C3-SB1-0012-01	00733688W		N/A		MO
B6.04123B	C3-SB1-3648-01	00733691Q		N/A		MO
B6.04124C	C3-SB1-3648-02	00733694U		N/A		MO
B6.04124C	C3-SB1-3648-02	00735156E	DUP	N/A		MO
B6.04125D	C3-SB2-0012-01	00733697X		N/A		MO
B6.04126E	C3-SB2-1224-01	00733700Y		N/A		MO
B6.04127F	C3-SB3-0012-01	00733703B		N/A		MO
B6.04128G	C3-SB3-1224-01	00733706E		N/A		MO
B6.04129H	C3-SB4-0012-01	00733709H		N/A		MO
B6.04130A	C3-SB4-1224-01	00733712C		N/A		MO
B6.04131B	C3-SB5-0012-01	00733715F		N/A		MO
B6.04132C	C3-SB6-0012-01	00733718J		N/A		MO
B6.04133D	C3-SB6-3648-01	00733721D		N/A		MO
B6.04134E	C3-SB7-0012-01	00733724G		N/A		MO
B6.04135F	C3-SB7-3648-01	00733727K		N/A		MO
B6.04136G	C3-SB8-0012-01	00733730E		N/A		MO
B6.04137H	C3-SB8-1224-01	00733733H		N/A		MO
LCS-00735157F *		00735157F	LCS	N/A		MO
RBK-00735158G *		00735158G	RBK	N/A		MO

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013426H

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04124C	00735156E	DUP	BI212		1.0	0.09	PASS-J
B6.04124C	00735156E	DUP	BI214		0.5	0.06	PASS-J
B6.04124C	00735156E	DUP	CS137		563.4	-1.18	PASS
B6.04124C	00735156E	DUP	K40		2.1	0.27	PASS
B6.04124C	00735156E	DUP	PB210		1.7	-0.09	PASS-J
B6.04124C	00735156E	DUP	PB212		4.1	0.52	PASS-J
B6.04124C	00735156E	DUP	PB214		1.5	0.18	PASS-J
B6.04124C	00735156E	DUP	RA226		3.7	0.34	PASS-J
B6.04124C	00735156E	DUP	RA228		1.0	0.12	PASS
B6.04124C	00735156E	DUP	TH234		7.2	-0.30	PASS-J
B6.04124C	00735156E	DUP	TL208		0.0	-0.00	PASS-J
LCS-00735157F	00735157F	LCS	BI207	97.7		-0.42	PASS
LCS-00735157F	00735157F	LCS	EU155	101.4		0.22	PASS
RBK-00735158G	00735158G	RBK	BI212				PASS-J
RBK-00735158G	00735158G	RBK	CS137				PASS
RBK-00735158G	00735158G	RBK	K40				PASS
RBK-00735158G	00735158G	RBK	PB210				PASS-J
RBK-00735158G	00735158G	RBK	PB212				PASS-J
RBK-00735158G	00735158G	RBK	PB214				PASS-J
RBK-00735158G	00735158G	RBK	RA226				PASS-J
RBK-00735158G	00735158G	RBK	RA228				PASS
RBK-00735158G	00735158G	RBK	TH234				PASS-J
RBK-00735158G	00735158G	RBK	TL208				PASS-J

Note: Results qualified with -J may be significantly under or over-estimated and are not evaluated for QC purposes.

U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
TH ANALYSES

REPORT OF SAMPLE DELIVERY GROUP #1600016

Project:	Canadian Radium & Uranium, Mt. Kisco, NY
Analysis method:	Isotopic Thorium Using NaOH Fusion
Report ID:	1600016-TH
Report type:	Original
Date reported:	06/29/2016
Total pages in report:	33

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B6.04121Z	C2-SB3-8496-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04122A	C3-SB1-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04123B	C3-SB1-3648-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04124C	C3-SB1-3648-02	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04125D	C3-SB2-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04126E	C3-SB2-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04127F	C3-SB3-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04128G	C3-SB3-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04129H	C3-SB4-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04130A	C3-SB4-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04131B	C3-SB5-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04132C	C3-SB6-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04133D	C3-SB6-3648-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04134E	C3-SB7-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04135F	C3-SB7-3648-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04136G	C3-SB8-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04137H	C3-SB8-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016

EXCEPTIONS

1. **Packaging and shipping** – No problems were observed.
2. **Documentation** – No problems were observed.
3. **Sample preparation** – No problems were encountered.
4. **Analysis** – Samples B6.04131, B6.04132, B6.04134, and B6.04136 had yields below NAREL's lower acceptance criterion during the original analysis of this SDG. These four samples were reanalyzed and are reported in this data package.
5. **Holding times** – No holding times were specified.

QUALITY CONTROL

1. **QC samples** – All QC analysis results met NAREL acceptance criteria.
2. **Yields** – All chemical yields were within acceptance limits.
3. **Instruments** – Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

ACCREDITATION

All analyses included in this data package are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard.

CERTIFICATION

I certify that this data report complies with the terms and conditions of the Project Acceptance Form and/or the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

Velinda Herbert — 6/30/16

Velinda Herbert
Quality Assurance Manager, NAREL

Date

Cynthia White — 6-30-16

Cynthia White
Director, Center for Environmental Radioanalytical Laboratory Science

Date

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample, or blank spike
MS	Matrix spike
MSD	Matrix spike duplicate (not currently analyzed)
RBK	Method blank
STD	External standard (used for ^{228}Ra yield determination)

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "*Z* scores." A *Z* score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The *Z* score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The *Z* score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of %R in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either $|Z| \leq 3$ or $60 \leq \%R \leq 110$.

Chain of Custody Forms

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	C002-SB003-0012-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
4	C003-SB001-0012-01 ✓	4/5/2016 ✓	12:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	✓16 oz glass jar

Crushed Jar NO LOST

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CHCP NAREL	04/19/16 @1115	Good ① Crushed Sample 16oz ICC

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
3	C003-SB001-3648-01 ✓	4/5/2016	12:21 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
	C003-SB001-3648-01	4/5/2016	12:21	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB001-3648-01	4/5/2016	12:21	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB001-3648-02 ✓	4/5/2016	12:21	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB001-3648-02 ✓	4/5/2016	12:21 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB001-3648-02 ✓	4/5/2016	12:21 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB002-0012-01	4/5/2016	11:10	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-0012-01	4/5/2016	11:10	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-0012-01	4/5/2016	11:10	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB002-1224-01	4/5/2016	11:05	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-1224-01	4/5/2016	11:05	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-1224-01	4/5/2016	11:05	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB003-0012-01	4/5/2016	13:20	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB003-0012-01	4/5/2016	13:20	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB003-0012-01	4/5/2016	13:20	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB003-1224-01	4/5/2016	13:20	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
3	C003-SB003-1224-01 ✓	4/5/2016	13:20 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB003-1224-01 ✓	4/5/2016	13:20 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓ ?
	C003-SB004-0012-01	4/5/2016	13:48	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	[signature] RST3		[signature] NAREL	04/19/16 @1115	

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	C003-SB004-0012-01	4/5/2016	13:48	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-0012-01	4/5/2016	13:48	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB007-0012-01 ✓	4/5/2016	16:23 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB007-0012-01 ✓	4/5/2016	16:23 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB007-0012-01 ✓	4/5/2016	16:23 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Isotopic Thorium~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~8 oz glass jar~~
	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Isotopic Uranium~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~8 oz glass jar~~

4/12/16
4/12/16
6

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CH NAREL	4/19/16 0115	Good

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
Dist Rec	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Gamma Spec (Modified)~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~16 oz glass jar~~
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	C003-SB007-3648-01 ✓	4/5/2016	16:23	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Thorium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Uranium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	LABLE ISSUE	16 oz glass jar ✓
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓

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Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		[signature] NAREL	04/19/16 @ 11:15	Good

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

ANALYSIS SUMMARY

Analysis method: NAREL ACT-02F-TH
Title: Isotopic Thorium Using NaOH Fusion

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B6.04121Z	C2-SB3-8496-01		06/14/2016	0013451J	0020930X
B6.04121Z	C2-SB3-8496-01	DUP	06/14/2016	0013451J	0020930X
B6.04122A	C3-SB1-0012-01		06/14/2016	0013451J	0020930X
B6.04123B	C3-SB1-3648-01		06/14/2016	0013451J	0020930X
B6.04124C	C3-SB1-3648-02		06/14/2016	0013451J	0020930X
B6.04125D	C3-SB2-0012-01		06/14/2016	0013451J	0020930X
B6.04126E	C3-SB2-1224-01		06/14/2016	0013451J	0020930X
B6.04127F	C3-SB3-0012-01		06/14/2016	0013451J	0020930X
B6.04128G	C3-SB3-1224-01		06/16/2016	0013451J	0020944D
B6.04129H	C3-SB4-0012-01		06/16/2016	0013451J	0020944D
B6.04130A	C3-SB4-1224-01		06/16/2016	0013451J	0020944D
B6.04131B	C3-SB5-0012-01		06/21/2016	0013471N	0020953E
B6.04132C	C3-SB6-0012-01		06/21/2016	0013471N	0020953E
B6.04132C	C3-SB6-0012-01	DUP	06/21/2016	0013471N	0020953E
B6.04133D	C3-SB6-3648-01		06/17/2016	0013451J	0020944D
B6.04134E	C3-SB7-0012-01		06/21/2016	0013471N	0020953E
B6.04135F	C3-SB7-3648-01		06/17/2016	0013451J	0020944D
B6.04136G	C3-SB8-0012-01		06/21/2016	0013471N	0020953E
B6.04137H	C3-SB8-1224-01		06/16/2016	0013451J	0020944D
LCS-00735458R *		LCS	06/14/2016	0013451J	0020930X
RBK-00735457Q *		RBK	06/14/2016	0013451J	0020930X
LCS-00735846A *		LCS	06/21/2016	0013471N	0020953E
RBK-00735845Z *		RBK	06/21/2016	0013471N	0020953E

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04121Z	Amount analyzed:	1.079e+00 GASH
Client sample ID:	C2-SB3-8496-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020930X
Collected:	2016-04-06 13:19 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	84.48 %	Analyst:	SPK
Ash/dry weight:	98.41 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 16:01	1000.0	AS97	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	6.13e-02	3.9e-02	3.2e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th228	1.03e+00	1.5e-01	2.2e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th230	7.73e-01	1.3e-01	5.4e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th232	9.07e-01	1.4e-01	1.8e-02	PCI/GDRY	06/13/2016 16:01 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04121Z	Amount analyzed:	1.019e+00 GASH
Client sample ID:	C2-SB3-8496-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020930X
Collected:	2016-04-06 13:19 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	84.48 %	Analyst:	SPK
Ash/dry weight:	98.41 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 16:01	1000.0	AS98	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	5.34e-02	3.6e-02	2.7e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th228	1.08e+00	1.6e-01	2.4e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th230	9.50e-01	1.4e-01	5.7e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th232	1.03e+00	1.5e-01	2.1e-02	PCI/GDRY	06/13/2016 16:01 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04122A	Amount analyzed:	1.008e+00 GASH
Client sample ID:	C3-SB1-0012-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020930X
Collected:	2016-04-05 12:19 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	98.90 %	Analyst:	SPK
Ash/dry weight:	90.07 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 16:01	1000.0	AS99	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	4.52e-02	3.7e-02	3.2e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th228	9.79e-01	1.6e-01	2.2e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th230	5.04e-01	1.1e-01	5.7e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th232	9.91e-01	1.6e-01	1.8e-02	PCI/GDRY	06/13/2016 16:01 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04123B	Amount analyzed:	1.016e+00 GASH
Client sample ID:	C3-SB1-3648-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020930X
Collected:	2016-04-05 12:21 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	85.94 %	Analyst:	SPK
Ash/dry weight:	99.22 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 16:01	1000.0	AS100	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	6.49e-02	4.3e-02	3.8e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th228	6.47e-01	1.2e-01	3.0e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th230	6.16e-01	1.2e-01	6.0e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th232	5.75e-01	1.1e-01	2.4e-02	PCI/GDRY	06/13/2016 16:01 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04124C	Amount analyzed:	1.007e+00 GASH
Client sample ID:	C3-SB1-3648-02	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020930X
Collected:	2016-04-05 12:21 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	86.13 %	Analyst:	SPK
Ash/dry weight:	99.19 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 16:01	1000.0	AS101	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	4.06e-02	3.9e-02	4.4e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th228	8.02e-01	1.4e-01	2.8e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th230	6.27e-01	1.3e-01	6.4e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th232	8.29e-01	1.5e-01	2.0e-02	PCI/GDRY	06/13/2016 16:01 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04125D	Amount analyzed:	9.869e-01 GASH
Client sample ID:	C3-SB2-0012-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020930X
Collected:	2016-04-05 11:10 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	97.78 %	Analyst:	SPK
Ash/dry weight:	87.91 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 16:01	1000.0	AS103	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	7.74e-02	6.4e-02	5.6e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th228	6.21e-01	1.5e-01	5.4e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th230	6.12e-01	1.5e-01	7.6e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th232	5.02e-01	1.3e-01	4.3e-02	PCI/GDRY	06/13/2016 16:01 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04126E	Amount analyzed:	1.052e+00 GASH
Client sample ID:	C3-SB2-1224-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020930X
Collected:	2016-04-05 11:05 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	91.36 %	Analyst:	SPK
Ash/dry weight:	97.64 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 16:01	1000.0	AS104	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	4.62e-02	5.0e-02	6.1e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th228	8.08e-01	1.7e-01	5.9e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th230	7.21e-01	1.6e-01	7.2e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th232	6.59e-01	1.5e-01	2.8e-02	PCI/GDRY	06/13/2016 16:01 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04127F	Amount analyzed:	1.012e+00 GASH
Client sample ID:	C3-SB3-0012-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020930X
Collected:	2016-04-05 13:20 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	99.30 %	Analyst:	SPK
Ash/dry weight:	86.10 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 16:01	1000.0	AS105	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	5.97e-02	3.9e-02	2.7e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th228	6.67e-01	1.1e-01	1.9e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th230	4.68e-01	9.4e-02	5.2e-02	PCI/GDRY	06/13/2016 16:01 CDT
Th232	6.94e-01	1.2e-01	1.9e-02	PCI/GDRY	06/13/2016 16:01 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04128G	Amount analyzed:	1.029e+00 GASH
Client sample ID:	C3-SB3-1224-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020944D
Collected:	2016-04-05 13:20 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	93.08 %	Analyst:	SPK
Ash/dry weight:	96.01 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:13	1000.0	AS108	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	7.10e-02	4.5e-02	4.0e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th228	8.61e-01	1.4e-01	2.9e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th230	7.97e-01	1.3e-01	5.7e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th232	8.77e-01	1.4e-01	1.6e-02	PCI/GDRY	06/15/2016 16:13 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04129H	Amount analyzed:	1.004e+00 GASH
Client sample ID:	C3-SB4-0012-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020944D
Collected:	2016-04-05 13:48 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	96.57 %	Analyst:	SPK
Ash/dry weight:	93.52 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:13	1000.0	AS109	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	6.86e-02	4.0e-02	3.1e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th228	5.12e-01	9.1e-02	2.3e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th230	5.55e-01	1.0e-01	5.5e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th232	5.21e-01	9.2e-02	1.4e-02	PCI/GDRY	06/15/2016 16:13 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04130A	Amount analyzed:	1.005e+00 GASH
Client sample ID:	C3-SB4-1224-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020944D
Collected:	2016-04-05 13:49 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	91.41 %	Analyst:	SPK
Ash/dry weight:	98.01 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:13	1000.0	AS110	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	6.84e-02	4.3e-02	3.9e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th228	7.80e-01	1.3e-01	2.8e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th230	5.83e-01	1.1e-01	5.8e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th232	7.25e-01	1.2e-01	1.9e-02	PCI/GDRY	06/15/2016 16:13 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04131B	Amount analyzed:	5.495e-01 GASH
Client sample ID:	C3-SB5-0012-01	Preparation batch #:	0013471N
Matrix:	SOIL	Assay batch #:	0020953E
Collected:	2016-04-05 14:22 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	95.68 %	Analyst:	SPK
Ash/dry weight:	86.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/20/2016 15:37	1000.0	AS33	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.34e-01	7.4e-02	4.5e-02	PCI/GDRY	06/20/2016 15:37 CDT
Th228	3.02e-01	8.8e-02	5.6e-02	PCI/GDRY	06/20/2016 15:37 CDT
Th230	3.14e-01	9.9e-02	9.3e-02	PCI/GDRY	06/20/2016 15:37 CDT
Th232	2.70e-01	8.1e-02	4.1e-02	PCI/GDRY	06/20/2016 15:37 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04132C	Amount analyzed:	5.670e-01 GASH
Client sample ID:	C3-SB6-0012-01	Preparation batch #:	0013471N
Matrix:	SOIL	Assay batch #:	0020953E
Collected:	2016-04-05 14:49 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	94.80 %	Analyst:	SPK
Ash/dry weight:	95.66 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/20/2016 15:36	1000.0	AS36	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	3.59e-02	4.1e-02	4.5e-02	PCI/GDRY	06/20/2016 15:36 CDT
Th228	5.92e-01	1.3e-01	5.8e-02	PCI/GDRY	06/20/2016 15:36 CDT
Th230	7.32e-01	1.5e-01	9.9e-02	PCI/GDRY	06/20/2016 15:36 CDT
Th232	5.10e-01	1.2e-01	3.1e-02	PCI/GDRY	06/20/2016 15:36 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04132C	Amount analyzed:	5.627e-01 GASH
Client sample ID:	C3-SB6-0012-01	Preparation batch #:	0013471N
Matrix:	SOIL	Assay batch #:	0020953E
Collected:	2016-04-05 14:49 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	94.80 %	Analyst:	SPK
Ash/dry weight:	95.66 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/20/2016 15:36	1000.0	AS37	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.34e-01	7.8e-02	6.0e-02	PCI/GDRY	06/20/2016 15:36 CDT
Th228	5.08e-01	1.2e-01	5.0e-02	PCI/GDRY	06/20/2016 15:36 CDT
Th230	7.18e-01	1.6e-01	1.0e-01	PCI/GDRY	06/20/2016 15:36 CDT
Th232	4.54e-01	1.1e-01	3.8e-02	PCI/GDRY	06/20/2016 15:36 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04133D	Amount analyzed:	1.004e+00 GASH
Client sample ID:	C3-SB6-3648-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020944D
Collected:	2016-04-05 14:50 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	95.09 %	Analyst:	SPK
Ash/dry weight:	75.18 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/16/2016 13:38	1000.0	AS121	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	0.00e+00	9.2e-03	2.2e-02	PCI/GDRY	06/16/2016 13:38 CDT
Th228	6.33e-01	1.0e-01	2.0e-02	PCI/GDRY	06/16/2016 13:38 CDT
Th230	4.30e-01	8.2e-02	4.5e-02	PCI/GDRY	06/16/2016 13:38 CDT
Th232	5.72e-01	9.4e-02	1.2e-02	PCI/GDRY	06/16/2016 13:38 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04134E	Amount analyzed:	5.348e-01 GASH
Client sample ID:	C3-SB7-0012-01	Preparation batch #:	0013471N
Matrix:	SOIL	Assay batch #:	0020953E
Collected:	2016-04-05 16:23 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	95.07 %	Analyst:	SPK
Ash/dry weight:	93.71 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/20/2016 15:36	1000.0	AS38	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.11e-01	7.8e-02	8.4e-02	PCI/GDRY	06/20/2016 15:36 CDT
Th228	5.02e-01	1.2e-01	6.7e-02	PCI/GDRY	06/20/2016 15:36 CDT
Th230	1.67e+00	2.7e-01	1.1e-01	PCI/GDRY	06/20/2016 15:36 CDT
Th232	4.12e-01	1.1e-01	4.1e-02	PCI/GDRY	06/20/2016 15:36 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04135F	Amount analyzed:	1.001e+00 GASH
Client sample ID:	C3-SB7-3648-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020944D
Collected:	2016-04-05 16:23 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	76.42 %	Analyst:	SPK
Ash/dry weight:	74.56 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/16/2016 13:38	1000.0	AS125	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.54e-03	1.4e-02	3.2e-02	PCI/GDRY	06/16/2016 13:38 CDT
Th228	7.65e-01	1.2e-01	2.6e-02	PCI/GDRY	06/16/2016 13:38 CDT
Th230	6.01e-01	1.0e-01	4.6e-02	PCI/GDRY	06/16/2016 13:38 CDT
Th232	6.96e-01	1.1e-01	2.0e-02	PCI/GDRY	06/16/2016 13:38 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04136G	Amount analyzed:	5.848e-01 GASH
Client sample ID:	C3-SB8-0012-01	Preparation batch #:	0013471N
Matrix:	SOIL	Assay batch #:	0020953E
Collected:	2016-04-05 16:58 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	97.15 %	Analyst:	SPK
Ash/dry weight:	93.40 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/20/2016 15:36	1000.0	AS39	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.78e-01	8.5e-02	4.5e-02	PCI/GDRY	06/20/2016 15:36 CDT
Th228	3.62e-01	9.5e-02	4.6e-02	PCI/GDRY	06/20/2016 15:36 CDT
Th230	5.63e-01	1.3e-01	9.4e-02	PCI/GDRY	06/20/2016 15:36 CDT
Th232	3.35e-01	9.0e-02	3.1e-02	PCI/GDRY	06/20/2016 15:36 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04137H	Amount analyzed:	1.014e+00 GASH
Client sample ID:	C3-SB8-1224-01	Preparation batch #:	0013451J
Matrix:	SOIL	Assay batch #:	0020944D
Collected:	2016-04-05 16:59 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	95.02 %	Analyst:	SPK
Ash/dry weight:	92.62 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:13	1000.0	AS132	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	2.34e-01	8.3e-02	4.4e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th228	6.78e-01	1.2e-01	3.0e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th230	3.64e+00	4.3e-01	5.6e-02	PCI/GDRY	06/15/2016 16:13 CDT
Th232	5.84e-01	1.1e-01	2.0e-02	PCI/GDRY	06/15/2016 16:13 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00735458R	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013451J
Matrix:	N/A	Assay batch #:	0020930X
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 16:01	1000.0	AS106	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	7.04e-03	2.0e-02	3.5e-02	PCI	06/13/2016 16:01 CDT
Th228	4.37e-02	3.1e-02	3.6e-02	PCI	06/13/2016 16:01 CDT
Th230	2.45e+00	3.1e-01	6.4e-02	PCI	06/13/2016 16:01 CDT
Th232	2.12e-02	2.2e-02	2.8e-02	PCI	06/13/2016 16:01 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00735457Q	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013451J
Matrix:	N/A	Assay batch #:	0020930X
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 16:01	1000.0	AS107	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.63e-02	2.5e-02	3.8e-02	PCI	06/13/2016 16:01 CDT
Th228	2.88e-02	2.2e-02	2.4e-02	PCI	06/13/2016 16:01 CDT
Th230	2.97e-02	3.7e-02	6.0e-02	PCI	06/13/2016 16:01 CDT
Th232	1.15e-03	1.1e-02	2.4e-02	PCI	06/13/2016 16:01 CDT

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SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00735846A	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013471N
Matrix:	N/A	Assay batch #:	0020953E
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/20/2016 15:36	1000.0	AS40	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	5.66e-02	4.5e-02	5.3e-02	PCI	06/20/2016 15:36 CDT
Th228	-1.72e-02	1.9e-02	5.2e-02	PCI	06/20/2016 15:36 CDT
Th230	1.97e+00	2.5e-01	6.3e-02	PCI	06/20/2016 15:36 CDT
Th232	2.21e-02	2.2e-02	2.8e-02	PCI	06/20/2016 15:36 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00735845Z	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013471N
Matrix:	N/A	Assay batch #:	0020953E
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/20/2016 15:36	1000.0	AS65	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.18e-01	6.4e-02	4.6e-02	PCI	06/20/2016 15:36 CDT
Th228	2.17e-02	3.0e-02	5.1e-02	PCI	06/20/2016 15:36 CDT
Th230	3.55e-02	4.5e-02	7.4e-02	PCI	06/20/2016 15:36 CDT
Th232	2.20e-02	2.9e-02	4.6e-02	PCI	06/20/2016 15:36 CDT

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SDG 1600016

PREPARATION BATCH SUMMARY

Preparation batch #: 0013451J
Analysis method: NAREL ACT-02F-TH
Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	± 2 σ Uncertainty	Analyst
B6.04121Z	C2-SB3-8496-01	00733684R		83.68 %	7.66 %	SPK
B6.04121Z	C2-SB3-8496-01	00735456P	DUP	88.48 %	7.95 %	SPK
B6.04122A	C3-SB1-0012-01	00733687V		68.41 %	6.91 %	SPK
B6.04123B	C3-SB1-3648-01	00733690P		81.85 %	7.76 %	SPK
B6.04124C	C3-SB1-3648-02	00733693T		67.32 %	6.82 %	SPK
B6.04125D	C3-SB2-0012-01	00733696W		40.34 %	5.22 %	SPK
B6.04126E	C3-SB2-1224-01	00733699Z		45.81 %	5.53 %	SPK
B6.04127F	C3-SB3-0012-01	00733702A		75.96 %	7.27 %	SPK
B6.04128G	C3-SB3-1224-01	00733705D		78.27 %	7.37 %	SPK
B6.04129H	C3-SB4-0012-01	00733708G		91.78 %	8.16 %	SPK
B6.04130A	C3-SB4-1224-01	00733711B		88.36 %	8.05 %	SPK
B6.04133D	C3-SB6-3648-01	00733720C		86.82 %	7.99 %	SPK
B6.04135F	C3-SB7-3648-01	00733726J		79.68 %	7.53 %	SPK
B6.04137H	C3-SB8-1224-01	00733732G		75.84 %	7.27 %	SPK
LCS-00735458R *		00735458R	LCS	71.48 %	7.15 %	SPK
RBK-00735457Q *		00735457Q	RBK	77.53 %	7.28 %	SPK

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013451J

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04121Z	00735456P	DUP	TH227		13.8	-0.30	PASS
B6.04121Z	00735456P	DUP	TH228		4.9	0.48	PASS
B6.04121Z	00735456P	DUP	TH230		20.5	1.84	PASS
B6.04121Z	00735456P	DUP	TH232		12.3	1.18	PASS
LCS-00735458R	00735458R	LCS	TH230	122.3		2.85	WARN
RBK-00735457Q	00735457Q	RBK	TH227				PASS
RBK-00735457Q	00735457Q	RBK	TH228				PASS
RBK-00735457Q	00735457Q	RBK	TH230				PASS
RBK-00735457Q	00735457Q	RBK	TH232				PASS

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SDG 1600016

PREPARATION BATCH SUMMARY

Preparation batch #: 0013471N
Analysis method: NAREL ACT-02F-TH
Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	± 2 σ Uncertainty	Analyst
B6.04131B	C3-SB5-0012-01	00735840U		86.93 %	7.90 %	SPK
B6.04132C	C3-SB6-0012-01	00735841V		87.19 %	7.71 %	SPK
B6.04132C	C3-SB6-0012-01	00735844Y	DUP	86.39 %	7.89 %	SPK
B6.04134E	C3-SB7-0012-01	00735842W		86.05 %	7.99 %	SPK
B6.04136G	C3-SB8-0012-01	00735843X		84.85 %	7.66 %	SPK
LCS-00735846A *		00735846A	LCS	71.78 %	6.94 %	SPK
RBK-00735845Z *		00735845Z	RBK	64.91 %	6.74 %	SPK

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013471N

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04132C	00735844Y	DUP	TH227		115.2	2.21	WARN
B6.04132C	00735844Y	DUP	TH228		15.3	-0.96	PASS
B6.04132C	00735844Y	DUP	TH230		2.0	-0.13	PASS
B6.04132C	00735844Y	DUP	TH232		11.7	-0.70	PASS
LCS-00735846A	00735846A	LCS	TH230	98.6		-0.21	PASS
RBK-00735845Z	00735845Z	RBK	TH227				WARN
RBK-00735845Z	00735845Z	RBK	TH228				PASS
RBK-00735845Z	00735845Z	RBK	TH230				PASS
RBK-00735845Z	00735845Z	RBK	TH232				PASS

U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
GAMMA ANALYSES

REPORT OF SAMPLE DELIVERY GROUP #1600017

Project:	Canadian Radium & Uranium, Mt. Kisco, NY
Analysis method:	Gamma-ray Spectrometry - Sealed Radium Cans
Report ID:	1600017-GAMMA-RA
Report type:	Original
Date reported:	06/16/2016
Total pages in report:	31

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B6.04138J	C3-SB9-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04139K	C3-SB9-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04140C	C3-SB10-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04141D	C3-SB10-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04142E	C3-SB10-6072-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04143F	C3-SB10-7284-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04144G	C3-SB10-8496-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04145H	C3-SB11-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04146J	C3-SB11-3648-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04147K	C3-SB12-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04148L	C3-SB13-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04149M	C3-SB13-1224-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04150E	C3-SB14-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04151F	C3-SB15-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04152G	C3-SB15-2436-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04153H	C3-SB16-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04154J	C3-SB16-3648-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016

EXCEPTIONS

1. **Packaging and shipping** – No problems were observed.
2. **Documentation** – No problems were observed.
3. **Sample preparation** – No problems were encountered.
4. **Analysis** – Samples were held for 21 days to allow for ingrowth. Client requested that NAREL report the following: Cs-137, Th-234, Tl-208, Ra-228, Ac-228, Bi-210, Ra-226, Pb-214, Bi-214, Bi-212, Pb-212, Pb-210, and K-40. Client was informed that NAREL does not provide Ac-228 or Bi-210 results by gamma analysis. Also, client requested specific methods to be used, but NAREL uses in-house methods. Client agreed NAREL methods were acceptable. Please see page 4 of this report with regards to exceptions for reporting of some of the nuclides in this list. For Pb-210 in soil samples, NAREL flags the results because of the larger uncertainty associated with gamma-ray attenuation in uncharacterized materials at low energies (46.5 keV).
5. **Holding times** – No holding times were specified.

QUALITY CONTROL

1. **QC samples** – All QC analysis results met NAREL acceptance criteria.
2. **Instruments** – Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

ACCREDITATION

All analyses included in this data package are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard.

CERTIFICATION

I certify that this data report complies with the terms and conditions of the Project Acceptance Form and/or the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

Velinda Herbert — 6/22/16
Velinda Herbert — Date
Quality Assurance Manager, NAREL

Cynthia White — 6-22-16
Cynthia White — Date
Director, Center for Environmental Radioanalytical Laboratory Science

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample, or blank spike
MS	Matrix spike
MSD	Matrix spike duplicate (not currently analyzed)
RBK	Method blank
STD	External standard (used for ^{228}Ra yield determination)

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "*Z* scores." A *Z* score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The *Z* score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The *Z* score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of %R in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either $|Z| \leq 3$ or $60 \leq \%R \leq 110$.

GENERAL INFORMATION (CONTINUED)

GAMMA ANALYSIS

The reporting format lists the gamma emitters in alphabetical order. The activity, 2-sigma uncertainty, and a sample-specific estimate of the MDC for radionuclides measured by gamma spectroscopy are reported only if the nuclide is detected above background with the exception of client requested nuclides of interest. The activity for each of the requested nuclides is reported whether negative, positive, or zero along with the associated 2-sigma uncertainty and the sample-specific estimate of the MDC.

Due to potential spectral interferences and other possible problems associated with the determination of the activity of certain radionuclides, the activities for ^{214}Bi, ^{214}Pb, ^{234}Th, ^{234m}Pa, ^{226}Ra, ^{231}Th, and ^{235}U are subject to greater uncertainty than other commonly reported radionuclides. It should be noted that this potential uncertainty is not included in the two-sigma expanded uncertainty that is reported with each result. Although in this report we do provide the calculated activities for these radionuclides, we recommend that the results be used only as a qualitative means of indicating the presence of these radionuclides and not as a quantitative measure of their concentration. The results for these nuclides are not used in the evaluation of quality control samples. Furthermore, because of mutual interference between ^{226}Ra and ^{235}U, NAREL's gamma analysis software tends to overestimate the amounts of these nuclides whenever both are present in a sample. Lower estimates for ^{226}Ra activities can be obtained from the reported activities of its decay products, ^{214}Pb and ^{214}Bi, which are likely to be somewhat less than the ^{226}Ra activity because of the potential escape of radon gas.

NAREL's gamma-ray spectrometry software corrects activities and MDCs for decay between collection and analysis, but only up to a limit of twelve half-lives. If the decay time for a sample exceeds twelve half-lives of a radionuclide, that radionuclide is not reported. This software feature may affect results for short-lived radionuclides, such as ^{131}I and ^{140}Ba, when there is a long delay between collection and analysis.

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
Digital Rec CHS	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Gamma Spec (Modified)~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~16 oz glass jar~~
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	C003-SB007-3648-01 ✓	4/5/2016	16:23	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Thorium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Uranium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	LABLE ISSUE	16 oz glass jar ✓
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓

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Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CHP NAREL	04/19/16 @11:15	Good

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

Cont #4

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB010-7284-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-7284-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-7284-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB010-8496-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-8496-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-8496-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓✓	Soil	4 C	N	1	16 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Isotopic Thorium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4	C003-SB011-3648-01 ✓	4/6/2016	11:13	Isotopic Thorium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-3648-01 ✓	4/6/2016	11:13	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-3648-01 ✓	4/6/2016	11:13	Gamma Spec (Modified) ✓✓	Soil	4 C	N	Broken 1	16 oz glass jar ✓ Broke
3	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓

6

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		NAREL	04/19/16 @ 1115	Good (1) Broken Jar No Lost

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
✓	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB013-0012-01	4/6/2016	12:00	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
✓	C003-SB013-0012-01	4/6/2016	12:00	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar
	C003-SB013-0012-01	4/6/2016	12:00	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar
	C003-SB013-1224-01	4/6/2016	12:01	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
	C003-SB013-1224-01	4/6/2016	12:01	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB013-1224-01	4/6/2016	12:01	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
4	C003-SB014-0012-01 ✓	4/6/2016	12:28	Isotopic Thorium ✓ ✓	Soil	4 C	N	1	8 oz glass jar ✓
✓ 4	C003-SB014-0012-01 ✓	4/6/2016	12:28	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB014-0012-01 ✓	4/6/2016	12:28	Gamma Spec (Modified) ✓	Soil	4 C	N	Broken 1	16 oz glass jar ✓
5	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	Broken 1	16 oz glass jar ✓
5	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Isotopic Uranium ✓	Soil	4 C	N	Broken 1	8 oz glass jar ✓
5	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB016-0012-01	4/6/2016	08:35	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
6 ✓	C003-SB016-0012-01	4/6/2016	08:35	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CHAD NAREL	04/19/16 @1115	Good 2 Broken containers

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
✓	C003-SB016-0012-01	4/6/2016	08:35	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar
	C003-SB016-3648-01	4/6/2016	08:36	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
✓	C003-SB016-3648-01	4/6/2016	08:36	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar
	C003-SB016-3648-01	4/6/2016	08:36	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		NAREL	04/18/16 @1115	Good

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

ANALYSIS SUMMARY

Analysis method: NAREL GAM-01-RA
Title: Gamma-ray Spectrometry - Sealed Radium Cans

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B6.04138J	C3-SB9-0012-01		06/10/2016	0013448P	0020923Y
B6.04139K	C3-SB9-1224-01		06/10/2016	0013448P	0020923Y
B6.04140C	C3-SB10-0012-01		06/10/2016	0013448P	0020923Y
B6.04141D	C3-SB10-1224-01		06/10/2016	0013448P	0020923Y
B6.04142E	C3-SB10-6072-01		06/10/2016	0013448P	0020923Y
B6.04143F	C3-SB10-7284-01		06/10/2016	0013448P	0020923Y
B6.04144G	C3-SB10-8496-01		06/11/2016	0013448P	0020923Y
B6.04145H	C3-SB11-0012-01		06/11/2016	0013448P	0020923Y
B6.04146J	C3-SB11-3648-01		06/11/2016	0013448P	0020923Y
B6.04146J	C3-SB11-3648-01	DUP	06/14/2016	0013448P	0020923Y
B6.04147K	C3-SB12-0012-01		06/11/2016	0013448P	0020923Y
B6.04148L	C3-SB13-0012-01		06/11/2016	0013448P	0020923Y
B6.04149M	C3-SB13-1224-01		06/11/2016	0013448P	0020923Y
B6.04150E	C3-SB14-0012-01		06/14/2016	0013448P	0020923Y
B6.04151F	C3-SB15-0012-01		06/14/2016	0013448P	0020923Y
B6.04152G	C3-SB15-2436-01		06/14/2016	0013448P	0020923Y
B6.04153H	C3-SB16-0012-01		06/15/2016	0013448P	0020923Y
B6.04154J	C3-SB16-3648-01		06/15/2016	0013448P	0020923Y
LCS-00735408F *		LCS	06/16/2016	0013448P	0020923Y
RBK-00735409G *		RBK	06/16/2016	0013448P	0020923Y

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04138J	Amount analyzed:	1.610e+02 GDRY
Client sample ID:	C3-SB9-0012-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-05 18:02 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	96.88 %	Analyst:	MO
Ash/dry weight:	93.31 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/09/2016 14:36	1000.0	GE04	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	3.13e-01	1.7e-01	1.7e-01	PCI/GDRY	04/05/2016 18:02 EDT
Bi214	J	6.56e-01	7.9e-02	2.5e-02	PCI/GDRY	04/05/2016 18:02 EDT
Cs137		9.47e-04	9.3e-03	1.2e-02	PCI/GDRY	04/05/2016 18:02 EDT
K40		9.17e+00	1.0e+00	1.5e-01	PCI/GDRY	04/05/2016 18:02 EDT
Pb210	J	5.53e-01	2.0e-01	2.3e-01	PCI/GDRY	04/05/2016 18:02 EDT
Pb212	J	3.78e-01	4.5e-02	1.8e-02	PCI/GDRY	04/05/2016 18:02 EDT
Pb214	J	7.87e-01	9.1e-02	2.6e-02	PCI/GDRY	04/05/2016 18:02 EDT
Ra226	J	1.04e+00	2.6e-01	2.6e-01	PCI/GDRY	04/05/2016 18:02 EDT
Ra228		3.99e-01	6.4e-02	4.5e-02	PCI/GDRY	04/05/2016 18:02 EDT
Th234	J	1.81e-01	2.0e-01	2.8e-01	PCI/GDRY	04/05/2016 18:02 EDT
Tl208	J	1.02e-01	1.7e-02	1.2e-02	PCI/GDRY	04/05/2016 18:02 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04139K	Amount analyzed:	3.580e+02 GDRY
Client sample ID:	C3-SB9-1224-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-05 18:02 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	94.08 %	Analyst:	MO
Ash/dry weight:	96.64 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/09/2016 14:37	1000.0	GE17	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	6.63e-01	1.7e-01	1.7e-01	PCI/GDRY	04/05/2016 18:02 EDT
Bi214	J	1.46e+00	1.6e-01	2.6e-02	PCI/GDRY	04/05/2016 18:02 EDT
Cs137		-6.22e-03	9.2e-03	1.5e-02	PCI/GDRY	04/05/2016 18:02 EDT
K40		1.20e+01	1.3e+00	1.2e-01	PCI/GDRY	04/05/2016 18:02 EDT
Pb210	J	1.45e+00	2.2e-01	2.0e-01	PCI/GDRY	04/05/2016 18:02 EDT
Pb212	J	5.30e-01	6.2e-02	1.8e-02	PCI/GDRY	04/05/2016 18:02 EDT
Pb214	J	1.66e+00	1.9e-01	2.6e-02	PCI/GDRY	04/05/2016 18:02 EDT
Ra226	J	2.15e+00	2.9e-01	2.1e-01	PCI/GDRY	04/05/2016 18:02 EDT
Ra228		5.69e-01	8.2e-02	5.8e-02	PCI/GDRY	04/05/2016 18:02 EDT
Th234	J	4.07e-01	1.7e-01	2.4e-01	PCI/GDRY	04/05/2016 18:02 EDT
Tl208	J	1.67e-01	2.3e-02	1.6e-02	PCI/GDRY	04/05/2016 18:02 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04140C	Amount analyzed:	3.230e+02 GDRY
Client sample ID:	C3-SB10-0012-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	97.86 %	Analyst:	MO
Ash/dry weight:	92.49 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/09/2016 14:39	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	5.73e-01	1.1e-01	9.8e-02	PCI/GDRY	04/05/2016 15:52 EDT
Bi214	J	3.62e-01	4.4e-02	1.8e-02	PCI/GDRY	04/05/2016 15:52 EDT
Cs137		6.03e-03	6.3e-03	7.5e-03	PCI/GDRY	04/05/2016 15:52 EDT
K40		9.23e+00	1.0e+00	6.1e-02	PCI/GDRY	04/05/2016 15:52 EDT
Pb210	J	1.48e+00	2.3e-01	1.9e-01	PCI/GDRY	04/05/2016 15:52 EDT
Pb212	J	5.19e-01	6.0e-02	1.2e-02	PCI/GDRY	04/05/2016 15:52 EDT
Pb214	J	4.31e-01	5.0e-02	1.5e-02	PCI/GDRY	04/05/2016 15:52 EDT
Ra226	J	7.00e-01	1.3e-01	1.4e-01	PCI/GDRY	04/05/2016 15:52 EDT
Ra228		5.49e-01	6.5e-02	2.6e-02	PCI/GDRY	04/05/2016 15:52 EDT
Th234	J	4.63e-01	1.3e-01	1.7e-01	PCI/GDRY	04/05/2016 15:52 EDT
Tl208	J	1.73e-01	2.1e-02	7.7e-03	PCI/GDRY	04/05/2016 15:52 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04141D	Amount analyzed:	3.040e+02 GDRY
Client sample ID:	C3-SB10-1224-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	91.93 %	Analyst:	MO
Ash/dry weight:	92.48 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/09/2016 14:41	1000.0	GE18	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.09e+00	2.6e-01	3.0e-01	PCI/GDRY	04/05/2016 15:52 EDT
Bi214	J	2.65e+01	2.9e+00	4.1e-02	PCI/GDRY	04/05/2016 15:52 EDT
Cs137		7.10e-02	1.5e-02	2.1e-02	PCI/GDRY	04/05/2016 15:52 EDT
K40		1.31e+01	1.5e+00	2.9e-01	PCI/GDRY	04/05/2016 15:52 EDT
Pb210	J	3.27e+01	3.8e+00	5.8e-01	PCI/GDRY	04/05/2016 15:52 EDT
Pb212	J	8.48e-01	9.9e-02	4.7e-02	PCI/GDRY	04/05/2016 15:52 EDT
Pb214	J	3.00e+01	3.3e+00	5.4e-02	PCI/GDRY	04/05/2016 15:52 EDT
Ra226	J	3.52e+01	3.9e+00	6.9e-01	PCI/GDRY	04/05/2016 15:52 EDT
Ra228		8.66e-01	1.2e-01	1.2e-01	PCI/GDRY	04/05/2016 15:52 EDT
Th234	J	7.80e-01	4.3e-01	6.7e-01	PCI/GDRY	04/05/2016 15:52 EDT
Tl208	J	2.62e-01	3.4e-02	2.5e-02	PCI/GDRY	04/05/2016 15:52 EDT
U235	J	3.03e-01	1.2e-01	1.8e-01	PCI/GDRY	04/05/2016 15:52 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04142E	Amount analyzed:	2.620e+02 GDRY
Client sample ID:	C3-SB10-6072-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	80.93 %	Analyst:	MO
Ash/dry weight:	88.93 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/09/2016 14:43	1000.0	GE12	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.89e+00	3.0e-01	2.3e-01	PCI/GDRY	04/05/2016 15:52 EDT
Bi214	J	5.03e+00	5.5e-01	3.3e-02	PCI/GDRY	04/05/2016 15:52 EDT
Cs137		5.70e-03	1.4e-02	2.3e-02	PCI/GDRY	04/05/2016 15:52 EDT
K40		1.13e+01	1.3e+00	1.8e-01	PCI/GDRY	04/05/2016 15:52 EDT
Pb210	J	4.27e+00	5.1e-01	2.0e-01	PCI/GDRY	04/05/2016 15:52 EDT
Pb212	J	1.60e+00	1.8e-01	2.4e-02	PCI/GDRY	04/05/2016 15:52 EDT
Pb214	J	5.85e+00	6.4e-01	3.8e-02	PCI/GDRY	04/05/2016 15:52 EDT
Ra226	J	7.41e+00	8.8e-01	3.6e-01	PCI/GDRY	04/05/2016 15:52 EDT
Ra228		1.61e+00	1.8e-01	5.9e-02	PCI/GDRY	04/05/2016 15:52 EDT
Th234	J	8.96e-01	2.2e-01	2.9e-01	PCI/GDRY	04/05/2016 15:52 EDT
Tl208	J	4.91e-01	5.7e-02	1.8e-02	PCI/GDRY	04/05/2016 15:52 EDT
U235	J	1.41e-01	5.8e-02	8.4e-02	PCI/GDRY	04/05/2016 15:52 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04143F	Amount analyzed:	2.020e+02 GDRY
Client sample ID:	C3-SB10-7284-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	64.74 %	Analyst:	MO
Ash/dry weight:	77.25 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/09/2016 14:49	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	3.48e+00	4.9e-01	2.8e-01	PCI/GDRY	04/05/2016 15:52 EDT
Bi214	J	3.21e+00	3.6e-01	4.2e-02	PCI/GDRY	04/05/2016 15:52 EDT
Cs137		-1.29e-02	1.7e-02	1.9e-02	PCI/GDRY	04/05/2016 15:52 EDT
K40		9.59e+00	1.1e+00	1.9e-01	PCI/GDRY	04/05/2016 15:52 EDT
Pb210	J	2.84e+00	3.7e-01	2.7e-01	PCI/GDRY	04/05/2016 15:52 EDT
Pb212	J	3.42e+00	3.8e-01	3.6e-02	PCI/GDRY	04/05/2016 15:52 EDT
Pb214	J	3.81e+00	4.2e-01	4.5e-02	PCI/GDRY	04/05/2016 15:52 EDT
Ra226	J	5.16e+00	6.8e-01	4.1e-01	PCI/GDRY	04/05/2016 15:52 EDT
Ra228		3.28e+00	3.6e-01	5.7e-02	PCI/GDRY	04/05/2016 15:52 EDT
Th234	J	1.79e+00	3.9e-01	4.1e-01	PCI/GDRY	04/05/2016 15:52 EDT
Tl208	J	9.92e-01	1.1e-01	2.1e-02	PCI/GDRY	04/05/2016 15:52 EDT
U235	J	1.77e-01	7.2e-02	9.8e-02	PCI/GDRY	04/05/2016 15:52 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04144G	Amount analyzed:	5.000e+02 GDRY
Client sample ID:	C3-SB10-8496-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	71.62 %	Analyst:	MO
Ash/dry weight:	92.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 14:59	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.17e+00	1.6e-01	1.0e-01	PCI/GDRY	04/05/2016 15:52 EDT
Bi214	J	9.83e-01	1.1e-01	1.7e-02	PCI/GDRY	04/05/2016 15:52 EDT
Cs137		-1.20e-03	7.3e-03	1.2e-02	PCI/GDRY	04/05/2016 15:52 EDT
K40		1.34e+01	1.5e+00	6.7e-02	PCI/GDRY	04/05/2016 15:52 EDT
Pb210	J	6.28e-01	1.3e-01	1.4e-01	PCI/GDRY	04/05/2016 15:52 EDT
Pb212	J	1.16e+00	1.3e-01	1.6e-02	PCI/GDRY	04/05/2016 15:52 EDT
Pb214	J	1.13e+00	1.3e-01	2.2e-02	PCI/GDRY	04/05/2016 15:52 EDT
Ra226	J	2.28e+00	3.1e-01	2.1e-01	PCI/GDRY	04/05/2016 15:52 EDT
Ra228		1.16e+00	1.3e-01	2.9e-02	PCI/GDRY	04/05/2016 15:52 EDT
Th234	J	1.28e+00	1.8e-01	1.8e-01	PCI/GDRY	04/05/2016 15:52 EDT
Tl208	J	3.63e-01	4.1e-02	9.1e-03	PCI/GDRY	04/05/2016 15:52 EDT
U235	J	1.00e-01	4.1e-02	5.7e-02	PCI/GDRY	04/05/2016 15:52 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04145H	Amount analyzed:	1.840e+02 GDRY
Client sample ID:	C3-SB11-0012-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-06 11:13 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	96.90 %	Analyst:	MO
Ash/dry weight:	94.29 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:01	1000.0	GE04	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.92e-01	2.1e-01	1.8e-01	PCI/GDRY	04/06/2016 11:13 EDT
Bi214	J	5.84e-01	7.1e-02	2.7e-02	PCI/GDRY	04/06/2016 11:13 EDT
Cs137		-5.16e-03	1.0e-02	1.3e-02	PCI/GDRY	04/06/2016 11:13 EDT
K40		2.08e+01	2.3e+00	1.4e-01	PCI/GDRY	04/06/2016 11:13 EDT
Pb210	J	5.77e-01	1.9e-01	2.4e-01	PCI/GDRY	04/06/2016 11:13 EDT
Pb212	J	1.03e+00	1.1e-01	1.9e-02	PCI/GDRY	04/06/2016 11:13 EDT
Pb214	J	6.85e-01	8.0e-02	2.6e-02	PCI/GDRY	04/06/2016 11:13 EDT
Ra226	J	1.13e+00	2.5e-01	2.5e-01	PCI/GDRY	04/06/2016 11:13 EDT
Ra228		9.83e-01	1.2e-01	5.1e-02	PCI/GDRY	04/06/2016 11:13 EDT
Th234	J	7.34e-01	2.1e-01	2.8e-01	PCI/GDRY	04/06/2016 11:13 EDT
Tl208	J	3.04e-01	3.7e-02	1.5e-02	PCI/GDRY	04/06/2016 11:13 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04146J	Amount analyzed:	5.780e+02 GDRY
Client sample ID:	C3-SB11-3648-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-06 11:13 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	87.49 %	Analyst:	MO
Ash/dry weight:	97.41 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:05	1000.0	GE17	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.45e-01	1.7e-01	1.5e-01	PCI/GDRY	04/06/2016 11:13 EDT
Bi214	J	4.40e-01	5.4e-02	2.2e-02	PCI/GDRY	04/06/2016 11:13 EDT
Cs137		-5.29e-03	8.7e-03	1.0e-02	PCI/GDRY	04/06/2016 11:13 EDT
K40		1.46e+01	1.6e+00	1.1e-01	PCI/GDRY	04/06/2016 11:13 EDT
Pb210	J	6.94e-01	1.8e-01	2.4e-01	PCI/GDRY	04/06/2016 11:13 EDT
Pb212	J	8.45e-01	9.6e-02	1.8e-02	PCI/GDRY	04/06/2016 11:13 EDT
Pb214	J	5.10e-01	6.1e-02	2.3e-02	PCI/GDRY	04/06/2016 11:13 EDT
Ra226	J	1.00e+00	1.9e-01	2.0e-01	PCI/GDRY	04/06/2016 11:13 EDT
Ra228		8.85e-01	1.0e-01	5.2e-02	PCI/GDRY	04/06/2016 11:13 EDT
Th234	J	5.44e-01	1.7e-01	2.4e-01	PCI/GDRY	04/06/2016 11:13 EDT
Tl208	J	2.64e-01	3.1e-02	1.3e-02	PCI/GDRY	04/06/2016 11:13 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04146J	Amount analyzed:	5.780e+02 GDRY
Client sample ID:	C3-SB11-3648-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-06 11:13 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	87.49 %	Analyst:	MO
Ash/dry weight:	97.41 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 11:36	1000.0	GE18	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.01e+00	1.7e-01	1.5e-01	PCI/GDRY	04/06/2016 11:13 EDT
Bi214	J	4.33e-01	5.2e-02	2.0e-02	PCI/GDRY	04/06/2016 11:13 EDT
Cs137		-8.83e-04	7.0e-03	8.8e-03	PCI/GDRY	04/06/2016 11:13 EDT
K40		1.47e+01	1.6e+00	9.0e-02	PCI/GDRY	04/06/2016 11:13 EDT
Pb210	J	6.89e-01	1.6e-01	2.1e-01	PCI/GDRY	04/06/2016 11:13 EDT
Pb212	J	8.26e-01	9.3e-02	1.7e-02	PCI/GDRY	04/06/2016 11:13 EDT
Pb214	J	4.99e-01	5.9e-02	2.2e-02	PCI/GDRY	04/06/2016 11:13 EDT
Ra226	J	8.35e-01	1.6e-01	1.8e-01	PCI/GDRY	04/06/2016 11:13 EDT
Ra228		8.40e-01	9.9e-02	4.9e-02	PCI/GDRY	04/06/2016 11:13 EDT
Th234	J	5.71e-01	1.4e-01	2.1e-01	PCI/GDRY	04/06/2016 11:13 EDT
Tl208	J	2.66e-01	3.2e-02	1.4e-02	PCI/GDRY	04/06/2016 11:13 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04147K	Amount analyzed:	1.360e+02 GDRY
Client sample ID:	C3-SB12-0012-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-06 11:35 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	98.86 %	Analyst:	MO
Ash/dry weight:	80.06 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:10	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	4.73e-01	1.9e-01	2.0e-01	PCI/GDRY	04/06/2016 11:35 EDT
Bi214	J	3.46e-01	5.1e-02	3.3e-02	PCI/GDRY	04/06/2016 11:35 EDT
Cs137		-3.25e-03	1.1e-02	1.3e-02	PCI/GDRY	04/06/2016 11:35 EDT
K40		1.11e+01	1.3e+00	1.6e-01	PCI/GDRY	04/06/2016 11:35 EDT
Pb210	J	4.27e-01	1.3e-01	1.7e-01	PCI/GDRY	04/06/2016 11:35 EDT
Pb212	J	4.66e-01	5.6e-02	2.6e-02	PCI/GDRY	04/06/2016 11:35 EDT
Pb214	J	3.95e-01	5.5e-02	3.4e-02	PCI/GDRY	04/06/2016 11:35 EDT
Ra226	J	6.67e-01	2.3e-01	2.4e-01	PCI/GDRY	04/06/2016 11:35 EDT
Ra228		4.48e-01	6.7e-02	6.1e-02	PCI/GDRY	04/06/2016 11:35 EDT
Th234	J	5.13e-01	2.2e-01	2.4e-01	PCI/GDRY	04/06/2016 11:35 EDT
Tl208	J	1.40e-01	2.2e-02	1.7e-02	PCI/GDRY	04/06/2016 11:35 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04148L	Amount analyzed:	1.540e+02 GDRY
Client sample ID:	C3-SB13-0012-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-06 12:00 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	99.04 %	Analyst:	MO
Ash/dry weight:	83.55 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:11	1000.0	GE12	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	6.14e-01	1.9e-01	1.9e-01	PCI/GDRY	04/06/2016 12:00 EDT
Bi214	J	4.26e-01	5.7e-02	3.1e-02	PCI/GDRY	04/06/2016 12:00 EDT
Cs137		4.22e-03	9.8e-03	1.2e-02	PCI/GDRY	04/06/2016 12:00 EDT
K40		1.26e+01	1.4e+00	1.5e-01	PCI/GDRY	04/06/2016 12:00 EDT
Pb210	J	4.36e-01	2.2e-01	2.7e-01	PCI/GDRY	04/06/2016 12:00 EDT
Pb212	J	5.05e-01	5.9e-02	2.0e-02	PCI/GDRY	04/06/2016 12:00 EDT
Pb214	J	4.72e-01	5.8e-02	2.7e-02	PCI/GDRY	04/06/2016 12:00 EDT
Ra226	J	8.52e-01	2.2e-01	2.5e-01	PCI/GDRY	04/06/2016 12:00 EDT
Ra228		5.43e-01	7.8e-02	5.6e-02	PCI/GDRY	04/06/2016 12:00 EDT
Th234	J	4.59e-01	2.1e-01	2.8e-01	PCI/GDRY	04/06/2016 12:00 EDT
Tl208	J	1.58e-01	2.2e-02	1.3e-02	PCI/GDRY	04/06/2016 12:00 EDT
U235	J	6.65e-02	3.6e-02	5.3e-02	PCI/GDRY	04/06/2016 12:00 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04149M	Amount analyzed:	3.600e+02 GDRY
Client sample ID:	C3-SB13-1224-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-06 12:01 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	93.44 %	Analyst:	MO
Ash/dry weight:	98.23 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:13	1000.0	GE18	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.52e-01	1.7e-01	1.6e-01	PCI/GDRY	04/06/2016 12:01 EDT
Bi214	J	1.80e+00	2.0e-01	2.4e-02	PCI/GDRY	04/06/2016 12:01 EDT
Cs137		2.23e-03	9.0e-03	1.5e-02	PCI/GDRY	04/06/2016 12:01 EDT
K40		1.23e+01	1.4e+00	1.1e-01	PCI/GDRY	04/06/2016 12:01 EDT
Pb210	J	2.01e+00	2.9e-01	2.4e-01	PCI/GDRY	04/06/2016 12:01 EDT
Pb212	J	7.38e-01	8.3e-02	1.8e-02	PCI/GDRY	04/06/2016 12:01 EDT
Pb214	J	2.05e+00	2.3e-01	2.4e-02	PCI/GDRY	04/06/2016 12:01 EDT
Ra226	J	2.79e+00	3.6e-01	2.3e-01	PCI/GDRY	04/06/2016 12:01 EDT
Ra228		8.21e-01	9.8e-02	5.6e-02	PCI/GDRY	04/06/2016 12:01 EDT
Th234	J	5.46e-01	1.6e-01	2.3e-01	PCI/GDRY	04/06/2016 12:01 EDT
Tl208	J	2.17e-01	2.7e-02	1.5e-02	PCI/GDRY	04/06/2016 12:01 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04150E	Amount analyzed:	3.130e+02 GDRY
Client sample ID:	C3-SB14-0012-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-06 12:28 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	97.41 %	Analyst:	MO
Ash/dry weight:	91.39 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 11:38	1000.0	GE12	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	5.88e-01	1.4e-01	1.3e-01	PCI/GDRY	04/06/2016 12:28 EDT
Bi214	J	5.75e-01	6.7e-02	2.0e-02	PCI/GDRY	04/06/2016 12:28 EDT
Cs137		8.12e-03	6.9e-03	8.5e-03	PCI/GDRY	04/06/2016 12:28 EDT
K40		1.15e+01	1.3e+00	9.4e-02	PCI/GDRY	04/06/2016 12:28 EDT
Pb210	J	5.92e-01	1.9e-01	2.3e-01	PCI/GDRY	04/06/2016 12:28 EDT
Pb212	J	5.46e-01	6.2e-02	1.5e-02	PCI/GDRY	04/06/2016 12:28 EDT
Pb214	J	6.62e-01	7.6e-02	2.1e-02	PCI/GDRY	04/06/2016 12:28 EDT
Ra226	J	1.02e+00	2.0e-01	2.0e-01	PCI/GDRY	04/06/2016 12:28 EDT
Ra228		5.56e-01	6.8e-02	3.8e-02	PCI/GDRY	04/06/2016 12:28 EDT
Th234	J	3.68e-01	1.5e-01	2.2e-01	PCI/GDRY	04/06/2016 12:28 EDT
Tl208	J	1.67e-01	2.1e-02	1.0e-02	PCI/GDRY	04/06/2016 12:28 EDT
U235	J	4.46e-02	3.7e-02	5.2e-02	PCI/GDRY	04/06/2016 12:28 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04151F	Amount analyzed:	2.820e+02 GDRY
Client sample ID:	C3-SB15-0012-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-06 10:43 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	85.96 %	Analyst:	MO
Ash/dry weight:	95.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 11:39	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.04e+00	1.8e-01	1.4e-01	PCI/GDRY	04/06/2016 10:43 EDT
Bi214	J	8.69e-01	1.0e-01	2.6e-02	PCI/GDRY	04/06/2016 10:43 EDT
Cs137		7.26e-02	1.3e-02	1.1e-02	PCI/GDRY	04/06/2016 10:43 EDT
K40		1.35e+01	1.5e+00	1.2e-01	PCI/GDRY	04/06/2016 10:43 EDT
Pb210	J	1.38e+00	2.8e-01	2.9e-01	PCI/GDRY	04/06/2016 10:43 EDT
Pb212	J	8.58e-01	9.7e-02	2.3e-02	PCI/GDRY	04/06/2016 10:43 EDT
Pb214	J	1.05e+00	1.2e-01	2.9e-02	PCI/GDRY	04/06/2016 10:43 EDT
Ra226	J	1.79e+00	2.9e-01	2.4e-01	PCI/GDRY	04/06/2016 10:43 EDT
Ra228		8.62e-01	1.1e-01	4.8e-02	PCI/GDRY	04/06/2016 10:43 EDT
Th234	J	7.92e-01	2.7e-01	3.0e-01	PCI/GDRY	04/06/2016 10:43 EDT
Tl208	J	2.64e-01	3.3e-02	1.4e-02	PCI/GDRY	04/06/2016 10:43 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04152G	Amount analyzed:	6.550e+02 GDRY
Client sample ID:	C3-SB15-2436-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-06 10:43 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	91.97 %	Analyst:	MO
Ash/dry weight:	98.05 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/13/2016 11:40	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.03e+00	1.4e-01	9.1e-02	PCI/GDRY	04/06/2016 10:43 EDT
Bi214	J	5.52e-01	6.3e-02	1.6e-02	PCI/GDRY	04/06/2016 10:43 EDT
Cs137		9.09e-03	4.7e-03	6.2e-03	PCI/GDRY	04/06/2016 10:43 EDT
K40		1.29e+01	1.4e+00	5.7e-02	PCI/GDRY	04/06/2016 10:43 EDT
Pb210	J	5.59e-01	1.6e-01	2.0e-01	PCI/GDRY	04/06/2016 10:43 EDT
Pb212	J	8.83e-01	1.0e-01	1.3e-02	PCI/GDRY	04/06/2016 10:43 EDT
Pb214	J	6.46e-01	7.4e-02	1.7e-02	PCI/GDRY	04/06/2016 10:43 EDT
Ra226	J	1.16e+00	1.8e-01	1.6e-01	PCI/GDRY	04/06/2016 10:43 EDT
Ra228		8.98e-01	1.0e-01	2.7e-02	PCI/GDRY	04/06/2016 10:43 EDT
Th234	J	5.99e-01	1.6e-01	2.1e-01	PCI/GDRY	04/06/2016 10:43 EDT
Tl208	J	2.80e-01	3.2e-02	8.2e-03	PCI/GDRY	04/06/2016 10:43 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04153H	Amount analyzed:	1.750e+02 GDRY
Client sample ID:	C3-SB16-0012-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-06 08:35 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	96.85 %	Analyst:	MO
Ash/dry weight:	93.53 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 16:02	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.72e-01	1.9e-01	1.6e-01	PCI/GDRY	04/06/2016 08:35 EDT
Bi214	J	3.89e-01	5.2e-02	2.9e-02	PCI/GDRY	04/06/2016 08:35 EDT
Cs137		1.36e-03	1.1e-02	1.2e-02	PCI/GDRY	04/06/2016 08:35 EDT
K40		1.69e+01	1.9e+00	1.4e-01	PCI/GDRY	04/06/2016 08:35 EDT
Pb210	J	6.19e-01	1.8e-01	2.2e-01	PCI/GDRY	04/06/2016 08:35 EDT
Pb212	J	7.71e-01	8.7e-02	2.4e-02	PCI/GDRY	04/06/2016 08:35 EDT
Pb214	J	4.84e-01	6.2e-02	3.1e-02	PCI/GDRY	04/06/2016 08:35 EDT
Ra226	J	8.72e-01	2.2e-01	2.2e-01	PCI/GDRY	04/06/2016 08:35 EDT
Ra228		7.96e-01	1.0e-01	5.0e-02	PCI/GDRY	04/06/2016 08:35 EDT
Th234	J	6.86e-01	2.7e-01	2.8e-01	PCI/GDRY	04/06/2016 08:35 EDT
Tl208	J	2.25e-01	2.8e-02	1.4e-02	PCI/GDRY	04/06/2016 08:35 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04154J	Amount analyzed:	5.820e+02 GDRY
Client sample ID:	C3-SB16-3648-01	Preparation batch #:	0013448P
Matrix:	SOIL	Assay batch #:	0020923Y
Collected:	2016-04-06 08:36 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	88.04 %	Analyst:	MO
Ash/dry weight:	97.34 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 16:03	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	9.88e-01	1.4e-01	9.5e-02	PCI/GDRY	04/06/2016 08:36 EDT
Bi214	J	5.37e-01	6.2e-02	1.6e-02	PCI/GDRY	04/06/2016 08:36 EDT
Cs137		1.34e-03	6.4e-03	7.7e-03	PCI/GDRY	04/06/2016 08:36 EDT
K40		1.30e+01	1.4e+00	6.3e-02	PCI/GDRY	04/06/2016 08:36 EDT
Pb210	J	5.53e-01	1.7e-01	2.1e-01	PCI/GDRY	04/06/2016 08:36 EDT
Pb212	J	9.01e-01	1.0e-01	1.5e-02	PCI/GDRY	04/06/2016 08:36 EDT
Pb214	J	6.19e-01	7.1e-02	1.9e-02	PCI/GDRY	04/06/2016 08:36 EDT
Ra226	J	1.11e+00	1.8e-01	1.7e-01	PCI/GDRY	04/06/2016 08:36 EDT
Ra228		9.38e-01	1.1e-01	2.4e-02	PCI/GDRY	04/06/2016 08:36 EDT
Th234	J	6.07e-01	1.7e-01	2.3e-01	PCI/GDRY	04/06/2016 08:36 EDT
Tl208	J	2.88e-01	3.3e-02	7.8e-03	PCI/GDRY	04/06/2016 08:36 EDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00735408F	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013448P
Matrix:	N/A	Assay batch #:	0020923Y
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	N/A	Analyst:	MO
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 15:25	1000.0	GE16	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi207		4.61e+03	4.9e+02	5.3e+01	PCI	12/15/2010 12:00 CST
Bi212	J	3.80e+02	1.3e+02	1.5e+02	PCI	12/15/2010 12:00 CST
Bi214	J	1.22e+02	1.5e+01	8.4e+00	PCI	12/15/2010 12:00 CST
Eu155		1.13e+03	1.3e+02	3.6e+01	PCI	12/15/2010 12:00 CST
Pb212	J	3.32e+02	3.9e+01	1.8e+01	PCI	12/15/2010 12:00 CST
Pb214	J	1.46e+02	2.0e+01	1.5e+01	PCI	12/15/2010 12:00 CST
Ra226	J	3.19e+02	8.8e+01	1.1e+02	PCI	12/15/2010 12:00 CST
Ra228		3.62e+02	4.7e+01	4.1e+01	PCI	12/15/2010 12:00 CST
Tl208	J	1.10e+02	1.5e+01	1.0e+01	PCI	12/15/2010 12:00 CST

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00735409G	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013448P
Matrix:	N/A	Assay batch #:	0020923Y
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	N/A	Analyst:	MO
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 15:37	1000.0	GE15	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	1.44e+01	2.3e+01	2.4e+01	PCI	06/09/2016 07:00 CDT
Bi214	J	-4.27e+00	5.3e+00	5.6e+00	PCI	06/09/2016 07:00 CDT
Cs137		2.17e-01	1.6e+00	1.8e+00	PCI	06/09/2016 07:00 CDT
Pb210	J	3.95e+01	3.7e+01	4.4e+01	PCI	06/09/2016 07:00 CDT
Pb212	J	-4.85e+00	3.5e+00	4.5e+00	PCI	06/09/2016 07:00 CDT
Pb214	J	-2.07e+00	4.9e+00	5.3e+00	PCI	06/09/2016 07:00 CDT
Ra226	J	-1.14e+01	3.4e+01	3.6e+01	PCI	06/09/2016 07:00 CDT
Ra228		-6.91e+00	7.5e+00	8.9e+00	PCI	06/09/2016 07:00 CDT
Th234	J	1.13e+00	4.0e+01	4.1e+01	PCI	06/09/2016 07:00 CDT
Tl208	J	-5.55e-01	2.0e+00	2.5e+00	PCI	06/09/2016 07:00 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG 1600017

PREPARATION BATCH SUMMARY

Preparation batch #: 0013448P
Analysis method: NAREL GAM-01-RA
Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	± 2 σ Uncertainty	Analyst
B6.04138J	C3-SB9-0012-01	00733736L		N/A		MO
B6.04139K	C3-SB9-1224-01	00733739P		N/A		MO
B6.04140C	C3-SB10-0012-01	00733742J		N/A		MO
B6.04141D	C3-SB10-1224-01	00733745M		N/A		MO
B6.04142E	C3-SB10-6072-01	00733748Q		N/A		MO
B6.04143F	C3-SB10-7284-01	00733751K		N/A		MO
B6.04144G	C3-SB10-8496-01	00733754N		N/A		MO
B6.04145H	C3-SB11-0012-01	00733757R		N/A		MO
B6.04146J	C3-SB11-3648-01	00733760L		N/A		MO
B6.04146J	C3-SB11-3648-01	00735407E	DUP	N/A		MO
B6.04147K	C3-SB12-0012-01	00733763P		N/A		MO
B6.04148L	C3-SB13-0012-01	00733766T		N/A		MO
B6.04149M	C3-SB13-1224-01	00733769W		N/A		MO
B6.04150E	C3-SB14-0012-01	00733772Q		N/A		MO
B6.04151F	C3-SB15-0012-01	00733775U		N/A		MO
B6.04152G	C3-SB15-2436-01	00733778X		N/A		MO
B6.04153H	C3-SB16-0012-01	00733781R		N/A		MO
B6.04154J	C3-SB16-3648-01	00733784V		N/A		MO
LCS-00735408F *		00735408F	LCS	N/A		MO
RBK-00735409G *		00735409G	RBK	N/A		MO

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013448P

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04146J	00735407E	DUP	BI212		6.2	0.49	PASS-J
B6.04146J	00735407E	DUP	BI214		1.5	-0.18	PASS-J
B6.04146J	00735407E	DUP	CS137		-142.8	0.79	PASS
B6.04146J	00735407E	DUP	K40		0.7	0.09	PASS
B6.04146J	00735407E	DUP	PB210		0.8	-0.04	PASS-J
B6.04146J	00735407E	DUP	PB212		2.4	-0.29	PASS-J
B6.04146J	00735407E	DUP	PB214		2.3	-0.28	PASS-J
B6.04146J	00735407E	DUP	RA226		18.3	-1.36	PASS-J
B6.04146J	00735407E	DUP	RA228		5.2	-0.62	PASS
B6.04146J	00735407E	DUP	TH234		4.9	0.25	PASS-J
B6.04146J	00735407E	DUP	TL208		0.6	0.07	PASS-J
LCS-00735408F	00735408F	LCS	BI207	97.9		-0.37	PASS
LCS-00735408F	00735408F	LCS	EU155	110.3		1.48	PASS
RBK-00735409G	00735409G	RBK	BI212				PASS-J
RBK-00735409G	00735409G	RBK	BI214				PASS-J
RBK-00735409G	00735409G	RBK	CS137				PASS
RBK-00735409G	00735409G	RBK	PB210				WARN-J
RBK-00735409G	00735409G	RBK	PB212				WARN-J
RBK-00735409G	00735409G	RBK	PB214				PASS-J
RBK-00735409G	00735409G	RBK	RA226				PASS-J
RBK-00735409G	00735409G	RBK	RA228				PASS
RBK-00735409G	00735409G	RBK	TH234				PASS-J
RBK-00735409G	00735409G	RBK	TL208				PASS-J

Note: Results qualified with -J may be significantly under or over-estimated and are not evaluated for QC purposes.

U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
U ANALYSES

REPORT OF SAMPLE DELIVERY GROUP #1600016

Project:	Canadian Radium & Uranium, Mt. Kisco, NY
Analysis method:	Isotopic Uranium Using NaOH Fusion
Report ID:	1600016-U
Report type:	Original
Date reported:	06/29/2016
Total pages in report:	51

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B6.04121Z	C2-SB3-8496-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04122A	C3-SB1-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04123B	C3-SB1-3648-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04124C	C3-SB1-3648-02	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04125D	C3-SB2-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04126E	C3-SB2-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04127F	C3-SB3-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04128G	C3-SB3-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04129H	C3-SB4-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04130A	C3-SB4-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04131B	C3-SB5-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04132C	C3-SB6-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04133D	C3-SB6-3648-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04134E	C3-SB7-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04135F	C3-SB7-3648-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04136G	C3-SB8-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04137H	C3-SB8-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016

EXCEPTIONS

1. **Packaging and shipping** – No problems were observed.
2. **Documentation** – No problems were observed.
3. **Sample preparation** – No problems were encountered.
4. **Analysis** – The original analysis of the samples in this SDG had a U-238 duplicate failure. The client was contacted and instructed NAREL to reanalyze the samples and to report the original and the reanalysis results, both of which are reported in this data package. The original results are in preparation batch 0013452K. The reanalysis results are in preparation batch 0013488Y. Please refer to the preparation batch number found on each results page to determine whether the results are the original analysis or the reanalysis for the sample.
   The reanalysis of sample B6.04133 was counted using a detector that failed its efficiency check after the sample had been counted. The sample was recounted on a different detector. The results of the recount of the reanalysis are reported in this data package.
5. **Holding times** – No holding times were specified.

QUALITY CONTROL

1. **QC samples** – All QC analysis results met NAREL acceptance criteria.
2. **Yields** – All chemical yields were within acceptance limits.
3. **Instruments** – Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

ACCREDITATION

All analyses included in this data package are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard.

CERTIFICATION

I certify that this data report complies with the terms and conditions of the Project Acceptance Form and/or the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

Velinda Herbert — 7/7/16
Velinda Herbert — Date
Quality Assurance Manager, NAREL

Cynthia White — 7-7-16
Cynthia White — Date
Director, Center for Environmental Radioanalytical Laboratory Science

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample, or blank spike
MS	Matrix spike
MSD	Matrix spike duplicate (not currently analyzed)
RBK	Method blank
STD	External standard (used for ^{228}Ra yield determination)

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "*Z* scores." A *Z* score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The *Z* score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The *Z* score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of %R in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either $|Z| \leq 3$ or $60 \leq \%R \leq 110$.

Chain of Custody Forms

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	C002-SB003-0012-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-7284-01 ✓	4/6/2016	13:18	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C002-SB003-8496-01 ✓	4/6/2016	13:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
4	C003-SB001-0012-01 ✓	4/5/2016 ✓	12:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	✓16 oz glass jar

Crushed Jar NO LOST

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CHCP NAREL	04/19/16 @1115	Good ① Crushed Sample 16oz ICC

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
3	C003-SB001-3648-01 ✓	4/5/2016	12:21 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
	C003-SB001-3648-01	4/5/2016	12:21	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB001-3648-01	4/5/2016	12:21	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB001-3648-02 ✓	4/5/2016	12:21	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB001-3648-02 ✓	4/5/2016	12:21 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB001-3648-02 ✓	4/5/2016	12:21 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB002-0012-01	4/5/2016	11:10	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-0012-01	4/5/2016	11:10	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-0012-01	4/5/2016	11:10	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB002-1224-01	4/5/2016	11:05	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-1224-01	4/5/2016	11:05	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB002-1224-01	4/5/2016	11:05	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB003-0012-01	4/5/2016	13:20	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB003-0012-01	4/5/2016	13:20	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB003-0012-01	4/5/2016	13:20	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB003-1224-01	4/5/2016	13:20	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
3	C003-SB003-1224-01 ✓	4/5/2016	13:20 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB003-1224-01 ✓	4/5/2016	13:20 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓ ?
	C003-SB004-0012-01	4/5/2016	13:48	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	RST3		CHAIN NAREL	04/19/16 0111	

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	C003-SB004-0012-01	4/5/2016	13:48	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-0012-01	4/5/2016	13:48	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB004-1224-01	4/5/2016	13:49	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB005-0012-01	4/5/2016	14:22	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-0012-01	4/5/2016	14:49	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB006-3648-01	4/5/2016	14:50	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB007-0012-01 ✓	4/5/2016	16:23 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB007-0012-01 ✓	4/5/2016	16:23 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB007-0012-01 ✓	4/5/2016	16:23 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Isotopic Thorium~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~8 oz glass jar~~
	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Isotopic Uranium~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~8 oz glass jar~~

4/19/16
4/12/16
6

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CH NAREL	4/19/16 0915	Good

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Gamma Spec (Modified)~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~16 oz glass jar~~
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	C003-SB007-3648-01	4/5/2016	16:23	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB008-0012-01	4/5/2016	16:58	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
3	C003-SB008-0012-01	4/5/2016	16:58	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	C003-SB008-0012-01	4/5/2016	16:58	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB008-1224-01	4/5/2016	16:59	Isotopic Thorium	Soil	4 C	Y	2	8 oz glass jar
3	C003-SB008-1224-01	4/5/2016	16:59	Isotopic Uranium	Soil	4 C	Y	2	8 oz glass jar
3	C003-SB008-1224-01	4/5/2016	16:59	Gamma Spec (Modified)	Soil	4 C	N	LABLE ISSUE	16 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB010-0012-01	4/5/2016	15:52	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
3	C003-SB010-0012-01	4/5/2016	15:52	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	C003-SB010-0012-01	4/5/2016	15:52	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CHAP NAREL	04/19/16	Good

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

ANALYSIS SUMMARY

Analysis method: NAREL ACT-02F-U
Title: Isotopic Uranium Using NaOH Fusion

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B6.04121Z	C2-SB3-8496-01		06/15/2016	0013452K	0020935C
B6.04121Z	C2-SB3-8496-01	DUP	06/15/2016	0013452K	0020935C
B6.04121Z	C2-SB3-8496-01		06/28/2016	0013488Y	0020974K
B6.04121Z	C2-SB3-8496-01	DUP	06/28/2016	0013488Y	0020974K
B6.04122A	C3-SB1-0012-01		06/15/2016	0013452K	0020935C
B6.04122A	C3-SB1-0012-01		06/28/2016	0013488Y	0020974K
B6.04123B	C3-SB1-3648-01		06/15/2016	0013452K	0020935C
B6.04123B	C3-SB1-3648-01		06/28/2016	0013488Y	0020974K
B6.04124C	C3-SB1-3648-02		06/15/2016	0013452K	0020935C
B6.04124C	C3-SB1-3648-02		06/28/2016	0013488Y	0020974K
B6.04125D	C3-SB2-0012-01		06/15/2016	0013452K	0020935C
B6.04125D	C3-SB2-0012-01		06/28/2016	0013488Y	0020974K
B6.04126E	C3-SB2-1224-01		06/15/2016	0013452K	0020935C
B6.04126E	C3-SB2-1224-01		06/28/2016	0013488Y	0020974K
B6.04127F	C3-SB3-0012-01		06/15/2016	0013452K	0020935C
B6.04127F	C3-SB3-0012-01		06/28/2016	0013488Y	0020974K
B6.04128G	C3-SB3-1224-01		06/16/2016	0013452K	0020943C
B6.04128G	C3-SB3-1224-01		06/28/2016	0013488Y	0020974K
B6.04129H	C3-SB4-0012-01		06/16/2016	0013452K	0020943C
B6.04129H	C3-SB4-0012-01		06/28/2016	0013488Y	0020974K
B6.04130A	C3-SB4-1224-01		06/16/2016	0013452K	0020943C
B6.04130A	C3-SB4-1224-01		06/28/2016	0013488Y	0020974K
B6.04131B	C3-SB5-0012-01		06/16/2016	0013452K	0020943C
B6.04131B	C3-SB5-0012-01		06/28/2016	0013488Y	0020974K
B6.04132C	C3-SB6-0012-01		06/16/2016	0013452K	0020943C
B6.04132C	C3-SB6-0012-01		06/28/2016	0013488Y	0020974K
B6.04133D	C3-SB6-3648-01		06/16/2016	0013452K	0020943C
B6.04133D	C3-SB6-3648-01		06/28/2016	0013488Y	0020974K
B6.04134E	C3-SB7-0012-01		06/16/2016	0013452K	0020943C
B6.04134E	C3-SB7-0012-01		06/28/2016	0013488Y	0020974K
B6.04135F	C3-SB7-3648-01		06/16/2016	0013452K	0020943C
B6.04135F	C3-SB7-3648-01		06/28/2016	0013488Y	0020974K
B6.04136G	C3-SB8-0012-01		06/16/2016	0013452K	0020943C
B6.04136G	C3-SB8-0012-01		06/28/2016	0013488Y	0020974K
B6.04137H	C3-SB8-1224-01		06/16/2016	0013452K	0020943C
B6.04137H	C3-SB8-1224-01		06/28/2016	0013488Y	0020974K
LCS-00735461L *		LCS	06/15/2016	0013452K	0020935C

RBK-00735460K *		RBK	06/15/2016	0013452K	0020935C
LCS-00736160E *		LCS	06/28/2016	0013488Y	0020974K
RBK-00736159M *		RBK	06/28/2016	0013488Y	0020974K

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04121Z	Amount analyzed:	1.079e+00 GASH
Client sample ID:	C2-SB3-8496-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020935C
Collected:	2016-04-06 13:19 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	84.48 %	Analyst:	SPK
Ash/dry weight:	98.41 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 15:12	1000.0	AS72	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	7.52e-01	1.4e-01	2.1e-02	PCI/GDRY	06/14/2016 15:12 CDT
U235	J	1.35e-02	2.1e-02	3.1e-02	PCI/GDRY	06/14/2016 15:12 CDT
U238	J	6.48e-01	1.2e-01	2.9e-02	PCI/GDRY	06/14/2016 15:12 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04121Z	Amount analyzed:	1.019e+00 GASH
Client sample ID:	C2-SB3-8496-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020935C
Collected:	2016-04-06 13:19 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	84.48 %	Analyst:	SPK
Ash/dry weight:	98.41 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 15:11	1000.0	AS73	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	7.55e-01	1.3e-01	3.9e-02	PCI/GDRY	06/14/2016 15:11 CDT
U235	J	5.17e-02	3.4e-02	3.6e-02	PCI/GDRY	06/14/2016 15:11 CDT
U238	J	9.65e-01	1.5e-01	2.6e-02	PCI/GDRY	06/14/2016 15:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04121Z	Amount analyzed:	8.116e-01 GASH
Client sample ID:	C2-SB3-8496-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-06 13:19 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	84.48 %	Analyst:	SPK
Ash/dry weight:	98.41 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:48	1000.0	AS33	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	8.21e-01	1.5e-01	3.3e-02	PCI/GDRY	06/27/2016 16:48 CDT
U235	3.93e-02	3.3e-02	2.8e-02	PCI/GDRY	06/27/2016 16:48 CDT
U238	8.42e-01	1.5e-01	2.9e-02	PCI/GDRY	06/27/2016 16:48 CDT

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04121Z	Amount analyzed:	8.155e-01 GASH
Client sample ID:	C2-SB3-8496-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-06 13:19 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	84.48 %	Analyst:	SPK
Ash/dry weight:	98.41 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:48	1000.0	AS34	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	7.47e-01	1.4e-01	3.0e-02	PCI/GDRY	06/27/2016 16:48 CDT
U235	1.90e-02	2.4e-02	3.2e-02	PCI/GDRY	06/27/2016 16:48 CDT
U238	8.01e-01	1.4e-01	2.7e-02	PCI/GDRY	06/27/2016 16:48 CDT

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04122A	Amount analyzed:	1.008e+00 GASH
Client sample ID:	C3-SB1-0012-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020935C
Collected:	2016-04-05 12:19 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	98.90 %	Analyst:	SPK
Ash/dry weight:	90.07 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 15:11	1000.0	AS75	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	5.97e-01	1.2e-01	5.4e-02	PCI/GDRY	06/14/2016 15:11 CDT
U235	J	3.63e-02	3.2e-02	4.1e-02	PCI/GDRY	06/14/2016 15:11 CDT
U238	J	6.34e-01	1.2e-01	4.3e-02	PCI/GDRY	06/14/2016 15:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04122A	Amount analyzed:	1.009e+00 GASH
Client sample ID:	C3-SB1-0012-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 12:19 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	98.90 %	Analyst:	SPK
Ash/dry weight:	90.07 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:48	1000.0	AS36	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	6.37e-01	1.1e-01	1.6e-02	PCI/GDRY	06/27/2016 16:48 CDT
U235	4.49e-02	2.8e-02	1.9e-02	PCI/GDRY	06/27/2016 16:48 CDT
U238	6.15e-01	1.1e-01	2.4e-02	PCI/GDRY	06/27/2016 16:48 CDT

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04123B	Amount analyzed:	1.016e+00 GASH
Client sample ID:	C3-SB1-3648-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020935C
Collected:	2016-04-05 12:21 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	85.94 %	Analyst:	SPK
Ash/dry weight:	99.22 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 15:11	1000.0	AS78	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	5.45e-01	1.1e-01	3.3e-02	PCI/GDRY	06/14/2016 15:11 CDT
U235	J	2.20e-02	2.2e-02	2.2e-02	PCI/GDRY	06/14/2016 15:11 CDT
U238	J	5.31e-01	1.0e-01	2.6e-02	PCI/GDRY	06/14/2016 15:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04123B	Amount analyzed:	1.023e+00 GASH
Client sample ID:	C3-SB1-3648-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 12:21 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	85.94 %	Analyst:	SPK
Ash/dry weight:	99.22 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:47	1000.0	AS37	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	5.11e-01	1.0e-01	3.1e-02	PCI/GDRY	06/27/2016 16:47 CDT
U235	5.34e-02	3.4e-02	2.8e-02	PCI/GDRY	06/27/2016 16:47 CDT
U238	6.17e-01	1.2e-01	2.7e-02	PCI/GDRY	06/27/2016 16:47 CDT

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04124C	Amount analyzed:	1.007e+00 GASH
Client sample ID:	C3-SB1-3648-02	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020935C
Collected:	2016-04-05 12:21 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	86.13 %	Analyst:	SPK
Ash/dry weight:	99.19 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 15:11	1000.0	AS79	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	6.39e-01	1.1e-01	1.9e-02	PCI/GDRY	06/14/2016 15:11 CDT
U235	J	2.39e-02	2.2e-02	2.6e-02	PCI/GDRY	06/14/2016 15:11 CDT
U238	J	5.48e-01	9.8e-02	1.6e-02	PCI/GDRY	06/14/2016 15:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04124C	Amount analyzed:	1.006e+00 GASH
Client sample ID:	C3-SB1-3648-02	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 12:21 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	86.13 %	Analyst:	SPK
Ash/dry weight:	99.19 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:47	1000.0	AS38	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	5.29e-01	1.0e-01	2.5e-02	PCI/GDRY	06/27/2016 16:47 CDT
U235	3.03e-02	2.7e-02	3.3e-02	PCI/GDRY	06/27/2016 16:47 CDT
U238	5.60e-01	1.1e-01	2.7e-02	PCI/GDRY	06/27/2016 16:47 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04125D	Amount analyzed:	9.869e-01 GASH
Client sample ID:	C3-SB2-0012-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020935C
Collected:	2016-04-05 11:10 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	97.78 %	Analyst:	SPK
Ash/dry weight:	87.91 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 15:11	1000.0	AS80	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	4.04e-01	9.5e-02	2.2e-02	PCI/GDRY	06/14/2016 15:11 CDT
U235	J	3.81e-02	3.2e-02	3.6e-02	PCI/GDRY	06/14/2016 15:11 CDT
U238	J	4.21e-01	9.7e-02	2.2e-02	PCI/GDRY	06/14/2016 15:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04125D	Amount analyzed:	1.010e+00 GASH
Client sample ID:	C3-SB2-0012-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 11:10 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	97.78 %	Analyst:	SPK
Ash/dry weight:	87.91 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:47	1000.0	AS40	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	4.97e-01	9.3e-02	1.6e-02	PCI/GDRY	06/27/2016 16:47 CDT
U235	1.62e-02	1.9e-02	2.6e-02	PCI/GDRY	06/27/2016 16:47 CDT
U238	4.65e-01	8.9e-02	1.9e-02	PCI/GDRY	06/27/2016 16:47 CDT

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04126E	Amount analyzed:	1.052e+00 GASH
Client sample ID:	C3-SB2-1224-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020935C
Collected:	2016-04-05 11:05 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	91.36 %	Analyst:	SPK
Ash/dry weight:	97.64 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 15:11	1000.0	AS65	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	5.46e-01	1.2e-01	5.5e-02	PCI/GDRY	06/14/2016 15:11 CDT
U235	J	3.43e-02	3.8e-02	5.8e-02	PCI/GDRY	06/14/2016 15:11 CDT
U238	J	5.53e-01	1.2e-01	5.8e-02	PCI/GDRY	06/14/2016 15:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04126E	Amount analyzed:	1.040e+00 GASH
Client sample ID:	C3-SB2-1224-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 11:05 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	91.36 %	Analyst:	SPK
Ash/dry weight:	97.64 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:47	1000.0	AS65	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	4.30e-01	9.0e-02	3.7e-02	PCI/GDRY	06/27/2016 16:47 CDT
U235	3.75e-02	3.3e-02	4.7e-02	PCI/GDRY	06/27/2016 16:47 CDT
U238	4.68e-01	9.4e-02	3.7e-02	PCI/GDRY	06/27/2016 16:47 CDT

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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04127F	Amount analyzed:	1.002e+00 GASH
Client sample ID:	C3-SB3-0012-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020935C
Collected:	2016-04-05 13:20 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	99.30 %	Analyst:	SPK
Ash/dry weight:	86.10 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 15:12	1000.0	AS68	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	5.04e-01	1.1e-01	3.7e-02	PCI/GDRY	06/14/2016 15:12 CDT
U235	J	1.35e-02	2.4e-02	4.0e-02	PCI/GDRY	06/14/2016 15:12 CDT
U238	J	4.78e-01	1.1e-01	3.0e-02	PCI/GDRY	06/14/2016 15:12 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04127F	Amount analyzed:	7.672e-01 GASH
Client sample ID:	C3-SB3-0012-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 13:20 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	99.30 %	Analyst:	SPK
Ash/dry weight:	86.10 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:47	1000.0	AS66	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	5.70e-01	1.2e-01	2.5e-02	PCI/GDRY	06/27/2016 16:47 CDT
U235	2.16e-02	2.7e-02	3.6e-02	PCI/GDRY	06/27/2016 16:47 CDT
U238	5.69e-01	1.2e-01	3.0e-02	PCI/GDRY	06/27/2016 16:47 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04128G	Amount analyzed:	1.029e+00 GASH
Client sample ID:	C3-SB3-1224-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020943C
Collected:	2016-04-05 13:20 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	93.08 %	Analyst:	SPK
Ash/dry weight:	96.01 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:11	1000.0	AS97	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	5.81e-01	1.2e-01	2.4e-02	PCI/GDRY	06/15/2016 16:11 CDT
U235	J	2.85e-02	2.9e-02	2.9e-02	PCI/GDRY	06/15/2016 16:11 CDT
U238	J	6.62e-01	1.3e-01	2.4e-02	PCI/GDRY	06/15/2016 16:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04128G	Amount analyzed:	9.475e-01 GASH
Client sample ID:	C3-SB3-1224-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 13:20 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	93.08 %	Analyst:	SPK
Ash/dry weight:	96.01 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:47	1000.0	AS68	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	6.06e-01	1.1e-01	2.5e-02	PCI/GDRY	06/27/2016 16:47 CDT
U235	2.47e-02	2.4e-02	2.7e-02	PCI/GDRY	06/27/2016 16:47 CDT
U238	5.99e-01	1.1e-01	2.5e-02	PCI/GDRY	06/27/2016 16:47 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04129H	Amount analyzed:	1.004e+00 GASH
Client sample ID:	C3-SB4-0012-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020943C
Collected:	2016-04-05 13:48 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	96.57 %	Analyst:	SPK
Ash/dry weight:	93.52 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:11	1000.0	AS98	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	4.70e-01	9.3e-02	2.1e-02	PCI/GDRY	06/15/2016 16:11 CDT
U235	J	3.68e-02	2.7e-02	2.1e-02	PCI/GDRY	06/15/2016 16:11 CDT
U238	J	5.21e-01	9.9e-02	2.1e-02	PCI/GDRY	06/15/2016 16:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04129H	Amount analyzed:	1.028e+00 GASH
Client sample ID:	C3-SB4-0012-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 13:48 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	96.57 %	Analyst:	SPK
Ash/dry weight:	93.52 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:47	1000.0	AS69	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	5.98e-01	1.1e-01	2.2e-02	PCI/GDRY	06/27/2016 16:47 CDT
U235	3.77e-02	2.8e-02	2.7e-02	PCI/GDRY	06/27/2016 16:47 CDT
U238	6.05e-01	1.1e-01	2.2e-02	PCI/GDRY	06/27/2016 16:47 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04130A	Amount analyzed:	1.005e+00 GASH
Client sample ID:	C3-SB4-1224-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020943C
Collected:	2016-04-05 13:49 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	91.41 %	Analyst:	SPK
Ash/dry weight:	98.01 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:11	1000.0	AS99	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	6.66e-01	1.3e-01	2.1e-02	PCI/GDRY	06/15/2016 16:11 CDT
U235	J	1.87e-02	2.4e-02	3.2e-02	PCI/GDRY	06/15/2016 16:11 CDT
U238	J	6.36e-01	1.2e-01	2.1e-02	PCI/GDRY	06/15/2016 16:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04130A	Amount analyzed:	1.002e+00 GASH
Client sample ID:	C3-SB4-1224-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 13:49 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	91.41 %	Analyst:	SPK
Ash/dry weight:	98.01 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:47	1000.0	AS70	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	5.92e-01	1.2e-01	2.7e-02	PCI/GDRY	06/27/2016 16:47 CDT
U235	1.54e-02	2.4e-02	3.9e-02	PCI/GDRY	06/27/2016 16:47 CDT
U238	6.35e-01	1.2e-01	2.7e-02	PCI/GDRY	06/27/2016 16:47 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04131B	Amount analyzed:	1.012e+00 GASH
Client sample ID:	C3-SB5-0012-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020943C
Collected:	2016-04-05 14:22 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	95.68 %	Analyst:	SPK
Ash/dry weight:	86.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:11	1000.0	AS100	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	3.42e-01	7.2e-02	2.2e-02	PCI/GDRY	06/15/2016 16:11 CDT
U235	J	1.77e-02	1.8e-02	1.8e-02	PCI/GDRY	06/15/2016 16:11 CDT
U238	J	3.18e-01	6.9e-02	1.5e-02	PCI/GDRY	06/15/2016 16:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04131B	Amount analyzed:	6.471e-01 GASH
Client sample ID:	C3-SB5-0012-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 14:22 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	95.68 %	Analyst:	SPK
Ash/dry weight:	86.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:48	1000.0	AS71	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	3.89e-01	9.7e-02	4.5e-02	PCI/GDRY	06/27/2016 16:48 CDT
U235	1.52e-02	2.4e-02	3.5e-02	PCI/GDRY	06/27/2016 16:48 CDT
U238	4.85e-01	1.1e-01	2.9e-02	PCI/GDRY	06/27/2016 16:48 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04132C	Amount analyzed:	9.741e-01 GASH
Client sample ID:	C3-SB6-0012-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020943C
Collected:	2016-04-05 14:49 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	94.80 %	Analyst:	SPK
Ash/dry weight:	95.66 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:11	1000.0	AS101	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	4.36e-01	9.4e-02	2.4e-02	PCI/GDRY	06/15/2016 16:11 CDT
U235	J	9.34e-03	1.7e-02	2.3e-02	PCI/GDRY	06/15/2016 16:11 CDT
U238	J	4.25e-01	9.2e-02	2.0e-02	PCI/GDRY	06/15/2016 16:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04132C	Amount analyzed:	1.010e+00 GASH
Client sample ID:	C3-SB6-0012-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 14:49 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	94.80 %	Analyst:	SPK
Ash/dry weight:	95.66 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:48	1000.0	AS72	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	4.82e-01	9.6e-02	2.2e-02	PCI/GDRY	06/27/2016 16:48 CDT
U235	2.41e-02	2.3e-02	2.6e-02	PCI/GDRY	06/27/2016 16:48 CDT
U238	3.90e-01	8.4e-02	2.2e-02	PCI/GDRY	06/27/2016 16:48 CDT

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04133D	Amount analyzed:	1.004e+00 GASH
Client sample ID:	C3-SB6-3648-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020943C
Collected:	2016-04-05 14:50 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	95.09 %	Analyst:	SPK
Ash/dry weight:	75.18 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:11	1000.0	AS105	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	6.00e-01	1.2e-01	2.5e-02	PCI/GDRY	06/15/2016 16:11 CDT
U235	J	1.12e-02	2.0e-02	3.3e-02	PCI/GDRY	06/15/2016 16:11 CDT
U238	J	5.66e-01	1.1e-01	2.0e-02	PCI/GDRY	06/15/2016 16:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04133D	Amount analyzed:	9.909e-01 GASH
Client sample ID:	C3-SB6-3648-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020999V
Collected:	2016-04-05 14:50 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	95.09 %	Analyst:	SPK
Ash/dry weight:	75.18 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
07/05/2016 09:34	1000.0	AS34	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	5.96e-01	1.2e-01	2.0e-02	PCI/GDRY	07/05/2016 09:34 CDT
U235	3.88e-02	3.0e-02	2.4e-02	PCI/GDRY	07/05/2016 09:34 CDT
U238	5.27e-01	1.1e-01	2.0e-02	PCI/GDRY	07/05/2016 09:34 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04134E	Amount analyzed:	1.002e+00 GASH
Client sample ID:	C3-SB7-0012-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020943C
Collected:	2016-04-05 16:23 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	95.07 %	Analyst:	SPK
Ash/dry weight:	93.71 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:11	1000.0	AS103	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	5.02e-01	9.7e-02	2.4e-02	PCI/GDRY	06/15/2016 16:11 CDT
U235	J	2.74e-02	2.4e-02	2.5e-02	PCI/GDRY	06/15/2016 16:11 CDT
U238	J	4.19e-01	8.7e-02	1.7e-02	PCI/GDRY	06/15/2016 16:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04134E	Amount analyzed:	6.946e-01 GASH
Client sample ID:	C3-SB7-0012-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 16:23 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	95.07 %	Analyst:	SPK
Ash/dry weight:	93.71 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:48	1000.0	AS75	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	4.08e-01	9.2e-02	5.4e-02	PCI/GDRY	06/27/2016 16:48 CDT
U235	1.51e-03	2.0e-02	4.5e-02	PCI/GDRY	06/27/2016 16:48 CDT
U238	4.11e-01	8.9e-02	3.1e-02	PCI/GDRY	06/27/2016 16:48 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04135F	Amount analyzed:	1.001e+00 GASH
Client sample ID:	C3-SB7-3648-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020943C
Collected:	2016-04-05 16:23 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	76.42 %	Analyst:	SPK
Ash/dry weight:	74.56 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:11	1000.0	AS104	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	6.13e-01	1.2e-01	2.9e-02	PCI/GDRY	06/15/2016 16:11 CDT
U235	J	3.48e-02	2.8e-02	2.8e-02	PCI/GDRY	06/15/2016 16:11 CDT
U238	J	6.16e-01	1.2e-01	3.1e-02	PCI/GDRY	06/15/2016 16:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04135F	Amount analyzed:	1.007e+00 GASH
Client sample ID:	C3-SB7-3648-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 16:23 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	76.42 %	Analyst:	SPK
Ash/dry weight:	74.56 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:48	1000.0	AS77	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	5.57e-01	1.1e-01	2.8e-02	PCI/GDRY	06/27/2016 16:48 CDT
U235	2.85e-02	2.6e-02	2.4e-02	PCI/GDRY	06/27/2016 16:48 CDT
U238	5.35e-01	1.1e-01	2.4e-02	PCI/GDRY	06/27/2016 16:48 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04136G	Amount analyzed:	1.013e+00 GASH
Client sample ID:	C3-SB8-0012-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020943C
Collected:	2016-04-05 16:58 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	97.15 %	Analyst:	SPK
Ash/dry weight:	93.40 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:11	1000.0	AS106	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	3.68e-01	7.6e-02	2.1e-02	PCI/GDRY	06/15/2016 16:11 CDT
U235	J	2.06e-02	2.0e-02	2.2e-02	PCI/GDRY	06/15/2016 16:11 CDT
U238	J	3.81e-01	7.7e-02	1.9e-02	PCI/GDRY	06/15/2016 16:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04136G	Amount analyzed:	7.249e-01 GASH
Client sample ID:	C3-SB8-0012-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 16:58 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	97.15 %	Analyst:	SPK
Ash/dry weight:	93.40 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:48	1000.0	AS78	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	4.81e-01	1.1e-01	3.2e-02	PCI/GDRY	06/27/2016 16:48 CDT
U235	4.01e-02	3.4e-02	3.8e-02	PCI/GDRY	06/27/2016 16:48 CDT
U238	4.14e-01	9.8e-02	4.3e-02	PCI/GDRY	06/27/2016 16:48 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04137H	Amount analyzed:	1.014e+00 GASH
Client sample ID:	C3-SB8-1224-01	Preparation batch #:	0013452K
Matrix:	SOIL	Assay batch #:	0020943C
Collected:	2016-04-05 16:59 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	95.02 %	Analyst:	SPK
Ash/dry weight:	92.62 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/15/2016 16:11	1000.0	AS107	RCL

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	J	4.78e-01	9.9e-02	1.9e-02	PCI/GDRY	06/15/2016 16:11 CDT
U235	J	3.23e-02	2.7e-02	2.3e-02	PCI/GDRY	06/15/2016 16:11 CDT
U238	J	5.67e-01	1.1e-01	1.9e-02	PCI/GDRY	06/15/2016 16:11 CDT

Note: A “J” qualifier indicates a result that may be significantly under or overestimated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04137H	Amount analyzed:	1.020e+00 GASH
Client sample ID:	C3-SB8-1224-01	Preparation batch #:	0013488Y
Matrix:	SOIL	Assay batch #:	0020974K
Collected:	2016-04-05 16:59 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	95.02 %	Analyst:	SPK
Ash/dry weight:	92.62 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:48	1000.0	AS79	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	5.37e-01	9.6e-02	2.1e-02	PCI/GDRY	06/27/2016 16:48 CDT
U235	1.82e-02	2.0e-02	2.8e-02	PCI/GDRY	06/27/2016 16:48 CDT
U238	4.84e-01	9.0e-02	1.5e-02	PCI/GDRY	06/27/2016 16:48 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00735461L	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013452K
Matrix:	N/A	Assay batch #:	0020935C
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 15:12	1000.0	AS69	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	1.89e+00	2.3e-01	2.4e-02	PCI	06/14/2016 15:12 CDT
U235	1.09e-01	4.6e-02	2.5e-02	PCI	06/14/2016 15:12 CDT
U238	1.96e+00	2.3e-01	2.1e-02	PCI	06/14/2016 15:12 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00735460K	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013452K
Matrix:	N/A	Assay batch #:	0020935C
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/14/2016 15:12	1000.0	AS70	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	2.44e-02	2.2e-02	2.7e-02	PCI	06/14/2016 15:12 CDT
U235	3.08e-03	1.4e-02	2.8e-02	PCI	06/14/2016 15:12 CDT
U238	1.93e-02	1.9e-02	1.9e-02	PCI	06/14/2016 15:12 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00736160E	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013488Y
Matrix:	N/A	Assay batch #:	0020974K
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:48	1000.0	AS80	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	1.98e+00	2.5e-01	2.3e-02	PCI	06/27/2016 16:48 CDT
U235	9.29e-02	4.5e-02	2.8e-02	PCI	06/27/2016 16:48 CDT
U238	1.98e+00	2.5e-01	2.3e-02	PCI	06/27/2016 16:48 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600016

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00736159M	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013488Y
Matrix:	N/A	Assay batch #:	0020974K
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/27/2016 16:48	1000.0	AS81	CEB

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	1.05e-02	1.6e-02	2.4e-02	PCI	06/27/2016 16:48 CDT
U235	-3.13e-03	1.1e-02	3.3e-02	PCI	06/27/2016 16:48 CDT
U238	1.05e-02	1.6e-02	2.4e-02	PCI	06/27/2016 16:48 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG 1600016

PREPARATION BATCH SUMMARY

Preparation batch #: 0013452K
Analysis method: NAREL ACT-02F-U
Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	± 2 σ Uncertainty	Analyst
B6.04121Z	C2-SB3-8496-01	00733683Q		60.49 %	5.91 %	SPK
B6.04121Z	C2-SB3-8496-01	00735459T	DUP	63.63 %	5.75 %	SPK
B6.04122A	C3-SB1-0012-01	00733686U		52.55 %	4.99 %	SPK
B6.04123B	C3-SB1-3648-01	00733689X		74.38 %	6.81 %	SPK
B6.04124C	C3-SB1-3648-02	00733692R		71.78 %	6.25 %	SPK
B6.04125D	C3-SB2-0012-01	00733695V		59.58 %	5.92 %	SPK
B6.04126E	C3-SB2-1224-01	00733698Y		53.57 %	5.44 %	SPK
B6.04127F	C3-SB3-0012-01	00733701Z		48.77 %	5.09 %	SPK
B6.04128G	C3-SB3-1224-01	00733704C		53.32 %	5.38 %	SPK
B6.04129H	C3-SB4-0012-01	00733707F		75.41 %	6.84 %	SPK
B6.04130A	C3-SB4-1224-01	00733710A		63.76 %	6.11 %	SPK
B6.04131B	C3-SB5-0012-01	00733713D		83.45 %	7.44 %	SPK
B6.04132C	C3-SB6-0012-01	00733716G		69.59 %	6.47 %	SPK
B6.04133D	C3-SB6-3648-01	00733719K		51.06 %	5.23 %	SPK
B6.04134E	C3-SB7-0012-01	00733722E		77.05 %	7.00 %	SPK
B6.04135F	C3-SB7-3648-01	00733725H		54.25 %	5.47 %	SPK
B6.04136G	C3-SB8-0012-01	00733728L		86.38 %	7.60 %	SPK
B6.04137H	C3-SB8-1224-01	00733731F		63.56 %	6.02 %	SPK
LCS-00735461L *		00735461L	LCS	82.23 %	7.30 %	SPK
RBK-00735460K *		00735460K	RBK	75.23 %	6.95 %	SPK

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013452K

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04121Z	00735459T	DUP	U234		0.4	0.03	PASS-J
B6.04121Z	00735459T	DUP	U235		117.1	1.91	PASS-J
B6.04121Z	00735459T	DUP	U238		39.3	3.25	FAIL-J
LCS-00735461L	00735461L	LCS	U234	94.5		-0.92	PASS
LCS-00735461L	00735461L	LCS	U235	115.7		0.64	PASS
LCS-00735461L	00735461L	LCS	U238	96.2		-0.63	PASS
RBK-00735460K	00735460K	RBK	U234				PASS
RBK-00735460K	00735460K	RBK	U235				PASS
RBK-00735460K	00735460K	RBK	U238				PASS

Note: Results qualified with -J may be significantly under or over-estimated and are not evaluated for QC purposes.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG 1600016

PREPARATION BATCH SUMMARY

Preparation batch #: 0013488Y
Analysis method: NAREL ACT-02F-U
Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	± 2 σ Uncertainty	Analyst
B6.04121Z	C2-SB3-8496-01	00736139H		71.96 %	6.64 %	SPK
B6.04121Z	C2-SB3-8496-01	00736161F	DUP	78.88 %	7.12 %	SPK
B6.04122A	C3-SB1-0012-01	00736140A		74.95 %	6.71 %	SPK
B6.04123B	C3-SB1-3648-01	00736141B		71.14 %	6.60 %	SPK
B6.04124C	C3-SB1-3648-02	00736142C		78.52 %	7.14 %	SPK
B6.04125D	C3-SB2-0012-01	00736143D		73.61 %	6.64 %	SPK
B6.04126E	C3-SB2-1224-01	00736145F		74.25 %	6.78 %	SPK
B6.04127F	C3-SB3-0012-01	00736146G		65.65 %	6.30 %	SPK
B6.04128G	C3-SB3-1224-01	00736147H		76.44 %	6.90 %	SPK
B6.04129H	C3-SB4-0012-01	00736148J		69.98 %	6.52 %	SPK
B6.04130A	C3-SB4-1224-01	00736149K		66.12 %	6.36 %	SPK
B6.04131B	C3-SB5-0012-01	00736150C		77.57 %	6.99 %	SPK
B6.04132C	C3-SB6-0012-01	00736151D		74.69 %	6.83 %	SPK
B6.04133D	C3-SB6-3648-01	00736152E		55.30 %	5.22 %	SPK
B6.04134E	C3-SB7-0012-01	00736153F		79.30 %	6.68 %	SPK
B6.04135F	C3-SB7-3648-01	00736154G		55.28 %	5.67 %	SPK
B6.04136G	C3-SB8-0012-01	00736155H		79.02 %	7.10 %	SPK
B6.04137H	C3-SB8-1224-01	00736156J		68.53 %	6.05 %	SPK
LCS-00736160E *		00736160E	LCS	77.35 %	7.08 %	SPK
RBK-00736159M *		00736159M	RBK	74.36 %	6.89 %	SPK

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013488Y

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04121Z	00736161F	DUP	U234		9.4	-0.73	PASS
B6.04121Z	00736161F	DUP	U235		69.4	-1.00	PASS
B6.04121Z	00736161F	DUP	U238		5.0	-0.39	PASS
LCS-00736160E	00736160E	LCS	U234	99.1		-0.15	PASS
LCS-00736160E	00736160E	LCS	U235	99.1		-0.04	PASS
LCS-00736160E	00736160E	LCS	U238	97.3		-0.44	PASS
RBK-00736159M	00736159M	RBK	U234				PASS
RBK-00736159M	00736159M	RBK	U235				PASS
RBK-00736159M	00736159M	RBK	U238				PASS

U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
TH ANALYSES

REPORT OF SAMPLE DELIVERY GROUP #1600017

Project:	Canadian Radium & Uranium, Mt. Kisco, NY
Analysis method:	Isotopic Thorium Using NaOH Fusion
Report ID:	1600017-TH
Report type:	Original
Date reported:	06/29/2016
Total pages in report:	29

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B6.04138J	C3-SB9-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04139K	C3-SB9-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04140C	C3-SB10-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04141D	C3-SB10-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04142E	C3-SB10-6072-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04143F	C3-SB10-7284-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04144G	C3-SB10-8496-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04145H	C3-SB11-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04146J	C3-SB11-3648-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04147K	C3-SB12-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04148L	C3-SB13-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04149M	C3-SB13-1224-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04150E	C3-SB14-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04151F	C3-SB15-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04152G	C3-SB15-2436-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04153H	C3-SB16-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04154J	C3-SB16-3648-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016

EXCEPTIONS

1. **Packaging and shipping** – No problems were observed.
2. **Documentation** – No problems were observed.
3. **Sample preparation** – No problems were encountered.
4. **Analysis** – No problems were encountered.
5. **Holding times** – No holding times were specified.

QUALITY CONTROL

1. **QC samples** – All QC analysis results met NAREL acceptance criteria.
2. **Yields** – All chemical yields were within acceptance limits.
3. **Instruments** – Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

ACCREDITATION

All analyses included in this data package are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard.

CERTIFICATION

I certify that this data report complies with the terms and conditions of the Project Acceptance Form and/or the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

Velinda Herbert — 6/30/16

Velinda Herbert
Quality Assurance Manager, NAREL

Date

Cynthia White — 6-30-16

Cynthia White
Director, Center for Environmental Radioanalytical Laboratory Science

Date

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample, or blank spike
MS	Matrix spike
MSD	Matrix spike duplicate (not currently analyzed)
RBK	Method blank
STD	External standard (used for ^{228}Ra yield determination)

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "*Z* scores." A *Z* score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The *Z* score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The *Z* score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of %R in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either $|Z| \leq 3$ or $60 \leq \%R \leq 110$.

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
Did not Rec'd	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Gamma Spec (Modified)~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~16 oz glass jar~~
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	C003-SB007-3648-01 ✓	4/5/2016	16:23	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Thorium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Uranium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	LABLE ISSUE	16 oz glass jar ✓
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓

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Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RSTS		CHP NAREL	04/19/16 @ 11:15	Good

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

Cont #4

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB010-7284-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-7284-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-7284-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB010-8496-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-8496-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-8496-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓✓	Soil	4 C	N	1	16 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Isotopic Thorium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4	C003-SB011-3648-01 ✓	4/6/2016	11:13	Isotopic Thorium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-3648-01 ✓	4/6/2016	11:13	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-3648-01 ✓	4/6/2016	11:13	Gamma Spec (Modified) ✓✓	Soil	4 C	N	Broken 1	16 oz glass jar ✓ Broke
3	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓

6

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		NAREL	04/19/16 @ 1115	Good (1) Broken Jar No Lost

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
✓	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB013-0012-01	4/6/2016	12:00	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
✓	C003-SB013-0012-01	4/6/2016	12:00	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar
	C003-SB013-0012-01	4/6/2016	12:00	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar
	C003-SB013-1224-01	4/6/2016	12:01	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
	C003-SB013-1224-01	4/6/2016	12:01	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB013-1224-01	4/6/2016	12:01	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
4	C003-SB014-0012-01 ✓	4/6/2016	12:28	Isotopic Thorium ✓ ✓	Soil	4 C	N	1	8 oz glass jar ✓
✓ 4	C003-SB014-0012-01 ✓	4/6/2016	12:28	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB014-0012-01 ✓	4/6/2016	12:28	Gamma Spec (Modified) ✓	Soil	4 C	N	Broken 1	16 oz glass jar ✓
5	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	Broken 1	16 oz glass jar ✓
5	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Isotopic Uranium ✓	Soil	4 C	N	Broken 1	8 oz glass jar ✓
5	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB016-0012-01	4/6/2016	08:35	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
6 ✓	C003-SB016-0012-01	4/6/2016	08:35	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CHAD NAREL	04/19/16 @1115	Good 2 Broken containers

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
✓	C003-SB016-0012-01	4/6/2016	08:35	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar
	C003-SB016-3648-01	4/6/2016	08:36	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
✓	C003-SB016-3648-01	4/6/2016	08:36	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar
	C003-SB016-3648-01	4/6/2016	08:36	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		NAREL	04/18/16 @1115	Good

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

ANALYSIS SUMMARY

Analysis method: NAREL ACT-02F-TH
Title: Isotopic Thorium Using NaOH Fusion

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B6.04138J	C3-SB9-0012-01		06/23/2016	0013480P	0020964H
B6.04139K	C3-SB9-1224-01		06/23/2016	0013480P	0020964H
B6.04140C	C3-SB10-0012-01		06/23/2016	0013480P	0020964H
B6.04141D	C3-SB10-1224-01		06/23/2016	0013480P	0020964H
B6.04142E	C3-SB10-6072-01		06/23/2016	0013480P	0020964H
B6.04142E	C3-SB10-6072-01	DUP	06/23/2016	0013480P	0020964H
B6.04143F	C3-SB10-7284-01		06/23/2016	0013480P	0020964H
B6.04144G	C3-SB10-8496-01		06/23/2016	0013480P	0020964H
B6.04145H	C3-SB11-0012-01		06/24/2016	0013480P	0020966K
B6.04146J	C3-SB11-3648-01		06/24/2016	0013480P	0020966K
B6.04147K	C3-SB12-0012-01		06/24/2016	0013480P	0020966K
B6.04148L	C3-SB13-0012-01		06/24/2016	0013480P	0020966K
B6.04149M	C3-SB13-1224-01		06/24/2016	0013480P	0020966K
B6.04150E	C3-SB14-0012-01		06/24/2016	0013480P	0020966K
B6.04151F	C3-SB15-0012-01		06/24/2016	0013480P	0020966K
B6.04152G	C3-SB15-2436-01		06/24/2016	0013480P	0020966K
B6.04153H	C3-SB16-0012-01		06/24/2016	0013480P	0020966K
B6.04154J	C3-SB16-3648-01		06/24/2016	0013480P	0020966K
LCS-00736018Z *		LCS	06/23/2016	0013480P	0020964H
RBK-00736017Y *		RBK	06/23/2016	0013480P	0020964H

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04138J	Amount analyzed:	7.943e-01 GASH
Client sample ID:	C3-SB9-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 18:02 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	96.88 %	Analyst:	SPK
Ash/dry weight:	93.31 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS144	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	6.99e-02	4.6e-02	4.3e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	3.79e-01	8.3e-02	3.6e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	5.47e-01	1.1e-01	6.8e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	3.17e-01	7.4e-02	2.4e-02	PCI/GDRY	06/22/2016 17:11 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04139K	Amount analyzed:	1.004e+00 GASH
Client sample ID:	C3-SB9-1224-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 18:02 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	94.08 %	Analyst:	SPK
Ash/dry weight:	96.64 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS125	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	-3.48e-03	1.2e-02	3.6e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	4.64e-01	8.7e-02	2.8e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	9.52e-01	1.4e-01	5.6e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	4.98e-01	9.1e-02	1.5e-02	PCI/GDRY	06/22/2016 17:11 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04140C	Amount analyzed:	1.009e+00 GASH
Client sample ID:	C3-SB10-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	97.86 %	Analyst:	SPK
Ash/dry weight:	92.49 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS129	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	8.28e-02	4.2e-02	3.1e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	4.61e-01	8.2e-02	3.1e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	4.39e-01	8.3e-02	5.3e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	5.43e-01	9.0e-02	1.9e-02	PCI/GDRY	06/22/2016 17:11 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04141D	Amount analyzed:	1.012e+00 GASH
Client sample ID:	C3-SB10-1224-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	91.93 %	Analyst:	SPK
Ash/dry weight:	92.48 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS132	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	7.01e-01	1.5e-01	2.6e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	8.61e-01	1.3e-01	1.8e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	1.50e+01	1.5e+00	5.4e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	9.06e-01	1.4e-01	2.0e-02	PCI/GDRY	06/22/2016 17:11 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04142E	Amount analyzed:	1.013e+00 GASH
Client sample ID:	C3-SB10-6072-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	80.93 %	Analyst:	SPK
Ash/dry weight:	88.93 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS134	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	2.48e-01	7.3e-02	2.9e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	1.79e+00	2.1e-01	2.5e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	4.46e+00	4.6e-01	5.0e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	1.67e+00	2.0e-01	1.6e-02	PCI/GDRY	06/22/2016 17:11 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04142E	Amount analyzed:	1.007e+00 GASH
Client sample ID:	C3-SB10-6072-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	80.93 %	Analyst:	SPK
Ash/dry weight:	88.93 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS135	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	2.76e-01	8.4e-02	3.1e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	1.67e+00	2.2e-01	2.0e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	4.24e+00	4.7e-01	5.2e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	1.56e+00	2.0e-01	1.8e-02	PCI/GDRY	06/22/2016 17:11 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04143F	Amount analyzed:	9.732e-01 GASH
Client sample ID:	C3-SB10-7284-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	64.74 %	Analyst:	SPK
Ash/dry weight:	77.25 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS136	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	2.55e-01	8.9e-02	3.9e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	2.35e+00	3.2e-01	2.7e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	3.98e+00	5.0e-01	5.2e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	2.38e+00	3.2e-01	2.7e-02	PCI/GDRY	06/22/2016 17:11 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04144G	Amount analyzed:	9.936e-01 GASH
Client sample ID:	C3-SB10-8496-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	71.62 %	Analyst:	SPK
Ash/dry weight:	92.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS140	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.32e-01	5.8e-02	3.8e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	1.06e+00	1.6e-01	2.3e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	1.13e+00	1.7e-01	5.5e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	1.22e+00	1.7e-01	1.9e-02	PCI/GDRY	06/22/2016 17:11 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04145H	Amount analyzed:	9.616e-01 GASH
Client sample ID:	C3-SB11-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 11:13 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	96.90 %	Analyst:	SPK
Ash/dry weight:	94.29 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS97	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.48e-01	8.9e-02	5.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	1.04e+00	2.1e-01	4.5e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	7.89e-01	1.8e-01	7.5e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	8.50e-01	1.9e-01	4.5e-02	PCI/GDRY	06/23/2016 16:19 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04146J	Amount analyzed:	1.007e+00 GASH
Client sample ID:	C3-SB11-3648-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 11:13 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	87.49 %	Analyst:	SPK
Ash/dry weight:	97.41 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS98	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.01e-01	4.9e-02	3.2e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	6.86e-01	1.1e-01	2.0e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	4.44e-01	8.9e-02	5.6e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	7.01e-01	1.1e-01	1.8e-02	PCI/GDRY	06/23/2016 16:19 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04147K	Amount analyzed:	1.018e+00 GASH
Client sample ID:	C3-SB12-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 11:35 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	98.86 %	Analyst:	SPK
Ash/dry weight:	80.06 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS99	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.26e-01	5.2e-02	2.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	4.04e-01	7.6e-02	1.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	3.64e-01	7.5e-02	4.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	4.58e-01	8.3e-02	1.8e-02	PCI/GDRY	06/23/2016 16:19 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04148L	Amount analyzed:	1.004e+00 GASH
Client sample ID:	C3-SB13-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 12:00 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	99.04 %	Analyst:	SPK
Ash/dry weight:	83.55 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS100	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	5.55e-02	4.5e-02	4.5e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	5.11e-01	1.1e-01	3.1e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	5.34e-01	1.2e-01	5.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	5.85e-01	1.2e-01	2.8e-02	PCI/GDRY	06/23/2016 16:19 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04149M	Amount analyzed:	1.031e+00 GASH
Client sample ID:	C3-SB13-1224-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 12:01 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	93.44 %	Analyst:	SPK
Ash/dry weight:	98.23 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS101	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.23e-01	5.5e-02	2.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	6.55e-01	1.1e-01	1.9e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	1.24e+00	1.8e-01	5.6e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	4.97e-01	9.1e-02	1.5e-02	PCI/GDRY	06/23/2016 16:19 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04150E	Amount analyzed:	9.574e-01 GASH
Client sample ID:	C3-SB14-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 12:28 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	97.41 %	Analyst:	SPK
Ash/dry weight:	91.39 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS103	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	8.24e-02	4.8e-02	3.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	4.73e-01	9.5e-02	3.1e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	6.46e-01	1.2e-01	5.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	4.66e-01	9.3e-02	2.6e-02	PCI/GDRY	06/23/2016 16:19 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04151F	Amount analyzed:	9.994e-01 GASH
Client sample ID:	C3-SB15-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 10:43 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	85.96 %	Analyst:	SPK
Ash/dry weight:	95.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS104	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.17e-01	5.7e-02	3.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	9.16e-01	1.5e-01	3.4e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	7.78e-01	1.3e-01	5.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	8.45e-01	1.4e-01	2.5e-02	PCI/GDRY	06/23/2016 16:19 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04152G	Amount analyzed:	1.011e+00 GASH
Client sample ID:	C3-SB15-2436-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 10:43 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	91.97 %	Analyst:	SPK
Ash/dry weight:	98.05 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS105	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	8.92e-02	4.9e-02	4.2e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	8.13e-01	1.3e-01	2.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	5.41e-01	1.0e-01	5.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	8.49e-01	1.3e-01	1.9e-02	PCI/GDRY	06/23/2016 16:19 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04153H	Amount analyzed:	9.052e-01 GASH
Client sample ID:	C3-SB16-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 08:35 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	96.85 %	Analyst:	SPK
Ash/dry weight:	93.53 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS106	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.06e-01	5.5e-02	3.1e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	6.68e-01	1.2e-01	1.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	4.87e-01	1.0e-01	6.2e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	6.04e-01	1.1e-01	1.8e-02	PCI/GDRY	06/23/2016 16:19 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04154J	Amount analyzed:	1.005e+00 GASH
Client sample ID:	C3-SB16-3648-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 08:36 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	88.04 %	Analyst:	SPK
Ash/dry weight:	97.34 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS107	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.16e-01	5.6e-02	2.9e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	8.07e-01	1.3e-01	3.1e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	7.02e-01	1.2e-01	5.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	8.60e-01	1.4e-01	1.6e-02	PCI/GDRY	06/23/2016 16:19 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00736018Z	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013480P
Matrix:	N/A	Assay batch #:	0020964H
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS141	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	5.89e-02	3.9e-02	4.1e-02	PCI	06/22/2016 17:11 CDT
Th228	1.71e-02	1.7e-02	2.2e-02	PCI	06/22/2016 17:11 CDT
Th230	2.16e+00	2.4e-01	5.7e-02	PCI	06/22/2016 17:11 CDT
Th232	1.14e-02	1.5e-02	2.2e-02	PCI	06/22/2016 17:11 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00736017Y	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013480P
Matrix:	N/A	Assay batch #:	0020964H
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS142	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Th227	1.17e-01	5.4e-02	4.0e-02	PCI	06/22/2016 17:11 CDT
Th228	1.20e-02	2.1e-02	3.6e-02	PCI	06/22/2016 17:11 CDT
Th230	3.57e-02	3.6e-02	5.8e-02	PCI	06/22/2016 17:11 CDT
Th232	1.10e-02	1.4e-02	1.8e-02	PCI	06/22/2016 17:11 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG 1600017

PREPARATION BATCH SUMMARY

Preparation batch #: 0013480P
Analysis method: NAREL ACT-02F-TH
Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	± 2 σ Uncertainty	Analyst
B6.04138J	C3-SB9-0012-01	00733735K		77.41 %	6.84 %	SPK
B6.04139K	C3-SB9-1224-01	00733738N		91.15 %	8.12 %	SPK
B6.04140C	C3-SB10-0012-01	00733741H		81.54 %	6.98 %	SPK
B6.04141D	C3-SB10-1224-01	00733744L		86.17 %	7.81 %	SPK
B6.04142E	C3-SB10-6072-01	00733747P		88.02 %	7.43 %	SPK
B6.04142E	C3-SB10-6072-01	00736016X	DUP	92.02 %	8.41 %	SPK
B6.04143F	C3-SB10-7284-01	00733750J		63.96 %	6.73 %	SPK
B6.04144G	C3-SB10-8496-01	00733753M		80.40 %	7.38 %	SPK
B6.04145H	C3-SB11-0012-01	00733756Q		41.54 %	5.21 %	SPK
B6.04146J	C3-SB11-3648-01	00733759U		92.46 %	8.15 %	SPK
B6.04147K	C3-SB12-0012-01	00733762N		85.03 %	7.81 %	SPK
B6.04148L	C3-SB13-0012-01	00733765R		58.64 %	6.44 %	SPK
B6.04149M	C3-SB13-1224-01	00733768V		87.51 %	7.91 %	SPK
B6.04150E	C3-SB14-0012-01	00733771P		79.37 %	7.55 %	SPK
B6.04151F	C3-SB15-0012-01	00733774T		78.55 %	7.43 %	SPK
B6.04152G	C3-SB15-2436-01	00733777W		84.29 %	7.70 %	SPK
B6.04153H	C3-SB16-0012-01	00733780Q		83.08 %	7.77 %	SPK
B6.04154J	C3-SB16-3648-01	00733783U		79.17 %	7.37 %	SPK
LCS-00736018Z *		00736018Z	LCS	83.88 %	7.24 %	SPK
RBK-00736017Y *		00736017Y	RBK	77.71 %	6.87 %	SPK

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013480P

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04142E	00736016X	DUP	TH227		10.7	0.50	PASS
B6.04142E	00736016X	DUP	TH228		6.5	-0.75	PASS
B6.04142E	00736016X	DUP	TH230		5.0	-0.66	PASS
B6.04142E	00736016X	DUP	TH232		6.8	-0.77	PASS
LCS-00736018Z	00736018Z	LCS	TH230	108.2		1.33	PASS
RBK-00736017Y	00736017Y	RBK	TH227				WARN
RBK-00736017Y	00736017Y	RBK	TH228				PASS
RBK-00736017Y	00736017Y	RBK	TH230				PASS
RBK-00736017Y	00736017Y	RBK	TH232				PASS

U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
U ANALYSES

REPORT OF SAMPLE DELIVERY GROUP #1600017

Project:	Canadian Radium & Uranium, Mt. Kisco, NY
Analysis method:	Isotopic Uranium Using NaOH Fusion
Report ID:	1600017-U
Report type:	Original
Date reported:	06/29/2016
Total pages in report:	29

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B6.04138J	C3-SB9-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04139K	C3-SB9-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04140C	C3-SB10-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04141D	C3-SB10-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04142E	C3-SB10-6072-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04143F	C3-SB10-7284-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04144G	C3-SB10-8496-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04145H	C3-SB11-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04146J	C3-SB11-3648-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04147K	C3-SB12-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04148L	C3-SB13-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04149M	C3-SB13-1224-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04150E	C3-SB14-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04151F	C3-SB15-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04152G	C3-SB15-2436-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04153H	C3-SB16-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04154J	C3-SB16-3648-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016

EXCEPTIONS

1. **Packaging and shipping** – No problems were observed.
2. **Documentation** – No problems were observed.
3. **Sample preparation** – No problems were encountered.
4. **Analysis** – No problems were encountered.
5. **Holding times** – No holding times were specified.

QUALITY CONTROL

1. **QC samples** – All QC analysis results met NAREL acceptance criteria.
2. **Yields** – All chemical yields were within acceptance limits.
3. **Instruments** – Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

ACCREDITATION

All analyses included in this data package are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard.

CERTIFICATION

I certify that this data report complies with the terms and conditions of the Project Acceptance Form and/or the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

Velinda Herbert — 6/30/16

Velinda Herbert
Quality Assurance Manager, NAREL

Date

Cynthia White — 6-30-16

Cynthia White
Director, Center for Environmental Radioanalytical Laboratory Science

Date

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample, or blank spike
MS	Matrix spike
MSD	Matrix spike duplicate (not currently analyzed)
RBK	Method blank
STD	External standard (used for ^{228}Ra yield determination)

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "*Z* scores." A *Z* score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The *Z* score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The *Z* score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of %R in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either $|Z| \leq 3$ or $60 \leq \%R \leq 110$.

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
Did not Rec'd	~~C003-SB007-2436-02~~	~~4/5/2016~~	~~16:23~~	~~Gamma Spec (Modified)~~	~~Soil~~	~~4 C~~	~~N~~	~~1~~	~~16 oz glass jar~~
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
3	C003-SB007-3648-01 ✓	4/5/2016	16:23	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB008-0012-01 ✓	4/5/2016	16:58 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Thorium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Uranium ✓	Soil	4 C	Y	✓2	8 oz glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	LABLE ISSUE	16 oz glass jar ✓
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-0012-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB009-1224-01	4/5/2016	18:02	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓

7

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RSTS		CHP NAREL	04/19/16 @ 11:15	Good

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

Cont #4

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB010-7284-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-7284-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-7284-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
3	C003-SB010-8496-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-8496-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
3	C003-SB010-8496-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓✓	Soil	4 C	N	1	16 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Isotopic Thorium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
4	C003-SB011-3648-01 ✓	4/6/2016	11:13	Isotopic Thorium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-3648-01 ✓	4/6/2016	11:13	Isotopic Uranium ✓✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB011-3648-01 ✓	4/6/2016	11:13	Gamma Spec (Modified) ✓✓	Soil	4 C	N	Broken 1	16 oz glass jar ✓ Broke
3	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓

6

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		NAREL	04/19/16 @ 1115	Good (1) Broken Jar No Lost

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
✓	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB013-0012-01	4/6/2016	12:00	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
✓	C003-SB013-0012-01	4/6/2016	12:00	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar
	C003-SB013-0012-01	4/6/2016	12:00	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar
	C003-SB013-1224-01	4/6/2016	12:01	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
	C003-SB013-1224-01	4/6/2016	12:01	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB013-1224-01	4/6/2016	12:01	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
4	C003-SB014-0012-01 ✓	4/6/2016	12:28	Isotopic Thorium ✓ ✓	Soil	4 C	N	1	8 oz glass jar ✓
✓ 4	C003-SB014-0012-01 ✓	4/6/2016	12:28	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
4	C003-SB014-0012-01 ✓	4/6/2016	12:28	Gamma Spec (Modified) ✓	Soil	4 C	N	Broken 1	16 oz glass jar ✓
5	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	Broken 1	16 oz glass jar ✓
5	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
5	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Isotopic Uranium ✓	Soil	4 C	N	Broken 1	8 oz glass jar ✓
5	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB016-0012-01	4/6/2016	08:35	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
6 ✓	C003-SB016-0012-01	4/6/2016	08:35	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		CHAD NAREL	04/19/16 @1115	Good 2 Broken containers

USEPA
DateShipped: 4/18/2016
CarrierName: FedEx
AirbillNo: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Corp/NY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
✓	C003-SB016-0012-01	4/6/2016	08:35	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar
	C003-SB016-3648-01	4/6/2016	08:36	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar
✓	C003-SB016-3648-01	4/6/2016	08:36	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar
	C003-SB016-3648-01	4/6/2016	08:36	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar

Special Instructions: Sample Analysis PO#-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumbaly@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3		NAREL	04/18/16 @1115	Good

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

ANALYSIS SUMMARY

Analysis method: NAREL ACT-02F-U
Title: Isotopic Uranium Using NaOH Fusion

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B6.04138J	C3-SB9-0012-01		06/23/2016	0013481Q	0020965J
B6.04139K	C3-SB9-1224-01		06/23/2016	0013481Q	0020965J
B6.04140C	C3-SB10-0012-01		06/23/2016	0013481Q	0020965J
B6.04141D	C3-SB10-1224-01		06/23/2016	0013481Q	0020965J
B6.04142E	C3-SB10-6072-01		06/23/2016	0013481Q	0020965J
B6.04142E	C3-SB10-6072-01	DUP	06/23/2016	0013481Q	0020965J
B6.04143F	C3-SB10-7284-01		06/23/2016	0013481Q	0020965J
B6.04144G	C3-SB10-8496-01		06/23/2016	0013481Q	0020965J
B6.04145H	C3-SB11-0012-01		06/24/2016	0013481Q	0020967L
B6.04146J	C3-SB11-3648-01		06/24/2016	0013481Q	0020967L
B6.04147K	C3-SB12-0012-01		06/24/2016	0013481Q	0020967L
B6.04148L	C3-SB13-0012-01		06/24/2016	0013481Q	0020967L
B6.04149M	C3-SB13-1224-01		06/24/2016	0013481Q	0020967L
B6.04150E	C3-SB14-0012-01		06/24/2016	0013481Q	0020967L
B6.04151F	C3-SB15-0012-01		06/24/2016	0013481Q	0020967L
B6.04152G	C3-SB15-2436-01		06/24/2016	0013481Q	0020967L
B6.04153H	C3-SB16-0012-01		06/24/2016	0013481Q	0020967L
B6.04154J	C3-SB16-3648-01		06/24/2016	0013481Q	0020967L
LCS-00736021U *		LCS	06/23/2016	0013481Q	0020965J
RBK-00736020T *		RBK	06/23/2016	0013481Q	0020965J

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04138J	Amount analyzed:	7.983e-01 GASH
Client sample ID:	C3-SB9-0012-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020965J
Collected:	2016-04-05 18:02 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	96.88 %	Analyst:	SPK
Ash/dry weight:	93.31 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:05	1000.0	AS80	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	3.73e-01	8.5e-02	2.9e-02	PCI/GDRY	06/22/2016 17:05 CDT
U235	2.17e-02	2.3e-02	2.9e-02	PCI/GDRY	06/22/2016 17:05 CDT
U238	3.71e-01	8.5e-02	2.7e-02	PCI/GDRY	06/22/2016 17:05 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04139K	Amount analyzed:	1.004e+00 GASH
Client sample ID:	C3-SB9-1224-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020965J
Collected:	2016-04-05 18:02 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	94.08 %	Analyst:	SPK
Ash/dry weight:	96.64 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:06	1000.0	AS113	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	4.62e-01	8.2e-02	2.0e-02	PCI/GDRY	06/22/2016 17:06 CDT
U235	1.81e-02	1.7e-02	2.0e-02	PCI/GDRY	06/22/2016 17:06 CDT
U238	5.37e-01	9.0e-02	1.3e-02	PCI/GDRY	06/22/2016 17:06 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04140C	Amount analyzed:	1.009e+00 GASH
Client sample ID:	C3-SB10-0012-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020965J
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	97.86 %	Analyst:	SPK
Ash/dry weight:	92.49 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:06	1000.0	AS115	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	3.92e-01	7.2e-02	1.5e-02	PCI/GDRY	06/22/2016 17:06 CDT
U235	1.28e-02	1.5e-02	2.1e-02	PCI/GDRY	06/22/2016 17:06 CDT
U238	4.94e-01	8.3e-02	1.5e-02	PCI/GDRY	06/22/2016 17:06 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04141D	Amount analyzed:	1.012e+00 GASH
Client sample ID:	C3-SB10-1224-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020965J
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	91.93 %	Analyst:	SPK
Ash/dry weight:	92.48 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:06	1000.0	AS116	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	6.30e-01	9.9e-02	1.8e-02	PCI/GDRY	06/22/2016 17:06 CDT
U235	3.85e-02	2.4e-02	1.9e-02	PCI/GDRY	06/22/2016 17:06 CDT
U238	7.15e-01	1.1e-01	1.6e-02	PCI/GDRY	06/22/2016 17:06 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04142E	Amount analyzed:	1.013e+00 GASH
Client sample ID:	C3-SB10-6072-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020965J
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	80.93 %	Analyst:	SPK
Ash/dry weight:	88.93 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:06	1000.0	AS117	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	1.34e+00	1.7e-01	2.0e-02	PCI/GDRY	06/22/2016 17:06 CDT
U235	7.06e-02	3.2e-02	1.9e-02	PCI/GDRY	06/22/2016 17:06 CDT
U238	1.35e+00	1.7e-01	1.6e-02	PCI/GDRY	06/22/2016 17:06 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04142E	Amount analyzed:	1.007e+00 GASH
Client sample ID:	C3-SB10-6072-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020965J
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	80.93 %	Analyst:	SPK
Ash/dry weight:	88.93 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:06	1000.0	AS118	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	1.38e+00	1.7e-01	1.9e-02	PCI/GDRY	06/22/2016 17:06 CDT
U235	5.48e-02	2.8e-02	1.5e-02	PCI/GDRY	06/22/2016 17:06 CDT
U238	1.33e+00	1.7e-01	1.6e-02	PCI/GDRY	06/22/2016 17:06 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04143F	Amount analyzed:	9.732e-01 GASH
Client sample ID:	C3-SB10-7284-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020965J
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	64.74 %	Analyst:	SPK
Ash/dry weight:	77.25 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:06	1000.0	AS119	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	1.74e+00	2.1e-01	2.0e-02	PCI/GDRY	06/22/2016 17:06 CDT
U235	8.15e-02	3.3e-02	1.7e-02	PCI/GDRY	06/22/2016 17:06 CDT
U238	1.85e+00	2.2e-01	1.6e-02	PCI/GDRY	06/22/2016 17:06 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04144G	Amount analyzed:	9.936e-01 GASH
Client sample ID:	C3-SB10-8496-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020965J
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	71.62 %	Analyst:	SPK
Ash/dry weight:	92.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:05	1000.0	AS120	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	1.41e+00	1.8e-01	1.7e-02	PCI/GDRY	06/22/2016 17:05 CDT
U235	7.80e-02	3.5e-02	2.0e-02	PCI/GDRY	06/22/2016 17:05 CDT
U238	1.44e+00	1.8e-01	1.4e-02	PCI/GDRY	06/22/2016 17:05 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04145H	Amount analyzed:	9.616e-01 GASH
Client sample ID:	C3-SB11-0012-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020967L
Collected:	2016-04-06 11:13 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	96.90 %	Analyst:	SPK
Ash/dry weight:	94.29 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:17	1000.0	AS33	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	8.44e-01	1.4e-01	2.4e-02	PCI/GDRY	06/23/2016 16:17 CDT
U235	2.16e-02	2.3e-02	2.9e-02	PCI/GDRY	06/23/2016 16:17 CDT
U238	8.11e-01	1.4e-01	2.9e-02	PCI/GDRY	06/23/2016 16:17 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04146J	Amount analyzed:	1.007e+00 GASH
Client sample ID:	C3-SB11-3648-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020967L
Collected:	2016-04-06 11:13 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	87.49 %	Analyst:	SPK
Ash/dry weight:	97.41 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:17	1000.0	AS34	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	4.83e-01	1.1e-01	2.9e-02	PCI/GDRY	06/23/2016 16:17 CDT
U235	3.35e-02	3.0e-02	2.8e-02	PCI/GDRY	06/23/2016 16:17 CDT
U238	4.85e-01	1.1e-01	3.5e-02	PCI/GDRY	06/23/2016 16:17 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04147K	Amount analyzed:	1.018e+00 GASH
Client sample ID:	C3-SB12-0012-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020967L
Collected:	2016-04-06 11:35 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	98.86 %	Analyst:	SPK
Ash/dry weight:	80.06 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:17	1000.0	AS36	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	3.72e-01	7.2e-02	1.8e-02	PCI/GDRY	06/23/2016 16:17 CDT
U235	1.02e-02	1.4e-02	2.1e-02	PCI/GDRY	06/23/2016 16:17 CDT
U238	3.43e-01	6.8e-02	1.3e-02	PCI/GDRY	06/23/2016 16:17 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04148L	Amount analyzed:	1.004e+00 GASH
Client sample ID:	C3-SB13-0012-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020967L
Collected:	2016-04-06 12:00 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	99.04 %	Analyst:	SPK
Ash/dry weight:	83.55 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:17	1000.0	AS37	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	4.14e-01	9.5e-02	2.6e-02	PCI/GDRY	06/23/2016 16:17 CDT
U235	2.82e-02	2.7e-02	3.1e-02	PCI/GDRY	06/23/2016 16:17 CDT
U238	4.13e-01	9.5e-02	2.9e-02	PCI/GDRY	06/23/2016 16:17 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04149M	Amount analyzed:	1.031e+00 GASH
Client sample ID:	C3-SB13-1224-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020967L
Collected:	2016-04-06 12:01 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	93.44 %	Analyst:	SPK
Ash/dry weight:	98.23 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:17	1000.0	AS38	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	3.53e-01	8.7e-02	3.2e-02	PCI/GDRY	06/23/2016 16:17 CDT
U235	2.04e-02	2.3e-02	2.6e-02	PCI/GDRY	06/23/2016 16:17 CDT
U238	4.44e-01	9.9e-02	3.0e-02	PCI/GDRY	06/23/2016 16:17 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04150E	Amount analyzed:	9.574e-01 GASH
Client sample ID:	C3-SB14-0012-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020967L
Collected:	2016-04-06 12:28 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	97.41 %	Analyst:	SPK
Ash/dry weight:	91.39 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:17	1000.0	AS40	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	3.95e-01	8.9e-02	2.9e-02	PCI/GDRY	06/23/2016 16:17 CDT
U235	4.33e-02	3.2e-02	3.2e-02	PCI/GDRY	06/23/2016 16:17 CDT
U238	4.36e-01	9.4e-02	3.1e-02	PCI/GDRY	06/23/2016 16:17 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04151F	Amount analyzed:	9.994e-01 GASH
Client sample ID:	C3-SB15-0012-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020967L
Collected:	2016-04-06 10:43 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	85.96 %	Analyst:	SPK
Ash/dry weight:	95.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:17	1000.0	AS65	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	5.28e-01	1.0e-01	4.6e-02	PCI/GDRY	06/23/2016 16:17 CDT
U235	2.94e-02	2.9e-02	4.2e-02	PCI/GDRY	06/23/2016 16:17 CDT
U238	6.03e-01	1.1e-01	4.2e-02	PCI/GDRY	06/23/2016 16:17 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04152G	Amount analyzed:	1.011e+00 GASH
Client sample ID:	C3-SB15-2436-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020967L
Collected:	2016-04-06 10:43 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	91.97 %	Analyst:	SPK
Ash/dry weight:	98.05 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:17	1000.0	AS66	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	5.15e-01	1.1e-01	3.2e-02	PCI/GDRY	06/23/2016 16:17 CDT
U235	2.69e-02	2.6e-02	2.9e-02	PCI/GDRY	06/23/2016 16:17 CDT
U238	4.63e-01	9.8e-02	2.4e-02	PCI/GDRY	06/23/2016 16:17 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04153H	Amount analyzed:	9.052e-01 GASH
Client sample ID:	C3-SB16-0012-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020967L
Collected:	2016-04-06 08:35 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	96.85 %	Analyst:	SPK
Ash/dry weight:	93.53 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:17	1000.0	AS68	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	4.90e-01	1.0e-01	3.1e-02	PCI/GDRY	06/23/2016 16:17 CDT
U235	3.12e-03	1.4e-02	2.8e-02	PCI/GDRY	06/23/2016 16:17 CDT
U238	4.84e-01	9.9e-02	2.9e-02	PCI/GDRY	06/23/2016 16:17 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	B6.04154J	Amount analyzed:	1.005e+00 GASH
Client sample ID:	C3-SB16-3648-01	Preparation batch #:	0013481Q
Matrix:	SOIL	Assay batch #:	0020967L
Collected:	2016-04-06 08:36 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	88.04 %	Analyst:	SPK
Ash/dry weight:	97.34 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:17	1000.0	AS69	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	5.87e-01	1.3e-01	2.6e-02	PCI/GDRY	06/23/2016 16:17 CDT
U235	1.67e-02	2.6e-02	3.9e-02	PCI/GDRY	06/23/2016 16:17 CDT
U238	5.07e-01	1.2e-01	3.2e-02	PCI/GDRY	06/23/2016 16:17 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00736021U	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013481Q
Matrix:	N/A	Assay batch #:	0020965J
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:06	1000.0	AS121	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	1.91e+00	2.3e-01	2.2e-02	PCI	06/22/2016 17:06 CDT
U235	8.48e-02	4.1e-02	2.1e-02	PCI	06/22/2016 17:06 CDT
U238	2.02e+00	2.4e-01	2.2e-02	PCI	06/22/2016 17:06 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG #1600017

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00736020T	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013481Q
Matrix:	N/A	Assay batch #:	0020965J
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-U
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:06	1000.0	AS122	RCL

ANALYTICAL RESULTS

Analyte	Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
U234	2.01e-02	2.0e-02	2.5e-02	PCI	06/22/2016 17:06 CDT
U235	1.33e-03	1.2e-02	2.8e-02	PCI	06/22/2016 17:06 CDT
U238	1.78e-02	1.8e-02	2.3e-02	PCI	06/22/2016 17:06 CDT

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY

SDG 1600017

PREPARATION BATCH SUMMARY

Preparation batch #: 0013481Q
Analysis method: NAREL ACT-02F-U
Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	± 2 σ Uncertainty	Analyst
B6.04138J	C3-SB9-0012-01	00733734J		87.35 %	7.71 %	SPK
B6.04139K	C3-SB9-1224-01	00733737M		82.61 %	6.94 %	SPK
B6.04140C	C3-SB10-0012-01	00733740G		84.17 %	7.02 %	SPK
B6.04141D	C3-SB10-1224-01	00733743K		80.77 %	6.76 %	SPK
B6.04142E	C3-SB10-6072-01	00733746N		80.38 %	6.88 %	SPK
B6.04142E	C3-SB10-6072-01	00736019A	DUP	78.40 %	6.65 %	SPK
B6.04143F	C3-SB10-7284-01	00733749R		78.53 %	6.67 %	SPK
B6.04144G	C3-SB10-8496-01	00733752L		75.55 %	6.43 %	SPK
B6.04145H	C3-SB11-0012-01	00733755P		70.62 %	6.56 %	SPK
B6.04146J	C3-SB11-3648-01	00733758T		58.86 %	5.83 %	SPK
B6.04147K	C3-SB12-0012-01	00733761M		80.51 %	7.06 %	SPK
B6.04148L	C3-SB13-0012-01	00733764Q		56.08 %	5.62 %	SPK
B6.04149M	C3-SB13-1224-01	00733767U		64.43 %	6.23 %	SPK
B6.04150E	C3-SB14-0012-01	00733770N		65.22 %	6.12 %	SPK
B6.04151F	C3-SB15-0012-01	00733773R		71.37 %	6.59 %	SPK
B6.04152G	C3-SB15-2436-01	00733776V		70.31 %	6.61 %	SPK
B6.04153H	C3-SB16-0012-01	00733779Y		74.54 %	6.78 %	SPK
B6.04154J	C3-SB16-3648-01	00733782T		51.65 %	5.32 %	SPK
LCS-00736021U *		00736021U	LCS	80.74 %	7.26 %	SPK
RBK-00736020T *		00736020T	RBK	83.22 %	7.36 %	SPK

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013481Q

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04142E	00736019A	DUP	U234		2.8	0.31	PASS
B6.04142E	00736019A	DUP	U235		25.2	-0.74	PASS
B6.04142E	00736019A	DUP	U238		1.4	-0.15	PASS
LCS-00736021U	00736021U	LCS	U234	95.8		-0.70	PASS
LCS-00736021U	00736021U	LCS	U235	90.4		-0.44	PASS
LCS-00736021U	00736021U	LCS	U238	99.4		-0.10	PASS
RBK-00736020T	00736020T	RBK	U234				PASS
RBK-00736020T	00736020T	RBK	U235				PASS
RBK-00736020T	00736020T	RBK	U238				PASS

DATE: November 6, 2016

SUBJECT: Radiochemical data validation for Pace Analytical Services, Inc. Pittsburgh, data package 30179165 in regards to Canadian Radium and Uranium Site, Mount Kisco, Westchester County, New York, Revision 1.

FROM: Rick Haaker; CHP, CIH, Chemist

RF Haaker

TO: Eric Daly USEPA On-Scene Coordinator

Bernard Nwosu, Weston Solutions RST 3 Site Project Manager

DCN: RST3-02-F-0062, Revision 1

Associated TDD: TO-0006-0053

1. Overview

This report addresses the above referenced data package that was analyzed by Pace Analytical Laboratories, of St. Louis, MO. The analytes (isotopes) and methods are provided in the following table.

Table of Isotopes and Analytical Methods.

Method	**Isotope**
EPA 901.1	Bismuth-212, Lead-210, Lead-212, Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236, Uranium-238
EPA 904.0	Radium-228
EPA 903.1	Radium-226

2. INTRODUCTION

Two (2) water samples and fifty four (54) soil samples were collected during the time period April 5, 2016 and April 6, 2016. The following table provides a list of these field samples. The samples were submitted under one nine page long Chain of Custody form (No. 2-040716-155816-0006) and all samples were logged in on one "Sample Condition Upon Receipt" form. The 1,810 page long lab report package included a summary report, results, chain of custody, case narrative, raw data. An electronic data deliverables (EDD) was provided, which contained much, but not all, raw data and results in a readily accessible format.

The radio-analytical data were validated to Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP) *Chapter 8 - Radiochemical Data Verification and Validation*[1]and the requirements of the quality assurance project plan (QAPP).[2] The depth of the validation was necessarily limited because Derived Concentration Guidelines (DCGL), and some specific data performance requirements have not been designated.

DATA VALIDATION PRECAUTIONS AND LIMITATIONS

It should be noted that this technical report describes method validation and is not intended to provide guidance for validation of overall program/project objectives and requirements. Project validation is generally performed by project management personnel and involves a comprehensive review of all aspects (and objectives) of a sampling and analysis project.

Table of Sample IDs and Analytical Methods. .

SAMPLENAME	LABSAMPID	Matrix	Method	Isotope
C002-SB001-1224-01	30179165001	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C002-SB001-1224-01	30179165001	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C002-SB001-2436-01	30179165002	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C002-SB001-2436-01	30179165002	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C002-SB001-3648-01	30179165003	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226,

[1] Multi-Agency Radiological Laboratory Analytical Protocols Manual, Volume I, NUREG-1576, EPA 402-B-04-001A, NTIS PB2004-105421, July 2004.

[2] SITE-SPECIFIC UFP QUALITY ASSURANCE PROJECT PLAN CANADIAN RADIUM AND URANIUM CORPORATION SITE, MOUNT KISCO, WESTCHESTER COUNTY, NEW YORK, DC No.: RST3-02-D-0010, TDD No.: TO-0006-0053. July 2015.

SAMPLENAME	LABSAMPID	Matrix	Method	Isotope
				Radium-228, Thallium-208, Thorium-234, Uranium-235
C002-SB001-3648-01	30179165003	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C002-SB002-4860-01	30179165004	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C002-SB002-4860-01	30179165004	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C002-SB002-6072-01	30179165005	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C002-SB002-6072-01	30179165005	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C002-SB003-2436-01	30179165006	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C002-SB003-2436-01	30179165006	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C002-SB003-3648-01	30179165007	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C002-SB003-3648-01	30179165007	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB001-1224-01	30179165008	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB001-1224-01	30179165008	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB001-2436-01	30179165009	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB001-2436-01	30179165009	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB002-2436-01	30179165012	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226,

SAMPLENAME	LABSAMPID	Matrix	Method	Isotope
				Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB002-2436-01	30179165012	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB002-3648-01	30179165013	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB002-3648-01	30179165013	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB003-2436-01	30179165014	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB003-2436-01	30179165014	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB003-3648-01	30179165015	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB003-3648-01	30179165015	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB004-2436-01	30179165016	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB004-2436-01	30179165016	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB004-3648-01	30179165017	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB004-3648-01	30179165017	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB005-1224-01	30179165018	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB005-1224-01	30179165018	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB005-2436-01	30179165019	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226,

SAMPLENAME	LABSAMPID	Matrix	Method	Isotope
				Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB005-2436-01	30179165019	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB005-3648-01	30179165020	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB005-3648-01	30179165020	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB006-1224-01	30179165021	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB006-1224-01	30179165021	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB006-2436-01	30179165022	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB006-2436-01	30179165022	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB007-1224-01	30179165023	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB007-1224-01	30179165023	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB007-2436-01	30179165024	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB007-2436-01	30179165024	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB007-2436-02	30179165025	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB007-2436-02	30179165025	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB008-2436-01	30179165026	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226,

SAMPLENAME	LABSAMPID	Matrix	Method	Isotope
				Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB008-2436-01	30179165026	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB008-3648-01	30179165027	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB008-3648-01	30179165027	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB009-2436-01	30179165028	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB009-2436-01	30179165028	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB009-3648-01	30179165029	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB009-3648-01	30179165029	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB010-2436-01	30179165030	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB010-2436-01	30179165030	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB010-3648-01	30179165031	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB010-3648-01	30179165031	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB010-4860-01	30179165032	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB010-4860-01	30179165032	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB011-1224-01	30179165033	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226,

SAMPLENAME	LABSAMPID	Matrix	Method	Isotope
				Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB011-1224-01	30179165033	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB011-2436-01	30179165034	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB011-2436-01	30179165034	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB012-1224-01	30179165035	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB012-1224-01	30179165035	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB012-2436-01	30179165036	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB012-2436-01	30179165036	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB012-3648-01	30179165037	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB012-3648-01	30179165037	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB013-2436-01	30179165038	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB013-2436-01	30179165038	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB013-2436-02	30179165039	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB013-2436-02	30179165039	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB013-3648-01	30179165040	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226,

SAMPLENAME	LABSAMPID	Matrix	Method	Isotope
				Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB013-3648-01	30179165040	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB014-1224-01	30179165043	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB014-1224-01	30179165043	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB014-2436-01	30179165044	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB014-2436-01	30179165044	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB014-3648-01	30179165045	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB014-3648-01	30179165045	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB015-1224-01	30179165046	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB015-1224-01	30179165046	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB015-3648-01	30179165047	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB015-3648-01	30179165047	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB016-1224-01	30179165048	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB016-1224-01	30179165048	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C003-SB016-2436-01	30179165049	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226,

SAMPLENAME	LABSAMPID	Matrix	Method	Isotope
				Radium-228, Thallium-208, Thorium-234, Uranium-235
C003-SB016-2436-01	30179165049	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C004-SB001-0012-01	30179165050	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C004-SB001-0012-01	30179165050	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C004-SB001-1224-01	30179165051	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C004-SB001-1224-01	30179165051	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C004-SB001-2436-01	30179165052	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C004-SB001-2436-01	30179165052	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C004-SB001-3648-01	30179165053	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C004-SB001-3648-01	30179165053	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C004-SB001-3648-02	30179165054	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C004-SB001-3648-02	30179165054	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C004-SB001-7284-01	30179165055	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226, Radium-228, Thallium-208, Thorium-234, Uranium-235
C004-SB001-7284-01	30179165055	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
C004-SB001-8496-01	30179165056	S	EPA 901.1	Bismuth-212 Lead-210,Lead-212,Potassium-40, Radium-226,

SAMPLENAME	LABSAMPID	Matrix	Method	Isotope
				Radium-228, Thallium-208, Thorium-234, Uranium-235
C004-SB001-8496-01	30179165056	S	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
RB-040516	30179165059	W	EPA 903.1	Radium-226
RB-040516	30179165059	W	EPA 904.0	Radium-228
RB-040516	30179165059	W	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238
RB-040616	30179165060	W	EPA 903.1	Radium-226
RB-040616	30179165060	W	EPA 904.0	Radium-228
RB-040616	30179165060	W	HSL-300	Thorium-228, Thorium-230, Thorium-232, U-233/234, U-235/236,Uranium-238

3. DATA QUALIFIERS

Final Data qualifiers are codes placed on an analytical result that alert data users to the validator's concern about the result. These qualifiers may be summarized as U, J, R, or Q in the final validation report.

None the analysis was performed and radioactivity was detected. The result is statistically positive at the 95% confidence level, above the critical level and above the MDC. The radionuclide is considered to be present in the sample.

U A normal, not detected (< critical value) result.

UJ The analyte was not detected, but the required MDA was not attained. A number of specific problems also resulted in assignment of a J qualifier where results were more uncertain than usual. This qualifier may also be applied if no activity was detected, but there is a deficiency such as an association with missing or poorly performing QC samples.

Q A reported combined standard uncertainty, which exceeds the project's required method uncertainty. (In this report Q was only used as an intermediate or preliminary qualifier.)

J An unusually uncertain or estimated result.

R A rejected result: the problems (quantitative or qualitative) are so severe that the data cannot be used.

The data validator should be aware that a data qualifier or a set of qualifiers does not apply to all similar data. The data validator should incorporate the project MQOs into the testing and qualifying decision-making process.

During the data validation process the data validator may use additional qualifiers based on QC sample results and acceptance criteria. The final validation reports should also include a summary of QC sample performance for use by the data assessor. Intermediate or preliminary qualifiers, such as 'S', 'B' or 'P' are assigned on the basis of QC sample performance and these are taken into consideration in assignment of a final qualifier to an analytical result.

J1+ A result for a sample whose associated blank contained detected activity above the critical level and the result for the sample was less than 5 times the result for the blank.

S A result with a related spike result (laboratory control sample [LCS], matrix spike [MS] or matrix spike duplicate [MSD]) that is outside the control limit for recovery (%R); S+ or S- used to indicate high or low recovery.

P A result with an associated replicate result that exceeds the control limit.

P1 A result for a particular analyte and sample that has associated with it a poorly performing pair of field replicates.

B A result with associated blank result, which is outside the control limit, B+ or B-.used to indicate high or low results.

The logic for mapping preliminary data qualifiers to final data qualifiers is provided in the following table (next page). Each sample result has only one final data qualifier, but may have several preliminary or intermediate data qualifiers.

4. Equations

The following equations are frequently used to compare the performance of pairs of aliquots that were drawn from the same sample.

A. Duplicate error ratio

The duplicate error ratio is the relative error in a pair of measurements and takes into account the measurement results, Ma and Mb, as well as the standard errors associated with the measurements, 2Sa and 2Sb.

By convention, laboratories report analytical errors as 2 times the standard deviation, 2 Sa and 2 Sb. If Ma and Mb are results from duplicate aliquots that were taken from a homogeneous sample, then ninety-five percent of the time the DER is expected to be less than 1.96. Ninety-nine percent of the time it is expected to be less than 2.58.

$$DER = 2 \times \frac{Abs(Ma - Mb)}{\sqrt{(2\,Sa)^2 + (2\,Sb)^2}}$$

B. Relative Percent Difference

The relative percent difference (RPctD) is a measure of consistency of measured concentration between two aliquots of a sample.

$$RPctD = 200\% \times \frac{Abs(Ma - Mb)}{Ma + Mb}$$

C. Matrix Spike Percent Difference

$$MSPctD = 100\% \times \frac{Spike\ Result - Unspiked\ Result}{Spike}$$

D. Matrix Spike Normalized Difference

$$MSND = 2 \times \frac{Spike\ Result - Unspiked\ Result - Spike}{((2\,S_{Spike\ Result})^2 + (2\,S_{UnSpike\ Result})^2 + (2\,S_{Spike\ Result})^2)^{0.5}}$$

Ninety-five percent of the time the absolute value of the matrix spike normalized difference is expected to be less than 1.96, and ninety-nine percent of the time it should be less than 2.58.

Table of preliminary and final data qualifiers for this dataset.

Intermediate Qualifiers	Final Qualifiers
B+,	J
J,	J
J-, R,	R
J+, P,	J
J+, P, J1+, B+, Q, U	U
J1+, B+,	J
J1+, B+, J,	J
J1+, B+, Q, J,	J
J1+, B+, Q, U	U
P,	J
P, Q, U	U
P1,	J
P1, B+,	J
P1, B+, J,	J
P1, J+, P, B+,	J
P1, J+, P, J1+, B+,	J
P1, J1+, B+, J,	J
P1, J1+, B+, Q, U	U
P1, Q, U	U
Q, U	U
S, B+,	J
S, J1+, B+,	J
S+,	J
S+, B+,	J
S+, J1+, B+,	J
S+, J1+, B+, J,	J
S+, Q, U	U

5. SAMPLE HANDLING AND ANALYSIS EVALUATION

This section contains the technical review comments describing the findings and observations for each of the main verification and validation parameters described in MARLAP Chapter 8 - Radiochemical Data Verification and Validation.

A. Sample Descriptors (MARLAP 8.5.1.1)

Each sample should have a unique identification code that can be cross-referenced to a unique

laboratory identification number.

Discussion

The laboratory identification numbers were correctly listed in the cover page/case narrative in the data package. The one laboratory data package, Pace # 30179165 includes several groups of samples/analyses that are organized by QC batch number.

B. Aliquot Size (MARLAP 8.5.1.2)

The aliquot or sample size used for analysis should be documented so that it can be checked when reviewing calculations, examining dilution factors or analyzing any data that requires aliquant as an input. It is also imperative that the appropriate unit (liter, kilogram, etc.) is assigned to the aliquant.

Discussion

Each sample in the data package had an aliquot size associated with each result. No issues of this type were recognized and no qualifiers were assigned on this basis.

C. Dates of Sample Collection, Preparation, and Analysis (MARLAP 8.5.1.3)

The analytical data package should report date of sampling, preparation, and analysis. These data are used to calculate radiological holding times, some of which may be specified in the Field Sampling Plan.

Discussion

Data were provided and the holding time requirements (i.e. <6 months) were met for every analysis in the data package. No issues of this type were recognized and no qualifiers were assigned on that basis.

D. Preservation (MARLAP 8.5.1.4)

Appropriate preservation is dependent upon analyte and matrix and should be defined in sampling and analysis documentation.

Discussion

The “Sample Condition Upon Receipt” checklist is found immediately after the chain of custody form in the data package (page 86). It describes the preservation state of samples. The lab reported that water samples were acceptably preserved by acidification. Soil samples required no special preservation

No issues of this type were noted and no sample results were assigned qualifiers on this basis.

E. Tracking (MARLAP 8.5.1.5)

Each analytical result should be linked to the instrument or detector on which it was counted.

Discussion

Each analytical result in the data package was linked to a specific detector. Thus no issues of this type were recognized and no qualifiers were assigned on this basis.

F. Traceability (MARLAP 8.5.1.6)

The traceability of standards and reference materials to be used during the analysis should be specified in the Field Sampling Plan.

Discussion

The Field Sampling Plan did not provide specific requirements for traceability. However, there is documentation that all radioactive standards are directly or indirectly traceable to NIST. No qualifiers were assigned on this basis.

G. QC Types and Linkages (MARLAP 8.5.1.7)

The type and quantity of QC samples should be identified and listed in the SOW and the results provided by the laboratory in a summary report. Replicates and matrix spike results should be linked to the original sample results.

The information obtained from the analysis of laboratory-generated duplicates is useful to evaluate analytical variability and laboratory precision. Results from the analysis of laboratory-generated duplicate samples can also reflect the homogeneity or inhomogeneity of individual samples or groups of samples of the same matrices.

Discussion

The QAPP did not require matrix spike and matrix spike duplicates for water samples. In addition it is ambiguous about the number of matrix spike and matrix spike duplicates that are required per QA batch.

Significantly, there was no matrix spike or matrix spike duplicate sample for QA batch 28966. This QA batch pertained to alpha spectroscopy by method HSL-300 (isotopic uranium and isotopic thorium) and 108 results are affected. UJ or J .qualifiers were assigned to all HSL-300 results in QA batch 28966. No other qualifiers were assigned on the basis of QC types and linkages.

There were blank, laboratory control standard (LCS) and duplicate LCS (LCSD) results for each method. Matrix spikes were run for water samples, although they were not required by the QAPP.

The following table is a key that identifies which samples were field splits or field duplicates. Field duplicates were not required for water samples. Ordinary samples were not otherwise re-run as duplicates.

Table of Field Replicate Samples.

Method	Matrix	Client ID 2nd	Client ID 1st	Internal ID 2nd	Interna lID 1st	QABatch
EPA 901.1	Soil	C003-SB007-2436-02	C003-SB007-2436-01	30179165025	30179165024	RADC28962
EPA 901.1	Soil	C003-SB013-2436-02	C003-SB013-2436-01	30179165039	30179165038	RADC28963
EPA 901.1	Soil	C004-SB001-3648-02	C004-SB001-3648-01	30179165054	30179165053	RADC29068
HSL-300	Soil	C003-SB007-2436-02	C003-SB007-2436-01	30179165025	30179165024	RADC28966
HSL-300	Soil	C003-SB013-2436-02	C003-SB013-2436-01	30179165039	30179165038	RADC28966
HSL-300	Soil	C004-SB001-3648-02	C004-SB001-3648-01	30179165054	30179165053	RADC28967

H. Chemical Separation (Yield) (MARLAP 8.5.1.8)

Yield assesses the effects of the sample matrix and the chemical separation steps on the analytical result and estimates the analyte loss throughout the total analytical process.

The evaluation of an analytical yield serves to evaluate the efficiency of radiochemical separations utilized when preparing samples for measurement or analysis. The use of a tracer is conducted when a known amount of a chemical tracer is added to unknown samples; during analysis, a yield or recovery of the tracer material is used to determine the efficiency of the entire analytical process. The tracer that is chosen is used because it mimics the properties of one or more target radionuclides. A tracer refers to a radioactive isotope, while a carrier is a non-radioactive substance.

Discussion

The analyses that employed a tracer or carrier include:

- EPA Method 903.1, radium-226 in drinking water by radon emanation employs both carriers and a barium-133 tracer.
- EPA Method 904, radium-228 in drinking water by gas flow proportional counting of beta emitters. The carriers employed were stable barium and yttrium. Barium-133 is used as a tracer.
- Isotopic thorium by alpha spectroscopy (thorium-234 tracer),
- Isotopic uranium by alpha spectroscopy (uranium-232 tracer).

The QAPP does not provide any chemical yield acceptance criteria for water samples analyzed by methods EPA 903.1 and EPA 904.

The samples listed in the following table were assigned an intermediate qualifier, 'J' (more uncertain than usual) due to low recovery of carrier or tracer. These thorium results had a thorium-234 recovery below 30%.

Table of analytical results that exhibited a low recovery of tracer.

Batch	InternalID	ClientID	Method	Matrix	Isotope	Tracer Grav Qualifier
RADC28965	30179165004	C002-SB002-4860-01	HSL-300	Soil	Thorium-228	J,
RADC28965	30179165004	C002-SB002-4860-01	HSL-300	Soil	Thorium-230	J,
RADC28965	30179165004	C002-SB002-4860-01	HSL-300	Soil	Thorium-232	J,
RADC28965	30179165005	C002-SB002-6072-01	HSL-300	Soil	Thorium-228	J,
RADC28965	30179165005	C002-SB002-6072-01	HSL-300	Soil	Thorium-230	J,
RADC28965	30179165005	C002-SB002-6072-01	HSL-300	Soil	Thorium-232	J,
RADC28965	30179165017	C003-SB004-3648-01	HSL-300	Soil	Thorium-228	J,
RADC28965	30179165017	C003-SB004-3648-01	HSL-300	Soil	Thorium-230	J,
RADC28965	30179165017	C003-SB004-3648-01	HSL-300	Soil	Thorium-232	J,

I. Self-Absorption (MARLAP 8.5.1.9)

For some radiochemical analytical methods, the SOW may specify the generation of a self-absorption curve, which correlates mass of sample deposited in a known geometry to detector efficiency.

Discussion

The laboratory performs a self-absorption calibration for radium-228 (EPA Method 904). There is no aspect of EPA Method 903.1 where an explicit self-absorption correction is necessary. EPA Method 901.1 (gamma spectroscopy) does not appear to employ a self-absorption correction, although the reference material used for the laboratory control standard (LCS, LCSD) appears to be in the same geometry and have a similar density as the regular samples.

Alpha spectroscopy (HSL-300) is very sensitive to self-absorption effects, but self-absorption problems by this analytical method become evident from peak shape and full-width at half-maximum values. No explicit self-absorption correction was applied to HSL-300 results.

No qualifiers were assigned on this basis.

J. Efficiency, Calibration Curves, and Instrument Background (MARLAP 8.5.1.10)

The determination of detector efficiency is a detailed process that is best checked during an audit of the laboratory's capabilities and is usually not part of the verification and validation process.

Discussion

Overall these data were not organized in a fashion that allowed them to be reviewed in a comprehensive

fashion in a reasonable amount of time. Documentation was provided in the package that the equipment used was calibrated, that backgrounds were determined, and that the efficiencies of the detectors were well determined. In addition, the laboratory QA narratives did not identify any deficiencies of this nature.

No issues of these types were recognized and no qualifiers were assigned on this basis.

K. Spectrometry Resolution (MARLAP 8.5.1.11)

The measured resolution of alpha and gamma spectrometers, and spectral information should be provided in the data package to evaluate if proper peak identification and separation was made.

Discussion

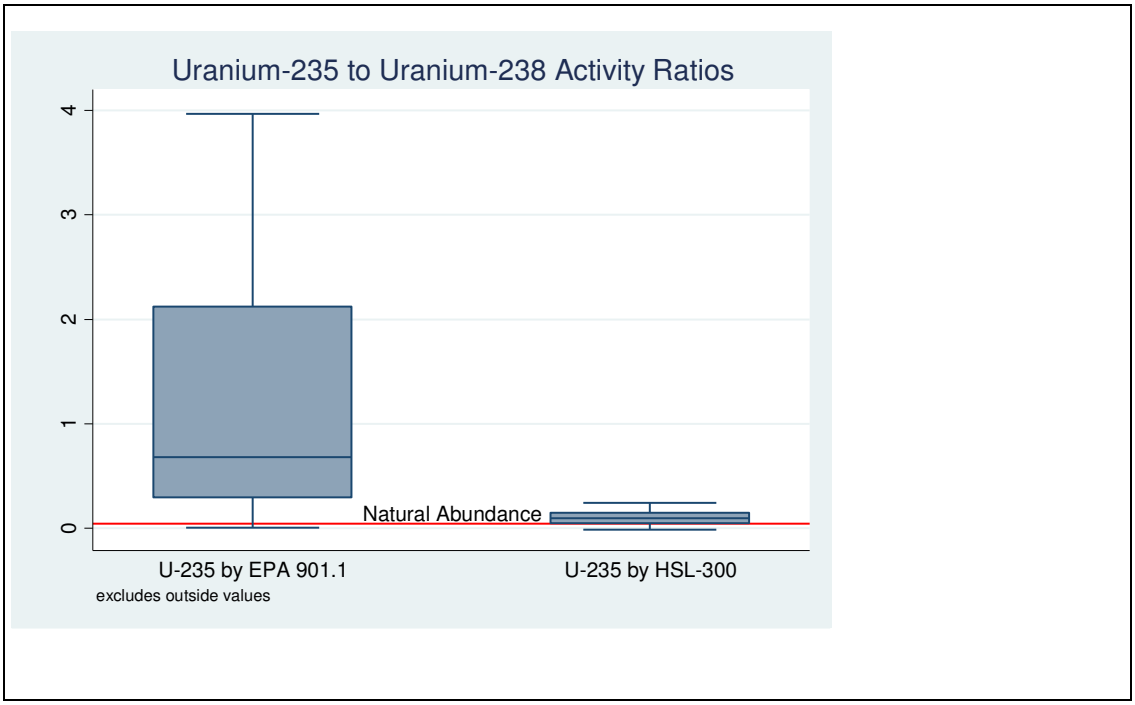
Overall the spectrometry resolution and peak width data were not organized in a fashion that allowed them to be reviewed in a comprehensive fashion in a reasonable amount of time.

FWHM data are provided for the alpha spectroscopy results. There are no established acceptance criteria for alpha spectrometer resolution in the QAPP. Energy resolution was sufficient to allow resolution of the alpha emitting thorium or uranium isotopes of interest. The individual alpha spectra for samples and standards are provided. I viewed each alpha spectrum and did not see any results where peak broadening would be likely to cause the counts for the isotopes of interest to be underestimated or overestimated.

FWHM data for gamma spectroscopy results are within 0.5%, which meets the requirements of the QAPP. In addition, the laboratory narratives did not identify any issues related to spectrometer resolution.

It is notable that both uranium-235 and radium-226 have gamma emissions at 186 KeV and the gamma spectrometer resolution was insufficient to avoid problems. The result was a severe positive bias in the reported concentrations of uranium-235 by method EPA 901.1 and erratic ratios of uranium-235 to uranium-238, as depicted in the boxplots below. As a consequence, all 52 uranium-235 results reported by EPA 901.1 were rejected (i.e. assigned a data qualifier of 'R'). Uranium-235 should be estimated from HSL-300 results, not from gamma spectroscopy results. This is a commonly encountered difficulty with using gamma spectroscopy to estimate uranium-235 concentrations in samples that contain radium-226.

Distribution of activity ratios of U-235 to U-238 in soil samples.



No other issues with missing spectra or spectral resolution were recognized and no other qualifiers were assigned on this basis.

L. Dilution and Correction Factors (MARLAP 8.5.1.12)

Samples for radiochemistry are usually not diluted. If required, dilution and correction factors (i.e., dry weight correction, ashed weight correction) should be provided in the data package so that the final calculations of all data affected by dilution factors can be recalculated and confirmed.

Discussion

Dilutions of the standard solutions are addressed in the data packages. Aliquot sizes, wet weights and dry weights are provided in the data package for each sample and method of analysis. No issues with these factors were recognized and no qualifiers were assigned on this basis.

M. Counts and Count Time (Duration) (MARLAP 8.5.1.13)

The count time for each sample, QC analysis, and instrument background should be recorded in the data package. The ability to detect radionuclides is directly related to the count time.

Discussion

Count times, QC analyses, and backgrounds are documented in the data package. Count times were nearly always sufficient for results to have the required MDC. No issues with missing data of these types were recognized.

N. Result of Measurement, Uncertainty, Minimum Detectable Concentration, and Units (MARLAP 8.5.1.14)

The result of each measurement, its expanded measurement uncertainty, and the estimated sample- or

analyte-specific MDC should be reported for each sample in the appropriate units.

Discussion

No issues with these factors were recognized and no qualifiers were assigned on this basis.

Three isotopes that were requested by gamma spectroscopy require discussion: bismuth-210, lead-210 and uranium-235. Bismuth-210 is a pure beta emitter, so it cannot be determined by gamma spectroscopy.

Lead-210 emits a low-energy 46 keVgamma ray with a low (4%) abundance. It can be detected by gamma spectroscopy at relatively low levels provided that the sample geometry is optimized for low energy gamma emitters and there are not elevated concentrations of other gamma emitting isotopes in the sample. If lead-210 is a contaminant of concern, then it is preferable to quantify it by measurement of its daughter, polonium-210 by alpha spectroscopy using method HSL-300. The detection limit for lead-210 by EPA Method 901.1 is not low enough that good risk-based decisions can always be made concerning clean-up.

Uranium-235 was estimated by gamma spectroscopy by EPA Method 901.1 and by HSL-300 (alpha spectroscopy). The gamma spectroscopy method relied on measuring the intensity of a 186 KeV gamma emission. Radium-226 is also present in the samples and it also has a 186 KeV gamma emission that interferes with the determination of uranium-235 by gamma spectroscopy. This has the effect of making EPA Method 901.1 decidedly unreliable for quantifying uranium-235 in many circumstances. All fifty-two uranium-235 results by method EPA 901.1 were rejected because of this difficulty.

6. QUALITY CONTROL SAMPLES TECHNICAL REVIEW

A. Method Blanks (MARLAP 8.5.2.1)

The requirement for a method blank is usually established in the SOW and appropriate plan documents. Check to see if a method blank was analyzed and no detected concentration/activity found in the results.

Discussion

Method blank results were provided for every analyte in the data package.

Activity was detected in method blanks for soil and liquid as noted below. An intermediate qualifier value of 'J' means that the analyte was detected above the critical level in the method blank. If no intermediate qualifier value is provided for a method blank, then the analyte of interest was detected above the minimum detectable concentration MDC.

The analytes of interest are all naturally occurring, so it is possible that activity may be present in blanks through no fault of the analytical laboratory. Clearly it is desirable for there to be no activity in the blanks wherever possible.

Table of method blanks having detected activity.

InternalID	Matrix	Batch	Method	Isotope	Conc	Units	Interim Qualifier
1059349	Soil	RADC28961	EPA 901.1	Bismuth-212	0.632	pCi/g	J,
1059349	Soil	RADC28961	EPA 901.1	Lead-210	7.754	pCi/g	J,
1059359	Soil	RADC28963	EPA 901.1	Lead-210	6.515	pCi/g	Q, J,
1062230	Soil	RADC29068	EPA 901.1	Radium-226	0.078	pCi/g	J,
1059351	Soil	RADC28962	EPA 901.1	Radium-228	0.139	pCi/g	J,

1059359	Soil	RADC28963	EPA 901.1	Radium-228	0.112	pCi/g	J,
1064918	Water	RADC29125	EPA 904.0	Radium-228	0.288	pCi/L	J,
1059349	Soil	RADC28961	EPA 901.1	Thallium-208	0.053	pCi/g	Q, J,
1059442	Soil	RADC28966	HSL-300	Thorium-228	0.055	pCi/g	Q, J,
1059443	Soil	RADC28967	HSL-300	Thorium-228	0.167	pCi/g	J,
1057508	Water	RADC28888	HSL-300	Thorium-230	0.009	pCi/L	Q, J,
1059442	Soil	RADC28966	HSL-300	Thorium-230	0.031	pCi/g	Q, J,
1059442	Soil	RADC28966	HSL-300	Thorium-232	0	pCi/g	Q, J,
1059443	Soil	RADC28967	HSL-300	Thorium-232	0	pCi/g	Q, J,
1059441	Soil	RADC28965	HSL-300	U-233/234	0.039	pCi/g	Q, J,
1059442	Soil	RADC28966	HSL-300	U-233/234	0.065	pCi/g	
1059441	Soil	RADC28965	HSL-300	U-235/236	0.041	pCi/g	Q, J,
1059442	Soil	RADC28966	HSL-300	U-235/236	0.063	pCi/g	
1057508	Water	RADC28888	HSL-300	Uranium-238	0.017	pCi/L	Q, J,
1059441	Soil	RADC28965	HSL-300	Uranium-238	0.043	pCi/g	Q, J,
1059442	Soil	RADC28966	HSL-300	Uranium-238	0.028	pCi/g	Q, J,
1059443	Soil	RADC28967	HSL-300	Uranium-238	0.028	pCi/g	Q, J,

B. Laboratory Control Samples (MARLAP 8.5.2.2)

Laboratory control samples (LCS) and LCS duplicates (LCSD) were run for each batch and analysis type, and all spike and recovery results for LCS samples were acceptable, based on QAPP requirements. All duplicate error ratios (DER) for LCS-LCSD pairs were smaller than 1.96, which should be considered good agreement, Tracer/carrier results for LCS and LCSD samples were also within the QAPP limits.

Method	Batch	Matrix	InternalID	Isotope	DER
HSL-300	RADC28888	Water	LCS28888	Thorium-230	0.105
HSL-300	RADC28888	Water	LCS28888	Uranium-238	0.175
EPA 901.1	RADC28961	Soil	LCS28961	Cesium-137	0.503
EPA 901.1	RADC28961	Soil	LCS28961	Cobalt-60	0.696
EPA 901.1	RADC28961	Soil	LCS28961	Lead-210	0.361
EPA 901.1	RADC28961	Soil	LCS28961	Lead-210	0.361
EPA 901.1	RADC28961	Soil	LCS28961	Lead-210	0.361
EPA 901.1	RADC28961	Soil	LCS28961	Lead-210	0.361
EPA 901.1	RADC28962	Soil	LCS28962	Cesium-137	0.726
EPA 901.1	RADC28962	Soil	LCS28962	Cobalt-60	0.614
EPA 901.1	RADC28962	Soil	LCS28962	Lead-210	0.105
EPA 901.1	RADC28962	Soil	LCS28962	Lead-210	0.105
EPA 901.1	RADC28962	Soil	LCS28962	Lead-210	0.105
EPA 901.1	RADC28962	Soil	LCS28962	Lead-210	0.105
EPA 901.1	RADC28963	Soil	LCS28963	Cesium-137	0.288
EPA 901.1	RADC28963	Soil	LCS28963	Cobalt-60	0.321
EPA 901.1	RADC28963	Soil	LCS28963	Lead-210	0.527
EPA 901.1	RADC28963	Soil	LCS28963	Lead-210	0.527

Method	Batch	Matrix	InternalID	Isotope	DER
EPA 901.1	RADC28963	Soil	LCS28963	Lead-210	0.527
EPA 901.1	RADC28963	Soil	LCS28963	Lead-210	0.527
EPA 901.1	RADC28964	Soil	LCS28964	Cesium-137	0.401
EPA 901.1	RADC28964	Soil	LCS28964	Cobalt-60	0.379
EPA 901.1	RADC28964	Soil	LCS28964	Lead-210	1.157
EPA 901.1	RADC28964	Soil	LCS28964	Lead-210	1.157
EPA 901.1	RADC28964	Soil	LCS28964	Lead-210	1.157
EPA 901.1	RADC28964	Soil	LCS28964	Lead-210	1.157
HSL-300	RADC28965	Soil	LCS28965	Thorium-230	0.365
HSL-300	RADC28965	Soil	LCS28965	U-233/234	0.656
HSL-300	RADC28965	Soil	LCS28965	Uranium-238	1.297
HSL-300	RADC28966	Soil	LCS28966	Thorium-230	0.015
HSL-300	RADC28966	Soil	LCS28966	U-233/234	0.721
HSL-300	RADC28966	Soil	LCS28966	Uranium-238	0.855
HSL-300	RADC28967	Soil	LCS28967	U-233/234	0.061
HSL-300	RADC28967	Soil	LCS28967	Uranium-238	1.127
EPA 901.1	RADC29068	Soil	LCS29068	Cesium-137	0.54
EPA 901.1	RADC29068	Soil	LCS29068	Cobalt-60	0.782
EPA 901.1	RADC29068	Soil	LCS29068	Lead-210	0.052
EPA 901.1	RADC29068	Soil	LCS29068	Lead-210	0.052
EPA 901.1	RADC29068	Soil	LCS29068	Lead-210	0.052
EPA 901.1	RADC29068	Soil	LCS29068	Lead-210	0.052
EPA 903.1	RADC29121	Water	LCS29121	Radium-226	0.856
EPA 904.0	RADC29125	Water	LCS29125	Radium-228	0.982
HSL-300	RADC29150	Soil	LCS29150	Thorium-230	0.442

No issues of this type involving Laboratory Control Samples were recognized and no qualifiers were assigned on this basis.

C. Laboratory Replicates (MARLAP 8.5.2.3)

The objective of replicate analyses is to measure laboratory precision based on each sample matrix. Check to see if laboratory replicate was analyzed and within control limits.

Discussion

Laboratory replicates in this data package were of principally of two types, LCS / LCSD and MS/MSD. Ordinary samples *per se* were not ever treated as replicates. There were field replicates, though. In addition, there were matrix spike and matrix spike duplicate samples; these were not always comparable because sometimes the amount of spike added to the sample was different, however.

The satisfactory performance of LCS and LCSD samples was addressed in section B, "Laboratory Control Samples (MARLAP 8.5.2.2)." Lab replicates exhibited reasonable Duplicate Error Ratios (DER), with all DERs being less than 1.96. No qualifiers were assigned on the basis of laboratory replicate performance.

D. Matrix Spikes and Matrix Spike Duplicates (MARLAP 8.5.2.4)

Matrix spike samples provide information about the effect of each sample matrix on the preparation and measurement methodology. The test uncovers the possible existence of recovery problems, based on either a statistical test or a specified fixed control limit.

Discussion

Matrix spikes or matrix spike duplicates were not required by the QAPP for water samples.

The thorium-230 matrix spike result for MS # 30179165010 exhibited a low percent recovery of the spike and a high value of the spike normalized difference. However the chemical yield on this MS sample was acceptable and there is not a spike performance criteria for this type of sample in the QAPP. In addition, the relative percent differences (R%D) and duplicate error ratios (DER) are acceptable.

Contrary to requirements, matrix spike and matrix spike duplicate samples were not run as part of QA batch 28966. One-hundred and eight isotopic uranium and isotopic thorium results were affected. The affected samples were assigned a J (more uncertain that usual) or UJ (not detected, but more uncertain than usual) qualifier.

No other results were qualified on this basis.

Table summarizing matrix spike performance.

Spike Sample ID	Sample ID	Client Sample ID	Isotope	Method	Batch	Units	Spike Normalized Diff	Spike Recovery (%)
30179165010	30179165009	C003-SB001-2436-01 MS	Thorium-230	HSL-300	RADC28965	pCi/g	-3.82	68.9
30179165010	30179165009	C003-SB001-2436-01 MS	U-233/234	HSL-300	RADC28965	pCi/g	-0.59	94.8
30179165010	30179165009	C003-SB001-2436-01 MS	Uranium-238	HSL-300	RADC28965	pCi/g	-1.3	89.3
30179165011	30179165009	C003-SB001-2436-01 MSD	Thorium-230	HSL-300	RADC28965	pCi/g	-1.71	83.8
30179165011	30179165009	C003-SB001-2436-01 MSD	U-233/234	HSL-300	RADC28965	pCi/g	0.68	106.9
30179165011	30179165009	C003-SB001-2436-01 MSD	Uranium-238	HSL-300	RADC28965	pCi/g	1.18	112.5
30179165041	30179165040	C003-SB013-3648-01 MS	U-233/234	HSL-300	RADC28967	pCi/g	-0.18	98.4
30179165041	30179165040	C003-SB013-3648-01 MS	Uranium-238	HSL-300	RADC28967	pCi/g	0.1	100.8
30179165042	30179165040	C003-SB013-3648-01 MSD	U-233/234	HSL-300	RADC28967	pCi/g	-0.17	98.4
30179165042	30179165040	C003-SB013-3648-01 MSD	Uranium-238	HSL-300	RADC28967	pCi/g	-0.36	96.7
30179165057	30179165056	C004-SB001-8496-01 MS	U-233/234	HSL-300	RADC28967	pCi/g	-0.86	93.1
30179165057	30179165056	C004-SB001-8496-01 MS	Uranium-238	HSL-300	RADC28967	pCi/g	-0.41	96.6
30179165058	30179165056	C004-SB001-8496-01 MSD	U-233/234	HSL-300	RADC28967	pCi/g	-0.08	99.3
30179165058	30179165056	C004-SB001-8496-01 MSD	Uranium-238	HSL-300	RADC28967	pCi/g	0.13	101.2

Table summarizing matrix spike /matrix spike duplicate performance

.Batch	MSD Internal ID	MS Internal ID	Media	Nuclide	R%D	DER
RADC28965	30179165011	30179165010	Soil	Thorium-230	14.8	1.05
RADC28965	30179165011	30179165010	Soil	U-233/234	8.5	0.67
RADC28965	30179165011	30179165010	Soil	Uranium-238	18.8	1.48
RADC28967	30179165042	30179165041	Soil	U-233/234	1.5	0.12
RADC28967	30179165042	30179165057	Soil	U-233/234	6.3	0.52

.Batch	MSD Internal ID	MS Internal ID	Media	Nuclide	R%D	DER
RADC28967	30179165042	30179165041	Soil	Uranium-238	5.5	0.45
RADC28967	30179165042	30179165057	Soil	Uranium-238	0.5	0.04
RADC28967	30179165058	30179165041	Soil	U-233/234	3	0.25
RADC28967	30179165058	30179165057	Soil	U-233/234	4.7	0.4
RADC28967	30179165058	30179165041	Soil	Uranium-238	2	0.16
RADC28967	30179165058	30179165057	Soil	Uranium-238	3	0.25

E. Field Replicate Sample Performance

Field replicates are given in the following table.

Table of field duplicate samples.

Method	Matrix	Client ID 2nd	ClientI D 1st	Internal ID 2nd	InternalI D 1st	QA Batch#
EPA 901.1	Soil	C003-SB007-2436-02	C003-SB007-2436-01	30179165025	30179165024	RADC28962
EPA 901.1	Soil	C003-SB013-2436-02	C003-SB013-2436-01	30179165039	30179165038	RADC28963
EPA 901.1	Soil	C004-SB001-3648-02	C004-SB001-3648-01	30179165054	30179165053	RADC29068
HSL-300	Soil	C003-SB007-2436-02	C003-SB007-2436-01	30179165025	30179165024	RADC28966
HSL-300	Soil	C003-SB013-2436-02	C003-SB013-2436-01	30179165039	30179165038	RADC28966
HSL-300	Soil	C004-SB001-3648-02	C004-SB001-3648-01	30179165054	30179165053	RADC28967

No criteria for field duplicates are given in the QAPP other than Worksheet 35, which states “Compare results of field duplicate (or replicate) analyses with RPD criteria.” No duplicate error ratio performance requirement is provided.

The relative percent differences (R%D) were calculated for the field duplicate pairs of samples. This statistic potentially can provide indications of the uniformity of the analyte in the media sampled. High values of relative percent difference greater than 40% suggest that the distribution of contaminants in the media sampled might be relatively heterogeneous. However duplicate error ratios were less than than 1.96, and that suggest that there might not be significant differences in the replicate results once the standard errors of the results are also taken into consideration. The more discordant field duplicates are

provided in the table below.

Table of relatively discrepant field replicate results.

Batch	Analytical Method	Client ID 1st	ClientI D 2nd	Isotope	Rel%Diff	DER
RADC29068	EPA 901.1	C004-SB001-3648-01	C004-SB001-3648-02	Bismuth-212	72	1.95
RADC28966	HSL-300	C003-SB007-2436-01	C003-SB007-2436-02	U-233/234	54	1.7
RADC28966	HSL-300	C003-SB013-2436-01	C003-SB013-2436-02	Thorium-228	64	1.87
RADC28967	HSL-300	C004-SB001-3648-01	C004-SB001-3648-02	Thorium-230	55	1.41

No intermediate data qualifiers were assigned to regular samples / analytes associated with these field duplicate QA sample pair results.

F. Rinse Blank Sample Performance

Rinse blank duplicate performance was addressed along with other laboratory replicates in a previous section. Rinse blanks with activity reported in excess of the nominal critical level are provided in the following table. Concentrations (Conc), the uncertainty at 2 standard deviations (2 S) and nominal critical level are all in units of pCi/L.

The samples of primary interest in this investigation are soil samples. The presence of a small amount of activity in the rinse blanks does not imply that cross-contamination between soil samples occurred to a degree that is likely to compromise the validity of the soil sample results. No qualifiers were assigned to soil samples results on the basis of rinse blank results. Result, uncertainty (2 S), MDA and nominal critical level are all in units of pCi/L.

Table of analytical results for rinse blanks

Internal ID	Client ID	Method	Isotope	Result	2 S	MDA	Nominal Critical Level	Intermediate Qualifier
30179165059	RB-040516	EPA 903.1	Radium-226	0.992	0.717	0.982	0.443	
30179165060	RB-040616	EPA 903.1	Radium-226	0.161	0.35	0.646	0.251	U,
30179165059	RB-040516	EPA 904.0	Radium-228	0.725	0.409	0.738	0.266	J, J1+, B+,
30179165060	RB-040616	EPA 904.0	Radium-228	0.454	0.406	0.831	0.303	J, J1+, B+,
30179165059	RB-040516	HSL-300	Thorium-228	0.101	0.091	0.146	0.056	J,
30179165059	RB-040516	HSL-300	Thorium-230	0.043	0.039	0.025	0.013	J1+, B+,

Internal ID	Client ID	Method	Isotope	Result	2 S	MDA	Nominal Critical Level	Intermediate Qualifier
30179165059	RB-040516	HSL-300	Thorium-232	0	0.038	0.025	0.013	J,
30179165059	RB-040516	HSL-300	Uranium-238	0.046	0.088	0.189	0.053	U, J1+, B+,
30179165060	RB-040616	HSL-300	Thorium-228	0.186	0.104	0.125	0.046	
30179165060	RB-040616	HSL-300	Thorium-230	0.031	0.041	0.064	0.018	J, J1+, B+,
30179165060	RB-040616	HSL-300	Thorium-232	0.019	0.041	0.026	0.013	J,
30179165060	RB-040616	HSL-300	Uranium-238	0.015	0.07	0.148	0.039	U, J1+, B+,
30179165059	RB-040516	HSL-300	U-233/234	0.059	0.087	0.164	0.082	U,
30179165059	RB-040516	HSL-300	U-235/236	0.047	0.101	0.145	0.072	U,
30179165060	RB-040616	HSL-300	U-233/234	0.078	0.086	0.135	0.068	J,
30179165060	RB-040616	HSL-300	U-235/236	0.017	0.091	0.13	0.065	U,

7. TEST OF DETECTION AND UNUSUAL UNCERTAINTY EVALUATION

A. Detection (MARLAP 8.5.3.1)

Detection qualifiers were assigned following the rationale described in Section 3.

Discussion

The following field samples carry an intermediate qualifier.

The following samples carry either a preliminary data qualifier or a final data qualifier

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C002-SB001-1224-01	30179165001	RADC28964	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C002-SB001-1224-01	30179165001	RADC28964	Soil	EPA 901.1	REG	Lead-210	J,	J
C002-SB001-1224-01	30179165001	RADC28964	Soil	EPA 901.1	REG	Thorium-234	U,	U

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C002-SB001-1224-01	30179165001	RADC28964	Soil	EPA 901.1	REG	Uranium-235	R,	R
C002-SB001-1224-01	30179165001	RADC28965	Soil	HSL-300	REG	U-235/236	J, J1+, B+,	J
C002-SB001-2436-01	30179165002	RADC28961	Soil	EPA 901.1	REG	Bismuth-212	U, J1+, B+,	UJ
C002-SB001-2436-01	30179165002	RADC28961	Soil	EPA 901.1	REG	Radium-228	U,	U
C002-SB001-2436-01	30179165002	RADC28961	Soil	EPA 901.1	REG	Thallium-208	U, J1+, B+,	UJ
C002-SB001-2436-01	30179165002	RADC28961	Soil	EPA 901.1	REG	Thorium-234	U,	U
C002-SB001-2436-01	30179165002	RADC28961	Soil	EPA 901.1	REG	Uranium-235	R,	R
C002-SB001-2436-01	30179165002	RADC28965	Soil	HSL-300	REG	U-235/236	J, J1+, B+,	J
C002-SB001-3648-01	30179165003	RADC28961	Soil	EPA 901.1	REG	Bismuth-212	J, J1+, B+,	J
C002-SB001-3648-01	30179165003	RADC28961	Soil	EPA 901.1	REG	Lead-210	J1+, B+,	J
C002-SB001-3648-01	30179165003	RADC28961	Soil	EPA 901.1	REG	Thorium-234	U,	U
C002-SB001-3648-01	30179165003	RADC28961	Soil	EPA 901.1	REG	Uranium-235	R,	R
C002-SB001-3648-01	30179165003	RADC28965	Soil	HSL-300	REG	U-235/236	J, J1+, B+,	J
C002-SB002-4860-01	30179165004	RADC28961	Soil	EPA 901.1	REG	Bismuth-212	J, J1+, B+,	J
C002-SB002-4860-01	30179165004	RADC28961	Soil	EPA 901.1	REG	Lead-210	J1+, B+,	J
C002-SB002-4860-01	30179165004	RADC28961	Soil	EPA 901.1	REG	Thorium-234	U,	U
C002-SB002-4860-01	30179165004	RADC28961	Soil	EPA 901.1	REG	Uranium-235	R,	R
C002-SB002-4860-01	30179165004	RADC28965	Soil	HSL-300	REG	Thorium-228	J,	J
C002-SB002-4860-01	30179165004	RADC28965	Soil	HSL-300	REG	Thorium-230	J,	J
C002-SB002-4860-01	30179165004	RADC28965	Soil	HSL-300	REG	Thorium-232	J,	J
C002-SB002-4860-01	30179165004	RADC28965	Soil	HSL-300	REG	U-235/236	J, J1+, B+,	J
C002-SB002-6072-01	30179165005	RADC28962	Soil	EPA 901.1	REG	Lead-210	J,	J
C002-SB002-6072-01	30179165005	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C002-SB002-6072-01	30179165005	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C002-SB002-6072-01	30179165005	RADC28965	Soil	HSL-300	REG	Thorium-228	J,	J
C002-SB002-6072-01	30179165005	RADC28965	Soil	HSL-300	REG	Thorium-230	J,	J
C002-SB002-6072-01	30179165005	RADC28965	Soil	HSL-300	REG	Thorium-232	J,	J
C002-SB002-6072-01	30179165005	RADC28965	Soil	HSL-300	REG	U-235/236	J, J1+, B+,	J
C002-SB003-2436-01	30179165006	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C002-SB003-2436-01	30179165006	RADC28962	Soil	EPA 901.1	REG	Radium-228	J1+, B+,	J
C002-SB003-2436-01	30179165006	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C002-SB003-2436-01	30179165006	RADC28962	Soil	EPA 901.1	REG	Uranium-235	J, R,	R
C002-SB003-2436-01	30179165006	RADC28965	Soil	HSL-300	REG	U-235/236	J, J1+, B+,	J
C002-SB003-3648-01	30179165007	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C002-SB003-3648-01	30179165007	RADC28962	Soil	EPA 901.1	REG	Radium-228	J,	J
C002-SB003-3648-01	30179165007	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C002-SB003-3648-01	30179165007	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C002-SB003-3648-01	30179165007	RADC28965	Soil	HSL-300	REG	U-235/236	J1+, B+,	J
C003-SB001-1224-01	30179165008	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB001-1224-01	30179165008	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB001-1224-01	30179165008	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB001-1224-01	30179165008	RADC28962	Soil	EPA 901.1	REG	Uranium-235	J, R,	R
C003-SB001-1224-01	30179165008	RADC28965	Soil	HSL-300	REG	U-235/236	J1+, B+,	J
C003-SB001-2436-01	30179165009	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB001-2436-01	30179165009	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB001-2436-01	30179165009	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB001-2436-01	30179165009	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB001-2436-01	30179165009	RADC28965	Soil	HSL-300	REG	U-235/236	J, J1+, B+,	J
C003-SB002-2436-01	30179165012	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C003-SB002-2436-01	30179165012	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB002-2436-01	30179165012	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB002-2436-01	30179165012	RADC28962	Soil	EPA 901.1	REG	Uranium-235	U,	U
C003-SB002-2436-01	30179165012	RADC28965	Soil	HSL-300	REG	U-235/236	J1+, B+,	J
C003-SB002-3648-01	30179165013	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C003-SB002-3648-01	30179165013	RADC28962	Soil	EPA 901.1	REG	Thallium-208	J,	J
C003-SB002-3648-01	30179165013	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB002-3648-01	30179165013	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB002-3648-01	30179165013	RADC28965	Soil	HSL-300	REG	U-235/236	J, J1+, B+,	J
C003-SB003-2436-01	30179165014	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB003-2436-01	30179165014	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB003-2436-01	30179165014	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB003-2436-01	30179165014	RADC28965	Soil	HSL-300	REG	U-235/236	J1+, B+,	J

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C003-SB003-3648-01	30179165015	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB003-3648-01	30179165015	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB003-3648-01	30179165015	RADC28962	Soil	EPA 901.1	REG	Thallium-208	J,	J
C003-SB003-3648-01	30179165015	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB003-3648-01	30179165015	RADC28962	Soil	EPA 901.1	REG	Uranium-235	J, R,	R
C003-SB003-3648-01	30179165015	RADC28965	Soil	HSL-300	REG	U-235/236	J, J1+, B+,	J
C003-SB004-2436-01	30179165016	RADC28962	Soil	EPA 901.1	REG	Lead-210	J,	J
C003-SB004-2436-01	30179165016	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB004-2436-01	30179165016	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB004-2436-01	30179165016	RADC28965	Soil	HSL-300	REG	U-235/236	J1+, B+,	J
C003-SB004-3648-01	30179165017	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB004-3648-01	30179165017	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB004-3648-01	30179165017	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB004-3648-01	30179165017	RADC28965	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB004-3648-01	30179165017	RADC28965	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB004-3648-01	30179165017	RADC28965	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB004-3648-01	30179165017	RADC28965	Soil	HSL-300	REG	U-235/236	J1+, B+,	J
C003-SB005-1224-01	30179165018	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB005-1224-01	30179165018	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB005-1224-01	30179165018	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB005-1224-01	30179165018	RADC28965	Soil	HSL-300	REG	U-235/236	J, J1+, B+,	J
C003-SB005-2436-01	30179165019	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB005-2436-01	30179165019	RADC28962	Soil	EPA 901.1	REG	Radium-228	J,	J
C003-SB005-2436-01	30179165019	RADC28962	Soil	EPA 901.1	REG	Thallium-208	U,	U
C003-SB005-2436-01	30179165019	RADC28962	Soil	EPA 901.1	REG	Thorium-234	J,	J
C003-SB005-2436-01	30179165019	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB005-2436-01	30179165019	RADC28965	Soil	HSL-300	REG	U-235/236	J1+, B+,	J
C003-SB005-3648-01	30179165020	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB005-3648-01	30179165020	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB005-3648-01	30179165020	RADC28962	Soil	EPA 901.1	REG	Radium-228	J1+, B+,	J
C003-SB005-3648-01	30179165020	RADC28962	Soil	EPA 901.1	REG	Thorium-234	J,	J

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C003-SB005-3648-01	30179165020	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB005-3648-01	30179165020	RADC28965	Soil	HSL-300	REG	U-235/236	J, J1+, B+,	J
C003-SB006-1224-01	30179165021	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C003-SB006-1224-01	30179165021	RADC28962	Soil	EPA 901.1	REG	Thallium-208	U,	U
C003-SB006-1224-01	30179165021	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB006-1224-01	30179165021	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB006-1224-01	30179165021	RADC28967	Soil	HSL-300	REG	Thorium-228	J1+, B+,	J
C003-SB006-1224-01	30179165021	RADC28967	Soil	HSL-300	Soil	U-235/236	J,	J
C003-SB006-2436-01	30179165022	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB006-2436-01	30179165022	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB006-2436-01	30179165022	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB006-2436-01	30179165022	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB006-2436-01	30179165022	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB006-2436-01	30179165022	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB006-2436-01	30179165022	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB006-2436-01	30179165022	RADC28966	Soil	HSL-300	REG	U-235/236	U, J1+, B+, UJ,	UJ
C003-SB006-2436-01	30179165022	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB007-1224-01	30179165023	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C003-SB007-1224-01	30179165023	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB007-1224-01	30179165023	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB007-1224-01	30179165023	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB007-1224-01	30179165023	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB007-1224-01	30179165023	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB007-1224-01	30179165023	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB007-1224-01	30179165023	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB007-1224-01	30179165023	RADC28966	Soil	HSL-300	REG	U-235/236	J, J1+, B+, J,	J
C003-SB007-1224-01	30179165023	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB007-2436-01	30179165024	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB007-2436-01	30179165024	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB007-2436-01	30179165024	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB007-2436-01	30179165024	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C003-SB007-2436-01	30179165024	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB007-2436-01	30179165024	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB007-2436-01	30179165024	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB007-2436-01	30179165024	RADC28966	Soil	HSL-300	REG	U-235/236	U, J1+, B+, UJ,	UJ
C003-SB007-2436-01	30179165024	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB007-2436-02	30179165025	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB007-2436-02	30179165025	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB007-2436-02	30179165025	RADC28962	Soil	EPA 901.1	REG	Uranium-235	U,	U
C003-SB007-2436-02	30179165025	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB007-2436-02	30179165025	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB007-2436-02	30179165025	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB007-2436-02	30179165025	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB007-2436-02	30179165025	RADC28966	Soil	HSL-300	REG	U-235/236	J1+, B+, J,	J
C003-SB007-2436-02	30179165025	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB008-2436-01	30179165026	RADC28964	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C003-SB008-2436-01	30179165026	RADC28964	Soil	EPA 901.1	REG	Thallium-208	J,	J
C003-SB008-2436-01	30179165026	RADC28964	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB008-2436-01	30179165026	RADC28964	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB008-2436-01	30179165026	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB008-2436-01	30179165026	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB008-2436-01	30179165026	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB008-2436-01	30179165026	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB008-2436-01	30179165026	RADC28966	Soil	HSL-300	REG	U-235/236	J, J1+, B+, J,	J
C003-SB008-2436-01	30179165026	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB008-3648-01	30179165027	RADC28964	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C003-SB008-3648-01	30179165027	RADC28964	Soil	EPA 901.1	REG	Thorium-234	J,	J
C003-SB008-3648-01	30179165027	RADC28964	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB008-3648-01	30179165027	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB008-3648-01	30179165027	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB008-3648-01	30179165027	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB008-3648-01	30179165027	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C003-SB008-3648-01	30179165027	RADC28966	Soil	HSL-300	REG	U-235/236	J1+, B+, J,	J
C003-SB008-3648-01	30179165027	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB009-2436-01	30179165028	RADC28962	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB009-2436-01	30179165028	RADC28962	Soil	EPA 901.1	REG	Lead-210	U,	U
C003-SB009-2436-01	30179165028	RADC28962	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB009-2436-01	30179165028	RADC28962	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB009-2436-01	30179165028	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB009-2436-01	30179165028	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB009-2436-01	30179165028	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB009-2436-01	30179165028	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB009-2436-01	30179165028	RADC28966	Soil	HSL-300	REG	U-235/236	J, J1+, B+, J,	J
C003-SB009-2436-01	30179165028	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB009-3648-01	30179165029	RADC28963	Soil	EPA 901.1	REG	Lead-210	J, J1+, B+,	J
C003-SB009-3648-01	30179165029	RADC28963	Soil	EPA 901.1	REG	Thorium-234	J,	J
C003-SB009-3648-01	30179165029	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB009-3648-01	30179165029	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB009-3648-01	30179165029	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB009-3648-01	30179165029	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB009-3648-01	30179165029	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB009-3648-01	30179165029	RADC28966	Soil	HSL-300	REG	U-235/236	J1+, B+, J,	J
C003-SB009-3648-01	30179165029	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB010-2436-01	30179165030	RADC28963	Soil	EPA 901.1	REG	Thallium-208	U,	U
C003-SB010-2436-01	30179165030	RADC28963	Soil	EPA 901.1	REG	Thorium-234	J,	J
C003-SB010-2436-01	30179165030	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB010-2436-01	30179165030	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB010-2436-01	30179165030	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB010-2436-01	30179165030	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB010-2436-01	30179165030	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB010-2436-01	30179165030	RADC28966	Soil	HSL-300	REG	U-235/236	J, J1+, B+, J,	J
C003-SB010-2436-01	30179165030	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB010-3648-01	30179165031	RADC28963	Soil	EPA 901.1	REG	Bismuth-212	U,	U

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C003-SB010-3648-01	30179165031	RADC28963	Soil	EPA 901.1	REG	Lead-212	U,	U
C003-SB010-3648-01	30179165031	RADC28963	Soil	EPA 901.1	REG	Potassium-40	J,	J
C003-SB010-3648-01	30179165031	RADC28963	Soil	EPA 901.1	REG	Radium-228	U,	U
C003-SB010-3648-01	30179165031	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB010-3648-01	30179165031	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB010-3648-01	30179165031	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB010-3648-01	30179165031	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB010-3648-01	30179165031	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB010-3648-01	30179165031	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB010-3648-01	30179165031	RADC28966	Soil	HSL-300	REG	U-235/236	J1+, B+, J,	J
C003-SB010-3648-01	30179165031	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB010-4860-01	30179165032	RADC28963	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB010-4860-01	30179165032	RADC28963	Soil	EPA 901.1	REG	Lead-212	U,	U
C003-SB010-4860-01	30179165032	RADC28963	Soil	EPA 901.1	REG	Radium-228	U, J1+, B+,	UJ
C003-SB010-4860-01	30179165032	RADC28963	Soil	EPA 901.1	REG	Thallium-208	U,	U
C003-SB010-4860-01	30179165032	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB010-4860-01	30179165032	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB010-4860-01	30179165032	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB010-4860-01	30179165032	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB010-4860-01	30179165032	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB010-4860-01	30179165032	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB010-4860-01	30179165032	RADC28966	Soil	HSL-300	REG	U-235/236	J1+, B+, J,	J
C003-SB010-4860-01	30179165032	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB011-1224-01	30179165033	RADC28963	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C003-SB011-1224-01	30179165033	RADC28963	Soil	EPA 901.1	REG	Lead-210	J1+, B+,	J
C003-SB011-1224-01	30179165033	RADC28963	Soil	EPA 901.1	REG	Radium-228	J,	J
C003-SB011-1224-01	30179165033	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB011-1224-01	30179165033	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB011-1224-01	30179165033	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB011-1224-01	30179165033	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB011-1224-01	30179165033	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C003-SB011-1224-01	30179165033	RADC28966	Soil	HSL-300	REG	U-233/234	J1+, B+, J,	J
C003-SB011-1224-01	30179165033	RADC28966	Soil	HSL-300	REG	U-235/236	J, J1+, B+, J,	J
C003-SB011-1224-01	30179165033	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB011-2436-01	30179165034	RADC28963	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB011-2436-01	30179165034	RADC28963	Soil	EPA 901.1	REG	Lead-210	U, J1+, B+,	UJ
C003-SB011-2436-01	30179165034	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB011-2436-01	30179165034	RADC28963	Soil	EPA 901.1	REG	Uranium-235	U, R,	R
C003-SB011-2436-01	30179165034	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB011-2436-01	30179165034	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB011-2436-01	30179165034	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB011-2436-01	30179165034	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB011-2436-01	30179165034	RADC28966	Soil	HSL-300	REG	U-235/236	U, J1+, B+, UJ,	UJ
C003-SB011-2436-01	30179165034	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB012-1224-01	30179165035	RADC28963	Soil	EPA 901.1	REG	Lead-210	J1+, B+,	J
C003-SB012-1224-01	30179165035	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB012-1224-01	30179165035	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB012-1224-01	30179165035	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB012-1224-01	30179165035	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB012-1224-01	30179165035	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB012-1224-01	30179165035	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB012-1224-01	30179165035	RADC28966	Soil	HSL-300	REG	U-235/236	J, J1+, B+, J,	J
C003-SB012-1224-01	30179165035	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB012-2436-01	30179165036	RADC28963	Soil	EPA 901.1	REG	Lead-212	U,	U
C003-SB012-2436-01	30179165036	RADC28963	Soil	EPA 901.1	REG	Thallium-208	U,	U
C003-SB012-2436-01	30179165036	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB012-2436-01	30179165036	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB012-2436-01	30179165036	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB012-2436-01	30179165036	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB012-2436-01	30179165036	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB012-2436-01	30179165036	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB012-2436-01	30179165036	RADC28966	Soil	HSL-300	REG	U-235/236	J, J1+, B+, J,	J

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C003-SB012-2436-01	30179165036	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB012-3648-01	30179165037	RADC28963	Soil	EPA 901.1	REG	Lead-212	J,	J
C003-SB012-3648-01	30179165037	RADC28963	Soil	EPA 901.1	REG	Radium-228	J,	J
C003-SB012-3648-01	30179165037	RADC28963	Soil	EPA 901.1	REG	Thallium-208	J,	J
C003-SB012-3648-01	30179165037	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB012-3648-01	30179165037	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB012-3648-01	30179165037	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB012-3648-01	30179165037	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB012-3648-01	30179165037	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB012-3648-01	30179165037	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB012-3648-01	30179165037	RADC28966	Soil	HSL-300	REG	U-235/236	J1+, B+, J,	J
C003-SB012-3648-01	30179165037	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB013-2436-01	30179165038	RADC28963	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C003-SB013-2436-01	30179165038	RADC28963	Soil	EPA 901.1	REG	Lead-210	U, J1+, B+,	UJ
C003-SB013-2436-01	30179165038	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB013-2436-01	30179165038	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB013-2436-01	30179165038	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB013-2436-01	30179165038	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB013-2436-01	30179165038	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB013-2436-01	30179165038	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB013-2436-01	30179165038	RADC28966	Soil	HSL-300	REG	U-235/236	J1+, B+, J,	J
C003-SB013-2436-01	30179165038	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB013-2436-02	30179165039	RADC28963	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB013-2436-02	30179165039	RADC28963	Soil	EPA 901.1	REG	Lead-210	J, J1+, B+,	J
C003-SB013-2436-02	30179165039	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB013-2436-02	30179165039	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB013-2436-02	30179165039	RADC28966	Soil	HSL-300	REG	Thorium-228	J,	J
C003-SB013-2436-02	30179165039	RADC28966	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB013-2436-02	30179165039	RADC28966	Soil	HSL-300	REG	Thorium-232	J,	J
C003-SB013-2436-02	30179165039	RADC28966	Soil	HSL-300	REG	U-233/234	J,	J
C003-SB013-2436-02	30179165039	RADC28966	Soil	HSL-300	REG	U-235/236	J, J1+, B+, J,	J

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C003-SB013-2436-02	30179165039	RADC28966	Soil	HSL-300	REG	Uranium-238	J,	J
C003-SB013-3648-01	30179165040	RADC28963	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB013-3648-01	30179165040	RADC28963	Soil	EPA 901.1	REG	Lead-212	U,	U
C003-SB013-3648-01	30179165040	RADC28963	Soil	EPA 901.1	REG	Radium-228	U, J1+, B+,	UJ
C003-SB013-3648-01	30179165040	RADC28963	Soil	EPA 901.1	REG	Thallium-208	U,	U
C003-SB013-3648-01	30179165040	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB013-3648-01	30179165040	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB013-3648-01	30179165040	RADC28967	Soil	HSL-300	REG	Thorium-228	J1+, B+,	J
C003-SB013-3648-01	30179165040	RADC28967	Soil	HSL-300	Soil	U-235/236	U,	U
C003-SB014-1224-01	30179165043	RADC28963	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB014-1224-01	30179165043	RADC28963	Soil	EPA 901.1	REG	Lead-210	J1+, B+,	J
C003-SB014-1224-01	30179165043	RADC28963	Soil	EPA 901.1	REG	Radium-228	J,	J
C003-SB014-1224-01	30179165043	RADC28963	Soil	EPA 901.1	REG	Thallium-208	J,	J
C003-SB014-1224-01	30179165043	RADC28963	Soil	EPA 901.1	REG	Thorium-234	J,	J
C003-SB014-1224-01	30179165043	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB014-1224-01	30179165043	RADC28967	Soil	HSL-300	REG	Thorium-228	J, J1+, B+,	J
C003-SB014-1224-01	30179165043	RADC28967	Soil	HSL-300	Soil	U-235/236	U,	U
C003-SB014-2436-01	30179165044	RADC28963	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C003-SB014-2436-01	30179165044	RADC28963	Soil	EPA 901.1	REG	Thallium-208	U,	U
C003-SB014-2436-01	30179165044	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB014-2436-01	30179165044	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB014-2436-01	30179165044	RADC28967	Soil	HSL-300	Soil	U-235/236	J,	J
C003-SB014-3648-01	30179165045	RADC28963	Soil	EPA 901.1	REG	Lead-210	J1+, B+,	J
C003-SB014-3648-01	30179165045	RADC28963	Soil	EPA 901.1	REG	Thorium-234	J,	J
C003-SB014-3648-01	30179165045	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB014-3648-01	30179165045	RADC28967	Soil	HSL-300	REG	Thorium-228	J1+, B+,	J
C003-SB015-1224-01	30179165046	RADC28963	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C003-SB015-1224-01	30179165046	RADC28963	Soil	EPA 901.1	REG	Lead-210	U, J1+, B+,	UJ
C003-SB015-1224-01	30179165046	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB015-1224-01	30179165046	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB015-1224-01	30179165046	RADC28967	Soil	HSL-300	Soil	U-235/236	U,	U

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C003-SB015-3648-01	30179165047	RADC28963	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C003-SB015-3648-01	30179165047	RADC28963	Soil	EPA 901.1	REG	Lead-210	J1+, B+,	J
C003-SB015-3648-01	30179165047	RADC28963	Soil	EPA 901.1	REG	Radium-228	U, J1+, B+,	UJ
C003-SB015-3648-01	30179165047	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB015-3648-01	30179165047	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB015-3648-01	30179165047	RADC28967	Soil	HSL-300	REG	Thorium-228	J1+, B+,	J
C003-SB015-3648-01	30179165047	RADC28967	Soil	HSL-300	Soil	U-235/236	J,	J
C003-SB016-1224-01	30179165048	RADC28963	Soil	EPA 901.1	REG	Lead-210	U, J1+, B+,	UJ
C003-SB016-1224-01	30179165048	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB016-1224-01	30179165048	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C003-SB016-1224-01	30179165048	RADC28967	Soil	HSL-300	Soil	U-235/236	J,	J
C003-SB016-2436-01	30179165049	RADC28963	Soil	EPA 901.1	REG	Lead-210	U, J1+, B+,	UJ
C003-SB016-2436-01	30179165049	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C003-SB016-2436-01	30179165049	RADC28963	Soil	EPA 901.1	REG	Uranium-235	U,	U
C003-SB016-2436-01	30179165049	RADC28967	Soil	HSL-300	REG	Thorium-230	J,	J
C003-SB016-2436-01	30179165049	RADC28967	Soil	HSL-300	Soil	U-235/236	U,	U
C004-SB001-0012-01	30179165050	RADC28963	Soil	EPA 901.1	REG	Lead-210	U, J1+, B+,	UJ
C004-SB001-0012-01	30179165050	RADC28963	Soil	EPA 901.1	REG	Thorium-234	U,	U
C004-SB001-0012-01	30179165050	RADC28963	Soil	EPA 901.1	REG	Uranium-235	R,	R
C004-SB001-0012-01	30179165050	RADC28967	Soil	HSL-300	REG	Thorium-228	J1+, B+,	J
C004-SB001-0012-01	30179165050	RADC28967	Soil	HSL-300	Soil	U-235/236	U,	U
C004-SB001-1224-01	30179165051	RADC29068	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C004-SB001-1224-01	30179165051	RADC29068	Soil	EPA 901.1	REG	Lead-210	J,	J
C004-SB001-1224-01	30179165051	RADC29068	Soil	EPA 901.1	REG	Thorium-234	U,	U
C004-SB001-1224-01	30179165051	RADC29068	Soil	EPA 901.1	REG	Uranium-235	R,	R
C004-SB001-2436-01	30179165052	RADC29068	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C004-SB001-2436-01	30179165052	RADC29068	Soil	EPA 901.1	REG	Lead-210	U,	U
C004-SB001-2436-01	30179165052	RADC29068	Soil	EPA 901.1	REG	Thorium-234	J,	J
C004-SB001-2436-01	30179165052	RADC29068	Soil	EPA 901.1	REG	Uranium-235	R,	R
C004-SB001-2436-01	30179165052	RADC28967	Soil	HSL-300	Soil	U-235/236	U,	U
C004-SB001-3648-01	30179165053	RADC29068	Soil	EPA 901.1	REG	Lead-210	U,	U

Client ID	Internal ID	Batch	Matrix	Method	Sample Type	Isotope	Intermediate Qualifier	Final Qualifiers
C004-SB001-3648-01	30179165053	RADC29068	Soil	EPA 901.1	REG	Thorium-234	U,	U
C004-SB001-3648-01	30179165053	RADC29068	Soil	EPA 901.1	REG	Uranium-235	U, R,	R
C004-SB001-3648-01	30179165053	RADC28967	Soil	HSL-300	Soil	U-235/236	J,	J
C004-SB001-3648-02	30179165054	RADC29068	Soil	EPA 901.1	REG	Bismuth-212	J,	J
C004-SB001-3648-02	30179165054	RADC29068	Soil	EPA 901.1	REG	Lead-210	U,	U
C004-SB001-3648-02	30179165054	RADC29068	Soil	EPA 901.1	REG	Thorium-234	U,	U
C004-SB001-3648-02	30179165054	RADC29068	Soil	EPA 901.1	REG	Uranium-235	R,	R
C004-SB001-3648-02	30179165054	RADC28967	Soil	HSL-300	Soil	U-235/236	J,	J
C004-SB001-7284-01	30179165055	RADC29068	Soil	EPA 901.1	REG	Lead-210	U,	U
C004-SB001-7284-01	30179165055	RADC29068	Soil	EPA 901.1	REG	Thorium-234	U,	U
C004-SB001-7284-01	30179165055	RADC29068	Soil	EPA 901.1	REG	Uranium-235	J, R,	R
C004-SB001-7284-01	30179165055	RADC28967	Soil	HSL-300	REG	Thorium-228	J1+, B+,	J
C004-SB001-7284-01	30179165055	RADC28967	Soil	HSL-300	Soil	U-235/236	U,	U
C004-SB001-8496-01	30179165056	RADC29068	Soil	EPA 901.1	REG	Bismuth-212	U,	U
C004-SB001-8496-01	30179165056	RADC29068	Soil	EPA 901.1	REG	Lead-210	U,	U
C004-SB001-8496-01	30179165056	RADC29068	Soil	EPA 901.1	REG	Thallium-208	J,	J
C004-SB001-8496-01	30179165056	RADC29068	Soil	EPA 901.1	REG	Thorium-234	U,	U
C004-SB001-8496-01	30179165056	RADC29068	Soil	EPA 901.1	REG	Uranium-235	R,	R
C004-SB001-8496-01	30179165056	RADC28967	Soil	HSL-300	Soil	U-235/236	U,	U
RB-040516	30179165059	RADC29125	Water	EPA 904.0	REG	Radium-228	J, J1+, B+,	J
RB-040516	30179165059	RADC28888	Water	HSL-300	REG	Thorium-228	J,	J
RB-040516	30179165059	RADC28888	Water	HSL-300	REG	Thorium-230	J1+, B+,	J
RB-040516	30179165059	RADC28888	Water	HSL-300	REG	Thorium-232	J,	J
RB-040516	30179165059	RADC28888	Water	HSL-300	REG	Uranium-238	U, J1+, B+,	UJ
RB-040616	30179165060	RADC29121	Water	EPA 903.1	REG	Radium-226	U,	U
RB-040616	30179165060	RADC29125	Water	EPA 904.0	REG	Radium-228	J, J1+, B+,	J
RB-040616	30179165060	RADC28888	Water	HSL-300	REG	Thorium-230	J, J1+, B+,	J
RB-040616	30179165060	RADC28888	Water	HSL-300	REG	Thorium-232	J,	J
RB-040616	30179165060	RADC28888	Water	HSL-300	REG	Uranium-238	U, J1+, B+,	UJ

B. Detection Capability (MARLAP 8.5.3.2)

If the project requires a certain detection capability, the requirement should be expressed as a required minimum detectable concentration (RMDC). A failure to meet the RMDC is more often an important issue when the analyte is not detected.

The RMDC is usually specified in the QAPP and is compared to the sample-specific MDC achieved by the method. Required detection limits are provided in the QAPP. Samples are qualified "UJ" where no activity was detected in a sample but the required detection limit was not attained.

Discussion

In practice the required MDC was sufficiently high that the actual detection limit was well below the required detection limit.

C. Large or Unusual Uncertainty (MARLAP 8.5.3.3)

The reported combined standard uncertainty is compared to the maximum allowable standard uncertainty. Either absolute (in concentration units) or relative uncertainties (expressed as a percent) are used in the comparison, depending on the reported concentration.

Discussion

No specific requirement in the project QAPP was recognized for qualifying results based on maximum allowable uncertainty. Samples were assigned an intermediate qualifier 'Q' if the sample result was not statistically distinguishable from zero based on a one-tailed 95% confidence bound. In practice these samples tended to receive either a J or a U final data qualifier, depending upon whether the nominal critical level was exceeded.

Samples were qualified as '***J***' if activity was found in the blank and the sample result was less than 5 times the result in the blank, or if there was some other reason to conclude that the analytical result was biased high and more uncertain than usual. The "other reason" may be surmised from the intermediate data qualifiers that were assigned to the result in nearly every instance.

8. SUMMARY OF DATA USABILITY

There were a total of 796 radionuclide results for the field samples in this data package.. The meaning of each qualifier is described in section 3 of this report. The count of each final qualifier type for field samples is provided in the following table.

Table of the number of each of the various final data qualifiers.

Final Qualifiers	Number of Occurrences
	419
J	206
R	52
U	103
UJ	16

The distribution of qualifiers among field samples is further broken down in the following table.

Table of counts of various qualifiers by counting technique

Method	Description	Final Qualifiers	Number of Occurrences
EPA 901.1	Gamma Spectroscopy		262
EPA 901.1	Gamma Spectroscopy	J	52
EPA 901.1	Gamma Spectroscopy	R	52
EPA 901.1	Gamma Spectroscopy	U	91
EPA 901.1	Gamma Spectroscopy	UJ	11
EPA 903.1	Radium-226 in Drinking Water		1
EPA 903.1	Radium-226 in Drinking Water	U	1
EPA 904.0	Radium-228 in Drinking Water	J	2
HSL-300	Alpha Spectroscopy		156
HSL-300	Alpha Spectroscopy	J	152
HSL-300	Alpha Spectroscopy	U	11
HSL-300	Alpha Spectroscopy	UJ	5

9. REFERENCES

SITE-SPECIFIC UFP QUALITY ASSURANCE PROJECT PLAN CANADIAN RADIUM AND URANIUM CORPORATION SITE, MOUNT KISCO, WESTCHESTER COUNTY, NEW YORK, DC No.: RST3-02-D-0010, TDD No.: TO-0006-0053. July 2015.

Multi-Agency Radiological Laboratory Analytical Protocols Manual, Volume I, NUREG-1576, EPA 402-B-04-001A, NTIS PB2004-105421, July 2004.

10. APPENDED DOCUMENTS

- Consolidated table of analytical results with qualifiers (24 pages).
- Radiological Data Verification/Validation Checklist (2 pages).

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
C002-SB001-1224-01 / 30179165001									
	EPA 901.1	Bismuth-212	Soil	0.745	1.274	1.275	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	7.903	13.005	15.7	J,	J	pCi/g
	EPA 901.1	Lead-212	Soil	0.693	0.16	0.163			pCi/g
	EPA 901.1	Potassium-40	Soil	11.609	2.179	0.941			pCi/g
	EPA 901.1	Radium-226	Soil	5.624	0.803	0.175			pCi/g
	EPA 901.1	Radium-228	Soil	0.921	0.279	0.325			pCi/g
	EPA 901.1	Thallium-208	Soil	0.295	0.098	0.077			pCi/g
	EPA 901.1	Thorium-234	Soil	0	0.991	4.05	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.284	0.145	0.157	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.65	0.334	0.362			pCi/g
	HSL-300	Thorium-230	Soil	1.89	0.579	0.199			pCi/g
	HSL-300	Thorium-232	Soil	0.812	0.35	0.167			pCi/g
	HSL-300	U-233/234	Soil	0.519	0.187	0.107			pCi/g
	HSL-300	U-235/236	Soil	0.067	0.072	0.089	J, J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.594	0.201	0.091			pCi/g
C002-SB001-2436-01 / 30179165002									
	EPA 901.1	Bismuth-212	Soil	1.821	6.026	5.993	U, J1+, B+,	UJ	pCi/g
	EPA 901.1	Lead-210	Soil	120.52	77.6	93.33			pCi/g
	EPA 901.1	Lead-212	Soil	1.127	0.564	0.864			pCi/g
	EPA 901.1	Potassium-40	Soil	10.158	6.089	5.052			pCi/g
	EPA 901.1	Radium-226	Soil	89.391	11.931	1.026			pCi/g
	EPA 901.1	Radium-228	Soil	0.518	1.642	1.598	U,	U	pCi/g
	EPA 901.1	Thallium-208	Soil	0	0.328	0.582	U, J1+, B+,	UJ	pCi/g
	EPA 901.1	Thorium-234	Soil	3.66	5.035	22.61	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	6.563	1.291	0.884	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.17	0.501	0.417			pCi/g
	HSL-300	Thorium-230	Soil	10.3	2.09	0.287			pCi/g
	HSL-300	Thorium-232	Soil	1.29	0.509	0.256			pCi/g
	HSL-300	U-233/234	Soil	0.74	0.273	0.149			pCi/g
	HSL-300	U-235/236	Soil	0.08	0.097	0.134	J, J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.915	0.312	0.17			pCi/g
C002-SB001-3648-01 / 30179165003									

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Bismuth-212	Soil	1.551	1.686	1.814	J, J1+, B+,	J	pCi/g
	EPA 901.1	Lead-210	Soil	5.782	2.996	3.591	J1+, B+,	J	pCi/g
	EPA 901.1	Lead-212	Soil	1.095	0.276	0.27			pCi/g
	EPA 901.1	Potassium-40	Soil	11.212	3.006	1.838			pCi/g
	EPA 901.1	Radium-226	Soil	2.207	0.386	0.189			pCi/g
	EPA 901.1	Radium-228	Soil	0.948	0.496	0.857			pCi/g
	EPA 901.1	Thallium-208	Soil	0.535	0.159	0.105			pCi/g
	EPA 901.1	Thorium-234	Soil	1.215	1.415	3.159	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.292	0.136	0.154	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.34	0.579	0.624			pCi/g
	HSL-300	Thorium-230	Soil	0.598	0.338	0.224			pCi/g
	HSL-300	Thorium-232	Soil	1.1	0.468	0.122			pCi/g
	HSL-300	U-233/234	Soil	0.37	0.194	0.151			pCi/g
	HSL-300	U-235/236	Soil	0.082	0.107	0.148	J, J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.604	0.255	0.165			pCi/g
C002-SB002-4860-01 / 30179165004									
	EPA 901.1	Bismuth-212	Soil	1.842	2.635	2.85	J, J1+, B+,	J	pCi/g
	EPA 901.1	Lead-210	Soil	14.252	5.308	5.881	J1+, B+,	J	pCi/g
	EPA 901.1	Lead-212	Soil	1.335	0.355	0.398			pCi/g
	EPA 901.1	Potassium-40	Soil	8.462	3.884	3.329			pCi/g
	EPA 901.1	Radium-226	Soil	12.829	1.827	0.342			pCi/g
	EPA 901.1	Radium-228	Soil	1.69	0.558	0.425			pCi/g
	EPA 901.1	Thallium-208	Soil	0.645	0.239	0.201			pCi/g
	EPA 901.1	Thorium-234	Soil	0.206	3.935	4.973	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.902	0.297	0.292	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.06	0.561	0.613	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	2.02	0.749	0.291	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.805	0.452	0.346	J,	J	pCi/g
	HSL-300	U-233/234	Soil	1.02	0.355	0.176			pCi/g
	HSL-300	U-235/236	Soil	0.119	0.126	0.158	J, J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.909	0.334	0.201			pCi/g
C002-SB002-6072-01 / 30179165005									
	EPA 901.1	Bismuth-212	Soil	2.365	2.212	2.308			pCi/g
	EPA 901.1	Lead-210	Soil	3.558	5.406	6.84	J,	J	pCi/g
	EPA 901.1	Lead-212	Soil	1.503	0.347	0.318			pCi/g
	EPA 901.1	Potassium-40	Soil	12.566	3.845	2.763			pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Radium-226	Soil	8.709	1.299	0.314			pCi/g
	EPA 901.1	Radium-228	Soil	1.788	0.581	0.594			pCi/g
	EPA 901.1	Thallium-208	Soil	0.626	0.215	0.169			pCi/g
	EPA 901.1	Thorium-234	Soil	0.998	3.437	4.33	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.668	0.284	0.29	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.5	0.687	0.727	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	0.852	0.472	0.378	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	1.36	0.598	0.161	J,	J	pCi/g
	HSL-300	U-233/234	Soil	1.03	0.237	0.073			pCi/g
	HSL-300	U-235/236	Soil	0.037	0.046	0.067	J, J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.875	0.211	0.058			pCi/g
C002-SB003-2436-01 / 30179165006									
	EPA 901.1	Bismuth-212	Soil	1.078	0.732	1.007			pCi/g
	EPA 901.1	Lead-210	Soil	1.561	10.873	13.82	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.636	0.145	0.12			pCi/g
	EPA 901.1	Potassium-40	Soil	13.028	2.489	1.015			pCi/g
	EPA 901.1	Radium-226	Soil	0.947	0.213	0.168			pCi/g
	EPA 901.1	Radium-228	Soil	0.686	0.255	0.195	J1+, B+,	J	pCi/g
	EPA 901.1	Thallium-208	Soil	0.195	0.066	0.052			pCi/g
	EPA 901.1	Thorium-234	Soil	0.466	2.708	3.401	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.107	0.125	0.113	J, R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.741	0.405	0.443			pCi/g
	HSL-300	Thorium-230	Soil	0.683	0.363	0.261			pCi/g
	HSL-300	Thorium-232	Soil	0.352	0.25	0.119			pCi/g
	HSL-300	U-233/234	Soil	0.551	0.225	0.138			pCi/g
	HSL-300	U-235/236	Soil	0.045	0.092	0.128	J, J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.406	0.188	0.098			pCi/g
C002-SB003-3648-01 / 30179165007									
	EPA 901.1	Bismuth-212	Soil	3.637	4.258	4.42	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	51.323	13.99	13.26			pCi/g
	EPA 901.1	Lead-212	Soil	0.907	0.413	0.621			pCi/g
	EPA 901.1	Potassium-40	Soil	19.625	4.97	3.069			pCi/g
	EPA 901.1	Radium-226	Soil	60.495	8.113	0.824			pCi/g
	EPA 901.1	Radium-228	Soil	1.293	1.371	1.374	J,	J	pCi/g
	EPA 901.1	Thallium-208	Soil	0.414	0.246	0.29			pCi/g
	EPA 901.1	Thorium-234	Soil	0.651	6.709	8.284	U,	U	pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Uranium-235	Soil	4.294	0.827	0.593	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.954	0.469	0.499			pCi/g
	HSL-300	Thorium-230	Soil	44.8	7.63	0.121			pCi/g
	HSL-300	Thorium-232	Soil	0.847	0.404	0.121			pCi/g
	HSL-300	U-233/234	Soil	1.03	0.309	0.125			pCi/g
	HSL-300	U-235/236	Soil	0.09	0.089	0.061	J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	1.2	0.339	0.047			pCi/g
C003-SB001-1224-01 / 30179165008									
	EPA 901.1	Bismuth-212	Soil	0.43	1.58	1.636	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	0	4.361	21.56	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.861	0.197	0.178			pCi/g
	EPA 901.1	Potassium-40	Soil	12.818	2.594	1.235			pCi/g
	EPA 901.1	Radium-226	Soil	1.289	0.24	0.167			pCi/g
	EPA 901.1	Radium-228	Soil	0.915	0.336	0.274			pCi/g
	EPA 901.1	Thallium-208	Soil	0.267	0.094	0.076			pCi/g
	EPA 901.1	Thorium-234	Soil	1.161	1.121	4.205	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.107	0.104	0.122	J, R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.925	0.396	0.35			pCi/g
	HSL-300	Thorium-230	Soil	0.902	0.369	0.09			pCi/g
	HSL-300	Thorium-232	Soil	0.334	0.214	0.09			pCi/g
	HSL-300	U-233/234	Soil	0.435	0.166	0.038			pCi/g
	HSL-300	U-235/236	Soil	0.106	0.088	0.049	J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.415	0.163	0.07			pCi/g
C003-SB001-2436-01 / 30179165009									
	EPA 901.1	Bismuth-212	Soil	0.285	2.132	2.403	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	1.976	3.342	4.262	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.943	0.226	0.209			pCi/g
	EPA 901.1	Potassium-40	Soil	13.81	2.86	1.014			pCi/g
	EPA 901.1	Radium-226	Soil	3.393	0.553	0.233			pCi/g
	EPA 901.1	Radium-228	Soil	1.311	0.397	0.194			pCi/g
	EPA 901.1	Thallium-208	Soil	0.4	0.122	0.083			pCi/g
	EPA 901.1	Thorium-234	Soil	0	1.148	3.257	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.345	0.151	0.159	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.715	0.356	0.324			pCi/g
	HSL-300	Thorium-230	Soil	0.633	0.319	0.185			pCi/g
	HSL-300	Thorium-232	Soil	0.629	0.315	0.1			pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	HSL-300	U-233/234	Soil	0.458	0.217	0.116			pCi/g
	HSL-300	U-235/236	Soil	0.053	0.109	0.151	J, J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.523	0.235	0.138			pCi/g
C003-SB002-2436-01 / 30179165012									
	EPA 901.1	Bismuth-212	Soil	0.858	1.244	1.256	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	2.336	12.72	16.02	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.997	0.21	0.181			pCi/g
	EPA 901.1	Potassium-40	Soil	14.618	2.534	0.651			pCi/g
	EPA 901.1	Radium-226	Soil	0.668	0.164	0.139			pCi/g
	EPA 901.1	Radium-228	Soil	1.224	0.297	0.14			pCi/g
	EPA 901.1	Thallium-208	Soil	0.384	0.111	0.077			pCi/g
	EPA 901.1	Thorium-234	Soil	0.642	2.61	3.28	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.013	0.088	0.109	U,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.09	0.457	0.454			pCi/g
	HSL-300	Thorium-230	Soil	0.257	0.202	0.235			pCi/g
	HSL-300	Thorium-232	Soil	0.756	0.347	0.22			pCi/g
	HSL-300	U-233/234	Soil	0.615	0.171	0.081			pCi/g
	HSL-300	U-235/236	Soil	0.097	0.074	0.092	J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.546	0.157	0.057			pCi/g
C003-SB002-3648-01 / 30179165013									
	EPA 901.1	Bismuth-212	Soil	2.33	2.817	2.768	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	60.996	41.09	48.33			pCi/g
	EPA 901.1	Lead-212	Soil	0.841	0.335	0.485			pCi/g
	EPA 901.1	Potassium-40	Soil	11.657	2.492	1.156			pCi/g
	EPA 901.1	Radium-226	Soil	29.964	4.05	0.497			pCi/g
	EPA 901.1	Radium-228	Soil	1.24	0.883	0.862			pCi/g
	EPA 901.1	Thallium-208	Soil	0.216	0.25	0.26	J,	J	pCi/g
	EPA 901.1	Thorium-234	Soil	1.587	9.519	11.57	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	1.88	0.464	0.415	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.704	0.305	0.279			pCi/g
	HSL-300	Thorium-230	Soil	10.2	1.9	0.153			pCi/g
	HSL-300	Thorium-232	Soil	0.845	0.32	0.129			pCi/g
	HSL-300	U-233/234	Soil	0.564	0.24	0.157			pCi/g
	HSL-300	U-235/236	Soil	0.057	0.102	0.077	J, J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.304	0.173	0.157			pCi/g
C003-SB003-2436-01 / 30179165014									

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Bismuth-212	Soil	1.582	1.132	1.061			pCi/g
	EPA 901.1	Lead-210	Soil	-2.011	13.632	17.27	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.892	0.204	0.189			pCi/g
	EPA 901.1	Potassium-40	Soil	14.779	2.696	0.925			pCi/g
	EPA 901.1	Radium-226	Soil	0.855	0.204	0.104			pCi/g
	EPA 901.1	Radium-228	Soil	0.721	0.377	0.457			pCi/g
	EPA 901.1	Thallium-208	Soil	0.471	0.105	0.038			pCi/g
	EPA 901.1	Thorium-234	Soil	0.626	2.884	3.64	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.129	0.109	0.112	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.54	0.619	0.418			pCi/g
	HSL-300	Thorium-230	Soil	0.346	0.272	0.255			pCi/g
	HSL-300	Thorium-232	Soil	1.43	0.577	0.139			pCi/g
	HSL-300	U-233/234	Soil	0.632	0.211	0.157			pCi/g
	HSL-300	U-235/236	Soil	0.103	0.083	0.045	J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.746	0.223	0.069			pCi/g
C003-SB003-3648-01 / 30179165015									
	EPA 901.1	Bismuth-212	Soil	-0.533	2.354	2.472	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	8.169	20.834	26.1	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.729	0.226	0.251			pCi/g
	EPA 901.1	Potassium-40	Soil	5.763	1.604	0.756			pCi/g
	EPA 901.1	Radium-226	Soil	2.108	0.436	0.23			pCi/g
	EPA 901.1	Radium-228	Soil	1.019	0.36	0.389			pCi/g
	EPA 901.1	Thallium-208	Soil	0.146	0.176	0.189	J,	J	pCi/g
	EPA 901.1	Thorium-234	Soil	1.144	4.054	5.165	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.106	0.157	0.191	J, R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.525	0.247	0.241			pCi/g
	HSL-300	Thorium-230	Soil	0.639	0.257	0.062			pCi/g
	HSL-300	Thorium-232	Soil	0.548	0.236	0.062			pCi/g
	HSL-300	U-233/234	Soil	0.577	0.209	0.094			pCi/g
	HSL-300	U-235/236	Soil	0.041	0.074	0.056	J, J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.612	0.216	0.079			pCi/g
C003-SB004-2436-01 / 30179165016									
	EPA 901.1	Bismuth-212	Soil	2.478	1.245	1.095			pCi/g
	EPA 901.1	Lead-210	Soil	2.978	4.262	5.379	J,	J	pCi/g
	EPA 901.1	Lead-212	Soil	0.964	0.254	0.271			pCi/g
	EPA 901.1	Potassium-40	Soil	15.18	3.144	1.114			pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Radium-226	Soil	6.679	1.031	0.235			pCi/g
	EPA 901.1	Radium-228	Soil	1.971	0.53	0.213			pCi/g
	EPA 901.1	Thallium-208	Soil	0.414	0.137	0.112			pCi/g
	EPA 901.1	Thorium-234	Soil	0	1.573	3.737	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.506	0.21	0.225	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.12	0.533	0.538			pCi/g
	HSL-300	Thorium-230	Soil	1.47	0.585	0.296			pCi/g
	HSL-300	Thorium-232	Soil	0.586	0.352	0.249			pCi/g
	HSL-300	U-233/234	Soil	0.644	0.182	0.097			pCi/g
	HSL-300	U-235/236	Soil	0.083	0.063	0.032	J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.693	0.19	0.097			pCi/g
C003-SB004-3648-01 / 30179165017									
	EPA 901.1	Bismuth-212	Soil	1.205	0.823	0.758			pCi/g
	EPA 901.1	Lead-210	Soil	4.749	10.085	12.57	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.653	0.159	0.154			pCi/g
	EPA 901.1	Potassium-40	Soil	12.645	2.199	0.375			pCi/g
	EPA 901.1	Radium-226	Soil	0.952	0.206	0.172			pCi/g
	EPA 901.1	Radium-228	Soil	0.8	0.247	0.179			pCi/g
	EPA 901.1	Thallium-208	Soil	0.239	0.09	0.071			pCi/g
	EPA 901.1	Thorium-234	Soil	0.627	2.546	3.2	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.135	0.107	0.115	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.806	0.463	0.518	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	0.443	0.325	0.356	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.723	0.41	0.317	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.539	0.173	0.089			pCi/g
	HSL-300	U-235/236	Soil	0.097	0.074	0.038	J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.553	0.175	0.089			pCi/g
C003-SB005-1224-01 / 30179165018									
	EPA 901.1	Bismuth-212	Soil	0	0.978	4.432	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	11.702	6.301	6.988			pCi/g
	EPA 901.1	Lead-212	Soil	1.001	0.288	0.327			pCi/g
	EPA 901.1	Potassium-40	Soil	15.208	3.362	1.364			pCi/g
	EPA 901.1	Radium-226	Soil	13.168	1.864	0.341			pCi/g
	EPA 901.1	Radium-228	Soil	1.082	0.795	0.833			pCi/g
	EPA 901.1	Thallium-208	Soil	0.277	0.279	0.249			pCi/g
	EPA 901.1	Thorium-234	Soil	1.739	1.842	5.346	U,	U	pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Uranium-235	Soil	1.241	0.324	0.282	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.438	0.284	0.417			pCi/g
	HSL-300	Thorium-230	Soil	3.92	0.917	0.15			pCi/g
	HSL-300	Thorium-232	Soil	0.536	0.263	0.081			pCi/g
	HSL-300	U-233/234	Soil	0.464	0.18	0.114			pCi/g
	HSL-300	U-235/236	Soil	0.072	0.076	0.095	J, J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.588	0.205	0.097			pCi/g
C003-SB005-2436-01 / 30179165019									
	EPA 901.1	Bismuth-212	Soil	0.463	4.694	5.173	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	33.665	11.499	11.44			pCi/g
	EPA 901.1	Lead-212	Soil	1.156	0.4	0.528			pCi/g
	EPA 901.1	Potassium-40	Soil	29.801	5.684	1.648			pCi/g
	EPA 901.1	Radium-226	Soil	28.307	3.901	0.546			pCi/g
	EPA 901.1	Radium-228	Soil	0.971	0.843	1.685	J,	J	pCi/g
	EPA 901.1	Thallium-208	Soil	0.167	0.392	0.435	U,	U	pCi/g
	EPA 901.1	Thorium-234	Soil	5.245	3.337	5.971	J,	J	pCi/g
	EPA 901.1	Uranium-235	Soil	2.342	0.59	0.496	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.946	0.464	0.473			pCi/g
	HSL-300	Thorium-230	Soil	2.97	0.859	0.224			pCi/g
	HSL-300	Thorium-232	Soil	0.607	0.344	0.266			pCi/g
	HSL-300	U-233/234	Soil	1.08	0.266	0.088			pCi/g
	HSL-300	U-235/236	Soil	0.097	0.073	0.038	J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	1.2	0.285	0.071			pCi/g
C003-SB005-3648-01 / 30179165020									
	EPA 901.1	Bismuth-212	Soil	0.76	1.69	1.895	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	0	1.823	3.733	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.814	0.206	0.196			pCi/g
	EPA 901.1	Potassium-40	Soil	11.608	2.548	1.019			pCi/g
	EPA 901.1	Radium-226	Soil	1.187	0.274	0.179			pCi/g
	EPA 901.1	Radium-228	Soil	0.662	0.27	0.566	J1+, B+,	J	pCi/g
	EPA 901.1	Thallium-208	Soil	0.31	0.11	0.084			pCi/g
	EPA 901.1	Thorium-234	Soil	1.775	1.519	2.075	J,	J	pCi/g
	EPA 901.1	Uranium-235	Soil	0.207	0.1	0.111	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.63	0.335	0.404			pCi/g
	HSL-300	Thorium-230	Soil	0.374	0.232	0.21			pCi/g
	HSL-300	Thorium-232	Soil	0.757	0.332	0.089			pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	HSL-300	U-233/234	Soil	0.473	0.219	0.148			pCi/g
	HSL-300	U-235/236	Soil	0.08	0.105	0.145	J, J1+, B+,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.36	0.191	0.162			pCi/g
C003-SB006-1224-01 / 30179165021									
	EPA 901.1	Bismuth-212	Soil	1.939	2.859	3.084	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	25.154	8.053	7.68			pCi/g
	EPA 901.1	Lead-212	Soil	0.819	0.311	0.421			pCi/g
	EPA 901.1	Potassium-40	Soil	16.311	3.546	1.391			pCi/g
	EPA 901.1	Radium-226	Soil	18.408	2.571	0.455			pCi/g
	EPA 901.1	Radium-228	Soil	1.736	0.672	0.538			pCi/g
	EPA 901.1	Thallium-208	Soil	0.117	0.278	0.312	U,	U	pCi/g
	EPA 901.1	Thorium-234	Soil	1.547	2.052	5.792	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	1.509	0.396	0.346	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.722	0.336	0.409	J1+, B+,	J	pCi/g
	HSL-300	Thorium-230	Soil	3.17	0.758	0.132			pCi/g
	HSL-300	Thorium-232	Soil	0.884	0.333	0.156			pCi/g
	HSL-300	U-233/234	Soil	0.538	0.195	0.075			pCi/g
	HSL-300	U-235/236	Soil	-0.005	0.071	0.098	J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.459	0.179	0.089			pCi/g
C003-SB006-2436-01 / 30179165022									
	EPA 901.1	Bismuth-212	Soil	1.586	1.267	1.492			pCi/g
	EPA 901.1	Lead-210	Soil	0.248	2.393	3.221	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.809	0.204	0.186			pCi/g
	EPA 901.1	Potassium-40	Soil	12.504	2.718	1.066			pCi/g
	EPA 901.1	Radium-226	Soil	0.555	0.181	0.316			pCi/g
	EPA 901.1	Radium-228	Soil	1.017	0.36	0.204			pCi/g
	EPA 901.1	Thallium-208	Soil	0.312	0.109	0.084			pCi/g
	EPA 901.1	Thorium-234	Soil	0.458	1.532	1.986	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.127	0.142	0.122	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.769	0.401	0.382	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	0.426	0.279	0.218	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.824	0.394	0.118	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.416	0.188	0.124	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.013	0.088	0.144	U, J1+, B+,	UJ	pCi/g
	HSL-300	Uranium-238	Soil	0.406	0.184	0.093	J,	J	pCi/g
C003-SB007-1224-01 / 30179165023									

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Bismuth-212	Soil	1.003	1.424	1.441	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	-8.479	18.826	23.15	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.672	0.187	0.208			pCi/g
	EPA 901.1	Potassium-40	Soil	12.173	2.262	0.479			pCi/g
	EPA 901.1	Radium-226	Soil	2.826	0.453	0.156			pCi/g
	EPA 901.1	Radium-228	Soil	1.009	0.264	0.235			pCi/g
	EPA 901.1	Thallium-208	Soil	0.344	0.122	0.092			pCi/g
	EPA 901.1	Thorium-234	Soil	1.616	3.298	4.081	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.23	0.133	0.142	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.677	0.355	0.386	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	0.812	0.365	0.217	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.438	0.258	0.099	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.436	0.17	0.089	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.034	0.067	0.088	J, J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.54	0.192	0.075	J,	J	pCi/g
C003-SB007-2436-01 / 30179165024									
	EPA 901.1	Bismuth-212	Soil	2.321	1.073	0.719			pCi/g
	EPA 901.1	Lead-210	Soil	0	1.697	4.523	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.888	0.231	0.227			pCi/g
	EPA 901.1	Potassium-40	Soil	13.642	2.958	1.155			pCi/g
	EPA 901.1	Radium-226	Soil	1.002	0.22	0.176			pCi/g
	EPA 901.1	Radium-228	Soil	1.529	0.398	0.221			pCi/g
	EPA 901.1	Thallium-208	Soil	0.398	0.133	0.095			pCi/g
	EPA 901.1	Thorium-234	Soil	0.171	1.928	2.503	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.175	0.102	0.114	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.964	0.449	0.442	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	0.567	0.32	0.256	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.657	0.338	0.111	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.349	0.183	0.143	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.015	0.101	0.166	U, J1+, B+,	UJ	pCi/g
	HSL-300	Uranium-238	Soil	0.488	0.217	0.107	J,	J	pCi/g
C003-SB007-2436-02 / 30179165025									
	EPA 901.1	Bismuth-212	Soil	1.75	0.94	0.978			pCi/g
	EPA 901.1	Lead-210	Soil	-4.407	16.096	20.15	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.793	0.194	0.185			pCi/g
	EPA 901.1	Potassium-40	Soil	12.225	2.359	0.804			pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Radium-226	Soil	0.869	0.232	0.192			pCi/g
	EPA 901.1	Radium-228	Soil	1.089	0.308	0.359			pCi/g
	EPA 901.1	Thallium-208	Soil	0.266	0.089	0.069			pCi/g
	EPA 901.1	Thorium-234	Soil	0	1.779	4.125	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.044	0.104	0.129	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.949	0.465	0.536	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	0.491	0.301	0.277	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.935	0.42	0.26	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.607	0.242	0.165	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.078	0.094	0.07	J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.494	0.21	0.085	J,	J	pCi/g
C003-SB008-2436-01 / 30179165026									
	EPA 901.1	Bismuth-212	Soil	2.729	3.165	3.3	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	49.489	9.419	7.833			pCi/g
	EPA 901.1	Lead-212	Soil	1.094	0.295	0.386			pCi/g
	EPA 901.1	Potassium-40	Soil	11.298	3.279	2.437			pCi/g
	EPA 901.1	Radium-226	Soil	39.184	4.354	0.41			pCi/g
	EPA 901.1	Radium-228	Soil	2.117	0.908	0.833			pCi/g
	EPA 901.1	Thallium-208	Soil	0.234	0.276	0.298	J,	J	pCi/g
	EPA 901.1	Thorium-234	Soil	1.978	4.062	5.109	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	2.837	0.496	0.364	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.06	0.373	0.268	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	12.8	2.32	0.147	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.95	0.338	0.124	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.691	0.243	0.125	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.045	0.081	0.061	J, J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.781	0.261	0.125	J,	J	pCi/g
C003-SB008-3648-01 / 30179165027									
	EPA 901.1	Bismuth-212	Soil	0.966	1.2	1.507	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	3.546	1.996	2.42			pCi/g
	EPA 901.1	Lead-212	Soil	1.099	0.218	0.175			pCi/g
	EPA 901.1	Potassium-40	Soil	9.025	2.048	1.257			pCi/g
	EPA 901.1	Radium-226	Soil	1.238	0.29	0.208			pCi/g
	EPA 901.1	Radium-228	Soil	1.385	0.331	0.238			pCi/g
	EPA 901.1	Thallium-208	Soil	0.398	0.116	0.085			pCi/g
	EPA 901.1	Thorium-234	Soil	1.253	1.293	1.988	J,	J	pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Uranium-235	Soil	0.198	0.131	0.136	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.944	0.439	0.352	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	1.11	0.465	0.215	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.903	0.412	0.117	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.711	0.216	0.076	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.083	0.074	0.045	J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.821	0.237	0.076	J,	J	pCi/g
C003-SB009-2436-01 / 30179165028									
	EPA 901.1	Bismuth-212	Soil	0.548	0.723	2.505	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	2.2	3.849	4.936	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	1.021	0.272	0.276			pCi/g
	EPA 901.1	Potassium-40	Soil	10.563	2.656	1.347			pCi/g
	EPA 901.1	Radium-226	Soil	3.014	0.514	0.213			pCi/g
	EPA 901.1	Radium-228	Soil	1.078	0.399	0.449			pCi/g
	EPA 901.1	Thallium-208	Soil	0.459	0.161	0.124			pCi/g
	EPA 901.1	Thorium-234	Soil	1.253	2.658	3.348	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.233	0.17	0.2	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.849	0.422	0.542	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	1.19	0.444	0.175	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.686	0.328	0.208	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.818	0.296	0.129	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0	0.102	0.077	J, J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.366	0.186	0.109	J,	J	pCi/g
C003-SB009-3648-01 / 30179165029									
	EPA 901.1	Bismuth-212	Soil	7.565	2.698	1.848			pCi/g
	EPA 901.1	Lead-210	Soil	4.188	5.628	7.101	J, J1+, B+,	J	pCi/g
	EPA 901.1	Lead-212	Soil	3.887	0.691	0.415			pCi/g
	EPA 901.1	Potassium-40	Soil	15.827	3.739	1.712			pCi/g
	EPA 901.1	Radium-226	Soil	6.583	1.07	0.366			pCi/g
	EPA 901.1	Radium-228	Soil	4.622	0.924	0.327			pCi/g
	EPA 901.1	Thallium-208	Soil	1.614	0.331	0.1			pCi/g
	EPA 901.1	Thorium-234	Soil	4.806	1.937	5.319	J,	J	pCi/g
	EPA 901.1	Uranium-235	Soil	0.635	0.233	0.25	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	3.23	0.875	0.413	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	2.6	0.745	0.227	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	2.62	0.748	0.191	J,	J	pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	HSL-300	U-233/234	Soil	2.55	0.567	0.103	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.147	0.115	0.102	J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	2.77	0.602	0.087	J,	J	pCi/g
C003-SB010-2436-01 / 30179165030									
	EPA 901.1	Bismuth-212	Soil	8.627	10.22	7.863			pCi/g
	EPA 901.1	Lead-210	Soil	184.76	91.79	120.1			pCi/g
	EPA 901.1	Lead-212	Soil	2.352	0.893	1.34			pCi/g
	EPA 901.1	Potassium-40	Soil	21.543	6.301	4.886			pCi/g
	EPA 901.1	Radium-226	Soil	255.39	33.81	1.371			pCi/g
	EPA 901.1	Radium-228	Soil	2.669	2.317	2.146			pCi/g
	EPA 901.1	Thallium-208	Soil	0	0.338	0.755	U,	U	pCi/g
	EPA 901.1	Thorium-234	Soil	21.573	12.072	31.83	J,	J	pCi/g
	EPA 901.1	Uranium-235	Soil	18.785	2.784	1.171	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.45	0.653	0.732	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	128	21	0.25	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	1.72	0.658	0.293	J,	J	pCi/g
	HSL-300	U-233/234	Soil	1.21	0.368	0.137	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.148	0.132	0.159	J, J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	1.46	0.413	0.103	J,	J	pCi/g
C003-SB010-3648-01 / 30179165031									
	EPA 901.1	Bismuth-212	Soil	0	8.86	22.47	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	810.09	128.76	65.28			pCi/g
	EPA 901.1	Lead-212	Soil	0.058	3.064	3.52	U,	U	pCi/g
	EPA 901.1	Potassium-40	Soil	10.296	19.15	17.69	J,	J	pCi/g
	EPA 901.1	Radium-226	Soil	926.1	122.85	5.779			pCi/g
	EPA 901.1	Radium-228	Soil	3.296	3.311	6.988	U,	U	pCi/g
	EPA 901.1	Thallium-208	Soil	2.386	2.326	1.634			pCi/g
	EPA 901.1	Thorium-234	Soil	3.823	33.453	40.87	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	62.472	8.882	2.873	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.91	1.03	0.833	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	546	88.2	0.531	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	2.93	1.27	0.473	J,	J	pCi/g
	HSL-300	U-233/234	Soil	1.76	0.461	0.161	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.119	0.109	0.069	J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	1.31	0.377	0.083	J,	J	pCi/g
C003-SB010-4860-01 / 30179165032									

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Bismuth-212	Soil	1.186	7.386	7.296	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	230.53	124.28	141.6			pCi/g
	EPA 901.1	Lead-212	Soil	0	0.507	1.468	U,	U	pCi/g
	EPA 901.1	Potassium-40	Soil	18.202	5.706	4.596			pCi/g
	EPA 901.1	Radium-226	Soil	195.8	26.002	1.366			pCi/g
	EPA 901.1	Radium-228	Soil	0	1.422	2.328	U, J1+, B+,	UJ	pCi/g
	EPA 901.1	Thallium-208	Soil	0	0.257	0.665	U,	U	pCi/g
	EPA 901.1	Thorium-234	Soil	0	11.725	31.08	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	4.484	0.957	1.432	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.17	0.476	0.345	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	116	18.9	0.241	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.949	0.411	0.217	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.98	0.328	0.155	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.139	0.124	0.075	J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	1.13	0.358	0.155	J,	J	pCi/g
C003-SB011-1224-01 / 30179165033									
	EPA 901.1	Bismuth-212	Soil	1.942	1.891	2.009	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	11.287	5.291	5.373	J1+, B+,	J	pCi/g
	EPA 901.1	Lead-212	Soil	0.678	0.221	0.264			pCi/g
	EPA 901.1	Potassium-40	Soil	13.393	2.976	1.22			pCi/g
	EPA 901.1	Radium-226	Soil	5.492	0.871	0.304			pCi/g
	EPA 901.1	Radium-228	Soil	0.599	0.668	0.804	J,	J	pCi/g
	EPA 901.1	Thallium-208	Soil	0.339	0.145	0.126			pCi/g
	EPA 901.1	Thorium-234	Soil	1.288	2.545	3.192	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.468	0.177	0.189	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.867	0.436	0.502	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	1.1	0.456	0.261	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.739	0.36	0.111	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.244	0.134	0.1	J1+, B+, J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.044	0.079	0.059	J, J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.383	0.169	0.084	J,	J	pCi/g
C003-SB011-2436-01 / 30179165034									
	EPA 901.1	Bismuth-212	Soil	0	0.334	2.166	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	0.424	16.114	20.52	U, J1+, B+,	UJ	pCi/g
	EPA 901.1	Lead-212	Soil	0.851	0.203	0.187			pCi/g
	EPA 901.1	Potassium-40	Soil	16.599	3.02	0.915			pCi/g

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	EPA 901.1	Radium-226	Soil	1.675	0.286	0.173			pCi/g
	EPA 901.1	Radium-228	Soil	0.838	0.415	0.373			pCi/g
	EPA 901.1	Thallium-208	Soil	0.334	0.102	0.074			pCi/g
	EPA 901.1	Thorium-234	Soil	0	2.257	4.287	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.072	0.13	0.157	U, R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.02	0.46	0.418	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	0.939	0.42	0.247	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.79	0.377	0.113	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.361	0.163	0.123	J,	J	pCi/g
	HSL-300	U-235/236	Soil	-0.005	0.074	0.103	U, J1+, B+,	UJ	pCi/g
	HSL-300	Uranium-238	Soil	0.572	0.209	0.105	J,	J	pCi/g
C003-SB012-1224-01 / 30179165035									
	EPA 901.1	Bismuth-212	Soil	2.026	1.546	1.59			pCi/g
	EPA 901.1	Lead-210	Soil	8.64	5.157	6.064	J1+, B+,	J	pCi/g
	EPA 901.1	Lead-212	Soil	0.911	0.265	0.311			pCi/g
	EPA 901.1	Potassium-40	Soil	15.026	3.142	1.137			pCi/g
	EPA 901.1	Radium-226	Soil	8.152	1.19	0.258			pCi/g
	EPA 901.1	Radium-228	Soil	1.007	0.618	0.632			pCi/g
	EPA 901.1	Thallium-208	Soil	0.505	0.153	0.11			pCi/g
	EPA 901.1	Thorium-234	Soil	0.417	3.147	3.969	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.919	0.289	0.252	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.721	0.376	0.423	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	8.42	1.74	0.102	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.633	0.32	0.102	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.395	0.186	0.139	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.035	0.09	0.124	J, J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.374	0.183	0.158	J,	J	pCi/g
C003-SB012-2436-01 / 30179165036									
	EPA 901.1	Bismuth-212	Soil	5.952	3.718	4.073			pCi/g
	EPA 901.1	Lead-210	Soil	205.99	96.837	108.5			pCi/g
	EPA 901.1	Lead-212	Soil	0	0.433	1.218	U,	U	pCi/g
	EPA 901.1	Potassium-40	Soil	14.755	5.406	4.159			pCi/g
	EPA 901.1	Radium-226	Soil	132.07	17.536	1.181			pCi/g
	EPA 901.1	Radium-228	Soil	2.206	0.934	1.355			pCi/g
	EPA 901.1	Thallium-208	Soil	0.238	0.446	0.522	U,	U	pCi/g
	EPA 901.1	Thorium-234	Soil	10	19.794	23.66	U,	U	pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Uranium-235	Soil	9.273	1.471	0.823	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.598	0.375	0.471	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	84.8	14	0.122	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	1.06	0.461	0.122	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.796	0.258	0.109	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.038	0.077	0.106	J, J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.671	0.233	0.119	J,	J	pCi/g
C003-SB012-3648-01 / 30179165037									
	EPA 901.1	Bismuth-212	Soil	7.031	6.018	4.871			pCi/g
	EPA 901.1	Lead-210	Soil	73.896	17.078	14.96			pCi/g
	EPA 901.1	Lead-212	Soil	0.594	0.457	0.729	J,	J	pCi/g
	EPA 901.1	Potassium-40	Soil	22.578	5.318	3.273			pCi/g
	EPA 901.1	Radium-226	Soil	75.935	10.175	0.889			pCi/g
	EPA 901.1	Radium-228	Soil	1.037	1.502	1.744	J,	J	pCi/g
	EPA 901.1	Thallium-208	Soil	0.323	0.397	0.58	J,	J	pCi/g
	EPA 901.1	Thorium-234	Soil	0	4.993	10.2	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	5.507	1.046	0.717	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.808	0.372	0.311	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	21	3.74	0.178	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.712	0.332	0.096	J,	J	pCi/g
	HSL-300	U-233/234	Soil	4.38	0.885	0.127	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.253	0.158	0.117	J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	3.07	0.67	0.09	J,	J	pCi/g
C003-SB013-2436-01 / 30179165038									
	EPA 901.1	Bismuth-212	Soil	0.721	1.23	1.253	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	2.784	15.717	19.59	U, J1+, B+,	UJ	pCi/g
	EPA 901.1	Lead-212	Soil	0.493	0.151	0.182			pCi/g
	EPA 901.1	Potassium-40	Soil	12.381	2.328	0.863			pCi/g
	EPA 901.1	Radium-226	Soil	3.49	0.53	0.146			pCi/g
	EPA 901.1	Radium-228	Soil	0.757	0.261	0.197			pCi/g
	EPA 901.1	Thallium-208	Soil	0.285	0.1	0.077			pCi/g
	EPA 901.1	Thorium-234	Soil	1.066	3.291	4.07	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.396	0.155	0.145	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.545	0.314	0.372	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	1.74	0.561	0.209	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.515	0.276	0.095	J,	J	pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	HSL-300	U-233/234	Soil	0.439	0.179	0.114	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.082	0.081	0.055	J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.46	0.181	0.042	J,	J	pCi/g
C003-SB013-2436-02 / 30179165039									
	EPA 901.1	Bismuth-212	Soil	0	0.63	2.446	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	3.54	3.307	4.07	J, J1+, B+,	J	pCi/g
	EPA 901.1	Lead-212	Soil	0.558	0.165	0.184			pCi/g
	EPA 901.1	Potassium-40	Soil	12.774	2.594	0.879			pCi/g
	EPA 901.1	Radium-226	Soil	3.611	0.566	0.171			pCi/g
	EPA 901.1	Radium-228	Soil	0.915	0.35	0.268			pCi/g
	EPA 901.1	Thallium-208	Soil	0.248	0.081	0.051			pCi/g
	EPA 901.1	Thorium-234	Soil	0.391	1.965	2.495	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.357	0.142	0.142	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.06	0.451	0.401	J,	J	pCi/g
	HSL-300	Thorium-230	Soil	2.02	0.63	0.233	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.485	0.275	0.101	J,	J	pCi/g
	HSL-300	U-233/234	Soil	0.455	0.2	0.054	J,	J	pCi/g
	HSL-300	U-235/236	Soil	0.057	0.093	0.07	J, J1+, B+, J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.332	0.169	0.099	J,	J	pCi/g
C003-SB013-3648-01 / 30179165040									
	EPA 901.1	Bismuth-212	Soil	1.112	5.339	5.289	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	129.86	65.094	80.33			pCi/g
	EPA 901.1	Lead-212	Soil	0	0.473	1.095	U,	U	pCi/g
	EPA 901.1	Potassium-40	Soil	16.945	4.821	3.37			pCi/g
	EPA 901.1	Radium-226	Soil	110.8	14.723	0.952			pCi/g
	EPA 901.1	Radium-228	Soil	0	0.856	1.575	U, J1+, B+,	UJ	pCi/g
	EPA 901.1	Thallium-208	Soil	0	0.271	0.495	U,	U	pCi/g
	EPA 901.1	Thorium-234	Soil	3.979	5.134	21.27	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	8.314	1.442	0.857	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.69	0.382	0.434	J1+, B+,	J	pCi/g
	HSL-300	Thorium-230	Soil	34.5	5.95	0.204			pCi/g
	HSL-300	Thorium-232	Soil	0.966	0.424	0.243			pCi/g
	HSL-300	U-233/234	Soil	0.907	0.285	0.124			pCi/g
	HSL-300	U-235/236	Soil	0.022	0.08	0.061	U,	U	pCi/g
	HSL-300	Uranium-238	Soil	0.634	0.23	0.124			pCi/g
C003-SB014-1224-01 / 30179165043									

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Bismuth-212	Soil	0.767	1.893	2.085	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	10.944	3.618	3.491	J1+, B+,	J	pCi/g
	EPA 901.1	Lead-212	Soil	0.612	0.189	0.228			pCi/g
	EPA 901.1	Potassium-40	Soil	13.807	2.847	1.206			pCi/g
	EPA 901.1	Radium-226	Soil	5.061	0.746	0.195			pCi/g
	EPA 901.1	Radium-228	Soil	0.595	0.426	0.693	J,	J	pCi/g
	EPA 901.1	Thallium-208	Soil	0.136	0.169	0.186	J,	J	pCi/g
	EPA 901.1	Thorium-234	Soil	1.664	2.037	2.558	J,	J	pCi/g
	EPA 901.1	Uranium-235	Soil	0.448	0.178	0.168	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.425	0.304	0.434	J, J1+, B+,	J	pCi/g
	HSL-300	Thorium-230	Soil	5.21	1.21	0.105			pCi/g
	HSL-300	Thorium-232	Soil	0.501	0.284	0.105			pCi/g
	HSL-300	U-233/234	Soil	0.398	0.195	0.127			pCi/g
	HSL-300	U-235/236	Soil	0	0.101	0.076	U,	U	pCi/g
	HSL-300	Uranium-238	Soil	0.381	0.189	0.107			pCi/g
C003-SB014-2436-01 / 30179165044									
	EPA 901.1	Bismuth-212	Soil	2.847	4.251	4.158	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	123.07	66.319	78.77			pCi/g
	EPA 901.1	Lead-212	Soil	0.994	0.502	0.779			pCi/g
	EPA 901.1	Potassium-40	Soil	18.577	4.684	2.853			pCi/g
	EPA 901.1	Radium-226	Soil	93.089	12.376	0.836			pCi/g
	EPA 901.1	Radium-228	Soil	1.943	1.157	1.116			pCi/g
	EPA 901.1	Thallium-208	Soil	0	0.185	0.44	U,	U	pCi/g
	EPA 901.1	Thorium-234	Soil	6.556	15.461	18.52	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	6.585	1.088	0.649	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.941	0.383	0.321			pCi/g
	HSL-300	Thorium-230	Soil	33.2	5.63	0.082			pCi/g
	HSL-300	Thorium-232	Soil	0.904	0.355	0.082			pCi/g
	HSL-300	U-233/234	Soil	0.966	0.286	0.079			pCi/g
	HSL-300	U-235/236	Soil	0.067	0.077	0.103	J,	J	pCi/g
	HSL-300	Uranium-238	Soil	1.01	0.294	0.094			pCi/g
C003-SB014-3648-01 / 30179165045									
	EPA 901.1	Bismuth-212	Soil	2.324	1.242	1.087			pCi/g
	EPA 901.1	Lead-210	Soil	6.835	4.362	4.854	J1+, B+,	J	pCi/g
	EPA 901.1	Lead-212	Soil	0.916	0.233	0.239			pCi/g
	EPA 901.1	Potassium-40	Soil	12.645	3.034	1.731			pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Radium-226	Soil	5.636	0.838	0.196			pCi/g
	EPA 901.1	Radium-228	Soil	1.232	0.452	0.336			pCi/g
	EPA 901.1	Thallium-208	Soil	0.382	0.145	0.131			pCi/g
	EPA 901.1	Thorium-234	Soil	1.802	1.707	2.999	J,	J	pCi/g
	EPA 901.1	Uranium-235	Soil	0.414	0.159	0.17	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.656	0.287	0.226	J1+, B+,	J	pCi/g
	HSL-300	Thorium-230	Soil	2.28	0.598	0.128			pCi/g
	HSL-300	Thorium-232	Soil	0.491	0.234	0.07			pCi/g
	HSL-300	U-233/234	Soil	0.718	0.23	0.087			pCi/g
	HSL-300	U-235/236		0.13	0.1	0.052			pCi/g
	HSL-300	Uranium-238	Soil	0.57	0.2	0.073			pCi/g
C003-SB015-1224-01 / 30179165046									
	EPA 901.1	Bismuth-212	Soil	1.128	1.327	1.323	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	-2.152	17.964	22.45	U, J1+, B+,	UJ	pCi/g
	EPA 901.1	Lead-212	Soil	0.836	0.2	0.197			pCi/g
	EPA 901.1	Potassium-40	Soil	14.352	2.514	0.44			pCi/g
	EPA 901.1	Radium-226	Soil	2.918	0.537	0.232			pCi/g
	EPA 901.1	Radium-228	Soil	1.075	0.325	0.427			pCi/g
	EPA 901.1	Thallium-208	Soil	0.371	0.113	0.091			pCi/g
	EPA 901.1	Thorium-234	Soil	1.393	1.458	4.808	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.356	0.159	0.149	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.08	0.419	0.333			pCi/g
	HSL-300	Thorium-230	Soil	0.424	0.24	0.186			pCi/g
	HSL-300	Thorium-232	Soil	0.721	0.316	0.085			pCi/g
	HSL-300	U-233/234	Soil	0.446	0.178	0.117			pCi/g
	HSL-300	U-235/236	Soil	0.034	0.07	0.098	U,	U	pCi/g
	HSL-300	Uranium-238	Soil	0.543	0.197	0.1			pCi/g
C003-SB015-3648-01 / 30179165047									
	EPA 901.1	Bismuth-212	Soil	0.046	3.005	3.339	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	12.479	5.911	6.313	J1+, B+,	J	pCi/g
	EPA 901.1	Lead-212	Soil	0.98	0.279	0.331			pCi/g
	EPA 901.1	Potassium-40	Soil	14.738	3.346	1.803			pCi/g
	EPA 901.1	Radium-226	Soil	11.757	1.683	0.306			pCi/g
	EPA 901.1	Radium-228	Soil	0.046	0.993	1.061	U, J1+, B+,	UJ	pCi/g
	EPA 901.1	Thallium-208	Soil	0.506	0.162	0.125			pCi/g
	EPA 901.1	Thorium-234	Soil	0	2.248	4.666	U,	U	pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Uranium-235	Soil	0.975	0.291	0.261	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.758	0.327	0.296	J1+, B+,	J	pCi/g
	HSL-300	Thorium-230	Soil	1.33	0.432	0.171			pCi/g
	HSL-300	Thorium-232	Soil	0.603	0.27	0.074			pCi/g
	HSL-300	U-233/234	Soil	0.61	0.216	0.114			pCi/g
	HSL-300	U-235/236	Soil	0.077	0.081	0.102	J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.462	0.186	0.13			pCi/g
C003-SB016-1224-01 / 30179165048									
	EPA 901.1	Bismuth-212	Soil	1.332	0.999	0.941			pCi/g
	EPA 901.1	Lead-210	Soil	-0.708	14.296	18.24	U, J1+, B+,	UJ	pCi/g
	EPA 901.1	Lead-212	Soil	0.86	0.201	0.187			pCi/g
	EPA 901.1	Potassium-40	Soil	11.902	2.794	1.628			pCi/g
	EPA 901.1	Radium-226	Soil	1.057	0.261	0.189			pCi/g
	EPA 901.1	Radium-228	Soil	1.244	0.318	0.169			pCi/g
	EPA 901.1	Thallium-208	Soil	0.36	0.114	0.088			pCi/g
	EPA 901.1	Thorium-234	Soil	1.205	2.002	3.707	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.193	0.167	0.132	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.35	0.516	0.467			pCi/g
	HSL-300	Thorium-230	Soil	0.408	0.255	0.241			pCi/g
	HSL-300	Thorium-232	Soil	1.16	0.445	0.225			pCi/g
	HSL-300	U-233/234	Soil	0.439	0.178	0.103			pCi/g
	HSL-300	U-235/236	Soil	0.096	0.09	0.101	J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.421	0.174	0.113			pCi/g
C003-SB016-2436-01 / 30179165049									
	EPA 901.1	Bismuth-212	Soil	1.52	1.18	1.189			pCi/g
	EPA 901.1	Lead-210	Soil	0.306	2.68	3.583	U, J1+, B+,	UJ	pCi/g
	EPA 901.1	Lead-212	Soil	0.893	0.218	0.191			pCi/g
	EPA 901.1	Potassium-40	Soil	14.109	2.98	1.102			pCi/g
	EPA 901.1	Radium-226	Soil	0.821	0.235	0.119			pCi/g
	EPA 901.1	Radium-228	Soil	1.267	0.373	0.368			pCi/g
	EPA 901.1	Thallium-208	Soil	0.329	0.104	0.064			pCi/g
	EPA 901.1	Thorium-234	Soil	0.18	1.782	2.318	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.002	0.123	0.161	U,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.885	0.362	0.312			pCi/g
	HSL-300	Thorium-230	Soil	0.158	0.141	0.17	J,	J	pCi/g
	HSL-300	Thorium-232	Soil	0.567	0.267	0.143			pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	HSL-300	U-233/234	Soil	0.317	0.146	0.103			pCi/g
	HSL-300	U-235/236	Soil	0.034	0.069	0.096	U,	U	pCi/g
	HSL-300	Uranium-238	Soil	0.379	0.159	0.073			pCi/g
C004-SB001-0012-01 / 30179165050									
	EPA 901.1	Bismuth-212	Soil	1.749	0.998	1.478			pCi/g
	EPA 901.1	Lead-210	Soil	8.123	15.244	18.79	U, J1+, B+,	UJ	pCi/g
	EPA 901.1	Lead-212	Soil	0.864	0.21	0.206			pCi/g
	EPA 901.1	Potassium-40	Soil	14.147	2.631	0.824			pCi/g
	EPA 901.1	Radium-226	Soil	1.705	0.325	0.158			pCi/g
	EPA 901.1	Radium-228	Soil	1.282	0.342	0.178			pCi/g
	EPA 901.1	Thallium-208	Soil	0.305	0.086	0.054			pCi/g
	EPA 901.1	Thorium-234	Soil	1.193	3.356	4.189	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.168	0.169	0.148	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.798	0.356	0.273	J1+, B+,	J	pCi/g
	HSL-300	Thorium-230	Soil	0.324	0.213	0.166			pCi/g
	HSL-300	Thorium-232	Soil	0.528	0.273	0.09			pCi/g
	HSL-300	U-233/234	Soil	0.453	0.185	0.117			pCi/g
	HSL-300	U-235/236	Soil	0.021	0.076	0.057	U,	U	pCi/g
	HSL-300	Uranium-238	Soil	0.452	0.182	0.044			pCi/g
C004-SB001-1224-01 / 30179165051									
	EPA 901.1	Bismuth-212	Soil	1.441	1.604	2.299	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	2.429	2.535	3.468	J,	J	pCi/g
	EPA 901.1	Lead-212	Soil	0.873	0.223	0.224			pCi/g
	EPA 901.1	Potassium-40	Soil	13.325	3.325	2.044			pCi/g
	EPA 901.1	Radium-226	Soil	3.634	0.579	0.278			pCi/g
	EPA 901.1	Radium-228	Soil	1.122	0.437	0.474			pCi/g
	EPA 901.1	Thallium-208	Soil	0.336	0.116	0.098			pCi/g
	EPA 901.1	Thorium-234	Soil	0.105	2.222	2.846	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.363	0.178	0.181	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.09	0.392	0.375			pCi/g
	HSL-300	Thorium-230	Soil	1.02	0.349	0.121			pCi/g
	HSL-300	Thorium-232	Soil	1.06	0.358	0.144			pCi/g
	HSL-300	U-233/234	Soil	0.762	0.244	0.042			pCi/g
	HSL-300	U-235/236		0.102	0.09	0.055			pCi/g
	HSL-300	Uranium-238	Soil	0.51	0.192	0.078			pCi/g
C004-SB001-2436-01 / 30179165052									

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Bismuth-212	Soil	0.116	1.488	1.554	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	-1.201	15.893	19.92	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.73	0.18	0.186			pCi/g
	EPA 901.1	Potassium-40	Soil	13.714	2.451	0.703			pCi/g
	EPA 901.1	Radium-226	Soil	2.965	0.447	0.169			pCi/g
	EPA 901.1	Radium-228	Soil	1.096	0.33	0.217			pCi/g
	EPA 901.1	Thallium-208	Soil	0.284	0.087	0.065			pCi/g
	EPA 901.1	Thorium-234	Soil	3.298	3.371	4.016	J,	J	pCi/g
	EPA 901.1	Uranium-235	Soil	0.264	0.159	0.143	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.23	0.39	0.241			pCi/g
	HSL-300	Thorium-230	Soil	0.657	0.261	0.132			pCi/g
	HSL-300	Thorium-232	Soil	0.773	0.286	0.111			pCi/g
	HSL-300	U-233/234	Soil	0.649	0.229	0.084			pCi/g
	HSL-300	U-235/236	Soil	0.038	0.079	0.109	U,	U	pCi/g
	HSL-300	Uranium-238	Soil	0.66	0.232	0.099			pCi/g
C004-SB001-3648-01 / 30179165053									
	EPA 901.1	Bismuth-212	Soil	2.023	0.915	0.663			pCi/g
	EPA 901.1	Lead-210	Soil	0	1.806	4.104	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	1.264	0.268	0.204			pCi/g
	EPA 901.1	Potassium-40	Soil	15.916	3.205	1.065			pCi/g
	EPA 901.1	Radium-226	Soil	0.895	0.244	0.115			pCi/g
	EPA 901.1	Radium-228	Soil	1.627	0.419	0.203			pCi/g
	EPA 901.1	Thallium-208	Soil	0.469	0.135	0.086			pCi/g
	EPA 901.1	Thorium-234	Soil	0.949	1.599	2.405	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.069	0.126	0.158	U, R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.896	0.361	0.28			pCi/g
	HSL-300	Thorium-230	Soil	0.267	0.185	0.191			pCi/g
	HSL-300	Thorium-232	Soil	0.561	0.268	0.17			pCi/g
	HSL-300	U-233/234	Soil	0.409	0.172	0.099			pCi/g
	HSL-300	U-235/236	Soil	0.079	0.082	0.098	J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.47	0.185	0.083			pCi/g
C004-SB001-3648-02 / 30179165054									
	EPA 901.1	Bismuth-212	Soil	0.948	0.612	1.441	J,	J	pCi/g
	EPA 901.1	Lead-210	Soil	-4.986	14.443	18.01	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	1.049	0.214	0.156			pCi/g
	EPA 901.1	Potassium-40	Soil	17.198	2.98	0.778			pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Radium-226	Soil	0.712	0.188	0.134			pCi/g
	EPA 901.1	Radium-228	Soil	1.166	0.349	0.252			pCi/g
	EPA 901.1	Thallium-208	Soil	0.37	0.102	0.066			pCi/g
	EPA 901.1	Thorium-234	Soil	0	1.98	3.997	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.132	0.137	0.114	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.875	0.342	0.333			pCi/g
	HSL-300	Thorium-230	Soil	0.471	0.222	0.119			pCi/g
	HSL-300	Thorium-232	Soil	0.726	0.282	0.065			pCi/g
	HSL-300	U-233/234	Soil	0.382	0.157	0.093			pCi/g
	HSL-300	U-235/236	Soil	0.01	0.066	0.108	J,	J	pCi/g
	HSL-300	Uranium-238	Soil	0.459	0.173	0.07			pCi/g
C004-SB001-7284-01 / 30179165055									
	EPA 901.1	Bismuth-212	Soil	2.043	1.695	1.733			pCi/g
	EPA 901.1	Lead-210	Soil	1.29	2.575	3.34	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.894	0.213	0.18			pCi/g
	EPA 901.1	Potassium-40	Soil	12.418	2.693	1.052			pCi/g
	EPA 901.1	Radium-226	Soil	0.611	0.185	0.211			pCi/g
	EPA 901.1	Radium-228	Soil	1.053	0.321	0.316			pCi/g
	EPA 901.1	Thallium-208	Soil	0.37	0.119	0.084			pCi/g
	EPA 901.1	Thorium-234	Soil	0	1.143	2.468	U,	U	pCi/g
	EPA 901.1	Uranium-235	Soil	0.119	0.155	0.15	J, R,	R	pCi/g
	HSL-300	Thorium-228	Soil	0.682	0.306	0.286	J1+, B+,	J	pCi/g
	HSL-300	Thorium-230	Soil	0.48	0.238	0.135			pCi/g
	HSL-300	Thorium-232	Soil	0.762	0.309	0.16			pCi/g
	HSL-300	U-233/234	Soil	0.394	0.175	0.136			pCi/g
	HSL-300	U-235/236	Soil	0.048	0.078	0.058	U,	U	pCi/g
	HSL-300	Uranium-238	Soil	0.245	0.131	0.07			pCi/g
C004-SB001-8496-01 / 30179165056									
	EPA 901.1	Bismuth-212	Soil	0.901	1.053	2.081	U,	U	pCi/g
	EPA 901.1	Lead-210	Soil	2.426	27.587	34	U,	U	pCi/g
	EPA 901.1	Lead-212	Soil	0.954	0.252	0.296			pCi/g
	EPA 901.1	Potassium-40	Soil	15.751	3.172	1.373			pCi/g
	EPA 901.1	Radium-226	Soil	11.042	1.546	0.356			pCi/g
	EPA 901.1	Radium-228	Soil	1.367	0.425	0.384			pCi/g
	EPA 901.1	Thallium-208	Soil	0.167	0.174	0.181	J,	J	pCi/g
	EPA 901.1	Thorium-234	Soil	0	3.981	7.342	U,	U	pCi/g

Client ID / Lab Sample ID	Method	Isotope	Matrix	Conc	2 S	MDC	Qualifiers	Final Qualifiers	Units
	EPA 901.1	Uranium-235	Soil	0.773	0.261	0.26	R,	R	pCi/g
	HSL-300	Thorium-228	Soil	1.1	0.379	0.291			pCi/g
	HSL-300	Thorium-230	Soil	2.9	0.69	0.15			pCi/g
	HSL-300	Thorium-232	Soil	0.493	0.225	0.064			pCi/g
	HSL-300	U-233/234	Soil	0.443	0.175	0.107			pCi/g
	HSL-300	U-235/236	Soil	0	0.069	0.052	U,	U	pCi/g
	HSL-300	Uranium-238	Soil	0.472	0.182	0.107			pCi/g
RB-040516 / 30179165059									
	EPA 903.1	Radium-226	Water	0.992	0.717	0.982			pCi/L
	EPA 904.0	Radium-228	Water	0.725	0.409	0.738	J, J1+, B+,	J	pCi/L
	HSL-300	Thorium-228	Water	0.101	0.091	0.146	J,	J	pCi/L
	HSL-300	Thorium-230	Water	0.043	0.039	0.025	J1+, B+,	J	pCi/L
	HSL-300	Thorium-232	Water	0	0.038	0.025	J,	J	pCi/L
	HSL-300	U-233/234		0.059	0.087	0.164	U,	U	pCi/L
	HSL-300	U-235/236		0.047	0.101	0.145	U,	U	pCi/L
	HSL-300	Uranium-238	Water	0.046	0.088	0.189	U, J1+, B+,	UJ	pCi/L
RB-040616 / 30179165060									
	EPA 903.1	Radium-226	Water	0.161	0.35	0.646	U,	U	pCi/L
	EPA 904.0	Radium-228	Water	0.454	0.406	0.831	J, J1+, B+,	J	pCi/L
	HSL-300	Thorium-228	Water	0.186	0.104	0.125			pCi/L
	HSL-300	Thorium-230	Water	0.031	0.041	0.064	J, J1+, B+,	J	pCi/L
	HSL-300	Thorium-232	Water	0.019	0.041	0.026	J,	J	pCi/L
	HSL-300	U-233/234		0.078	0.086	0.135	J,	J	pCi/L
	HSL-300	U-235/236		0.017	0.091	0.13	U,	U	pCi/L
	HSL-300	Uranium-238	Water	0.015	0.07	0.148	U, J1+, B+,	UJ	pCi/L

Qualifier Explanation: See section 3 of the memo DCN: RST3-03-F-0001 Revision 1

CONC - Concentration

2 S - Total propagated uncertainty at 2 standard deviations

MDC - Minimum detectable concentration

Radiological Data Verification/Validation Checklist

Site Name:_Canadain Uranium and Radium Corporation Site____ Analytical Laboratory_____ Pace Analytical

Case Number_____TDD: TO-0006-0053 _____ Reviewer _____Rick Haaker, CHP, CIH__ Date _____November 5, 2016

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Part 1 - Sample Handling and Analysis Evaluation

MARLAP Ref.	Criteria	Yes	No	NA	Comments
8.5.1.1	Sample Descriptors - Each sample has a unique ID code which is cross-reference to unique Lab ID	X			
8.5.1.2	Aliquant Size - amount of sample used in analysis provided	X			
8.5.1.3	Dates of sample collection, sample prep and sample analysis provided	X			
8.5.1.4	Samples properly preserved	X			
8.5.1.5	Each analytical result linked to instrument/detector	X			
8.5.1.6	Traceability of standards and reference materials provided	X			
8.5.1.7	QC samples analyzed	X			In general yes. Batch number 28966, analyzed by HSL-300, did not include matrix spikes or matrix spike duplicates.
8.5.1.8	Yield (chemical separation, carrier and/or radiotracer) within acceptable ranges	X			Except where noted in the validation report.
8.5.1.9	Self-absorption curve provided		X		Curves not provided by for radium-228 by gas flow proportional counting but there is evidence that typical mass of the sample was taken into account during the instrument calibration.
8.5.1.10	Efficiency, calibration curves and instrument background information provided	X			
8.5.1.11	Spectrometry resolution data provided	X			Most uranium-235 data from EPA 901.1 was rejected because gamma spectral resolution was not sufficient to resolve uranium-235 and radium-226 gamma contributions at 186 KeV. Severe positive bias is present in uranium-235 data by EPA 901.1.
8.5.1.12	Dilution factors and corrections factors addressed and documentation provided.	X			Provided in data packages but not reviewed in detail by the validator.
8.5.1.13	Count Time for each sample, QC analysis and instrument background provided	X			
8.5.1.14	For each measurement: 1) Measurement uncertainty reported 2) Analyte MDC reported 3) Appropriate units used	 X X X			

*** Covers Pace Analytical Data Packages: 30179165**

Part 2 - Quality Control

MARLAP Ref.	Criteria	Yes	No	NA	Comments
8.5.2.1	Method Blanks analyzed and no detected concentration/activity found		X		See section 6A of the validation report for detections in the method blanks. This affected the qualifiers assigned to some field samples
8.5.2.2	Laboratory Control Samples analyzed and within acceptable ranges	X			
8.5.2.3	Laboratory replicates analyzed and within control limits	X			The laboratory replicates were either MS/MSD or LCS/LCSD sample pairs. No regular samples were treated as duplicates
8.5.2.4	Matrix Spikes/Matrix Spike Duplicate analyzed and within established criteria	X			Matrix spikes were analyzed. MS duplicates were analyzed for soils as required by the field sampling plan. See section 6D of report for details of poorly performing spikes.
8.5.3.1	Test of detection information (critical value) provided.			X	The MDC was provided based on alpha = beta = 0.05. The critical value was not required by QAPP and not provided in all cases. The critical level can be approximated as 50% of the MDC. It can be calculated from the data provided in the package.
8.5.3.2	Detection Capability: Required Minimum Detectable Concentration (RMDC) less than the Minimum Detectable Concentration (MDC) for each analyte		X		Thorium-234 and lead-210 detection limits were frequently greater than 1 pCi/g. This is not a reasonable performance requirement for these two isotopes by EPA 901.1, however.
8.5.3.3	Uncertainty 1. Laboratory's combined standard uncertainty at concentrations lower that the action level less than required method uncertainty (expressed in concentration units) 2. Laboratory's relative combined standard uncertainty at concentrations above the action level less than required relative method uncertainty (express as a percent)			X X	No precision criteria was recognized in the QAPP for individual analytical results. Such samples would have received a final qualifier of J or U, depending on whether the critical level was exceeded, however.

Additional Comments: EPA 901.1 samples had ingrowth periods of 20 – 22 days, which is sufficient for ingrowth of radon-222 progeny.