FINAL STATUS SURVEY REPORT
Timken Motor and Crane Services
DBA Schulz Electric, LLC
30 Gando Drive, New Haven CT

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Final Status Survey Report

Revision 0

January 25, 2022

Timken Motor and Crane Services DBA Schulz Electric, LLC.
30 Gando Drive
New Haven CT 06513

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Table of Revisions

Revision Number	Date	Reason for Revision	Author
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1.0 Glossary of Terms, Acronyms, and Abbreviations

ALARA	Acronym for "As Low as Reasonably Achievable"
BKGD	As used on the report to indicate background radiation levels
CNA	C.N. Associates, Inc.
CPM	Counts per Minute
DBA	Doing Business As
$DCGL_w$	Derived Concentration Guideline
DPM	Disintegrations per Minute
DPT	Decommissioning Planning Team
DQO	Data Quality Objectives
FSS	Final Status Survey
FSSR	Final Status Survey Report
HSA	Historical Site Assessment
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDC	Minimum Detectable Concentration
ND	Non-detectable
NPP	Nuclear Power Plants
RAM	Radioactive Material
RAML	Radioactive Material License
ROCs	Radionuclides of Concern
RSO	Radiation Safety Officer
VSP	Visual Sample Plan

2.0 Executive Summary

A Decommissioning Planning Team (DPT) consisting of Company staff and a third-party consultant, CN Associates, Inc. (CNA), was formed to complete decommissioning of the current facility located at 30 Gando Drive, New Haven, Connecticut. The operations that are currently conducted at this facility are being transferred to another location. Timken Motor and Crane Services, DBA Schulz Electric, LLC is licensed to perform decontamination and repair/refurbishment of slightly contaminated electric motors from Nuclear Power Plants (NPPs).

CNA was retained to plan, conduct, and document a Historical Site Assessment (HSA) and radiological Final Status Survey (FSS) for the purposes of complying with the regulatory criteria for unrestricted release of the facility.

The DPT relied upon the NUREG-1575, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* and NUREG-1757, Volume 1, *Consolidated Decommissioning Guidance*, to develop the FSS and this Final Status Survey Report (FSSR). In addition, the guidance provided in *Remediation Standards for Radionuclide Contamination in Connecticut* was referenced in the performance of the ALARA analysis required by 10 CFR 20.

3.0 Purpose and Scope

The purpose and scope of this report is to provide the documentation that is required in accordance with 10 CFR20.1402, Radiological Criteria for Unrestricted Use, specifically:

> *A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year, including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). Determination of the levels which are ALARA must take into account consideration of any detriments, such as deaths from transportation accidents, expected to potentially result from decontamination and waste disposal.*

To document meeting the above criteria, NUREG 1757 requires the following information to be submitted in a Final Status Survey Report (FSSR):

- An overview of the results of the Final Status Survey (FSS) (Section 11.0).
- A discussion of any changes that were made in the FSS from what was proposed in the decommissioning plan or other prior submittals. (There were no changes in the decommissioning plan or other documents submitted).

- A description of the method by which the number of samples was determined for each survey unit (See Section 9.3.2)
- A summary of the values used to determine the number of samples (See Section 7.0 and 9.3.2)
- The survey results for each survey unit include: (See Attachments 15.4.1 to 15.4.8)
    - The number of samples taken for the survey unit.
    - A description of the survey unit, including (a) a map or drawing of the survey unit showing the reference system and random start systematic sample locations for Class 1 and 2 survey units and random locations shown for Class 3 survey units and reference areas, and (b) a discussion of remedial actions and unique features.
    - The measured sample concentrations in units that are comparable to the DCGL.
    - The statistical evaluation of the measured concentrations.
    - Judgmental and miscellaneous sample data sets reported separately from those samples collected for performing the statistical evaluation.
    - A discussion of anomalous data, including any areas of elevated direct radiation detected during scanning that exceeded the investigation level or measurement locations in excess of $DCGL_W$; and
    - A statement that a given survey unit satisfied the $DCGL_W$ and the elevated measurement comparison if any sample points exceeded the $DCGL_W$.
- A description of any changes in initial survey unit assumptions relative to the extent of residual radioactivity (e.g., material not accounted for during site characterization). (There were no changes in the assumptions).
- A description of how ALARA practices were employed to achieve final activity levels (See Section 12)
- If a survey unit fails, a description of the investigation conducted to ascertain the reason for the failure and a discussion of the impact that the failure has on the conclusion that the facility is ready for final radiological surveys and that it satisfies the release criteria. (None of the survey units failed the FSS).
- If a survey unit fails, a discussion of the impact that the reason for the failure has on other survey unit information. (None of the survey units failed the FSS).

4.0 Property

4.1 Name

Timken Motor and Crane Services, DBA Schulz Electric, LLC.

4.2 Location

30 Gando Drive
New Haven CT, 06513

5.0 Summary of Historical Site Assessment (HSA)

An HSA was completed at the site on July 23, 2021 (Reference 14.5). The purpose of the HSA was to accomplish the following:

- The HSA identifies the types, forms, and quantities of radionuclide(s) that might contribute to any residual radioactivity at the site to determine if:
  1. The facility is impacted and requires immediate action to reduce risks to human health and the environment.
  2. The facility is impacted and requires further study to arrive at the best possible classification; or
  3. The facility is not impacted, and no further action is needed because little to no residual radioactivity remains at the site.

- The HSA provides the foundation for conducting an informed evaluation of the facility in preparation for conducting decommissioning and the FSS to demonstrate compliance with NRC Regulations in 10 CFR 20.1402, Radiological Criteria for Unrestricted Use.

The following conclusions were reached from the HSA:

- **Potential, likely, or known sources of RAM and radioactive contamination have been identified based upon the information contained in historical records and Scoping Surveys.** The extent of radioactive materials has been identified and located in a small, contaminated area within the restricted area and that there was no radioactive material identified in any of the unrestricted areas of the facility. (See Figure 1)

- **No areas of the site require immediate action to reduce the threat to human health and safety.** The results of routine surveys and characterization surveys did not reveal any areas of elevated radiation in the facility that pose a threat to personnel involved in final site decommissioning activities.

- **The likelihood of contaminant migration has been carefully and thoroughly assessed.** There are no suspected impacts to the environment. Work activities involved small quantities of RAM that were contained within the restricted area and there was no evidence of migration of contamination to any areas outside of the restricted area. There was an authorized release pathway of radionuclides to sanitary sewerage, but the practice of the site was to only release

water that had no detectable activity to the sanitary sewer. In any case, this specific storm drain discharge will be sampled as part of the FSS. There is no suspected contamination to be present in the storm drain based on the past practices at the site. Gamma Isotopic analysis will be performed at the discharge (See Section 10)

- **The need for future scoping and characterization surveys has been determined.** Surveys of the facility to identify any areas containing elevated levels of radiation have been sufficient to identify the impacted and non-impacted areas. No additional surveys are required. The HSA determined the radionuclides of concern (see Section 6.0) and established the release criteria consistent with the guidelines in NUREG-1757.

- **The results of the HSA indicate facility is consistent with Group 2 Decommissioning requirements in accordance with NUREG-1757.** The results of the HSA indicate that the radiological condition of the facility is consistent with Group 2 Decommissioning and decommissioning work at the facility will not require a decommissioning plan as the areas will be remediated with common cleaning and decontamination methods.

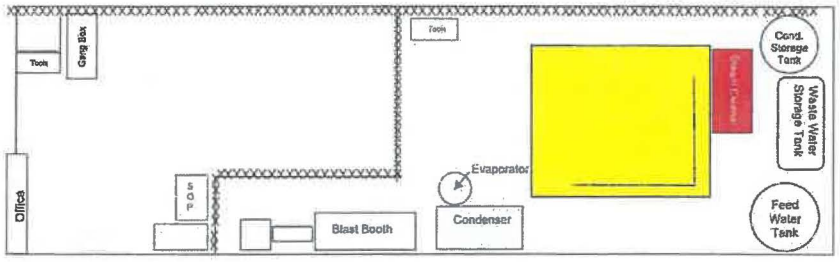
- **The need for additional work to reduce radiation at the site to levels that are as low as reasonably achievable (ALARA) has been effectively determined.** There exists no residual contamination at greater than the NUREG 1757 screening criteria and the evaluation will be based upon Connecticut State guidance and is included in Section 12.

- **An initial classification of unimpacted and potentially impacted portions of the site as Class 1, 2, or 3 Areas (or a combination thereof) as defined in MARSSIM has been made.** Results of the HSA support the classification of the site into unimpacted and potentially impacted areas. For completing FSS, potentially impacted areas of the facility are discussed in Section 6 of this report.

6.0 Findings and Background Information

Figure 1 illustrates the historical layout where radioactive materials were used at the site. The area was disassembled and decontaminated, and all material was removed from the site prior to performance of the FSS. This section will describe the historical use of radioactive materials at 30 Gando Drive.

Figure 1 - Gando Restricted Area



6.1 History of Radioactive Material Use

The primary activities performed at the site included the receipt and decontamination of contaminated motors from NPPs. The motors were received outside of the restricted area and surveys were performed. The motors are then moved into the building in the restricted area where additional surveys were performed. The motors are decontaminated using one of two methods – water blasting or grit blasting.

Figure 2 - Pressure Washer

The primary method of decontamination was pressure washing with high pressure water (See Figure 2). Any item needing decontamination is placed in the contaminated area shown in Figure 1. The water is collected in a decontamination pad. The decontamination pad is a stainless-steel berm that collects all the water from decontamination. The water is then disposed of via a water evaporation system. There was a total of 30 to 40 motors that needed to be decontaminated on an annual basis.

Figure 3 - Sand Blast Unit

In the case of more aggressive decontamination, a self-contained sand blast cabinet is available (See Figure 3). The system is a self-contained unit and all sand blast grit used is collected in the cabinet. The unit also includes a separate HEPA filter to filter the exhaust of the unit. This method of decontamination is used approximately 3 to 4 times per year and the grit is disposed of as radioactive waste.

The primary method to address the water collected in motor decontamination is by evaporation. The system is shown in Figure 4. The system consists of an electric water evaporator, a tank to collect the wastewater from decontamination, and the distillate tank. Once enough water is collected, the evaporation is started to reduce the inventory of wastewater from decontamination. The distillate water is sampled and sent to an offsite company for analysis of radioactive material and disposed of in accordance with 10 CFR 20 and the requirements contained in the radiation protection program (Reference 14.6).

Figure 4 - Water Evaporation System

6.2 Current Use of Radioactive Materials

There is no current use of licensed radioactive material at the site. As part of the preparation to relocate to 110 Commerce Street, the restricted area equipment was disassembled, surveyed, and loaded into containers to facilitate the move. The restricted area was decontaminated using simple cleaning techniques. Once the license amendment was received for Commerce Street, the containers were transferred to the new facility. The only material onsite at the time of the FSS will be exempt check sources used to perform instrumentation response checks during the survey.

6.3 Beta/Gamma Radionuclides

The primary beta/gamma emitting radionuclides are those associated with the operation of a nuclear power plant. As part of the HSA and the characterization survey, several smears were sent for offsite, independent analysis. Based upon the absence of detectable alpha contamination (both total and removable), analyses included gamma isotopic and tritium analyses. The results are provided in Table 1.

Table 1- Isotopic Analysis of Wipes from 30 Gando Drive Contaminated Area

Sample ID	Isotopic Results (Reported as dpm/100 cm^2)							
	Sb 125	Cs-137	Co-58	Co-60	Co-57	Tritium	Mn-54	Nb-94
DC-13 Smear	27.3	384	13.6	444	ND	2664	ND	ND
DC-15 Smear	ND	41.7	ND	24.4	ND	153.4	ND	ND
DC 18 Smear	ND	60.8	ND	6.5	ND	149.6	ND	ND
DC 19 Smear	159.8	76.6	ND	2886	4.6	21,955	21.2	20.4

The primary surveys to be performed at the site will be a non-isotopic specific gross beta survey. The screening criteria in Figure 5 for Co-60 will provide the basis for the release limit at the site for the gross beta surveys on building surfaces. Based on these results in Table 1 and the criteria in Figure 5, it was concluded that the most limiting radionuclide at the site was Co-60.

Figure 5 – NUREG-1757 Building Surface Screening Criteria

APPENDIX B

Table B.1 Acceptable License Termination Screening Values of Common Radionuclides for Building-Surface Contamination

Radionuclide	Symbol	Acceptable Screening Levels[a] for Unrestricted Release (dpm/100 cm^2)[b]
Hydrogen-3 (Tritium)	^{3}H	120000000
Carbon-14	^{14}C	3700000
Sodium-22	^{22}Na	9500
Sulfur-35	^{35}S	13000000
Chlorine-36	^{36}Cl	500000
Manganese-54	^{54}Mn	32000
Iron-55	^{55}Fe	4500000
Cobalt-60	^{60}Co	7100
Nickel-63	^{63}Ni	1800000
Strontium-90	^{90}Sr	8700
Technetium-99	^{99}Tc	1300000
Iodine-129	^{129}I	35000
Cesium-137	^{137}Cs	28000
Iridium-192	^{192}Ir	74000

Notes:

a Screening levels are based on the assumption that the fraction of removable surface contamination is equal to 0.1. For cases when the fraction of removable contamination is undetermined or higher than 0.1, users may assume, for screening purposes, that 100 percent of surface contamination is removable, and therefore the screening levels should be decreased by a factor of 10. Alternatively, users having site-specific data on the fraction of removable contamination, based on site-specific resuspension factors (e.g., within 10 percent to 100 percent range), may calculate site-specific screening levels using DandD, Version 2.

b Units are disintegrations per minute (dpm) per 100 square centimeters (dpm/100 cm^2). One dpm is equivalent to 0.0167 becquerel (Bq). Therefore, to convert to units of Bq/m^2, multiply each value by 1.67. The screening values represent surface concentrations of individual radionuclides that would be deemed in compliance with the 0.25 mSv/y (25 mrem/y) unrestricted release dose limit in 10 CFR 20.1402. For radionuclides in a mixture, the "sum of fractions" rule applies, see Part 20, Appendix B, Note 4.

During the FSS, there are several planned volumetric samples that will be obtained of the restricted area cement, the RAM storage area asphalt, and soil at the storm water discharge. Based upon the isotopic analysis performed, the following chart illustrates the screening criteria that will be used as the release criteria to evaluate the sample results.

Figure 6 – NUREG-1757 Soil Screening Criteria

Table B.2 Screening Values (pCi/g) of Common Radionuclides for Soil Surface Contamination Levels (continued)

Radionuclide	Symbol	Surface Soil Screening Values[a]
Thorium-228	^{228}Th	4.7 E+00
Thorium-228 + C[b]	^{228}Th + C	4.7 E+00
Thorium-230	^{230}Th	1.8 E+00
Thorium-230 + C	^{230}Th + C	6.0 E-01
Thorium-232	^{232}Th	1.1 E+00
Thorium-232 + C	^{232}Th + C	1.1 E+00
Protactinium-231	^{231}Pa	3.0 E-01
Protactinium-231 + C	^{231}Pa + C	3.0 E-01
Uranium-234	^{234}U	1.3 E+01
Uranium-235	^{235}U	8.0 E+00
Uranium-235 + C	^{235}U + C	2.9 E-01
Uranium-238	^{238}U	1.4 E+01
Uranium-238 + C	^{238}U + C	5.0 E-01
Plutonium-238	^{238}Pu	2.5 E+00
Plutonium-239	^{239}Pu	2.3 E+00
Plutonium-241	^{241}Pu	7.2 E+01
Americium-241	^{241}Am	2.1 E+00
Curium-242	^{242}Cm	1.6 E+02
Curium-243	^{243}Cm	3.2 E+00

These values represent surficial surface soil concentrations of individual radionuclides that would be deemed in compliance with the 25 mrem/y (0.25 mSv/y) unrestricted release dose limit in 10 CFR 20.1402. For radionuclides in a mixture, the "sum of fractions" rule applies; see Part 20, Appendix B, Note 4.

Notes:

a Screening values are in units of (pCi/g) equivalent to 25 mrem/y (0.25 mSv/y). To convert from pCi/g to units of becquerel per kilogram (Bq/kg), divide each value by 0.027. These values were derived using DandD screening methodology (NUREG/CR–5512, Volume 3). They were derived based on selection of the 90th percentile of the output dose distribution *for each specific radionuclide* (or radionuclide with the specific decay chain). Behavioral parameters were set at the mean of the distribution of the assumed critical group. The metabolic parameters were set at "Standard Man" or at the mean of the distribution for an average man.

b "Plus Chain (+C)" indicates a value for a radionuclide with its decay progeny present in equilibrium. The values are concentrations of the parent radionuclide, but account for contributions from the complete chain of progeny in equilibrium with the parent radionuclide (NUREG/CR–5512 Volumes 1, 2, and 3).

6.4 Alpha Radionuclides

As determined through the review of historical information and the characterization surveys performed at the site as a function of the HSA, there were no indications of alpha contamination present above the established minimum detectable activities (MDA). Based upon the fact that site historical surveys and characterization surveys did not identify alpha contamination above minimum detectable activity (MDA), and to determine the potential

radionuclides of concern, a documentation review was conducted to determine the typical alpha radionuclides present (Figure 7).

Figure 7- Principle Transuranic Nuclides in Spent Fuel

Principal Transuranic Nuclides in Spent Fuel

Nuclide	Half-Life (yr)	Decay Mode	@ 1 yr	@ 10 yr
Pu-238	86	Alpha	18%	38%
Pu-239/240	24131	Alpha	6%	14%
Am-241	432	Alpha	2%	30%
Cm-242	0.45	alpha, feeds Pu-238	62%	0%
Cm-243/244	18	alpha, feeds Pu-240	12%	18%
TOTAL			100%	100%
Pu-241	14.4	beta, feeds Am-241	924% of alpha	1390% of alpha

Reference: Light Water Reactor Nuclear Fuel Cycle. CRC Press. 1981

Table 2 presents the primary alpha emitting radionuclides of concern from Figure 7. The DCGL was determined using the default settings for surfaces in NRC decommissioning computer code DandD for the radionuclides listed below.

Table 2 - Alpha Building Surface Release Criteria

Radionuclide	Calculated dose from 1 dpm/100 cm^2 (mrem)	DCGL ratioed to 25 mrem–dpm/100cm^2
Pu-238	0.8	31
Pu-239	0.9	28
Am-241	0.9	28
Cm-244	0.5	50
Source Term at 1 year from Figure 7	0.3	83
Source Term at 10 years from Figure 7	0.8	31

6.5 ROCs and Release Criteria

Based on a review of the radioactive material license, the history of sources used at the facility, and the history of operations at the facility, the surveys will be conducted as non-radionuclide

specific, primarily to detect gross beta and alpha radiations. The following screening $DCGL_w$ values based upon the guidelines in NUREG 1757 and calculated in Table 2 will be used to evaluate if radiological conditions meet the acceptable release criteria to demonstrate compliance to the NRC release criteria in 10 CFR 20.1402. The gross beta release criteria is based on Co-60, and the gross alpha release criteria is based on the 10 year alpha source term from a typically nuclear power plant.

Table 3 - Release Criteria for Unrestricted Release at 30 Gando Drive

Radiation	DCGL (dpm/100cm²)
Gross Beta	7000
Gross Alpha	31

6.6 Area Classification Definitions

The facility will be classified into the following areas based upon the criteria and definitions discussed in the MARSSIM manual:

- Non-impacted Areas – are areas that have no reasonable potential for residual contamination
- Class 1 Areas – are impacted areas that prior to remediation may have concentrations of residual radioactivity that exceed the $DCGL_w$. Areas that have, or had prior to remediation, a potential for radioactive contamination (based on site operating history) or known contamination (based on previous radiation surveys) above the DCGLW. Examples of Class 1 areas include:
  - 1) site areas previously subjected to remedial actions,
  - 2) locations where leaks or spills are known to have occurred,
  - 3) former burial or disposal sites,
  - 4) waste storage sites, and
  - 5) areas with contaminants in discrete solid pieces of material and high specific activity
- Class 2 Areas – Areas that have, or had prior to remediation, a potential for radioactive contamination or known contamination, but are not expected to exceed the $DCGL_w$. To justify changing the classification from Class 1 to Class 2, there should be measurement data that provides a high degree of confidence that no individual measurement would exceed the $DCGL_w$. Other justifications for reclassifying an area as Class 2 may be appropriate, based on

site-specific considerations. Examples of areas that might be classified as Class 2 for the FSS include:

- 1) locations where radioactive materials were present in an unsealed form,
- 2) potentially contaminated transport routes,
- 3) areas downwind from stack release points,
- 4) upper walls and ceilings of buildings or rooms subjected to airborne radioactivity,
  5) areas handling low concentrations of radioactive materials, and
- 6) areas on the perimeter of former contamination control areas are impacted areas where concentrations of residual activity that exceed the $DCGL_W$ are not expected.

- Class 3 Areas - Any impacted areas that are not expected to contain any residual radioactivity or are expected to contain levels of residual radioactivity at a small fraction of the $DCGL_W$, based on site operating history and previous radiation surveys. Examples of areas that might be classified as Class 3 include buffer zones around Class 1 or Class 2 areas, and areas with very low potential for residual contamination but insufficient information to justify a non-impacted classification or impacted areas that have a low probability of containing areas with residual radioactivity.

6.7 Impacted Areas

Areas of the site classified as impacted areas are identified in Figure 8. The specific area classifications will be discussed in Section 9.1.4.

Figure 8 – Impacted Areas

6.8 Non - Impacted Areas

Based on the history of the site and the scoping surveys conducted by CN, the remaining areas, including the walls above 8' and the ceilings will be considered non-impacted areas. Surveys will

be conducted as part of the FSS, however, on any remaining equipment and support structures. Separate judgmental survey units will be established to perform and document these surveys.

7.0 Data Quality Objectives

When data are being used to select between two alternative conditions (e.g., compliance or non-compliance with a standard), the Data Quality Objectives (DQO) process is a recommended systematic planning tool. DQOs are qualitative and quantitative statements and are designed to clarify the study objective, define the performance criteria, define the appropriate type of data needed, and specify tolerable probabilities of decision-making errors. Project-specific DQOs were developed using the seven-step DQO Process.

7.1 Step 1 – State the Problem

Problem Statement: Develop the FSS to ensure that the radiological conditions of the site are assessed to support release of the site for unrestricted use and subsequent submittal of a license amendment to remove the 30 Gando Drive location from the radioactive material license (RML).

Planning Team: The team will consist of the representatives from the company and the consulting firm retained to conduct the FSS. The following are the key personnel involved:

Representatives of Schulz Electric:

- Mr. Stephen Cross, RSO
- Mr. Charles (Bill) Eldredge
- Mr. Richard Chrzanowski

Representatives of CN:

- Mr. Ron Cardarelli, Principal of CN
- Mr. Willie Harris, CHP, Senior Director, Radiation Protection

Conceptual Model (CM) of potential Hazard: The conceptual model (CM) that describes the potential hazard to be addressed is the potential for residual contamination from the decontamination of motors that were received from Nuclear Power Plants.

7.2 Step 2 – Identify the Goal of the Study/Decision

This step will identify the primary study question to be addressed. Using the study question, a decision statement will be developed.

Primary Study Question

Do the impacted areas of the facility contain mean levels of residual contamination that exceed the NRC criteria for unrestricted use of the facility, thereby requiring additional remedial decommissioning work prior to release of the site?

Decision Statement

Determine whether the radioactive contamination levels in the impacted areas exceed NRC release criteria.

7.3 Step 3 – Identify the Information Inputs

The third step of the DQO Process determines the types and sources of information needed to resolve the decision statement; whether new data collection is necessary; the information basis the planning team will need for establishing appropriate analysis approaches and performance or acceptance criteria; and whether appropriate sampling and analysis methodology exists to properly measure environmental characteristics for addressing the problem.

Identifying the Information Inputs and Source of Data

Inputs to the decision will consist of historical documents summarized in the HSA. This information defined the impacted and non-impacted areas, the ROCs, and release criteria. Based on this information, additional radiological surveys will be conducted using the guidance in MARSSIM to collect the final radiological conditions at the site.

Determination of the Action Level

The criteria or action level will utilize the radiological screening criteria from NUREG-1757, Vol 1, Appendix B for beta contamination. A generic screening criterion using the NRC developed computer code DandD will be used to establish the alpha contamination screening criteria. These values were discussed in Section 6.

7.4 Step 4 – Define the Boundaries of the Study

Step 4 of the process identifies the target population of interest and specifies the temporal and spatial feature(s) pertinent for decision making.

Sample Population

The sample population will consist of samples obtained in the impacted areas. The number of samples and methodology will be determined using the guidance contained in NUREG-1575, MARSSIM manual.

Special and Temporal Boundaries

Temporal boundaries for the study are defined by the period of use of radiological materials at the site. Spatial boundaries are defined by the locations of historical radiological materials storage, use or known or suspected release.

If there is reasonable potential, or conclusive evidence, that an area was potentially impacted (i.e., contaminated) by site activities involving the use, storage, or release of licensed radioactive materials in the building, then that area was considered potentially radiologically impacted.

7.5 Step 5 – Develop the Analytic Approach

Step 5 of the DQO Process develops an analytic approach to guide how to analyze the study results and draw conclusions from the data. This will entail specifying the appropriate parameters, development of a working action level, and generate an "If Then...Else" decision rule.

Specify the Acton Level

The screening criteria of NUREG-1757, Vol 1, Appendix B will be utilized as the action level for decision making for beta/gamma contamination, and alpha contamination will use screening criteria derived using the NRC program DandD and the default settings.

Specify the Decision Rules

Based on the survey requirements located in the MARSSIM manual, there will be two primary types of surveys conducted, a scan survey and a static/fixed point survey (See Section 9.0). Table 4 describes the decision rules developed to analyze the survey results.

Table 4 - Decision Criteria

	If	Then	Else
1	Scan surveys indicate the potential presence of alpha or beta/gamma radioactivity at greater than the investigational threshold	Flag the area for additional surveys and/or sampling	Consider the area to have passed this screening criteria
2	If analysis of smears indicates the potential for removable alpha or beta/gamma contamination greater than 10 percent of the applicable release limit	Flag the area for investigation and/or remediation	Consider the area to have passed the release criteria
3	Fixed-point static measurements indicate the potential for total alpha activity exceed the release criteria	Flag the area for investigation and/or remediation	Consider the area to have passed this release criteria

7.6 Step 6 – Specify the Performance or Acceptance Criteria

Step 6 will specify the decision rule as a statistical hypothesis test, examine the consequences of making incorrect decisions from the test and define the acceptable limits on making errors.

Hypothesis

The planning team followed the recommend guidelines in MARSSIM and various statistical programs, such as Visual Sampling Plan to establish the Null Hypothesis (H_o) and the alternate hypothesis (H_a). The null hypothesis is that the site is radiologically contaminated and the alternative if the null hypothesis is rejected, is, the site is radiologically uncontaminated. The Hypotheses are stated below:

H_o: *true mean of radiological contamination at the site is greater than the screening criteria indicating the site is radiologically contaminated*

H_a: *true mean of the radiological contamination at the site is less than the screening criteria indicating the site is NOT radiologically contaminated*

Decision Errors

- Type I Decision Errors occur when the null hypothesis is rejected, but true. In this case survey and sampling results would be used to conclude that no residual contamination exists above release criteria, when in fact it does. The decision error was set at 0.05.

- Type II Decision Errors occur when the null hypothesis is accepted, but false. In this case, survey and sampling results would be used to conclude that residual contamination exists at levels above release criteria, when in fact it does not. The decision error was set at 0.05.

7.7 Step 7 – Develop the Detailed Plan for Obtaining Data

The goal of Step 7 is to develop a resource-effective design for collecting and measuring environmental samples, or for generating other types of information needed to address your problem

Selecting the Design

Section 9 will discuss the FSS design specifications. The FSS will be performed using the guidelines from NUREG-1575. The procedure used in the field is included as Appendix 15.5.

8.0 Disposition of Sources and Radioactive Materials

8.1 Sealed Sources

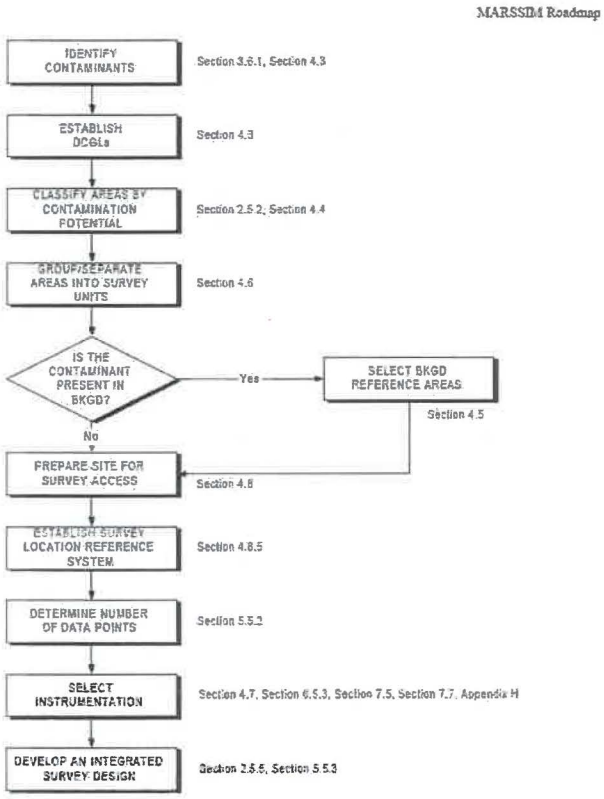
At the time of the FSS, except for exempt sealed sources used to perform instrument source checks, all sources were transferred to the 110 Commerce Street location.

8.2 Radioactive Materials

At the time of the FSS, all radioactive materials were removed from the site.

FSS design followed the general process illustrated in MARSSIM and shown in Figure 9. The first several steps of the process have been discussed in previous sections of the report. The next steps in the process in accordance with Figure 9 are to establish the survey units, determine background levels, number of sample points, and instrumentation. The next sections of the report discuss these steps.

Figure 9 - MARSSIM Survey Design Flowchart



9.1 Survey Units

Table 5 from MARSSIM states the recommend area for the survey units for both structures and land areas. This table was used as a guideline to develop the survey units listed in section 9.1.4 and shown in Figure 10.

Table 5 - Recommended Survey Areas for Various Class Survey Units

Class	Area	Survey area
1	Structures	Up to 100 m^2 (1076 ft^2)
1	Land Areas	Up to 2000 m^2
2	Structures	100 to 1000 m^2 (1076 to 10764 ft^2)
2	Land Areas	2000 to 10,000 m^2
3	Structures	No Limit
3	Land Areas	No Limit

9.1.1 Class 1 Areas

Based upon document reviews, history of the facility and the characterization survey, there was one Class 1 area identified in the facility (See Table 6). The Class 1 area encompasses the floor of the contaminated area established in the restricted area that was used to perform decontamination of motors and the immediate floor area outside of the contaminated area (Note: this is referred to as the Decon Area). While there were no indications of areas expected to exceed the established $DCGL_w$, it was conservatively decided to treat this as a Class 1 area.

9.1.2 Class 2

Based upon document reviews, history of the facility and the characterization survey, there were Five (5) Class 2 areas identified in the facility (See Table 6). These areas encompassed the walls of the old decon area up to 8 feet, the floor of the restricted area outside of the decon room, and the old RP office area.

The walls up to 8 feet and the outside material storage area met the criteria for a Class 3 survey unit. The DPT made the conservative decision to treat these areas as a Class 2 survey area.

9.1.3 Class 3

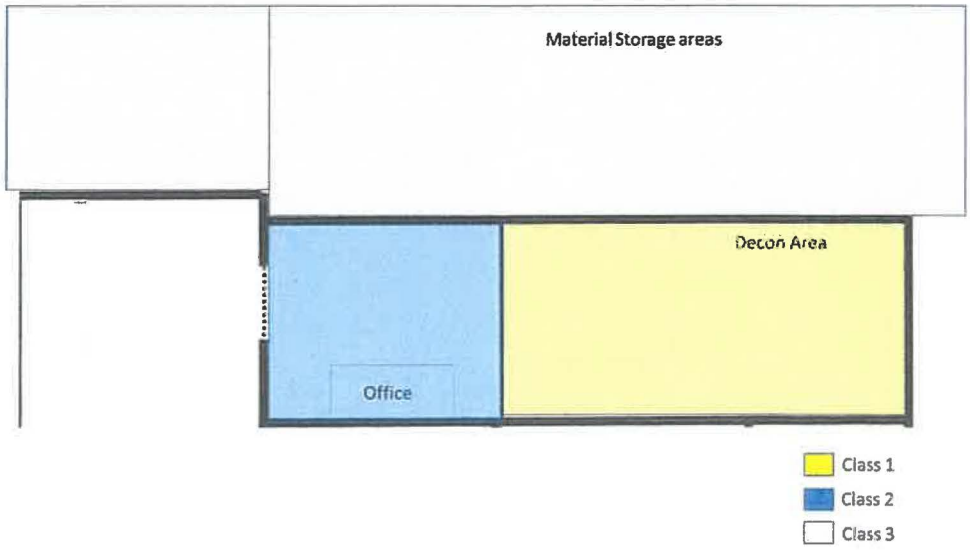
There were no Class 3 survey units. Based upon the existing data, a lack of historical airborne radioactivity events, and the characterization surveys, the team determined that the walls above 8 feet and the ceiling were non-impacted areas. Based upon the facility design, the team determined the most likely locations for residual contamination would be the remaining service equipment, such as the crane and crane tracks. As a result, survey units 7 and 8 were developed as judgmental surveys for these specific locations.

9.1.4 Survey Unit Listings

Table 6 - List of Survey Units for FSS

Survey Unit	Description	Class	Approximate Area (Square feet)
1	Decon area floor	1	990
2	Decon area walls (up to 8 feet)	2	990
3	Inside Restricted area Floor (excluding the old office area)	2	840
4	Inside Restricted area wall (up to 8')	2	900
5	Office Area	2	450
6	Outside material storages	2	1840
7	Frames, pipes, and other obstructions on the wall	NA	NA
8	Remaining Equipment and ventilation pipes	NA	NA

Figure 10 - Gando Street Survey Unit Classification Map



9.2 General Requirements

The following survey general requirements were considered in the develop of the FSS design regarding percentage of surface scans to be performed and surface activity measurements to be performed:

Table 7 - MARSSIM Survey Guidance for FSS's

Area Classification	Structures		Land Areas	
	Surface Scans	Surface Activity Measurements	Surface Scans	Surface Soil Measurements
Class 1	100%	Number of data points from statistical tests	100%	Number of data points from statistical tests
Class 2	10 to 100% (10 to 50% for upper walls and ceilings) systematic and Judgmental	Number of data points from statistical tests	10 to 100% systematic and judgmental	Number of data points from statistical tests
Class 3	NA – No Class 3 Areas	NA – No Class 3 Areas	NA – No Class 3 Areas	NA – No Class 3 Areas

9.3 Sample Requirements

The FSS to be conducted for the site will consist of scan surveys and fixed-point/static surveys as described below.

9.3.1 Scan Surveys

As described in MARSSIM, the objective of a scan survey is to identify any locations within the survey unit that are indicative of elevated activity that exceeds the pre-established investigation level. If any elevated indications are found, the area is marked, and further investigation is performed. During the survey design, the scan percentages stated in Table 2 will be implemented for the Class 1 and Class 2 areas. The scan percentage for a Class 2 Area is 10 to 100%. After a detailed review of the results of the scoping surveys contained within the HSA, the minimum scan percentage for a Class 2 Area will be approximately 50% percent of the floors and approximately 25 to 50% of the walls up to 8 feet. The specific instruments used for the scan surveys are discussed in Section 9.4.

During the performance of scan surveys on the floor, the data recording feature of the instrument will be used during the survey. The results will be recorded in approximately 2 second intervals. During performance of the wall surveys, the technicians will record the range of readings in gross counts per minute on the survey data sheet that they observe for each pass made with the instrument. Any elevated readings will be indicated on the survey map and a bias sample will be obtained at this point. See the specific survey unit results for a discussion of the survey results and the recorded values from the survey.

9.3.2 Fixed Point/Static Surveys

9.3.2.1 Number of Samples

The statistical analysis that will be conservatively used is the MARSSIM Sign Test. The number of sample/surface measurement locations to be obtained was determined in accordance with MARSSIM Table 5.5. The following parameters were used in determination of number of measurement points for the FSS:

- alpha and beta errors of 0.05
- a conservative value for the relative shift of 1.2 was determined for planning the sample locations prior to the site visit
- Based on this value, the number of points to be considered per survey area was 23 (See Figure 11).

As a final check, the number of required survey points based upon actual data was calculated to validate the conservative assumptions. These values are reported in Appendices 15.4 for each survey unit and were calculated to be approximately 14 samples.

Figure 11 - MARSSIM Table 5.5

Table 5.5 Values of N for Use with the Sign Test

	α=0.01					α=0.025					α=0.05					α=0.10					α=0.25				
	β					β					β					β					β				
Δ/σ	0.01	0.025	0.05	0.10	0.25	0.01	0.025	0.05	0.10	0.25	0.01	0.025	0.05	0.10	0.25	0.01	0.025	0.05	0.10	0.25	0.01	0.025	0.05	0.10	0.25
0.1	4095	3476	2984	2483	1704	3476	2907	2459	1989	1313	2984	2459	2048	1620	1018	2483	1989	1620	1244	725	1704	1313	1018	725	345
0.2	1035	879	754	623	431	879	735	622	503	333	754	622	518	410	258	623	503	410	315	184	431	333	258	184	88
0.3	468	398	341	282	195	398	333	281	227	150	341	281	234	185	117	282	227	185	143	83	195	150	117	83	40
0.4	270	230	197	162	113	230	1921	162	131	87	197	162	136	107	68	162	131	107	82	49	113	87	68	49	23
0.5	178	152	130	107	75	152	126	107	87	58	130	107	89	71	45	107	87	71	54	33	75	58	45	33	16
0.6	129	110	94	77	54	110	92	77	63	42	94	77	65	52	33	77	63	52	40	23	54	42	33	23	11
0.7	99	83	72	59	41	83	70	59	48	33	72	59	50	40	26	59	48	40	30	18	41	33	26	18	9
0.8	80	68	58	48	34	68	57	48	39	26	58	48	40	32	21	48	39	32	24	15	34	26	21	15	8
0.9	66	57	48	40	28	57	47	40	33	22	48	40	34	27	17	40	33	27	21	12	28	22	17	12	6
1.0	57	48	41	34	24	48	40	34	28	18	41	34	29	23	15	34	28	23	18	11	24	18	15	11	5
1.1	50	42	36	30	21	42	35	30	24	17	36	30	26	21	14	30	24	21	16	10	21	17	14	10	5
1.2	45	38	33	27	20	38	32	27	22	15	33	27	23	18	12	27	22	18	15	9	20	15	12	9	5
1.3	41	35	30	25	17	35	29	24	21	14	30	24	21	17	11	25	21	17	14	8	17	14	11	8	4
1.4	38	33	28	23	16	33	27	23	18	12	28	23	20	16	10	23	18	16	12	9	16	12	10	8	4
1.5	35	30	27	22	15	30	26	22	17	12	27	22	18	15	10	22	17	15	11	8	15	12	10	8	4
1.6	34	29	24	21	15	29	24	21	17	11	24	21	17	14	9	21	17	14	11	8	15	11	9	8	4
1.7	33	28	24	20	14	28	23	20	16	11	24	20	17	14	9	20	16	14	10	8	14	11	9	8	4
1.8	32	27	23	20	14	27	22	20	16	11	23	20	16	12	9	20	16	12	10	8	14	11	9	8	4
1.9	30	26	22	18	14	26	22	18	15	10	22	18	16	12	9	18	15	12	10	6	14	10	9	6	4
2.0	29	26	22	18	12	26	21	18	15	10	22	18	15	12	8	18	15	12	10	6	12	10	8	6	3
2.5	28	23	21	17	12	23	20	17	14	10	21	17	15	11	8	17	14	11	9	5	12	10	8	5	3
3.0	27	23	20	17	12	23	20	17	14	9	20	17	14	11	8	17	14	11	9	5	12	9	8	5	3

Survey Planning and Design

9.3.2.2 Measurements Performed

At each fixed-point/static survey location, the following specific analysis was conducted:

- A two-minute sample count for alpha and beta total contamination with a hand-held dual probe detector. The gross counts were recorded on the survey data sheet to minimize in field calculational and transcription errors.
- A 100 cm^2 disc smear was obtained for removable surface contamination counted with a Ludlum 3030. The smears were counted for 5 minutes to meet the MDA for the alpha analysis.
- An "on-contact" reading was obtained for beta radiation by taking an open window-closed window reading with an Ion chamber. The difference between the open window and closed window readings were recorded on the data sheet.

- An "on-contact" and one-meter reading dose rate measurement was obtained for external gamma radiation

The instruments used for each of these surveys is discussed in Section 9.4 of this report.

9.4 Instruments

Table 8 summarizes the instruments that were used during the FSS. Calibration certificates are included as Appendix 15.2.

Table 8- Instruments Used for FSS

Make	Model/Probe	Serial Number	Calibration Due Date	Purpose
Ludlum	3002/FM3	25020397	08/20/2022	Floor cart used to perform alpha and beta scans
Ludlum	2221/44-10	335853	09/23/2022	3"x3" NaI(Tl) used in the performance of gamma walkover surveys
Ludlum	2360/43-93	319914	08/04/2022	Fixed Point measurements and wall scan surveys for alpha and beta contamination
Ludlum	2360/43-93	329121	02/24/2022	Fixed Point measurements and wall scan surveys for alpha and beta contamination
Thermo Fisher Scientific	RO20	12301	11/27/2021	Beta Dose rate measurements
Ludlum	19	300696	08/31/2022	Gamma µR dose rate measurements
Ludlum	3030	312329	01/05/2022	Bench Counter used to count alpha and beta Removable contamination

The Model 3002 is a durable, lightweight instrument designed for alpha and beta radiation survey with an external detector. It features a large, easy-to-read LCD screen and audible alarms and is controlled using a simple five-button interface. Three modes of operation are available – RATE, MAX, and COUNT – which can be selected by pressing the MODE button. Measurements can be collected in cps, cpm, Bq, or dpm units. Pressing the α-β button switches between alpha, beta, or alpha and beta measurements. When enabled with the optional Lumic Data Logger Kit (see Options), data can be logged in any of the operational modes using the LOG button on the handle. Up to 1000 data points can be stored internally.

The Model 3002/FM Series Alpha-Beta Floor Monitors allow a user to quickly survey large areas for alpha-beta contamination. They combine the dependable Model 3002 Alpha-Beta Survey Meter with two alpha-beta scintillation detectors in configurations ideal for floor monitoring. The use of scintillation detectors creates an instrument that requires much less maintenance than traditional gas flow proportional detectors. The active area of the probe is 1080 cm^2.

The Ludlum Model 44-10 is a NaI(Tl) scintillator. The instrument is used for low-level, wide energy gamma detection. The recommended energy range is 30 keV to 3.0 MeV.

The Ludlum 2360 General Purpose Data Logger - This instrument is an optimized Alpha-Beta Ratemeter, Scaler, and Data Logger that offers a traditional analog readout supplemented with a digital LCD for the scaler function. This meter supports many different externally connected detectors. A front panel mounted three-way switch facilitates selecting alpha only, beta only, or alpha plus beta. Other controls include a rotary switch for selecting any of the four-decade ranges, battery test, and instrument shut-off; a switch for viewing the high voltage or resetting the counts; an audio volume adjustment knob; a scaler count time selector rotary switch; and a handle mounted push-button for logging and starting scaler count cycles.

The Ludlum model 2224-1 Alpha Beta Ratemeter – the instrument is similar in design and operation as the previously described 2360 and functional equivalent for the purposes of this survey effort.

The Ludlum 43-93 is a handheld probe having an active area of 100 cm^2. It utilizes a ZnS(Ag) detecting medium for alpha radiation and a plastic scintillator detecting medium adhered behind the ZnS(Ag) surface for beta-gamma radiation.

The Model 19 is a highly sensitive gamma microR meter employing an internally housed, 2.5 x 2.5 cm (1.0 x 1.0 in.) NaI detector. The measuring range is 0 to 5000 μR/hr. The cast aluminum instrument housing with a separate battery compartment and accompanying metal handle offer an industrial robustness and quality that promote long lasting protection and instrument life.

The RO-20 is a portable air ionization chamber instrument used to detect beta, gamma, and X-radiation. The instrument features five linear ranges of operation to measure exposure from background to 50 R/h full scale.

The Ludlum 3030 is an integrated sample counting system using a lockable tray to hold 47millimeter (mm)-diameter disc smears in a shielded cavity to minimize background interference. The system uses a ZnS(Ag) scintillating medium for the measurement of alpha radiation adhered to a plastic scintillating medium for the measurement of beta-gamma radiation.

9.5 Background Radiation Determination

An area that was non-impacted in the facility immediately outside of the restricted area was selected to perform the background radiation level determination. These values were used in the MDA calculations for the various instruments used to conduct the FSS and for determination of threshold trigger points during the scan surveys.

9.6 Instrument Statistics

Minimum counting times for background determinations and counting times for measurement of total and removable activity were chosen to provide a minimum detectable concentration (MDC) that meets the acceptance criteria specified in Section 4.1. MARSSIM equations relative to building surfaces have been modified to convert to units of dpm/100cm^2.

Equation 1- Scan MDC Equation

$$MDC_{scan} = \frac{d' \sqrt{b_i} \left(\frac{60}{i}\right)}{\sqrt{p}\, E_{TOT} \frac{A}{100cm^2}}$$

Where:

d' = index of sensitivity from MARSSIM Table 6.5 – value used was 1.38
b_i = background counts see Table 6
i = scan interval – 2 seconds
p = surveyor efficiency – MARSSIM guidance -0.5
E_{TOT} = total efficiency of system (instrument and surface)
A = detector probe area (1080 sq. cm)

Static measurement minimum detectable activities (MDAs) are determined in units of dpm/100cm^2 using the equation derived by Strom and Stansbury (1992) [1], as shown in Equation 2.

Equation 2- Static Measure MDA Equation

$$MDA = \frac{3+3.29\sqrt{R_b t_s\left(1+\frac{t_s}{t_b}\right)}}{t_s \varepsilon}\frac{100\ cm^2}{A_D}$$

Where:

R_b = background count rate per minute
t_s = sample count time in minutes
t_b = background count time in minutes
e = efficiency
A_D = detector probe area 100 sq cm

Table 9 lists the calculated MDA results for the various instruments used in the performance of the FSS.

Table 9- Instrument MDCs

Measurement Type	Detector Model No.	Scan Rate (inches/second) Or Count Time	Background pm) and count time	Total Efficiency (%)	MDA (dpm)/100 cm^2
Floor Scans Beta	3002/FM3	3"; Observation interval 2 seconds	470	10.9	195
Floor Scans Alpha	3002/FM3	3"; Observation interval 2 seconds	1.8	9.3	14.5
Wall Scans – Beta	43-93	1"/sec	229	15	786
Wall Scans – Alpha	43-93	1"/sec	0.7	15	47
Fixed Point - Beta	43-93	2 minutes	229/30 minutes	15	342
Fixed Point - Alpha	43-93	2 minutes	0.8/30 minutes	15	24
Smear Count - Beta	3030	5 Minutes	29.3/30 minutes	33.4	27.6
Smear Count - Alpha	3030	5 Minutes	0.1/30 minutes	29.8	3.7

1 Strom, DJ., and P.S. Stansbury. "Minimum Detectable Activity When Background Is Counted Longer Than the Sample," Health Physics 63(3):360-1. September 1992.

9.7 Quality Control

9.7.1 Calibration

Survey instrumentation used for FSS was calibrated and maintained in accordance with the manufacturer's recommendations for each instrument. At a minimum, instruments were calibrated annually, unless the manufacturer recommended a shorter calibration cycle. Radioactive sources used for calibration were traceable to the National Institute of Standards and Technology (NIST). The calibration records for the instruments used to conduct the FSS are included as Appendix 15.2.

9.7.2 Sources

Instruments and detectors were calibrated for the radiation types and energies of interest at the site. The calibration sources for the survey instruments typically employed were Tc-99, Cs-137, and/or Co-60. In all cases, the surface efficiency as determined appropriate for the weighted mean energy for each ROC regardless of the energy of the calibration source was used. The daily response checks were performed with a Cs-137 and an Am-241 source (See Appendix 15.3).

9.7.3 Response Checks

Instrument response checks were conducted twice daily to assure proper instrument response. The acceptable response for field instrumentation was set at an instrument reading within ±20% of the check source value established during or after calibration.

The acceptable response for analytic instruments (e.g., the Ludlum 3030) was within ±2 standard deviations of the mean.

9.7.4 Survey Procedure

The procedure developed for the FSS is attached as Appendix 15.5. The key elements of the procedure included:

- Required instruments for the surveys.
- The required scan rates to ensure compliance with the required MDCs for the surveys.
- Specific threshold values for the technicians to identify areas for additional follow-up for scan and fixed-point surveys.
- Instruments source check requirements.
- Discussion of recording data in the field

9.8 Calculation of Static Point Results

Technicians were instructed to record the gross counts (total counts) on the survey data sheets. Equation 3, MARSSIM Equation 6-4, shown below was used to calculate the surface activity. The results for each static point are included in Appendix 15.4.

Equation 3 - Basic Activity Calculation Equation

$$\frac{dpm}{100\ cm^2} = \frac{\frac{C_s}{T_s} - \frac{C_b}{T_b}}{(\varepsilon_T)\ x\ \frac{A}{100}}$$

Where:

C_S represents the total number of sample counts,
T_S represents the time for which the sample was counted,
C_b represents the total number of background counts, and
T_b represents the time for which background was counted

10.0 Offsite Analysis

During the FSS conducted at the site, there were a total of 15 samples that were sent to an independent third-party laboratory for isotopic analysis. These samples sent offsite included the following:

- Two (2) asphalt samples from the area outside the restricted area and the RAM storage area
- Three (3) cement samples that were obtained from the restricted area floor, two of which were from the previously posted contaminated area.
- Three (3) samples from the storm drain and discharge runoff from the storm drain outside the restricted area
- Seven (7) smear samples that were obtained from inside the restricted area.

Table 10 summarizes the results and the actual analysis reports are included as Appendix 15.6.

Table 10 - Summary of Offsite Isotopic Analysis Reports

Sample ID	Description	Reactor Isotopes				Naturally Occurring Isotopes in Soil (pCi/g)
		Cs-137	Mn-54	Co-60 and Co-58	Alpha	
AS-1	Asphalt	ND	ND	ND	NA	Bi-214 (.245), Pb-212 (0.276), Pb-214 (0.306), K-40 (4.0) Ra-226 (0.245), Tl-208 (0.08)
As-2	Asphalt	ND	ND	ND	NA	Be-7 (0.478)[1],Bi-214 (.217), Pb-212 (0.317),Pb-214 (0.503), K-40 (5.37) Ra-226 (0.217), Tl-208 (0.08)
C-1	Cement	0.151 pCi/g 1.3% of DCGL	MDA	MDA	NA	Bi-214 (.295), Pb-212 (0.312), Pb-214 (0.4), K-40 (6.08) Ra-226 (0.217), Ra-226 (0.295), Ra-228 (0.362), Tl-208 (0.136) Ac-228 (0.362)
C-2	Cement	0.403 pCi/g 3.6% of DCGL	MDA	MDA	NA	Bi-214 (.397), Pb-212 (0.381), Pb-214 (0.74), K-40 (7.24) Ra-226 (0.379), Ra-228 (0.307), Tl-208 (0.072), Ac-228 (0/307
C-3	Cement	MDA	MDA	MDA	NA	Bi-214 (.415), Pb-212 (0.464), Pb-214 (0.42), K-40 (7.21) Ra-226 (0.415), Ra-228 (0.514), Tl-208 (0.093) Ac-208 (0.514
D-1	Dirt	0.202 pCi/g 1.8% of DCGL	MDA	MDA	NA	Be-7 (0.708Bi-212 (0.896), Bi-214 (.457), Pb-212 (0.785), Pb-214 (0.659), K-40 (9.09) Ra-226 (0.457), Ra-228 (0.858) Tl-208 (0.226)
D-2	Dirt	0.095 pCi/g <1% of DCGL	MDA	MDA	NA	Bi-212 (0.896), Bi-214 (.457), Pb-212 (0.785), Pb-214 (0.659), K-40 (9.09) Ra-226 (0.457), Ra-228 (0.858) Tl-208 (0.226
SDR		0.0604 pCi/g <1% of DCGL	MDA	MDA	NA	Bi-212 (0.896), Bi-214 (.457), Pb-212 (0.785), Pb-214 (0.659), K-40 (9.09) Ra-226 (0.457), Ra-228 (0.858) Tl-208 (0.226
W-1 2	Smear	MDA	MDA	MDA	MDA	MDA
W-1-16	Smear	MDA	MDA	MDA	MDA	MDA
W-1-20	Smear	2.38 pCi/filter[2] 5.2 dpm/100cm^2	MDA	MDA	MDA	MDA
W-1-30	Smear	64.5 pCi/filter 143 dpm/100cm^2	MDA	7.06 pCi/filter 15.6 dpm/100cm^2	0.7 pCi/filter 1.5 dpm/100cm^2	MDA
w-2-3	Smear	50.5 pCi/filter 112 dpm/100cm^2	MDA	11 pCi/filter 24.4 dpm/100cm^2	MDA	MDA
w-7-14	Smear	43.5 pCi/filter 96.6 dpm/100cm^2	MDA	4.89 pCi/filter 10.8 dpm/100cm^2	MDA	MDA
w-7-30		135 pCi/filter 299 dpm/100cm^2	MDA	5.18 pCi/filter 11.5 dpm/100cm^2	0.5 pCi/filter 1.1 dpm/100cm^2	MDA

Notes:

[1] Beryllium-7 is a natural cosmogenic radionuclide produced in the upper atmosphere by cosmic ray spallation of nitrogen and oxygen

[2] As used in the table filter is used the same as smear. On the GEL report the values are reported as activity per filter.

The following conclusions were drawn from a review of the offsite laboratory results:

- Outside Samples –
  - Low levels of Cs-137 were detected in the samples that were taken in the asphalt and the storm drain runoff. All the results were significantly less than the screening criteria of 11 pCi/g with the highest reported value at 0.202 pCi/g which is 1.8% of the release criteria. This value is consistent with background levels of cesium because of fallout.

  - All other isotopes identified in the sample were attributed to natural radioactive material.
- Inside cement samples
  - Low levels of Cs-137 were detected in the cement. The highest report value was 0.403 pCi/g in the decontamination area. This value is significantly less than the screening criteria of 11 pCi/g.
  - The other reported isotopes were consistent with those attributed to natural background radiation.
- Wipe/Smear Results
  - All results in the report from the lab were significantly less than the release criteria of 700 dpm/100 cm^2.[2]

11.0 Final Status Survey Results

All survey units PASSED the requirements of the FSS. Table 11 summarizes the results for the survey units. The detailed results for each of the survey units is in Appendix 15.4. The following is a summary of the results:

- Survey Units 1 to 6 data were evaluated using the computer program – Visual Sample Plan. The survey units were evaluated against the $DCGL_w$. All survey units passed the screening criteria.
- Survey Units 7 and 8 were evaluated against the release criteria for equipment and materials.
- Alpha Total Contamination: There were a total of 6 out of 291 fixed/total alpha contamination measurements obtained that were greater than MDA. These were all located in the outside areas on the asphalt with the highest reported value being 36 dpm/100 cm^2. Based on the location, the material, and the third-party laboratory analysis, these results were attributed to natural background. The results were evaluated in VSP and using the Sign Statistical test, the survey unit passed the FSS.
- Beta Total Contamination: There were a total of 9 out of 291 fixed/total beta contamination measurements that were greater than MDA. There were NO results that were greater than the unrestricted use release criteria. The highest measured value was 6227 dpm/100cm^2 that was decontaminated to 2840 dpm/100cm^2.
- Removable Alpha Contamination: NO removable contamination results that were greater than MDA.
- Beta Removable Contamination: There were a total of 5 wipes measurements that indicated a value greater than MDA. All values greater than MDA were less than the

[2] The value was derived from the screening criteria in that the value for removable contamination should not exceed 10 percent of 7000 dpm/100 cm^2

required release criteria. One area was identified with a removable contamination level of 340 dpm/100cm^2 , this area was decontaminated, and the follow-up survey determined that the final activity was 34 dpm/100 cm^2.

- Beta Dose Rates: NO beta dose rates were detected
- Gamma Dose Rates: NO gamma dose rates were detected that were distinguishable from background.

Table 11 - Summary of Survey Unit Results

	Total Contamination (dpm/100 cm^2)		Removable Contamination (dpm/100 cm^2)		Beta Dose Rates	Gamma (mR/hr)		Results
Survey Unit	Alpha	Beta/Gamma	Alpha	Beta	On contact (Note 1)	On contact	One Meter	
1	MDA	370	MDA	MDA	ND	BKGD	BKGD	PASSED
2	MDA	586	MDA	MDA	ND	BKGD	BKGD	PASSED
3	MDA	MDA	MDA	MDA	ND	BKGD	BKGD	PASSED
4	MDA	674	MDA	MDA	ND	BKGD	BKGD	PASSED
5	MDA	MDA	MDA	MDA	ND	BKGD	BKGD	PASSED
6	36	MDA	MDA	MDA	ND	BKGD	BKGD	PASSED
7	MDA	6227/2840	MDA	315/34	ND	BKGD	BKGD	PASSED
8	MDA	MDA	MDA	MDA	ND	BKGD	BKGD	PASSED

Notes:

- *(1) As used in this table, ND is used to indicate that the open window reading minus the closed window reading was zero.*

12.0 ALARA Analysis

As part of preparation for the final status survey and license termination, the site was cleaned and all contaminated areas were decontaminated. The contaminated areas were decontaminated, these areas were removed. The site used the NRC screening criteria, and as such no site specific dose modeling is required.

The ALARA screening analysis was performed using equation 15 from the criteria in reference 14.4. This equation provides a standard equation to evaluate the screening criteria to pre-determine residual activity levels that are considered to be ALARA.

Equation 4 - Equation 15 Connecticut ALARA Analysis

$$\frac{C}{DCGL_w} = \left(\frac{Cost_T}{\$3{,}000(P_D)(0.019)(F)(A)}\right)\left(\frac{r+\lambda}{1-e^{-(r\lambda)N}}\right)$$

Where:

$3000	Acceptable value for collective dose averted in dollars per person-Rem
F	fraction of the residual radioactivity removed by the remediation action. F may be considered to the removable fraction for the remediation action being evaluated.
0.019	annual dose to an average member of the critical group from residual radioactivity at the Derived Concentration Guideline Level ($DCGL_w$) concentration in Rem/yr.
C	average concentration of residual radioactivity in the area being evaluated in units of activity per unit area for buildings or activity per unit volume for soils
$DCGL_w$	derived concentration guideline equivalent to the average concentration of residual radioactivity that would give a dose of 19 mRem/yr to the average member of the critical group
A	area being evaluated in square meters
P_D	Population density for the critical group scenario in people/m^2
r	monetary discount rate in units yr^{-1}
λ	radiological decay constant for the radionuclide in units yr^{-1}
N	number of years over which the collective dose will be calculated

Based upon the results obtained during the final status survey, the following values will be used conduct the ALARA evaluation for the residual contamination at the site:

- F This value will be set at a value of 0.2. Based upon the previous actions taken, the removal fraction is low and will require aggressive methods to remove the residual contamination.
- A The area with residual contamination is contained in small, localized area near the frame support for the overhead crane. The area will be conservatively estimated at 10 m^2.
- P_D due to the isolated nature of the location, the value will be estimated at 0.05 person/m^2.
- r 0.025 based upon the Federal Discount rate
- λ 0.1315 yr^{-1} based upon Co-60
- N 70 years
- Cost The cost to remove the residual contamination will be estimated at $4,000 for equipment rentals, labor costs, and disposal of waste.

Equation 5 – ALARA Concentration Calculation

$$\frac{C}{DCGL_w} = \left(\frac{\$4{,}000}{\$3{,}000(0.05)(0.019)(0.2)(10)}\right)\left(\frac{0.025 + 0.1315}{1 - e^{-(0.025*0.1315)70}}\right) = 10.4$$

The analysis indicates that due to the isolated nature of the residual contamination, that a value less than the $DCGL_w$ will demonstrate compliance with the ALARA requirement.

13.0 Conclusions

In accordance 10 CFR20.1402, this report is submitted to present the results of the survey conducted and to document the final radiological conditions of the Schulz Electric Facility located at 30 Gando Drive. Based on the results, the conditions meet the requirements for unrestricted release of the facility.

14.0 References

14.1 NUREG-1575, Revision 1, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*

14.2 NUREG-1757, Volume 1, Revision 2, *Consolidated Decommissioning Guidance*

14.3 Nuclear Regulatory Commission, 10 CFR20.1402, *Radiological Criteria for Unrestricted Use*

14.4 Remediation Standards for Radionuclide Contamination in Connecticut, Connecticut Department of Environmental Division of Radiation, Bureau of Air Management and Connecticut Department of Public Health, Division of Environmental Epidemiology and Occupational Health

14.5 Historical Site Assessment Report, Schulz Electric, July 2021.

14.6 Schulz Electric Radiation Protection Program, Revision 3

14.7 Light Water Reactor Nuclear Fuel Cycle, CRC Press 1981

14.8 United States Nuclear Regulatory Commission, DandD Computer Code

14.9 Visual Sample Plan

15.0 Appendices

15.1 Radioactive Material License
15.2 Instrument Calibration Records
15.3 Sealed Source Certificates

15.4 Survey Unit Results
15.5 Survey Procedure
15.6 Offsite Isotopic Results

15.1 Radioactive Material License

NRC FORM 374 — PAGE 1 OF 3 PAGES

U.S. NUCLEAR REGULATORY COMMISSION — Amendment No. 18

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 70 and 71, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	In accordance with the letter dated October 25, 2021,	4. Expiration Date: January 31, 2026
1. Timken Motor and Crane Services, LLC 2. 110 Commerce Street East Haven, CT 06513	3. License No.: 06-31045-01 is amended in its entirety to read as follows:	5. Docket No.: 030-36931 Reference No.:

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license	9. Authorized use
A. Any byproduct material with Atomic Numbers 1 through 96	A. Contamination	A. 30 millicuries per radionuclide and 100 millicuries total	A. For the possession, storage, maintenance, repair, and decontamination of contaminated equipment.
B. Any Special Nuclear Material	B. Contamination	B. 450 milligrams per radionuclide and 4.5 grams total	B. For the possession, storage, maintenance, repair, and decontamination of contaminated equipment.

NRC FORM 374A	U.S. NUCLEAR REGULATORY COMMISSION	PAGE 2 OF 3 PAGES
MATERIALS LICENSE SUPPLEMENTARY SHEET	License No.: 06-31045-01	Docket or Reference No.: 030-36931
	Amendment No. 18	

CONDITIONS

10. Licensed material shall be used or stored at the licensee's facilities located at 30 Gando Drive, New Haven, Connecticut, and 110 Commerce Street, East Haven, Connecticut 06512.

11. Licensed material shall only be used by, or under the supervision of: Stephen M. Cross, Charles W. Eldredge and Michael Pini.

12. The Radiation Safety Officer (RSO) for this license is Stephen M. Cross.

13. Radioactive waste possessed under this license shall be stored in accordance with the statements, representations, and procedures included with the licensee's waste storage plan described in the application dated July 28, 2015 and the letter dated January 5, 2016.

NRC FORM 374A	U.S. NUCLEAR REGULATORY COMMISSION	PAGE 3 OF 3 PAGES
MATERIALS LICENSE SUPPLEMENTARY SHEET	License No.: 06-31045-01 Amendment No. 18	Docket or Reference No.: 030-36931

14. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. This license condition applies only to those statements, representations, and procedures that are required to be submitted in accordance with the regulations. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence impose on the licensee requirements that are more restrictive than or in addition to the regulations.

A. Application dated July 28, 2015 (ML15232A243)
B. Letter dated January 5, 2016 (ML16021A397)
C. Letter dated October 25, 2021 (ML21302A216)

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date: December 8, 2021

By: Elizabeth Ullrich Digitally signed by Elizabeth Ullrich Date: 2021.12.08 11:38:51 -05'00'

Elizabeth Ullrich
Region 1

15.2 Instrument Calibration Records

Designer and Manufacturer of Scientific and Industrial Instruments
www.ludlums.com

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
501 Oak Street
325-235-5494
Sweetwater, TX 79556, U.S.A.
ACCREDITED CERT # 4084.01

Customer: CN ASSOCIATES INC — ORDER NO.: 20396739/506483

Mfg.: Ludlum Measurements, Inc. — Model: 19 — Serial No.: 300696

Mfg.: — Model: — Serial No.:

Cal. Date: 31-Mar-21 — Cal Due Date: 31-Mar-22 — Cal. Interval: 1 Year — Meterface: 202-1070

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. — T.: 72 °F — RH: 28 % — Alt: 712.0 mm Hg

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

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

☐ Calibrated in accordance with LMI SOP 14.8 — ☑ Calibrated in accordance with LMI SOP 14.9

Instrument Volt Set 550 V. Input Sens. 30 mV Det. Oper. ____ V at ____ mV Threshold Dial Ratio ____ = ____ mV

☑ HV Readout (2 points) Ref./Inst. 500 / 500 V Ref./Inst. 1000 / 980 V

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.
Multimeter uncertainty within 1.3% of reading. Gamma uncertainty within 5.0% of reading. Neutron uncertainty within 7.0% of reading. Count rate uncertainty within 5.4% of reading

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING
5000	4000µR/hr	4 6 0	4 0 0
5000	1000µR/hr	1 2 0	1 0 0
500	400µR/hr = 7320 cpm	4 2 0	4 0 0
500	100µR/hr	1 0 5	1 0 0
250	200µR/hr = 3660 cpm	2 0 0	2 0 0
250	100µR/hr	1 0 5	1 0 0
50	7320 cpm	4 1	4 0
50	1830 cpm	1 6	1 0
25	3660 cpm	2 0	2 0
25	915 cpm	5	5

Range(s) Calibrated Electronically

Digital Readout	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING

Log Scale	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING

Ludlum Measurements, Inc. certifies that the above calibration has been performed by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques.
All parameters determinations are based on the manufacturer's specifications without considering uncertainty factors.
Measurement results represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k=2.
The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI/NCSLAS-2013
ISO/IEC 17025:2017(E)
State of Texas Calibration License No. LD-1993

Reference Instruments and/or Sources: Cs-137 S/N: ☐ 059 ☑ 2171CP ☐ 2261CP ☐ 720 ☐ 734 ☐ 781 ☐ 1131 ☐ 1615 ☐ 1598 ☐ 1909 ☐ 1918CP ☐ 2324/2521
☐ 6717CO ☐ 6718CO ☐ 60648 ☐ 70897 ☐ 73410 ☐ E552 ☐ G112 ☐ 2168CP ☐ S-394 ☐ S-1054 ☐ T10081 ☐ T10082 Neutron Am-241 Be ☐ T-304 Ra-226 ☐ Y982
☐ E551 ☐ S105 ☐ CSV250

☐ Alpha S/N ____ ☐ Beta S/N ____ ☐ Other ____

☑ m 500 S/N 189509 ☐ Oscilloscope S/N ____ ☑ Multimeter S/N 71300492

Calibrator: WENDELL WILLIAMS — Title: Calibrator — Date: 31 MAR 21

QC'd By: ____ — Title: Final QC — Date: 1 APR 21

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.
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AC Insl. Only ☐ Passed Dielectric (Hi-Pot) and Continuity Test ☐ Failed: ____

MA

Certificate of Calibration

Atlantic Nuclear Corp. / 100 Weymouth St Unit E Rockland MA 02370
Tel (800) 878-9118 Fax (781) 878-3378

Customer CN Associates Order No. AN84124
Mfg. Ludlum Model 2221 Serial No. 335853
Mfg. Alpha Spectra Model 12112/3 Serial No. 052316K1
Cal. Date 09/23/2021 Cal Due Date 09/23/2022 Cal Interval 1 Year Meter face Digital
Check mark applies to applicable
Instrument and/or detector IAW mfg spec Temp 74.1 RH 50 Alt. in. Hg 30.01

☐ New Instrument Inst. received ☒ within toler +/- 10 % ☐ 10-20% ☐ Out of tol. ☐ Requiring Repair ☐ Other

Mechanical ck. ✓ Meter zeroed ✓
F/S Resp ck. ✓ Reset ck ✓
Audio ck. ✓ Alarm settings ck. ✓ Batt ck. ✓

Instrument Volt Set 600 V. input sens 100 mV Det Oper _____ _____ _____ = _____

Comments:

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING
Digital	100 cpm	99 cpm	99 cpm
	1 kcpm	1,005 cpm	1,005 cpm
	10 kcpm	9,953 cpm	9,953 cpm
	100 kcpm	99,475 cpm	99,475 cpm
	800 kcpm	800,686 cpm	800,686 cpm
	300 µR/hr	591,168 counts	591,168 counts
	10 µR/hr Background	20,770 counts	20,770 counts

Probe Reads 21.6% Efficiency for NIST Traceable Source Cs-137 S/N: BA-8905 on Contact

All Reference Instruments and/or Sources; Cs-137 Gamma S/N

☐ Alpha S/N _____ ☐ Beta S/N _____ ☒ Mdl. 28-5 S/N: 10184 Cs-137
☒ m 500 S/N 54679 ☐ Gamma S/N MO-547 ☐ Mdl. 28-8 S/N: 10391 Cs-137

Calibrated by: Anthony Nguyen **Date:** 09/23/2021

All Calibrations are NIST traceable and compliant with ANSI/NCSL Z540-1-1994 and ANSI N323A-1997 with Atlantic Nuclear procedures unless otherwise stated. State of Massachusetts License number # 56-0477

Certificate of Calibration

Atlantic Nuclear Corp. / 100 Weymouth St Unit E Rockland MA 02370
Tel (800) 878-9118 Fax (781) 878-3378

Customer CN Associates Order No. AN83759
Mfg. Ludlum Model 2360 Serial No. 319914
Mfg. Ludlum Model 43-93 Serial No. PR354535
Cal. Date 08/04/2021 Cal Due Date 08/04/2022 Cal Interval 1 Year Meter face Analog
Check mark applies to applicable
instrument and/or detector IAW mfg spec Temp 73.0 RH 47 Alt. in. Hg 29.95

☐ New Instrument Inst. received ☒ within toler +/- 10 % ☐ 10-20% ☐ Out of tol. ☐ Requiring Repair ☐ Other

Mechanical ck. ✓ Meter zeroed ✓
F/S Resp ck. ✓ Reset ck ✓
Audio ck. ✓ Alarm settings ck. Batt ck. ✓

Instrument Volt Set 725 V. input sens 4 (β) mV Det Oper 116 (α) _____ _____ = _____

Comments:

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING
X1	100 cpm	100 cpm (100 cpm)	100 cpm (100 cpm)
X1	400 cpm	400 cpm (400 cpm)	400 cpm (400 cpm)
X10	1 kcpm	1 kcpm (1,002 cpm)	1 kcpm (1,002 cpm)
X10	4 kcpm	4 kcpm (4,013 cpm)	4 kcpm (4,013 cpm)
X100	10 kcpm	10 kcpm (10,021 cpm)	10 kcpm (10,021 cpm)
X100	40 kcpm	40 kcpm (40,062 cpm)	40 kcpm (40,062 cpm)
X1000	100 kcpm	100 kcpm (100,105 cpm)	100 kcpm (100,105 cpm)
X1000	400 kcpm	400 kcpm (400,747 cpm)	400 kcpm (400,747 cpm)
Background	Alpha	2 cpm	2 cpm
	Alpha+Beta	235 cpm	235 cpm
	Beta	233 cpm	233 cpm

Probe Reads 19.1% Efficiency for NIST Traceable Source Tc-99 S/N: 1699-94
Probe Reads 20.2% Efficiency for NIST Traceable Source Th-230 S/N: S-3689B

Reference Instruments and/or Sources: Cs-137 Gamma S/N

☐ Alpha S/N _____ ☐ Beta S/N _____ ☐ Mdl. 28-5 S/N: 10184 Cs-137
☒ m 500 S/N 54679 ☐ Gamma S/N MO-547 ☐ Mdl. 28-8 S/N: 10391 Cs-137

Calibrated by: Anthony Nguyen **Date:** 08/04/2021

All Calibrations are NIST traceable and compliant with ANSI/NCSL Z540-1-1994 and ANSI N323A-1997 with Atlantic Nuclear procedures unless otherwise stated. State of Massachusetts License number # 56-0477

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of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
501 Oak Street
325-235-5494
Sweetwater, TX 79556, U.S.A.

ACCREDITED CERT # 4084.01

Customer: CN ASSOCIATES INC ORDER NO.: 20380677/495492

Mfg.: Ludlum Measurements, Inc. Model: 2360 Serial No.: 319925

Mfg.: Ludlum Measurements, Inc. Model: 43-37-1 Serial No.: PR352913

Cal. Date: 14-Jul-20 Cal Due Date: 14-Jul-21 Cal. Interval: 1 Year Meterface: 202-855

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 72 °F RH 61 % Alt 701.0 mm Hg

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

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☑ F/S Resp. ck ☑ Reset ck. ☑ Window Operation ☑ Geotropism
☑ Audio ck. ☑ Alarm Setting ck. ☑ Batt. ck. ☐ RS-232 Port OK

☑ Calibrated in accordance with LMI SOP 14.8 ☐ Calibrated in accordance with LMI SOP 14.9

Instrument Volt Set 1850 V

☑ HV Readout (2 points) Ref./Inst. 500 / 497 V Ref./Inst. 1500 / 1494 V

Firmware Version: 2901b.24
Alpha Threshold: 90 mV
Beta Threshold: 4.4 mV
Beta Window: 30 mV
Overload checked but not set.
Instrument calibrated with a 391 cable.
High voltage set with detector Disconnected

(EEPROM Settings)
User Time: 0.1
Alpha Alarm: 999999
Beta Alarm: 999999
A/B Alarm: 999999
Model 2360 Date: 14-July-20
Calibration Date Due: 14-July-21

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.
Teletector uncertainty within 1.3% of reading. Gamma uncertainty within 5.0% of reading. Neutron uncertainty within 7.0% of reading. Count rate uncertainty within 5.4% of reading

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

ALL Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Digital Readout	400kcpm	39939 (0)	39939 (0)	Log Scale			
	40kcpm	3994	3994				
	4kcpm	399	399				
	400cpm	40	40				
	40cpm	4	4				

Ludlum Measurements, Inc certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other international Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. All pass/fail determinations are based on the manufacturer's specifications without considering uncertainty factors. Measurement results represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k=2. The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323AB-2013.

ISO/IEC 17025:2017(E) State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources: Cs-137 S/N: ☐ 059 ☐ 2171CP ☐ 2281CP ☐ 720 ☐ 734 ☐ 781 ☐ 1131 ☐ 1616 ☐ 1656 ☐ 1909 ☐ 1910CP ☐ 2324/2521 ☐ 5717CO ☐ 5719CO ☐ 60646 ☐ 70697 ☐ 73415 ☐ 6652 ☐ G112 ☐ 2158CP ☐ 6-394 ☐ S-1034 ☐ T10081 ☐ T10082 Neutron Am-241 Be ☐ T-394 Ra-226 ☐ Y982 ☐ E551 ☐ S105 ☐ CSV260

☑ Alpha S/N Pu239:2928 ☑ Beta S/N Tc99:NI-EV,SrY90:4016 ☐ Other

☑ m 500 S/N 289158 ☐ Oscilloscope S/N ☑ Multimeter S/N 20870423

Calibrator Jeremy Thompson Title Calibrator Date 14-July-20

QC'd By Title Final QC Date 14 Jul 20

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.
FORM C22S 03/14/2019 Page 1 of 2

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

www.ludlums.com
Designer and Manufacturer of Scientific and Industrial Instruments

LUDLUM MEASUREMENTS, INC.
501 Oak Street
325-235-5494
Sweetwater, TX 79556, U.S.A.

Bench Test Data For Detector

Customer CN ASSOCIATES INC ORDER NO. 20380677/495492

Detector 43-37-1 Serial No. PR352915 Alpha Input Sensitivity 90 mV

Counter 2360 Serial No. 319925 Beta Input Sensitivity 4.4 mV

Count Time 1Minute Beta Window 30 mV

Other _____ Distance Source to Detector 1/4 inches

High Voltage	Background		Isotope Ra-226 Size = 25,200dpm		Isotope Tc-99 Size = 23,730dpm		Isotope Sr-90 Size = 25,034dpm	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
1825	5	715	4478	917	6	6695	5	5915
* 1850	8	853	4714	1145	6	7306	13	6761
1875	8	1212	4879	1618	35	7239	34	7643
1900	23	1387	5070	1774	304	6137	292	7515

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

☑ Gas proportional detector count rate decreased ≤ 10% after 6 hour static test using 39" cable and alpha/beta counter.

Signature Jeramy Thompson Jeramy Thompson Date 14 July 22

Designer and Manufacturer of Scientific and Industrial Instruments
www.ludlums.com

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
601 Oak Street
325-235-5494
Sweetwater, TX 79556, U.S.A.
ACCREDITED CERT # 4084.01

Customer CN ASSOCIATES INC ORDER NO. 20394230/504723

Mfg. Ludlum Measurements, Inc. Model 2360 Serial No. 329121

Mfg. Ludlum Measurements, Inc. Model 43-93 Serial No. PR364210

Cal. Date 24-Feb-21 Cal Due Date 24-Feb-22 Cal. Interval 1 Year Meterface 202-855

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T 74 °F RH 27 % Alt 707.5 mm Hg

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

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☑ F/S Resp. ck ☑ Reset ck. ☑ Window Operation ☑ Geotropism
☑ Audio ck. ☑ Alarm Setting ck. ☑ Batt. ck. ☐ RS-232 Port OK
☑ Calibrated in accordance with LMI SOP 14.8 ☐ Calibrated in accordance with LMI SOP 14.9

Instrument Volt Set 725 V

☑ HV Readout (2 points) Ref./Inst. 500 / 501 V Ref./Inst. 1500 / 1500 V

Firmware Version: 3A013-144
Alpha Threshold: 130 mV
Beta Threshold: 3.5 mV
Beta Window: 30 mV
Overload Checked but not set.
Instrument calibrated with a 39" cable.
High voltage set with detector Disconnected

(EEPROM Settings)
User Time: 0.1
Alpha Alarm: 999999
Beta Alarm: 999999
A/B Alarm: 999999
Model 2360 Date: 24-Feb-21
Calibration Date Due: 24-Feb-22

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.
Multimeter uncertainty within 1.3% of reading. Gamma uncertainty within 5.0% of reading. Neutron uncertainty within 7.2% of reading. Count rate uncertainty within 5.4% of reading

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

ALL Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Digital Readout	400kcpm	399234 (cp)	399234 (cp)	Log Scale			
	40kcpm	3593	3593				
	4kcpm	395	395				
	400cpm	40	40				
	40cpm	4	4				

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standard Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. ISO/IEC 17025:2017[E]
All possible determinations are based on the manufacturer's specifications without considering uncertainty factor.
Measurement results represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k=2. State of Texas Calibration License No. LO-1913
The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323AB-2013.

Reference Instruments and/or Sources: Cs-137 S/N: ☐ 059 ☐ 2171CP ☐ 2261CP ☐ 720 ☐ 734 ☐ 781 ☐ 1131 ☐ 1616 ☐ 1696 ☐ 1909 ☐ 1916CP ☐ 2324/2521
☐ 5717CO ☐ 5719CO ☐ 60646 ☐ 70897 ☐ 73410 ☐ 8592 ☐ G172 ☐ 2168CP ☐ S-394 ☐ S-1054 ☐ 110081 ☐ 110082 Neutron Am-241 Be ☐ T-304 Ra-226 ☐ Y982
☐ 5551 ☐ 5105 ☐ CSV250

☑ Alpha S/N Pu239:2928 ☑ Beta S/N Tc99:Ni-EV,SrY90:4016 ☐ Other

☑ m 500 S/N 289158 ☐ Oscilloscope S/N ☑ Multimeter S/N 20870423

Calibrator Jeramy Thompson Title Calibrator Date 24-Feb-21
QC'd By Title Final QC Date 24 Feb 21

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.
FORM CZ25 01/22/2020 Page 1 of 2

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

LUDLUM MEASUREMENTS, INC.
P.O. BOX 810
Sweetwater, Texas 79556
Phone: (325) 235-5494
Fax: (325) 235-4672
Website: www.ludlums.com
Email: sales@ludlums.com

PACKING LIST

Order #	Ship Date	Page
20397747	6/29/2021	1

Packing No : 10096445

20397747

Bill To:

ATLANTIC NUCLEAR
100 WEYMOUTH ST - E1
ROCKLAND, MA 02370-1145
USA

800-876-9118

Ship To:

C.N. ASSOCIATES
75 SUMMER STREET
2ND FL, KEVIN MYERS
MANCHESTER, MA 01944
USA

ANC2@ATT.NET

1/2

CUSTOMER PO NUMBER	TERMS	SHIP VIA	EXWORKS
AN83077	NET 30 DAYS	FE GROUND ACCT	SWEETWATER TX

ORDERED BY	SALES REPRESENTATIVE	ORDER DATE	OUR ORDER #	CUSTOMER ID
CAROL 80-876-9118	ATLANTIC NUCLEAR CORP	4/14/2021	20397747	00008

LN	DL	DUE DATE	QUANTITY ORDERED	QUANTITY SHIPPED	C	UNIT	PART IDENTIFIER	DESCRIPTION / COMMENTS	ADDITIONAL INFO
01	01		1.00	1.00	N		46-4037-3	M 3002/FM3 1050CM2 A/B FLOOR MON	2.5020397

4 AA Batteries

1 manual

COMMENTS:
KLAVO
SIGNATURE REQUIRED
FEDX 818256221

(D) Product is export controlled for AT reasons under ECCN 1A 999. As such, these commodities, technology or software are eligible for export from the United States only in accordance with Export Administration regulations. Diversion contrary to U.S. law is prohibited.

CERTIFICATE OF COMPLIANCE

This is to certify that all materials, parts, and/or processes used in the manufacture of articles on this order are in accordance with the requirements, applicable drawings and specifications called for on the purchase order referenced above.

Quality Assurance
Richard Lewis

www.ludlums.com

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
501 Oak Street
325-235-5494
Sweetwater, TX 79556, U.S.A.

ACCREDITED CERT # 4084.01

Customer C.N. ASSOCIATES ORDER NO. 20397747

Mfg. Ludlum Measurements, Inc. Model 3002/FM3 Serial No. 25020397

Mfg. Ludlum Measurements, Inc. Model 43-204-2 Serial No. PR391121/PR391122

Cal. Date 23-Jun-21 Cal Due Date 23-Jun-22 Cal. Interval 1 Year Meterface CPM

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 76 °F RH 40 % Alt 703.8 mm Hg

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

☑ Mechanical ck. ☐ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☑ F/S Resp. ck ☐ Reset ck. ☑ Window Operation ☐ Geotropism
☑ Audio ck. ☑ Alarm Setting ck. ☑ Batt. ck. (Min. Volt) 4.4 VDC
☑ Calibrated in accordance with LMI SOP 14.8 ☐ Calibrated in accordance with LMI SOP 14.9

Instrument Volt Set 875 V Input Sens. Comment mV Det. Oper. 875 V at Comment mV Threshold Dial Ratio = mV

☑ HV Readout (2 points) Ref./Inst. 600 / 613 V Ref./Inst. 1800 / 1834 V

COMMENTS:

```
Alpha threshold = 120 mV
Alpha Window = disabled
Beta threshold = 3.5 mV
Beta window = 30 mV
Overload checked but not set.
"Scaler Readout" reflects 6 second count.
Firmware: 2L-N11.1198
See Attachments for all other settings.

**Threshold values entered into instrument parameters are different from actual threshold settings due to cable
length. Calibrated with 3 each "1 meter" cables.**
```

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

RANGE MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING	RANGE MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING

Range(s) Calibrated Electronically

Multimeter uncertainty within 1.3% of reading. Gamma uncertainty within 5.0% of reading. Neutron uncertainty within 7.0% of reading. Count rate uncertainty within 5.4% of reading

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Digital Readout	800K cpm		801 kcpm	Scaler	800K cpm		80.1 k
	200K cpm		200 kcpm		200K cpm		20.0 k
	80K cpm		80.1 kcpm		80K cpm		8.01 k
	20K cpm		20.0 kcpm		20K cpm		2.00 k
	8K cpm		8.00 kcpm		8K cpm		800
	2K cpm		2.00 kcpm		2K cpm		200
	800 cpm		800 cpm		800 cpm		80
	200 cpm		200 cpm		200 cpm		20

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques.
All specific determinations are based on the manufacturer's specifications without considering uncertainty factors.
Measurement results represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k=2. ISO/IEC 17025:2017(E)
This calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323AB-2013 State of Texas Calibration License No. LO-1943

Reference Instruments and/or Sources: Cs-137 S/N: ☐ 059 ☐ 2171CP ☐ 2261CP ☐ 720 ☐ 734 ☐ 781 ☐ 1131 ☐ 1616 ☐ 1696 ☐ 1909 ☐ 1916CP ☐ 2324/2521
☐ 5717CO ☐ 5719CO ☐ 60646 ☐ 70897 ☐ 78410 ☐ E532 ☐ G112 ☐ 2168CP ☐ S-394 ☒ S-1054 ☐ T10081 ☐ T10082 Neutron Am-241 Be ☐ T-394 Ra-226 ☐ Y982
☐ E551 ☐ 5105 ☐ CSV280

☑ Alpha S/N PU239 #4338 ☑ Beta S/N TC99 #636/83 ☐ Other

☑ m 500 S/N 38120 ☐ Oscilloscope S/N ☑ Multimeter S/N 443801.52

Calibrator LEONOR ORTEGA Leonor Ortega Title CALIBRATOR Date 23-Jun-21

QC'd By Diana Valdez Title Final QC Date 23 Jun 21

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.

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

Ludlum Device Parameters

Product: Model 3002
Serial Number: 25020397
6/23/2021 2:27:19 PM

Device

Device Serial Number	25020397
Device Firmware	2L-N11.1198
Device Model	Model 3002
Device Real Time Clock Day	23
Device Real Time Clock Hour	8
Device Real Time Clock Minutes	42
Device Real Time Clock Month	6
Device Real Time Clock Seconds	24
Device Real Time Clock Year	2021
Device Temperature	57
Device Backlight Threshold	2
Device Backlight Threshold Low Turn On	90
Device Backlight Threshold Low Turn Off	134
Device Backlight Threshold High Turn On	75
Device Backlight Threshold High Turn Off	112
Device Active Detector Mem	0
Device Stream Status	
Device Sleep	0
Device Log Button	0
Device Audio All Channel Activity	0
Device Count Display Mode	0
Device Count Audio Mode	0
Device Rate Reset Button	0
Device Button Handle RateMap 1	1
Device Button Handle RateMap 2	0
Device Button Handle RateMap 3	0
Device Button Handle CntMap 1	1
Device Button Handle CntMap 2	0
Device Button Handle CntMap 3	0

Log

Log Enabled	0

Device Calibration

Device Calibration High Voltage Rate	8.3067E-06
Device Calibration High Voltage Offset	36.669
Device Calibration High Voltage Slope	1.0097
Device Calibration Channel [1] Pulse Threshold Rate	0.00841751
Device Calibration Channel [1] Pulse Threshold Slope	0.640926
Device Calibration Channel [1] Pulse Threshold Offset	-0.000521886
Device Calibration Channel [1] Pulse Window Rate	0.00561167
Device Calibration Channel [1] Pulse Window Slope	0.635432

Device Calibration Channel [1] Pulse Window Offset	-0.000310887
Device Calibration Channel [1] Pulse Threshold Rate	-0.00561167
Device Calibration Channel [1] Pulse Threshold Slope	0.642346
Device Calibration Channel [1] Pulse Threshold Offset	-0.000244669
Device Calibration Channel [1] Pulse Window Rate	0.00280584
Device Calibration Channel [1] Pulse Window Slope	0.636605
Device Calibration Channel [1] Pulse Window Offset	-0.000433221

Detector 1

Detector [1] Serial Number	PR391121 / PR39112
Detector [1] High Voltage	875
Detector [1] Response Time	0
Detector [1] Overload	999
Detector [1] Operation Mode	0
Detector [1] Channel Display Mode	0
Detector [1] Auto Response Rate	1
Detector [1] Count Time	0
Detector [1] Unit 1 Rate Alpha Alarm Decimal Point	2
Detector [1] Unit 1 Rate Alpha Alarm Range	1
Detector [1] Unit 1 Rate Alpha Alarm Value	500
Detector [1] Unit 1 Scaler Alpha Alarm Decimal Point	2
Detector [1] Unit 1 Scaler Alpha Alarm Range	1
Detector [1] Unit 1 Scaler Alpha Alarm Value	500
Detector [1] Unit Alpha Source Channel	1
Detector [1] Unit 1 Rate Beta Alarm Decimal Point	2
Detector [1] Unit 1 Rate Beta Alarm Range	1
Detector [1] Unit 1 Rate Beta Alarm Value	500
Detector [1] Unit 1 Scaler Beta Alarm Decimal Point	2
Detector [1] Unit 1 Scaler Beta Alarm Range	1
Detector [1] Unit 1 Scaler Beta Alarm Value	500
Detector [1] Unit Beta Source Channel	0
Detector [1] Unit 1 Rate Unit Type	1
Detector [1] Unit 1 Rate Max Decimal Point	0
Detector [1] Unit 1 Rate Max Range	1
Detector [1] Unit 1 Rate Max Value	999
Detector [1] Unit 1 Rate Min Decimal Point	0
Detector [1] Unit 1 Rate Min Range	0
Detector [1] Unit 1 Scaler Min Decimal Point	0
Detector [1] Unit 1 Scaler Min Range	0
Detector [1] Unit 1 Scaler Unit Type	5
Detector [1] Channel [1] Loss of Count Time	60
Detector [1] Channel [1] Pulse Threshold	3
Detector [1] Channel [1] Pulse Window	26
Detector [1] Channel [1] Efficiency 4pi	15
Detector [1] Channel [2] Loss of Count Time	600
Detector [1] Channel [2] Pulse Threshold	100
Detector [1] Channel [2] Pulse Window	999
Detector [1] Channel [2] Efficiency 4pi	20

LUDLUM MEASUREMENTS, INC.
P.O. BOX 810
Sweetwater, Texas79556
Phone: (325) 235-5494
Fax: (325) 235-4672
Website: www.ludlums.com
Email: sales@ludlums.com

PACKING LIST

Order #	Ship Date	Page
20397747	5/29/2021	1

Packing No - 10098445

20397747

Bill To:

ATLANTIC NUCLEAR
100 WEYMOUTH ST - E1
ROCKLAND, MA 02370-1145
USA

800-878-9118

Ship To:

C.N. ASSOCIATES
76 SUMMER STREET
2ND FL, KEVIN MYERS
MANCHESTER, MA 01944
USA

ANC2@ATT.NET

2/2

CUSTOMER PO NUMBER	TERMS	SHIP VIA	EXWORKS
AN83077	NET 30 DAYS	FE GROUND ACCT	SWEETWATER TX

ORDERED BY	SALES REPRESENTATIVE	ORDER DATE	OUR ORDER #	CUSTOMER ID
CAROL 80-878-9118	ATLANTIC NUCLEAR CORP.	4/14/2021	20397747	00008

LN	DL	DUE DATE	QUANTITY ORDERED	QUANTITY SHIPPED	C	UNIT	PART IDENTIFIER	DESCRIPTION COMMENTS	ADDITIONAL INFO
01	01		1.00	1.00	N		48-4037-3	M 3002/FM3 1080CM2 A/R FLOOR MON 2)43-264-2 2 manuals	PR391121 PR391122

COMMENTS:
KLVO
SIGNATURE REQUIRED
FEDX 818256221

(D) Product is export controlled for AT reasons under ECCN1A 999. As such, these commodities, technology or software are eligible for export from the United States only in accordance with Export Administration regulations. Diversion contrary to U.S. law is prohibited.

CERTIFICATE OF COMPLIANCE

This is to certify that all materials, parts, and/or processes used in the manufacture of articles on this order are in accordance with the requirements, applicable drawings and specifications called for on the purchase order referenced above.

Quality Assurance
Richard Lewis

Order #: 20397747
Customer: C.N. ASSOCIATES
Detector: Detector: 1 **Serial No.:** PR391122
Instrument: Model 3002 **Serial No.:** 25020397
BKG Time: 60
Distance: SURFACE
Selected HV: 875
Date: 23 June, 2021
Notes: 43-204-2
Signature: Kevin Ortega

Channel(s)

Name	Threshold	Window
Beta	3 mV	26 mV
Alpha	100 mV	999 mV

Source(s)

Name	ID	Activity	Time	Type
PU239	4338	397 kdpm	60	α
TC99	636/83	227 kdpm	60	β

High Voltage	Background		PU239: 4338				TC99: 636/83			
	α	β	α	β	Cross Talk	Efficiency	α	β	Cross Talk	Efficiency
800	2	114	36,089	7,532	20.56%	9.09%	2	3,703	0.00%	1.58%
825	0	140	54,133	5,858	10.56%	13.64%	4	9,407	0.04%	4.08%
850	1	232	65,939	5,014	7.25%	16.61%	7	16,462	0.04%	7.15%
875	1	385	73,370	4,850	6.09%	18.48%	8	24,250	0.03%	10.51%
900	1	529	79,080	5,162	5.86%	19.92%	2	30,863	0.00%	13.36%
925	2	741	82,492	6,513	7.00%	20.78%	4	37,152	0.01%	16.04%

Order #: 20397747
Customer: C.N. ASSOCIATES
Detector: Detector: 1 **Serial No.:** PR391121
Instrument: Model 3002 **Serial No.:** 25020397
BKG Time: 60
Distance: SURFACE
Selected HV: 875
Date: 23 June, 2021
Notes: 43-209-2
Signature: Leona Ortega

Channel(s)

Name	Threshold	Window
Beta	3 mV	26 mV
Alpha	100 mV	999 mV

Source(s)

Name	ID	Activity	Time	Type
PU239	4338	397 kdpm	60	α
TC99	636/83	227 kdpm	60	β

High Voltage	Background		PU239: 4338				TC99: 636/83			
	α	β	α	β	Cross Talk	Efficiency	α	β	Cross Talk	Efficiency
800	1	94	36,363	7,495	20.35%	9.16%	4	3,571	0.09%	1.53%
825	0	152	53,968	5,785	10.44%	13.59%	3	9,146	0.03%	3.96%
850	0	288	65,971	4,975	7.10%	16.62%	1	16,097	0.01%	6.96%
875	1	382	74,537	4,899	6.06%	18.77%	3	23,595	0.01%	10.23%
900	2	535	79,546	5,092	5.73%	20.04%	5	30,418	0.01%	13.16%
925	2	691	82,377	6,560	7.12%	20.75%	5	37,068	0.01%	16.03%

Certificate of Calibration

Atlantic Nuclear Corp. / 100 Weymouth St Unit E Rockland MA 02370
Tel (800) 878-9118 Fax (781) 878-3378

Customer CN Associates Order No. AN82380
Mfg. Ludlum Model 3030 Serial No. 312329
Mfg. _____ Model _____ Serial No. _____
Cal. Date 01/05/2021 Cal Due Date 01/05/2022 Cal interval 1 Year Meter face Digital
Check mark applies to applicable
instrument and/or detector IAW mfg spec Temp 73.2 RH 32 Alt. In. Hg 29.74

☐ New Instrument Inst. received ☒ within toler +/- 10 % ☐ 10-20% ☐ Out of tol. ☐ Requiring Repair ☐ Other
Mechanical ck. ✓ Meter zeroed
F/S Resp ck. Reset ck
Audio ck. ✓ Alarm settings ck. Batt ck. ✓ _____
Instrument Volt Set 500 V. input sens. _____ mV Det Oper _____ _____ _____ = _____

Comments:

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING
Source	Serial Number	Efficiency	Efficiency
Pu-239	3937	36.9%	36.9%
Th-230	S-3689B	26.4%	26.4%
Tc-99	1699-94	15.7%	15.7%
Cs-137	BA-8905	31.9%	31.9%
Sr-90	D-712	23.2%	23.2%
C-14	1915-12-1	4.6%	4.6%

All results taken with 0 CPM Alpha Background & Approximately 30~40 CPM Beta Background observed

ƒM Reference Instruments and/or Sources: Cs-137 Gamma S/N

☐ Alpha S/N _____ ☐ Beta S/N _____ ☐ Mdl. 28-5 S/N: 10184 Cs-137
☐ m 500 S/N 54679 ☐ Gamma S/N MO-547 ☐ Mdl. 28-8 S/N: 10391 Cs-137

Calibrated by: Anthony Nguyen **Date:** 01/05/2021

All Calibrations are NIST traceable and compliant with ANSI/NCSL Z540-1-1994 and ANSI N323A-1997 with Atlantic Nuclear procedures unless otherwise stated. State of Massachusetts License number # 56-0477

Certificate of Calibration

Atlantic Nuclear Corp. / 100 Weymouth St Unit E Rockland MA 02370
Tel (800) 878-9118 Fax (781) 878-3378

Customer CN Associates Order No. AN82198
Mfg. Thermo Scientific Model RO20 Serial No. 12301
Mfg. Model Serial No.
Cal. Date 11/27/20 Cal Due Date 11/27/21 Cal Interval 1 Year Meter face Analog
Check mark applies to applicable
instrument and/or detector IAW mfg spec Temp 70 RH 62 Alt. In. Hg 30.08

☐ New Instrument Inst. received ☒ within toler +/- 10 % ☐ 10-20% ☐ Out of tol. ☐ Requiring Repair ☐ Other
Mechanical ck. ✓ Meter zeroed ✓
F/S Resp ck. Reset ck
Audio ck. Alarm settings ck. Batt ck. ✓

Instrument Volt Set ____ V. input sens ____ mV Det Oper ____ ____ ____ = ____

Comments:

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING
5 mR/hr	1 mR/hr	1 mR/hr	1 mR/hr
5 mR/hr	4 mR/hr	4 mR/hr	4 mR/hr
50 mR/hr	10 mR/hr	10 mR/hr	10 mR/hr
50 mR/hr	40 mR/hr	38 mR/hr	38 mR/hr
500 mR/hr	100 mR/hr	90 mR/hr	90 mR/hr
500 mR/hr	400 mR/hr	370 mR/hr	370 mR/hr
5 R/hr	1 R/hr	1 R/hr	1 R/hr
5 R/hr	4 R/hr	4 R/hr	4 R/hr
50 R/hr	10 R/hr	10 R/hr	10 R/hr
50 R/hr	40 R/hr	40 R/hr	40 R/hr

JM **Reference Instruments and/or Sources: Cs-137 Gamma S/N**

☐ Alpha S/N ____ ☐ Beta S/N ____ ☒ Mdl. 28-5 S/N: 10184 Cs-137
☐ m 500 S/N 54679 ☐ Gamma S/N MO-547 ☒ Mdl. 28-8 S/N: 10391 Cs-137

Calibrated by: [signature] **Date:** 11/27/20

All Calibrations are NIST traceable and compliant with ANSI/NCSL Z540-1-1994 and ANSI N323A-1997 with Atlantic Nuclear

15.3 Sealed Source Certificates

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION
Standard Reference Source

SRS Number: 118377
Source Description: 45 mm Diameter Cloth Smear in Low Smooth Bottom Aluminum Planchet
Product Code: AM1-EAB-PLN
Customer: C.N. Associates Inc.
P.O. Number: Myers 08-17-2020, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution calibrated by Eckert & Ziegler Analytics (EZA). The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. EZA maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Reference Date: 26-February-2021 12:00 PM EST

Isotope	Half-Life, d	Activity, Bq	Uncertainty u_A, %	u_B, %	U, %*	Calibration Method**
Am-241	1.580E+05	1.988E+02	0.1	1.8	3.7	4π LS

*Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." **Calibration Methods: 4π LS - 4π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)

F-CR-32, Rev. 0, 01 Nov 14

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

SRS Number: 118377

Comments:
Diameter of active area: 41 mm
0.5 mg/cm² mylar cover. Handle carefully to prevent scratching the mylar. No expiration date has been given for this source due to the fragile nature of the mylar covering. This source should be carefully tested for leakage at least every six months. If leakage is detected this source should be disposed of by approved radioactive waste disposal procedures.

Impurities:
α-impurities < 0.1%
γ-impurities < 0.1%

This source was wipe tested in its inactive areas with leak test results < 185 Bq (5 nCi) of removable activity per ISO 9978:1992.

Source Prepared by: A. Herron
A. Herron, Radiochemist

QC Approved by:
J. Lahr, Spectroscopist

Date: 19-FEB-21

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.ezag.com

CERTIFICATE OF CALIBRATION
Standard Reference Source

SRS Number: 118378
Source Description: 45 mm Diameter Cloth Smear in Low Smooth Bottom Aluminum Planchet
Product Code: CS7-EAB-PLN
Customer: C.N. Associates Inc.
P.O. Number: Myers 08-17-2020, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution calibrated with an ionization chamber. The ionization chamber was calibrated by the National Physical Laboratory (NPL), Teddington, U.K., and is traceable to national standards. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Reference Date: 28-February-2021 12:00 PM EST

Isotope	Half-Life, d	Activity, Bq	Uncertainty u_A, %	Uncertainty u_B, %	Uncertainty U, %*	Calibration Method**
Cs-137	1.099E+04	2.018E+02	0.1	1.8	3.7	IC

***Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." ****Calibration Methods:** 4π LS - 4π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)

F-CR-32, Rev. 0, 01 Nov 14

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

SRS Number: 118378

Comments:
Diameter of active area: 41 mm
0.5 mg/cm^2 mylar cover. Handle carefully to prevent scratching the mylar. No expiration date has been given for this source due to the fragile nature of the mylar covering. This source should be carefully tested for leakage at least every six months. If leakage is detected this source should be disposed of by approved radioactive waste disposal procedures.

Impurities:
γ-impurities < 0.1%

This source was wipe tested in its inactive areas with leak test results < 185 Bq (5 nCi) of removable activity per ISO 9978:1992.

Source Prepared by: A. Herron
A. Herron, Radiochemist

QC Approved by: J. Lahr
J. Lahr, Spectroscopist

Date: 19-FEB-21

15.4 Survey Unit Results

15.4.1 Survey Unit 1

Results/Conclusion

The survey unit **PASSED.**

Survey Unit Description

Survey Unit ONE (1) was classified as a Class 1 Survey Unit. The survey unit comprised the floor of the old decontamination room. The approximate area of the survey unit was 989 square feet.

Summary

This section summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples.

Table 12 - Survey Unit 1 Summary of Sampling Design

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location)in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version using the values obtained from table 5.5
Calculated number of samples prior to FSS	23
Calculated number of samples with actual data	14
Number of selected sample areas [b]	28

Specific Survey Unit Design

Sample Objective

The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold.

Design

A nonparametric systematic sampling approach with a random start was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because

the conceptual model and historical information indicate that typical parametric assumptions may not be true.

Both parametric and non-parametric equations rely on assumptions about the population. Typically, however, non-parametric equations require fewer assumptions and allow for more uncertainty about the statistical distribution of values at the site. The trade-off is that if the parametric assumptions are valid, the required number of samples is usuallyless than if a non-parametric equation was used.

For this design, systematic grid point sampling was chosen. Locating the sample points systematically provides data that are all equidistant apart.

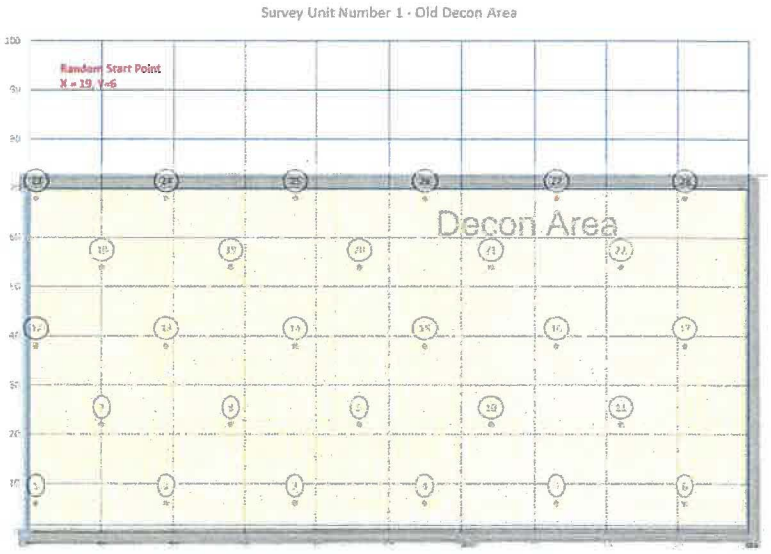
The survey design used a random grid starting point with the following specifications for the area:

- The minimum number of survey points was calculated at 23. The actual number of survey points was 28.
- The grid and spacing were standardized to a grid of approximately 100 by 70 to facilitate remote planning of the surveys.
- A triangle grid pattern for the fixed survey points was used as shown below. The random start point was X= 19, Y =6.
- Based on the standard grid, the calculated l=23 units and H= 43 units.

$$l = \sqrt[2]{\frac{area}{0.866n}} = \sqrt{\frac{7000}{0.866\ (23)}} = 18\ units$$

$$h = 0.866\ l = 16$$

Figure 12 - Survey Unit 1 Grid Map



Survey Unit Results

Survey Results are documented on survey number SZ/2021/10/05/01.

Direct Scan Results

There were no indications of elevated readings found during the scan survey that exceeded the predetermined investigational threshold.

Unbiased Sample Results

There were 28 direct/static sample points in the survey unit. The following is a summary of the results indicated in Table 13:

- Total and removable alpha contamination was less than MDA.
- There were 2 locations where the total beta contamination reading was greater than the MDA. The highest value obtained was at 370 dpm/100 cm^2. The values that were greater than MDA were significantly lower than any beta/gamma release unrestricted release criteria.
- Beta removable contamination at all locations was less than MDA.
- On contact Beta dose rates and gamma dose rates on contact and at 1 meter were indistinguishable from background.

Table 13 - Survey Unit 1 Results

Sample Point	Total Alpha (DPM/100cm^2)	Total Beta (DPM/100cm^2)	Removable Alpha (DPM/100cm^2)	Removable Beta (DPM/100cm^2)	Beta mRad/hr	Gamma On contact	Gamma 1 meter
1	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
2	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
3	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
4	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
5	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
6	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
7	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
8	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
9	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
10	MDA	MDA	MDA	MDA	ND	BKGD	BKGD

Sample Point	Total Alpha (DPM/100cm²)	Total Beta (DPM/100cm²)	Removable Alpha (DPM/100cm²)	Removable Beta (DPM/100cm²)	Beta mRad/hr	Gamma On contact	Gamma 1 meter
11	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
12	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
13	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
14	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
15	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
16	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
17	MDA	370	MDA	MDA	ND	BKGD	BKGD
18	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
19	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
20	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
21	MDA	345	MDA	MDA	ND	BKGD	BKGD
22	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
23	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
24	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
25	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
26	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
27	MDA	MDA	MDA	MDA	ND	BKGD	BKGD
28	MDA	MDA	MDA	MDA	ND	BKGD	BKGD

Data Plots

Graphical displays of the data are shown below: the Histogram and the Quantile-Quantile (Q-Q) plot. The Histogram is a plot of the fraction of the n observed data that fall within specified data "bins." A histogram is generated by dividing the x axis (range of the observed data values) into "bins" and displaying the number of data in each bin as the height of a bar for the bin. The area of the bar is the fraction of the n data values that lie within the bin. The sum of the fractions for all bins equals one. A histogram is used to assess how the n data are distributed (spread) over their range of values. If the histogram is more or less symmetric and bell shaped, then the data may be normally distributed.

The Q-Q plot graphs the quantiles of a set of n data against the quantiles of a specific distribution. We show here only the Q-Q plot for an assumed normal distribution. The pth quantile of a distribution of

data is the data value, xp, for which a fraction p of the distribution is less than xp. If the data plotted on the normal distribution Q-Q plot closely follow a straight line, even at the ends of the line, then the data may be assumed to be normally distributed. If the data points deviate substantially from a linear line, then the data are not normally distributed.

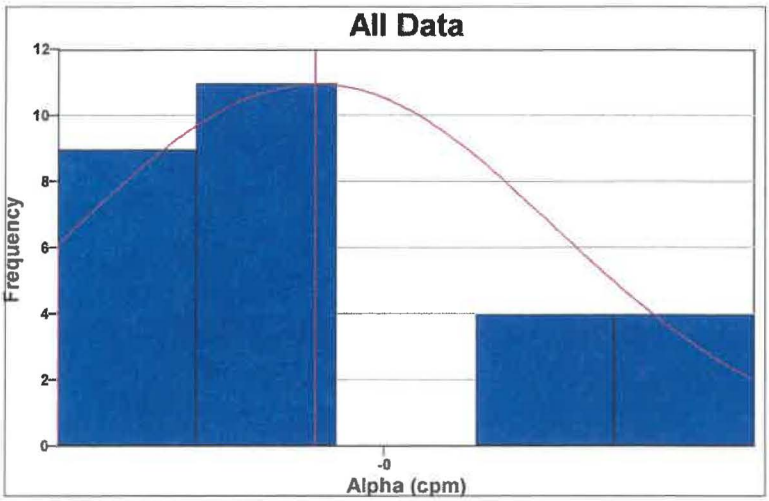
Data Analysis for Alpha

The following data was into Visual Sample Plan for statistical analysis of the results. The results were entered and evaluated in cpm against a calculated threshold of 5.2 cpm.

Alpha (cpm)										
Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
0	0	0.5	0.5	0.5	1	1	1	1	1	1
10	1	1	1	1	1	1	1.5	1.5	2	2
20	2	2	2.5	2.5						

SUMMARY STATISTICS for Alpha	
n	24
Min	0
Max	2.5
Range	2.5
Mean	1.2292
Median	1
Variance	0.41259
StdDev	0.64233
Std Error	0.13112
Skewness	0.50328
Interquartile Range	0.875

Percentiles								
1%	**5%**	**10%**	**25%**	**50%**	**75%**	**90%**	**95%**	**99%**
0	0.125	0.5	1	1	1.875	2.25	2.5	2.5



Tests for Alpha
Summary of Statistical Tests
The following table summarizes the data analysis results and is comparable to MARSSIM Table 8.2. This analysis applies to the discrete sample results (see MARSSIM 8.2.5).

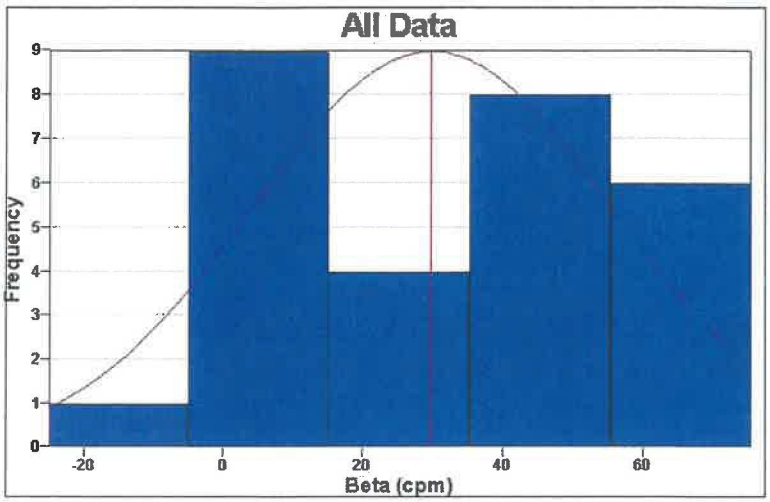
All Measurements < $DCGL_W$	Average > $DCGL_W$	Sign Test Result	Conclusion
Yes	No	N/A	**Survey Unit meets release criterion**

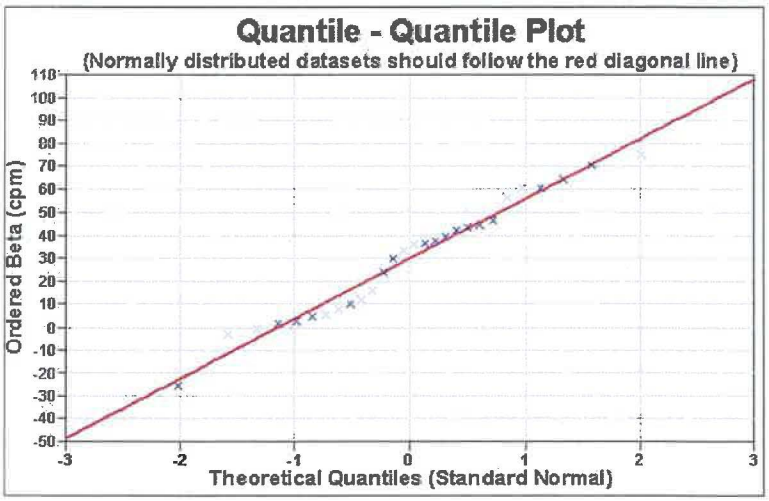
Data Analysis for Beta

Beta (cpm)										
Rank	1	2	3	4	5	6	7	8	9	10
0	148.5	157	171.5	194.5	195.5	196.5	196.5	199.5	201	202.5
10	204	205	208.5	210	211.5	212	215.5	217	218.5	219.5
20	232.5	287.5	319.5	341.5						

SUMMARY STATISTICS for Beta	
n	24
Min	148.5
Max	341.5
Range	193
Mean	215.23
Median	206.75
Variance	1938.5
StdDev	44.029
Std Error	8.9873
Skewness	1.6171
Interquartile Range	21.625

Percentiles								
1%	5%	10%	25%	50%	75%	90%	95%	99%
148.5	150.6	164.2	196.5	206.8	218.1	303.5	336	341.5





Tests for Beta
Summary of Statistical Tests
The following table summarizes the data analysis results and is comparable to MARSSIM Table 8.2. This analysis applies to the discrete sample results (see MARSSIM 8.2.5).

All Measurements < $DCGL_W$	Average > $DCGL_W$	Sign Test Result	Conclusion
Yes	No	N/A	**Survey Unit meets release criterion**

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
		Page #	Page 6 of 11

Attachment 1 - Survey Coversheet

Survey Number: SZ-2021-10-05-001 Page 1 of 6

Survey Unit:/Area **Unit 1; Class 1 Area; Old Decon Area Floor** Date: 10/5/2021

Brief Description: The following attachments were completed to perform Final Status Survey for the survey unit.

Attachments (NA block if not applicable for the survey):

- ☒ Attachment 2 Direct Scan Results
- ☒ Attachment 3 Fixed Point Measurement Datasheet
- ☒ Attachment 4 Removable Surface Contamination Results
- ☒ Attachment 5 Grid Survey Map
- ☐ Other: NA

Additional Information: (Discuss any additional information applicable to the survey unit)

HPT Name/Sign: Haider Hamza / Haider Hamza Date: 10-06-2021

HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewed By: Willie Harris Date: 10/6/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
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Attachment 2 – Direct Scan Survey Results

Survey Number SZ-2021-10-05-001 Page 2 of 6

Non-Elevated Readings			
Grid or Pass	Beta (cpm)	Alpha (cpm)	3"x3" Gamma Walkover (cpm)
1 (1-52)	632	7	17242-18151
2 (53-94)	556	11	17788-18543
3 (95-143)	638	8	17775-18615
4(144-212)	702	11	16254-18340
5 (213-267)	740	9	16457-18561
6 (268-334)	759	5	16666-17898
7 (335-401)	1070	16	15246-16798
8 (402-471)	1110	9	15546-16951
9 (472-539)	897	14	15065-16541
10 (540 – 594)	615	9	16009-17241
Elevated Readings (Record one-minute count at the location of any elevated readings)			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Beta Background (CPM)	Gamma Background (cpm)	QC Checks SAT (Y/N)
2221	335853	09-23-22	NA	NA	17K to 18K	Y
3002	25020397	08-20-22	2	461	NA	Y

HPT Name/Sign: Haider Hamzah Date: 10-06-2021

HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewer Name/Sign Willie Harris Date: 10/06/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
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Attachment 3 – Fixed Point Measurement Data Sheet

Survey Number SZ-2021-10-05-001 Page 3 of 6

Number	Grid Coordinates		Gross Alpha (cpm) (Total Counts; 2 min count)	Gross Beta (cpm) (Total Counts; 2 minute count)	Beta Dose Rate (On-Contact) (OW-CW reading)	Gamma Dose Rate (µR/hr)	
	X	Y				On-Contact	1 Meter
1	1	6	1	511	0	9	9
2	19	6	0	537	0	9	9
3	37	6	0	516	0	8	8
4	55	6	2	557	0	8	8
5	73	6	1	517	0	8	8
6	91	6	3	565	0	8	8
7	10	22	1	464	0	6	6
8	28	22	2	529	0	6	6
9	46	22	1	519	0	6	6
10	64	22	1	468	0	7	7
11	82	22	0	476	0	8	8
12	1	38	0	443	0	7	7
13	19	38	0	504	0	6	6
14	37	38	3	455	0	7	7
15	55	38	1	492	0	7	7
16	73	38	2	460	0	7	7
17	91	38	1	595	0	7	7
18	10	54	3	447	0	6	6
19	28	54	1	453	0	7	7
20	46	54	3	565	0	7	7
21	64	54	1	585	0	6	6
22	82	54	0	573	0	7	7
23	1	68	1	394	0	5	5
24	19	68	2	438	0	6	6
25	37	68	0	449	0	6	6
26	55	68	0	531	0	6	6
27	73	68	1	533	0	7	7
28	91	68	0	523	0	7	7

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
		Page #	Page 9 of 11

Attachment 3 – Fixed Point Measurements (Page 2)

Survey Number SZ-2021-10-05-001 Page 4 of 6

Instruments:

Instrument	Serial Number	Cal Due Date	Background Alpha	Background Beta/Gamma	QC Checks SAT (Y/N)
2360	319914	08-04-2022	0.8	229	Y
2360	329121	02-24-2022	0.7	222	Y
RO20	12301	11/27/2021	NA	4.2	Y
M19	300696	03/31/2022	NA	11	Y

HPT Name/Sign: Haider Hamza / Date: 10-06-2021

HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewer Name/Sign Willie Harris Date: 10/06/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
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Attachment 4 – 3030 Smear Results

Survey Number SZ-2021-10-05-001 Page 5 of 6

Location No	Description	Alpha (DPM)	Beta (DPM)	Location No	Description	Alpha (DPM)	Beta (DPM)
1	Floor	MDA	MDA	21	Floor	MDA	MDA
2	Floor	MDA	MDA	22	Floor	MDA	MDA
3	Floor	MDA	MDA	23	Floor	MDA	MDA
4	Floor	MDA	MDA	24	Floor	MDA	MDA
5	Floor	MDA	MDA	25	Floor	MDA	MDA
6	Floor	MDA	MDA	26	Floor	MDA	MDA
7	Floor	MDA	MDA	27	Floor	MDA	MDA
8	Floor	MDA	MDA	28	Floor	MDA	MDA
9	Floor	MDA	MDA	29	Biased	MDA	MDA
10	Floor	MDA	MDA	30	Biased	MDA	140
11	Floor	MDA	MDA	31	Biased	MDA	MDA
12	Floor	MDA	MDA				
13	Floor	MDA	MDA				
14	Floor	MDA	MDA				
15	Floor	MDA	MDA				
16	Floor	MDA	MDA				
17	Floor	MDA	MDA				
18	Floor	MDA	MDA				
19	Floor	MDA	MDA				
20	Floor	MDA	MDA				

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Alpha MDA (DPM)	Beta Background (CPM)	Beta MDA (DPM)
Ludlum 3030	312329	01/05/2022	0.1	3.7	33.3	29.4

HPT Name/Sign: D. Flaherty Date: 10/6/2021

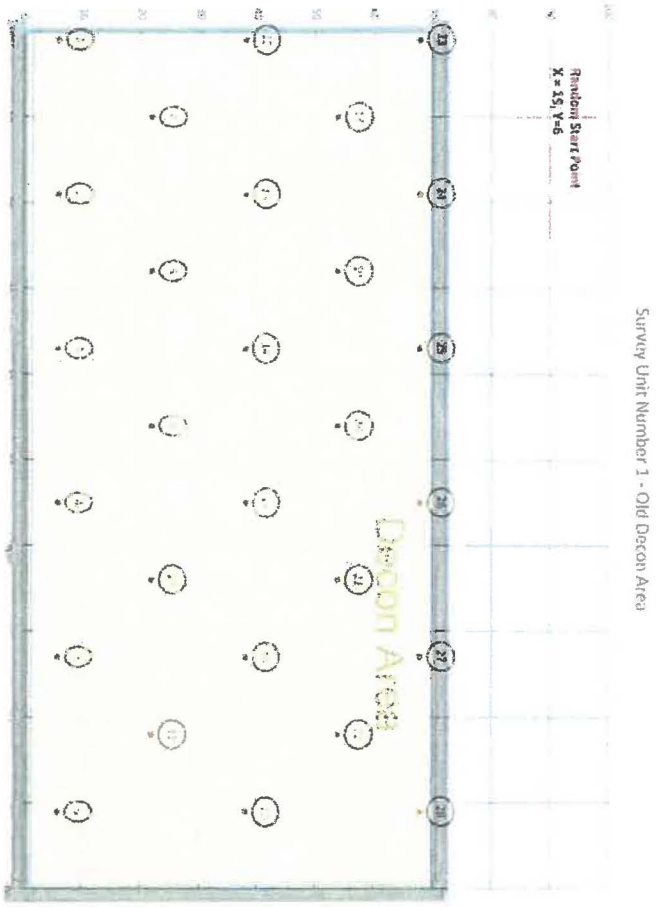
HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewer Name/Sign Willie Hess Date: 10/06/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
		Page #	Page 11 of 11

Attachment 5 – Grid Survey Map

Survey Number SZ-2021-10-05-001 Page __6__ of __6___



15.4.2 Survey Unit 2

Results/Conclusion

The survey unit **PASSED**

Survey Unit Description

Survey Unit TWO (2) was an interior Class 2 survey unit. The survey unit comprised the walls up to 8' of the old decontamination room. The approximate area of the survey unit was 990 square feet.

Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Table 14 summarizes the sampling design developed fir survey unit 2.

Table 14 - Survey Unit 2 Summary of Sampling Design

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location)in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Number of samples with MARSSIM Overage	14
Number of samples calculated during pre-planning [a]	23
Actual number of measurements	24

Primary Sampling Objective
The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold.

Selected Sampling Approach

A nonparametric systematic sampling approach with a random start was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information.

Specific Survey Unit Design

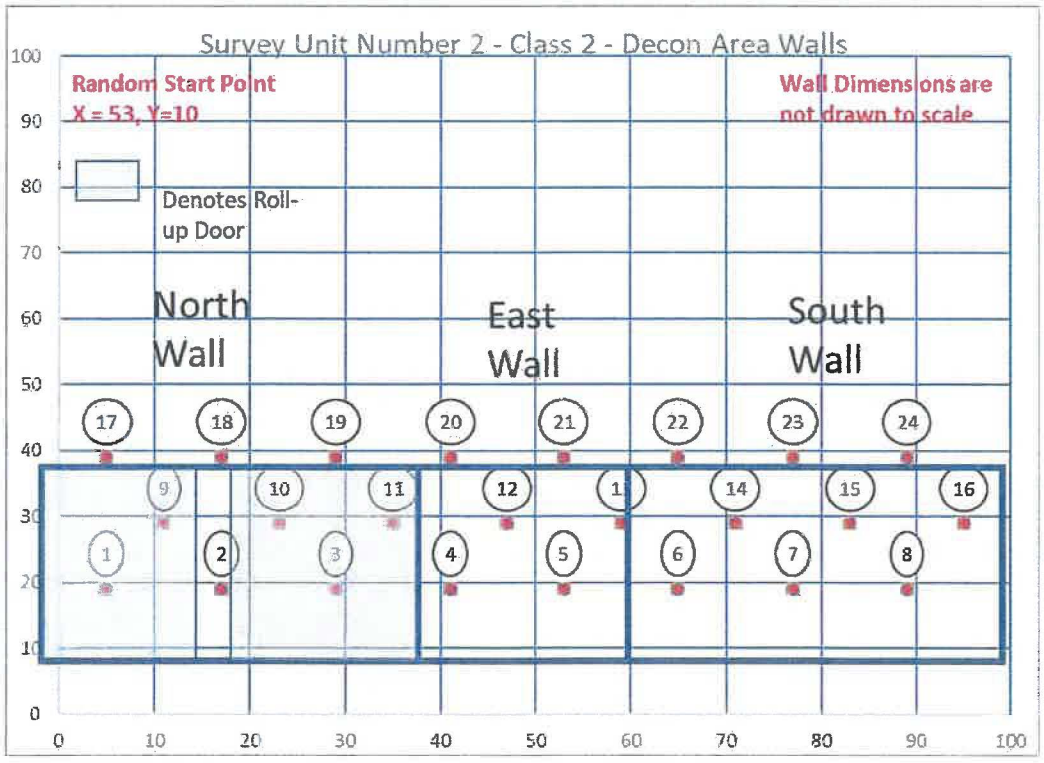
The survey design used a random grid starting point with the following specifications for the area:

- The minimum number of survey points was calculated prior to the FSS was 23. Based upon conditions determined at the time of the FSS, the actual required number of samples was 14. The actual number of survey points was 24.
- The grid and spacing were standardized to a grid of approximately 100 by 100 to facilitate remote planning of the surveys. The area to be surveyed was 3000 grid units.
- A triangle grid pattern for the fixed survey points was used as shown below. The random start point was X= 53, Y =10.
- Based on the standard grid, the calculated l=21 units and H= 18 units.

$$l = \sqrt[2]{\frac{area}{0.866n}} = \sqrt{\frac{3000}{0.866\ (32)}} = 112$$

$$h = 0.866\ l = 10$$

Figure 13 - Survey Unit 2 Grid Map



Survey Unit Results

Survey results are documented on survey number SZ/2021/10/05/003 and summarized below.

Direct Scan Results

Direct scan can of the surfaces area DID NOT indicate any areas of elevated contamination above the pre-established threshold during the survey.

Unbiased Sample Results

There were 24 direct reading sample points. Table 15, summarizes the results:

- Alpha: there were no indications were the Total and removable alpha contamination was greater than MDA.
- Beta: There were (2) two locations where the total measured contamination was greater than MDA. The highest recorded value was 586 dpm/100cm2, which is significantly less than the release criteria. There were no identified areas where the removable beta contamination was greater than MDA.
- Beat and gamma dose rates were indistinguishable from background

Table 15- Survey Unit 2 Results

Sample Point	Total Alpha (DPM/100cm²)	Total Beta (DPM/100cm²)	Removable Alpha (DPM/100cm²)	Removable Beta (DPM/100cm²)	Beta mRad/hr	Gamma On contact	Gamma 1 meter
1	MDA	MDA	MDA	MDA	ND	Background	Background
2	MDA	478	MDA	MDA	ND	Background	Background
3	MDA	586	MDA	MDA	ND	Background	Background
4	MDA	MDA	MDA	MDA	ND	Background	Background
5	MDA	MDA	MDA	MDA	ND	Background	Background
6	MDA	MDA	MDA	MDA	ND	Background	Background
7	MDA	MDA	MDA	MDA	ND	Background	Background
8	MDA	MDA	MDA	MDA	ND	Background	Background
9	MDA	MDA	MDA	MDA	ND	Background	Background
10	MDA	MDA	MDA	MDA	ND	Background	Background
11	MDA	MDA	MDA	MDA	ND	Background	Background
12	MDA	MDA	MDA	MDA	ND	Background	Background
13	MDA	MDA	MDA	MDA	ND	Background	Background
14	MDA	MDA	MDA	MDA	ND	Background	Background
15	MDA	MDA	MDA	MDA	ND	Background	Background
16	MDA	MDA	MDA	MDA	ND	Background	Background
17	MDA	MDA	MDA	MDA	ND	Background	Background
18	MDA	MDA	MDA	MDA	ND	Background	Background
19	MDA	MDA	MDA	MDA	ND	Background	Background
20	MDA	MDA	MDA	MDA	ND	Background	Background

21	MDA	MDA	MDA	MDA	ND	Background	Background
22	MDA	MDA	MDA	MDA	ND	Background	Background
23	MDA	MDA	MDA	MDA	ND	Background	Background
24	MDA	MDA	MDA	MDA	ND	Background	Background

Data Analysis for Alpha

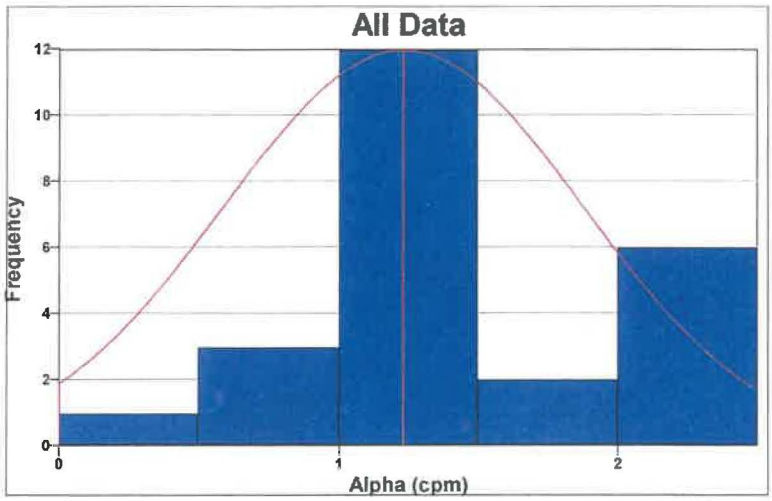
The following data was into Visual Sample Plan for statistical analysis of the results. The results were entered and evaluated in cpm against a calculated threshold of 5.2 cpm.

Alpha (cpm)										
Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
0	0	0.5	0.5	0.5	1	1	1	1	1	1
10	1	1	1	1	1	1	1.5	1.5	2	2
20	2	2	2.5	2.5						

SUMMARY STATISTICS for Alpha	
n	24
Min	0
Max	2.5
Range	2.5
Mean	1.2292
Median	1
Variance	0.41259
StdDev	0.64233
Std Error	0.13112
Skewness	0.50328
Interquartile Range	0.875

Percentiles								
1%	**5%**	**10%**	**25%**	**50%**	**75%**	**90%**	**95%**	**99%**
0	0.125	0.5	1	1	1.875	2.25	2.5	2.5

Alpha Data Plots



Tests for Alpha

Summary of Statistical Tests

The following table summarizes the data analysis results and is comparable to MARSSIM Table 8.2. This analysis applies to the discrete sample results (see MARSSIM 8.2.5).

All Measurements < $DCGL_w$	Average >$DCGL_w$	Sign Test Result	Conclusion
Yes	No	NA	**Survey Unit Meets the release criterion**

The test rejected the null hypothesis that the mean value at the site exceeds the threshold, so conclude the site is clean.

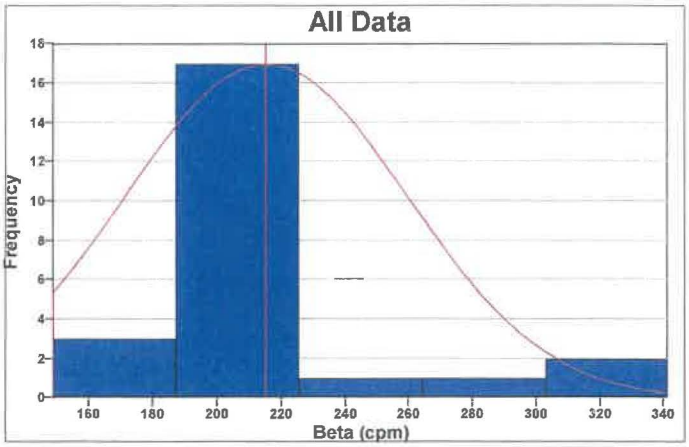
Data Analysis for Beta

The following data was into Visual Sample Plan for statistical analysis of the results

Beta (cpm)										
Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
0	148.5	157	171.5	194.5	195.5	196.5	196.5	199.5	201	202.5
10	204	205	208.5	210	211.5	212	215.5	217	218.5	219.5
20	232.5	287.5	319.5	341.5						

SUMMARY STATISTICS for Beta								
n	24							
Min	148.5							
Max	341.5							
Range	193							
Mean	215.23							
Median	206.75							
Variance	1938.5							
StdDev	44.029							
Std Error	8.9873							
Skewness	1.6171							
Interquartile Range	21.625							
Percentiles								
1%	5%	10%	25%	50%	75%	90%	95%	99%
148.5	150.6	164.2	196.5	206.8	218.1	303.5	336	341.5

Data Plots



Tests for Beta

Summary of Statistical Tests

The following table summarizes the data analysis results and is comparable to MARSSIM Table 8.2. This analysis applies to the discrete sample results (see MARSSIM 8.2.5).

All Measurements < $DCGL_W$	Average > $DCGL_W$	Sign Test Result	Conclusion
Yes	No	N/A	**Survey Unit meets release criterion**

The test rejected the null hypothesis that the mean value at the site exceeds the threshold, so conclude the site is clean.

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
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Attachment 1 - Survey Coversheet

Survey Number: SZ-2021-10-05-003 (Unit 2) Page 1 of 6

Survey Unit:/Area **Unit 2; Class 2 Area; Decon Area Walls to 8 feet** Date: 10/5/2021

Brief Description: The following attachments were completed to perform Final Status Survey for the survey unit.

Attachments (NA block if not applicable for the survey):

- ☒ Attachment 2 Direct Scan Results
- ☒ Attachment 3 Fixed Point Measurement Datasheet
- ☒ Attachment 4 Removable Surface Contamination Results
- ☒ Attachment 5 Grid Survey Map
- ☐ Other: NA

Additional Information: (Discuss any additional information applicable to the survey unit)

HPT Name/Sign: Haider Hamzah Date: 10-06-2021

HPT Name/Sign: Jiahuan Yu Date: 10/06/21

Reviewed By: Willie Hess Date: 10/06/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
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Attachment 2 – Direct Scan Survey Results

Survey Number SZ-2021-10-05-003 (Unit 2) Page __2__ of __6___

Non-Elevated Readings			
Grid or Pass	Beta (cpm)	Alpha (cpm)	3"x3" Gamma Walkover (cpm)
South Wall 1	270	2	NA
SW 2	225	2	NA
SW 3	207	1	NA
SW 4	230	1	NA
SW 5	225	2	NA
SW 6	225	1	NA
East wall 1	205	2	NA
EW 2	202	1	NA
EW 3	215	1	NA
North Wall 1	282	1	NA
NW 2	295	2	NA
NW 3	220	2	NA
NW 4	276	2	NA
NW 5	215	2	NA
NW 6	152	1	NA
Elevated Readings (Record one-minute count at the location of any elevated readings)			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Beta Background (CPM)	Gamma Background (cpm)	QC Checks SAT (Y/N)
2360	329121	02/24/2022	0.8	229	NA	Yes
2360	319914	08/04/2022	0.7	222	NA	Yes

HPT Name/Sign: Haider Hamza / [signature] Date: 10-05-2021

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign Mike Hearn / [signature] Date: 10/5/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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Attachment 3 – Fixed Point Measurement Data Sheet

Survey Number SZ-2021-10-05-003 (Unit 2) Page 3 of 6

Number	Grid Coordinates		Gross Alpha (Total Counts) Count time – 2 minutes	Gross Beta (Total Counts) Count Time = 2 minutes	Beta Dose Rate (On-Contact) (OW-CW reading)	Gamma Dose Rate (µR/hr)	
	X	Y				On-Contact	1 Meter
1	5	19	2	297	0	6	6
2	17	19	0	639	0	7	7
3	29	19	4	683	0	8	8
4	41	19	2	408	0	7	7
5	53	19	4	424	0	7	7
6	65	19	2	417	0	8	8
7	77	19	2	434	0	7	7
8	89	19	1	420	0	8	8
9	11	29	4	343	0	5	5
10	23	29	2	465	0	7	7
11	35	29	5	437	0	7	7
12	47	29	2	402	0	7	7
13	59	29	2	405	0	7	7
14	71	29	2	393	0	8	8
15	83	29	1	431	0	8	8
16	95	29	2	410	0	8	8
17	5	39	3	314	0	6	6
18	17	39	3	575	0	7	7
19	29	39	4	439	0	8	8
20	41	39	5	399	0	7	7
21	53	39	2	389	0	7	7
22	65	39	2	391	0	8	8
23	77	39	1	393	0	8	7
24	89	39	2	423	0	8	8

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 3 – Fixed Point Measurements (Page 2)

Survey Number SZ-2021-10-05-003 (Unit 2) Page __4__ of __6__

Instruments:

Instrument	Serial Number	Cal Due Date	Background	QC Checks SAT (Y/N)
2360	329121	02/24/2022	0.8 Alpha 229 Beta	Y
2360	319914	08/04/2022	0.7 Alpha 222 Beta	Y
M19	300696	03/31/2022	11 µR/hr	Y
R020	12301	11/27/2021	4.2 µR/hr	y

HPT Name/Sign: Haider Hamza / Haider Hamza Date: 10/06/2021

HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewer Name/Sign Date: 10/06/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
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Attachment 4 – 3030 Smear Results

Survey Number SZ-2021-10-05-003 (Unit 2) Page 5 of 6

Location No	Description	Alpha (DPM)	Beta (DPM)	Location No	Description	Alpha (DPM)	Beta (DPM)
1	Door	MDA	MDA	21	Wall	MDA	MDA
2	Wall	MDA	MDA	22	Wall	MDA	MDA
3	Door	MDA	105	23	Wall	MDA	MDA
4	Wall	MDA	MDA	24	Wall	MDA	MDA
5	Wall	MDA	MDA				
6	Wall	MDA	MDA				
7	Wall	MDA	MDA				
8	Wall	MDA	MDA				
9	Door	MDA	MDA				
10	Door	MDA	MDA				
11	Door	MDA	MDA				
12	Wall	MDA	MDA				
13	Wall	MDA	MDA				
14	Wall	MDA	MDA				
15	Wall	MDA	MDA				
16	Wall	MDA	MDA				
17	Door	MDA	MDA				
18	Wall	MDA	MDA				
19	Door	MDA	MDA				
20	Wall	MDA	MDA				

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Alpha MDA (DPM)	Beta Background (CPM)	Beta MDA (DPM)
3030	312329	01/05/2022	0.1	3.7	35	29.9

HPT Name/Sign: D. Flahaut Date: 10/6/2021

HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewer Name/Sign Willie Hasan Date: 10/6/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
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Attachment 5 – Grid Survey Map

Survey Number SZ-2021-10-05-003 (Unit 2) Page __6__ of __6___

15.4.3 Survey Unit 3

Results/Conclusion

The survey unit **PASSED**.

Survey Unit Description

Survey Unit 3 was an interior Class 2 survey unit. The location of floor of the restricted area. The approximate total area of the survey unit was 840 square feet.

Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Table 16 summarizes the sampling design developed.

Table 16 - Survey Unit 3 Summary of Sampling Design

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	MARSSIM version Tables 5.5
Calculated number of samples based on actual statistics at time of survey	15
Calculated Number of samples based on pre-planning conservative assumption of the relative shift	23
Actual Number of samples	24

Primary Sampling Objective

The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is

equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold.

Selected Sampling Approach

A nonparametric systematic sampling approach with a random start was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information (e.g., historical data from this site or a very similar site) indicate that typical parametric assumptions may not be true.

Specific Survey Unit Design

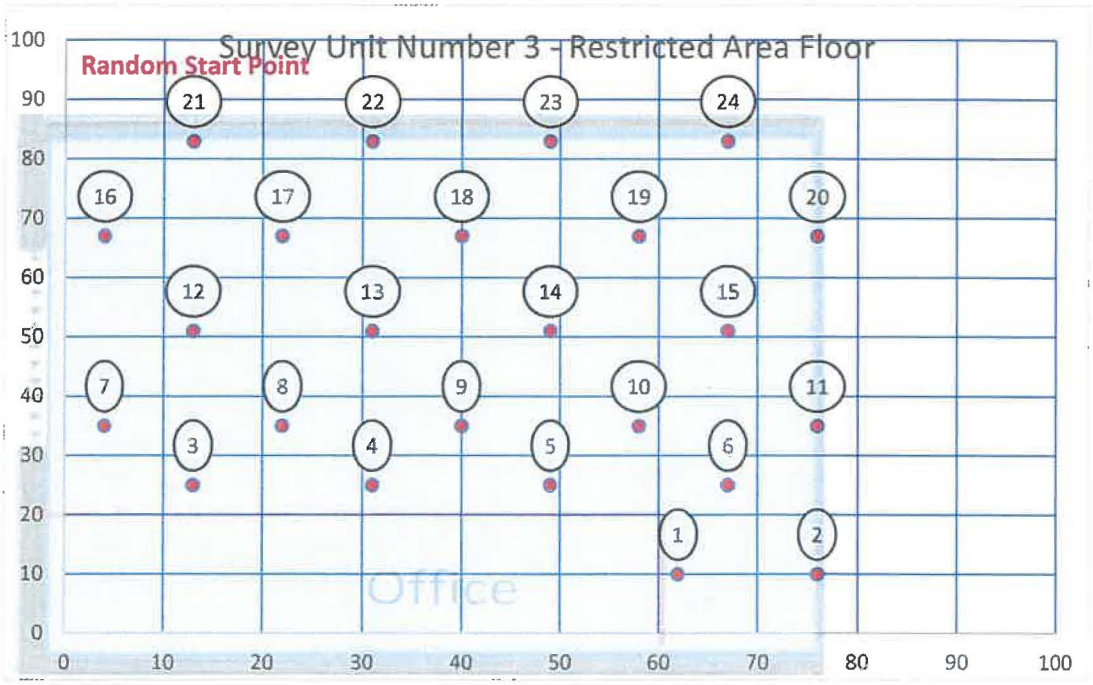
The survey design used a random grid starting point with the following specifications for the area:

- The minimum number of survey points was calculated at 23. The actual number of survey points was 24.
- The grid and spacing were standardized to a grid of approximately 80 by 90 to facilitate remote planning of the surveys.
- A triangle grid pattern for the fixed survey points was used as shown below. The random start point was X= 49, Y =83.
- Based on the standard grid, the calculated l=19 units and H= 16 units.

$$l = \sqrt[2]{\frac{grid\ area}{0.866n}} = \sqrt{\frac{7200}{0.866\ (23)}}\ (Area\ Correction) = 19$$

$$h = 0.866\ l = 16$$

Figure 14 - Survey Unit 3 Grid Map



Survey Unit Results

Results are summarized below and documented in survey number SZ/2021/10/05/002.

Direct Scan Results

Direct scan of the surfaces area indicated that there was no activity found above predetermined threshold value that required additional investigation.

Unbiased Sample Results

There were 24 direct reading sample points located in the survey unit. Table 17 has the results of the measurements performed in the survey unit. There were no indications that were great than MDA. Bata and gamma radiation levels were not discernable above background.

Table 17 - Survey Unit 3 Results

Sample Point	Total Alpha (DPM/100cm²)	Total Beta (DPM/100cm²)	Removable Alpha (DPM/100cm²)	Removable Beta (DPM/100cm²)	Beta mRad/hr	Gamma On contact	Gamma 1 meter
1	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
2	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
3	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
4	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
5	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
6	MDA	MDA	MDA	MDA	Non-Detect	Background	Background

7	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
8	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
9	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
10	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
11	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
12	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
13	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
14	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
15	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
16	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
17	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
18	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
19	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
20	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
21	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
22	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
23	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
24	MDA	MDA	MDA	MDA	Non-Detect	Background	Background

Data Analysis for Alpha

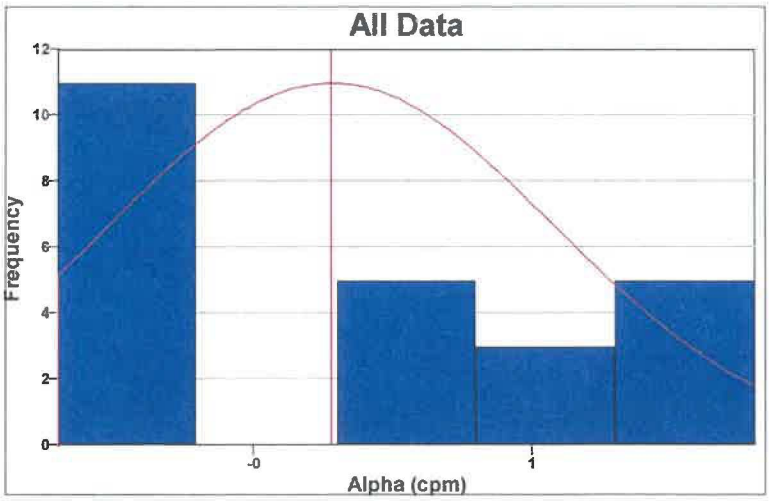
The following table lists the results in net cpm entered into the VSP program for data analysis.

Alpha (cpm)										
Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
0	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.2
10	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
20	0.3	0.3	0.3	0.3	0.8	0.8	0.8	0.8		

The following table presents the summary statistics for the alpha measurements conducted at the site.

SUMMARY STATISTICS for Alpha	
n	28
Min	-0.7
Max	0.8
Range	1.5
Mean	-0.14643

Median				-0.2				
Variance				0.26554				
StdDev				0.51531				
Std Error				0.097384				
Skewness				0.64665				
Interquartile Range				1				
Percentiles								
1%	**5%**	**10%**	**25%**	**50%**	**75%**	**90%**	**95%**	**99%**
-0.7	-0.7	-0.7	-0.7	-0.2	0.3	0.8	0.8	0.8



Tests for Alpha
Summary of Statistical Tests
The following table summarizes the data analysis results and is comparable to MARSSIM Table 8.2. This analysis applies to the discrete sample results (see MARSSIM 8.2.5).

All Measurements < $DCGL_W$	Average > $DCGL_W$	Sign Test Result	Conclusion
Yes	No	N/A	Survey Unit meets release criterion

The test rejected the null hypothesis that the mean value at the site exceeds the threshold, so conclude the site is clean.

Data Analysis for Gross Beta

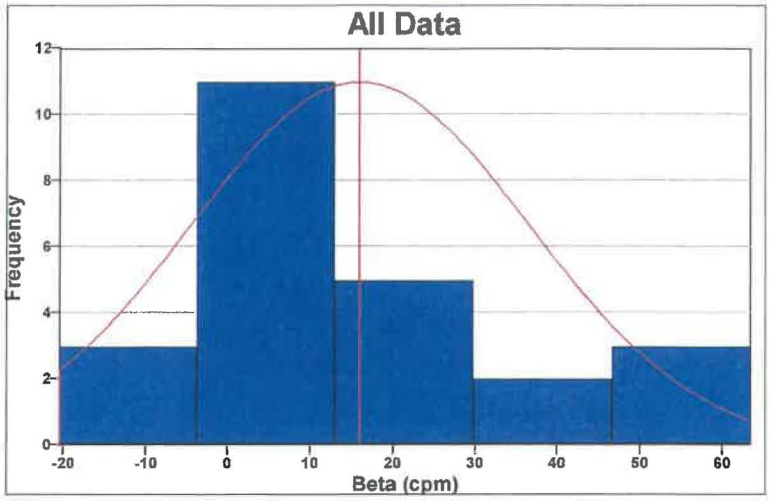
The following table presents the data entered into the VSP program in net cpm for data analysis.

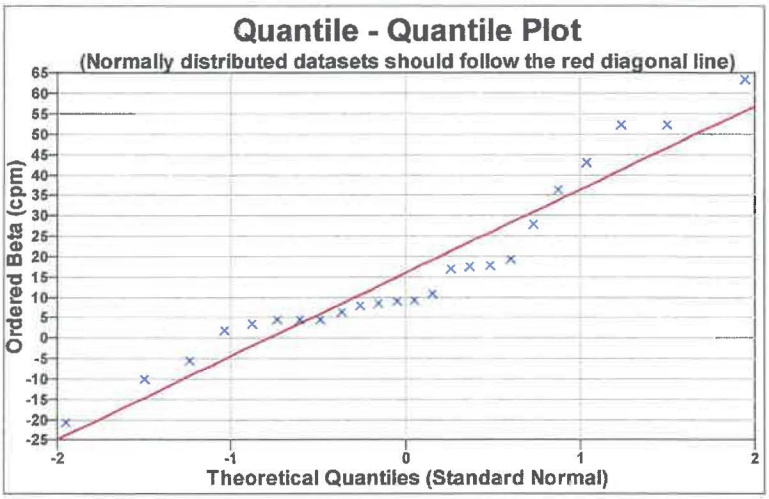
Beta (cpm)										
Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
0	-25	-3	-0.5	1.5	2.5	4.5	5.5	8	10	12
10	16	24	30	33.5	36	36.5	37.5	39.5	42.5	43.5
20	44.5	46.5	56.5	60.5	60.5	64.5	70.5	75.5		

The following table presents the summary statistics for the beta measurements conducted at the site.

SUMMARY STATISTICS for Beta	
n	28
Min	-25
Max	75.5
Range	100.5
Mean	29.768
Median	34.75
Variance	660.12
StdDev	25.693
Std Error	4.8555
Skewness	-0.070865
Interquartile Range	39.875

Percentiles								
1%	**5%**	**10%**	**25%**	**50%**	**75%**	**90%**	**95%**	**99%**
-25	-15.1	-0.75	6.125	34.75	46	65.1	73.25	75.5





Tests for Beta
Summary of Statistical Tests
The following table summarizes the data analysis results and is comparable to MARSSIM Table 8.2. This analysis applies to the discrete sample results (see MARSSIM 8.2.5).

All Measurements < $DCGL_W$	Average > $DCGL_W$	Sign Test Result	Conclusion
Yes	No	N/A	**Survey Unit meets release criterion**

The test rejected the null hypothesis that the mean value at the site exceeds the threshold, so conclude the site is clean.

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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Attachment 1 - Survey Coversheet

Survey Number: SZ-2021-10-05-002 Page 1 of 6

Survey Unit:/Area **Unit 3; Class 2 Area; Restricted Area Floor** Date: 10/05/2021

Brief Description: The following attachments were completed to perform Final Status Survey for the survey unit.

Attachments (NA block if not applicable for the survey):

- ☒ Attachment 2 Direct Scan Results
- ☒ Attachment 3 Fixed Point Measurement Datasheet
- ☒ Attachment 4 Removable Surface Contamination Results
- ☒ Attachment 5 Grid Survey Map
- ☐ Other: _____

Additional Information: (Discuss any additional information applicable to the survey unit)

HPT Name/Sign: Haider Hamza Date: 10-06-21

HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewed By: Willie Harris Date: 10/06/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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Attachment 2 – Direct Scan Survey Results

Survey Number SZ-2021-10-05-002 Page __2__ of __6___

Non-Elevated Readings			
Grid or Pass	Beta (cpm)	Alpha (cpm)	3"x3" Gamma Walkover (cpm)
1(1-65)	639	5	19563 – 21011
2 (66-105)	616	12	17653-19432
3 (106-144)	527	11	18765-19963
4 (145-177)	584	10	17021-18138
5 (178-225)	523	6	16432-17518
6 (226-250)	539	2	15014-16289
7 (251-281)	518	1	16101-17205
Elevated Readings (Record one-minute count at the location of any elevated readings)			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Beta Background (CPM)	Gamma Background (cpm)	QC Checks SAT (Y/N)
2221	335853	09-23-22	NA	NA	17K to 18K	Y
3002	25020397	08-20-22	2	461	NA	Y

HPT Name/Sign: Haider Hamza Date: 10-06-2021

HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewer Name/Sign Willie Harris Date: 10/06/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
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Attachment 3 – Fixed Point Measurement Data Sheet

Survey Number SZ-2021-10-05-002 Page __3__ of __6___

Number	Grid Coordinates		Gross Alpha (Total Counts) Count Time = 2 minutes	Gross Beta (Total Counts) (Count Time = 2 minutes)	Beta Dose Rate (On-Contact) (OW-CW reading)	Gamma Dose Rate (µR/hr)	
	X	Y				On-Contact	1 Meter
1	4	3	3	571	0	8	8
2	22	3	1	549	0	8	8
3	40	3	5	424	0	8	8
4	58	3	0	453	0	7	7
5	76	3	1	549	0	10	10
6	13	19	2	530	0	9	9
7	31	19	0	483	0	6	6
8	49	19	3	451	0	7	7
9	67	19	1	453	0	6	6
10	4	35	0	462	0	6	6
11	22	35	2	461	0	6	6
12	40	35	0	479	0	7	7
13	58	35	5	457	0	7	7
14	76	35	0	433	0	6	6
15	13	51	2	500	0	7	7
16	31	51	4	463	0	6	6
17	49	51	4	480	0	6	6
18	67	51	4	453	0	6	6
19	4	67	2	448	0	6	6
20	22	67	1	460	0	6	6
21	40	67	2	517	0	6	6
22	58	67	3	466	0	6	6
23	76	67	1	403	0	6	6
24	13	83	1	478	0	6	6

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 3 – Fixed Point Measurements (Page 2)

Survey Number SZ-2021-10-05-002 Page __4__ of __6__

Instruments:

Instrument	Serial Number	Cal Due Date	Background		QC Checks SAT (Y/N)
			Alpha	Beta/Gamma	
2360	319914	08-04-2022	0.8	229	Y
2360	329121	02-24-2022	0.7	222	Y
RO20	12301	11/27/2021	NA	4.2	Y
M19	300696	03/31/2022	NA	11	Y

HPT Name/Sign: Haider Hamza / Date: 10-06-2021

HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewer Name/Sign Willie Harris Date: 10/06/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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Attachment 4 – 3030 Smear Results

Survey Number SZ-2021-10-05-002 Page 5 of 6

Location No	Description	Alpha (DPM)	Beta (DPM)	Location No	Description	Alpha (DPM)	Beta (DPM)
1	Floor	MDA	MDA	21	Floor	MDA	MDA
2	Floor	MDA	MDA	22	Floor	MDA	MDA
3	Floor	MDA	MDA	23	Floor	MDA	MDA
4	Floor	MDA	MDA	24	Floor	MDA	MDA
5	Floor	MDA	MDA	25	Floor	MDA	MDA
6	Floor	MDA	MDA	26	Floor	MDA	MDA
7	Floor	MDA	MDA	27	Floor	MDA	MDA
8	Floor	MDA	MDA				
9	Floor	MDA	MDA				
10	Floor	MDA	MDA				
11	Floor	MDA	MDA				
12	Floor	MDA	MDA				
13	Floor	MDA	MDA				
14	Floor	MDA	MDA				
15	Floor	MDA	MDA				
16	Floor	MDA	MDA				
17	Floor	MDA	MDA				
18	Floor	MDA	MDA				
19	Floor	MDA	MDA				
20	Floor	MDA	MDA				

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Alpha MDA (DPM)	Beta Background (CPM)	Beta MDA (DPM)
Ludlum 3030	312329	01/05/2022	0.1	3.7	33.3	29.4

HPT Name/Sign: D. Flaherty Date: 10/6/2021

HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewer Name/Sign Allie Harris Date: 10/06/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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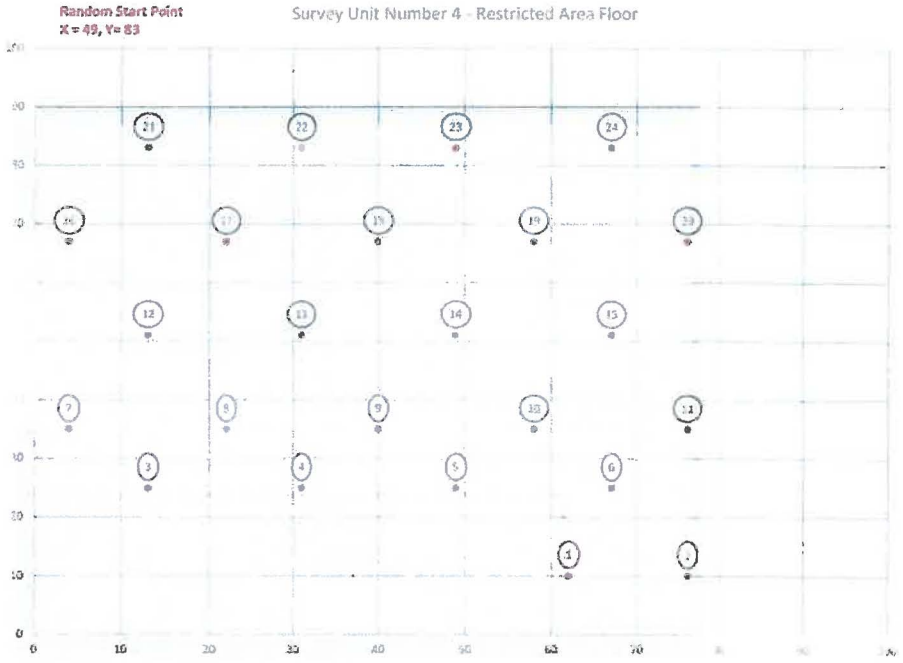
Attachment 5 – Grid Survey Map

Survey Number SZ-2021-10-05-002 Page __6__ of __6___



15.4.4 Survey Unit 4

Results/Conclusion

The survey unit PASSED.

Survey Unit Description

Survey Unit FOUR was an interior Class 2 survey Unit. The location was the walls up to 8 feet in the restricted area for the area – not including the office area walls or the walls in the previous area that was controlled as a contaminated area. The approximate area of the grid was 880 square feet.

Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Table summarizes the sampling design developed.

Table 18 - Survey Unit 4 Summary of Sampling Design

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location)in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version using table 5.5 and VSP
Number of samples calculated from VSP using actual site statistics	14
Number of samples calculated prior to the survey using estimated statistics	23
Number of selected sample areas [b]	24

Primary Sampling Objective

The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold.

Selected Sampling Approach

A nonparametric systematic sampling approach with a random start was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information indicate that typical parametric assumptions may not be true.

Specific Survey Unit Design

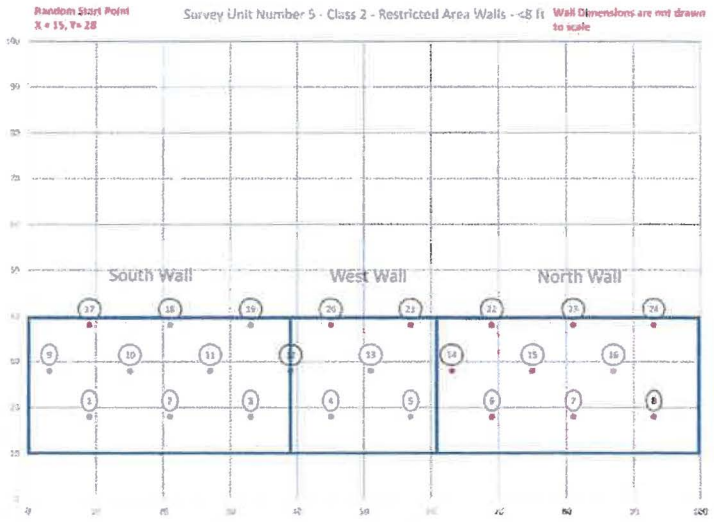
The survey design used a random grid starting point with the following specifications for the area:

- The minimum number of survey points was calculated at 23. The actual number of survey points was 24.
- The grid and spacing were standardized to a grid of approximately 100 by 30 to facilitate remote planning of the surveys.
- A triangle grid pattern for the fixed survey points was used as shown below. The random start point was X= 53, Y =9.
- Based on the standard grid, the calculated l=12 units and H= 10 units.

$$l = \sqrt[2]{\frac{area}{0.866n}} = \sqrt{\frac{3000}{0.866\ (23)}} = 12$$

$$h = 0.866\ l = 10$$

Figure 15 - Survey Unit 4 Grid Map



Survey Unit Results

Details of the results are included below and documented in survey number SZ/2021/10/06/001.

Direct Scan Results

Direct scans did not find any indications above the predetermined threshold value that would require additional investigation.

Unbiased Sample Results

There were 24 unbiased sample points obtained in the survey unit. As shown in Table 19

- Total and removable alpha contamination was less than MDA
- Beta removable contamination was less than MDA
- There were 3 locations where Total beta contamination was greater than MDA, with the highest location reading 674 dpm/100 cm^2. This represents a total fraction of < 10% of the release limit
- Beta and gamma radiation were non-discernable from background radiation

Table 19 - Survey Unit 4 Results

Sample Point	Total Alpha (DPM/100cm^2)	Total Beta (DPM/100cm^2)	Removable Alpha (DPM/100cm^2)	Removable Beta (DPM/100cm^2)	Beta mRad/hr	Gamma On contact	Gamma 1 meter
1	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
2	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
3	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
4	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
5	MDA	566	MDA	MDA	Non-Detect	Background	Background
6	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
7	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
8	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
9	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
10	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
11	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
12	MDA	674	MDA	MDA	Non-Detect	Background	Background
13	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
14	MDA	422	MDA	MDA	Non-Detect	Background	Background
15	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
16	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
17	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
18	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
19	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
20	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
21	MDA	MDA	MDA	MDA	Non-Detect	Background	Background

22	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
23	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
24	MDA	MDA	MDA	MDA	Non-Detect	Background	Background

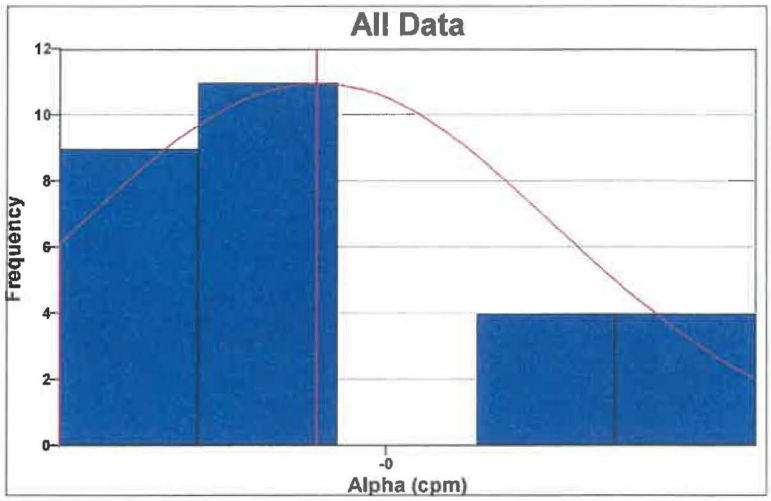
Data Analysis – Alpha

The following table states the data entered into VSP in cpm.

Alpha (cpm)										
Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
0	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.2
10	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
20	0.3	0.3	0.3	0.3	0.8	0.8	0.8	0.8		

The following table states the summary statistics for alpha measurements.

SUMMARY STATISTICS for Alpha								
n	28							
Min	-0.7							
Max	0.8							
Range	1.5							
Mean	-0.14643							
Median	-0.2							
Variance	0.26554							
StdDev	0.51531							
Std Error	0.097384							
Skewness	0.64665							
Interquartile Range	1							
Percentiles								
1%	**5%**	**10%**	**25%**	**50%**	**75%**	**90%**	**95%**	**99%**
-0.7	-0.7	-0.7	-0.7	-0.2	0.3	0.8	0.8	0.8



All Measurements < $DCGL_W$	Average > $DCGL_W$	Sign Test Result	Conclusion
Yes	No	N/A	**Survey Unit meets release criterion**

The test rejected the null hypothesis that the mean value at the site exceeds the threshold, so conclude the site is clean.

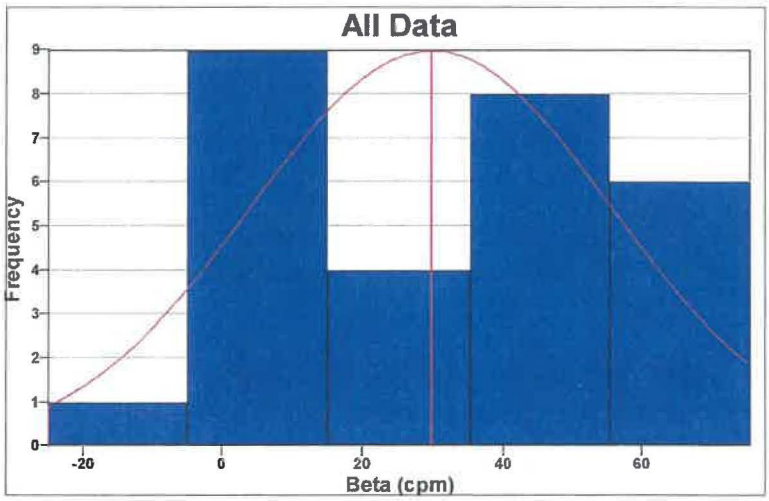
Data Analysis for Gross Beta

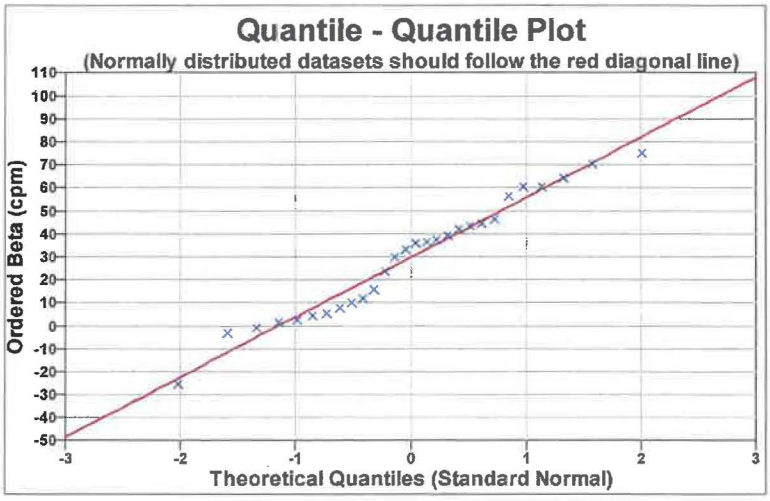
Beta (cpm)										
Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
0	-25	-3	-0.5	1.5	2.5	4.5	5.5	8	10	12
10	16	24	30	33.5	36	36.5	37.5	39.5	42.5	43.5
20	44.5	46.5	56.5	60.5	60.5	64.5	70.5	75.5		

SUMMARY STATISTICS for Beta	
n	28
Min	-25
Max	75.5
Range	100.5
Mean	29.768

Median	34.75
Variance	660.12
StdDev	25.693
Std Error	4.8555
Skewness	-0.070865
Interquartile Range	39.875

Percentiles								
1%	5%	10%	25%	50%	75%	90%	95%	99%
-25	-15.1	-0.75	6.125	34.75	46	65.1	73.25	75.5





Tests for Beta
Summary of Statistical Tests
The following table summarizes the data analysis results and is comparable to MARSSIM Table 8.2. This analysis applies to the discrete sample results (see MARSSIM 8.2.5).

All Measurements < $DCGL_W$	Average > $DCGL_W$	Sign Test Result	Conclusion
Yes	No	N/A	**Survey Unit meets release criterion**

The test rejected the null hypothesis that the mean value at the site exceeds the threshold, so conclude the site is clean.

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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Attachment 1 - Survey Coversheet

Survey Number: SZ-2021-10-06-001 (Unit 4) Page 1 of 6

Survey Unit:/Area **Unit 4; Class 2 Area; Restricted Area Walls to 8 feet** Date: 10/06/2021

Brief Description: The following attachments were completed to perform Final Status Survey for the survey unit.

Attachments (NA block if not applicable for the survey):

- ☒ Attachment 2 Direct Scan Results
- ☒ Attachment 3 Fixed Point Measurement Datasheet
- ☒ Attachment 4 Removable Surface Contamination Results
- ☒ Attachment 5 Grid Survey Map
- ☐ Other: NA

Additional Information: (Discuss any additional information applicable to the survey unit)

HPT Name/Sign: Haider Hamza / Date: 10-06-2021

HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewed By: Willie Harris Date: 10/6/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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Attachment 2 – Direct Scan Survey Results

Survey Number SZ-2021-10-06-001 (Unit 4) Page 2 of 6

Non-Elevated Readings			
Grid or Pass	Beta (cpm)	Alpha (cpm)	3"x3" Gamma Walkover (cpm)
South Wall – 1	205	2	NA
SW-2	207	2	NA
SW-3	240	2	NA
SW-4	208	1	NA
SW-5	209	2	NA
SW-6	240	3	NA
West Wall – 1	151	2	NA
WW-2	176	5	NA
North Wall – 1	175	1	NA
NW-2	161	2	NA
NW-3	162	1	NA
NW-4	178	2	NA
NW-5	160	3	NA
NW-6	167	3	NA
Elevated Readings (Record one-minute count at the location of any elevated readings)			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Beta Background (CPM)	Gamma Background (cpm)	QC Checks SAT (Y/N)
2360	319914	08/04/2022	0.7	222	NA	Yes
2360	329121	02/24/2022	0.8	229	NA	Yes

HPT Name/Sign: Haider Hamza / [signature] Date: 10-06-2021

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign: [signature] Date: 10/6/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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Attachment 3 – Fixed Point Measurement Data Sheet

Survey Number SZ-2021-10-06-001 (Unit 4) Page _3___ of __6___

Number	Grid Coordinates		Gross Alpha (Total Counts) 2 Minute count time	Gross Beta (cpm) (Total Counts) 2 Min Count	Beta Dose Rate (On-Contact) (OW-CW reading)	Gamma Dose Rate (µR/hr)	
	X	Y				On-Contact	1 Meter
1	9	18	0	421	0	8	8
2	21	18	5	370	0	8	8
3	33	18	3	373	0	8	8
4	45	18	3	341	0	8	8
5	57	18	1	675*	0	9	9
6	69	18	2	341	0	8	8
7	81	18	1	298	0	5	5
8	93	18	0	330	0	5	5
9	3	28	3	407	0	8	8
10	15	28	1	382	0	8	8
11	27	28	1	412	0	8	8
12	39	28	2	719*	0	9	9
13	51	28	2	338	0	7	7
14	63	28	4	616*	0	9	9
15	75	28	5	288	0	6	6
16	87	28	2	288	0	6	6
17	9	38	2	452	0	8	8
18	21	38	4	341	0	7	7
19	33	38	1	371	0	8	8
20	45	38	2	312	0	7	7
21	57	38	2	350	0	7	7
22	69	38	3	295	0	7	7
23	81	38	2	299	0	6	6
24	93	38	3	293	0	6	6

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 3 – Fixed Point Measurements (Page 2)

Survey Number SZ-2021-10-06-001 (Unit 4) Page 4 of 6

Instruments:

Instrument	Serial Number	Cal Due Date	Background	QC Checks SAT (Y/N)
2360	319914	08/04/2022	Alpha – 0.7 cpm Beta – 222 cpm	Yes
2360	329121	02/24/2022	Alpha – 0.8 cpm Beta – 229 cpm	Yes
M19	300696	03/31/2022	11 µR/hr	Yes
RO20	12301	11/27/2021	4.2 µR/hr	Yes

HPT Name/Sign: Haydar Hamza Date: 10-06-2021

HPT Name/Sign: Jihuan Yu Date: 10/06/21

Reviewer Name/Sign Willie Harris Date: 10/06/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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Attachment 4 – 3030 Smear Results

Survey Number SZ-2021-10-06-001 (Unit 4) Page 5 of 6

Location No	Description	Alpha (DPM)	Beta (DPM)	Location No	Description	Alpha (DPM)	Beta (DPM)
1	Wall	MDA	MDA	21	Wall	MDA	MDA
2	Wall	MDA	MDA	22	Wall	MDA	MDA
3	Wall	MDA	MDA	23	Wall	MDA	MDA
4	Wall	MDA	MDA	24	Wall	MDA	MDA
5	Wall	MDA	MDA				
6	Wall	MDA	MDA				
7	Wall	MDA	MDA				
8	Wall	MDA	MDA				
9	Wall	MDA	MDA				
10	Wall	MDA	MDA				
11	Wall	MDA	MDA				
12	Wall	MDA	MDA				
13	Wall	MDA	MDA				
14	Wall	MDA	MDA				
15	Wall	MDA	MDA				
16	Wall	MDA	MDA				
17	Wall	MDA	MDA				
18	Wall	MDA	MDA				
19	Wall	MDA	MDA				
20	Wall	MDA	MDA				

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Alpha MDA (DPM)	Beta Background (CPM)	Beta MDA (DPM)
Ludlum 3030	312329	01/05/2022	0.1	3.7	35	29.9

HPT Name/Sign: D. Flaherty Date: 10/6/2021

HPT Name/Sign: Jihwan Yu Date: 10/06/21

Reviewer Name/Sign [illegible] Date: 10/06/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
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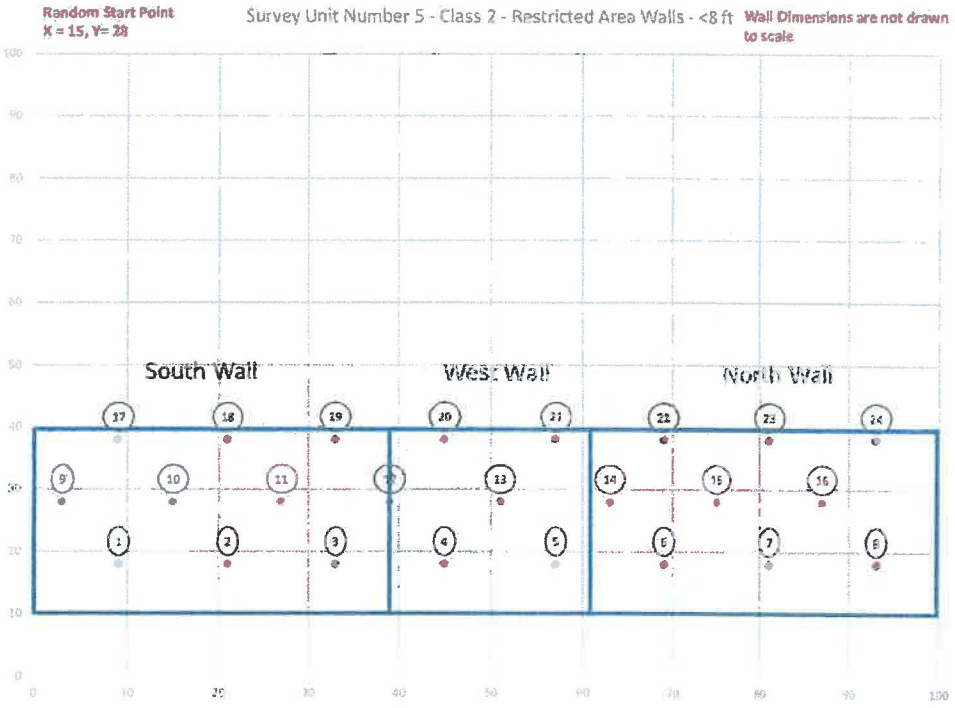
Attachment 5 – Grid Survey Map

Survey Number SZ-2021-10-06-001 (Unit 4) Page __6__ of __6___



15.4.5 Survey Unit 5

Results/Conclusion

The survey unit PASSED

Survey Unit Description

Survey Unit FIVE was an interior Class 2 survey Unit that comprised the area that was the previous radiation protection office. The approximate area of the survey unit grid was approximately 450 square feet.

Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Table 20 summarizes the sampling design developed.

Table 20 - Unit 5 Summary of Sampling Design

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the siteexceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version table 5.5
Calculated number of samples	11
Calculated Number of samples using pre-planning data	23
Number of selected sample areas [b]	25

Primary Sampling Objective

The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold.

Selected Sampling Approach

A nonparametric systematic sampling approach with a random start was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information indicate that typical parametric assumptions may not be true.

Specific Survey Unit Design

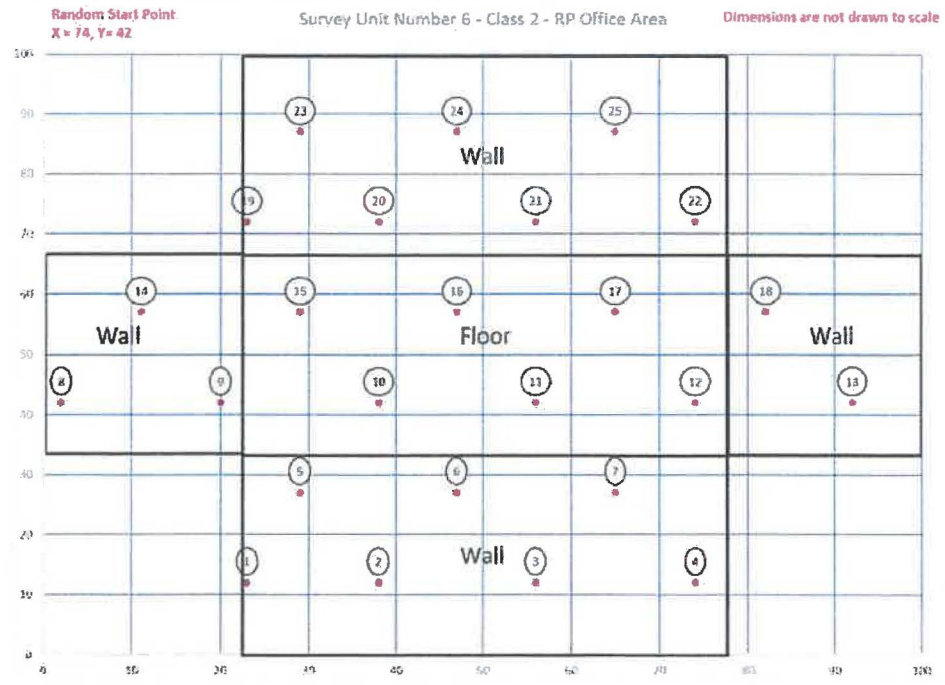
The survey design used a random grid starting point with the following specifications for the area:

- The minimum number of survey points was calculated at 23. The actual number of survey points was 25.
- The grid and spacing were standardized to a grid of approximately 100 by 60 to facilitate remote planning of the surveys.
- A triangle grid pattern for the fixed survey points was used as shown below. The random start point was X= 74, Y =42.
- Based on the standard grid, the calculated l=18 units and H= 16 units.

$$l = \sqrt[2]{\frac{area}{0.866n}} = \sqrt{\frac{3000}{0.866\ (21)}} = 18.2$$

$$h = 0.866\ l = 15.8$$

Figure 16 - Survey Unit 5 Grid Map



Survey Unit Results

Details of the results are below and documented in survey number SZ/2021/10/06/002.

Direct Scan Results

A scan of floor and wall surfaces area was performed and there were no indications detected greater than the preestablished investigation threshold value.

Unbiased Sample Results

There were 25 measurements obtained in the survey unit. Table 21 lists Survey Unit 5 sample results. As indicated, there were no measurements that were greater than MDA and beta and gamma radiation measurements were indistinguishable from background.

Table 21 - Survey Unit 5 Results

Sample Point	Total Alpha (DPM/100cm²)	Total Beta (DPM/100cm²)	Removable Alpha (DPM/100cm²)	Removable Beta (DPM/100cm²)	Beta mRad/hr	Gamma On contact	Gamma 1 meter
1	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
2	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
3	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
4	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
5	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
6	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
7	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
8	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
9	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
10	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
11	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
12	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
13	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
14	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
15	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
16	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
17	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
18	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
19	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
20	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
21	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
22	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
23	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
24	MDA	MDA	MDA	MDA	Non-Detect	Background	Background

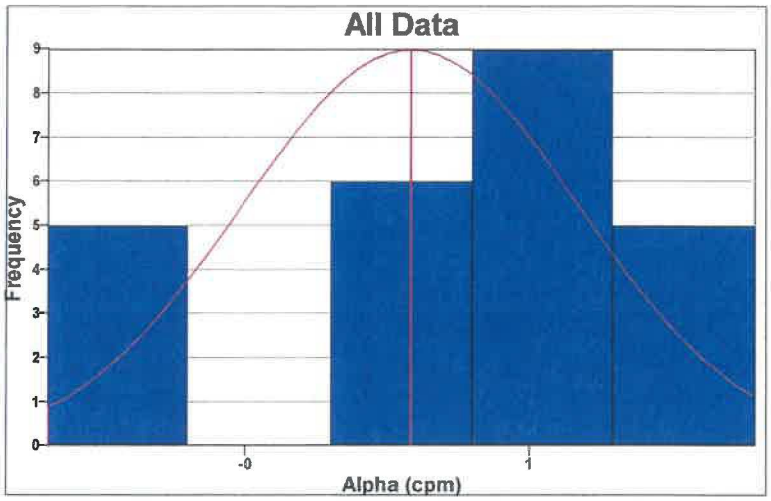
Sample Point	Total Alpha (DPM/100cm²)	Total Beta (DPM/100cm²)	Removable Alpha (DPM/100cm²)	Removable Beta (DPM/100cm²)	Beta mRad/hr	Gamma On contact	Gamma 1 meter
25	MDA	MDA	MDA	MDA	Non-Detect	Background	Background

Data Analysis – Alpha

Alpha (cpm)										
Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
0	-0.7	-0.2	-0.2	-0.2	-0.2	0.3	0.3	0.3	0.3	0.3
10	0.3	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
20	1.3	1.3	1.3	1.3	1.8					

SUMMARY STATISTICS for Alpha	
n	25
Min	-0.7
Max	1.8
Range	2.5
Mean	0.58
Median	0.8
Variance	0.35583
StdDev	0.59652
Std Error	0.1193
Skewness	-0.15414
Interquartile Range	0.5

Percentiles								
1%	**5%**	**10%**	**25%**	**50%**	**75%**	**90%**	**95%**	**99%**
-0.7	-0.55	-0.2	0.3	0.8	0.8	1.3	1.65	1.8



Tests for Alpha
Summary of Statistical Tests
The following table summarizes the data analysis results and is comparable to MARSSIM Table 8.2. This analysis applies to the discrete sample results (see MARSSIM 8.2.5).

All Measurements < $DCGL_W$	Average > $DCGL_W$	Sign Test Result	Conclusion
Yes	No	N/A	Survey Unit meets release criterion

The test rejected the null hypothesis that the mean value at the site exceeds the threshold, so conclude the site is clean.

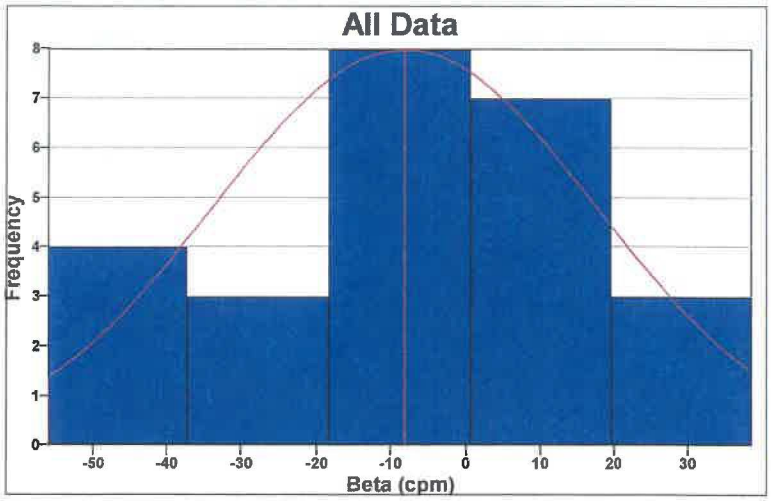
Data Analysis for Gross Beta

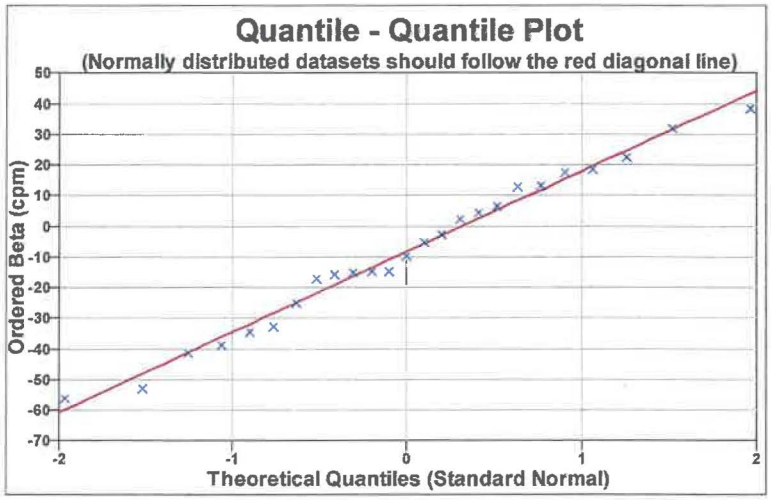
Beta (cpm)										
Rank	1	2	3	4	5	6	7	8	9	10
0	-56	-53	-41	-38.5	-34.5	-32.5	-25	-17	-15.5	-15
10	-14.5	-14.5	-9.5	-5	-2.5	2.5	4.5	6.5	13	13.5
20	17.5	18.5	22.5	32	38.5					

SUMMARY STATISTICS for Beta	
n	25
Min	-56
Max	38.5
Range	94.5
Mean	-8.2
Median	-9.5
Variance	653.17
StdDev	25.557
Std Error	5.1114
Skewness	-0.1173
Interquartile Range	42

Percentiles								
1%	5%	10%	25%	50%	75%	90%	95%	99%
-56	-55.1	-45.8	-28.75	-9.5	13.25	26.3	36.55	38.5

Data Plots





Tests for Beta
Summary of Statistical Tests
The following table summarizes the data analysis results and is comparable to MARSSIM Table 8.2. This analysis applies to the discrete sample results (see MARSSIM 8.2.5).

All Measurements < $DCGL_W$	Average > $DCGL_W$	Sign Test Result	Conclusion
Yes	No	N/A	**Survey Unit meets release criterion**

The test rejected the null hypothesis that the mean value at the site exceeds the threshold, so conclude the site is clean.

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
		Page #	Page 6 of 11

Attachment 1 - Survey Coversheet

Survey Number: SZ-2021-10-06-002 (Unit 5) Page 1 of 6

Survey Unit:/Area Unit 5; Class 2 Area; RP Office Area Date: _____

Brief Description: The following attachments were completed to perform Final Status Survey for the survey unit.

Attachments (NA block if not applicable for the survey):

- ☒ Attachment 2 Direct Scan Results
- ☒ Attachment 3 Fixed Point Measurement Datasheet
- ☒ Attachment 4 Removable Surface Contamination Results
- ☒ Attachment 5 Grid Survey Map
- ☐ Other: NA

Additional Information: (Discuss any additional information applicable to the survey unit)

HPT Name/Sign: Haider Hamza / Haider Hamza Date: 10-06-2021

HPT Name/Sign: Jihwan Yu Date: 10-06-2021

Reviewed By: Willie Harris Date: 10/28/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
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Attachment 2 – Direct Scan Survey Results

Survey Number SZ-2021-10-06-002 (Unit 5) Page __2__ of __6__

Non-Elevated Readings			
Grid or Pass	Beta (cpm)	Alpha (cpm)	3"x3" Gamma Walkover (cpm)
Floor Pass 1 (1 -29) Floor Cart	539	6	16593-20123
Floor Pass 2 (30-60) Floor Cart	547	10	17714-20234
Floor Pass 3 (61-93) Floor Cart	612	7	17550-20595
North Wall – 1	206	2	NA
NW -2	208	1	NA
West Wall – 1	227	1	NA
South Wall – 1	244	2	NA
South Wall – 2	224	2	NA
East Wall - 1	188	1	NA
Elevated Readings (Record one-minute count at the location of any elevated readings)			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Beta Background (CPM)	Gamma Background (cpm)	QC Checks SAT (Y/N)
3002	25020397	08-20-22	2	461	NA	Y
2221	335853	09-23-22	NA	NA	17K to 18K	Y
2360	319914	08-04-22	0.8	229	NA	Y

HPT Name/Sign: Haider Hamzah Date: 10-06-2021

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign Mike Hayes Date: 10/6/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
		Page #	Page 8 of 11

Attachment 3 – Fixed Point Measurement Data Sheet

Survey Number SZ-2021-10-06-002 (Unit 5) Page 3 of 6

Number	Grid Coordinates		Gross Alpha (cpm)	Gross Beta (cpm)	Beta Dose Rate (On-Contact) (OW-CW reading)	Gamma Dose Rate (µR/hr)	
	X	Y				On-Contact	1 Meter
1	23	12	3	367	0	8	8
2	38	12	3	362	0	8	8
3	56	12	3	415	0	8	8
4	74	12	4	394	0	8	8
5	29	27	2	375	0	7	7
6	47	27	2	379	0	7	7
7	65	27	2	439	0	8	8
8	2	42	2	338	0	8	8
9	20	42	4	332	0	7	7
10	38	42	1	470	0	7	7
11	56	42	4	481	0	8	8
12	74	42	0	521	0	8	8
13	92	42	5	434	0	8	8
14	11	57	3	410	0	8	8
15	29	57	2	453	0	8	8
16	47	57	2	508	0	9	9
17	65	57	4	489	0	9	9
18	82	57	1	425	0	9	9
19	23	72	3	415	0	8	8
20	38	72	3	414	0	8	8
21	56	72	1	449	0	8	8
22	74	72	1	471	0	10	10
23	29	87	3	413	0	9	9
24	47	87	3	479	0	10	10
25	65	87	3	457	0	9	9

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
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Attachment 3 – Fixed Point Measurements (Page 2)

Survey Number SZ-2021-10-06-002 (Unit 5) Page __4__ of __6__

Instruments:

Instrument	Serial Number	Cal Due Date	Background		QC Checks SAT (Y/N)
			Alpha	b/g	
2360	319914	08-04-2022	0.8	229	Y
2360	329121	02-24-2022	0.7	222	Y
RO20	12301	11/27/2021	NA	4.2	Y
M19	300696	03/31/2022	NA	11	Y

HPT Name/Sign: Haider Hamza Date: 10-06-2021

HPT Name/Sign: Jihuan Yu Date: 10-06-2021

Reviewer Name/Sign Willie Hayes Date: 10/6/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
		Page #	Page 10 of 11

Attachment 4 – 3030 Smear Results

Survey Number SZ-2021-10-06-002 (Unit 5) Page 5 of 6

Location No	Description	Alpha (DPM)	Beta (DPM)	Location No	Description	Alpha (DPM)	Beta (DPM)
1	Wall	MDA	MDA	21	Wall	MDA	MDA
2	Wall	MDA	MDA	22	Wall	MDA	MDA
3	Wall	MDA	MDA	23	Wall	MDA	MDA
4	Wall	MDA	MDA	24	Wall	MDA	MDA
5	Wall	MDA	MDA	25	Wall	MDA	MDA
6	Wall	MDA	MDA				
7	Wall	MDA	MDA				
8	Wall	MDA	MDA				
9	Wall	MDA	MDA				
10	Floor	MDA	MDA				
11	Floor	MDA	MDA				
12	Floor	MDA	MDA				
13	Wall	MDA	MDA				
14	Wall	MDA	MDA				
15	Floor	MDA	MDA				
16	Floor	MDA	MDA				
17	Floor	MDA	MDA				
18	Wall	MDA	MDA				
19	Wall	MDA	MDA				
20	Wall	MDA	MDA				

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Alpha MDA (DPM)	Beta Background (CPM)	Beta MDA (DPM)
Ludlum 3030	312329	01/05/2022	0.1	3.7	33.3	29.4

HPT Name/Sign: Jihwan Yu Date: 10-06-2021

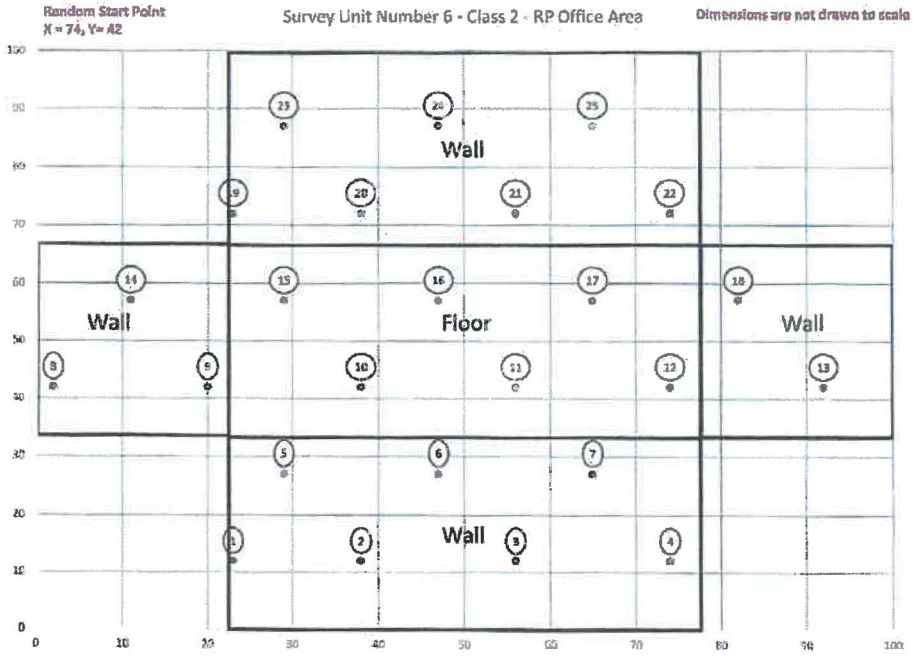
HPT Name/Sign: Donald Flahardy Date: 28 Oct 2021

Reviewer Name/Sign Mike Hynes Date: 10/16/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
		Page #	Page 11 of 11

Attachment 5 – Grid Survey Map

Survey Number SZ-2021-10-06-002 (Unit 5) Page __6__ of __6___



15.4.6 Survey Unit 6

Results/Conclusion

The survey unit PASSED

Survey Unit Description

Survey Unit SIX (6) was an exterior Class 2 survey unit. The survey unit comprised the area that was previously used as a RAM receipt and storage area. There was no history of spills or was uncontained RAM stored in the area. The approximate area of the grid was approximately 1840 total square feet for the floor and walls.

Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Table 22 summarizes the sampling design developed.

Table 22 - Survey Unit 6 Summary of Sampling Design

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location)in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Number of measurements with MARSSIM Overage with actual survey data	14
Number of measurements determined during pre-planning of survey [a]	23
Actual number of Measurements	36

Primary Sampling Objective

The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold.

Selected Sampling Approach

A nonparametric systematic sampling approach with a random start was used to determine the number of samples and to specify sampling locations.

Specific Survey Unit Design

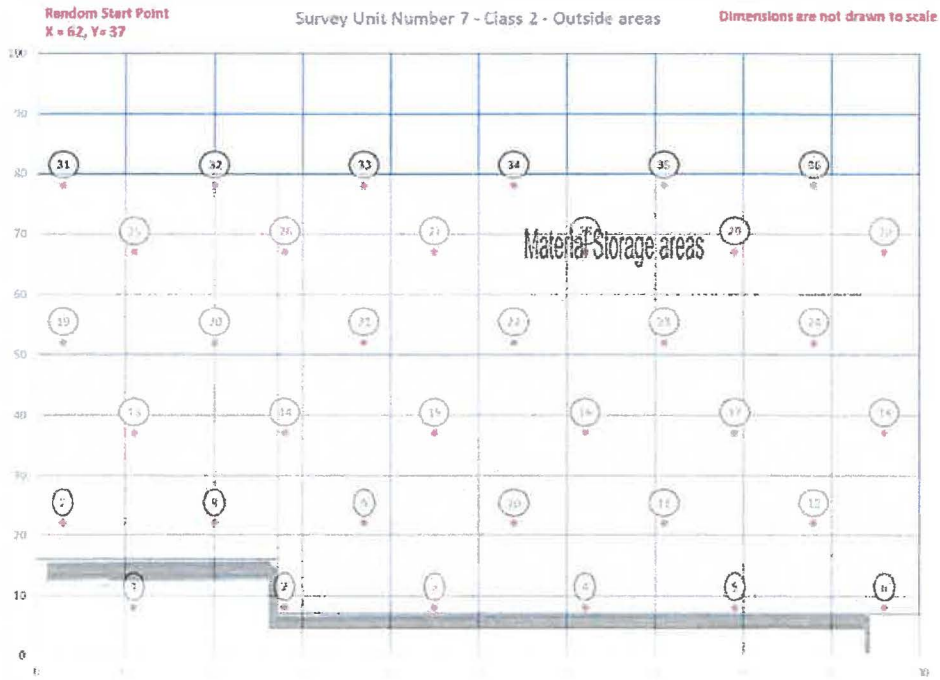
The survey design used a random grid starting point with the following specifications for the area:

- The minimum number of survey points was calculated at 23. The actual number of survey points was 36.
- The grid and spacing were standardized to a grid of approximately 100 by 100 to facilitate remote planning of the surveys.
- A triangle grid pattern for the fixed survey points was used as shown below. The random start point was X= 62, Y =37.
- Based on the standard grid, the calculated l=18 units and H= 14 units.

$$l = \sqrt[2]{\frac{area}{0.866n}} = \sqrt{\frac{6400}{0.866\ (21)}} = 15$$

$$h = 0.866\ l = 15$$

Figure 17 - Survey Unit 6 Grid Map



Survey Unit Results

Details of the results are below and documented in survey number SZ/10/06/003.

Direct Scan Results

Direct scans of the surfaces were performed with a 3"x3" NaI(Tl) detector. The scan survey did not identify any indications of radioactivity greater than the pre-determined thresholds for follow-up investigation. As a result, there were no biased samples obtained in the survey unit.

Unbiased Sample Results

There were 36 direct reading measurement points for the survey unit. Table 23 lists the measurement results, and these are summarized below:

- Total Alpha – there were 5 measurements that were greater than MDA. One isolated measurement exceeded the $DCGL_w$ value of 31 dpm/100 cm^2. Two samples of the asphalt were obtained for offsite analysis. The results from the analysis did not indicate any gamma emitting isotopes associated with the nuclear power plant isotopic mix. The results indicated several naturally occurring isotopes. As a result, the elevated alpha activity was attributed to naturally occurring radioactivity. The results, however, were analyzed as if these were true NPP alpha emitters. The survey unit still passed all statistical tests.
- Total Beta – there were 2 locations where the measurements were greater than MDA. These results were significantly less than the release criteria.
- There were no removable alpha or beta contamination detected in the survey unit.
- Beta and gamma radiation measurements were indistinguishable from background.

Table 23 - Survey Unit 6 Results

Sample Point	Total Alpha (DPM/100cm²)	Total Beta (DPM/100cm²)	Removable Alpha (DPM/100cm²)	Removable Beta (DPM/100cm²)	Beta mRad/hr	Gamma On contact	Gamma 1 meter
1	26	386	MDA	MDA	Non-Detect	Background	Background
2	MDA	331	MDA	MDA	Non-Detect	Background	Background
3	36	MDA	MDA	MDA	Non-Detect	Background	Background
4	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
5	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
6	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
7	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
8	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
9	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
10	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
11	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
12	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
13	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
14	MDA	MDA	MDA	MDA	Non-Detect	Background	Background

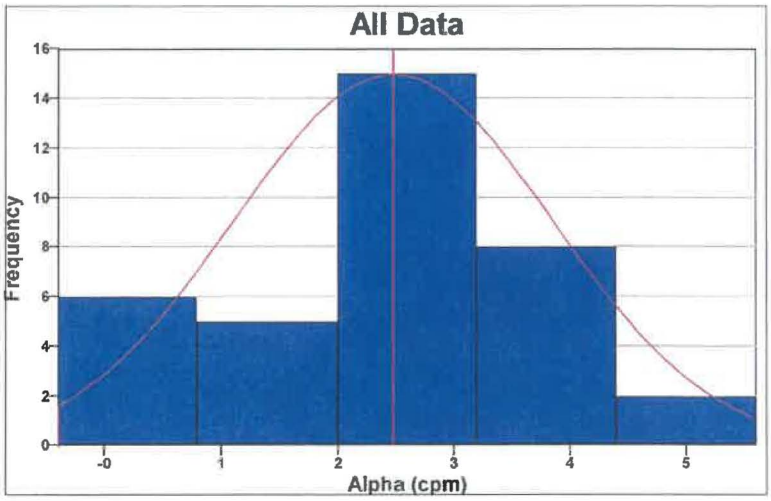
Sample Point	Total Alpha (DPM/100cm²)	Total Beta (DPM/100cm²)	Removable Alpha (DPM/100cm²)	Removable Beta (DPM/100cm²)	Beta mRad/hr	Gamma On contact	Gamma 1 meter
15	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
16	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
17	26	MDA	MDA	MDA	Non-Detect	Background	Background
18	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
19	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
20	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
21	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
22	26	MDA	MDA	MDA	Non-Detect	Background	Background
23	26	MDA	MDA	MDA	Non-Detect	Background	Background
24	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
25	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
26	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
27	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
28	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
29	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
30	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
31	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
32	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
33	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
334	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
35	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
36	MDA	MDA	MDA	MDA	Non-Detect	Background	Background

Data Analysis – Alpha

Alpha (cpm)										
Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
0	-0.4	0.6	0.6	0.6	0.6	0.6	1.1	1.1	1.1	1.6
10	1.6	2.1	2.1	2.1	2.1	2.1	2.6	2.6	2.6	2.6
20	2.6	3.1	3.1	3.1	3.1	3.1	3.6	3.6	3.6	3.6
30	4.1	4.1	4.1	4.1	4.6	5.6				

SUMMARY STATISTICS for Alpha	
n	36
Min	-0.4
Max	5.6
Range	6
Mean	2.475
Median	2.6
Variance	1.8768
StdDev	1.37
Std Error	0.22833
Skewness	-0.022613
Interquartile Range	2.375

Percentiles								
1%	5%	10%	25%	50%	75%	90%	95%	99%
-0.4	0.45	0.6	1.225	2.6	3.6	4.1	4.75	5.6



Tests for Alpha
Summary of Statistical Tests
The following table summarizes the data analysis results and is comparable to MARSSIM Table 8.2. This analysis applies to the discrete sample results (see MARSSIM 8.2.5).

All Measurements < $DCGL_W$	Average > $DCGL_W$	Sign Test Result	Conclusion
No	No	95% confident that the true mean Alpha is less than 5.2 cpm	Sign Test indicates Survey Unit meets release criterion

MARSSIM Sign Test

The Sign test was performed in accordance with the guidance given in section 8.3.2 of MARSSIM. Each measurement (X_i) was subtracted from the action level to obtain n differences: $d_i = AL - X_i$. Any differences of zero were discarded from consideration and the sample size was reduced accordingly. The test statistic S+ was calculated by counting the positive differences. S+ was then compared with the critical value k, which was obtained from Table I.3 in Appendix I of MARSSIM.

If $S+ > k$, then the null hypothesis is rejected.

MARSSIM SIGN TEST		
Test Statistic S+	**95% Critical Value**	**Null Hypothesis**
35	23	Reject

The test rejected the null hypothesis that the mean value at the site exceeds the threshold, so conclude the site is clean.

Data Analysis for Gross Beta

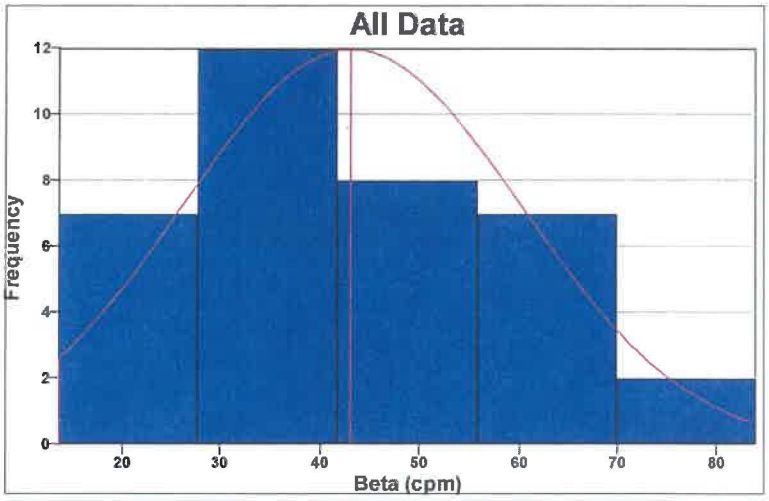
The following data points were entered by the user for analysis.

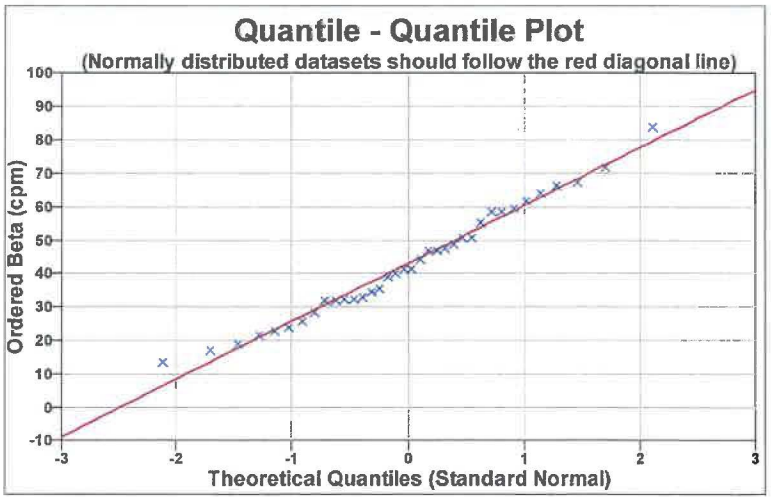
Beta (cpm)										
Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
0	13.5	17	19	21.5	23	24	26	28.5	32	32
10	32.5	32.5	33	34.5	35.5	39	40	41.5	41.5	44.5
20	47	47	47.5	49	51	51	55.5	58.5	58.5	59.5
30	62	64	66.5	67.5	72	84				

SUMMARY STATISTICS for Beta	
n	36
Min	13.5
Max	84
Range	70.5
Mean	43.097
Median	41.5
Variance	290.54
StdDev	17.045
Std Error	2.8409
Skewness	0.32108
Interquartile Range	25.75
Percentiles	

1%	5%	10%	50%	75%	90%	95%	99%
13.5	16.48	20.75	41.5	57.75	66.8	73.8	84

Data Plots





Tests for Beta
Summary of Statistical Tests
The following table summarizes the data analysis results and is comparable to MARSSIM Table 8.2. This analysis applies to the discrete sample results (see MARSSIM 8.2.5).

All Measurements < $DCGL_W$	Average > $DCGL_W$	Sign Test Result	Conclusion
Yes	No	N/A	**Survey Unit meets release criterion**

The test rejected the null hypothesis that the mean value at the site exceeds the threshold, so conclude the site is clean.

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
		Page #	Page 6 of 11

Attachment 1 - Survey Coversheet

Survey Number: SZ / 10 / 06 / 003 Page 1 of 6

Survey Unit:/Area **Unit 6; Class 2 Area; Outside Material Storage** Date: 10/6/2021

Brief Description: The following attachments were completed to perform Final Status Survey for the survey unit.

Attachments (NA block if not applicable for the survey):

- ☒ Attachment 2 Direct Scan Results
- ☒ Attachment 3 Fixed Point Measurement Datasheet
- ☒ Attachment 4 Removable Surface Contamination Results
- ☒ Attachment 5 Grid Survey Map
- ☐ Other: _____

Additional Information: (Discuss any additional information applicable to the survey unit)

HPT Name/Sign: Haider Hamza / Haider Hamza Date: 10-06-2021

HPT Name/Sign: Jihwan Yu Date: 10-06-2021

Reviewed By: Willie Harris Date: 10/28/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
		Implementation Date	9/30/2021
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Attachment 2 – Direct Scan Survey Results

Survey Number: SZ / 10 / 06 / 003 Page 2 of 6

Non-Elevated Readings			
Grid or Pass	Beta (cpm)	Alpha (cpm)	3"x3" Gamma Walkover (cpm)
Pass 1	NA	NA	10763-11495
Pass 2	NA	NA	10893 – 11763
Pass 3	NA	NA	10938 – 11653
Pass 4	NA	NA	12569 - 13317
Elevated Readings (Record one-minute count at the location of any elevated readings)			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Beta Background (CPM)	Gamma Background (cpm)	QC Checks SAT (Y/N)
Ludlum 2360 with 3"x3" Nal	335853	9/23/2022	NA	NA	11K to 13K	Y

HPT Name/Sign: Haider Hamza / Hh A Lm Date: 10-06-2021

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign Willie Hayes Date: 10/28/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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		Implementation Date	9/30/2021
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Attachment 3 – Fixed Point Measurement Data Sheet

Survey Number: SZ / 10 / 06 / 003 Page 3 of 6

Number	Grid Coordinates		Gross Alpha (Total Counts 2-minute count)	Gross Beta (Total Counts 2-minute count)	Beta Dose Rate (On-Contact) (OW-CW reading)	Gamma Dose Rate (μR/hr)	
	X	Y				On-Contact	1 Meter
1	11	8	13	612	0	6	6
2	28	8	10	588	0	6	6
3	45	8	16	568	0	6	6
4	62	8	9	577	0	6	6
5	79	8	6	522	0	6	6
6	96	8	10	561	0	6	6
7	3	22	11	563	0	5	5
8	20	22	6	509	0	5	5
9	37	22	11	579	0	5	5
10	54	22	12	501	0	5	5
11	71	22	8	561	0	5	5
12	88	22	6	546	0	5	5
13	11	37	12	513	0	5	5
14	28	37	11	524	0	5	5
15	45	37	6	533	0	5	5
16	62	37	7	482	0	5	5
17	79	37	13	538	0	5	5
18	96	37	10	509	0	5	5
19	3	52	9	527	0	5	5
20	20	52	11	478	0	5	5
21	37	52	8	555	0	5	5
22	54	52	13	508	0	5	5
23	71	52	13	508	0	5	5
24	88	52	6	539	0	5	5
25	11	67	10	527	0	5	5
26	28	67	9	487	0	5	5
27	45	67	7	546	0	5	5
28	62	67	10	492	0	5	5
29	79	67	9	510	0	5	5
30	96	67	9	496	0	5	5
31	3	78	11	572	0	5	5

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 3 – Fixed Point Measurements (Page 2)

Survey Number: SZ / 10 / 06 / 003 Page 4 of 6

Number	Grid Coordinates		Gross Alpha (Total Counts 2-minute count)	Gross Beta (Total Counts 2-minute count)	Beta Dose Rate (On-Contact) (OW-CW reading)	Gamma Dose Rate (µR/hr)	
	X	Y				On-Contact	1 Meter
32	20	78	4	490	0	4	4
33	37	78	12	515	0	4	4
34	54	78	7	471	0	4	4
35	71	78	14	542	0	4	4
36	88	78	12	538	0	5	5

Instruments:

Instrument	Serial Number	Cal Due Date	Background		QC Checks SAT (Y/N)
			Alpha (cpm)	b/g	
2360	329121	02/24/22	2.5	222 cpm	Y
2360	319914	08/04/22	2.5	229 cpm	Y
M19	300696	03/31/22	NA	11	Y
R020	12301	11/27/21	NA	4.2	Y

HPT Name/Sign: Haider Hamza / Haider Hamza Date: 10-06-2021

HPT Name/Sign: Jihwan Yu Date: 10-06-2021

Reviewer Name/Sign Wilk Hayes Date: 10/28/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 4 – 3030 Smear Results

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Location No	Description	Alpha (DPM)	Beta (DPM)	Location No	Description	Alpha (DPM)	Beta (DPM)
1	Asphalt	MDA	MDA	21	Asphalt	MDA	MDA
2	Asphalt	MDA	MDA	22	Asphalt	MDA	MDA
3	Asphalt	MDA	MDA	23	Asphalt	MDA	MDA
4	Asphalt	MDA	MDA	24	Asphalt	MDA	MDA
5	Asphalt	MDA	MDA	25	Asphalt	MDA	MDA
6	Asphalt	MDA	MDA	26	Asphalt	MDA	MDA
7	Asphalt	MDA	MDA	27	Asphalt	MDA	MDA
8	Asphalt	MDA	MDA	28	Asphalt	MDA	MDA
9	Asphalt	MDA	MDA	29	Asphalt	MDA	MDA
10	Asphalt	MDA	MDA	30	Asphalt	MDA	MDA
11	Asphalt	MDA	MDA	31	Asphalt	MDA	MDA
12	Asphalt	MDA	MDA	32	Asphalt	MDA	MDA
13	Asphalt	MDA	MDA	33	Asphalt	MDA	MDA
14	Asphalt	MDA	MDA	34	Asphalt	MDA	MDA
15	Asphalt	MDA	MDA	35	Asphalt	MDA	MDA
16	Asphalt	MDA	MDA	36	Asphalt	MDA	MDA
17	Asphalt	MDA	MDA				
18	Asphalt	MDA	MDA				
19	Asphalt	MDA	MDA				
20	Asphalt	MDA	MDA				

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Alpha MDA (DPM)	Beta Background (CPM)	Beta MDA (DPM)
Ludlum 3030	312329	01/05/22	0.1	3.7	35	29.9

HPT Name/Sign: Jihwan Yu Date: 10-06-2021

HPT Name/Sign: Donald Flahardy Date: 28 Oct 2021

Reviewer Name/Sign Date: 10/28/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 5 – Grid Survey Map

Survey Number: SZ / 10 / 06 / 003

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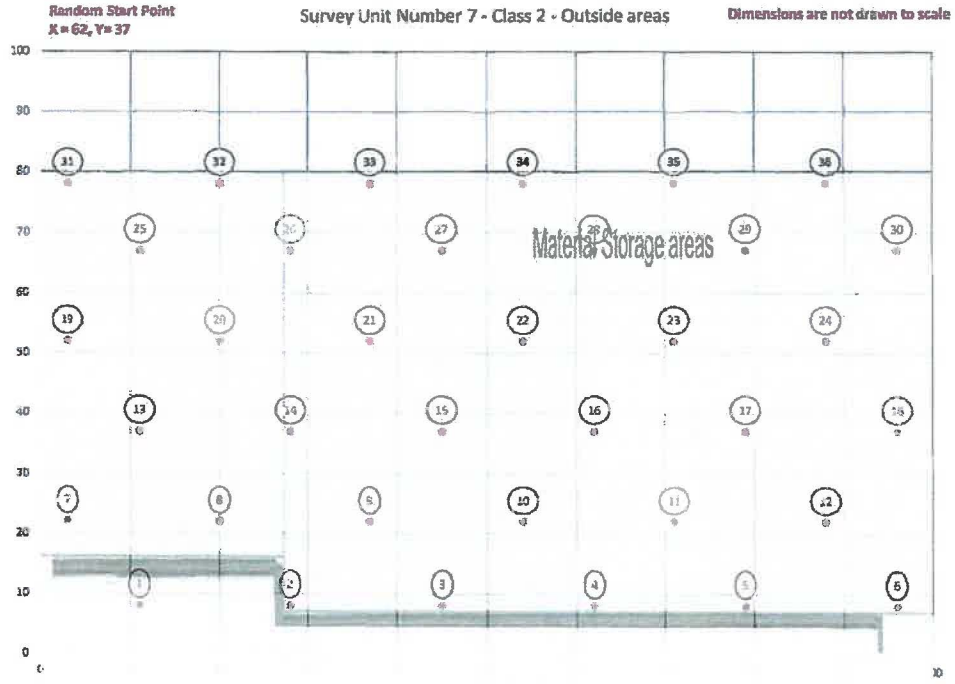

15.4.7 Survey Unit 7

Results/Conclusion

The survey unit PASSED

Survey Unit Description

Survey Unit Seven (7) was an interior judgmental survey unit that was developed to survey the room components that were remaining in the restricted area such as the electrical receptacles and the frame supports for the crane.

Specific Survey Unit Design

Table 24 is a summary of the Unit 7 Sampling Design.

Table 24 - Survey Unit 7 Summary of Sampling Design

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Obtain measurements at specific locations to ensure remaining room components were less than the release criteria
Type of Sampling Design	Judgment Sample Locations
Sample Placement (Location)in the Field	Judgement sample locations where higher potential for contamination was suspected
Number of measurements determined during pre-planning of survey [a]	23
Actual number of Measurements	35

Survey Unit Results

Details of the results are below and documented in survey number SZ/2021/10/07/001

Direct Scan Results

Direct scans of the surfaces did not identify any elevated areas of radioactivity above the pre-determined investigation threshold.

Judgmental/Biased Sample Results

There were 33 measurements obtained in the survey unit. Table 25 lists the results obtained which are summarized below. All the results were less than the release criteria. While all the results were below the release criteria, sample point 30 was decontaminated.

- Total Contamination – the pe-decontamination level at location number 30 was and the area was deconned to a total fixed contamination value of 2840 dpm/100 cm^2.
- Removeable contamination – area 30 was decontaminated from 315 to 34 dpm/100 cm^2

Table 25 - Survey Unit 7 Results

Sample Point	Total Alpha (DPM/100cm^2)	Total Beta (DPM/100cm^2)	Removable Alpha (DPM/100cm^2)	Removable Beta (DPM/100cm^2)	Beta mRad/hr	Gamma On contact	Gamma 1 meter
1	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
2	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
3	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
4	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
5	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
6	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
7	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
8	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
9	MDA	MDA	MDA	37	Non-Detect	Background	Background
10	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
11	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
12	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
13	26	MDA	MDA	53	Non-Detect	Background	Background
14	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
15	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
16	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
17	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
18	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
19	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
20	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
21	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
22	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
23	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
24	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
25	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
26	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
27	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
28	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
29	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
30	MDA	6227/2840	MDA	315/34	Non-Detect	Background	Background
31	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
32	MDA	MDA	MDA	MDA	Non-Detect	Background	Background
33	MDA	MDA	MDA	MDA	Non-Detect	Background	Background

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 1 - Survey Coversheet

Survey Number: SZ/2021/10/07/001 Page 1 of 8

Survey Unit:/Area Survey Unit 7: Miscellaneous Pipes and obstructions Date: 10/7/2021

Brief Description: The following attachments were completed to perform Final Status Survey for the survey unit.

Attachments (NA block if not applicable for the survey):

- ☒ Attachment 2 Direct Scan Results
- ☒ Attachment 3 Fixed Point Measurement Datasheet
- ☒ Attachment 4 Removable Surface Contamination Results
- ☒ Attachment 5 Grid Survey Map
- ☐ Other: NA

Additional Information: (Discuss any additional information applicable to the survey unit)
Attachment 2 – the Grid or Pass number refers to the picture/item number of the equipment. During the survey 100% of the accessible surface area was scanned. The highest observed reading in the beta and alpha responses were recorded.

Attachments 3 and 4 – Fixed points are smear locations are indicated on the pictures with the corresponding number from the attachment.

HPT Name/Sign: Haider Hamza / [signature] Date: 10.07.2021

HPT Name/Sign: _____ Date: _____

Reviewed By: Willie Harris [signature] Date: 11/8/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 2 – Direct Scan Survey Results

Survey Number: SZ/2021/10/07/001 Page 2 of 8

Non-Elevated Readings			
Grid or Pass	Beta (cpm)	Alpha (cpm)	3"x3" Gamma Walkover (cpm)
ME-1	196	2	NA
ME-2	203	1	NA
ME-3	186	1	NA
ME-4	214	3	NA
ME-5	185	3	NA
ME-6	210	3	NA
ME-7	201	2	NA
Elevated Readings (Record one-minute count at the location of any elevated readings)			
None			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Beta Background (CPM)	Gamma Background (cpm)	QC Checks SAT (Y/N)
2360	329121	02/24/22	0.9	227	NA	Y
2360	319914	08/04/22	1.5	234	NA	Y

HPT Name/Sign: Haider Hamzat Date: 10-07-2021

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign Mike Hess Date: 10/8/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 3 – Fixed Point Measurement Data Sheet

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Number	Grid Coordinates		Gross Alpha (Total Counts; 2 minute count time)	Gross Beta (Total Counts; 2 minute count time)	Beta Dose Rate (On-Contact) (OW-CW reading)	Gamma Dose Rate (µR/hr)	
	X	Y				On-Contact	1 Meter
1	NA	NA	5	521	0	6	6
2	NA	NA	0	444	0	7	7
3	NA	NA	4	420	0	8	8
4	NA	NA	1	486	0	7	7
5	NA	NA	6	327	0	7	7
6	NA	NA	6	337	0	7	7
7	NA	NA	3	316	0	5	5
8	NA	NA	2	293	0	6	6
9	NA	NA	3	391	0	7	7
10	NA	NA	2	317	0	6	6
11	NA	NA	4	287	0	5	5
12	NA	NA	1	243	0	4	4
13	NA	NA	9	509	0	4	4
14	NA	NA	3	475	0	4	4
15	NA	NA	2	422	0	4	4
16	NA	NA	3	369	0	4	4
17	NA	NA	1	320	0	4	4
18	NA	NA	5	305	0	4	4
19	NA	NA	2	273	0	4	4
20	NA	NA	1	286	0	5	5
21	NA	NA	0	377	0	5	5
22	NA	NA	5	308	0	4	4
23	NA	NA	1	280	0	4	4
24	NA	NA	3	295	0	4	4
25	NA	NA	3	299	0	4	4
26	NA	NA	2	364	0	6	6
27	NA	NA	4	334	0	5	5
28	NA	NA	8	294	0	5	5
29	NA	NA	4	408	0	5	5
30	NA	NA	12	2985	0	7	7
31	NA	NA	3	482	0	5	5
32	NA	NA	4	480	0	5	5
33	NA	NA	6	416	0	4	4

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Attachment 3 – Fixed Point Measurements (Page 2)

Survey Number: SZ/2021/10/07/001 Page 4 of 8

Instruments:

Instrument	Serial Number	Cal Due Date	Background		QC Checks
			Alpha	Beta/gamma	SAT (Y/N)
2360	329121	02/24/22	0.9	227	Y
2360	319914	08/04/22	1.5	234	Y
RO20	12301	11/27/2021	NA	1.5 mR/hr	Y
M19	300696	03/31/2022	NA	6 µR/hr	Y

HPT Name/Sign: Haider Hamza / Haider Hamza Date: 10-07-2021

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign Mike Hess Date: 11/8/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 4 – 3030 Smear Results

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Location No	Description	Alpha (DPM)	Beta (DPM)	Location No	Description	Alpha (DPM)	Beta (DPM)
1	See Picture	MDA	MDA	21	See Picture	MDA	MDA
2	See Picture	MDA	MDA	22	See Picture	MDA	MDA
3	See Picture	MDA	MDA	23	See Picture	MDA	MDA
4	See Picture	MDA	MDA	24	See Picture	MDA	MDA
5	See Picture	MDA	MDA	25	See Picture	MDA	MDA
6	See Picture	MDA	MDA	26	See Picture	MDA	MDA
7	See Picture	MDA	MDA	27	See Picture	MDA	MDA
8	See Picture	MDA	MDA	28	See Picture	MDA	MDA
9	See Picture	MDA	37	29	See Picture	MDA	MDA
10	See Picture	MDA	MDA	30	See Picture	MDA	315
11	See Picture	MDA	MDA	31	See Picture	MDA	MDA
12	See Picture	MDA	MDA	32	See Picture	MDA	MDA
13	See Picture	MDA	53	33	See Picture	MDA	MDA
14	See Picture	MDA	MDA	34	Post Decon Smear 30	MDA	34
15	See Picture	MDA	MDA	35			
16	See Picture	MDA	MDA	36			
17	See Picture	MDA	MDA	37			
18	See Picture	MDA	MDA	38			
19	See Picture	MDA	MDA	39			
20	See Picture	MDA	MDA	40			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Alpha MDA (DPM)	Beta Background (CPM)	Beta MDA (DPM)
Ludlum 3030	312329	01/05/22	0.1	3.7	35	29.9

HPT Name/Sign: Donald Flahardy Date: 7Nov2021

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign _____ Date: 11/8/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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Attachment 5 – Grid Survey Map

Survey Number: SZ/2021/10/07/001

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Figure 1 - Equipment ID MIS-1

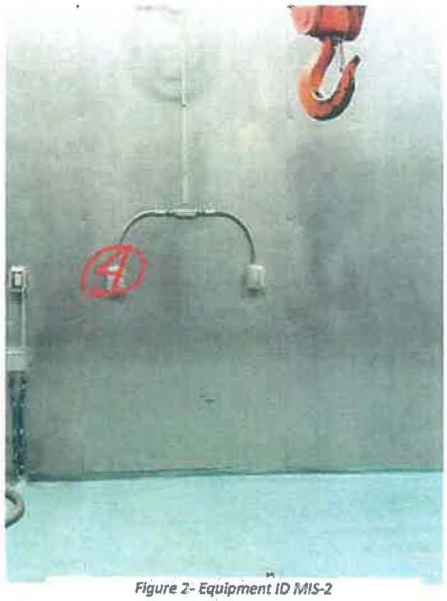

Figure 2- Equipment ID MIS-2

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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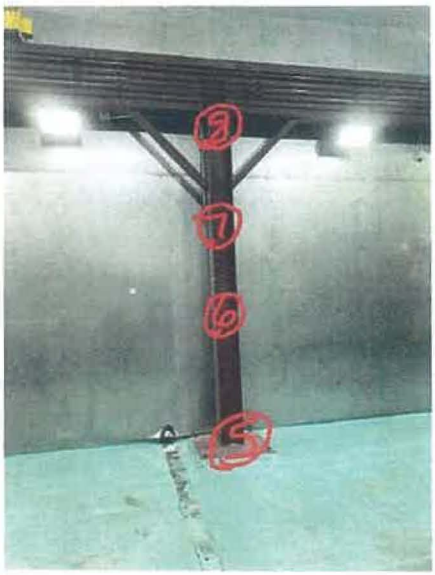

Figure 3 - Equipment ID MIS-3

Figure 4 - Equipment ID - MIS - 4

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Figure 5 - Equipment ID MIS-5

Figure 6 - Equipment ID MIS-6

15.4.8 Survey Unit 8

Results/Conclusion

The survey unit PASSED.

Survey Unit Description

Survey Unit EIGHT (8) was an interior Class 2 Survey Unit. The survey was a judgment survey unit developed to confirm previous surveys to release for unrestricted use the remaining equipment and HVAC plenum in the previous Restricted area.

Specific Survey Unit Design

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Obtain measurements at specific locations to ensure remaining room components were less than the release criteria
Type of Sampling Design	Judgment Sample Locations
Sample Placement (Location) in the Field	Judgement sample locations where higher potential for contamination was suspected
Number of measurements determined during pre-planning of survey [a]	23
Actual number of Measurements	23

Survey Unit Results

Details of the results are below and documented in survey number SZ/2021/10/07/002.

Direct Scan Results

Direct scans of the equipment and large area wipes were performed in all accessible areas of the equipment depicted in the actual survey maps. There were no indications that were discernible from background or above the threshold level.

Biased/Judgment Sample Results

There were 23 direct reading sample points taken. Table 26 lists the results and are summarized below:

- Alpha: There were no total alpha or removable alpha contamination greater than MDA
- Beta: There were no indications of total beta or removable beta contamination greater than MDA.
- Beta/Gamma Radiation: All readings were non-distinguishable from background

Table 26 - Survey Unit 8 Results

Sample Point	Total Alpha (DPM/100cm²)	Total Beta (DPM/100cm²)	Removable Alpha (DPM/100cm²)	Removable Beta (DPM/100cm²)	Beta mRad/hr	Gamma On contact	Gamma 1 meter
1	MDA	MDA	MDA	MDA	ND	Background	Background
2	MDA	MDA	MDA	MDA	ND	Background	Background
3	MDA	MDA	MDA	MDA	ND	Background	Background
4	MDA	MDA	MDA	MDA	ND	Background	Background
5	MDA	MDA	MDA	MDA	ND	Background	Background
6	MDA	MDA	MDA	MDA	ND	Background	Background
7	MDA	MDA	MDA	MDA	ND	Background	Background
8	MDA	MDA	MDA	MDA	ND	Background	Background
9	MDA	MDA	MDA	MDA	ND	Background	Background
10	MDA	MDA	MDA	MDA	ND	Background	Background
11	MDA	MDA	MDA	MDA	ND	Background	Background
12	MDA	MDA	MDA	MDA	ND	Background	Background
13	MDA	MDA	MDA	MDA	ND	Background	Background
14	MDA	MDA	MDA	MDA	ND	Background	Background
15	MDA	MDA	MDA	MDA	ND	Background	Background
16	MDA	MDA	MDA	MDA	ND	Background	Background
17	MDA	MDA	MDA	MDA	ND	Background	Background
18	MDA	MDA	MDA	MDA	ND	Background	Background
19	MDA	MDA	MDA	MDA	ND	Background	Background
20	MDA	MDA	MDA	MDA	ND	Background	Background
21	MDA	MDA	MDA	MDA	ND	Background	Background
22	MDA	MDA	MDA	MDA	ND	Background	Background
23	MDA	MDA	MDA	MDA	ND	Background	Background

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 1 - Survey Coversheet

Survey Number: SZ/2021/10/07/002 Page 1 of 8

Survey Unit:/Area Survey Unit 8, Miscellaneous Equipment/ Ventilation Date: Oct 7, 2021

Brief Description: The following attachments were completed to perform Final Status Survey for the survey unit.

Attachments (NA block if not applicable for the survey):

- ☒ Attachment 2 Direct Scan Results
- ☒ Attachment 3 Fixed Point Measurement Datasheet
- ☒ Attachment 4 Removable Surface Contamination Results
- ☒ Attachment 5 Grid Survey Map
- ☐ Other: NA

Additional Information: (Discuss any additional information applicable to the survey unit)

1. Large Area Wipe Surveys (LAWs) were performed on each item depicted in the photographs and all were non-discernable from background.
2. Attachment 2 – the grid or pass refers to the equipment; 100% of accessible areas were scanned, maximum readings observed during the scan are recorded.

HPT Name/Sign: Haider Hamza / [signature] Date: 10-07-2021

HPT Name/Sign: _____ Date: _____

Reviewed By: [signature] Date: 11/8/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 2 – Direct Scan Survey Results

Survey Number: SZ/2021/10/07/002 Page 2 of 8

Non-Elevated Readings			
Grid or Pass	Beta (cpm)	Alpha (cpm)	3"x3" Gamma Walkover (cpm)
Hoist 209586	287	4	NA
Crane 209586	175	2	NA
Hoist 209686	210	2	NA
Crane 209686	177	1	NA
Supply Vent	236	1	NA
Exhaust Vent	225	1	NA
Elevated Readings (Record one-minute count at the location of any elevated readings)			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Beta Background (CPM)	Gamma Background (cpm)	QC Checks SAT (Y/N)
2360	329121	02/24/22	0.9	227	NA	Y
2360	319914	08/04/22	1.5	234	NA	Y

HPT Name/Sign: Haider Hamzal Haider Hamza Date: 10-07-2021

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign Mike Haas Mike Haas Date: 11/8/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr.	Revision #	0
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Attachment 3 – Fixed Point Measurement Data Sheet

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Number	Grid Coordinates		Gross Alpha (Total Counts for two-minute count time)	Gross Beta (Total Counts for two-minute count time)	Beta Dose Rate (On-Contact) (OW-CW reading)	Gamma Dose Rate (μR/hr)	
	X	Y				On-Contact	1 Meter
1	NA	NA	5	305	0	4	4
2	NA	NA	3	399	0	4	4
3	NA	NA	2	286	0	4	4
4	NA	NA	3	378	0	4	4
5	NA	NA	2	336	0	4	4
6	NA	NA	3	356	0	4	4
7	NA	NA	0	326	0	4	4
8	NA	NA	1	352	0	4	4
9	NA	NA	0	310	0	4	4
10	NA	NA	1	340	0	4	4
11	NA	NA	0	322	0	4	4
12	NA	NA	2	332	0	4	4
13	NA	NA	1	340	0	4	4
14	NA	NA	0	396	0	4	4
15	NA	NA	1	376	0	4	4
16	NA	NA	2	364	0	4	4
17	NA	NA	1	400	0	4	4
18	NA	NA	2	488	0	4	4
19	NA	NA	2	508	0	4	4
20	NA	NA	4	270	0	4	4
21	NA	NA	1	466	0	4	4
22	NA	NA	1	448	0	4	4
23	NA	NA	0	392	0	4	4
24							
25							
26							
27							

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 3 – Fixed Point Measurements (Page 2)

Survey Number: SZ/2021/10/07/002 Page 4 of 8

Instruments:

Instrument	Serial Number	Cal Due Date	Background		QC Checks SAT (Y/N)
			alpha	Beta/gamma	
2360	329121	02/24/22	0.9	227	Y
2360	319914	08/04/22	1.5	234	Y
RO20	12301	11/27/21	NA	0.1 mR/hr	Y
M19	300696	03/31/22	NA	6 µR/hr	Y

HPT Name/Sign: Haider Hamzal Date: 10-07-2021

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign Mike Hess Date: 11/8/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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Attachment 4 – 3030 Smear Results

Survey Number: SZ/2021/10/07/002 Page 5 of 8

Location No	Description	Alpha (DPM)	Beta (DPM)	Location No	Description	Alpha (DPM)	Beta (DPM)
1	See Picture	MDA	MDA	21	See Picture	MDA	MDA
2	See Picture	MDA	MDA	22	See Picture	MDA	MDA
3	See Picture	MDA	MDA	23	See Picture	MDA	MDA
4	See Picture	MDA	MDA	24			
5	See Picture	MDA	MDA	25			
6	See Picture	MDA	MDA	26			
7	See Picture	MDA	MDA	27			
8	See Picture	MDA	MDA	28			
9	See Picture	MDA	MDA	29			
10	See Picture	MDA	MDA	30			
11	See Picture	MDA	MDA	31			
12	See Picture	MDA	MDA	32			
13	See Picture	MDA	MDA	33			
14	See Picture	MDA	MDA	34			
15	See Picture	MDA	MDA	35			
16	See Picture	MDA	MDA	36			
17	See Picture	MDA	MDA	37			
18	See Picture	MDA	MDA	38			
19	See Picture	MDA	MDA	39			
20	See Picture	MDA	MDA	40			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Alpha MDA (DPM)	Beta Background (CPM)	Beta MDA (DPM)
Ludlum 3030	312329	01/05/22	0.1	3.7	35	29.9

HPT Name/Sign: Donald Flahardy Date: 7Nov2021

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign Willie Harris Date: 11/8/2021

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 5 – Grid Survey Map

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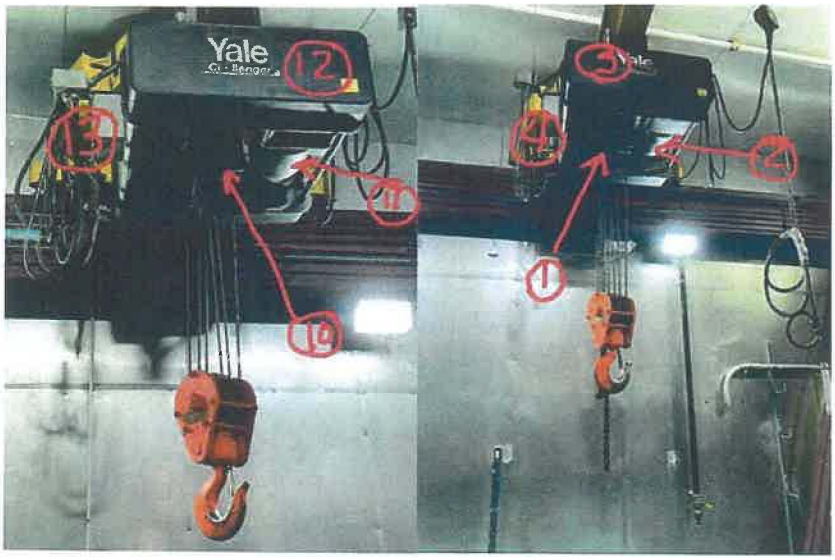

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Note: Smears obtained under plastic wrap on the plenum

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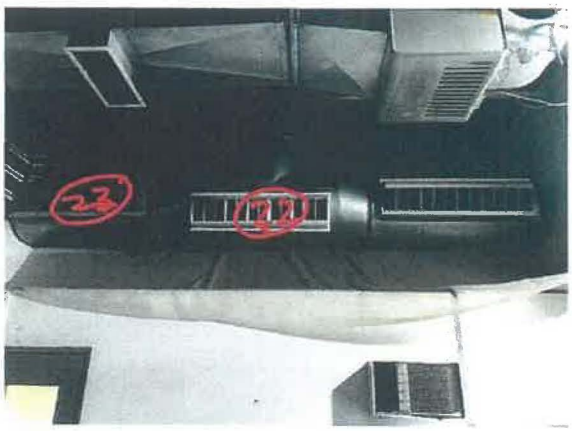

15.5 Survey Procedure

Schulz Electric Final Status Survey Procedure

CN ASSOCIATES	Location	SOP#	CN-RP-SE-001
	Schulz Electric 30 Gando Dr	Revision #	0
		Implementation Date	9/30/2021
		Reviewed By:	Don Flahardy/ *Don Flahardy*
			Print Name/Signature/Date
Page	Page 1 of 11	Approved by	Willie Harris/ 9/30/21
Owner	Harris		Print Name/Signature/Date

Revision History

Revision Number	Date	Summary of Revisions
0		Initial Revision

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
	Location	SOP#	CN-RP-SE-001
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1. **Purpose**
   1.1. Conduct the Final Status Survey (FSS) at the Timken/Schulz Electric facility located at 30 Gando Drive in New Haven Connecticut.

2. **Scope**
   2.1. This document applies to FSS specific to this location. The following surveys will be conducted:
      2.1.1. Fixed Point/Static Surveys
      2.1.2. Scan Surveys.
   2.2. The survey will be designed using the guidelines include in NUREG 1575, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)

3. **Precautions and Limitations**
   3.1. Follow the applicable precautions and limitations of the associated instrument operating procedures.

4. **Prerequisites**
   4.1. Applicable instrumentation is available, within the required calibration frequency, and has satisfactorily passed a daily source check.
   4.2. The area/Survey units have been classified in accordance with MARSSIM Rev 1 and the Historical Site Assessment

5. **Responsibilities**
   5.1. C.N. Management/Supervision
      5.1.1. Direct the performance of the surveys to be conducted in a specific area/survey unit.
      5.1.2. Resolve any issues that arise during the performance of the surveys in a specific unit and any changes are documented on the survey coversheet (Attachment 1).
      5.1.3. Review and analyze the survey unit results and determine if additional actions to remediation is required
   5.2. Survey Tech(s):
      5.2.1. Performance of the FSSs
      5.2.2. Documentation of the results of the FSS in accordance with Section 7.0.

6. **Procedure**

   6.1. General Requirements

      6.1.1. **DETERMINE** the required surveys based upon the survey unit and area classification.
      6.1.2. **OBTAIN** the survey grid map for the area.
      6.1.3. **CONDUCT** a pre-job as appropriate for the survey to be performed.
      6.1.4. **OBTAIN** the required instruments to conduct the fixed point or scan survey per CN Management directions.

6.1.4.1. **PERFORM and DOCUMENT** QC checks of the instruments (i.e., check battery, calibration, etc.) in accordance with instrument operating procedures or Technical Manual **PRIOR to use.**

6.1.4.2. **PERFORM and DOCUMENT** QC checks of the instruments (i.e., check battery, calibration, etc.) in accordance with instrument operating procedures or Technical Manual at **the end of the day.**

6.2. Conduct of Scan Surveys

6.2.1. **CONDUCT** surface scans using either handheld alpha/beta scintillators or large area counters with a dual window alpha/beta ratemeter (i.e., floor carts). Scan coverage shall be as determined by CN Management based upon the Final Status Survey Plan/Report.

6.2.2. **PERFORM** all scans keeping the scan probe at approximately 0.5 inches (1 cm) from the surface and moving at a rate of:

6.2.2.1. No more than 1 detector width per second or approximately 3" per second for handheld probes such as the Ludlum 43-93 or Ludlum 43-89 or a rate determined by CN management based upon background radiation and the MDA for the instrument.

6.2.2.2. No more than two detector widths per second or 6" per second for the large area counters (floor cart) or a rate determined by CN management based upon background radiation and the MDA for the instrument.

6.2.3. **MARK** the location with chalk and **RECORD** on Attachment 2 the location of any small area of elevated activity (if found) that exceeds two times the established background value. At each of these locations:

6.2.3.1. **ANNOTATE** on the grid map the location of the elevated activity

6.2.3.2. **RECORD** the location and activity on Attachment 2.

6.2.3.3. **INCLUDE** this location as a biased sample point and conduct the additional surveys specified in Section 6.3

6.2.4. **IF NO** areas are found that exceed the threshold values in step 6.3 in a specific grid, **THEN**

6.2.4.1. **ANNOTATE** the pass number on the Grid survey may

6.2.4.2. **RECORD** the grid numbers and pass number on Attachment 2 and the highest alpha and beta cpm observed in that specific grid.

6.2.5. **PERFORM** a gamma walkover survey with the 3"x3" NaI(Tl) as directed by CN management. Record Results on Attachment 2.

6.2.6. **REVIEW** initial survey results with CN management.

6.3. Conduct of Fixed-Point Surveys.

6.3.1. **ENSURE** that the most recent grid survey with sample points identified has been obtained.

6.3.2. **MEASURE** and **RECORD** the following gamma dose rates

6.3.2.1. At approximately 1 cm (0.5 inches) from the surface, and

6.3.2.2. at approximately 1 meter (40 inches or 3.3 feet) from the surface at each sample location

6.3.2.3. Record on the attached survey form, Attachment 3.

6.3.3. **MEASURE** and **RECORD** the beta dose rates
6.3.3.1. At approximately 1 cm (0.5 inches) from the surface
6.3.3.2. Obtain an OPEN window (OW) reading and a CLOSED window (CW) reading

NOTE

Based on background, CN management may specify other count times to ensure that the required MDA values are obtained to meet the associated release criteria.

6.3.3.3. Record the OW-CW reading on Attachment 3

6.3.4. **PERFORM** a 2-minute alpha-beta measurement at each location
6.3.4.1. On contact with the surface
6.3.4.2. Record the counts per minute (CPM) in both the alpha and beta channel in each two-minute measurement interval on Attachment 3.
6.3.5. **PERFORM** a loose surface contamination smear survey over 100 cm^2
6.3.5.1. **COUNT** the smears with the Ludlum 3030.
6.3.5.2. **RECORD** alpha and beta contamination results in DPM on Attachment 4 or equivalent.
6.3.5.3. **RETAIN** smears as directed for offsite analysis.
6.3.6. **REVIEW** initial survey results with CN management
6.3.7. **OBTAIN** samples of asphalt, concrete, and soil as directed by CN management and the survey unit sampling plan.
6.3.7.1. OBTAIN a sample at any location identified greater than 2 times background on asphalt, soil, or concrete
6.3.7.2. OBTAIN samples as directed and prepare for offsite analysis.
6.3.7.3. **ANNOTATE** sample locations on appropriate attachment to the procedure

7. Documentation

7.1. . COMPLETE the following attachments for each survey unit:
7.1.1. Attachment 1 – Survey Unit Coversheet
7.1.2. Attachment 2 – Direct Scan Survey Results
7.1.3. Attachment 3 – Fixed Point Survey Results
7.1.4. Attachment 4 – 3030 Smear Results
7.1.5. Annotated Grid Map for the Survey Unit
7.2. FORWARD all documentation to CN management for review and data analysis

8. References

8.1. CN-RP-010 Radiological Surveys
8.2. CN Associates Radiation Safety Program and Manual
8.3. NUREG 1575, Rev 1 Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)

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9. Definitions

9.1. None

10. Attachments

10.1. Attachment 1 – Survey Coversheet
10.2. Attachment 2 – Direct Scan Results
10.3. Attachment 3 – Fixed Point Measurement Datasheet
10.4. Attachment 4 – Removable Surface Contamination Results
10.5. Attachment 5 – Grid Map

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Attachment 1 - Survey Coversheet

Survey Number: ____ / ___ / ___ / ____ Page ___ of ___

Survey Unit:/Area _____ Date: _____

Brief Description: The following attachments were completed to perform Final Status Survey for the survey unit.

Attachments (NA block if not applicable for the survey):

☐ Attachment 2 Direct Scan Results

☐ Attachment 3 Fixed Point Measurement Datasheet

☐ Attachment 4 Removable Surface Contamination Results

☐ Attachment 5 Grid Survey Map

☐ Other: _____

Additional Information: (Discuss any additional information applicable to the survey unit)

HPT Name/Sign: _____ Date: _____

HPT Name/Sign: _____ Date: _____

Reviewed By: _____ Date: _____

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Attachment 2 – Direct Scan Survey Results

Survey Number ____/____/____/____ Page ____ of ____

Non-Elevated Readings			
Grid or Pass	Beta (cpm)	Alpha (cpm)	3"x3" Gamma Walkover (cpm)
Elevated Readings (Record one-minute count at the location of any elevated readings)			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Beta Background (CPM)	Gamma Background (cpm)	QC Checks SAT (Y/N)

HPT Name/Sign: _____ Date: _____

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign _____ Date: _____

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 3 – Fixed Point Measurement Data Sheet

Survey Number ____/____/____/____ Page ____of____

Number	Grid Coordinates		Gross Alpha (cpm)	Gross Beta (cpm)	Beta Dose Rate (On-Contact) (OW-CW reading)	Gamma Dose Rate (μR/hr)	
	X	Y				On-Contact	1 Meter
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
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23							
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26							
27							

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 3 – Fixed Point Measurements (Page 2)

Survey Number ____/____/____/____ Page ____ of ____

Instruments:

Instrument	Serial Number	Cal Due Date	Background	QC Checks SAT (Y/N)

HPT Name/Sign: _____ Date: _____

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign _____ Date: _____

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 4 – 3030 Smear Results

Survey Number ____/____/____/____ Page ____ of ____

Location No	Description	Alpha (DPM)	Beta (DPM)	Location No	Description	Alpha (DPM)	Beta (DPM)
1				21			
2				22			
3				23			
4				24			
5				25			
6				26			
7				27			
8				28			
9				29			
10				30			
11				31			
12				32			
13				33			
14				34			
15				35			
16				36			
17				37			
18				38			
19				39			
20				40			

Instrument	Serial Number	Cal Due Date	Alpha Background (CPM)	Alpha MDA (DPM)	Beta Background (CPM)	Beta MDA (DPM)

HPT Name/Sign: _____ Date: _____

HPT Name/Sign: _____ Date: _____

Reviewer Name/Sign _____ Date: _____

CN ASSOCIATES	Title	Schulz Electric Final Status Survey Procedure	
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Attachment 5 – Grid Survey Map

Survey Number ____/____/____/____ Page ____ of ____

Note: A survey/grid map of the individual areas will be included for each survey unit/area

GEL Laboratories LLC
a member of The GEL Group INC

gel.com

November 10, 2021

Mr. Ron Cardarelli
CN Associates, Inc.
PO Box 1446
18 Pine Street
Manchester, Massachusetts 01944

Re: Schulz Electric
Work Order: 559247

Dear Mr. Cardarelli:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on October 18, 2021. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4422.

Sincerely,

Jake Crook
Project Manager

Purchase Order: GELP20-0963R1
Enclosures

problem solved

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

Certificate of Analysis Report
for

CNAS001 CN Associates, Inc.

Client SDG: 559247 GEL Work Order: 559247

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria
** Analyte is a Tracer compound
** Analyte is a surrogate compound
U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
UI Gamma Spectroscopy—Uncertain identification

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Jake Crook.

Reviewed by Jake W Crook

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company: CN Associates, Inc.
Address: PO Box 1446
18 Pine Street
Manchester, Massachusetts 01944
Report Date: November 10, 2021
Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: AS-1
Sample ID: 559247001
Matrix: Solid
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client
Moisture: 1.89%

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"														
Actinium-228	U	0.392	+/-0.176	0.426	+/-0.252		pCi/g			MXR1	11/10/21	0553	2187275	1
Americium-241	U	0.186	+/-0.167	0.231	+/-0.168	2.10	pCi/g							
Antimony-124	U	0.0206	+/-0.0405	0.152	+/-0.0416		pCi/g							
Antimony-125	U	0.0215	+/-0.0638	0.136	+/-0.0645		pCi/g							
Barium-133	U	-0.00222	+/-0.0372	0.0655	+/-0.0372		pCi/g							
Barium-140	U	0.118	+/-0.557	1.17	+/-0.559		pCi/g							
Beryllium-7	U	0.285	+/-0.335	0.748	+/-0.359		pCi/g							
Bismuth-212	U	-0.235	+/-0.406	0.689	+/-0.420		pCi/g							
Bismuth-214		0.245	+/-0.107	0.112	+/-0.110		pCi/g							
Cerium-139	U	-0.000217	+/-0.0258	0.0475	+/-0.0258		pCi/g							
Cerium-141	U	0.00488	+/-0.0641	0.122	+/-0.0642		pCi/g							
Cerium-144	U	-0.00559	+/-0.133	0.251	+/-0.133		pCi/g							
Cesium-134	U	0.0154	+/-0.0366	0.0746	+/-0.0373		pCi/g							
Cesium-136	U	0.0898	+/-0.234	0.532	+/-0.238		pCi/g							
Cesium-137	U	0.0341	+/-0.0479	0.0505	+/-0.0479	0.100	pCi/g							
Chromium-51	U	-0.0854	+/-0.448	0.875	+/-0.450		pCi/g							
Cobalt-56	U	-0.0219	+/-0.0343	0.0626	+/-0.0357		pCi/g							
Cobalt-57	U	-0.00816	+/-0.0187	0.0335	+/-0.0190		pCi/g							
Cobalt-58	U	0.00951	+/-0.0354	0.0789	+/-0.0357		pCi/g							
Cobalt-60	U	0.00834	+/-0.0306	0.0708	+/-0.0309		pCi/g							
Europium-152	U	0.0203	+/-0.0699	0.146	+/-0.0705		pCi/g							
Europium-154	U	-0.0206	+/-0.0996	0.197	+/-0.100		pCi/g							
Europium-155	U	0.00877	+/-0.0697	0.136	+/-0.0698		pCi/g							
Iridium-192	U	-0.00106	+/-0.0293	0.0589	+/-0.0293		pCi/g							
Iron-59	U	-0.0390	+/-0.100	0.160	+/-0.102		pCi/g							
Lead-210	U	-0.734	+/-3.41	6.58	+/-3.43		pCi/g							
Lead-212		0.276	+/-0.121	0.0898	+/-0.123		pCi/g							
Lead-214		0.306	+/-0.114	0.102	+/-0.117		pCi/g							
Manganese-54	U	0.00306	+/-0.0285	0.0613	+/-0.0285		pCi/g							
Mercury-203	U	0.00463	+/-0.0404	0.0813	+/-0.0404		pCi/g							
Neodymium-147	U	-0.412	+/-1.39	2.62	+/-1.40		pCi/g							
Neptunium-239	U	-0.217	+/-0.176	0.280	+/-0.202		pCi/g							
Niobium-94	U	0.0266	+/-0.0316	0.0687	+/-0.0338		pCi/g							
Niobium-95	U	0.0184	+/-0.0459	0.0947	+/-0.0467		pCi/g							
Potassium-40		4.00	+/-0.939	0.530	+/-1.02		pCi/g							
Promethium-144	U	-0.00336	+/-0.0348	0.0651	+/-0.0348		pCi/g							
Promethium-146	U	-0.00180	+/-0.0345	0.0677	+/-0.0345		pCi/g							
Radium-226		0.245	+/-0.107	0.112	+/-0.110		pCi/g							

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : CN Associates, Inc.
Address : PO Box 1446
18 Pine Street
Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: AS-1
Sample ID: 559247001

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"													
Radium-228	U	0.392	+/-0.176	0.426	+/-0.252		pCi/g						
Ruthenium-106	U	0.341	+/-0.329	0.489	+/-0.331		pCi/g						
Silver-110m	U	0.000665	+/-0.0391	0.0834	+/-0.0391		pCi/g						
Sodium-22	U	0.00508	+/-0.0324	0.0714	+/-0.0324		pCi/g						
Thallium-208		0.0860	+/-0.0444	0.0528	+/-0.0450		pCi/g						
Thorium-234	U	0.00553	+/-0.933	1.86	+/-0.933		pCi/g						
Tin-113	U	-0.0189	+/-0.0368	0.0676	+/-0.0378		pCi/g						
Uranium-235	U	-0.0948	+/-0.148	0.254	+/-0.154		pCi/g						
Uranium-238	U	0.00553	+/-0.933	1.86	+/-0.933		pCi/g						
Yttrium-88	U	0.00974	+/-0.0373	0.0935	+/-0.0376		pCi/g						
Zinc-65	U	0.0450	+/-0.0581	0.144	+/-0.0616		pCi/g						
Zirconium-95	U	-0.0199	+/-0.0716	0.132	+/-0.0722		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	AA1	10/19/21	1111	2187220

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:
The MDC is a sample specific MDC
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:
DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd : Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Company: CN Associates, Inc.
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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: AS-2
Sample ID: 559247002
Matrix: Solid
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client
Moisture: 1.83%

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"														
Actinium-228		0.500	+/-0.211	0.174	+/-0.216		pCi/g			MXRI	11/10/21	0553	2187275	1
Americium-241	U	-0.0387	+/-0.143	0.271	+/-0.144	2.10	pCi/g							
Antimony-124	U	-0.0317	+/-0.0777	0.146	+/-0.0790		pCi/g							
Antimony-125	U	0.00414	+/-0.0518	0.106	+/-0.0519		pCi/g							
Barium-133	U	0.0124	+/-0.0255	0.0504	+/-0.0261		pCi/g							
Barium-140	U	-0.0900	+/-0.447	0.864	+/-0.449		pCi/g							
Beryllium-7		0.478	+/-0.399	0.439	+/-0.402		pCi/g							
Bismuth-212	U	0.604	+/-0.495	0.667	+/-0.498		pCi/g							
Bismuth-214		0.217	+/-0.135	0.0773	+/-0.137		pCi/g							
Cerium-139	U	-0.00588	+/-0.0178	0.0355	+/-0.0181		pCi/g							
Cerium-141	U	0.0254	+/-0.0561	0.119	+/-0.0571		pCi/g							
Cerium-144	U	-0.0263	+/-0.123	0.249	+/-0.123		pCi/g							
Cesium-134	U	0.0103	+/-0.0239	0.0518	+/-0.0244		pCi/g							
Cesium-136	U	0.161	+/-0.158	0.405	+/-0.175		pCi/g							
Cesium-137	U	0.0110	+/-0.0274	0.0563	+/-0.0279	0.100	pCi/g							
Chromium-51	U	0.0446	+/-0.359	0.734	+/-0.360		pCi/g							
Cobalt-56	U	-0.00958	+/-0.0322	0.0635	+/-0.0325		pCi/g							
Cobalt-57	U	0.00669	+/-0.0163	0.0350	+/-0.0166		pCi/g							
Cobalt-58	U	-0.0151	+/-0.0270	0.0515	+/-0.0279		pCi/g							
Cobalt-60	U	0.00733	+/-0.0247	0.0556	+/-0.0249		pCi/g							
Europium-152	U	-0.00435	+/-0.0553	0.0994	+/-0.0554		pCi/g							
Europium-154	U	-0.0215	+/-0.0721	0.141	+/-0.0727		pCi/g							
Europium-155	U	0.0359	+/-0.0659	0.144	+/-0.0679		pCi/g							
Iridium-192	U	0.0180	+/-0.0232	0.0516	+/-0.0246		pCi/g							
Iron-59	U	-0.0163	+/-0.0661	0.133	+/-0.0665		pCi/g							
Lead-210	U	2.31	+/-4.57	9.60	+/-4.69		pCi/g							
Lead-212		0.317	+/-0.0851	0.0652	+/-0.0887		pCi/g							
Lead-214		0.503	+/-0.113	0.195	+/-0.120		pCi/g							
Manganese-54	U	0.000699	+/-0.0211	0.0452	+/-0.0211		pCi/g							
Mercury-203	U	-0.00406	+/-0.0328	0.0580	+/-0.0328		pCi/g							
Neodymium-147	U	0.0734	+/-1.22	2.45	+/-1.22		pCi/g							
Neptunium-239	U	-0.106	+/-0.153	0.301	+/-0.161		pCi/g							
Niobium-94	U	0.0397	+/-0.0379	0.0491	+/-0.0421		pCi/g							
Niobium-95	U	-0.0350	+/-0.0350	0.0482	+/-0.0386		pCi/g							
Potassium-40		5.37	+/-0.873	0.523	+/-0.984		pCi/g							
Promethium-144	U	0.0235	+/-0.0286	0.0572	+/-0.0306		pCi/g							
Promethium-146	U	-0.00228	+/-0.0222	0.0444	+/-0.0222		pCi/g							
Radium-226		0.217	+/-0.135	0.0773	+/-0.137		pCi/g							
Radium-228		0.500	+/-0.211	0.174	+/-0.216		pCi/g							

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Certificate of Analysis

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Report Date: November 10, 2021

Contact: Mr Ron Cardarelli
Project: Schulz Electric

Client Sample ID: AS-2
Sample ID: 559247002

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"														
Ruthenium-106	U	-0.135	+/-0.222	0.386	+/-0.230		pCi/g							
Silver-110m	U	-0.0464	+/-0.0343	0.0524	+/-0.0404		pCi/g							
Sodium-22	U	-0.00978	+/-0.0251	0.0480	+/-0.0255		pCi/g							
Thallium-208		0.0896	+/-0.0782	0.0415	+/-0.0786		pCi/g							
Thorium-234	U	-0.486	+/-1.20	2.55	+/-1.22		pCi/g							
Tin-113	U	0.0447	+/-0.0787	0.0563	+/-0.0788		pCi/g							
Uranium-235	U	-0.0144	+/-0.123	0.250	+/-0.123		pCi/g							
Uranium-238	U	-0.486	+/-1.20	2.55	+/-1.22		pCi/g							
Yttrium-88	U	0.0271	+/-0.0243	0.0735	+/-0.0273		pCi/g							
Zinc-65	U	0.0261	+/-0.0367	0.0932	+/-0.0387		pCi/g							
Zirconium-95	U	-0.0228	+/-0.0413	0.0800	+/-0.0426		pCi/g							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	AAJ	10/19/21	1111	2187220

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:
DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: C-1
Sample ID: 559247003
Matrix: Solid
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client
Moisture: 3.06%

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"														
Actinium-228		0.362	+/-0.171	0.344	+/-0.239		pCi/g			MXR1	11/10/21	0553	2187275	1
Americium-241	U	-0.0535	+/-0.101	0.193	+/-0.103	2.10	pCi/g							
Antimony-124	U	0.0149	+/-0.0479	0.133	+/-0.0484		pCi/g							
Antimony-125	U	-0.0201	+/-0.0588	0.111	+/-0.0595		pCi/g							
Barium-133	U	-0.0146	+/-0.0261	0.0421	+/-0.0270		pCi/g							
Barium-140	U	-0.204	+/-0.571	1.04	+/-0.578		pCi/g							
Beryllium-7	U	-0.0754	+/-0.253	0.478	+/-0.255		pCi/g							
Bismuth-212	U	0.289	+/-0.356	0.798	+/-0.380		pCi/g							
Bismuth-214		0.295	+/-0.128	0.0953	+/-0.130		pCi/g							
Cerium-139	U	0.00157	+/-0.0201	0.0381	+/-0.0201		pCi/g							
Cerium-141	U	-0.0417	+/-0.0653	0.115	+/-0.0680		pCi/g							
Cerium-144	U	-0.0454	+/-0.136	0.250	+/-0.138		pCi/g							
Cesium-134	U	0.00216	+/-0.0293	0.0600	+/-0.0293		pCi/g							
Cesium-136	U	-0.121	+/-0.146	0.237	+/-0.157		pCi/g							
Cesium-137		0.151	+/-0.0555	0.0537	+/-0.0570	0.100	pCi/g							
Chromium-51	U	-0.230	+/-0.379	0.703	+/-0.394		pCi/g							
Cobalt-56	U	-0.0194	+/-0.0339	0.0621	+/-0.0351		pCi/g							
Cobalt-57	U	0.00451	+/-0.0153	0.0305	+/-0.0154		pCi/g							
Cobalt-58	U	-0.00777	+/-0.0279	0.0553	+/-0.0281		pCi/g							
Cobalt-60	U	0.0157	+/-0.0298	0.0665	+/-0.0307		pCi/g							
Europium-152	U	-0.0631	+/-0.0665	0.109	+/-0.0726		pCi/g							
Europium-154	U	-0.0481	+/-0.0691	0.115	+/-0.0725		pCi/g							
Europium-155	U	0.0439	+/-0.0593	0.125	+/-0.0626		pCi/g							
Iridium-192	U	-0.00457	+/-0.0256	0.0502	+/-0.0257		pCi/g							
Iron-59	U	0.0772	+/-0.0868	0.201	+/-0.0939		pCi/g							
Lead-210	U	0.776	+/-2.86	5.86	+/-2.88		pCi/g							
Lead-212		0.312	+/-0.0871	0.0749	+/-0.0915		pCi/g							
Lead-214		0.400	+/-0.131	0.0859	+/-0.136		pCi/g							
Manganese-54	U	0.00489	+/-0.0254	0.0534	+/-0.0255		pCi/g							
Mercury-203	U	-0.00873	+/-0.0324	0.0631	+/-0.0326		pCi/g							
Neodymium-147	U	2.03	+/-1.44	2.88	+/-1.72		pCi/g							
Neptunium-239	U	0.0373	+/-0.164	0.323	+/-0.165		pCi/g							
Niobium-94	U	-0.0239	+/-0.0216	0.0364	+/-0.0242		pCi/g							
Niobium-95	U	0.0207	+/-0.0363	0.0789	+/-0.0375		pCi/g							
Potassium-40		6.08	+/-0.953	0.549	+/-1.11		pCi/g							
Promethium-144	U	-0.0146	+/-0.0287	0.0423	+/-0.0295		pCi/g							
Promethium-146	U	-0.0191	+/-0.0251	0.0436	+/-0.0266		pCi/g							
Radium-226		0.295	+/-0.128	0.0953	+/-0.130		pCi/g							
Radium-228		0.362	+/-0.171	0.344	+/-0.239		pCi/g							

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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: C-1
Sample ID: 559247003

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"														
Ruthenium-106	U	0.240	+/-0.175	0.440	+/-0.207		pCi/g							
Silver-110m	U	0.0225	+/-0.0368	0.0820	+/-0.0382		pCi/g							
Sodium-22	U	-0.0172	+/-0.0246	0.0409	+/-0.0259		pCi/g							
Thallium-208		0.136	+/-0.0528	0.0382	+/-0.0541		pCi/g							
Thorium-234	U	-0.337	+/-0.885	1.78	+/-0.901		pCi/g							
Tin-113	U	-0.0128	+/-0.0310	0.0581	+/-0.0315		pCi/g							
Uranium-235	U	-0.0123	+/-0.138	0.256	+/-0.138		pCi/g							
Uranium-238	U	-0.337	+/-0.885	1.78	+/-0.901		pCi/g							
Yttrium-88	U	-0.00580	+/-0.0261	0.0557	+/-0.0262		pCi/g							
Zinc-65	U	0.0326	+/-0.0416	0.103	+/-0.0442		pCi/g							
Zirconium-95	U	0.0287	+/-0.0622	0.135	+/-0.0636		pCi/g							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	AA1	10/19/21	1111	2187220

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
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Mtd.: Method
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RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Company : CN Associates, Inc.
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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: C-2
Sample ID: 559247004
Matrix: Solid
Collect Date: 07-OCT-21
Receive Date: 18-OCT-21
Collector: Client
Moisture: 4.1%

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"														
Actinium-228		0.307	+/-0.167	0.163	+/-0.171		pCi/g			MXR1	11/10/21	0554	2187275	1
Americium-241	U	0.0294	+/-0.131	0.250	+/-0.132	2.10	pCi/g							
Antimony-124	U	0.0183	+/-0.0648	0.141	+/-0.0653		pCi/g							
Antimony-125	U	-0.00465	+/-0.0613	0.0999	+/-0.0614		pCi/g							
Barium-133	U	0.0153	+/-0.0265	0.0486	+/-0.0274		pCi/g							
Barium-140	U	-0.0326	+/-0.457	0.881	+/-0.457		pCi/g							
Beryllium-7	U	0.0805	+/-0.257	0.519	+/-0.260		pCi/g							
Bismuth-212	U	0.446	+/-0.322	0.706	+/-0.382		pCi/g							
Bismuth-214		0.379	+/-0.105	0.0781	+/-0.110		pCi/g							
Cerium-139	U	-0.00394	+/-0.0187	0.0368	+/-0.0188		pCi/g							
Cerium-141	U	-0.00216	+/-0.0554	0.0934	+/-0.0554		pCi/g							
Cerium-144	U	-0.0674	+/-0.135	0.237	+/-0.139		pCi/g							
Cesium-134	U	0.00470	+/-0.0242	0.0472	+/-0.0243		pCi/g							
Cesium-136	U	0.00555	+/-0.168	0.330	+/-0.168		pCi/g							
Cesium-137		0.403	+/-0.0593	0.0376	+/-0.0694	0.100	pCi/g							
Chromium-51	U	0.0273	+/-0.356	0.680	+/-0.356		pCi/g							
Cobalt-56	U	0.0109	+/-0.0283	0.0563	+/-0.0287		pCi/g							
Cobalt-57	U	0.0111	+/-0.0167	0.0331	+/-0.0175		pCi/g							
Cobalt-58	U	0.0245	+/-0.0588	0.0591	+/-0.0589		pCi/g							
Cobalt-60	U	0.0317	+/-0.0299	0.0649	+/-0.0333		pCi/g							
Europium-152	U	-0.0287	+/-0.0563	0.109	+/-0.0579		pCi/g							
Europium-154	U	0.0265	+/-0.0708	0.146	+/-0.0719		pCi/g							
Europium-155	U	-0.0109	+/-0.0608	0.114	+/-0.0610		pCi/g							
Iridium-192	U	-0.00838	+/-0.0255	0.0466	+/-0.0258		pCi/g							
Iron-59	U	0.0321	+/-0.0707	0.147	+/-0.0723		pCi/g							
Lead-210	U	1.36	+/-4.74	9.86	+/-4.78		pCi/g							
Lead-212		0.381	+/-0.0832	0.0612	+/-0.0886		pCi/g							
Lead-214		0.479	+/-0.116	0.0899	+/-0.122		pCi/g							
Manganese-54	U	0.00189	+/-0.0249	0.0469	+/-0.0249		pCi/g							
Mercury-203	U	-0.00569	+/-0.0315	0.0591	+/-0.0316		pCi/g							
Neodymium-147	U	-1.24	+/-1.05	1.54	+/-1.20		pCi/g							
Neptunium-239	U	-0.0564	+/-0.167	0.302	+/-0.169		pCi/g							
Niobium-94	U	-0.00856	+/-0.0219	0.0393	+/-0.0223		pCi/g							
Niobium-95	U	-0.0130	+/-0.0329	0.0584	+/-0.0334		pCi/g							
Potassium-40		7.24	+/-0.928	0.384	+/-1.17		pCi/g							
Promethium-144	U	0.00297	+/-0.0254	0.0483	+/-0.0255		pCi/g							
Promethium-146	U	0.0200	+/-0.0258	0.0547	+/-0.0274		pCi/g							
Radium-226		0.379	+/-0.105	0.0781	+/-0.110		pCi/g							
Radium-228		0.307	+/-0.167	0.163	+/-0.171		pCi/g							

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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: C-2
Sample ID: 559247004

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"														
Ruthenium-106	U	0.0269	+/-0.209	0.406	+/-0.209		pCi/g							
Silver-110m	U	-0.0276	+/-0.0312	0.0541	+/-0.0337		pCi/g							
Sodium-22	U	0.0119	+/-0.0247	0.0518	+/-0.0253		pCi/g							
Thallium-208		0.0720	+/-0.0427	0.0429	+/-0.0432		pCi/g							
Thorium-234	U	1.51	+/-2.32	2.02	+/-2.35		pCi/g							
Tin-113	U	-0.0299	+/-0.0360	0.0515	+/-0.0385		pCi/g							
Uranium-235	U	0.137	+/-0.204	0.218	+/-0.204		pCi/g							
Uranium-238	U	1.51	+/-2.32	2.02	+/-2.35		pCi/g							
Yttrium-88	U	0.0146	+/-0.0206	0.0522	+/-0.0217		pCi/g							
Zinc-65	U	0.0188	+/-0.0714	0.124	+/-0.0720		pCi/g							
Zirconium-95	U	-0.0221	+/-0.0450	0.0800	+/-0.0462		pCi/g							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	AA1	10/19/21	1111	2187220

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows.

DF: Dilution Factor
DL: Detection Limit
LC/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company: CN Associates, Inc.
Address: PO Box 1446
18 Pine Street
Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: C-3
Sample ID: 559247005
Matrix: Solid
Collect Date: 07-OCT-21
Receive Date: 18-OCT-21
Collector: Client
Moisture: 3.21%

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"														
Actinium-228		0.514	+/-0.181	0.157	+/-0.190		pCi/g			MXR1	11/10/21	0554	2187275	1
Americium-241	U	0.0263	+/-0.129	0.256	+/-0.130	2.10	pCi/g							
Antimony-124	U	-0.0336	+/-0.0638	0.116	+/-0.0657		pCi/g							
Antimony-125	U	0.0400	+/-0.0642	0.129	+/-0.0668		pCi/g							
Barium-133	U	0.000932	+/-0.0335	0.0572	+/-0.0335		pCi/g							
Barium-140	U	0.262	+/-0.516	1.01	+/-0.529		pCi/g							
Beryllium-7	U	0.124	+/-0.446	0.561	+/-0.446		pCi/g							
Bismuth-212	U	0.347	+/-0.384	0.781	+/-0.416		pCi/g							
Bismuth-214		0.415	+/-0.109	0.0938	+/-0.115		pCi/g							
Cerium-139	U	-0.0103	+/-0.0232	0.0433	+/-0.0238		pCi/g							
Cerium-141	U	-0.0271	+/-0.0649	0.123	+/-0.0661		pCi/g							
Cerium-144	U	-0.00264	+/-0.143	0.281	+/-0.143		pCi/g							
Cesium-134	U	0.0157	+/-0.0283	0.0572	+/-0.0292		pCi/g							
Cesium-136	U	-0.241	+/-0.204	0.335	+/-0.233		pCi/g							
Cesium-137	U	0.0124	+/-0.0253	0.0513	+/-0.0259	0.100	pCi/g							
Chromium-51	U	0.0554	+/-0.422	0.830	+/-0.423		pCi/g							
Cobalt-56	U	0.0201	+/-0.0296	0.0616	+/-0.0311		pCi/g							
Cobalt-57	U	0.0126	+/-0.0193	0.0399	+/-0.0202		pCi/g							
Cobalt-58	U	0.00651	+/-0.0325	0.0633	+/-0.0326		pCi/g							
Cobalt-60	U	0.00498	+/-0.0276	0.0546	+/-0.0277		pCi/g							
Europium-152	U	-0.0512	+/-0.0809	0.127	+/-0.0842		pCi/g							
Europium-154	U	0.00561	+/-0.0810	0.159	+/-0.0810		pCi/g							
Europium-155	U	0.0747	+/-0.0756	0.161	+/-0.0831		pCi/g							
Iridium-192	U	-0.0177	+/-0.0314	0.0584	+/-0.0325		pCi/g							
Iron-59	U	0.000451	+/-0.0756	0.148	+/-0.0756		pCi/g							
Lead-210	U	3.17	+/-4.86	10.1	+/-5.08		pCi/g							
Lead-212		0.464	+/-0.0904	0.0773	+/-0.0988		pCi/g							
Lead-214		0.420	+/-0.149	0.102	+/-0.153		pCi/g							
Manganese-54	U	-0.0243	+/-0.0259	0.0431	+/-0.0283		pCi/g							
Mercury-203	U	0.0206	+/-0.0405	0.0770	+/-0.0416		pCi/g							
Neodymium-147	U	-0.234	+/-1.36	2.17	+/-1.36		pCi/g							
Neptunium-239	U	-0.156	+/-0.187	0.352	+/-0.201		pCi/g							
Niobium-94	U	0.0109	+/-0.0219	0.0443	+/-0.0224		pCi/g							
Niobium-95	U	0.00376	+/-0.0380	0.0639	+/-0.0380		pCi/g							
Potassium-40		7.21	+/-0.992	0.501	+/-1.23		pCi/g							
Promethium-144	U	-0.00454	+/-0.0214	0.0406	+/-0.0215		pCi/g							
Promethium-146	U	0.0320	+/-0.0401	0.0623	+/-0.0428		pCi/g							
Radium-226		0.415	+/-0.109	0.0938	+/-0.115		pCi/g							
Radium-228		0.514	+/-0.181	0.157	+/-0.190		pCi/g							

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Certificate of Analysis

Company : CN Associates, Inc.
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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: C-3
Sample ID: 559247005

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"													
Ruthenium-106	U	0.207	+/-0.223	0.471	+/-0.242		pCi/g						
Silver-110m	U	-0.00902	+/-0.0389	0.0708	+/-0.0391		pCi/g						
Sodium-22	U	0.00249	+/-0.0289	0.0569	+/-0.0290		pCi/g						
Thallium-208		0.0933	+/-0.0621	0.0449	+/-0.0627		pCi/g						
Thorium-234	U	-0.293	+/-1.19	2.39	+/-1.20		pCi/g						
Tin-113	U	0.00817	+/-0.0344	0.0674	+/-0.0346		pCi/g						
Uranium-235	U	0.155	+/-0.147	0.298	+/-0.163		pCi/g						
Uranium-238	U	-0.293	+/-1.19	2.39	+/-1.20		pCi/g						
Yttrium-88	U	0.00677	+/-0.0248	0.0544	+/-0.0250		pCi/g						
Zinc-65	U	0.0874	+/-0.0667	0.137	+/-0.0779		pCi/g						
Zirconium-95	U	0.0160	+/-0.0586	0.116	+/-0.0591		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	AA1	10/19/21	1111	2187220

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:
DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : CN Associates, Inc.
Address : PO Box 1446
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Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: D-1
Sample ID: 559247006
Matrix: Solid
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client
Moisture: 23.5%

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"													
Actinium-228		0.858	+/-0.220	0.156	+/-0.235		pCi/g			MXR1	11/10/21 0555	2187275	1
Americium-241	U	0.0290	+/-0.0803	0.142	+/-0.0814	2.10	pCi/g						
Antimony-124	U	0.0247	+/-0.0893	0.194	+/-0.0900		pCi/g						
Antimony-125	U	0.0213	+/-0.0696	0.135	+/-0.0703		pCi/g						
Barium-133	U	-0.00713	+/-0.0348	0.0564	+/-0.0349		pCi/g						
Barium-140	U	-0.0660	+/-0.488	0.966	+/-0.489		pCi/g						
Beryllium-7		0.780	+/-0.623	0.582	+/-0.627		pCi/g						
Bismuth-212		0.896	+/-0.692	0.531	+/-0.698		pCi/g						
Bismuth-214		0.457	+/-0.117	0.0988	+/-0.125		pCi/g						
Cerium-139	U	0.0109	+/-0.0234	0.0471	+/-0.0240		pCi/g						
Cerium-141	U	-0.0672	+/-0.0665	0.120	+/-0.0732		pCi/g						
Cerium-144	U	-0.00468	+/-0.142	0.280	+/-0.142		pCi/g						
Cesium-134	U	0.0419	+/-0.0421	0.0672	+/-0.0463		pCi/g						
Cesium-136	U	0.0915	+/-0.171	0.378	+/-0.176		pCi/g						
Cesium-137		0.202	+/-0.0611	0.0542	+/-0.0640	0.100	pCi/g						
Chromium-51	U	-0.406	+/-0.425	0.717	+/-0.464		pCi/g						
Cobalt-56	U	-0.0171	+/-0.0330	0.0567	+/-0.0339		pCi/g						
Cobalt-57	U	-0.00934	+/-0.0170	0.0326	+/-0.0176		pCi/g						
Cobalt-58	U	0.00853	+/-0.0313	0.0645	+/-0.0315		pCi/g						
Cobalt-60	U	0.0238	+/-0.0311	0.0699	+/-0.0330		pCi/g						
Europium-152	U	-0.0658	+/-0.0794	0.127	+/-0.0849		pCi/g						
Europium-154	U	-0.0536	+/-0.0725	0.128	+/-0.0766		pCi/g						
Europium-155	U	0.0176	+/-0.0694	0.141	+/-0.0698		pCi/g						
Iridium-192	U	0.00692	+/-0.0302	0.0586	+/-0.0303		pCi/g						
Iron-59	U	-0.0395	+/-0.0894	0.158	+/-0.0913		pCi/g						
Lead-210		6.21	+/-3.32	2.30	+/-3.37		pCi/g						
Lead-212		0.785	+/-0.103	0.0753	+/-0.121		pCi/g						
Lead-214		0.659	+/-0.179	0.221	+/-0.187		pCi/g						
Manganese-54	U	-0.000773	+/-0.0233	0.0460	+/-0.0233		pCi/g						
Mercury-203	U	0.0271	+/-0.0378	0.0763	+/-0.0397		pCi/g						
Neodymium-147	U	-0.575	+/-1.12	2.12	+/-1.15		pCi/g						
Neptunium-239	U	-0.0683	+/-0.171	0.331	+/-0.174		pCi/g						
Niobium-94	U	-0.00154	+/-0.0243	0.0471	+/-0.0244		pCi/g						
Niobium-95	U	-0.0102	+/-0.0421	0.0722	+/-0.0423		pCi/g						
Potassium-40		9.09	+/-1.07	0.513	+/-1.35		pCi/g						
Promethium-144	U	0.0124	+/-0.0273	0.0559	+/-0.0279		pCi/g						
Promethium-146	U	-0.00953	+/-0.0300	0.0581	+/-0.0304		pCi/g						
Radium-226		0.457	+/-0.117	0.0988	+/-0.125		pCi/g						
Radium-228		0.858	+/-0.220	0.156	+/-0.235		pCi/g						

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Certificate of Analysis

Company: CN Associates, Inc.
Address: PO Box 1446
18 Pine Street
Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: D-1
Sample ID: 559247006

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"													
Ruthenium-106	U	-0.233	+/-0.217	0.365	+/-0.242		pCi/g						
Silver-110m	U	-0.00908	+/-0.0407	0.0663	+/-0.0409		pCi/g						
Sodium-22	U	-0.0178	+/-0.0248	0.0440	+/-0.0261		pCi/g						
Thallium-208		0.226	+/-0.0620	0.0465	+/-0.0656		pCi/g						
Thorium-234	UI	0.000	+/-2.04	1.21	+/-2.08		pCi/g						
Tin-113	U	0.00656	+/-0.0343	0.0664	+/-0.0345		pCi/g						
Uranium-235	U	0.00360	+/-0.139	0.271	+/-0.139		pCi/g						
Uranium-238	UI	0.000	+/-2.04	1.21	+/-2.08		pCi/g						
Yttrium-88	U	0.0147	+/-0.0304	0.0721	+/-0.0311		pCi/g						
Zinc-65	U	0.0173	+/-0.0562	0.107	+/-0.0568		pCi/g						
Zirconium-95	U	0.0357	+/-0.0569	0.123	+/-0.0593		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	AAI	10/19/21	1111	2187220

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5 2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company: CN Associates, Inc.
Address: PO Box 1446
18 Pine Street
Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: D-2
Sample ID: 559247007
Matrix: Solid
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client
Moisture: 16%

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"														
Actinium-228		1.59	+/-0.322	0.234	+/-0.356		pCi/g			MXR1	11/10/21	0556	2187275	1
Americium-241	U	-0.0807	+/-0.162	0.268	+/-0.166	2.10	pCi/g							
Antimony-124	U	0.0489	+/-0.0976	0.234	+/-0.100		pCi/g							
Antimony-125	U	-0.125	+/-0.0796	0.125	+/-0.0982		pCi/g							
Barium-133	U	0.00334	+/-0.0406	0.0721	+/-0.0407		pCi/g							
Barium-140	U	-0.178	+/-0.760	1.42	+/-0.765		pCi/g							
Beryllium-7	U	-0.0209	+/-0.379	0.727	+/-0.379		pCi/g							
Bismuth-212		1.28	+/-0.974	0.941	+/-0.981		pCi/g							
Bismuth-214		0.825	+/-0.206	0.119	+/-0.219		pCi/g							
Cerium-139	U	-0.00872	+/-0.0309	0.0540	+/-0.0312		pCi/g							
Cerium-141	U	-0.0149	+/-0.0947	0.168	+/-0.0949		pCi/g							
Cerium-144	U	0.215	+/-0.236	0.365	+/-0.237		pCi/g							
Cesium-134	U	0.0763	+/-0.0497	0.0958	+/-0.0609		pCi/g							
Cesium-136	U	-0.0150	+/-0.242	0.464	+/-0.242		pCi/g							
Cesium-137		0.0959	+/-0.0616	0.0746	+/-0.0622	0.100	pCi/g							
Chromium-51	U	0.152	+/-0.584	1.06	+/-0.588		pCi/g							
Cobalt-56	U	0.0252	+/-0.0428	0.0898	+/-0.0443		pCi/g							
Cobalt-57	U	0.0135	+/-0.0260	0.0491	+/-0.0268		pCi/g							
Cobalt-58	U	-0.00355	+/-0.0401	0.0766	+/-0.0402		pCi/g							
Cobalt-60	U	0.0279	+/-0.0390	0.0758	+/-0.0410		pCi/g							
Europium-152	U	0.0513	+/-0.0830	0.172	+/-0.0863		pCi/g							
Europium-154	U	-0.0596	+/-0.0969	0.176	+/-0.101		pCi/g							
Europium-155	U	0.110	+/-0.105	0.205	+/-0.117		pCi/g							
Iridium-192	U	-0.0222	+/-0.0395	0.0644	+/-0.0407		pCi/g							
Iron-59	U	-0.00940	+/-0.0986	0.187	+/-0.0987		pCi/g							
Lead-210	U	1.56	+/-5.01	5.92	+/-5.01		pCi/g							
Lead-212		1.63	+/-0.150	0.0956	+/-0.198		pCi/g							
Lead-214		1.11	+/-0.182	0.340	+/-0.203		pCi/g							
Manganese-54	U	-0.00776	+/-0.0425	0.0772	+/-0.0427		pCi/g							
Mercury-203	U	-0.00578	+/-0.0603	0.104	+/-0.0604		pCi/g							
Neodymium-147	U	-1.14	+/-1.64	2.87	+/-1.72		pCi/g							
Neptunium-239	U	-0.0724	+/-0.237	0.421	+/-0.239		pCi/g							
Niobium-94	U	-0.0116	+/-0.0327	0.0588	+/-0.0331		pCi/g							
Niobium-95	U	-0.0117	+/-0.0507	0.0925	+/-0.0510		pCi/g							
Potassium-40		9.85	+/-1.39	0.579	+/-1.68		pCi/g							
Promethium-144	U	0.0120	+/-0.0382	0.0744	+/-0.0386		pCi/g							
Promethium-146	U	-0.0134	+/-0.0404	0.0750	+/-0.0409		pCi/g							
Radium-226		0.825	+/-0.206	0.119	+/-0.219		pCi/g							
Radium-228		1.59	+/-0.322	0.234	+/-0.356		pCi/g							

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Certificate of Analysis

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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: D-2
Sample ID: 559247007

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"													
Ruthenium-106	U	-0.103	+/-0.302	0.553	+/-0.306		pCi/g						
Silver-110m	U	-0.000651	+/-0.0537	0.101	+/-0.0537		pCi/g						
Sodium-22	U	-0.0212	+/-0.0345	0.0626	+/-0.0359		pCi/g						
Thallium-208		0.495	+/-0.114	0.0639	+/-0.123		pCi/g						
Thorium-234	UI	0.000	+/-2.85	2.19	+/-2.90		pCi/g						
Tin-113	U	-0.00478	+/-0.0463	0.0886	+/-0.0463		pCi/g						
Uranium-235	U	0.127	+/-0.200	0.379	+/-0.200		pCi/g						
Uranium-238	UI	0.000	+/-2.85	2.19	+/-2.90		pCi/g						
Yttrium-88	U	0.00690	+/-0.0419	0.0925	+/-0.0420		pCi/g						
Zinc-65	U	-0.0224	+/-0.0975	0.153	+/-0.0981		pCi/g						
Zirconium-95	U	0.102	+/-0.0846	0.188	+/-0.0967		pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	AA1	10/19/21	1111	2187220

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:
DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : CN Associates, Inc.
Address : PO Box 1446
18 Pine Street
Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: SDR-1
Sample ID: 559247008
Matrix: Solid
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client
Moisture: 51.3%

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"														
Actinium-228		0.714	+/-0.283	0.174	+/-0.290		pCi/g			MXR1	11/10/21	0557	2187275	1
Americium-241	U	-0.0426	+/-0.0843	0.160	+/-0.0865	2.10	pCi/g							
Antimony-124	U	0.0274	+/-0.0734	0.174	+/-0.0745		pCi/g							
Antimony-125	U	0.0123	+/-0.0588	0.121	+/-0.0591		pCi/g							
Barium-133	U	-0.0167	+/-0.0325	0.0487	+/-0.0334		pCi/g							
Barium-140	U	-0.0611	+/-0.459	0.903	+/-0.459		pCi/g							
Beryllium-7	U	-0.0145	+/-0.260	0.467	+/-0.260		pCi/g							
Bismuth-212		1.36	+/-0.645	0.669	+/-0.656		pCi/g							
Bismuth-214		0.522	+/-0.142	0.0829	+/-0.149		pCi/g							
Cerium-139	U	-0.0127	+/-0.0224	0.0395	+/-0.0233		pCi/g							
Cerium-141	U	-0.0179	+/-0.0670	0.122	+/-0.0675		pCi/g							
Cerium-144	U	0.0155	+/-0.134	0.257	+/-0.135		pCi/g							
Cesium-134	U	0.0304	+/-0.0326	0.0704	+/-0.0354		pCi/g							
Cesium-136	U	0.109	+/-0.210	0.463	+/-0.216		pCi/g							
Cesium-137		0.0604	+/-0.0468	0.0480	+/-0.0471	0.100	pCi/g							
Chromium-51	U	0.208	+/-0.372	0.793	+/-0.384		pCi/g							
Cobalt-56	U	0.00577	+/-0.0328	0.0658	+/-0.0329		pCi/g							
Cobalt-57	U	-0.00590	+/-0.0177	0.0326	+/-0.0179		pCi/g							
Cobalt-58	U	0.00499	+/-0.0308	0.0624	+/-0.0309		pCi/g							
Cobalt-60	U	0.00492	+/-0.0279	0.0596	+/-0.0280		pCi/g							
Europium-152	U	0.0178	+/-0.0627	0.129	+/-0.0632		pCi/g							
Europium-154	U	-0.0426	+/-0.0791	0.146	+/-0.0815		pCi/g							
Europium-155	UJ	0.000	+/-0.166	0.120	+/-0.166		pCi/g							
Iridium-192	U	-0.0168	+/-0.0237	0.0443	+/-0.0249		pCi/g							
Iron-59	U	-0.0192	+/-0.0754	0.150	+/-0.0759		pCi/g							
Lead-210	UJ	0.000	+/-3.78	3.66	+/-3.80		pCi/g							
Lead-212		0.728	+/-0.0969	0.0754	+/-0.114		pCi/g							
Lead-214		0.588	+/-0.160	0.0866	+/-0.167		pCi/g							
Manganese-54	U	0.0247	+/-0.0300	0.0641	+/-0.0321		pCi/g							
Mercury-203	U	-0.0198	+/-0.0343	0.0654	+/-0.0355		pCi/g							
Neodymium-147	U	-0.315	+/-1.29	2.48	+/-1.30		pCi/g							
Neptunium-239	U	-0.0613	+/-0.173	0.320	+/-0.175		pCi/g							
Niobium-94	U	-0.000657	+/-0.0234	0.0453	+/-0.0234		pCi/g							
Niobium-95	U	-0.00833	+/-0.0459	0.0752	+/-0.0461		pCi/g							
Potassium-40		10.9	+/-1.21	0.380	+/-1.59		pCi/g							
Promethium-144	U	-0.00966	+/-0.0249	0.0455	+/-0.0253		pCi/g							
Promethium-146	U	0.00750	+/-0.0260	0.0541	+/-0.0263		pCi/g							
Radium-226		0.522	+/-0.142	0.0829	+/-0.149		pCi/g							
Radium-228		0.714	+/-0.283	0.174	+/-0.290		pCi/g							

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Certificate of Analysis

Company : CN Associates, Inc.
Address : PO Box 1446
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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: SDR-1
Sample ID: 559247008

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Solid (Standard List) "Dry Weight Corrected"														
Ruthenium-106	U	-0.0995	+/-0.190	0.346	+/-0.195		pCi/g							
Silver-110m	U	0.00701	+/-0.0349	0.0709	+/-0.0350		pCi/g							
Sodium-22	U	-0.0170	+/-0.0292	0.0533	+/-0.0303		pCi/g							
Thallium-208		0.230	+/-0.0574	0.0514	+/-0.0608		pCi/g							
Thorium-234	U	0.423	+/-0.874	1.79	+/-0.899		pCi/g							
Tin-113	U	0.00549	+/-0.0310	0.0635	+/-0.0311		pCi/g							
Uranium-235	U	-0.0422	+/-0.135	0.246	+/-0.135		pCi/g							
Uranium-238	U	0.423	+/-0.874	1.79	+/-0.899		pCi/g							
Yttrium-88	U	-0.0234	+/-0.0314	0.0509	+/-0.0331		pCi/g							
Zinc-65	U	-0.00701	+/-0.0573	0.103	+/-0.0574		pCi/g							
Zirconium-95	U	-0.0576	+/-0.0691	0.115	+/-0.0740		pCi/g							

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	AA1	10/19/21	1111	2187220

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma)

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Company : CN Associates, Inc.
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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 1-2
Sample ID: 559247009
Matrix: Swipe
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Actinium-228	U	-2.33	+/-8.20	14.2	+/-8.28		pCi/Filter			MXR1	10/20/21	1315	2187276	1
Americium-241	U	0.938	+/-2.27	3.91	+/-2.31		pCi/Filter							
Antimony-124	U	-1.10	+/-4.78	9.31	+/-4.80		pCi/Filter							
Antimony-125	U	-2.63	+/-3.63	6.33	+/-3.83		pCi/Filter							
Barium-133	U	0.121	+/-1.53	2.70	+/-1.53		pCi/Filter							
Barium-140	U	-5.84	+/-10.1	17.6	+/-10.4		pCi/Filter							
Beryllium-7	U	-2.86	+/-11.4	21.2	+/-11.5		pCi/Filter							
Bismuth-212	U	8.51	+/-26.2	49.1	+/-26.5		pCi/Filter							
Bismuth-214	U	-2.62	+/-4.37	7.30	+/-4.54		pCi/Filter							
Cerium-139	U	-0.193	+/-0.851	1.49	+/-0.857		pCi/Filter							
Cerium-141	U	1.11	+/-3.78	2.86	+/-3.78		pCi/Filter							
Cerium-144	U	-0.261	+/-5.13	9.25	+/-5.13		pCi/Filter							
Cesium-134	U	-0.318	+/-1.74	3.20	+/-1.75		pCi/Filter							
Cesium-136	U	-3.19	+/-4.44	7.80	+/-4.69		pCi/Filter							
Cesium-137	U	2.30	+/-1.80	3.92	+/-2.10	25.0	pCi/Filter							
Chromium-51	U	2.59	+/-12.3	24.3	+/-12.4		pCi/Filter							
Cobalt-56	U	-0.729	+/-2.63	4.31	+/-2.65		pCi/Filter							
Cobalt-57	U	-0.260	+/-0.633	1.11	+/-0.645		pCi/Filter							
Cobalt-58	U	0.428	+/-2.08	3.65	+/-2.09		pCi/Filter							
Cobalt-60	U1	0.000	+/-2.74	2.98	+/-2.79		pCi/Filter							
Europium-152	U	0.610	+/-3.30	6.51	+/-3.32		pCi/Filter							
Europium-154	U	-7.06	+/-7.73	10.1	+/-8.40		pCi/Filter							
Europium-155	U	-0.880	+/-2.50	4.42	+/-2.54		pCi/Filter							
Iridium-192	U	0.249	+/-1.22	2.40	+/-1.23		pCi/Filter							
Iron-59	U	0.516	+/-4.02	8.25	+/-4.02		pCi/Filter							
Lead-210	U	11.9	+/-17.9	33.5	+/-18.7		pCi/Filter							
Lead-212	U	0.174	+/-2.94	4.36	+/-2.94		pCi/Filter							
Lead-214	U	1.84	+/-4.97	5.83	+/-5.04		pCi/Filter							
Manganese-54	U	0.742	+/-1.33	2.73	+/-1.38		pCi/Filter							
Mercury-203	U	0.740	+/-1.37	2.54	+/-1.41		pCi/Filter							
Neodymium-147	U	0.0729	+/-21.7	41.4	+/-21.7		pCi/Filter							
Neptunium-239	U	2.35	+/-6.04	11.5	+/-6.14		pCi/Filter							
Niobium-94	U	-0.791	+/-1.55	2.68	+/-1.60		pCi/Filter							
Niobium-95	U	1.00	+/-1.73	3.59	+/-1.79		pCi/Filter							
Potassium-40	U	13.6	+/-37.1	44.9	+/-37.1		pCi/Filter							
Promethium-144	U	-0.482	+/-1.76	3.14	+/-1.78		pCi/Filter							
Promethium-146	U	0.909	+/-1.53	3.18	+/-1.59		pCi/Filter							
Radium-226	U	-2.62	+/-4.37	7.30	+/-4.54		pCi/Filter							
Radium-228	U	-2.33	+/-8.20	14.2	+/-8.28		pCi/Filter							
Ruthenium-106	U	-0.199	+/-11.4	22.1	+/-11.4		pCi/Filter							
Silver-110m	U	-1.84	+/-2.13	3.26	+/-2.31		pCi/Filter							

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Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 1-2
Sample ID: 559247009

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Sodium-22	U	-2.49	+/-2.73	3.56	+/-2.96		pCi/Filter							
Thallium-208	U	-0.288	+/-2.02	3.60	+/-2.03		pCi/Filter							
Thorium-234	U	17.7	+/-45.6	47.0	+/-46.5		pCi/Filter							
Tin-113	U	0.902	+/-1.68	3.40	+/-1.73		pCi/Filter							
Uranium-235	U	3.85	+/-11.9	11.4	+/-11.9		pCi/Filter							
Uranium-238	U	17.7	+/-45.6	47.0	+/-46.5		pCi/Filter							
Yttrium-88	U	-0.424	+/-2.13	4.21	+/-2.13		pCi/Filter							
Zinc-65	U	-0.795	+/-3.35	6.56	+/-3.37		pCi/Filter							
Zirconium-95	U	1.49	+/-3.24	6.11	+/-3.31		pCi/Filter							
Rad Gas Flow Proportional Counting														
GFPC Gross A/B, Filter "As Received"														
Alpha	U	-0.0263	+/-0.0889	0.264	+/-0.0889	5.00	pCi/Filter			RXB2	10/26/21	1126	2188641	2

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:
The MDC is a sample specific MDC
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:
DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : CN Associates, Inc.
Address : PO Box 1446
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Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 1-16
Sample ID: 559247010
Matrix: Swipe
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Actinium-228	U	-1.44	+/-3.89	7.45	+/-3.95		pCi/Filter			MXR1	10/20/21	1321	2187276	1
Americium-241	U	0.385	+/-2.05	3.91	+/-2.06		pCi/Filter							
Antimony-124	U	2.10	+/-2.59	6.17	+/-2.76		pCi/Filter							
Antimony-125	U	0.771	+/-1.62	3.27	+/-1.66		pCi/Filter							
Barium-133	U	-0.408	+/-0.629	1.12	+/-0.656		pCi/Filter							
Barium-140	U	2.21	+/-4.34	9.01	+/-4.46		pCi/Filter							
Beryllium-7	U	3.73	+/-6.71	13.4	+/-6.93		pCi/Filter							
Bismuth-212	U	-6.19	+/-14.0	21.1	+/-14.3		pCi/Filter							
Bismuth-214	U	-0.747	+/-1.91	3.45	+/-1.94		pCi/Filter							
Cerium-139	U	-0.0259	+/-0.409	0.731	+/-0.409		pCi/Filter							
Cerium-141	U	-1.85	+/-1.16	1.60	+/-1.43		pCi/Filter							
Cerium-144	U	0.265	+/-3.10	5.62	+/-3.10		pCi/Filter							
Cesium-134	U	0.625	+/-0.903	1.78	+/-0.949		pCi/Filter							
Cesium-136	U	-2.47	+/-2.32	3.72	+/-2.60		pCi/Filter							
Cesium-137	UI	0.000	+/-1.56	1.31	+/-1.58	25.0	pCi/Filter							
Chromium-51	U	2.50	+/-6.26	12.5	+/-6.36		pCi/Filter							
Cobalt-56	U	-0.596	+/-0.963	1.58	+/-1.00		pCi/Filter							
Cobalt-57	U	0.345	+/-0.604	0.644	+/-0.605		pCi/Filter							
Cobalt-58	U	-0.0490	+/-0.707	1.35	+/-0.707		pCi/Filter							
Cobalt-60	U	0.767	+/-1.04	2.35	+/-1.10		pCi/Filter							
Europium-152	U	-0.628	+/-1.65	3.04	+/-1.68		pCi/Filter							
Europium-154	U	-1.69	+/-2.38	4.05	+/-2.51		pCi/Filter							
Europium-155	U	-0.570	+/-1.70	2.81	+/-1.72		pCi/Filter							
Iridium-192	U	0.253	+/-0.598	1.19	+/-0.609		pCi/Filter							
Iron-59	U	-0.267	+/-1.81	3.57	+/-1.81		pCi/Filter							
Lead-210	U	-9.91	+/-60.6	105	+/-60.8		pCi/Filter							
Lead-212	U	0.168	+/-1.62	2.18	+/-1.62		pCi/Filter							
Lead-214	U	0.00750	+/-1.67	3.02	+/-1.67		pCi/Filter							
Manganese-54	U	0.0413	+/-1.03	1.38	+/-1.03		pCi/Filter							
Mercury-203	U	-0.227	+/-0.572	1.06	+/-0.581		pCi/Filter							
Neodymium-147	U	-2.52	+/-9.54	17.5	+/-9.61		pCi/Filter							
Neptunium-239	U	-0.442	+/-3.66	6.61	+/-3.67		pCi/Filter							
Niobium-94	U	-0.668	+/-0.778	1.25	+/-0.840		pCi/Filter							
Niobium-95	U	1.30	+/-1.12	1.37	+/-1.14		pCi/Filter							
Potassium-40	U	-3.17	+/-12.0	23.6	+/-12.1		pCi/Filter							
Promethium-144	U	0.644	+/-0.753	1.58	+/-0.813		pCi/Filter							
Promethium-146	U	-0.239	+/-0.937	1.70	+/-0.943		pCi/Filter							
Radium-226	U	-0.747	+/-1.91	3.45	+/-1.94		pCi/Filter							
Radium-228	U	-1.44	+/-3.89	7.45	+/-3.95		pCi/Filter							
Ruthenium-106	U	0.927	+/-6.56	12.6	+/-6.58		pCi/Filter							
Silver-110m	U	0.179	+/-1.07	2.21	+/-1.07		pCi/Filter							

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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 1-16
Sample ID: 559247010

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Sodium-22	U	-0.594	+/-0.840	1.43	+/-0.884		pCi/Filter							
Thallium-208	UI	0.000	+/-1.65	1.05	+/-1.67		pCi/Filter							
Thorium-234	U	-12.3	+/-23.7	42.3	+/-24.5		pCi/Filter							
Tin-113	U	-0.158	+/-0.879	1.63	+/-0.882		pCi/Filter							
Uranium-235	U	-0.664	+/-3.96	6.48	+/-3.97		pCi/Filter							
Uranium-238	U	-12.3	+/-23.7	42.3	+/-24.5		pCi/Filter							
Yttrium-88	U	-0.0173	+/-0.771	1.78	+/-0.771		pCi/Filter							
Zinc-65	U	-0.485	+/-1.85	3.53	+/-1.86		pCi/Filter							
Zirconium-95	U	-0.318	+/-1.14	2.10	+/-1.15		pCi/Filter							
Rad Gas Flow Proportional Counting														
GFPC Gross A/B, Filter "As Received"														
Alpha	U	0.149	+/-0.182	0.304	+/-0.182	5.00	pCi/Filter			RXB2	10/26/21	1127	2188641	2

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:
DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company: CN Associates, Inc.
Address: PO Box 1446
18 Pine Street
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Report Date: November 10, 2021
Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 1-20
Sample ID: 559247011
Matrix: Swipe
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client
Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Actinium-228	U	-1.43	+/-3.90	7.21	+/-3.95		pCi/Filter			MXR1	10/20/21	1321	2187276	1
Americium-241	U	0.118	+/-2.84	4.98	+/-2.84		pCi/Filter							
Antimony-124	U	-1.42	+/-2.31	3.96	+/-2.40		pCi/Filter							
Antimony-125	U	1.95	+/-1.60	3.58	+/-1.84		pCi/Filter							
Barium-133	U	-0.176	+/-0.816	1.37	+/-0.820		pCi/Filter							
Barium-140	U	4.72	+/-6.52	11.3	+/-6.88		pCi/Filter							
Beryllium-7	U	4.67	+/-6.09	12.2	+/-6.47		pCi/Filter							
Bismuth-212	U	7.15	+/-13.7	24.2	+/-14.1		pCi/Filter							
Bismuth-214	UI	0.000	+/-2.48	3.65	+/-3.13		pCi/Filter							
Cerium-139	U	-0.193	+/-0.460	0.784	+/-0.470		pCi/Filter							
Cerium-141	U	-1.37	+/-1.25	1.81	+/-1.39		pCi/Filter							
Cerium-144	U	-0.687	+/-3.26	5.74	+/-3.28		pCi/Filter							
Cesium-134	U	0.604	+/-0.740	1.68	+/-0.793		pCi/Filter							
Cesium-136	U	1.01	+/-2.38	4.76	+/-2.42		pCi/Filter							
Cesium-137		2.38	+/-1.11	1.42	+/-1.16	25.0	pCi/Filter							
Chromium-51	U	3.51	+/-6.66	13.5	+/-6.85		pCi/Filter							
Cobalt-56	U	-0.438	+/-0.902	1.55	+/-0.925		pCi/Filter							
Cobalt-57	U	-0.165	+/-0.408	0.707	+/-0.415		pCi/Filter							
Cobalt-58	U	0.155	+/-0.773	1.56	+/-0.777		pCi/Filter							
Cobalt-60	U	1.06	+/-1.13	2.60	+/-1.23		pCi/Filter							
Europium-152	U	-1.03	+/-1.97	3.55	+/-2.02		pCi/Filter							
Europium-154	U	0.408	+/-2.04	4.63	+/-2.05		pCi/Filter							
Europium-155	U	0.595	+/-1.56	2.97	+/-1.58		pCi/Filter							
Iridium-192	U	-0.461	+/-0.639	1.14	+/-0.673		pCi/Filter							
Iron-59	U	1.24	+/-1.05	3.12	+/-1.20		pCi/Filter							
Lead-210	U	-34.2	+/-101	176	+/-102		pCi/Filter							
Lead-212	U	0.140	+/-1.66	2.08	+/-1.66		pCi/Filter							
Lead-214	U	1.51	+/-1.87	2.75	+/-2.00		pCi/Filter							
Manganese-54	U	-0.588	+/-0.874	1.44	+/-0.917		pCi/Filter							
Mercury-203	U	0.365	+/-0.680	1.28	+/-0.700		pCi/Filter							
Neodymium-147	U	-10.2	+/-11.1	17.8	+/-12.1		pCi/Filter							
Neptunium-239	U	-1.46	+/-4.04	7.07	+/-4.09		pCi/Filter							
Niobium-94	U	0.844	+/-0.994	1.75	+/-1.07		pCi/Filter							
Niobium-95	U	-0.164	+/-1.05	1.77	+/-1.06		pCi/Filter							
Potassium-40	U	4.45	+/-12.9	17.3	+/-12.9		pCi/Filter							
Promethium-144	U	0.0321	+/-0.821	1.55	+/-0.821		pCi/Filter							
Promethium-146	U	-0.136	+/-0.900	1.67	+/-0.902		pCi/Filter							
Radium-226	UI	0.000	+/-2.48	3.65	+/-3.13		pCi/Filter							
Radium-228	U	-1.43	+/-3.90	7.21	+/-3.95		pCi/Filter							
Ruthenium-106	U	-1.72	+/-7.21	13.2	+/-7.26		pCi/Filter							

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : CN Associates, Inc.
Address : PO Box 1446
18 Pine Street
Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 1-20
Sample ID: 559247011

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Silver-110m	U	-0.484	+/-1.24	1.88	+/-1.26		pCi/Filter							
Sodium-22	U	0.144	+/-0.721	1.63	+/-0.724		pCi/Filter							
Thallium-208		2.25	+/-1.21	1.06	+/-1.24		pCi/Filter							
Thorium-234	UI	0.000	+/-49.2	35.0	+/-50.8		pCi/Filter							
Tin-113	U	-0.0782	+/-0.762	1.46	+/-0.763		pCi/Filter							
Uranium-235	U	-0.00592	+/-4.00	6.55	+/-4.00		pCi/Filter							
Uranium-238	UI	0.000	+/-49.2	35.0	+/-50.8		pCi/Filter							
Yttrium-88	U	-0.0471	+/-0.896	1.92	+/-0.897		pCi/Filter							
Zinc-65	U	0.512	+/-2.10	4.35	+/-2.11		pCi/Filter							
Zirconium-95	U	-0.530	+/-1.43	2.56	+/-1.45		pCi/Filter							
Rad Gas Flow Proportional Counting														
GFPC Gross A/B, Filter "As Received"														
Alpha	U	-0.000475	+/-0.150	0.339	+/-0.150	5.00	pCi/Filter			RXS2	10/26/21	1127	2188641	2

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : CN Associates, Inc.
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Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 1-30
Sample ID: 559247012
Matrix: Swipe
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Actinium-228	U	-1.39	+/-3.78	6.86	+/-3.84		pCi/Filter			MXR1	10/20/21	1847	2187276	1
Americium-241	U	0.334	+/-4.61	8.77	+/-4.61		pCi/Filter							
Antimony-124	U	-0.200	+/-2.66	5.57	+/-2.66		pCi/Filter							
Antimony-125	U	1.98	+/-2.16	4.46	+/-2.35		pCi/Filter							
Barium-133	U	-0.293	+/-1.01	1.84	+/-1.02		pCi/Filter							
Barium-140	U	-0.770	+/-6.87	12.5	+/-6.88		pCi/Filter							
Beryllium-7	U	10.3	+/-8.78	18.2	+/-9.99		pCi/Filter							
Bismuth-212	U	0.233	+/-12.1	22.5	+/-12.1		pCi/Filter							
Bismuth-214	U	-1.19	+/-2.22	3.37	+/-2.29		pCi/Filter							
Cerium-139	U	-0.0689	+/-0.507	0.893	+/-0.508		pCi/Filter							
Cerium-141	U	0.546	+/-1.19	2.21	+/-1.22		pCi/Filter							
Cerium-144	U	-1.43	+/-3.81	6.59	+/-3.86		pCi/Filter							
Cesium-134	U	0.807	+/-0.867	1.99	+/-0.947		pCi/Filter							
Cesium-136	U	2.15	+/-2.64	5.26	+/-2.82		pCi/Filter							
Cesium-137		64.5	+/-4.74	1.85	+/-9.82	25.0	pCi/Filter							
Chromium-51	U	1.72	+/-8.59	16.5	+/-8.63		pCi/Filter							
Cobalt-56	U	-0.241	+/-1.02	1.94	+/-1.02		pCi/Filter							
Cobalt-57	U	0.0701	+/-0.516	0.939	+/-0.517		pCi/Filter							
Cobalt-58	U	-0.569	+/-0.858	1.27	+/-0.899		pCi/Filter							
Cobalt-60		7.06	+/-3.14	2.30	+/-3.22		pCi/Filter							
Europium-152	U	-0.387	+/-2.46	4.08	+/-2.46		pCi/Filter							
Europium-154	U	-0.667	+/-2.26	4.39	+/-2.28		pCi/Filter							
Europium-155	U	1.20	+/-1.99	3.84	+/-2.07		pCi/Filter							
Iridium-192	U	0.190	+/-0.785	1.52	+/-0.789		pCi/Filter							
Iron-59	U	1.90	+/-2.29	5.15	+/-2.45		pCi/Filter							
Lead-210	U	115	+/-198	396	+/-205		pCi/Filter							
Lead-212	U	1.94	+/-1.83	2.51	+/-2.04		pCi/Filter							
Lead-214	U	0.247	+/-2.07	3.61	+/-2.08		pCi/Filter							
Manganese-54	U	-0.315	+/-0.887	1.67	+/-0.900		pCi/Filter							
Mercury-203	U	-0.161	+/-0.752	1.41	+/-0.756		pCi/Filter							
Neodymium-147	U	-5.92	+/-11.2	19.5	+/-11.5		pCi/Filter							
Neptunium-239	U	-3.72	+/-4.73	7.91	+/-5.03		pCi/Filter							
Niobium-94	U	-0.635	+/-0.774	1.22	+/-0.830		pCi/Filter							
Niobium-95	U	-0.258	+/-0.875	1.68	+/-0.883		pCi/Filter							
Potassium-40	U	5.73	+/-17.6	13.8	+/-17.6		pCi/Filter							
Promethium-144	U	-1.24	+/-1.01	1.49	+/-1.17		pCi/Filter							
Promethium-146	U	-0.227	+/-1.26	2.19	+/-1.26		pCi/Filter							
Radium-226	U	-1.19	+/-2.22	3.37	+/-2.29		pCi/Filter							
Radium-228	U	-1.39	+/-3.78	6.86	+/-3.84		pCi/Filter							
Ruthenium-106	U	3.45	+/-8.26	15.0	+/-8.42		pCi/Filter							
Silver-110m	U	2.88	+/-1.89	2.94	+/-2.33		pCi/Filter							

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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 1-30
Sample ID: 559247012

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Sodium-22	U	-0.208	+/-0.807	1.58	+/-0.813		pCi/Filter							
Thallium-208	U	-0.387	+/-0.972	1.59	+/-0.989		pCi/Filter							
Thorium-234	U	-49.4	+/-39.9	68.2	+/-47.0		pCi/Filter							
Tin-113	U	-0.835	+/-1.12	1.93	+/-1.19		pCi/Filter							
Uranium-235	U	-1.53	+/-4.15	6.70	+/-4.21		pCi/Filter							
Uranium-238	U	-49.4	+/-39.9	68.2	+/-47.0		pCi/Filter							
Yttrium-88	U	0.342	+/-1.17	2.68	+/-1.18		pCi/Filter							
Zinc-65	U	3.48	+/-3.32	3.79	+/-3.34		pCi/Filter							
Zirconium-95	U	-0.450	+/-1.69	3.09	+/-1.70		pCi/Filter							
Rad Gas Flow Proportional Counting														
GFPC Gross A/B, Filter "As Received"														
Alpha		0.710	+/-0.318	0.323	+/-0.318	5.00	pCi/Filter			RXB2	10/26/21	1127	2188641	2

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:
DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Company : CN Associates, Inc.
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Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 2-3
Sample ID: 559247013
Matrix: Swipe
Collect Date: 05-OCT-21
Receive Date: 18-OCT-21
Collector: Client

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Actinium-228	U	15.3	+/-13.1	18.3	+/-15.0		pCi/Filter			MXR1	10/20/21	1929	2187276	1
Americium-241	U	-1.89	+/-2.38	3.83	+/-2.54		pCi/Filter							
Antimony-124	U	0.985	+/-4.38	9.91	+/-4.40		pCi/Filter							
Antimony-125	U	-2.37	+/-4.37	7.75	+/-4.50		pCi/Filter							
Barium-133	U	1.02	+/-1.53	3.13	+/-1.60		pCi/Filter							
Barium-140	U	9.75	+/-10.9	23.3	+/-11.8		pCi/Filter							
Beryllium-7	U	-10.7	+/-15.1	26.1	+/-15.9		pCi/Filter							
Bismuth-212	U	4.91	+/-26.3	48.4	+/-26.4		pCi/Filter							
Bismuth-214	U	-1.66	+/-4.63	7.94	+/-4.69		pCi/Filter							
Cerium-139	U	-0.496	+/-0.975	1.65	+/-1.01		pCi/Filter							
Cerium-141	U	-1.75	+/-1.87	3.05	+/-2.04		pCi/Filter							
Cerium-144	U	0.329	+/-5.70	10.3	+/-5.70		pCi/Filter							
Cesium-134	U	-0.530	+/-1.85	3.32	+/-1.87		pCi/Filter							
Cesium-136	U	0.757	+/-4.67	9.75	+/-4.68		pCi/Filter							
Cesium-137		50.5	+/-5.91	3.33	+/-8.44	25.0	pCi/Filter							
Chromium-51	U	1.60	+/-14.0	27.1	+/-14.0		pCi/Filter							
Cobalt-56	U	-3.14	+/-2.25	3.21	+/-2.71		pCi/Filter							
Cobalt-57	U	0.0895	+/-0.683	1.25	+/-0.684		pCi/Filter							
Cobalt-58	U	-0.266	+/-1.69	3.13	+/-1.69		pCi/Filter							
Cobalt-60		11.0	+/-3.75	3.21	+/-3.95		pCi/Filter							
Europium-152	U	0.669	+/-3.61	7.04	+/-3.63		pCi/Filter							
Europium-154	U	1.92	+/-6.37	12.1	+/-6.43		pCi/Filter							
Europium-155	U	-1.12	+/-2.61	4.57	+/-2.66		pCi/Filter							
Iridium-192	U	0.512	+/-1.39	2.73	+/-1.41		pCi/Filter							
Iron-59	U	-0.996	+/-4.14	7.96	+/-4.16		pCi/Filter							
Lead-210	U	27.4	+/-17.7	34.5	+/-21.8		pCi/Filter							
Lead-212	U	-1.20	+/-2.61	4.41	+/-2.67		pCi/Filter							
Lead-214	U	0.136	+/-3.15	5.82	+/-3.15		pCi/Filter							
Manganese-54	U	0.0890	+/-1.69	3.20	+/-1.69		pCi/Filter							
Mercury-203	U	-0.215	+/-1.37	2.34	+/-1.37		pCi/Filter							
Neodymium-147	U	-13.9	+/-24.6	43.1	+/-25.4		pCi/Filter							
Neptunium-239	U	1.84	+/-7.84	14.3	+/-7.88		pCi/Filter							
Niobium-94	U	1.51	+/-1.53	3.11	+/-1.68		pCi/Filter							
Niobium-95	U	-0.114	+/-1.83	3.41	+/-1.83		pCi/Filter							
Potassium-40	U	11.0	+/-30.2	47.1	+/-30.2		pCi/Filter							
Promethium-144	U	1.11	+/-1.49	2.96	+/-1.58		pCi/Filter							
Promethium-146	U	0.558	+/-2.25	3.92	+/-2.27		pCi/Filter							
Radium-226	U	-1.66	+/-4.63	7.94	+/-4.69		pCi/Filter							
Radium-228	U	15.3	+/-13.1	18.3	+/-15.0		pCi/Filter							
Ruthenium-106	U	-0.222	+/-14.4	27.1	+/-14.4		pCi/Filter							
Silver-110m	U	1.77	+/-2.40	5.08	+/-2.54		pCi/Filter							

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Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 2-3
Sample ID: 559247013

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Sodium-22	U	0.772	+/-2.27	4.35	+/-2.30		pCi/Filter							
Thallium-208	U	-0.939	+/-1.88	3.20	+/-1.93		pCi/Filter							
Thorium-234	U	34.4	+/-54.0	36.6	+/-54.6		pCi/Filter							
Tin-113	U	0.420	+/-1.74	3.40	+/-1.75		pCi/Filter							
Uranium-235	U	-3.94	+/-7.16	11.2	+/-7.40		pCi/Filter							
Uranium-238	U	34.4	+/-54.0	36.6	+/-54.6		pCi/Filter							
Yttrium-88	U	-0.665	+/-1.72	3.26	+/-1.74		pCi/Filter							
Zinc-65	U	-1.92	+/-3.54	5.80	+/-3.65		pCi/Filter							
Zirconium-95	U	-0.607	+/-3.11	5.71	+/-3.12		pCi/Filter							
Rad Gas Flow Proportional Counting														
GFPC Gross A/B, Filter "As Received"														
Alpha	U	0.113	+/-0.190	0.340	+/-0.190	5.00	pCi/Filter			RXB2	10/26/21	1127	2188641	2

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma)

Column headers are defined as follows:
DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 7-14
Sample ID: 559247014
Matrix: Swipe
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Actinium-228	U	-3.08	+/-3.94	6.62	+/-4.20		pCi/Filter			MXR1	10/20/21	2101	2187276	1
Americium-241	U	-0.598	+/-4.49	7.83	+/-4.50		pCi/Filter							
Antimony-124	U	-1.41	+/-2.53	4.67	+/-2.61		pCi/Filter							
Antimony-125	U	-2.27	+/-2.22	3.66	+/-2.46		pCi/Filter							
Barium-133	U	-0.751	+/-0.963	1.45	+/-1.02		pCi/Filter							
Barium-140	U	0.654	+/-7.11	12.0	+/-7.11		pCi/Filter							
Beryllium-7	U	5.72	+/-8.79	17.4	+/-9.18		pCi/Filter							
Bismuth-212		23.0	+/-11.7	20.4	+/-12.1		pCi/Filter							
Bismuth-214	U	-0.565	+/-2.30	3.94	+/-2.32		pCi/Filter							
Cerium-139	U	0.167	+/-0.513	0.947	+/-0.518		pCi/Filter							
Cerium-141	U	-0.478	+/-1.17	2.00	+/-1.19		pCi/Filter							
Cerium-144	U	-0.428	+/-3.71	6.59	+/-3.71		pCi/Filter							
Cesium-134	U	0.284	+/-0.890	1.88	+/-0.900		pCi/Filter							
Cesium-136	U	-1.73	+/-2.24	3.77	+/-2.38		pCi/Filter							
Cesium-137		43.5	+/-3.84	1.67	+/-6.95	25.0	pCi/Filter							
Chromium-51	U	5.41	+/-7.89	15.9	+/-8.27		pCi/Filter							
Cobalt-56	U	-0.448	+/-1.07	1.98	+/-1.09		pCi/Filter							
Cobalt-57	U	0.346	+/-0.426	0.842	+/-0.454		pCi/Filter							
Cobalt-58	U	0.187	+/-0.803	1.70	+/-0.808		pCi/Filter							
Cobalt-60		4.89	+/-1.89	1.90	+/-1.96		pCi/Filter							
Europium-152	U	0.577	+/-2.28	4.02	+/-2.29		pCi/Filter							
Europium-154	U	-0.546	+/-2.78	5.39	+/-2.79		pCi/Filter							
Europium-155	U	0.876	+/-1.91	3.66	+/-1.95		pCi/Filter							
Iridium-192	U	-0.288	+/-0.712	1.30	+/-0.725		pCi/Filter							
Iron-59	U	-0.762	+/-1.64	3.04	+/-1.68		pCi/Filter							
Lead-210	U	261	+/-290	338	+/-291		pCi/Filter							
Lead-212	U	1.22	+/-2.19	2.54	+/-2.26		pCi/Filter							
Lead-214	U	-0.295	+/-1.82	3.04	+/-1.83		pCi/Filter							
Manganese-54	U	-0.446	+/-0.705	1.27	+/-0.736		pCi/Filter							
Mercury-203	U	-0.138	+/-0.716	1.35	+/-0.718		pCi/Filter							
Neodymium-147	U	-14.8	+/-13.1	20.3	+/-14.8		pCi/Filter							
Neptunium-239	U	0.308	+/-4.87	8.91	+/-4.87		pCi/Filter							
Niobium-94	UI	0.000	+/-1.83	1.90	+/-2.09		pCi/Filter							
Niobium-95	U	-0.249	+/-0.851	1.64	+/-0.859		pCi/Filter							
Potassium-40	U	0.848	+/-13.3	27.5	+/-13.3		pCi/Filter							
Promethium-144	U	0.143	+/-0.918	1.57	+/-0.920		pCi/Filter							
Promethium-146	U	-0.382	+/-1.25	1.93	+/-1.26		pCi/Filter							
Radium-226	U	-0.565	+/-2.30	3.94	+/-2.32		pCi/Filter							
Radium-228	U	-3.08	+/-3.94	6.62	+/-4.20		pCi/Filter							
Ruthenium-106	U	-2.12	+/-9.02	14.2	+/-9.07		pCi/Filter							
Silver-110m	U	-0.463	+/-1.11	2.07	+/-1.13		pCi/Filter							

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company: CN Associates, Inc.
Address: PO Box 1446
18 Pine Street
Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 7-14
Sample ID: 559247014

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Sodium-22	U	-0.166	+/-0.989	1.93	+/-0.992		pCi/Filter							
Thallium-208	U	0.221	+/-1.29	1.60	+/-1.29		pCi/Filter							
Thorium-234	UI	0.000	+/-90.2	55.2	+/-91.4		pCi/Filter							
Tin-113	U	0.440	+/-1.01	1.99	+/-1.03		pCi/Filter							
Uranium-235	U	-0.468	+/-3.91	6.44	+/-3.91		pCi/Filter							
Uranium-238	UI	0.000	+/-90.2	55.2	+/-91.4		pCi/Filter							
Yttrium-88	U	0.151	+/-0.976	2.27	+/-0.979		pCi/Filter							
Zinc-65	U	-0.722	+/-1.94	3.59	+/-1.96		pCi/Filter							
Zirconium-95	U	-0.897	+/-1.61	2.80	+/-1.66		pCi/Filter							
Rad Gas Flow Proportional Counting														
GFPC Gross A/B, Filter "As Received"														
Alpha		0.748	+/-0.307	0.257	+/-0.308	5.00	pCi/Filter			RXB2	10/26/21	1127	2188641	2

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : CN Associates, Inc.
Address : PO Box 1446
18 Pine Street
Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 7-30
Sample ID: 559247015
Matrix: Swipe
Collect Date: 06-OCT-21
Receive Date: 18-OCT-21
Collector: Client

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Actinium-228	U	0.833	+/-5.85	8.49	+/-5.86		pCi/Filter			MXR1	10/20/21	2304	2187276	1
Americium-241	U	3.22	+/-3.62	7.27	+/-3.91		pCi/Filter							
Antimony-124	U	3.71	+/-2.67	7.17	+/-3.17		pCi/Filter							
Antimony-125	U	2.17	+/-2.65	5.26	+/-2.83		pCi/Filter							
Barium-133	U	0.425	+/-0.939	1.93	+/-0.999		pCi/Filter							
Barium-140	U	-5.05	+/-6.26	10.8	+/-6.69		pCi/Filter							
Beryllium-7	U	5.59	+/-9.25	18.2	+/-9.60		pCi/Filter							
Bismuth-212	U	3.59	+/-11.0	20.6	+/-11.1		pCi/Filter							
Bismuth-214	U	0.185	+/-2.03	3.71	+/-2.03		pCi/Filter							
Cerium-139	U	-0.277	+/-0.557	0.947	+/-0.574		pCi/Filter							
Cerium-141	U	0.371	+/-0.989	1.86	+/-1.00		pCi/Filter							
Cerium-144	U	0.0202	+/-3.37	6.11	+/-3.37		pCi/Filter							
Cesium-134	U	0.194	+/-0.722	1.52	+/-0.728		pCi/Filter							
Cesium-136	U	0.350	+/-2.17	4.46	+/-2.18		pCi/Filter							
Cesium-137		135	+/-6.27	1.57	+/-17.9	25.0	pCi/Filter							
Chromium-51	U	-2.98	+/-9.30	15.5	+/-9.40		pCi/Filter							
Cobalt-56	U	0.0620	+/-0.899	1.76	+/-0.899		pCi/Filter							
Cobalt-57	U	-0.185	+/-0.419	0.732	+/-0.428		pCi/Filter							
Cobalt-58	U	-0.521	+/-0.819	1.40	+/-0.855		pCi/Filter							
Cobalt-60		5.18	+/-2.21	1.91	+/-2.27		pCi/Filter							
Europium-152	U	0.801	+/-2.36	4.23	+/-2.39		pCi/Filter							
Europium-154	U	0.524	+/-2.09	4.88	+/-2.11		pCi/Filter							
Europium-155	U	-0.706	+/-1.79	3.16	+/-1.82		pCi/Filter							
Iridium-192	U	0.121	+/-0.914	1.59	+/-0.916		pCi/Filter							
Iron-59	U	0.527	+/-2.36	4.68	+/-2.37		pCi/Filter							
Lead-210	U	62.1	+/-152	274	+/-155		pCi/Filter							
Lead-212	U	2.10	+/-2.26	2.69	+/-2.46		pCi/Filter							
Lead-214	U	0.226	+/-1.95	3.25	+/-1.95		pCi/Filter							
Manganese-54	U	0.147	+/-0.664	1.38	+/-0.668		pCi/Filter							
Mercury-203	U	-0.414	+/-0.933	1.41	+/-0.952		pCi/Filter							
Neodymium-147	U	1.58	+/-12.9	24.9	+/-12.9		pCi/Filter							
Neptunium-239	U	-1.13	+/-4.36	7.77	+/-4.39		pCi/Filter							
Niobium-94	U	0.917	+/-0.750	1.67	+/-0.864		pCi/Filter							
Niobium-95	U	0.369	+/-0.722	1.57	+/-0.742		pCi/Filter							
Potassium-40	U	-8.56	+/-12.8	25.7	+/-13.4		pCi/Filter							
Promethium-144	U	0.499	+/-0.762	1.50	+/-0.797		pCi/Filter							
Promethium-146	U	1.23	+/-1.32	2.46	+/-1.44		pCi/Filter							
Radium-226	U	0.185	+/-2.03	3.71	+/-2.03		pCi/Filter							
Radium-228	U	0.833	+/-5.85	8.49	+/-5.86		pCi/Filter							
Ruthenium-106	U	2.66	+/-7.91	15.6	+/-8.01		pCi/Filter							
Silver-110m	U	0.696	+/-1.63	2.56	+/-1.66		pCi/Filter							

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Certificate of Analysis

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Manchester, Massachusetts 01944

Report Date: November 10, 2021

Contact: Mr. Ron Cardarelli
Project: Schulz Electric

Client Sample ID: Wipe 7-30
Sample ID: 559247015

Project: CNAS00221
Client ID: CNAS001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
Gammaspec, Gamma, Filter (Standard List) "As Received"														
Sodium-22	U	0.282	+/-0.694	1.70	+/-0.706		pCi/Filter							
Thallium-208	U	-0.0926	+/-0.889	1.58	+/-0.890		pCi/Filter							
Thorium-234	U	-23.1	+/-35.7	60.3	+/-37.6		pCi/Filter							
Tin-113	U	0.323	+/-1.11	2.15	+/-1.12		pCi/Filter							
Uranium-235	U	-4.65	+/-3.58	5.76	+/-4.17		pCi/Filter							
Uranium-238	U	-23.1	+/-35.7	60.3	+/-37.6		pCi/Filter							
Yttrium-88	U	-1.19	+/-1.05	2.08	+/-1.19		pCi/Filter							
Zinc-65	U	0.472	+/-1.99	4.04	+/-2.00		pCi/Filter							
Zirconium-95	U	1.52	+/-1.48	3.36	+/-1.65		pCi/Filter							
Rad Gas Flow Proportional Counting														
GFPC Gross A/B, Filter "As Received"														
Alpha		0.502	+/-0.249	0.219	+/-0.249	5.00	pCi/Filter			RXB2	10/26/21	1127	2188641	2

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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QC Summary

Report Date: November 10, 2021

CN Associates, Inc.
PO Box 1446
18 Pine Street
Manchester, Massachusetts

Contact: **Mr. Ron Cardarelli**

Workorder: **559247**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187275										
QC1204935111 559247001 DUP										
Actinium-228	U	0.392		0.372	pCi/g	13.4		(0% - 100%)	MXR1	11/10/21 06:56
	Uncertainty	+/-0.176		+/-0.177						
Americium-241	U	0.186	U	0.177	pCi/g	N/A		N/A		
	Uncertainty	+/-0.167		+/-0.194						
Antimony-124	U	0.0206	U	-0.00681	pCi/g	N/A		N/A		
	Uncertainty	+/-0.0405		+/-0.120						
Antimony-125	U	0.0215	U	0.0131	pCi/g	N/A		N/A		
	Uncertainty	+/-0.0638		+/-0.0737						
Barium-133	U	-0.00222	U	0.0132	pCi/g	N/A		N/A		
	Uncertainty	+/-0.0372		+/-0.0365						
Barium-140	U	0.118	U	0.0288	pCi/g	N/A		N/A		
	Uncertainty	+/-0.557		+/-0.627						
Beryllium-7	U	0.285	U	0.503	pCi/g	N/A		N/A		
	Uncertainty	+/-0.335		+/-0.360						
Bismuth-212	U	-0.235	U	0.349	pCi/g	N/A		N/A		
	Uncertainty	+/-0.406		+/-0.383						
Bismuth-214		0.245		0.185	pCi/g	27.7		(0% - 100%)		
	Uncertainty	+/-0.107		+/-0.124						
Cerium-139	U	-0.000217	U	-0.00714	pCi/g	N/A		N/A		
	Uncertainty	+/-0.0258		+/-0.0250						
Cerium-141	U	0.00488	U	0.0469	pCi/g	N/A		N/A		
	Uncertainty	+/-0.0641		+/-0.0714						
Cerium-144	U	-0.00559	U	-0.0266	pCi/g	N/A		N/A		
	Uncertainty	+/-0.133		+/-0.147						
Cesium-134	U	0.0154	U	0.0234	pCi/g	N/A		N/A		
	Uncertainty	+/-0.0366		+/-0.0305						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187275										
Cesium-136	U	0.0898	U	-0.00251	pCi/g	N/A			N/A MXR1	11/10/21 06:56
	Uncertainty	+/-0.234		+/-0.306						
Cesium-137	U	0.0341	U	0.00791	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0479		+/-0.0329						
Chromium-51	U	-0.0854	U	0.199	pCi/g	N/A			N/A	
	Uncertainty	+/-0.448		+/-0.445						
Cobalt-56	U	-0.0219	U	0.00798	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0343		+/-0.0429						
Cobalt-57	U	-0.00816	U	-0.0117	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0187		+/-0.0205						
Cobalt-58	U	0.00951	U	0.0570	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0354		+/-0.0410						
Cobalt-60	U	0.00834	U	-0.00499	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0306		+/-0.0360						
Europium-152	U	0.0203	U	-0.0316	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0699		+/-0.0699						
Europium-154	U	-0.0206	U	0.0176	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0996		+/-0.0987						
Europium-155	U	0.00877	U	-0.0233	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0697		+/-0.0832						
Iridium-192	U	-0.00106	U	-0.00990	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0293		+/-0.0301						
Iron-59	U	-0.0390	U	-0.0175	pCi/g	N/A			N/A	
	Uncertainty	+/-0.100		+/-0.0719						
Lead-210	U	-0.734	UI	0.000	pCi/g	N/A			N/A	
	Uncertainty	+/-3.41		+/-8.14						
Lead-212		0.276		0.389	pCi/g	34.2		(0% - 100%)		
	Uncertainty	+/-0.121		+/-0.144						
Lead-214		0.306		0.357	pCi/g	15.6		(0% - 100%)		
	Uncertainty	+/-0.114		+/-0.168						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187275										
Manganese-54	U	0.00306	U	0.0133	pCi/g	N/A			N/A MXR1	11/10/21 06:56
	Uncertainty	+/-0.0285		+/-0.0295						
Mercury-203	U	0.00463	U	0.0191	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0404		+/-0.0335						
Neodymium-147	U	-0.412	U	1.62	pCi/g	N/A			N/A	
	Uncertainty	+/-1.39		+/-1.44						
Neptunium-239	U	-0.217	U	-0.0357	pCi/g	N/A			N/A	
	Uncertainty	+/-0.176		+/-0.183						
Niobium-94	U	0.0266	U	0.0158	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0316		+/-0.0283						
Niobium-95	U	0.0184	U	0.00196	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0459		+/-0.0402						
Potassium-40		4.00		4.63	pCi/g	14.6		(0%-20%)		
	Uncertainty	+/-0.939		+/-1.01						
Promethium-144	U	-0.00336	U	0.00344	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0348		+/-0.0293						
Promethium-146	U	-0.00180	U	-0.0212	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0345		+/-0.0365						
Radium-226		0.245		0.185	pCi/g	27.7		(0% - 100%)		
	Uncertainty	+/-0.107		+/-0.124						
Radium-228	U	0.392		0.372	pCi/g	13.4		(0% - 100%)		
	Uncertainty	+/-0.176		+/-0.177						
Ruthenium-106	U	0.341	U	0.367	pCi/g	N/A			N/A	
	Uncertainty	+/-0.329		+/-0.364						
Silver-110m	U	0.000665	U	0.0209	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0391		+/-0.0347						
Sodium-22	U	0.00508	U	0.00530	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0324		+/-0.0349						
Thallium-208		0.0860		0.150	pCi/g	54.2		(0% - 100%)		
	Uncertainty	+/-0.0444		+/-0.0639						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187275										
Thorium-234	U	0.00553	U	-0.132	pCi/g	N/A			N/A MXR1	11/10/21 06:56
	Uncertainty	+/-0.933		+/-1.54						
Tin-113	U	-0.0189	U	-0.00356	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0368		+/-0.0383						
Uranium-235	U	-0.0948	U	-0.0193	pCi/g	N/A			N/A	
	Uncertainty	+/-0.148		+/-0.150						
Uranium-238	U	0.00553	U	-0.132	pCi/g	N/A			N/A	
	Uncertainty	+/-0.933		+/-1.54						
Yttrium-88	U	0.00974	U	-0.00869	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0373		+/-0.0170						
Zinc-65	U	0.0450	U	-0.0751	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0581		+/-0.0724						
Zirconium-95	U	-0.0199	U	-0.0334	pCi/g	N/A			N/A	
	Uncertainty	+/-0.0716		+/-0.0534						
QC1204935112 LCS										
Actinium-228			U	-0.807	pCi/g					11/10/21 06:57
	Uncertainty			+/-2.06						
Americium-241	485			514	pCi/g		106	(75%-125%)		
	Uncertainty			+/-9.68						
Antimony-124			U	-0.138	pCi/g					
	Uncertainty			+/-0.369						
Antimony-125			U	-0.313	pCi/g					
	Uncertainty			+/-1.22						
Barium-133			U	0.344	pCi/g					
	Uncertainty			+/-0.456						
Barium-140			U	0.715	pCi/g					
	Uncertainty			+/-4.08						
Beryllium-7			U	-1.39	pCi/g					
	Uncertainty			+/-5.00						
Bismuth-212			U	-1.54	pCi/g					
	Uncertainty			+/-5.15						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187275										
Bismuth-214			U	0.353	pCi/g				MXR1	11/10/21 06:57
	Uncertainty			+/-0.707						
Cerium-139			U	0.128	pCi/g					
	Uncertainty			+/-0.275						
Cerium-141			U	0.550	pCi/g					
	Uncertainty			+/-0.619						
Cerium-144			U	0.130	pCi/g					
	Uncertainty			+/-1.83						
Cesium-134			U	0.242	pCi/g					
	Uncertainty			+/-0.440						
Cesium-136			U	0.171	pCi/g					
	Uncertainty			+/-1.97						
Cesium-137	160			155	pCi/g		97	(75%-125%)		
	Uncertainty			+/-2.88						
Chromium-51			U	-2.96	pCi/g					
	Uncertainty			+/-5.04						
Cobalt-56			U	0.0552	pCi/g					
	Uncertainty			+/-0.515						
Cobalt-57			U	-0.0309	pCi/g					
	Uncertainty			+/-0.242						
Cobalt-58			U	0.117	pCi/g					
	Uncertainty			+/-0.496						
Cobalt-60	82.6			78.8	pCi/g		95.4	(75%-125%)		
	Uncertainty			+/-2.57						
Europium-152			U	0.134	pCi/g					
	Uncertainty			+/-1.17						
Europium-154			U	-0.160	pCi/g					
	Uncertainty			+/-0.582						
Europium-155			U	-0.313	pCi/g					
	Uncertainty			+/-0.972						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187275										
Iridium-192			U	0.152	pCi/g				MXR1	11/10/21 06:57
	Uncertainty			+/-0.423						
Iron-59			U	-0.225	pCi/g					
	Uncertainty			+/-1.38						
Lead-210				4180	pCi/g					
	Uncertainty			+/-233						
Lead-212			U	0.0708	pCi/g					
	Uncertainty			+/-0.562						
Lead-214			U	-0.294	pCi/g					
	Uncertainty			+/-0.908						
Manganese-54			U	0.157	pCi/g					
	Uncertainty			+/-0.436						
Mercury-203			U	-0.463	pCi/g					
	Uncertainty			+/-0.451						
Neodymium-147			U	0.499	pCi/g					
	Uncertainty			+/-9.48						
Neptunium-239			U	-1.78	pCi/g					
	Uncertainty			+/-2.42						
Niobium-94			U	-0.0816	pCi/g					
	Uncertainty			+/-0.308						
Niobium-95			U	-0.0588	pCi/g					
	Uncertainty			+/-0.458						
Potassium-40			U	-0.411	pCi/g					
	Uncertainty			+/-1.84						
Promethium-144			U	0.161	pCi/g					
	Uncertainty			+/-0.335						
Promethium-146			U	0.255	pCi/g					
	Uncertainty			+/-0.615						
Radium-226			U	0.353	pCi/g					
	Uncertainty			+/-0.707						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187275										
Radium-228			U	-0.807	pCi/g				MXR1	11/10/21 06:57
	Uncertainty			+/-2.06						
Ruthenium-106			U	-1.04	pCi/g					
	Uncertainty			+/-3.42						
Silver-110m			U	0.254	pCi/g					
	Uncertainty			+/-0.670						
Sodium-22			U	-0.0557	pCi/g					
	Uncertainty			+/-0.206						
Thallium-208			U	-0.0260	pCi/g					
	Uncertainty			+/-0.389						
Thorium-234			U	-3.58	pCi/g					
	Uncertainty			+/-14.0						
Tin-113			U	0.229	pCi/g					
	Uncertainty			+/-0.569						
Uranium-235			U	-0.695	pCi/g					
	Uncertainty			+/-1.76						
Uranium-238			U	-3.58	pCi/g					
	Uncertainty			+/-14.0						
Yttrium-88			U	-0.00425	pCi/g					
	Uncertainty			+/-0.170						
Zinc-65			U	-0.923	pCi/g					
	Uncertainty			+/-1.11						
Zirconium-95			U	0.115	pCi/g					
	Uncertainty			+/-0.792						
QC1204935110 MB										
Actinium-228			U	-0.0250	pCi/g					11/10/21 05:57
	Uncertainty			+/-0.0846						
Americium-241			U	0.00527	pCi/g					
	Uncertainty			+/-0.0737						
Antimony-124			U	0.0194	pCi/g					
	Uncertainty			+/-0.0380						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187275										
Antimony-125			U	-0.00550	pCi/g				MXR1	11/10/21 05:57
	Uncertainty			+/-0.0467						
Barium-133			U	-0.00169	pCi/g					
	Uncertainty			+/-0.0272						
Barium-140			U	-0.0285	pCi/g					
	Uncertainty			+/-0.205						
Beryllium-7			U	-0.00495	pCi/g					
	Uncertainty			+/-0.223						
Bismuth-212			U	0.165	pCi/g					
	Uncertainty			+/-0.331						
Bismuth-214			U	0.00108	pCi/g					
	Uncertainty			+/-0.0644						
Cerium-139			U	5.49E-05	pCi/g					
	Uncertainty			+/-0.0146						
Cerium-141			U	-0.0271	pCi/g					
	Uncertainty			+/-0.0357						
Cerium-144			U	-0.0167	pCi/g					
	Uncertainty			+/-0.108						
Cesium-134			U	0.00924	pCi/g					
	Uncertainty			+/-0.0175						
Cesium-136			U	-0.0629	pCi/g					
	Uncertainty			+/-0.0852						
Cesium-137			U	-0.00238	pCi/g					
	Uncertainty			+/-0.0160						
Chromium-51			U	0.0952	pCi/g					
	Uncertainty			+/-0.223						
Cobalt-56			U	-0.0103	pCi/g					
	Uncertainty			+/-0.0191						
Cobalt-57			U	0.00781	pCi/g					
	Uncertainty			+/-0.0118						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187275										
Cobalt-58			U	0.0311	pCi/g				MXR1	11/10/21 05:57
	Uncertainty			+/-0.0370						
Cobalt-60			U	0.0183	pCi/g					
	Uncertainty			+/-0.0260						
Europium-152			U	0.0103	pCi/g					
	Uncertainty			+/-0.0515						
Europium-154			U	0.00104	pCi/g					
	Uncertainty			+/-0.0440						
Europium-155			U	0.00514	pCi/g					
	Uncertainty			+/-0.0464						
Iridium-192			U	-0.00323	pCi/g					
	Uncertainty			+/-0.0180						
Iron-59			U	-0.0400	pCi/g					
	Uncertainty			+/-0.0611						
Lead-210			U	0.262	pCi/g					
	Uncertainty			+/-2.30						
Lead-212			U	-0.0114	pCi/g					
	Uncertainty			+/-0.0382						
Lead-214			U	0.0878	pCi/g					
	Uncertainty			+/-0.0641						
Manganese-54			U	0.000751	pCi/g					
	Uncertainty			+/-0.0231						
Mercury-203			U	0.00941	pCi/g					
	Uncertainty			+/-0.0193						
Neodymium-147			U	-0.0717	pCi/g					
	Uncertainty			+/-0.370						
Neptunium-239			U	-0.00957	pCi/g					
	Uncertainty			+/-0.138						
Niobium-94			U	0.00302	pCi/g					
	Uncertainty			+/-0.0167						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187275										
Niobium-95			U	-0.00481	pCi/g				MXR1	11/10/21 05:57
	Uncertainty			+/-0.0196						
Potassium-40			U	-0.0954	pCi/g					
	Uncertainty			+/-0.427						
Promethium-144			U	0.0158	pCi/g					
	Uncertainty			+/-0.0214						
Promethium-146			U	-0.0250	pCi/g					
	Uncertainty			+/-0.0268						
Radium-226			U	0.00108	pCi/g					
	Uncertainty			+/-0.0644						
Radium-228			U	-0.0250	pCi/g					
	Uncertainty			+/-0.0846						
Ruthenium-106			U	-0.0852	pCi/g					
	Uncertainty			+/-0.198						
Silver-110m			U	0.00523	pCi/g					
	Uncertainty			+/-0.0204						
Sodium-22			U	0.000368	pCi/g					
	Uncertainty			+/-0.0156						
Thallium-208			U	0.0126	pCi/g					
	Uncertainty			+/-0.0241						
Thorium-234			U	-0.0406	pCi/g					
	Uncertainty			+/-0.667						
Tin-113			U	-0.00241	pCi/g					
	Uncertainty			+/-0.0201						
Uranium-235			U	-0.0340	pCi/g					
	Uncertainty			+/-0.101						
Uranium-238			U	-0.0406	pCi/g					
	Uncertainty			+/-0.667						
Yttrium-88			U	0.00827	pCi/g					
	Uncertainty			+/-0.0309						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187275										
Zinc-65			U	0.0221	pCi/g				MXR1	11/10/21 05:57
	Uncertainty			+/-0.0401						
Zirconium-95			U	-0.00988	pCi/g					
	Uncertainty			+/-0.0522						
Batch 2187276										
QC12049351 14 559247009 DUP										
Actinium-228	U	-2.33	U	0.471	pCi/Filter	N/A			N/A MXR1	10/20/21 23:08
	Uncertainty	+/-8.20		+/-4.42						
Americium-241	U	0.938	U	2.15	pCi/Filter	N/A			N/A	
	Uncertainty	+/-2.27		+/-4.46						
Antimony-124	U	-1.10	U	0.262	pCi/Filter	N/A			N/A	
	Uncertainty	+/-4.78		+/-2.32						
Antimony-125	U	-2.63	U	-1.13	pCi/Filter	N/A			N/A	
	Uncertainty	+/-3.63		+/-1.80						
Barium-133	U	0.121	U	-0.0452	pCi/Filter	N/A			N/A	
	Uncertainty	+/-1.53		+/-0.793						
Barium-140	U	-5.84	U	1.37	pCi/Filter	N/A			N/A	
	Uncertainty	+/-10.1		+/-5.82						
Beryllium-7	U	-2.86	U	-5.26	pCi/Filter	N/A			N/A	
	Uncertainty	+/-11.4		+/-6.13						
Bismuth-212	U	8.51	U	10.7	pCi/Filter	N/A			N/A	
	Uncertainty	+/-26.2		+/-15.5						
Bismuth-214	U	-2.62	U	-1.24	pCi/Filter	N/A			N/A	
	Uncertainty	+/-4.37		+/-2.12						
Cerium-139	U	-0.193	U	0.233	pCi/Filter	N/A			N/A	
	Uncertainty	+/-0.851		+/-0.525						
Cerium-141	U	1.11	U	-0.807	pCi/Filter	N/A			N/A	
	Uncertainty	+/-3.78		+/-1.12						
Cerium-144	U	-0.261	U	-2.20	pCi/Filter	N/A			N/A	
	Uncertainty	+/-5.13		+/-2.91						
Cesium-134	U	-0.318	U	-0.147	pCi/Filter	N/A			N/A	
	Uncertainty	+/-1.74		+/-0.899						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187276										
Cesium-136	U	-3.19	U	1.09	pCi/Filter	N/A			N/A MXR1	10/20/21 23:08
	Uncertainty	+/-4.44		+/-2.23						
Cesium-137	U	2.30		2.38	pCi/Filter	48.8		(0% - 100%)		
	Uncertainty	+/-1.80		+/-1.22						
Chromium-51	U	2.59	U	1.06	pCi/Filter	N/A			N/A	
	Uncertainty	+/-12.3		+/-6.68						
Cobalt-56	U	-0.729	U	0.433	pCi/Filter	N/A			N/A	
	Uncertainty	+/-2.63		+/-1.08						
Cobalt-57	U	-0.260	U	-0.0341	pCi/Filter	N/A			N/A	
	Uncertainty	+/-0.633		+/-0.424						
Cobalt-58	U	0.428	U	0.157	pCi/Filter	N/A			N/A	
	Uncertainty	+/-2.08		+/-0.678						
Cobalt-60	U	0.000	U	0.0296	pCi/Filter	N/A			N/A	
	Uncertainty	+/-2.74		+/-0.927						
Europium-152	U	0.610	U	0.283	pCi/Filter	N/A			N/A	
	Uncertainty	+/-3.30		+/-1.56						
Europium-154	U	-7.06	U	4.22	pCi/Filter	N/A			N/A	
	Uncertainty	+/-7.73		+/-2.49						
Europium-155	U	-0.880	U	0.167	pCi/Filter	N/A			N/A	
	Uncertainty	+/-2.50		+/-1.93						
Iridium-192	U	0.249	U	-0.917	pCi/Filter	N/A			N/A	
	Uncertainty	+/-1.22		+/-0.670						
Iron-59	U	0.516	U	-0.248	pCi/Filter	N/A			N/A	
	Uncertainty	+/-4.02		+/-1.64						
Lead-210	U	11.9	U	-228	pCi/Filter	N/A			N/A	
	Uncertainty	+/-17.9		+/-176						
Lead-212	U	0.174	U	-0.239	pCi/Filter	N/A			N/A	
	Uncertainty	+/-2.94		+/-1.28						
Lead-214	U	1.84	U	0.928	pCi/Filter	N/A			N/A	
	Uncertainty	+/-4.97		+/-1.82						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187276										
Manganese-54	U	0.742	U	0.683	pCi/Filter	N/A			N/A MXR1	10/20/21 23:08
	Uncertainty	+/-1.33		+/-0.758						
Mercury-203	U	0.740	U	0.581	pCi/Filter	N/A			N/A	
	Uncertainty	+/-1.37		+/-0.657						
Neodymium-147	U	0.0729	U	-6.42	pCi/Filter	N/A			N/A	
	Uncertainty	+/-21.7		+/-10.2						
Neptunium-239	U	2.35	U	-1.11	pCi/Filter	N/A			N/A	
	Uncertainty	+/-6.04		+/-4.77						
Niobium-94	U	-0.791	U	-0.187	pCi/Filter	N/A			N/A	
	Uncertainty	+/-1.55		+/-0.848						
Niobium-95	U	1.00	U	0.770	pCi/Filter	N/A			N/A	
	Uncertainty	+/-1.73		+/-1.18						
Potassium-40	U	13.6	U	6.21	pCi/Filter	N/A			N/A	
	Uncertainty	+/-37.1		+/-12.3						
Promethium-144	U	-0.482	U	0.229	pCi/Filter	N/A			N/A	
	Uncertainty	+/-1.76		+/-0.928						
Promethium-146	U	0.909	U	-0.242	pCi/Filter	N/A			N/A	
	Uncertainty	+/-1.53		+/-1.07						
Radium-226	U	-2.62	U	-1.24	pCi/Filter	N/A			N/A	
	Uncertainty	+/-4.37		+/-2.12						
Radium-228	U	-2.33	U	0.471	pCi/Filter	N/A			N/A	
	Uncertainty	+/-8.20		+/-4.42						
Ruthenium-106	U	-0.199	U	-6.16	pCi/Filter	N/A			N/A	
	Uncertainty	+/-11.4		+/-6.95						
Silver-110m	U	-1.84	U	-0.492	pCi/Filter	N/A			N/A	
	Uncertainty	+/-2.13		+/-1.12						
Sodium-22	U	-2.49	U	1.49	pCi/Filter	N/A			N/A	
	Uncertainty	+/-2.73		+/-0.880						
Thallium-208	U	-0.288	U	-0.496	pCi/Filter	N/A			N/A	
	Uncertainty	+/-2.02		+/-0.916						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 3187276										
Thorium-234	U	17.7	U	-19.5	pCi/Filter	N/A			N/A MXR1	10/20/21 23:08
	Uncertainty	+/-45.6		+/-39.9						
Tin-113	U	0.902	U	-0.705	pCi/Filter	N/A			N/A	
	Uncertainty	+/-1.68		+/-0.872						
Uranium-235	U	3.85	U	0.566	pCi/Filter	N/A			N/A	
	Uncertainty	+/-11.9		+/-4.00						
Uranium-238	U	17.7	U	-19.5	pCi/Filter	N/A			N/A	
	Uncertainty	+/-45.6		+/-39.9						
Yttrium-88	U	-0.424	U	0.789	pCi/Filter	N/A			N/A	
	Uncertainty	+/-2.13		+/-0.934						
Zinc-65	U	-0.795	U	0.606	pCi/Filter	N/A			N/A	
	Uncertainty	+/-3.35		+/-1.79						
Zirconium-95	U	1.49	U	-0.115	pCi/Filter	N/A			N/A	
	Uncertainty	+/-3.24		+/-1.68						
QC1204935115 LCS										
Actinium-228			U	-49.7	pCi/Filter					10/21/21 05:46
	Uncertainty			+/-109						
Americium-241	30400			28600	pCi/Filter		94	(75%-125%)		
	Uncertainty			+/-523						
Antimony-124			U	44.3	pCi/Filter					
	Uncertainty			+/-23.2						
Antimony-125			U	-12.4	pCi/Filter					
	Uncertainty			+/-62.4						
Barium-133			U	-11.9	pCi/Filter					
	Uncertainty			+/-22.5						
Barium-140			U	12.3	pCi/Filter					
	Uncertainty			+/-83.1						
Beryllium-7			U	251	pCi/Filter					
	Uncertainty			+/-207						
Bismuth-212			U	58.5	pCi/Filter					
	Uncertainty			+/-241						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187276										
Bismuth-214			U	-6.18	pCi/Filter				MXR1	10/21/21 05:46
	Uncertainty			+/-35.8						
Cerium-139			U	1.59	pCi/Filter					
	Uncertainty			+/-10.7						
Cerium-141			U	-1.39	pCi/Filter					
	Uncertainty			+/-17.0						
Cerium-144			U	-26.7	pCi/Filter					
	Uncertainty			+/-77.9						
Cesium-134			U	14.4	pCi/Filter					
	Uncertainty			+/-25.1						
Cesium-136			U	12.8	pCi/Filter					
	Uncertainty			+/-34.3						
Cesium-137	9110			9460	pCi/Filter		104	(75%-125%)		
	Uncertainty			+/-165						
Chromium-51			U	37.7	pCi/Filter					
	Uncertainty			+/-148						
Cobalt-56			U	2.04	pCi/Filter					
	Uncertainty			+/-21.6						
Cobalt-57			U	8.76	pCi/Filter					
	Uncertainty			+/-16.4						
Cobalt-58			U	-3.23	pCi/Filter					
	Uncertainty			+/-22.1						
Cobalt-60	3870			4020	pCi/Filter		104	(75%-125%)		
	Uncertainty			+/-142						
Europium-152			U	-34.3	pCi/Filter					
	Uncertainty			+/-51.4						
Europium-154			U	1.76	pCi/Filter					
	Uncertainty			+/-32.4						
Europium-155			U	-32.1	pCi/Filter					
	Uncertainty			+/-48.6						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 3187276										
Iridium-192			U	11.9	pCi/Filter				MXR1	10/21/21 05:46
	Uncertainty			+/-22.2						
Iron-59			U	-36.5	pCi/Filter			(75%-125%)		
	Uncertainty			+/-50.1						
Lead-210				2.33E+05	pCi/Filter					
	Uncertainty			+/-7610						
Lead-212			U	11.3	pCi/Filter					
	Uncertainty			+/-24.2						
Lead-214			U	-4.60	pCi/Filter					
	Uncertainty			+/-39.9						
Manganese-54			U	-0.530	pCi/Filter					
	Uncertainty			+/-25.3						
Mercury-203			U	6.14	pCi/Filter					
	Uncertainty			+/-14.8						
Neodymium-147			U	-107	pCi/Filter					
	Uncertainty			+/-158						
Neptunium-239			U	2.26	pCi/Filter					
	Uncertainty			+/-128						
Niobium-94			U	13.7	pCi/Filter					
	Uncertainty			+/-16.6						
Niobium-95			U	-13.4	pCi/Filter					
	Uncertainty			+/-21.0						
Potassium-40			U	-3.84	pCi/Filter					
	Uncertainty			+/-105						
Promethium-144			U	2.73	pCi/Filter					
	Uncertainty			+/-15.7						
Promethium-146			U	-9.39	pCi/Filter					
	Uncertainty			+/-36.0						
Radium-226			U	-6.18	pCi/Filter					
	Uncertainty			+/-35.8						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187276										
Radium-228			U	-49.7	pCi/Filter				MXR1	10/21/21 05:46
	Uncertainty			+/-109						
Ruthenium-106			U	-17.0	pCi/Filter					
	Uncertainty			+/-167						
Silver-110m			U	-33.1	pCi/Filter					
	Uncertainty			+/-39.7						
Sodium-22			U	0.847	pCi/Filter					
	Uncertainty			+/-11.4						
Thallium-208			U	-12.2	pCi/Filter					
	Uncertainty			+/-19.1						
Thorium-234			U	-503	pCi/Filter					
	Uncertainty			+/-787						
Tin-113			U	-6.95	pCi/Filter					
	Uncertainty			+/-25.1						
Uranium-235			U	-52.8	pCi/Filter					
	Uncertainty			+/-73.8						
Uranium-238			U	-503	pCi/Filter					
	Uncertainty			+/-787						
Yttrium-88			U	3.22	pCi/Filter					
	Uncertainty			+/-10.8						
Zinc-65			U	31.0	pCi/Filter					
	Uncertainty			+/-54.1						
Zirconium-95			U	6.17	pCi/Filter					
	Uncertainty			+/-38.2						
QC1204935113 MB										
Actinium-228			U	-2.93	pCi/Filter					10/20/21 23:06
	Uncertainty			+/-3.69						
Americium-241			U	-1.58	pCi/Filter					
	Uncertainty			+/-2.67						
Antimony-124			U	-0.137	pCi/Filter					
	Uncertainty			+/-1.41						

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2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187276										
Antimony-125			U	-0.0704	pCi/Filter				MXR1	10/20/21 23:06
	Uncertainty			+/-1.65						
Barium-133			U	-0.0369	pCi/Filter					
	Uncertainty			+/-0.942						
Barium-140			U	-0.138	pCi/Filter					
	Uncertainty			+/-2.26						
Beryllium-7			U	-3.98	pCi/Filter					
	Uncertainty			+/-5.11						
Bismuth-212			U	8.61	pCi/Filter					
	Uncertainty			+/-11.7						
Bismuth-214			U	-0.974	pCi/Filter					
	Uncertainty			+/-2.06						
Cerium-139			U	-0.359	pCi/Filter					
	Uncertainty			+/-0.533						
Cerium-141			U	-0.405	pCi/Filter					
	Uncertainty			+/-0.862						
Cerium-144			U	-1.27	pCi/Filter					
	Uncertainty			+/-3.29						
Cesium-134			U	0.616	pCi/Filter					
	Uncertainty			+/-0.853						
Cesium-136			U	0.793	pCi/Filter					
	Uncertainty			+/-1.04						
Cesium-137			U	0.00627	pCi/Filter					
	Uncertainty			+/-0.758						
Chromium-51			U	0.416	pCi/Filter					
	Uncertainty			+/-4.85						
Cobalt-56			U	-0.107	pCi/Filter					
	Uncertainty			+/-1.00						
Cobalt-57			U	-0.154	pCi/Filter					
	Uncertainty			+/-0.482						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187276										
Cobalt-58			U	-0.679	pCi/Filter				MXR1	10/20/21 23:06
	Uncertainty			+/-0.786						
Cobalt-60			U	0.575	pCi/Filter					
	Uncertainty			+/-0.976						
Europium-152			U	0.998	pCi/Filter					
	Uncertainty			+/-1.80						
Europium-154			U	0.788	pCi/Filter					
	Uncertainty			+/-2.45						
Europium-155			U	-0.156	pCi/Filter					
	Uncertainty			+/-1.94						
Iridium-192			U	0.469	pCi/Filter					
	Uncertainty			+/-0.518						
Iron-59			U	-1.43	pCi/Filter					
	Uncertainty			+/-1.71						
Lead-210			U	78.7	pCi/Filter					
	Uncertainty			+/-98.4						
Lead-212			U	-0.529	pCi/Filter					
	Uncertainty			+/-1.37						
Lead-214			U	1.99	pCi/Filter					
	Uncertainty			+/-2.03						
Manganese-54			U	0.754	pCi/Filter					
	Uncertainty			+/-0.659						
Mercury-203			U	-0.303	pCi/Filter					
	Uncertainty			+/-0.598						
Neodymium-147			U	0.213	pCi/Filter					
	Uncertainty			+/-5.37						
Neptunium-239			U	-1.23	pCi/Filter					
	Uncertainty			+/-4.31						
Niobium-94			U	-0.115	pCi/Filter					
	Uncertainty			+/-0.697						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187276										
Niobium-95			U	0.578	pCi/Filter				MXR1	10/20/21 23:06
	Uncertainty			+/-0.741						
Potassium-40			U	7.34	pCi/Filter					
	Uncertainty			+/-15.6						
Promethium-144			U	0.104	pCi/Filter					
	Uncertainty			+/-0.802						
Promethium-146			U	-0.129	pCi/Filter					
	Uncertainty			+/-0.877						
Radium-226			U	-0.974	pCi/Filter					
	Uncertainty			+/-2.06						
Radium-228			U	-2.93	pCi/Filter					
	Uncertainty			+/-3.69						
Ruthenium-106			U	-2.13	pCi/Filter					
	Uncertainty			+/-6.89						
Silver-110m			U	-0.188	pCi/Filter					
	Uncertainty			+/-1.00						
Sodium-22			U	0.299	pCi/Filter					
	Uncertainty			+/-0.866						
Thallium-208			U	-0.722	pCi/Filter					
	Uncertainty			+/-0.970						
Thorium-234			U	23.1	pCi/Filter					
	Uncertainty			+/-57.1						
Tin-113			U	0.0241	pCi/Filter					
	Uncertainty			+/-0.874						
Uranium-235			U	1.56	pCi/Filter					
	Uncertainty			+/-4.12						
Uranium-238			U	23.1	pCi/Filter					
	Uncertainty			+/-57.1						
Yttrium-88			U	0.621	pCi/Filter					
	Uncertainty			+/-0.958						

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 2187276										
Zinc-65			U	1.59	pCi/Filter				MXR1	10/20/21 23:06
	Uncertainty			+/-2.59						
Zirconium-95			U	0.620	pCi/Filter					
	Uncertainty			+/-1.52						
Rad Gas Flow										
Batch 2188641										
QC1204937648 MB										
Alpha			U	-0.0123	pCi/Filter				RXB2	10/26/21 11:26
	Uncertainty			+/-0.102						

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

**	Analyte is a Tracer compound
<	Result is less than value reported
>	Result is greater than value reported
BD	Results are either below the MDC or tracer recovery is low
FA	Failed analysis.
H	Analytical holding time was exceeded
J	See case narrative for an explanation
J	Value is estimated
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
M	M if above MDC and less than LLD
M	REMP Result > MDC/CL and < RDL
N/A	RPD or %Recovery limits do not apply.
NI	See case narrative
ND	Analyte concentration is not detected above the detection limit
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
R	Sample results are rejected
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
UI	Gamma Spectroscopy--Uncertain identification
UJ	Gamma Spectroscopy--Uncertain identification
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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QC Summary

Workorder: 559247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

Y Other specific qualifiers were required to properly define the results. Consult case narrative.

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.

h Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Radiochemistry
Technical Case Narrative
CN Associates, Inc.
SDG #: 559247

Dry Weight

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Miscellaneous Information

Additional Comments
Samples 559247001 and 559247002 are miscellaneous solids and were not sieved. 559247001 (AS-1) and 559247002 (AS-2).

Gammaspec, Gamma, Solid (Standard List)

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Gammaspec, Gamma, Filter (Standard List)

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

GFPC Gross A/B, Filter

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Gross Alpha/Beta Preparation Information
None of the samples have been flamed.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Page: 1 of 2
Project #
GEL Quote #: GELP-20-1218
COC Number [1]: SZ Samples Page 1 of 2
PO Number:

GEL Laboratories LLC
Chemistry | Radiochemistry | Radiobioassay | Specialty Analytes
Chain of Custody and Analytical Request 559247

GEL Work Order Number: GEL Project Manager:

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: C.N. Associates Phone # 978-525-2400
Project/Site Name: Schulz Electric Fax #
Address: New Haven, CT
Collected By: D. Flaherdy Send Results To: ron.cardarelli@cnassociates.net; cindy.harrin

Sample Analysis Requested [5] (Fill in the number of containers for each test)

Sample ID (* For composites - indicate start and stop date/time)	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code [2]	Field Filtered [3]	Sample Matrix [4]	Should this sample be considered: Radioactive (If yes, please supply isotopic info.)	Should this sample be considered: (7) Known or possible Hazards	Total number of containers		EPA 906.0 Mod (H-3)	DOE EML HASL 300 4.5.2.3/Ga-01-R (Cs-137 + Licensed Emitters)	Gross Alpha						<-- Preservative Type (6)	Comments: Note: extra sample is required for sample-specific QC
AS-1	10/6/2021	1114	N	N	SS	N	N	1		X	X								see additional remarks
AS-2	10/6/2021	1120	N	N	SS	N	N	1		X	X								see additional remarks
C-1	10/6/2021	0:00	N	N	SS	N	N	1		X	X								see additional remarks
C-2	10/7/2021	1400	N	N	SS	N	N	1		X	X								see additional remarks
C-3	10/7/2021	1530	N	N	SS	N	N	1		X	X								see additional remarks
D-1	10/6/2021	1105	N	N	SO	N	N	1		X	X								see additional remarks
D-2	10/6/2021	1101	N	N	SO	N	N	1		X	X								see additional remarks
SDR-1	10/6/2021	1050	N	N	SD	N	N	1		X	X								see additional remarks
Wipe 1-2	10/4/2021	1400	N	N	P	N	N	1		X	X	X							
Wipe 1-16	10/4/2021	1500	N	N	P	N	N	1		X	X	X							

Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1 Donald Flaherdy	10/15/2021	12.30	1	10/18/21	1015
2			2		
3			3		

TAT Requested: Normal: X Rush: ____ Specify: ____ (Subject to Surcharge)

Fax Results: [ ] Yes [ ] No

Select Deliverable: [ ] C of A [ ] QC Summary [ ] Level 1 [ ] Level 2 [ ] Level 3 [ ] Level 4

Additional Remarks: Request gamma spec sufficient to achieve 2.1 pCi/gm Am-241

For Lab Receiving Use Only: Custody Seal Intact? [ ] Yes [ ] No Cooler Temp: ____ °C

* For sample shipping and delivery details, see Sample Receipt & Review form (SRR.)

Sample Collection Time Zone: [ ] Eastern [ ] Pacific [ ] Central [ ] Mountain [ ] Other:

1) Chain of Custody Number = Client Determined

2) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite

3) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered

4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal

5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1)

6) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

7) KNOWN OR POSSIBLE HAZARDS

RCRA Metals
As = Arsenic Hg= Mercury
Ba = Barium Se= Selenium
Cd = Cadmium Ag= Silver
Cr = Chromium MR= Misc. RCRA metals
Pb = Lead

Characteristic Hazards
FL = Flammable/Ignitable
CO = Corrosive
RE = Reactive

TSCA Regulated
PCB = Polychlorinated biphenyls

Listed Waste
LW= Listed Waste
(F,K,P and U-listed wastes.)
Waste code(s):

Other
OT= Other / Unknown
(i.e.: High/low pH, asbestos, beryllium, irritants, other misc. health hazards, etc.)
Description:

Please provide any additional details below regarding handling and/or disposal concerns. (i.e., Origin of sample(s), type of site collected from, odd matrices, etc.)

Page: 2 of 2
Project #
GEL Quote #: GELP-20-1218
COC Number (1): SZ Samples Page 2 of 2
PO Number:

GEL Laboratories LLC
gel.com
Chemistry | Radiochemistry | Radiobioassay | Specialty Analytics

Chain of Custody and Analytical Request

GEL Work Order Number:
GEL Project Manager:

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: C.N. Associates — Phone # 978-525-2400
Project/Site Name: Schulz Electric — Fax #
Address: New Haven, CT
Collected By: D. Flahardy — Send Results To: ron.cardarelli@cnassociates.net; cindy.harr

Sample Analysis Requested (5) (Fill in the number of containers for each test)

Sample ID (* For composites - indicate start and stop date/time)	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (2)	Field Filtered (3)	Sample Matrix (4)	Should this sample be considered: Radioactive (If yes, please supply isotopic info.)	Should this sample be considered: (?) Known or possible Hazards	Total number of containers		EPA 900.0 Mod (H-3)	EPA 900.0 Mod (H-3) LSC EERL_SOP 300 4.5.2.3/Ga-01-R (Ce-137 + Cs-137)	Gross Alpha							Preservative Type (6)
Wipe 1-30	10/4/2021	1515	N	N	P	N	N	1		X	X	X							
Wipe 1-30	10/4/2021	1530	N	N	P	N	N	1		X	X	X							
Wipe 2-3	10/5/2021	0900	N	N	P	N	N	1		X	X	X							
Wipe 7-14	10/6/2021	0900	N	N	P	N	N	1		X	X	X							
Wipe 7-30	10/6/2021	1030	N	N	P	N	N	1		X	X	X							
					P														
					P														

Comments
Note: extra sample is required for sample specific QC

Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1 Donald Flahardy	10/15/2021	1230	1	10/18/21	1015
2			2		
3			3		

TAT Requested: Normal: _X_ Rush: ____ Specify: _____ (Subject to Surcharge)
Fax Results: [ ] Yes [ ] No
Select Deliverable: [ ] C of A [ ] QC Summary [ ] Level 1 [ ] Level 2 [ ] Level 3 [ ] Level 4
Additional Remarks:
For Lab Receiving Use Only: Custody Seal Intact? [ ] Yes [ ] No Cooler Temp: ____ °C
> For sample shipping and delivery details, see Sample Receipt & Review form (SRR.)
Sample Collection Time Zone: [ ] Eastern [ ] Pacific [ ] Central [ ] Mountain [ ] Other:

1) Chain of Custody Number = Client Determined

2) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite

3) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered

4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Miscellaneous Liquid, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal

5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1)

6) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

7) KNOWN OR POSSIBLE HAZARDS

RCRA Metals
As = Arsenic, Hg = Mercury
Ba = Barium, Se = Selenium
Cd = Cadmium, Ag = Silver
Cr = Chromium, MR = Misc. RCRA metals
Pb = Lead

Characteristic Hazards
FL = Flammable/Ignitable
CO = Corrosive
RE = Reactive

TSCA Regulated
PCB = Polychlorinated biphenyls

Listed Waste
LW = Listed Waste
(F,K,P and U-listed wastes.)
Waste code(s):

Other
OT = Other / Unknown
(i.e.: High/low pH, asbestos, beryllium, irritants, other misc. health hazards, etc.)
Description:

Please provide any additional details below regarding handling and/or disposal concerns: (i.e.: Origin of sample(s), type of site collected from, odd matrices, etc.)

5c

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: CWS	SDG/AR/COC/Work Order: 559247
Received By: BE	Date Received: 10/18/21
Carrier and Tracking Number	Circle Applicable: FedEx Express (FedEx Ground) UPS Field Services Courier Other 2849 9314 9271

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
A) Shipped as a DOT Hazardous?		\	Hazard Class Shipped: UN#: If UN2910, is the Radioactive Shipment Survey Compliant? Yes___ No___
B) Did the client designate the samples are to be received as radioactive?		\	COC notation or radioactive stickers on containers equal client designation.
C) Did the RSO classify the samples as radioactive?		\	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 (0) CPM uR/Hr Classified as: Rad 1 Rad 2 Rad 3
D) Did the client designate samples are hazardous?		\	COC notation or hazard labels on containers equal client designation.
E) Did the RSO identify possible hazards?		\	If D or E is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	\			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	\			Circle Applicable: Client contacted and provided COC COC created upon receipt
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		\		Preservation Method: Wet Ice Ice Packs Dry ice (None) Other: *all temperatures are recorded in Celsius TEMP: 21
4	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: IR2:21 Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	\			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?		\		Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?			\	If Yes, are Encores or Soil Kits present for solids? Yes___ No___ NA___(If yes, take to VOA Freezer) Do liquid VOA vials contain acid preservation? Yes___ No___ NA___(If unknown, select No) Are liquid VOA vials free of headspace? Yes___ No___ NA___ Sample ID's and containers affected:
8	Samples received within holding time?	\			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	\			ID's and containers affected:
10	Date & time on COC match date & time on bottles?	\			Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11	Number of containers received match number indicated on COC?	\			Circle Applicable: No container count on COC Other (describe)
12	Are sample containers identifiable as GEL provided by use of GEL labels?			\	
13	COC form is properly signed in relinquished/received sections?	\			Circle Applicable: Not relinquished Other (describe)

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials KL Date 10/19/21 Page ___ of ___

GL-CHL-SR-001 Rev 7

List of current GEL Certifications as of 10 November 2021

State	Certification
Alabama	42200
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122021-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2019-165
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-21-19
Utah NELAP	SC000122021-36
Vermont	VT87156
Virginia NELAP	460202
Washington	C780