



DEPARTMENT OF THE ARMY
U.S. ARMY MEDICAL RESEARCH INSTITUTE OF CHEMICAL DEFENSE
8350 RICKETTS POINT ROAD
ABERDEEN PROVING GROUND, MD 21010-5400

December 19, 2022

U.S. Nuclear Regulatory Commission
Region I DNMS Kucebsubg Assistance Team
2100 Renaissance Boulevard
King of Prussia, PA 19406

License No: 19-00294-24

Dear Sir/Madam:

This letter is to transmit and request a formal review of the MARSSIM survey performed in October of 2022 for building E3081 located at the Edgewood Area of Aberdeen Proving Grounds (Enclosure 1). The intent of this report is to support the unrestricted release of Building E3081 allowing it to be transferred back to the Garrison for unrestricted use. Building E3081 is the final building covered under the License No: 19-00294-24. Previous Buildings were released by letter dated 10 December 2019 transmitting Amendment No.11. Also, NRC Form 314 certifying disposition of radioactive materials is attached (Enclosure 2). Please reference letter dated 10 November 2020 of our intent to terminate License No: 19-00294-24 (Enclosure 3).

My point of contact is Mr. Travis W. Lindeblad, Radiation Safety Officer. He may be reached at (410) 436-1831 or e-mail at travis.w.lindeblad.civ@health.mil.

Sincerely,

A handwritten signature in black ink, appearing to read "PK", is located below the "Sincerely," text.

Paul J. Kassebaum
Colonel, U.S. Army
Commanding

Enclosures

US Army MRICD
Building E3081
Edgewood, MD

RADIOLOGICAL FINAL STATUS SURVEY

November, 2022

A handwritten signature in black ink, appearing to read "Paul Madaury".

Report Prepared By: _____
Paul Madaury, CHP

RSO, Inc.
Laurel, MD

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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

The US Army MRICD has used and stored unsealed radioactive material in Building E3081 at Aberdeen Proving Ground Site under a NRC Radioactive Materials License (19-00294-24). The use of radioactive material at this building has terminated and a final status survey was commissioned to allow the release for unrestricted use. All radioactive materials and radioactive waste was disposed or transferred in accordance with NRC regulations (records are available upon request). A Radiological Final Status Survey based on the guidance in NUREG 1757 (Consolidated Decommissioning Guidance), and NUREG 1575 (MARSSIM) was requested. This site intends to terminate the NRC radioactive materials license at this time.

Historic Site Assessment

The known sources of radioactive material with contamination potential for purposes of this Final Status Survey (FSS) are Hydrogen-3 and Carbon-14 in mCi amounts. Based on the information provided by the Radiation Safety Officer, the impacted laboratories were limited to 274, 277, 285, 287, and 290.

The fume hoods in this survey were used for radioactive labeled chemicals. Considering the isotopes and activities used, the chemical hazard exceeds the radiation hazard of these laboratories. Techniques for radiological surveying needed to be performed with the chemical hazard as the primary safety concern to surveying personnel.

Scoping and Characterization Surveys

Scoping surveys indicated no contamination in labs 285, 287, and 290. Scans indicated contamination on the floor of lab 274, and inside of a fume hood in lab 277.

Characterization of the two areas showed the following:

- Floor of 274, Single Spot
 - Fixed Carbon -14 ~ 800 cm²
 - Wipe Test less than 100 dpm/100 cm²
 - Static Direct High 127,572 dpm/100 cm²
 - Static Direct Average over 800 cm², 48,606 dpm/100 cm²
- Hood of 277
 - Storage wells mounted in the work surface (base) of the hood
 - Carbon -14 in the right side well
 - Wipe test show Hydrogen -3 and Carbon -14 ranging from background to 2414 dpm/100 cm²
 - Instrument Scans show Carbon -14 54,828 dpm/100 cm²

2.0 Survey Design

2.1 Survey Design Basis

This Final Status Survey was designed in consideration of the guidance provided by the Nuclear Regulatory Commission (NRC) regarding Final Radiological Surveys. In particular the guidance provided by the NRC in NUREG 1757 (Consolidated Decommissioning Guidance) and NUREG 1575 (MARSSIM). Using NUREG 1757, this facility meets the requirements for what is termed Group 2 facilities (see following excerpt). Group 2 includes facilities that “would not have contaminated work areas at the levels above the decommissioning screening criteria”.

From NUREG 1757 v1 Chapter 7:

Group 2 facilities may have residual radiological contamination present in building surfaces and soils. However, licensees are able to demonstrate that their facilities meet the provisions of 10 CFR 20.1402 (“Radiological Criteria for Unrestricted Use”) by applying the screening approach dose analysis described in Chapter 6.

Additionally, licensees in Group 2 typically possess historical records of material receipt, use, and disposal, such that quantifying past radiological material possession and use may be developed with a high degree of confidence. Furthermore, these licensees have radiological survey records that characterize the residual radiological contamination levels present within the facilities and at their sites. That is, they are able to demonstrate residual radiological contamination levels without more sophisticated survey procedures (greater than those used for operational surveys) or dose modeling. These licensees do not need to use site-specific parameters or establish site-specific DCGLs in order to demonstrate acceptability for release of their sites.”

Derived Concentration Guideline Levels (DCGL’s) are radionuclide-specific concentration limits used by the licensee during decommissioning to achieve the regulatory dose standard that permits the release of the property and termination of the license. The DCGL applicable to the average concentration over a survey unit is called the DCGL_W. The DCGL applicable to limited areas of elevated concentrations within a survey unit is called the DCGL_{EMC}.

2.2 Decommissioning Criteria

The Radiological Criteria for Unrestricted Use for NRC regulations 10 CFR Part 20:

“A (The) 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 per year, including that from ground water sources of drinking water, and that the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA).”

2.3 Potential Radionuclide Contaminates and Screening Values

The information provided by the radiation safety officer noted the usage of Hydrogen-3 and Carbon-14 in the effected laboratories.

Table 1. Derived Contamination Guideline Levels which correspond to surface concentrations of radionuclide contamination that would result in a TEDE of 25

Final Status Survey

mrem/yr. From NUREG 1757 Appendix H. To be used when releasing survey units for unrestricted use.

Radionuclide	DCGL (dpm/100 cm ²)
Hydrogen-3	1.20 E 8
Carbon-14	3.7 E 6

2.4 Performance of Radiological Surveys

The final status surveys were conducted using guidance provided by the NRC in NUREG-1575, EPA 402-R-97-016, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM): Revision 1, August 2000.

2.5 Survey Design: Area Classification

Impacted Areas

- Impacted areas are areas that may have residual radioactivity from the licensed activities.
- Non-impacted areas are areas without residual radioactivity from licensed activities.
- NRC guidance provides that non-impacted areas do not require radiological surveys.

Area Classes

Impacted areas can be classified into one of the three classes, listed below, based on levels of residual radioactivity.

- Class 1 Areas are impacted areas that, prior to remediation, are expected to have concentrations of residual radioactivity that exceed the DCGL_W (DCGL_W is defined in Section 2.2 of MARSSIM);
- Class 2 Areas are impacted areas that, prior to remediation, are not likely to have concentrations of residual radioactivity that exceed the DCGL_W;
- Class 3 Areas are impacted areas that have a low probability of containing residual radioactivity.

All areas in this survey were deemed impacted, and the information provided, as well as scoping surveys was used to classify these areas as:

Survey Unit	Survey Class
274	2
277	2
285	3
287	3
290	3

2.6 Survey Number of Samples

The contaminant is not present in background. MARSSIM's guidance for determination of the number of samples needed for a survey unit when the DCGL is large, the relative shift is large (>3), using equal values of 0.05 for Type I and Type II errors, results in a number of data points needed of 14 for the sign test using table 5.5.

MARSSIM suggests class 2 survey units receive scanning over a portion of the survey unit based on the potential for contamination combined with direct measurements and sampling performed on a systematic grid and class 3 survey units receive judgmental scanning and randomly located measurements. For consistency, the method used for both classes of survey units included systematic square gridded data points starting at a random coordinate chosen with the Microsoft Excel Rand() function.

The survey units including the walls are not perfect squares, and the number of gridded samples that will fit within the boundary varies by survey unit. The randomly chosen sample location is noted as sample 1 for the wipes and direct measurements for each survey unit.

A direct (static) measurement, wipe test, and exposure rate measurement was performed at each survey location except where noted.

All other samples were taken at the surveyor's discretion and may include floors, walls, doors, and other likely locations of radiation use in a survey unit; or areas that did not have a random sample location.

If a gridded sample fell within a fume hood, for this particular survey, it was skipped. The fume hoods were surveyed separately due to the protocols required to survey in areas with the additional chemical hazard.

Below is a synopsis of the survey units and samples.

3 SURVEY METHODS AND INSTRUMENTS

Survey Unit	# of Gridded Sample Locations	Random Start Point (x, y) in ft	Grid Spacing (ft)	Total Sample Locations
274	18	0, 2	7.5	19
277	14	1, 3	5	60
285	18	3, 3	7.5	81
287	16	6, 4	8	35
290	16	6, 8	8	45

3.1 Survey Instruments

Exposure Rate Measurements

Gamma exposure rates were measured using a Bicron μ Rem survey meter (internal plastic scintillator) in all of the areas surveyed. Floor measurements were at waist level and other measurements were taken at approximately 30 cm from the surface.

Beta Scan Survey

Surface scanning speeds were 1 detector width per second. To optimize detection of elevated radiation levels (1.5 to 3 times background) during scanning, audible speakers were used in addition to noting the fluctuations in the analog meter reading. All scans were completed using a Ludlum (Model 2360 or 3002) with a Ludlum 43-93 probe (alpha/beta scintillator detector, thin window of 0.8 mg/cm² with an area of 100 cm²). Regardless of the survey unit class, 100% of the accessible surfaces up to 6' were scanned.

A high and average cpm were documented while surveying, with the average being the observed mid- point. The average is compared to the DCGL scan MDC for comparison. Because Hydrogen-3 is not detectable with this instrument, all beta scans were compared to the Carbon-14 DCGL, and the Carbon-14 efficiency was used for all counting statistics. Wipe tests were the primary detection method for Hydrogen-3 contamination.

Instrument efficiency for Carbon-14 was reported as 2 Pi with the source efficiency at 0.5 and surveyor efficiency at 0.5. Scan speed was 1 probe width per second.

The level of performance used was 95% true positive rate and 60% false positive rate corresponding to a value of 1.38 for performance detectability value from MARSSIM Table 6.5.

Below are examples of the calculations used for the Survey Meter Information sheet included with each lab survey. This example uses Meter 1 of the survey of lab 274.

SCAN MDC was calculated using the following process:

$$Scan\ MDC = \frac{MDCR}{\sqrt{p} \ \epsilon_i \ \epsilon_s \ \frac{probe\ area}{100\ cm^2}}$$

where

MDCR	=	minimum detectable count rate
ϵ_i	=	instrument efficiency
ϵ_s	=	surface efficiency
p	=	surveyor efficiency

MDCR Calculation:

$$b_i = \text{Background} * \text{Scan Interval} = 271.1 \text{ cpm} * (1 \text{ min} / 60 \text{ sec}) = 4.52 \text{ counts}$$

$$s_i = \text{Performance Detectability Value} * (b_i)^{0.5} = 1.38 * (4.52 \text{ counts})^{0.5} = 2.93 \text{ counts}$$

$$MDCR = s_i * (60 \text{ s/min}) / (\text{Interval}) = (2.93 \text{ counts}) * (60 \text{ sec/min}) / (1 \text{ sec}) = 176 \text{ cpm}$$

$$\text{Scan MDC} = (176 \text{ cpm}) / [(0.5)^{0.5} * 0.138 * 1 * (100 \text{ cm}^2 / 100 \text{ cm}^2)] = 7215 \text{ dpm}/100 \text{ cm}^2$$

The SCAN MDC is (7215 dpm/100 cm²) / (3.7 E6 dpm/100 cm²) = 0.2% of the DCGL for Carbon-14.

The needle mid-point of the low and high ratemeter response was reported as the average cpm. The high was also reported for reference.

Static (Direct) Measurements of Surfaces

Static radiation measurements for beta/gamma surface contamination were performed at sample locations using a Ludlum Model 2360 with a Ludlum 43-93 probe (alpha/beta scintillator detector, thin window of 0.8 mg/cm² with an area of 100 cm²). Measurements were conducted by integrating a 1 minute count time with the probe in direct contact with the surface.

Because Hydrogen-3 is not detectable with this instrument, all beta direct measurements were compared to the Carbon-14 DCGL, and the Carbon-14 efficiency was used for all counting statistics. Wipe tests were the primary detection method for Hydrogen-3 contamination.

Direct MDC is calculated using the following formula:

$$\text{MDC} = \frac{3 + 3.29 \sqrt{R_b T_{S+B} \left(1 + \frac{T_{S+B}}{T_b} \right)}}{K T_{S+B}}$$

R_b = Background count rate = 271.1 cpm

T_{S+B} = sample count time = 0.5 min

T_b = background count time = 10 min

K = 2 pi Efficiency * Source Efficiency * Probe Area Correction factor
 $= (0.138) * (0.5) * (100 \text{ cm}^2)/(100 \text{ cm}^2) = 0.069$

Direct MDC = $\frac{3 + 3.29 * (\text{SQRT } [(271.1 \text{ cpm})(0.5 \text{ min})(1 + (0.5 \text{ min} / 10 \text{ min}))])}{(0.069) * (0.5 \text{ min})}$

MDC Direct = 2449 dpm/100 cm²

The Direct MDC is (2449 dpm/100 cm²) / (3.7 E6 dpm/100 cm²) = 0.07 % of the DCGL_w

Removable Contamination

A wipe test for removable contamination was performed at each survey location. The wipe test consisted of wiping 100 cm² of the surface with a dry paper, using moderate pressure, and measuring the amount of radioactive material on the test material using a liquid scintillation counter.

Results were reported using three channels; Channel A includes the region of 0-18.6 keV to represent Hydrogen-3 contamination.

Channels B and C represented 18.6 keV – 156 keV (Carbon-14) and 156 keV – 2000 keV respectively.

Quality Assurance

Survey meters used to perform the Final Status Survey had been calibrated within 12 months of their use using radioactive standards traceable to NIST. Also, performance checks were completed on each survey meter at the beginning of the survey.

3.2 Survey Personnel and Resources***Personnel Qualifications***

All personnel had levels of training and experience commensurate with their assigned tasks. For those individuals involved in taking radiological measurements and samples, special instruction was provided when necessary on equipment, special techniques, and practices relating to survey activities.

3.3 Fume Hoods

The fume hoods in labs 277, 285, 287, and 290 were used for work with radiolabeled chemicals. The chemicals used were much more hazardous than the radioactive materials. For this reason, care needed to be taken for all sampling inside the hoods.

- Any entry to the hoods required personnel to be trained in both the radioactive and chemical hazard. PPE was chosen for the chemical hazard only, since the two main isotopes would not pose an external hazard.
- Other than wipe tests, special care needed to be taken to not have instrumentation touch the hood surfaces.
 - For this reason, direct measurements were not taken at sample locations inside the hoods.
- Wipe tests post analysis needed special care, and disposal to ensure proper chemical safety as well as radiation safety.

4.0 SURVEY RESULTS**4.1 Results**

Attachment A contains the survey results by survey points, scan results, exposure rate measurements, and raw and reduced data for the direct measurements.

Attachment B contains the wipe test analysis data print-out.

Attachment C contains the survey meter calibration reports.

Regarding the two locations noted in the characterization survey:

- The floor spot in room 274 is epoxy covered concrete. Wipe tests did not detect removable contamination. Discussions with the staff indicated that the epoxy coating was likely installed at construction. Since the only long lived isotopes were low energy beta emitters such as H-3 and C-14, it is unlikely that the direct measurements are detecting contamination from underneath the epoxy.

Decontamination was attempted using surface spray, abrasive sprays, and disposable towels. There was no noticeable change in the level of contamination for direct measurements or wipe tests, indicating this is fixed surface contamination.

- The fume hood in room 277 has chemical hazards that would not allow decontamination attempts.

4.2 Exposure Rates-Summary

The exposure rates measured indoors in various areas of the facility were consistent with normal background. The typical background exposure rates in and near the facility ranged from 5 to 20 $\mu\text{R/h}$ as measured in unaffected areas. Exposure rates were comparable to background of 5 $\mu\text{R/h}$.

4.3 Beta Scans-Summary

No areas of elevated residual activity, above the DCGL_w count rate were found in the beta scans. The two areas of contamination found above the Scan MDC were in laboratories 274 and the hood of 277.

4.4 Direct Measurements-Summary

Areas of elevated residual activity, above the DCGL_w count rate for the survey, were not found during the beta direct measurements. The highest measurement of 127,572 dpm/100 cm^2 was 3.4% of the DCGL_w.

4.5 Removable Contamination-Summary

Attachment B includes results of the removable surface activity from the wipe surveys. No removable contamination was detected, above the DCGL_w, on any of the wipe test samples collected for the final status survey.

The highest wipe test was found in the fume hood of lab 277, with a Channel A (Hydrogen-3) reading of 2,414 dpm/100 cm^2 , and with an assumed a wipe efficiency of 10%, corresponds to 24,414 dpm/100 cm^2 . This result was far less than the Hydrogen-3 DCGL_w of 1.2E8 dpm/100 cm^2 .

5.0 CONCLUSIONS

The radiological survey of the impacted areas demonstrates that the surface measurements were less than the site specific DCGL_w (25 mrem) for both fixed and removable surface contamination. Since all measurements were well below the DCGL_w, no statistical tests are warranted.

The survey units have met the requirements for unrestricted use.

6.0 REFERENCES

6.1 USNRC, Regulatory Guide 1.86., Termination of Operating Licenses for Nuclear Reactors, June 1974.

6.2 USNRC, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unaffected Use or Termination of Licenses for Byproduct, Source, or Special

Nuclear Material”, May 1987.

6.3 NUREG 1757, USNRC, “Decommissioning Process for Materials Licensees”, Final September 2003.

6.4 NUREG-1575, EPA 402-R-97-016, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM): Final, August 2000.

6.5 Decommissioning Health Physics, Second Edition, Eric W. Abelquist, 2014

7.0 ATTACHMENTS

Attachment A	Radiological Surveys
Attachment B	Wipe Test Analysis Data Print-Out
Attachment C	Survey Meter Calibration Reports

Attachment A

Radiological Survey Results

Surveyor: Paul Madairy

Surveyor: N/A

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Survey Meter Information

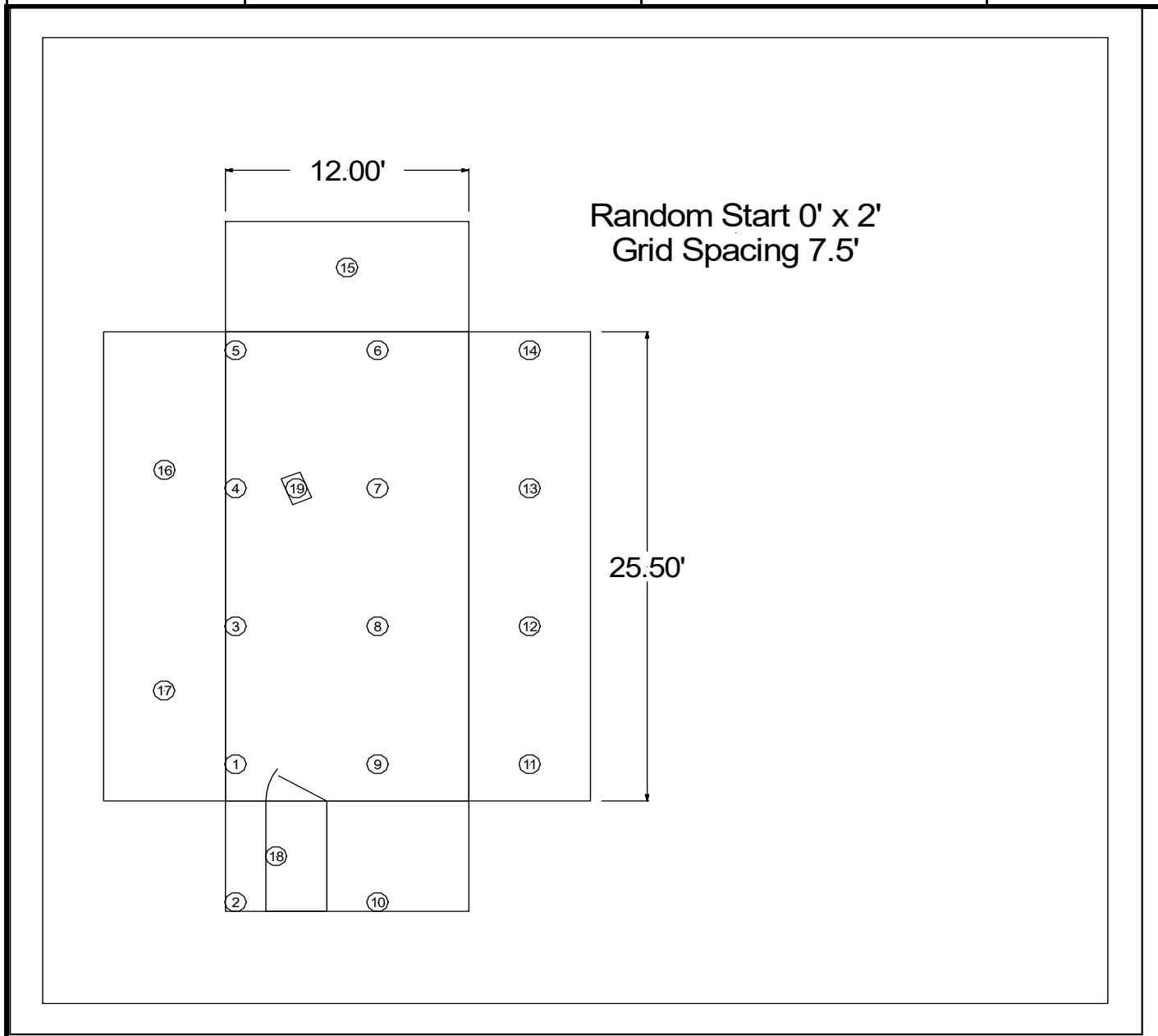
Site: US Army MRICD

Building: E3081

Lab/Room: 274

	Meter 1		Meter 2		Meter 3	Meter 4		Meter 5	
Date:	4/6/2022		5/11/2022		Not In Service	Not In Service		5/11/2022	
Make:	Ludlum		Ludlum					Bicron	
Model:	2360		2360					uRem	
SN:	155385		155385					C802F	
Probe Make:	Ludlum		Ludlum					N/A	
Probe Model:	43-93		43-93					N/A	
Probe SN:	PR356145		PR356145					N/A	
Probe Area (cm ²):	100		100					N/A	
Next Cal. Date:	12/10/2022		12/10/2022					6/3/2022	
Background Surface Material	Air		Air					Air	
Background(c) - Time(Min):	2711	10	2562	10		mRem/hr		5	mRem/hr
CS Isotope - Activity(μCi):	C-14	0.159	C-14	0.159				Cs-137	
CS Source(cpm)	4526		4119					OK	
Total Efficiency 2Pi, Isotope:	13.8%	C-14	13.8%	C-14		N/A	N/A	N/A	N/A
Source Efficiency/Surveyor Efficiency	0.25	0.50	0.25	0.50		N/A	N/A	N/A	N/A
Surface Efficiency/Scan Interval	1.00	1.0	1.00	1.0		N/A	N/A	N/A	N/A
Sample Count Time(min)	0.5		0.5			N/A		N/A	
L _c , L _d (Counts)	38	80	37	77		N/A	N/A	N/A	N/A
Direct MDC, Scan MDC (dpm/100cm ²)	2449	7215	2386	7014		N/A	N/A	N/A	N/A
MDCR , MDC Count Rate	176	356	171	339		N/A	N/A	N/A	N/A

Radiological Survey		US Army MRICD Edgewood MD			
				Building E3081	Room 274
Surveyors	Name: Paul Madairy	Name N/A	Date 4/6/2022		
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831			



Remarks:

Scan Zone Locations

Radiological Survey		US Army MRICD Edgewood MD		RSO, Inc.	
				Building E3081	Room 274
Surveyors	Name: Paul Madairy	Name N/A		Date 4/6/2022	
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831			
<div><div><div><div><div>5</div><div>1</div><div>2</div><div>3</div></div><div><div>4</div><div>6</div></div></div></div></div>					
Remarks:					

Site: US Army MRICDBuilding: E3081Lab/Room: 277Start Date: 03/11/22Finish Date: 03/11/22Surveyor: Paul MadairySurveyor: N/A

Area Survey Results			Wipe Tests		Direct Measurements			Dose Rate		β Scan Measurements; See Maps For Zones				
Sample Number	Description	Surface	H-3 (dpm/100 cm ²)	C-14 (dpm/100 cm ²)	Survey Meter #	Gross (cpm)	C-14 dpm/100 cm ²	Survey Meter #	Gross (μrem/hr)	Area	Survey Meter #	Gross High (cpm)	Gross Average (cpm)	C-14 dpm/100 cm ²
1	Benchtop	Solid Surface	<100	<100	1	168	-870	5	5	F1	1	275	225	783
2	Wall	Cinderblock	<100	<100	1	206	232	5	5	B1	1	275	225	783
3	Wall	Cinderblock	<100	<100	1	200	58	5	5	W1	1	275	225	783
4	Wall	Cinderblock	<100	<100	1	172	-754	5	5	W2	1	275	225	783
5	Floor	concrete	<100	<100	1	166	-928	5	5	W3	1	275	225	783
6	Cabinet	Metal	<100	<100	1	142	-1623	5	5					
7	Grating	Metal	<100	<100	1	150	-1391	5	5					
8	Grating	Metal	<100	<100	1	142	-1623	5	5					
9	Cabinet	Metal	<100	<100	1	126	-2087	5	5					
10	Floor	concrete	<100	<100	1	160	-1101	5	5					
11	Sink	Solid Surface	<100	<100	1	172	-754	5	5					
12	Glass Dryer	Metal	<100	<100	1	188	-290	5	5					
13	Wall	Cinderblock	<100	<100	1	160	-1101	5	5					
14	Panel	Metal	<100	<100	1	158	-1159	5	5					
15	Door	Metal	<100	<100	1	154	-1275	5	5					
16	Benchtop	Solid Surface	<100	<100	1	150	-1391	5	5					
17	Drain	Metal	<100	<100	1	168	-870	5	5					
18	Cabinet	Metal	<100	<100	1	156	-1217	5	5					
19	Cabinet	Metal	<100	<100	1	182	-464	5	5					
20	Floor	concrete	<100	<100	1	170	-812	5	5					
Sw1	Sink	Drain	<100	<100										
Sw2	Floor	Drain	<100	<100										
Hood 1														
1	Left Worktop	Metal	<100	<100				5	5	Hood 1	3	298	217	-384
2	Right Worktop	Metal	<100	<100				5	5					
3	Left Wall	Metal	<100	<100				5	5					
4	Right Wall	Metal	<100	<100				5	5					
5	Rear Wall	Metal	<100	<100				5	5					
6	Rear Wall	Metal	<100	<100				5	5					
7	Behind Baffle	Metal	<100	<100				5	5					
8	Duct Opening	Metal	<100	<100				5	5					
9	Airfoil	Metal	<100	<100				5	5					
10	Wells	Metal	4817	153				5	5					

Site: US Army MRICDBuilding: E3081Lab/Room: 277Start Date: 03/11/22Finish Date: 03/11/22Surveyor: Paul MadairySurveyor: N/A

Area Survey Results			Wipe Tests		Direct Measurements			Dose Rate		β Scan Measurements; See Maps For Zones				
Sample Number	Description	Surface	H-3 (dpm/100 cm ²)	C-14 (dpm/100 cm ²)	Survey Meter #	Gross (cpm)	C-14 dpm/100 cm ²	Survey Meter #	Gross (μrem/hr)	Area	Survey Meter #	Gross High (cpm)	Gross Average (cpm)	C-14 dpm/100 cm ²
H1 Mid Well														
1	Lid	Metal	29	46				5	5	Well	3	613	426	3838
2	Bottom	Metal	113	129				5	5					
3	Left Side	Metal	390	658				5	5					
4	Back Side	Metal	112	300				5	5					
5	Right Side	Metal	157	243				5	5					
6	Front Side	Metal	59	76				5	5					
H1 Right We														
1	Lid	Metal	174	183				5	5	Well	3	5720	2950	54828
2	Bottom	Metal	251	539				5	5					
3	Left Side	Metal	715	990				5	5					
4	Back Side	Metal	41	191				5	5					
5	Right Side	Metal	271	470				5	5					
6	Front Side	Metal	2414	1458				5	5					
H1 Left Wel														
1	Lid	Metal	88	193				5	5	Well	3	220	200	-727
2	Bottom	Metal	280	308				5	5					
3	Left Side	Metal	357	173				5	5					
4	Back Side	Metal	75	52				5	5					
5	Right Side	Metal	108	114				5	5					
6	Front Side	Metal	92	86				5	5					
Hood 2														
1	Left Worktop	Metal	<100	<100				5	5	Hood 2	3	278	207	-586
2	Right Worktop	Metal	<100	<100				5	5					
3	Left Wall	Metal	<100	<100				5	5					
4	Right Wall	Metal	<100	<100				5	5					
5	Rear Wall	Metal	<100	<100				5	5					
6	Rear Wall	Metal	<100	<100				5	5					
7	Behind Baffle	Metal	<100	<100				5	5					
8	Duct Opening	Metal	<100	<100				5	5					
9	Airfoil	Metal	<100	<100				5	5					
10	Sash	Metal	<100	<100				5	5					


Survey Meter Information

Site: US Army MRICD

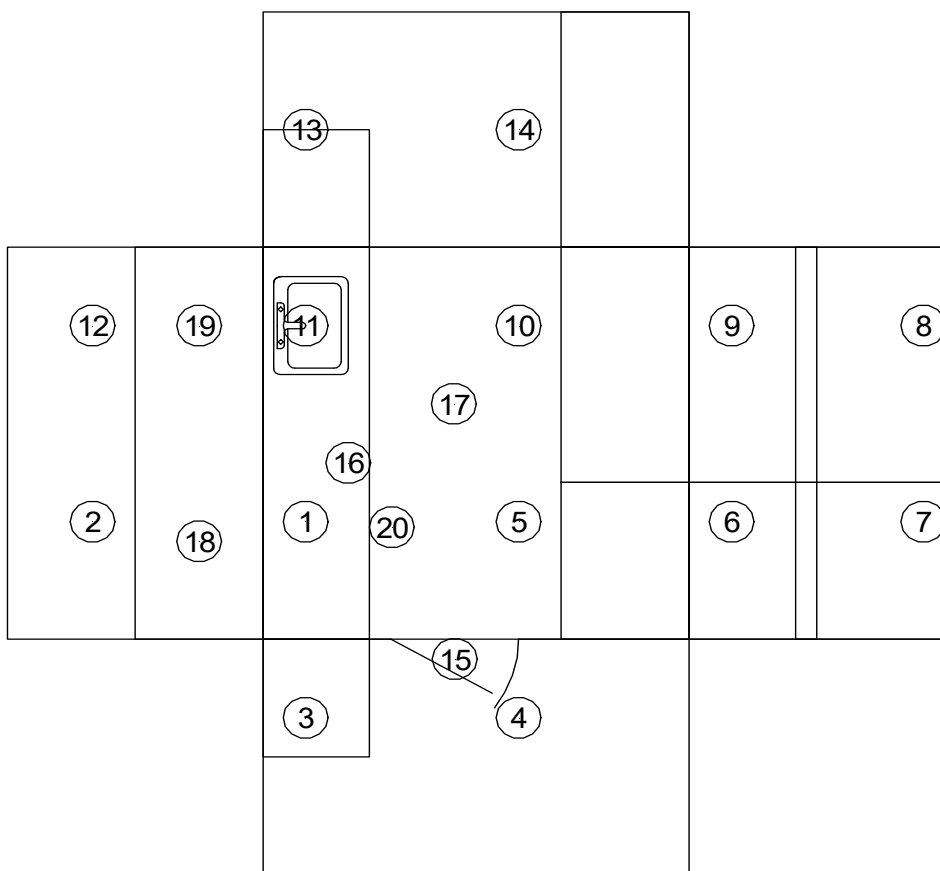
Building: E3081

Lab/Room: 277

	Meter 1		Meter 2		Meter 3		Meter 4		Meter 5	
Date:	3/11/2022		3/11/2022		10/12/2022		Not In Service		3/11/2022	
Make:	Ludlum		Ludlum		Ludlum				Bicron	
Model:	2360		2360		3002				uRem	
SN:	167707		167707		25012574				C802F	
Probe Make:	Ludlum		Ludlum		Ludlum				N/A	
Probe Model:	43-93		43-93		43-93				N/A	
Probe SN:	PR359841		PR359841		PR359841				N/A	
Probe Area (cm ²):	100		100		100				N/A	
Next Cal. Date:	12/10/2022		12/10/2022		4/5/2023				6/3/2022	
Background Surface Material	Air		Floor		Air				Air	
Background(c) - Time(Min):	1980	10	1699	10	2360	10	mRem/hr		5	mRem/hr
CS Isotope - Activity(μCi):	C-14	0.159	C-14	0.159	C-14	0.159			Cs-137	
CS Source(cpm)	2813		2813		2880				OK	
Total Efficiency 2Pi, Isotope:	13.8%	C-14	13.8%	C-14	19.8%	C-14	N/A	N/A	N/A	N/A
Source Efficiency/Surveyor Efficiency	0.25	0.50	0.25	0.50	0.25	0.50	N/A	N/A	N/A	N/A
Surface Efficiency/Scan Interval	1.00	1.0	1.00	1.0	1.00	1.0	N/A	N/A	N/A	N/A
Sample Count Time(min)	0.5		0.5		1.0		N/A		N/A	
L _c , L _d (Counts)	33	68	30	64	36	74	N/A	N/A	N/A	N/A
Direct MDC, Scan MDC (dpm/100cm ²)	2118	6166	1975	5711	1131	4692	N/A	N/A	N/A	N/A
MDCR , MDC Count Rate	150	271	139	238	164	292	N/A	N/A	N/A	N/A

Radiological Survey	US Army MRICD Edgewood MD			
			Building E3081	Room 277
Surveyors	Name: Paul Madairy	Name N/A	Date 3/11/2022	
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831		

Random Start 1' x 3'
Grid Spacing 5'



Remarks:

Scan Zone Locations

Radiological Survey		US Army MRICD Edgewood MD		RSO, Inc.	
				Building E3081	Room 277
Surveyors	Name: Paul Madairy		Name N/A		Date 3/11/2022
Contact	Name: Travis Lindeblad		Phone No. 410-436-1831		

W2

B1

W3

F1

W1


H1

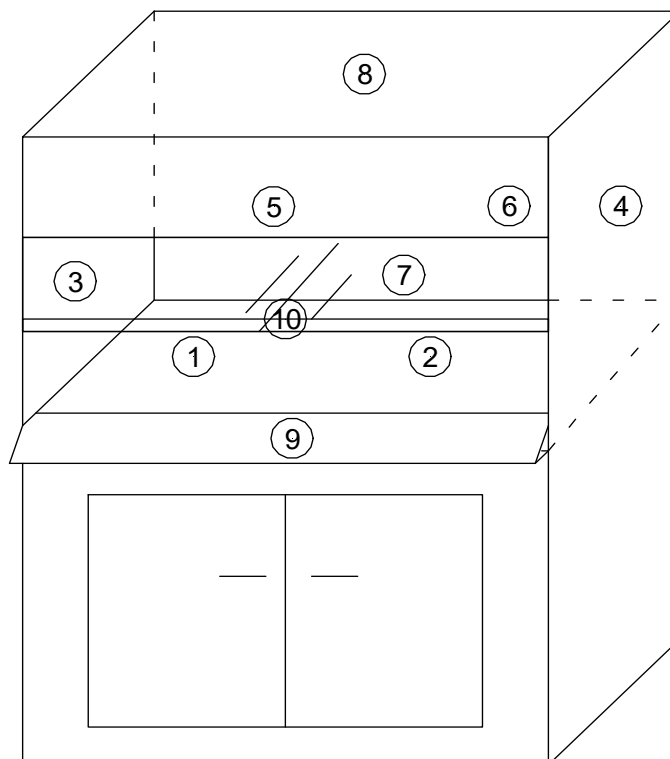
H2

W1

Remarks:

Hood Wipes, Directs, and Scans

Radiological Decommissioning Survey		US Army MRICD Edgewood MD			
				Building E3081	Room 277
Surveyors	Name: Paul Madairy	Name N/A	Date 3/11/2022		
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831	Fume Hood Diagram		



- | | |
|------------------|-----------------|
| 1 Left Benchtop | 6 Rear Wall |
| 2 Right Benchtop | 7 Behind Baffle |
| 3 Left Wall | 8 Duct Opening |
| 4 Right Wall | 9 Airfoil |
| 5 Rear Wall | 10 Sash |

Remarks:

Site: US Army MRICDBuilding: E3081Lab/Room: 285Start Date: 04/06/22Finish Date: 05/11/22Surveyor: Paul MadairySurveyor: N/A

Area Survey Results			Wipe Tests		Direct Measurements			Dose Rate		β Scan Measurements; See Maps For Zones				
Sample Number	Description	Surface	H-3 (dpm/100 cm ²)	C-14 (dpm/100 cm ²)	Survey Meter #	Gross (cpm)	C-14 dpm/100 cm ²	Survey Meter #	Gross (μrem/hr)	Area	Survey Meter #	Gross High (cpm)	Gross Average (cpm)	C-14 dpm/100 cm ²
1	Floor	Epoxy Concrete	<100	<100	2	242	-412	5	5	1	2	300	250	-180
2	Wall	Cinderblock	<100	<100	2	298	1212	5	5	2	2	300	275	545
3	Hood Front	Metal	<100	<100	2	246	-296	5	5	3	2	300	250	-180
4	Hood Front	Metal	<100	<100	2	224	-933	5	5	4	2	300	250	-180
5	Hood Front	Metal	<100	<100	2	234	-643	5	5	5	2	300	250	-180
6	Hood Front	Metal	<100	<100	2	228	-817	5	5	6	2	325	275	545
7	Floor	Epoxy Concrete	<100	<100	2	254	-64	5	5	7	2	300	250	-180
8	Floor	Epoxy Concrete	<100	<100	2	212	-1281	5	5	8	2	300	250	-180
9	Floor	Epoxy Concrete	<100	<100	2	224	-933	5	5					
10	Wall	Cinderblock	<100	<100	2	228	-817	5	5					
11	Floor	Epoxy Concrete	<100	<100	2	226	-875	5	5					
12	Floor	Epoxy Concrete	<100	<100	2	244	-354	5	5					
13	Floor	Epoxy Concrete	<100	<100	2	238	-528	5	5					
14	Floor	Epoxy Concrete	<100	<100	2	268	342	5	5					
15	Wall	Cinderblock	<100	<100	2	272	458	5	5					
16	Hood Front	Metal	<100	<100	2	256	-6	5	5					
17	Hood Front	Metal	<100	<100	2	244	-354	5	5					
18	Wall	Cinderblock	<100	<100	2	238	-528	5	5					
19	Wall	Cinderblock	<100	<100	2	254	-64	5	5					
S1	Floor Drain	Metal	<100	<100	2	224	-933	5	5					
S2	Floor Drain	Metal	<100	<100	2	218	-1107	5	5					
Hood 1														
1	Left Worktop	Metal	<100	<100				5	5	Hood 1	3	288	219	-343
2	Right Worktop	Metal	<100	<100				5	5					
3	Left Wall	Metal	<100	<100				5	5					
4	Right Wall	Metal	<100	<100				5	5					
5	Rear Wall	Metal	<100	<100				5	5					
6	Rear Wall	Metal	<100	<100				5	5					
7	Behind Baffle	Metal	<100	<100				5	5					
8	Duct Opening	Metal	<100	<100				5	5					
9	Airfoil	Metal	<100	<100				5	5					
10	Sash	Metal	<100	<100				5	5					
Hood 2														

Site: US Army MRICDBuilding: E3081Lab/Room: 285Start Date: 04/06/22Finish Date: 05/11/22Surveyor: Paul MadairySurveyor: N/A

Area Survey Results			Wipe Tests		Direct Measurements			Dose Rate		β Scan Measurements; See Maps For Zones				
Sample Number	Description	Surface	H-3 (dpm/100 cm ²)	C-14 (dpm/100 cm ²)	Survey Meter #	Gross (cpm)	C-14 dpm/100 cm ²	Survey Meter #	Gross (μrem/hr)	Area	Survey Meter #	Gross High (cpm)	Gross Average (cpm)	C-14 dpm/100 cm ²
1	Left Worktop	Metal	<100	<100				5	5	Hood 2	3	247	216	-404
2	Right Worktop	Metal	<100	<100				5	5					
3	Left Wall	Metal	<100	<100				5	5					
4	Right Wall	Metal	<100	<100				5	5					
5	Rear Wall	Metal	<100	<100				5	5					
6	Rear Wall	Metal	<100	<100				5	5					
7	Behind Baffle	Metal	<100	<100				5	5					
8	Duct Opening	Metal	<100	<100				5	5					
9	Airfoil	Metal	<100	<100				5	5					
10	Sash	Metal	<100	<100				5	5					
Hood 3														
1	Left Worktop	Metal	<100	<100				5	5	Hood 3	3	217	179	-1152
2	Right Worktop	Metal	<100	<100				5	5					
3	Left Wall	Metal	<100	<100				5	5					
4	Right Wall	Metal	<100	<100				5	5					
5	Rear Wall	Metal	<100	<100				5	5					
6	Rear Wall	Metal	<100	<100				5	5					
7	Behind Baffle	Metal	<100	<100				5	5					
8	Duct Opening	Metal	<100	<100				5	5					
9	Airfoil	Metal	<100	<100				5	5					
10	Sash	Metal	<100	<100				5	5					
Hood 4														
1	Left Worktop	Metal	<100	<100				5	5	Hood 4	3	232	193	-869
2	Right Worktop	Metal	<100	<100				5	5					
3	Left Wall	Metal	<100	<100				5	5					
4	Right Wall	Metal	<100	<100				5	5					
5	Rear Wall	Metal	<100	<100				5	5					
6	Rear Wall	Metal	<100	<100				5	5					
7	Behind Baffle	Metal	<100	<100				5	5					
8	Duct Opening	Metal	<100	<100				5	5					
9	Airfoil	Metal	<100	<100				5	5					
10	Sash	Metal	<100	<100				5	5					

Surveyor: Paul Madairy

Surveyor: N/A

[illegible]


Survey Meter Information

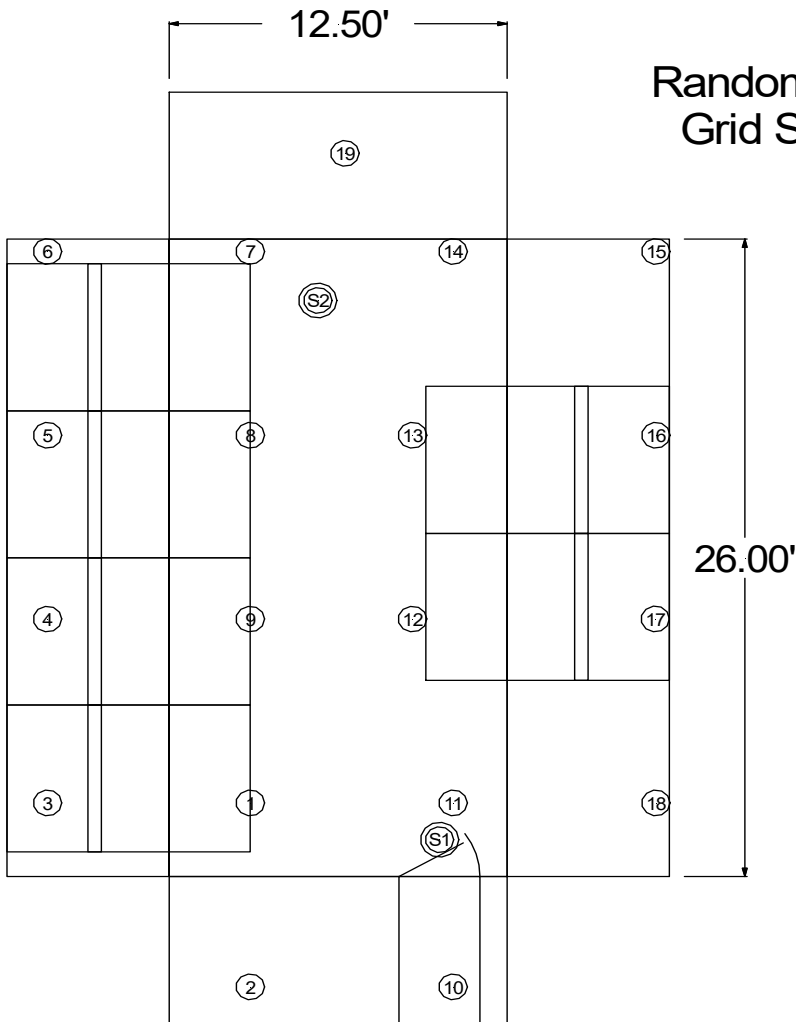
Site: US Army MRICD

Building: E3081

Lab/Room: 285

	Meter 1		Meter 2		Meter 3		Meter 4		Meter 5	
Date:	4/6/2022		5/11/2022		10/12/2022		Not In Service		5/11/2022	
Make:	Ludlum		Ludlum		Ludlum				Bicron	
Model:	2360		2360		3002				uRem	
SN:	155385		155385		25012574				C802F	
Probe Make:	Ludlum		Ludlum		Ludlum				N/A	
Probe Model:	43-93		43-93		43-93				N/A	
Probe SN:	PR356145		PR356145		PR359841				N/A	
Probe Area (cm ²):	100		100		100				N/A	
Next Cal. Date:	12/10/2022		12/10/2022		4/5/2023				6/3/2022	
Background Surface Material	Air		Air		Air				Air	
Background(c) - Time(Min):	2711	10	2562	10	2360	10	mRem/hr		5	mRem/hr
CS Isotope - Activity(μCi):	C-14	0.159	C-14	0.159	C-14	0.159			Cs-137	
CS Source(cpm)	4526		4119		2880				OK	
Total Efficiency 2Pi, Isotope:	13.8%	C-14	13.8%	C-14	19.8%	C-14	N/A	N/A	N/A	N/A
Source Efficiency/Surveyor Efficiency	0.25	0.50	0.25	0.50	0.25	0.50	N/A	N/A	N/A	N/A
Surface Efficiency/Scan Interval	1.00	1.0	1.00	1.0	1.00	1.0	N/A	N/A	N/A	N/A
Sample Count Time(min)	0.5		0.5		1.0		N/A		N/A	
L _c , L _d (Counts)	38	80	37	77	36	74	N/A	N/A	N/A	N/A
Direct MDC, Scan MDC (dpm/100cm ²)	2449	7215	2386	7014	1131	4692	N/A	N/A	N/A	N/A
MDCR , MDC Count Rate	176	356	171	339	164	292	N/A	N/A	N/A	N/A

Radiological Survey		US Army MRICD Edgewood MD			
				Building E3081	Room 285
Surveyors	Name: Paul Madairy		Name N/A		Date 4/6/2022
Contact	Name: Travis Lindeblad		Phone No. 410-436-1831		




Random Start 3' x 3'
Grid Spacing 7.5'

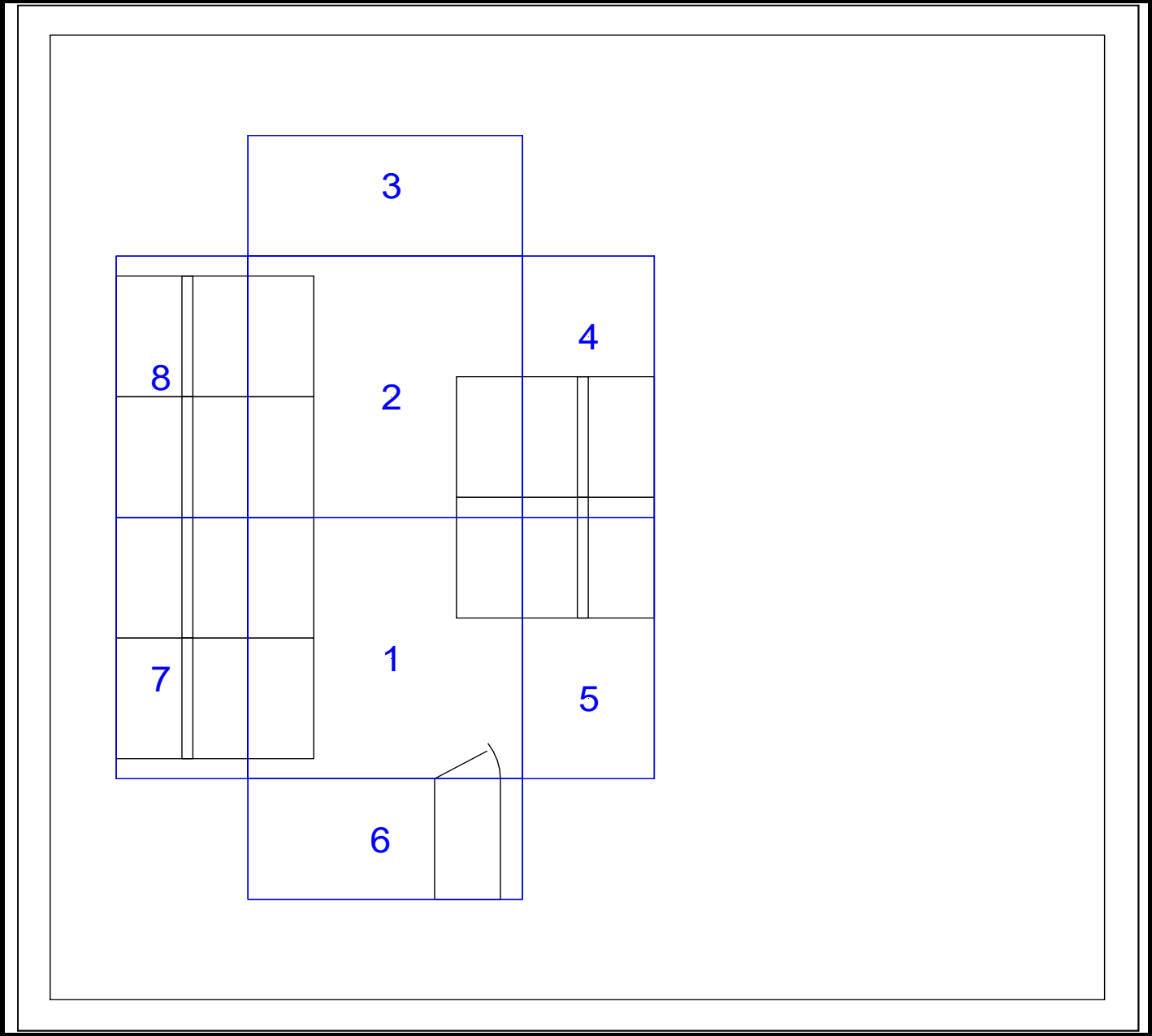
12.50'

26.00'

Remarks:


Scan Zone Locations

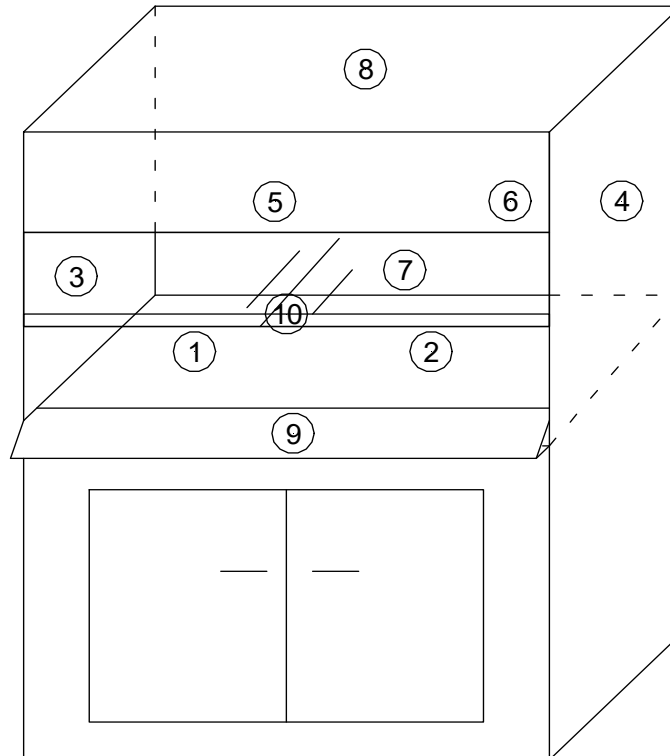
Radiological Survey	US Army MRICD Edgewood MD			
			Building E3081	Room 285
Surveyors	Name: Paul Madairy	Name N/A	Date 4/6/2022	
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831		



Remarks:

Hood Wipes, Directs, and Scans

Radiological Decommissioning Survey		US Army MRICD Edgewood MD			
				Building E3081	Room 285
Surveyors	Name: Paul Madairy	Name N/A	Date 4/6/2022		
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831	Fume Hood Diagram		



- | | |
|------------------|-----------------|
| 1 Left Benchtop | 6 Rear Wall |
| 2 Right Benchtop | 7 Behind Baffle |
| 3 Left Wall | 8 Duct Opening |
| 4 Right Wall | 9 Airfoil |
| 5 Rear Wall | 10 Sash |

Remarks:

Site: US Army MRICDBuilding: E3081Lab/Room: 287Start Date: 04/06/22Finish Date: 05/11/22Surveyor: Paul MadairySurveyor: N/A

Area Survey Results			Wipe Tests		Direct Measurements			Dose Rate		β Scan Measurements; See Maps For Zones				
Sample Number	Description	Surface	H-3 (dpm/100 cm ²)	C-14 (dpm/100 cm ²)	Survey Meter #	Gross (cpm)	C-14 dpm/100 cm ²	Survey Meter #	Gross (μrem/hr)	Area	Survey Meter #	Gross High (cpm)	Gross Average (cpm)	C-14 dpm/100 cm ²
1	Floor	Epoxy Concrete	<100	<100	2	242	-412	5	5	1	1	300	250	-612
2	Wall	Cinderblock	<100	<100	2	254	-64	5	5	2	1	325	275	113
3	Wall	Cinderblock	<100	<100	2	238	-528	5	5	3	1	300	250	-612
4	Cabinet	Metal	<100	<100	2	232	-701	5	5	4	1	300	250	-612
5	Wall	Cinderblock	<100	<100	2	242	-412	5	5	5	1	300	250	-612
6	Wall	Cinderblock	<100	<100	2	246	-296	5	5	6	1	325	275	113
7	Floor	Epoxy Concrete	<100	<100	2	252	-122	5	5	7	1	325	275	113
8	Floor	Epoxy Concrete	<100	<100	2	230	-759	5	5					
9	Wall	Cinderblock	<100	<100	2	276	574	5	5					
10	Floor	Epoxy Concrete	<100	<100	2	240	-470	5	5					
11	Floor	Epoxy Concrete	<100	<100	2	228	-817	5	5					
12	Floor	Epoxy Concrete	<100	<100	2	218	-1107	5	5					
13	Wall	Cinderblock	<100	<100	2	232	-701	5	5					
14	Wall	Cinderblock	<100	<100	2	246	-296	5	5					
15	Wall	Cinderblock	<100	<100	2	252	-122	5	5					
16	Wall	Cinderblock	<100	<100	2	238	-528	5	5					
17	Benchtop	Solid Surface	<100	<100	2	244	-354	5	5					
18	Benchtop	Solid Surface	<100	<100	2	290	980	5	5					
19	Benchtop	Solid Surface	<100	<100	2	228	-817	5	5					
20	Benchtop	Solid Surface	<100	<100	2	220	-1049	5	5					
21	Benchtop	Solid Surface	<100	<100	2	220	-1049	5	5					
22	Sink	Metal	<100	<100	2	246	-296	5	5					
23	Floor Drain	Metal	<100	<100	2	212	-1281	5	5					
S1	Sink	Metal	<100	<100										
S2	Floor Drain	Metal	<100	<100										
Hood 1														
1	Left Worktop	Metal	<100	<100				5	5	Hood 1	3	255	196	-808
2	Right Worktop	Metal	<100	<100				5	5					
3	Left Wall	Metal	<100	<100				5	5					
4	Right Wall	Metal	<100	<100				5	5					
5	Rear Wall	Metal	<100	<100				5	5					
6	Rear Wall	Metal	<100	<100				5	5					
7	Behind Baffle	Metal	<100	<100				5	5					
8	Duct Opening	Metal	<100	<100				5	5					

Site: US Army MRICD
Start Date: 04/06/22
Surveyor: Paul Madairy

Building: E3081
Finish Date: 05/11/22
Surveyor: N/A

Lab/Room: 287

[illegible]


Survey Meter Information

Site: US Army MRICD

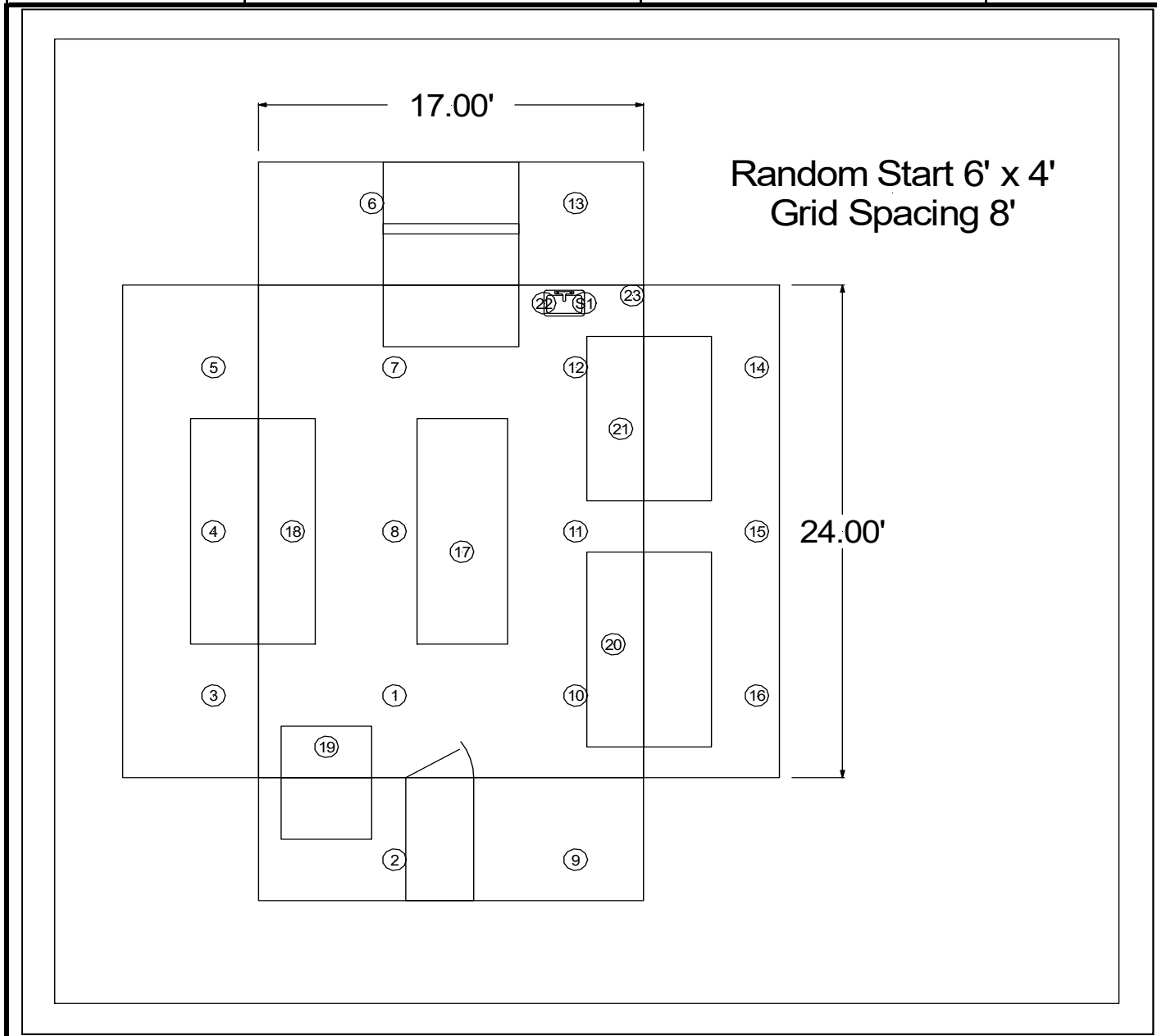
Building: E3081

Lab/Room: 287

	Meter 1		Meter 2		Meter 3		Meter 4		Meter 5	
Date:	4/6/2022		5/11/2022		10/12/2022		Not In Service		5/11/2022	
Make:	Ludlum		Ludlum		Ludlum				Bicron	
Model:	2360		2360		3002				uRem	
SN:	155385		155385		25012574				C802F	
Probe Make:	Ludlum		Ludlum		Ludlum				N/A	
Probe Model:	43-93		43-93		43-93				N/A	
Probe SN:	PR356145		PR356145		PR359841				N/A	
Probe Area (cm ²):	100		100		100				N/A	
Next Cal. Date:	12/10/2022		12/10/2022		4/5/2023				6/3/2022	
Background Surface Material	Air		Air		Air				Air	
Background(c) - Time(Min):	2711	10	2562	10	2360	10	mRem/hr		5	mRem/hr
CS Isotope - Activity(μCi):	C-14	0.159	C-14	0.159	C-14	0.159			Cs-137	
CS Source(cpm)	4526		4119		2880				OK	
Total Efficiency 2Pi, Isotope:	13.8%	C-14	13.8%	C-14	19.8%	C-14	N/A	N/A	N/A	N/A
Source Efficiency/Surveyor Efficiency	0.25	0.50	0.25	0.50	0.25	0.50	N/A	N/A	N/A	N/A
Surface Efficiency/Scan Interval	1.00	1.0	1.00	1.0	1.00	1.0	N/A	N/A	N/A	N/A
Sample Count Time(min)	0.5		0.5		1.0		N/A		N/A	
L _c , L _d (Counts)	38	80	37	77	36	74	N/A	N/A	N/A	N/A
Direct MDC, Scan MDC (dpm/100cm ²)	2449	7215	2386	7014	1131	4692	N/A	N/A	N/A	N/A
MDCR , MDC Count Rate	176	356	171	853	164	519	N/A	N/A	N/A	N/A


Radiological Survey	US Army MRICD Edgewood MD			
			Building E3081	Room 287

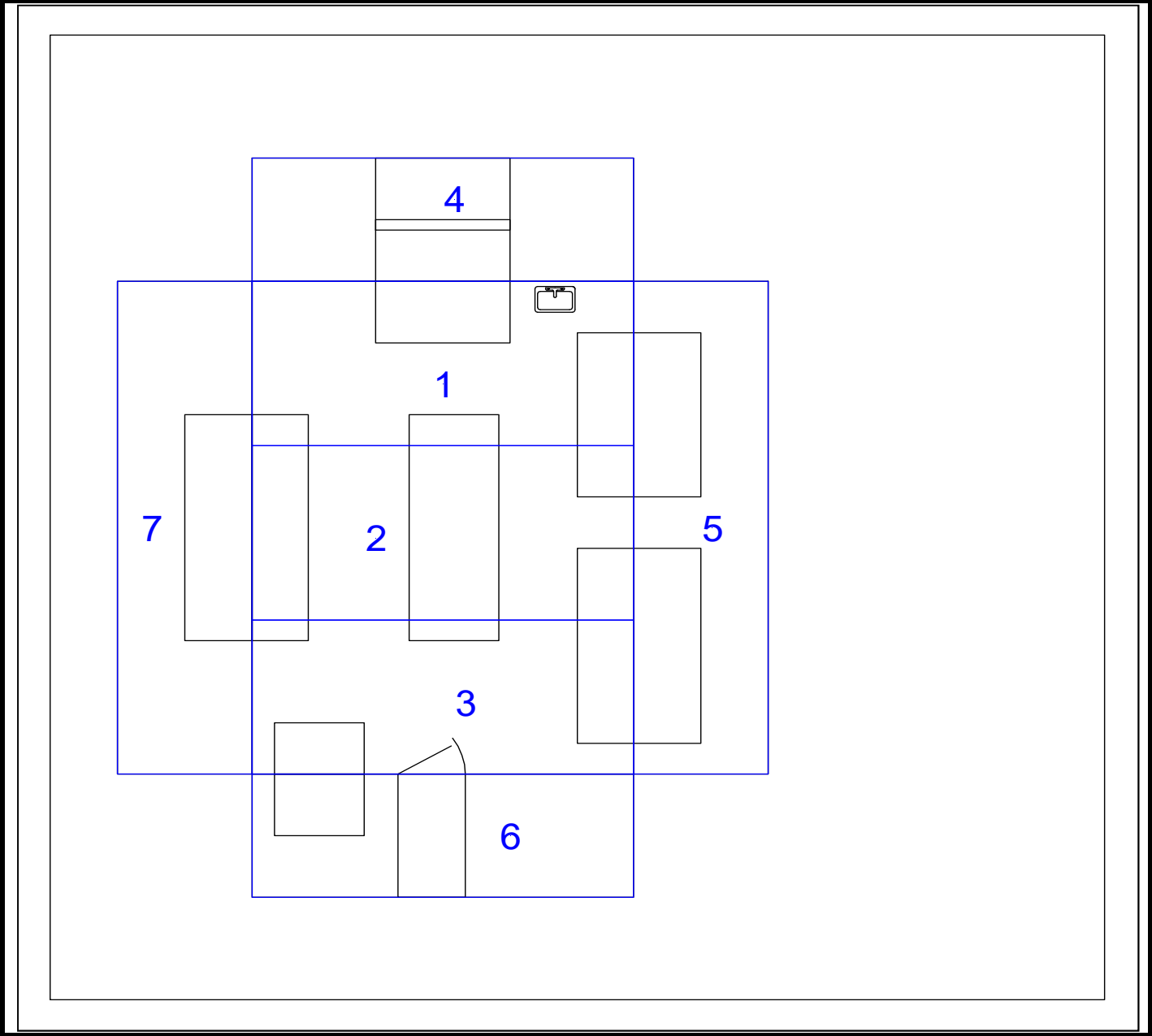
Surveyors	Name: Paul Madairy	Name N/A	Date 4/6/2022
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831	



Remarks:


Scan Zone Locations

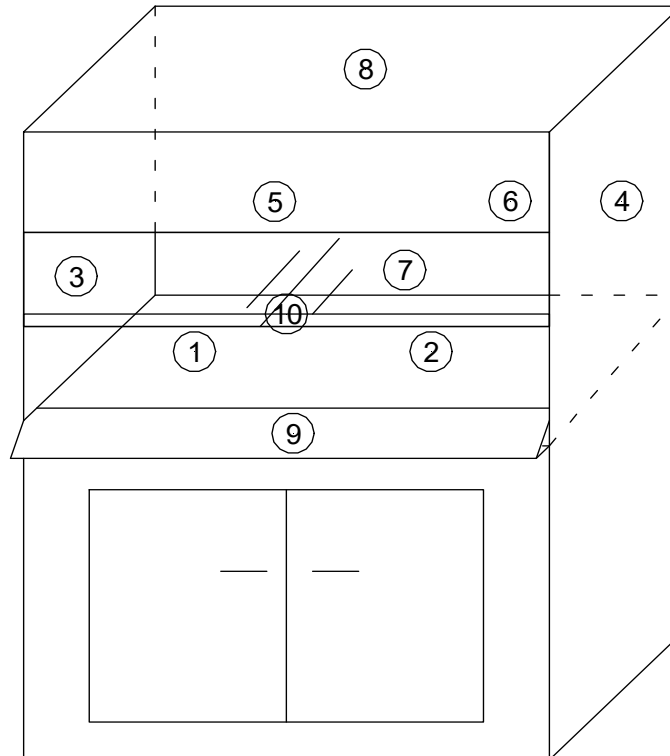
Radiological Survey	US Army MRICD			
	Edgewood MD		Building E3081	Room 287
Surveyors	Name: Paul Madairy	Name N/A	Date 4/6/2022	
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831		



Remarks:

Hood Wipes, Directs, and Scans

Radiological Decommissioning Survey		US Army MRICD Edgewood MD			
				Building E3081	Room 287
Surveyors	Name: Paul Madairy	Name N/A	Date 4/6/2022		
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831	Fume Hood Diagram		



- | | |
|------------------|-----------------|
| 1 Left Benchtop | 6 Rear Wall |
| 2 Right Benchtop | 7 Behind Baffle |
| 3 Left Wall | 8 Duct Opening |
| 4 Right Wall | 9 Airfoil |
| 5 Rear Wall | 10 Sash |

Remarks:

Site: US Army MRICDBuilding: E3081Lab/Room: 290Start Date: 04/06/22Finish Date: 05/11/22Surveyor: Paul MadairySurveyor: N/A

Area Survey Results			Wipe Tests		Direct Measurements			Dose Rate		β Scan Measurements; See Maps For Zones				
Sample Number	Description	Surface	H-3 (dpm/100 cm ²)	C-14 (dpm/100 cm ²)	Survey Meter #	Gross (cpm)	C-14 dpm/100 cm ²	Survey Meter #	Gross (μrem/hr)	Area	Survey Meter #	Gross High (cpm)	Gross Average (cpm)	C-14 dpm/100 cm ²
1	Floor	Epoxy Concrete	<100	<100	2	248	-238	5	5	1	1	275	250	-612
2	Floor	Epoxy Concrete	<100	<100	2	226	-875	5	5	2	1	275	225	-1336
3	Wall	Cinderblock	<100	<100	2	226	-875	5	5	3	1	275	225	-1336
4	Wall	Cinderblock	<100	<100	2	244	-354	5	5	4	1	300	250	-612
5	Wall	Cinderblock	<100	<100	2	210	-1339	5	5	5	1	300	250	-612
6	Wall	Cinderblock	<100	<100	2	228	-817	5	5	6	1	275	225	-1336
7	Floor	Epoxy Concrete	<100	<100	2	238	-528	5	5					
8	Floor	Epoxy Concrete	<100	<100	2	248	-238	5	5					
9	Floor	Epoxy Concrete	<100	<100	2	204	-1513	5	5					
10	Floor	Epoxy Concrete	<100	<100	2	230	-759	5	5					
11	Floor	Epoxy Concrete	<100	<100	2	244	-354	5	5					
12	Floor	Epoxy Concrete	<100	<100	2	236	-586	5	5					
13	Wall	Cinderblock	<100	<100	2	224	-933	5	5					
14	Wall	Cinderblock	<100	<100	2	218	-1107	5	5					
15	Wall	Cinderblock	<100	<100	2	256	-6	5	5					
16	Wall	Cinderblock	<100	<100	2	248	-238	5	5					
17	Wall	Cinderblock	<100	<100	2	262	168	5	5					
18	Door	Metal	<100	<100	2	224	-933	5	5					
19	Sink	Metal	<100	<100	2	198	-1687	5	5					
20	Wall	Cinderblock	<100	<100	2	220	-1049	5	5					
S1	Sink	Metal	<100	<100				5	5					
S2	Floor Drain	Metal	<100	<100	2	218	-1107	5	5					
S3	Floor Drain	Metal	<100	<100	2	246	-296	5	5					
S4	Floor Drain	Metal	<100	<100	2	242	-412	5	5					
S5	Floor Drain	Metal	<100	<100	2	214	-1223	5	5					
Hood 1														
1	Left Worktop	Metal	<100	<100				5	5	Hood 1	3	256	199	-747
2	Right Worktop	Metal	<100	<100				5	5					
3	Left Wall	Metal	<100	<100				5	5					
4	Right Wall	Metal	<100	<100				5	5					
5	Rear Wall	Metal	<100	<100				5	5					
6	Rear Wall	Metal	<100	<100				5	5					
7	Behind Baffle	Metal	<100	<100				5	5					
8	Duct Opening	Metal	<100	<100				5	5					

Site: US Army MRICD

Building: E3081

Lab/Room: 290

Start Date: 04/06/22

Finish Date: 05/11/22

Surveyor: Paul Madairy

Surveyor: N/A

[illegible]


Survey Meter Information

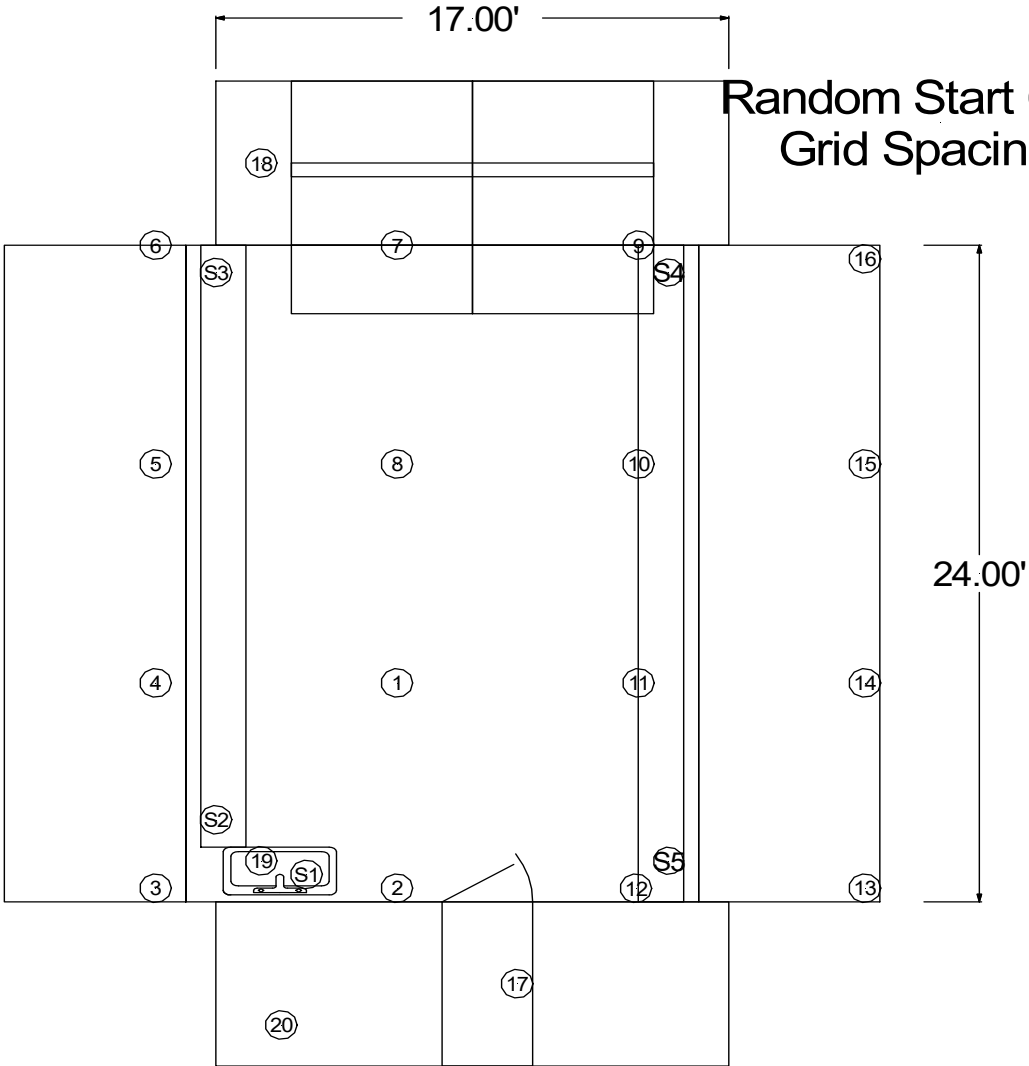
Site: US Army MRICD

Building: E3081

Lab/Room: 290

	Meter 1		Meter 2		Meter 3		Meter 4		Meter 5	
Date:	4/6/2022		5/11/2022		10/12/2022		Not In Service		5/11/2022	
Make:	Ludlum		Ludlum		Ludlum				Bicron	
Model:	2360		2360		3002				uRem	
SN:	155385		155385		25012574				C802F	
Probe Make:	Ludlum		Ludlum		Ludlum				N/A	
Probe Model:	43-93		43-93		43-93				N/A	
Probe SN:	PR356145		PR356145		PR359841				N/A	
Probe Area (cm ²):	100		100		100				N/A	
Next Cal. Date:	12/10/2022		12/10/2022		4/5/2023				6/3/2022	
Background Surface Material	Air		Air		Air				Air	
Background(c) - Time(Min):	2711	10	2562	10	2360	10	mRem/hr		5	mRem/hr
CS Isotope - Activity(μCi):	C-14	0.159	C-14	0.159	C-14	0.159			Cs-137	
CS Source(cpm)	4526		4119		2880				OK	
Total Efficiency 2Pi, Isotope:	13.8%	C-14	13.8%	C-14	19.8%	C-14	N/A	N/A	N/A	N/A
Source Efficiency/Surveyor Efficiency	0.25	0.50	0.25	0.50	0.25	0.50	N/A	N/A	N/A	N/A
Surface Efficiency/Scan Interval	1.00	1.0	1.00	1.0	1.00	1.0	N/A	N/A	N/A	N/A
Sample Count Time(min)	0.5		0.5		1.0		N/A		N/A	
L _c , L _d (Counts)	38	80	37	77	36	74	N/A	N/A	N/A	N/A
Direct MDC, Scan MDC (dpm/100cm ²)	2449	7215	2386	7014	1131	4692	N/A	N/A	N/A	N/A
MDCR , MDC Count Rate	176	356	171	339	164	292	N/A	N/A	N/A	N/A

Radiological Survey		US Army MRICD Edgewood MD			
				Building E3081	Room 290
Surveyors	Name: Paul Madairy	Name N/A	Date 4/6/2022		
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831			



17.00'

Random Start 6' x 8'
Grid Spacing 8'

24.00'

Remarks:

Scan Zone Locations

Radiological Survey		US Army MRICD Edgewood MD		RSO, Inc.	
				Building E3081	Room 290
Surveyors	Name: Paul Madairy	Name N/A		Date 4/6/2022	
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831			

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6

2

4


5

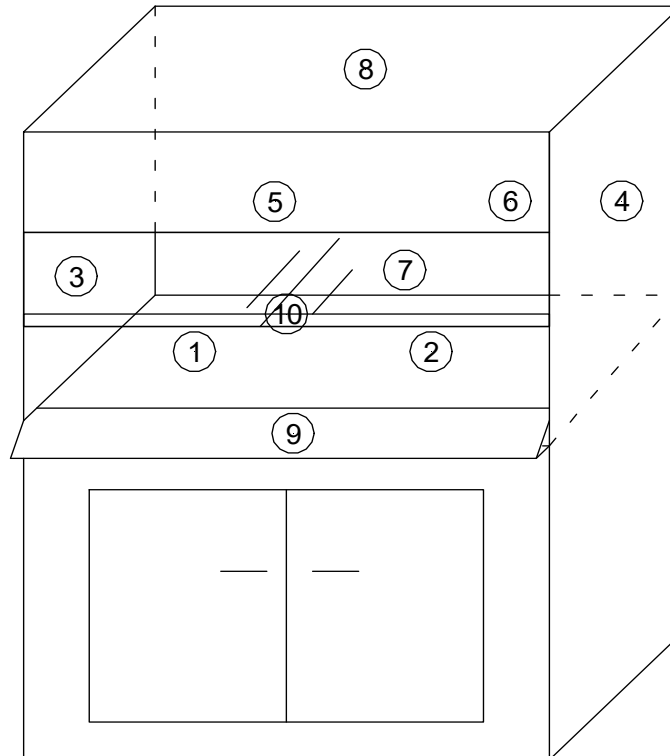
1

3

Remarks:

Hood Wipes, Directs, and Scans

Radiological Decommissioning Survey		US Army MRICD Edgewood MD			
				Building E3081	Room 290
Surveyors	Name: Paul Madairy	Name N/A	Date 4/6/2022		
Contact	Name: Travis Lindeblad	Phone No. 410-436-1831	Fume Hood Diagram		



- | | |
|------------------|-----------------|
| 1 Left Benchtop | 6 Rear Wall |
| 2 Right Benchtop | 7 Behind Baffle |
| 3 Left Wall | 8 Duct Opening |
| 4 Right Wall | 9 Airfoil |
| 5 Rear Wall | 10 Sash |

Remarks:

Attachment B

Wipe Test Analysis Data Print-Out

Assay Definition

Assay Description:

Basic dual DPM assay

Assay Type: DPM (Dual)

Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\Default\3h_14c_dpm\20220511_1425

Raw Results Path: C:\Packard\Tricarb\Results\Default\3h_14c_dpm\20220511_1425\20220511_1425.results

Assay File Name: C:\Packard\TriCarb\Assays\3h_14c_dpm.lsa

Count Conditions

Nuclide: 3H-14C

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H 02222022

Mid Energy: 14C 02222022

Count Time (min): 1.00

Count Mode: Normal

Assay Count Cycles: 1

Repeat Sample Count: 1

Number of Vials/Sample: 1

Calculate % Reference: On

Background Subtract

Background Subtract: Off

Low CPM Threshold: Off

2 Sigma % Terminator: Off

Regions	LL	UL
A	0.0	12.0
B	12.0	156.0
C	0.0	0.0

Count Corrections

Static Controller: On

Luminescence Correction: n/a

GCT: n/a

Colored Samples: Off

Heterogeneity Monitor: n/a

PAC: n/a

Coincidence Time (nsec): 18

Delay Before Burst (nsec): 75

PAC Strength: n/a

Cycle 1 Results

S#	Time	CPM 3H	CPM 14C	DPM 3H	DPM 14C	Eff 3H	Eff 14C	tSIE	MESSAGES
1	1	16	13	36	15	38.58	81.65	568	R
2	1	9	18	14	22	41.90	82.01	645	
3	1	6	10	11	11	41.61	81.97	638	
4	1	4	12	5	14	41.73	81.99	641	
5	1	4	14	5	17	40.04	81.76	598	
6	1	6	11	10	13	42.93	82.16	671	
7	1	4	7	8	8	39.00	81.68	576	
8	1	1	7	0	9	38.06	81.62	558	
9	1	4	9	7	11	39.27	81.70	581	
10	1	3	14	3	17	41.70	81.98	640	
11	1	5	13	8	15	41.48	81.95	634	
12	1	5	8	9	9	41.39	81.94	632	
13	1	5	15	7	18	41.69	81.98	640	

Please note: Wipe 19 in Lab 274 was on a separate analysis, after decontamination attempts.

Protocol# 8 - 3H_14C_DPM.lsa

User: Default

14	1	3	14	2	17	41.32	81.93	630
15	1	4	13	5	16	41.41	81.94	633
16	1	6	12	11	14	41.53	81.96	636
17	1	9	6	19	6	43.24	82.21	679
18	1	11	5	26	5	40.57	81.82	611

Missing vial 19.

20	1	3	13	3	16	42.35	82.08	656
21	1	5	8	9	9	41.24	81.92	628
22	1	4	11	5	14	40.81	81.86	617
23	1	6	8	12	9	40.75	81.85	616
24	1	5	11	8	13	40.93	81.87	620
25	1	6	11	11	13	42.08	82.04	649
26	1	4	1	10	1	38.68	81.66	570
27	1	5	11	8	13	40.56	81.82	611
28	1	3	11	4	13	38.98	81.68	576
29	1	3	7	5	8	40.99	81.88	622
30	1	2	10	1	12	38.04	81.62	558
31	1	4	17	4	21	39.69	81.73	589
32	1	3	7	5	8	39.94	81.75	595
33	1	6	9	12	10	40.56	81.82	611
34	1	0	8	0	10	41.00	81.88	622
35	1	2	5	3	6	40.99	81.88	622
36	1	3	8	5	10	40.94	81.88	621
37	1	6	8	12	9	40.19	81.77	602
38	1	0	8	0	10	41.06	81.89	624
39	1	4	8	8	9	36.39	81.51	527
40	1	3	13	2	16	38.86	81.67	573

Missing vial 41.

42	1	5	11	9	13	38.71	81.66	570
43	1	1	15	0	18	42.46	82.10	659
44	1	2	9	2	11	40.02	81.76	598
45	1	4	8	7	9	42.26	82.07	654
46	1	7	3	15	3	43.53	82.25	686
47	1	3	8	5	10	39.54	81.72	586
48	1	1	6	0	7	40.38	81.79	607
49	1	3	7	5	8	38.51	81.65	567
50	1	5	8	9	9	41.16	81.91	626
51	1	8	7	17	8	40.74	81.85	616
52	1	1	5	1	6	38.11	81.62	559
53	1	3	8	5	10	38.24	81.63	562
54	1	5	17	7	20	39.39	81.71	583
55	1	1	9	0	11	40.79	81.85	617
56	1	6	13	10	15	41.94	82.02	646
57	1	4	9	7	11	40.51	81.81	610
58	1	1	6	0	7	40.54	81.82	611
59	1	10	18	17	22	40.59	81.82	612
60	1	4	17	4	21	39.93	81.75	595
61	1	2	14	0	17	38.83	81.67	573
62	1	8	12	17	13	40.14	81.77	601
63	1	5	10	10	12	37.02	81.55	538
64	1	4	11	7	13	34.93	81.38	499
65	1	8	7	18	8	39.26	81.70	581
66	1	1	15	0	19	39.42	81.71	584

Missing vial 67.

68	1	7	11	14	13	39.77	81.73	591
69	1	2	8	2	10	39.40	81.71	583
70	1	4	4	9	4	39.28	81.70	581
71	1	6	6	12	7	41.93	82.02	646
72	1	1	5	1	6	40.12	81.76	600
73	1	4	11	6	13	40.22	81.77	603
74	1	2	7	2	8	40.15	81.77	601
75	1	3	10	4	12	39.08	81.69	577
76	1	6	7	12	8	41.14	81.90	626

Protocol# 8 - 3H_14C_DPM.lsa

User: Default

77	1	9	9	20	10	39.94	81.75	596
78	1	7	5	15	5	41.15	81.91	626
79	1	2	8	2	10	36.55	81.52	530
80	1	5	7	10	8	39.42	81.71	584
81	1	2	10	1	12	40.28	81.78	604
82	1	4	9	7	11	40.96	81.88	621
83	1	2	5	5	5	38.02	81.62	557
84	1	1	5	1	6	41.48	81.95	634
85	1	6	8	12	9	39.75	81.73	591
86	1	2	11	1	13	34.39	81.28	489
87	1	2	9	2	11	39.09	81.69	578
88	1	2	11	1	13	39.67	81.73	589
89	1	6	14	10	17	39.05	81.68	577
90	1	2	11	1	13	38.32	81.64	563
91	1	6	13	11	15	38.99	81.68	576
92	1	4	13	4	16	38.58	81.65	568

290

Assay Definition

Assay Description:

Basic dual DPM assay

Assay Type: DPM (Dual)

Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\Default\3h_14c_dpm\20220426_1210

Raw Results Path: C:\Packard\Tricarb\Results\Default\3h_14c_dpm\20220426_1210\20220426_1210.results

Assay File Name: C:\Packard\TriCarb\Assays\3h_14c_dpm.lsa

Count Conditions

Nuclide: 3H-14C

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H 02222022

Mid Energy: 14C 02222022

Count Time (min): 1.00

Count Mode: Normal

Assay Count Cycles: 1

Repeat Sample Count: 1

Number of Vials/Sample: 1

Calculate % Reference: On.

This location Number 19 from Lab 277. Multiple wipes were taken after a decontamination attempt.

Background Subtract

Background Subtract: Off

Low CPM Threshold: Off

2 Sigma % Terminator: Off

Regions	LL	UL
A	0.0	12.0
B	12.0	156.0
C	0.0	0.0

Count Corrections

Static Controller: On

Luminescence Correction: n/a

GCT: n/a

Colored Samples: Off

Heterogeneity Monitor: n/a

PAC: n/a

Coincidence Time (nsec): 18

Delay Before Burst (nsec): 75

PAC Strength: n/a

Cycle 1 Results

S#	Time	CPM 3H	CPM 14C	DPM 3H	DPM 14C	Eff 3H	Eff 14C	tSIE	MESSAGES
1	1	5	8	9	10	38.53	81.65	567	R
2	1	7	9	15	10	39.44	81.71	584	
3	1	6	8	13	9	39.66	81.72	589	
4	1	4	9	7	11	38.18	81.63	560	
5	1	1	8	0	10	39.74	81.73	590	
6	1	5	8	10	9	39.16	81.69	579	
7	1	8	13	16	15	39.14	81.69	579	
8	1	3	10	4	12	38.96	81.68	575	
Missing vial 9.									
BKGD	10	1	4	7	7	44.52	82.40	711	

Assay Definition

Assay Description:
 Basic dual DPM assay
 Assay Type: DPM (Dual)
 Report Name: Report1
 Output Data Path: C:\Packard\Tricarb\Results\Default\3h_14c_dpm\20220311_1312
 Raw Results Path: C:\Packard\Tricarb\Results\Default\3h_14c_dpm\20220311_1312\20220311_1312.results
 Assay File Name: C:\Packard\TriCarb\Assays\3h_14c_dpm.lsa

Count Conditions

Nuclide: 3H-14C
 Quench Indicator: tSIE/AEC
 External Std Terminator (sec): 0.5 2s%
 Pre-Count Delay (min): 0.00
 Quench Sets:
 Low Energy: 3H 02222022
 Mid Energy: 14C 02222022
 Count Time (min): 2.00
 Count Mode: Normal
 Assay Count Cycles: 1 Repeat Sample Count: 1
 Number of Vials/Sample: 1 Calculate % Reference: On

Background Subtract

Background Subtract: Off
 Low CPM Threshold: Off
 2 Sigma % Terminator: Off

Regions	LL	UL
A	0.0	12.0
B	12.0	156.0
C	0.0	0.0

Count Corrections

Static Controller: On Luminescence Correction: n/a GCT: n/a
 Colored Samples: Off Heterogeneity Monitor: n/a PAC: n/a
 Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75 PAC Strength: n/a

Cycle 1 Results

S#	Time	CPM 3H	CPM 14C	DPM 3H	DPM 14C	Eff 3H	Eff 14C	tSIE	MESSAGES
1	2	5	6	11	7	35.63	81.46	512	R
2	2	4	7	8	8	39.96	81.75	596	
3	2	3	6	6	6	38.89	81.67	574	
4	2	2	11	0	13	40.58	81.82	612	
5	2	2	9	1	11	36.96	81.55	537	
6	2	6	6	13	7	39.10	81.69	578	
7	2	4	8	7	10	36.26	81.50	524	
8	2	3	9	5	11	33.67	81.15	477	
9	2	1	7	0	8	39.49	81.71	585	
10	2	4	10	7	12	38.23	81.63	561	
11	2	2	11	2	13	29.13	80.26	402	
12	2	4	10	7	11	36.89	81.54	536	
13	2	3	7	4	8	38.53	81.65	567	

Protocol# 8 - 3H_14C_DPM.lsa

User: Default

14	2	5	6	11	7	37.07	81.55	539
15	2	6	10	11	11	38.57	81.65	568
16	2	2	12	1	14	33.51	81.12	475
17	2	2	9	1	10	35.12	81.42	503
277 18	2	2	7	3	9	40.15	81.77	601
19	2	2	7	2	8	40.74	81.85	616
20	2	4	9	6	11	37.64	81.59	550
21	2	4	5	8	5	38.98	81.68	576
22	2	4	9	8	11	36.42	81.51	527
Missing vial 23.								
BKGD	2	3	7	5	9	43.35	82.23	681

Protocol# 8 - 3H_14C_DPM.lsa

User: Default

E3081 Hood Wipes**Assay Definition**

Assay Description:

Basic dual DPM assay

Assay Type: DPM (Dual)

Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\Default\3h_14c_dpm\20220805_1106

Raw Results Path: C:\Packard\Tricarb\Results\Default\3h_14c_dpm\20220805_1106\20220805_1106.results

Assay File Name: C:\Packard\TriCarb\Assays\3h_14c_dpm.lsa

Count Conditions

Nuclide: 3H-14C

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H 06302022

Mid Energy: 14C 02222022

Count Time (min): 2.00

Count Mode: Normal

Assay Count Cycles: 1

Repeat Sample Count: 1

Number of Vials/Sample: 1

Calculate % Reference: On

Background Subtract

Background Subtract: Off

Low CPM Threshold: Off

2 Sigma % Terminator: Off

Regions	LL	UL
A	0.0	12.0
B	12.0	156.0
C	0.0	0.0

Count Corrections

Static Controller: On

Luminescence Correction: n/a

GCT: n/a

Colored Samples: Off

Heterogeneity Monitor: n/a

PAC: n/a

Coincidence Time (nsec): 18

Delay Before Burst (nsec): 75

PAC Strength: n/a

Cycle 1 Results

S#	Time	CPM 3H	CPM 14C	DPM 3H	DPM 14C	Eff 3H	Eff 14C	tSIE	MESSAGES
1	2	3	9	3	11	48.78	83.10	834	RE
2	2	4	10	4	12	48.18	83.02	819	E
3	2	4	10	6	12	44.27	82.47	725	E
4	2	5	11	7	14	44.39	82.49	728	E
5	2	1	12	0	15	42.67	82.25	686	
6	2	3	8	4	9	45.10	82.59	745	E
7	2	3	11	3	13	44.17	82.46	722	E
8	2	4	15	3	18	44.10	82.45	721	E
9	2	3	10	4	12	43.19	82.33	699	
10	2	4	10	5	12	43.19	82.32	699	
11	2	5	10	8	11	47.54	82.93	804	E
12	2	4	10	5	11	47.73	82.96	808	E
13	2	3	9	4	10	46.94	82.85	789	E

Protocol# 8 - 3H_14C_DPM.lsa

User: Default

14	2	4	16	4	19	47.54	82.93	804	E
15	2	2	11	0	13	43.30	82.34	701	
16	2	4	15	3	17	42.64	82.25	685	
17	2	3	8	4	9	48.49	83.06	826	E
18	2	3	8	4	9	48.63	83.08	830	E
19	2	5	9	8	11	46.29	82.76	773	E
20	2	4	14	4	16	39.90	81.87	619	
21	2	3	14	2	16	46.12	82.73	769	E
22	2	3	13	3	15	46.60	82.80	781	E
23	2	5	10	8	12	46.67	82.81	783	E
24	2	3	12	2	14	46.14	82.74	770	E
25	2	6	8	10	10	46.44	82.78	777	E
26	2	3	10	3	12	46.24	82.75	772	E
27	2	5	9	7	11	46.41	82.77	776	E
28	2	5	11	7	13	44.11	82.45	721	E
29	2	5	15	5	18	45.59	82.66	756	E
30	2	7	11	11	12	46.55	82.79	780	E
31	2	3	13	1	16	43.43	82.36	704	
32	2	4	7	6	7	49.47	83.20	850	E
33	2	3	10	3	12	46.54	82.79	779	E
34	2	4	12	4	14	46.42	82.77	777	E
35	2	4	6	6	7	46.15	82.74	770	E
36	2	2	16	0	20	45.51	82.65	755	E
37	2	3	14	1	16	45.72	82.68	760	E
38	2	2	14	0	17	45.03	82.58	743	E
39	2	3	14	2	17	46.02	82.72	767	E
40	2	4	14	3	17	46.78	82.82	785	E
41	2	5	15	5	18	43.67	82.39	710	
42	2	5	9	8	10	45.46	82.64	753	E
43	2	7	15	10	17	46.39	82.77	776	E
44	2	5	10	8	12	45.35	82.63	751	E
45	2	2	11	0	13	46.06	82.72	768	E
46	2	27	12	56	12	45.44	82.64	753	E
47	2	5	14	7	16	45.13	82.59	745	E
48	2	4	11	5	13	44.72	82.54	736	E
49	2	4	11	6	13	45.01	82.58	742	E
50	2	3	13	3	15	45.23	82.61	748	E
51	2	4	10	5	12	49.11	83.15	841	E
52	2	2	12	1	15	45.58	82.66	756	E
53	2	9	18	14	20	46.14	82.74	770	E
54	2	4	9	5	11	46.64	82.80	782	E
55	2	3	14	1	16	51.58	83.49	901	E
56	2	2	7	1	8	45.69	82.67	759	E
57	2	5	11	8	12	45.37	82.63	751	E
58	2	5	13	6	15	45.25	82.61	748	E
59	2	4	11	4	12	45.84	82.69	763	E
60	2	3	9	4	10	46.41	82.77	776	E
61	2	5	10	7	12	45.39	82.63	752	E
62	2	5	15	5	18	46.49	82.78	778	E
63	2	4	15	3	18	46.84	82.83	787	E
64	2	4	11	5	12	45.66	82.67	758	E
65	2	4	11	4	13	46.01	82.72	767	E
66	2	4	12	6	14	45.87	82.70	763	E
67	2	3	10	4	12	46.55	82.79	780	E
68	2	6	13	10	15	45.38	82.63	751	E
69	2	5	12	7	14	45.52	82.65	755	E
70	2	4	9	6	11	45.04	82.58	743	E
71	2	3	15	2	17	45.54	82.65	755	E
72	2	4	12	5	14	45.41	82.63	752	E
73	2	3	12	2	14	45.78	82.68	761	E
74	2	16	13	30	14	46.85	82.83	787	E
75	2	6	8	10	9	46.78	82.82	785	E
76	2	2	15	0	18	45.98	82.71	766	E

Protocol# 8 - 3H_14C_DPM.lsa

User: Default

77	2	6	11	8	13	46.21	82.74	771	E
78	2	3	16	0	19	45.19	82.60	747	E
79	2	5	9	7	11	48.19	83.02	819	E
80	2	6	13	8	15	46.56	82.79	780	E
81	2	3	10	3	12	45.50	82.65	754	E
82	2	4	11	5	12	46.11	82.73	769	E
83	2	5	11	7	13	45.99	82.71	766	E
84	2	4	11	5	13	45.95	82.71	765	E
85	2	8	9	12	10	50.06	83.28	864	E
86	2	5	14	6	17	46.02	82.72	767	E
87	2	3	12	3	14	45.38	82.63	751	E
88	2	6	11	9	12	44.66	82.53	734	E
89	2	3	14	2	17	45.83	82.69	762	E
90	2	4	13	4	15	45.64	82.67	758	E
91	2	17	15	31	16	48.42	83.05	825	E
92	2	35	18	67	18	48.61	83.08	829	E
93	2	4	13	5	15	51.33	83.46	895	E
94	2	14	7	25	6	50.55	83.35	876	E
95	2	14	13	23	14	52.50	83.62	923	E
96	2	9	15	15	18	43.88	82.42	715	
97	2	53	70	100	80	42.96	82.29	693	
98	2	4	9	6	11	45.05	82.58	744	E
99	2	3	17	1	21	45.32	82.62	750	E
100	2	38	30	80	33	42.37	82.21	679	
101	2	9	6	16	6	48.08	83.00	816	E
102	2	47	10	95	7	48.43	83.05	825	E
103	2	3	9	4	10	49.50	83.20	851	E
104	2	24	22	44	24	48.59	83.08	829	E
105	2	4	10	4	12	48.06	83.00	816	E
106	2	5	12	7	14	46.96	82.85	790	E
107	2	13	22	22	25	48.01	83.00	815	E
108	2	3	10	3	12	45.57	82.66	756	E
109	2	5	14	7	17	45.78	82.69	761	E
110	2	2369	343	4817	153	48.79	83.10	834	E

Protocol# 8 - 3H_14C_DPM.lsa

User: Default

Assay Definition

E3081 Lab 277
 Well Wipes inside
 Hood

Assay Description:

Basic dual DPM assay

Assay Type: DPM (Dual)

Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\Default\3h_14c_dpm\20221012_1501

Raw Results Path: C:\Packard\Tricarb\Results\Default\3h_14c_dpm\20221012_1501\20221012_1501.results

Assay File Name: C:\Packard\TriCarb\Assays\3h_14c_dpm.lsa

Count Conditions

Nuclide: 3H-14C

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H 06302022

Mid Energy: 14C 02222022

Count Time (min): 2.00

Count Mode: Normal

Assay Count Cycles: 1

Repeat Sample Count: 1

Number of Vials/Sample: 1

Calculate % Reference: On

Background Subtract

Background Subtract: Off

Low CPM Threshold: Off

2 Sigma % Terminator: Off

Regions	LL	UL
A	0.0	12.0
B	12.0	156.0
C	0.0	0.0

Count Corrections

Static Controller: On

Luminescence Correction: n/a

GCT: n/a

Colored Samples: Off

Heterogeneity Monitor: n/a

PAC: n/a

Coincidence Time (nsec): 18

Delay Before Burst (nsec): 75

PAC Strength: n/a

Cycle 1 Results

S#	Time	CPM 3H	CPM 14C	DPM 3H	DPM 14C	Eff 3H	Eff 14C	tSIE	MESSAGES
1	2	16	38	29	46	35.80	81.51	526	R
2	2	55	110	113	129	35.71	81.50	524	
3	2	168	539	390	658	25.29	79.50	357	
4	2	68	247	112	300	30.92	80.75	440	
5	2	77	203	157	243	31.72	80.89	453	
6	2	29	65	59	76	34.90	81.44	506	
7	2	89	156	174	183	38.33	81.70	582	
8	2	124	440	251	539	26.33	79.75	372	
9	2	288	818	715	990	25.57	79.57	361	
10	2	35	156	41	191	32.41	81.01	464	
11	2	114	384	271	470	24.16	79.24	341	
12	2	554	1216	2414	1458	17.23	77.04	256	
13	2	51	160	88	193	32.59	81.04	467	

Protocol# 8 - 3H_14C_DPM.lsa

User: Default

14	2	108	258	280	308	26.71	79.84	377
15	2	146	156	357	173	35.29	81.47	514
16	2	28	45	75	52	30.09	80.61	426
17	2	49	97	108	114	33.44	81.19	481
18	2	43	74	92	86	36.34	81.55	538
Missing vial 19.								
20	2	3	12	3	14	39.17	81.77	602

1 to 6 Middle Well

7 to 12 Left Well

13 to 18 Right Well

Attachment C

Survey Meter Calibration Reports

RSO, Inc.
P.O. Box 1450
Laurel, MD 20725
(301) 953-2482

RSO Job No. 14603

Certificate of Calibration

ISSUED TO: RSO, Inc.
5206 Minnick Road
Laurel, MD 20707



INSTRUMENT: LUDLUM
MODEL: 2360
TYPE: SCALER/RATE MTR
SN: 156385

CONTACT: Paul Madairy
PHONE: (301) 953-2432

PO NO: RSO 370

RSO, Inc. certifies that on 12/10/2021 the above described instrument was calibrated was calibrated using standards directly traceable to NIST or derived by ratio technique from NIST traceable standards and in accordance with RSO QAP-5, ANSI N323AB-2013 and ANSI NCSL Z540-1-1994.

The results are tabulated below. Calibration is traceable to NIST.

Calibration Data						
	RANGE	EXPECTED	OBSERVED		C.F.	NOTE
SCALER	ALPHA	10	10	cnts	1.00	
		4000	3999	cnts	1.00	
		100000	100011	cnts	1.00	
		400000	398617	cnts	1.00	
	BETA	10	10	cnts	1.00	
		4000	3995	cnts	1.00	
		100000	99996	cnts	1.00	
		400000	398411	cnts	1.00	
	x1	100	100	cpm	1.00	
		400	400	cpm	1.00	
	x10	1000	1000	cpm	1.00	
		4000	4000	cpm	1.00	
	x100	10000	10000	cpm	1.00	
		40000	40000	cpm	1.00	
	x1000	100000	100000	cpm	1.00	
		400000	400000	cpm	1.00	
	C.F. AVERAGE				1.00	

Notes

High Voltage = 652 V, Alpha Background = 0.5 cpm, Beta Background = 250 cpm.
Beta Threshold: 4 mV.
Beta Window: 31 mV.
Alpha Threshold: 130 mV.
Crosstalk: Beta:Alpha < 1%; Alpha:Beta < 10%.

Probe type(s) Probe1: ZnS Scint.

Probe2: Plastic Scint.

Probe3:

MODEL	SER#	WINDOW	GEOMETRY	VOLT	ISOTOPE 1	EFF.(%)	ISOTOPE 2	EFF.(%)	ISOTOPE 3	EFF.(%)	ISOTOPE 4	EFF.(%)
43-93	PR356145	FIXED	CONTACT	652	Th230*	21	Pu239**	21	Am241***	24		
* RSO#442 (Th-230 alpha).												
** RSO#61 (Pu-239 alpha).												
*** RSO#34 (Am-241 alpha).												
43-93	PR356145	FIXED	CONTACT	652	C14*	4.1	Tc99**	11	Cs137***	24	Sr90****	25
* RSO#700 (C-14 beta).												
** RSO#437 (Tc-99 beta).												
*** RSO#413 (Cs-137 beta/gamma).												
**** RSO#448 (Sr-90 beta).												

INSTRUMENT CHECKS

BATTERY CHECK: NORMAL
CHECK SOURCE 1: N/A READING:
CHECK SOURCE 2: N/A READING:

ENVIRONMENTAL

TEMP: 21°C
PRESS: 765 mmHg
HUMID: 30 %

THE SUGGESTED RECALIBRATION DATE FOR THIS INSTRUMENT IS 12/10/2022

Calibrated By:

Greg Smith

Reviewed By:

Cal Date: 12/10/2021

Maryland License MD-33-021-01

24317

RSO, Inc.
P.O. Box 1450
Laurel, MD 20725
(301) 953-2482

RSO Job No. 14799

Certificate of Calibration

ISSUED TO: RSO, Inc.
5204 Minnick Road
Laurel, MD 20707

INSTRUMENT: LUDLUM
MODEL: 3002
TYPE: DIG SCALER/RATE
SN: 25012574

CONTACT: Paul Madairy
PHONE:

PO NO: RSO 370

RSO, Inc. certifies that on 04/05/2022 the above described instrument was calibrated was calibrated using standards directly traceable to NIST or derived by ratio technique from NIST traceable standards and in accordance with RSO QAP-5, ANSI N323AB-2013 and ANSI NCSL Z540-1-1994.

The results are tabulated below. Calibration is traceable to NIST.

Calibration Data							
RANGE		EXPECTED	OBSERVED		C.F.	NOTE	
RATE	ALPHA	10	10	cpm	1.00		
		100	100	cpm	1.00		
		1.0	1	kcpm	1.00		
		400	400	kcpm	1.00		
	BETA	100	100	cpm	1.00		
		1000	1000	cpm	1.00		
		1.0	1.0	kcpm	1.00		
		400	400	kcpm	1.00		
SCALER	ALPHA	10	10	cnts	1.00		
		999	999	cnts	1.00		
		1.0	1.0	kcnts	1.00		
		400	400	kcnts	1.00		
	BETA	100	100	cnts	1.00		
		999	999	cnts	1.00		
		1.0	1.0	kcnts	1.00		
		400	400	kcnts	1.00		
		C.F. AVERAGE					1.00

Notes

BT: 4 mV; BW: 50 mV; AT: 120 mV.
Alpha Background: 3 cpm; Beta Background 210 cpm.
Cross Talk: Beta:Alpha < 1%; Alpha:Beta < 10%.

Probe type(s)		Probe1: ZnS Alpha Scint	Probe2: Beta Scint	Probe3:				
MODEL	SER#	WINDOW	GEOMETRY	VOLT	ISOTOPE 1 EFF.(%)	ISOTOPE 2 EFF.(%)	ISOTOPE 3 EFF.(%)	ISOTOPE 4 EFF.(%)
43-93	PR359841	FIXED	CONTACT	675	Th230* 23	Pu239** 21	Am241*** 24	
* RSO#442 (Th-230 alpha). ** RSO#61 (Pu-239 alpha). *** RSO#34 (Am-241 alpha).								
43-93	PR359841	FIXED	CONTACT	675	Ni63* 0.7	C14** 9.9	Tc99*** 13	Cs137**** 26
* RSO#364 (Ni-63 beta). ** RSO#700 (C-14 beta). *** RSO#437 (Tc-99 beta). **** RSO#413 (Cs-137 beta/gamma).								
					Sr90 28	RSO#348		

INSTRUMENT CHECKS


BATTERY CHECK: NORMAL
CHECK SOURCE 1: N/A READING:
CHECK SOURCE 2: N/A READING:

ENVIRONMENTAL

TEMP: 21°C
PRESS: 750 mmHg
HUMID: 30 %

THE SUGGESTED RECALIBRATION DATE FOR THIS INSTRUMENT IS **04/05/2023**

Calibrated By:


Greg Smith

Reviewed By:



Cal Date: 04/05/2022

Maryland License MD-33-021-01

24763

RSO, Inc.
P.O. Box 1450
Laurel, MD 20725
(301) 953-2482

RSO Job No. 14353

Certificate of Calibration

ISSUED TO: RSO, INC.
5206 Minnick Road
Laurel, MD 20707

INSTRUMENT: BICRON
MODEL: MICRO REM
TYPE: RATEMETER
SN: C802F

CONTACT: Paul Madairy
PHONE:

PO NO:

RSO, Inc. certifies that on 06/03/2021 the above described instrument was calibrated in a known radiation field using Cs-137 (662 keV) beam calibrator (J.L. Shepherd Model 28-6A, S/N 10056), RSO # 363 Certified Cs137 check source.

The results are tabulated below. Calibration is traceable to NIST.

Calibration Data						
	<u>RANGE</u>	<u>EXPECTED</u>	<u>OBSERVED</u>		<u>C.F.</u>	<u>NOTE</u>
X	0.1	10	10	uR/hr	1.00	
		16	16	uR/hr	1.00	
X	1	40	40	uR/hr	1.00	
		150	150	uR/hr	1.00	
X	10	500	450	uR/hr	1.11	
		1500	1500	uR/hr	1.00	
X	100	5000	4500	uR/hr	1.11	
		15000	15500	uR/hr	0.97	
X	1000	50000	45000	uR/hr	1.11	
		150000	155000	uR/hr	0.97	
C.F. AVERAGE					1.03	

Notes

Probe type(s) Probe1: SCINTILLATOR

Probe2:

Probe3:

MODEL	SER#	WINDOW	GEOMETRY	VOLT	ISOTOPE 1 EFF.(%)	ISOTOPE 2 EFF.(%)	ISOTOPE 3 EFF.(%)	ISOTOPE 4 EFF.(%)
INTERNAL		FIXED	FRONT					

Note: "As Found" condition +/- 10% of Expected values unless indicated.

INSTRUMENT CHECKS

BATTERY CHECK: NORMAL
CHECK SOURCE 1: N/A READING:
CHECK SOURCE 2: N/A READING:

ENVIRONMENTAL

TEMP: 22°C
PRESS: 754 mmHg
HUMID: 56 %

THE SUGGESTED RECALIBRATION DATE FOR THIS INSTRUMENT IS 06/03/2022

Calibrated By:


Greg Smith

Reviewed By:



Cal Date: 06/03/2021

Maryland License MD-33-021-01

25852



Tuesday, December 22, 2020

Ralph Cardenuto
Aberdeen Proving Grounds/MD
Bldg 4603, Attn STEAP-SH-EH
Aberdeen, MD 21005

Dear Mr. Cardenuto:

The attached signed shipping manifest copies are your notice of receipt of the radioactive waste materials shipment specified on the manifest number below.

Manifest Number
7988-718-T203642

Date Received
12/22/2020

Thank you for your business.

Sincerely,

Shipping and Receiving

cc: Manifest File
Shipping and Receiving file

Manifest Discrepancies

None

FORM 540				Energy Solutions / Bear Creek Operations		UNIFORM LOW-LEVEL, RADIOACTIVE WASTE MANIFEST		SHIPPING PAPER	
1. EMERGENCY TELEPHONE NUMBER (Include Area Code)				2. IS THIS AN EXCLUSIVE USER SHIPMENT?		3. ORGANIZATION		4. DOES EPA REGULATE WASTE REQUIRING A MANIFEST ACCORDING TO THIS SHIPMENT?	
800-223-1655				YES		Energy Solutions / NRC Action Act: Emergency Day Office		YES	
5. SHIPPER - NAME AND FACILITY				6. CARRIER - Name and Address		7. RECEIPT NUMBER		8. DOES EPA REGULATE WASTE REQUIRING A MANIFEST ACCORDING TO THIS SHIPMENT?	
Abraham Paving Gravel 6042 Pined Road Building #015 Abraham Paving Gravel, MO 21005				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		1700442		YES	
9. CONTACT				10. CONTACT		11. SHIPMENT ID NUMBER		12. IS THIS AN EXCLUSIVE USER SHIPMENT?	
Patrick Evans				Jeff Packard		1700442		YES	
13. CARRIER - Name and Address				14. CARRIER - Name and Address		15. CARRIER - Name and Address		16. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
17. CARRIER - Name and Address				18. CARRIER - Name and Address		19. CARRIER - Name and Address		20. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
21. CARRIER - Name and Address				22. CARRIER - Name and Address		23. CARRIER - Name and Address		24. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
25. CARRIER - Name and Address				26. CARRIER - Name and Address		27. CARRIER - Name and Address		28. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
29. CARRIER - Name and Address				30. CARRIER - Name and Address		31. CARRIER - Name and Address		32. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
33. CARRIER - Name and Address				34. CARRIER - Name and Address		35. CARRIER - Name and Address		36. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
37. CARRIER - Name and Address				38. CARRIER - Name and Address		39. CARRIER - Name and Address		40. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
41. CARRIER - Name and Address				42. CARRIER - Name and Address		43. CARRIER - Name and Address		44. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
45. CARRIER - Name and Address				46. CARRIER - Name and Address		47. CARRIER - Name and Address		48. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
49. CARRIER - Name and Address				50. CARRIER - Name and Address		51. CARRIER - Name and Address		52. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
53. CARRIER - Name and Address				54. CARRIER - Name and Address		55. CARRIER - Name and Address		56. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
57. CARRIER - Name and Address				58. CARRIER - Name and Address		59. CARRIER - Name and Address		60. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
61. CARRIER - Name and Address				62. CARRIER - Name and Address		63. CARRIER - Name and Address		64. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
65. CARRIER - Name and Address				66. CARRIER - Name and Address		67. CARRIER - Name and Address		68. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
69. CARRIER - Name and Address				70. CARRIER - Name and Address		71. CARRIER - Name and Address		72. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803				Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803		Hessan Transport Services 1800 Bear Creek Road Oak Ridge, TN 37803	
73. CARRIER - Name and Address				74. CARRIER - Name and Address		75. CARRIER - Name and Address		76. CARRIER - Name and Address	
Hessan Transport Services 1800 Bear Creek Road Oak Ridge,									

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number				
		MDJ210D21355	1	1865/220-1535	003715151 JJK				
5. Generator's Name and Mailing Address		Aberdeen Proving Ground PO Box 105 Gunpowder MD 21010-0105 (410) 436-2157		Generator's Site Address (if different than mailing address) Building ES863 APG, MD 21010					
Generator's Phone:									
6. Transporter 1 Company Name		Hittman Transport Services		U.S. EPA ID Number TNR 000034686					
7. Transporter 2 Company Name				U.S. EPA ID Number					
8. Designated Facility Name and Site Address		DSSI 657 Galleher Rd. Kingston, TN 37763 (865) 376-0084		U.S. EPA ID Number TND 982109142					
Facility's Phone:									
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))			10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes	
	1. UN1993 Waste Flammable liquid n.s., (Toluene) 3 (7) PGII Limited Quantity Radioactive Material			No. Type		85	P	D001 F005	
	2.								
	3.								
	4.								
14. Special Handling Instructions and Additional Information ERG #128 * See attached NRC Manifest for information Doc #18199 HW H698 R 55652									
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.									
Generator's/Officer's Printed/Typed Name MANSOOR ZAKA									
Signature Mansoor Zaka									
Month Day Year 11 06 18									
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Transporter signature (for exports only): Port of entry/exit: Date leaving U.S.:									
17. Transporter Acknowledgment of Receipt of Materials									
Transporter 1 Printed/Typed Name Chris Deaton									
Signature Chris Deaton									
Month Day Year 11 06 18									
Transporter 2 Printed/Typed Name									
Signature									
Month Day Year									
18. Discrepancy									
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection									
Manifest Reference Number:									
18b. Alternate Facility (or Generator)									
U.S. EPA ID Number									
Facility's Phone:									
18c. Signature of Alternate Facility (or Generator)									
Month Day Year									
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)									
1. 2. 3. 4.									
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a									
Printed/Typed Name									
Signature									
Month Day Year									

FORM 540

EnergySolutions Services, Inc.
UNIFORM LOW-LEVEL RADIOACTIVE
WASTE MANIFEST
SHIPPING PAPER1. EMERGENCY TELEPHONE NUMBER (Include Area Code)
(865) 220-1555ORGANIZATION
EnergySolutions / Brad Meale Attn: EDO

2. IS THIS AN "EXCLUSIVE USE" SHIPMENT?

☒ YES
☐ NO

3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST

1

4. DOES EPA REGULATE WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT?
If "Yes," provide Manifest Number =====>YES ☒ NO ☐
EPA MANIFEST NUMBER 003715151 JJK

11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (Including proper shipping name, hazard class, UN ID number, and any additional information)

UN1993 Waste Flammable Liquid, n.o.s., (Toluene) 3 (7), PG II

1-Plastic drum Vials

DOT LABEL "RADIOACTIVE"

NA

TRANSPORT INDEX NA

Liquid Metal Oxides

Am-241 C-14 H-3 N-63

1,861E+03 5,030E+01 NA

100 LBS; 4.01 FT3

APG 1

SHIPPER ID NUMBER 110618-DSSI

COLLECTOR ☒ PROCESSOR ☐

SHIPMENT NUMBER 110618-DSSI

GENERATOR TYPE (Specify)

TELEPHONE NUMBER (Include Area Code) (410) 306-2288

EPA ID NUMBER TND08778306

SHIPPING DATE 11/06/2018

TELEPHONE (Include Area Code) (865) 481-0222

DATE 11/16/18

AUTHORIZED SIGNATURE [Signature]

TITLE [Signature]

DATE 11/16/18

10. CERTIFICATION

This is to certify that the herein-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable requirements of the Department of Transportation. This also certifies that the materials are classified, packaged, marked, and labeled in accordance with the requirements of 10 CFR Parts 20 and 21, or equivalent state regulations.

7. FORM 540 AND 540A, FORM 541 AND 541A, FORM 542 AND 542A, ADDITIONAL INFORMATION

PAGE 1 OF 1 PAGE(S)

1 PAGE(S)

1 PAGE(S)

4 PAGE(S)

8. MANIFEST NUMBER (Use the number on all continuation pages)

APG 2018-001

9. CONSIGNEE - Name and Facility

DSSI

657 Gallaher Rd

Kingsport, TN 37763

10. CONTACT

Tammie Monday

TELEPHONE (Include Area Code) 865-376-0084

DATE

FOR CONSIGNEE USE ONLY

TENNESSEE "L" LICENSE FOR DELIVERY NO

SOUTH CAROLINA TRANSPORT PERMIT NO

US ECOLOGY GENERATOR NO

US ECOLOGY PERMIT NO

20. GENERATOR CERTIFICATION STATEMENT

A) Radioactive Material. Certification is hereby made to EnergySolutions, Inc. that this shipment of low-level radioactive material/waste has been prepared in accordance with the radioactive waste management program which has been approved by the Nuclear Regulatory Commission or an Agreement State regulatory agency and with the current revision of the EnergySolutions Material Acceptance Criteria.

B) Hazardous Materials. Generator hereby certifies that this material does not contain a hazardous waste as defined in 40 CFR 261.14.10

C) Delta. Generator hereby represents and warrants that all data set forth in this (UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST) are true and correct in all respects and in accordance with all applicable governmental laws, rules, regulations and EnergySolutions, Inc. State of Tennessee Radioactive Material Licenses.

[Signature] Print Name [Signature] Signature [Signature] Signature

11/16/18 Date

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

Additional Nuclear Regulatory Commission (NRC) Requirements for Control, Transfer and

Disposal of Radioactive Waste

1. MANIFEST TOTALS							2. MANIFEST NUMBER APG 2018-001	
NUMBER OF PACKAGES/ DISPOSAL CONTAINERS	NET WASTE VOLUME	NET WASTE WEIGHT	SPECIAL NUCLEAR MATERIAL (grams)			Total	3. PAGE 1 OF 1 PAGE(S)	4. SHIPPER NAME Aberdeen Proving Grounds
			U-233	U-235	Pu			
1	m3 4.0100	kg 85.0000	NP	NP	NP	NP		
			ACTIVITY			SOURCE (kg)		
	ALL NUCLIDES		C-14	Tc-99	I-129			
Mbq	1.8611E+03	1.8674E+03	3.7000E+00	NP	NP	(kg)	NA	SHIPMENT ID NUMBER
mCi	5.0300E+01	5.0200E+01	1.0000E-01	NP	NP	(lbs)	NA	1106118-DSSI

DISPOSAL CONTAINER DESCRIPTION										WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER					16 WASTE CLASSIFICATION		
5 CONTAINER IDENTIFICATION NUMBER/ID NUMBER	6 CONTAINER DESCRIPTION (See Note 1) PROCESS REQUESTED (See Note 1A) BURIAL/DISPOSITION (See Note 2A)	7 VOLUME (m ³) (ft ³)	8 WASTE AND CONTAINER WEIGHT (kg) (lb)	9 SURFACE RADIATION LEVEL (mSv/hr) (mrem/hr)	10 SURFACE CONTAMINATION (MBq/100 cm ²) (dpm/100cm ²)		11 WASTE DESCRIPTOR (See Note 2)	12 APPROXIMATE WASTE VOLUME(S) IN CONTAINER (m ³) (ft ³)	13 SOLIDIFICATION OR STABILIZATION MEDIA (See Note 3)	14 CHEMICAL FORM/ CHELATING AGENT	WEIGHT % CHELATING AGENT IF > 0.1%	15 RADIOLOGICAL DESCRIPTION					
					ALPHA	BETA- GAMMA						INDIVIDUAL RADIONUCLIDES AND ACTIVITY (MBq) AND CONTAINER TOTAL OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT					
APG 17718	3		0.1136	45.3592	<5.0000E-03	<1.6700E-06	<1.6700E-05	58-LIQUID SCINT. VIALS (GLASS / PLASTIC), 28	0.0882	NA	Metal Oxide/HP	NP	Am-241 C-14 H-3 Ni-63 Subtotal Total	3.7000E-05 3.7000E+00 1.8574E+03 5.0200E+01 3.3300E-03 1.8611E+03 1.8611E+03 5.0300E+01	1.0000E-06 1.0000E-01 5.0200E+01 9.0000E-05 5.0300E+01 5.0300E+01	AU	
			4.0700	100.0000	<5.0000E-01	<1.0000E+02	<1.0000E+03		3.0100								
Shipment Totals			0.1136	45.3592										1.8611E+03	5.0300E+01		
			4.0700	100.0000													

Note 1: Container Description Codes. For containers waste requiring disposal in approved structural over-packs the numerical code must be followed by "-OP."

Note 1A: Process Requested

NOTE 2: Waste Descriptor Codes. (Choose up to three which predominate by volume.)

NOTE 2A: Burial/Disposition Site

Notes: 3. **Solidification and Stabilization Media Codes.** (Choose up to three which predominate by volume. For media meeting disposal site structural stability requirements, the numerical code must be followed by "S," and the media vendor and brand name must also be identified in Item 13. Code 100=NONE REQUIRED)

3. Plastic Drum or Pail	11. Bulk, Unpackaged Waste
4. Metal Drum or Pail	12. Unpackaged Components
5. Metal Tank or Liner	13. High Integrity Container
6. Concrete Tank or Liner	19. Other: Describe in Item 6
7. Polyethylene Tank or Liner	or additional page
8. Fiberglass Tank or Liner	

Liquids for Incineration
Oil for Incineration
Other (describe)

27. Mechanical Filter	36. Sealed Source/Device	43. Activated Material
28. EPA or State Hazardous	37. Paint or Plating	59. Other. Describe in item 11, or additional page

☐ Other

(encapsulation)	in item 13, or
92. Bitumen	additional page
93. Vinyl Chloride	100. None Required

EnergySolutions Services, Inc.

UNIFORM LOW-LEVEL RADIOACTIVE
WASTE MANIFEST

MANIFEST INDEX AND REGIONAL COMPACT TABULATION

List all original "PROCESSED WASTE" generators (if any)
before "COLLECTED WASTE" generators.

WASTE COLLECTOR/PROCESSOR

1
NAME
Aberdeen Proving Ground
IDENTIFICATION NUMBER
718-DSSI

SHIPPER USE ONLY

2 MANIFEST NUMBER
APG 2018-0013
PAGE 1 OF 1 PAGE(S)SHIPPING DATE
11/8/2018

AS PROCESSED/COLLECTED TOTAL

4
GENERATOR
IDENTIFICATION
NUMBER5
GENERATOR NAME
PERMIT NUMBER (IF APPLICABLE)
AND TELEPHONE NUMBER6
GENERATOR
FACILITY
ADDRESS7
PREPROCESSED
WASTE
(OR MATERIAL)
VOLUME
(m3)8
MANIFEST NUMBER(S) UNDER
WHICH WASTE (OR MATERIAL)
RECEIVED AND DATE
OF RECEIPT9
WASTE CODE
P = PROCESSED
C = COLLECTED10
ORIGINATING
COMPACT
REGION
OR STATE11
A. SOURCE
MATERIAL
(kg)B. SHM
(lb)C. ACTIVITY
(MBq)D. VOLUME
(m3)

(ft3)

718-DSSI

Aberdeen Proving Ground
EP # MD 3210021365
(410) 306-2286C/O: EnergySolutions
PO Box 106
Gunpowder, MD 21010-0106

APG 2018-001 (11/08/2018)

C

MD

0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00

0.0000 0.0000

TOTALS OF ALL PAGES (FORMS 542 AND 542A)

0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00

0.0000 0.0000

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST ISOTOPES REPORT

For Manifest # APG 2018-001
EnergySolutions Services, Inc.

<u>Isotope</u>	Total Activity		
	<u>(MBq)</u>	<u>(mCi)</u>	<u>(Ci)</u>
Am-241	3.7000E-05	1.0000E-06	1.0000E-09
C-14	3.7000E+00	1.0000E-01	1.0000E-04
H-3	1.8574E+03	5.0200E+01	5.0200E-02
Ni-63	3.3300E-03	9.0000E-05	9.0000E-08

POTENTIAL HAZARDS**FIRE OR EXPLOSION**

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a **(P)** may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids are lighter than water.
- Substance may be transported hot.
- For hybrid vehicles, GUIDE 147 (lithium ion batteries) or GUIDE 138 (sodium batteries) should also be consulted.
- **If molten aluminum is involved, refer to GUIDE 169.**

HEALTH

- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire may produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION**Large Spill**

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

EMERGENCY RESPONSE

FIRE

CAUTION: All these products have a very low flash point: Use of water spray when fighting fire may be inefficient.

CAUTION: For mixtures containing alcohol or polar solvent, alcohol-resistant foam may be more effective.

Small Fire

- Dry chemical, CO₂, water spray or regular foam.

Large Fire

- Water spray, fog or regular foam.
- **Do not use straight streams.**
- Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean, non-sparking tools to collect absorbed material.

Large Spill

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.

FULL VEHICLE SURVEY FORM

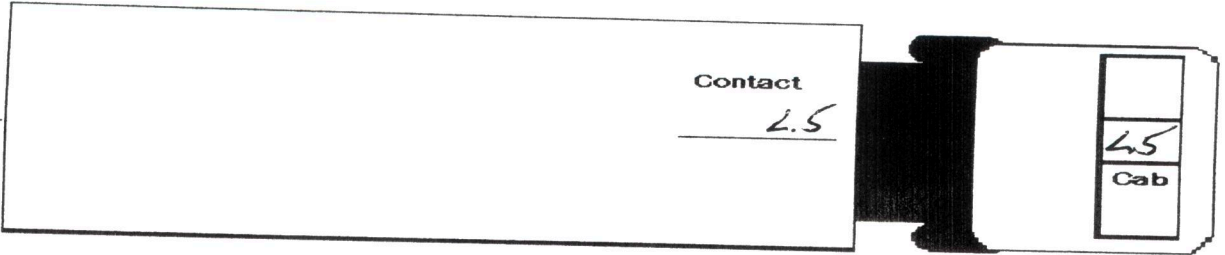
SURVEY NUMBER 1 -TRAN- 1

CONTACT 2M 4.5 CONTACT 2M 4.5 CONTACT 2M 4.5

Contact 2m 4.5 Contact 4.5

CONTACT 2M 4.5 CONTACT 2M 4.5 CONTACT 2M 4.5

DOSE RATE UNDER TRAILER 4.5



ALL DOSE RATES IN mR/Hr AS NOTED

SMEAR RESULTS @ DPM/100CM2

LOC	BETA / GAMMA	ALPHA
1	<1000	<100
2		
3		
4		
5		
6		
7		
8		
9	↓	↓
10		
11		
12		
13		

CIRCLED NUMBER ON THE ABOVE DRAWING INDICATES SWIPED LOCATION.

RWP # _____

DATE: 11/6/18 TIME: _____

SHIPMENT NUMBER: 110618-DSSI

TRACTOR #: 5437 TRAILER #: Q55652

INCOMING: FULL _____

OUTGOING: FULL X _____

TRUCKING COMPANY: _____ ES _____

TRAILER TYPE: FLAT X RAGTOP _____ VAN _____
RAIL FRAME _____ CASK _____

DOSE RATE INSTRUMENT
TYPE: 14C
SERIAL NUMBER: 35121
CAL. DUE DATE: 6/5/19

CONTAMINATION SURVEY INST. - BETA / GAMMA
TYPE: Model 3
SERIAL NUMBER: 87482
CAL. DUE DATE: 6/5/19

CONTAMINATION SURVEY INST. - ALPHA
TYPE: Model 12
SERIAL NUMBER: 91058
CAL. DUE DATE: 6/5/19

SHIPPING & RECEIVING TECHNICIAN: _____ CD _____

REVIEWED BY: _____ Chris Denton _____

LAND DISPOSAL NOTIFICATION AND CERTIFICATION FORM

Generator

Name:

APG

Manifest Document No.:

003715151 JJK

Profile No.:

State Manifest No:

1. Is this waste a non-wastewater or wastewater? (See 40 CFR 268.2) Check ONE: Non-wastewater ☒ Wastewater ☐
2. Identify ALL USEPA hazardous waste codes and State codes (if applicable) that apply to this waste shipment, as defined by 40 CFR 261. For each waste code, identify the corresponding subcategory, or check NONE if the waste code has no subcategory. Spent solvent standards are listed on the following page. If F039, multi-source leachate applies those constituents must be listed and attached by the generator. If D001-D043 requires treatment of the characteristic and meet 268.48 standards, then the underlying hazardous constituent(s) present in the waste must be listed and attached.

REF #	3. USEPA HAZARDOUS WASTE CODE(S) AND STATE CODE(S) (if applicable)	4. SUBCATEGORY ENTER THE SUBCATEGORY DESCRIPTION. IF NOT APPLICABLE, SIMPLY CHECK NONE.	5. HOW MUST THE WASTE BE MANAGED? ENTER LETTER FROM BELOW
	D001	Ignitable	
	F005	Toluene	* B-1
			* B-1

ME
ME

To identify F039 or D001-D043 underlying hazardous constituent(s), use the "F039/Underlying Hazardous Constituent Form" provided (Form B1) and check here:

If no UHCs are present in the waste upon its initial generation check here:

To list additional USEPA waste code(s) and subcategory(ies), use the supplemental sheet provided (Form A2) and check here:

HOW MUST THE WASTE BE MANAGED? In column 5 above, enter the letter (A, A1, A2, B1, B3, B4, C, D, or E) below that describes how the waste must be managed to comply with the land disposal regulations (40 CFR 268.7). Please understand that if you enter the letter B1, B3, B4, or D, you are making the appropriate certification as provided below. (States authorized by EPA to manage the LDR program may have regulatory citations different from the 40 CFR citations listed below. Where these regulatory citations differ, your certification will be deemed to refer to those state citations instead of the 40 CFR citations.)

A. RESTRICTED WASTE REQUIRES TREATMENT

This waste must be treated to the applicable treatment standards set forth in 40 CFR Part 268.40.

- ☐ A.1 For Hazardous Debris: "This hazardous debris is subject of the alternative treatment standards of 40 CFR Part 268.45
- ☐ A.2 For Soil: "This hazardous waste soil is subject to the alternative treatment standards of 40 CFR Part 268.49."

B.1 RESTRICTED WASTE TREATED TO PERFORMANCE STANDARDS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the treatment standards in 40 CFR Part 268.40 without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

B.3 GOOD FAITH ANALYTICAL CERTIFICATION FOR INCINERATED ORGANICS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based upon my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by combustion in units as specified in 268.42 Table 1. I have been unable to detect the nonwastewater organic constituents despite having used best good faith efforts to analyze for such constituents. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

B.4 DECHARACTERIZED WASTE REQUIRES TREATMENT FOR UNDERLYING HAZARDOUS CONSTITUENTS

"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 or 268.49, to remove the hazardous characteristic. This decharacterized waste contains underlying hazardous constituents that require further treatment to meet treatment standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

C. RESTRICTED WASTE SUBJECT TO A VARIANCE

This waste is subject to a national capacity variance, a treatability variance, or a case-by-case extension. Enter the effective date of prohibition in column 5 above.

D. RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT

"I certify under penalty of law I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR 268 Subpart D. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment."

E. WASTE IS NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS

This waste is a newly identified waste that is not currently subject to any 40 CFR Part 268 restrictions.

I hereby certify that all information submitted in this and all associated documents is complete and accurate, to the best of my knowledge and information.

Signature:

Manon Zulu

Title:

TSDF Mgr

Date:

11/06/18

FORM 540						EnergySolutions Services, Inc.															
UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST SHIPPING PAPER						SHIPPER - NAME AND FACILITY Aberdeen Proving Ground C/O: EnergySolutions PO Box 105 Gunpowder, MD 21010-0105															
1. EMERGENCY TELEPHONE NUMBER (Include Area Code) (865) 220-1555						USER PERMIT NUMBER T-TN012-L18				SHIPMENT NUMBER 110618-DSSI											
ORGANIZATION EnergySolutions / Brad Melto Attn: EDO						CONTACT Pat Eurea				TELEPHONE NUMBER (Include Area Code) (410) 306-2268											
2. IS THIS AN "EXCLUSIVE USE" SHIPMENT? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO						3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST 1				6. CARRIER - Name and Address Hittman Transport Services 1560 Bear Creek Road Oak Ridge, TN 37830											
						Truck #: 5437				Trailer #: Q55652											
4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT? If "Yes," provide Manifest Number ===== <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO						EPA MANIFEST NUMBER 003715151 JJK				CONTACT Karen Kirby											
						SIGNATURE -- Authorized carrier acknowledging waste receipt <i>[Signature]</i>				DATE 11/6/18											
11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (Including proper shipping name, hazard class, UN ID number, and any additional information)						12. DOT LABEL "RADIOACTIVE"		13. TRANSPORT INDEX		14. PHYSICAL AND CHEMICAL FORM		15. INDIVIDUAL RADIONUCLIDES		16. TOTAL PACKAGE ACTIVITY MBq mCi		17. LSA/SCO CLASS		18. TOTAL WEIGHT OR VOLUME (Use appropriate units)		19. IDENTIFICATION NUMBER OF PACKAGE	
UN1993 Waste Flammable Liquid, n.o.s., (Toluene) 3 (7), PG II Limited Quantity Radioactive Material 1-Plastic drum Vials						NA		NA		Liquid Metal Oxides		Am-241 C-14 H-3 Ni-63		1.8611E+03 5.0300E+01		NA		100 LBS; 4.01 FT3		APG 1	
FOR CONSIGNEE USE ONLY						GENERATOR CERTIFICATION STATEMENT															
TENNESSEE "LICENSE FOR DELIVERY" NO _____						A) Radioactive Materials. Certification is hereby made to EnergySolutions, Inc. that this shipment of low-level radioactive material/waste has been prepared in accordance with the radioactive waste management program which has been approved by the Nuclear Regulatory Commission or an Agreement State regulatory agency and with the current revision of the EnergySolutions Material Acceptance Criteria.															
SOUTH CAROLINA TRANSPORT PERMIT NO _____						B) Hazardous Materials. Generator hereby certifies that this material does not contain a hazardous waste as defined in 40 CFR 261.															
US ECOLOGY GENERATOR NO _____						C) Data. Generator hereby represents and warrants that all data set forth in this (UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST) are true and correct in all respects and in accordance with all applicable governmental laws, rules, regulations and EnergySolutions/Inc. State of Tennessee Radioactive Material Licenses.															
US ECOLOGY PERMIT NO _____						Print Name: <i>[Signature]</i> Signature: <i>[Signature]</i> Date: 11/6/18															

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number MD3210021355		2. Page 1 of 1		3. Emergency Response Phone (865) 220-1535		4. Manifest Tracking Number 003715151 JJK					
		5. Generator's Name and Mailing Address Aberdeen Proving Ground PO Box 105 Gun Powder MD 21010-0105 (410) 436-2157						Generator's Site Address (if different than mailing address) Building ES863 APG, MD 21010					
6. Transporter 1 Company Name Hittman Transport Services		U.S. EPA ID Number TNR 000034686											
7. Transporter 2 Company Name		U.S. EPA ID Number											
8. Designated Facility Name and Site Address QSSI 657 Galleher Rd. Kingston, TN 37763 (865) 376-0084		U.S. EPA ID Number TND 982109142											
9a. HM		9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))				10. Containers		11. Total Quantity		12. Unit Wt./Vol.		13. Waste Codes	
						No. Type							
X		1. UN 1993 Vasta Flammable liquid n.s. (Toluene) 3 (7) PG II Limited Quantity Radioactive Material				1 DF		85		P		0001 0005	
		2.											
		3.											
		4.											
14. Special Handling Instructions and Additional Information ERG #128 * See attached NRC Manifest for information Doc #18199 HW H698 8 SS652													
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.													
Generator's/Officer's Printed/Typed Name MANSOOR ZAKH						Signature <i>Mansoor Zakh</i>				Month Day Year 11 06 18			
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Transporter signature (for exports only): _____ Date leaving U.S.: _____													
17. Transporter Acknowledgment of Receipt of Materials													
Transporter 1 Printed/Typed Name Chris Deaton						Signature <i>Chris Deaton</i>				Month Day Year 11 06 18			
Transporter 2 Printed/Typed Name						Signature				Month Day Year			
18. Discrepancy													
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection													
18b. Alternate Facility (or Generator) Manifest Reference Number: _____ U.S. EPA ID Number _____													
Facility's Phone: _____													
18c. Signature of Alternate Facility (or Generator) _____ Month Day Year _____													
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)													
1.		2.		3.		4.							
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a													
Printed/Typed Name Tiffany Clark						Signature <i>Tiffany Clark</i>				Month Day Year 11 7 18			

FORM 640 EnergySolutions Services, Inc. UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST SHIPPING PAPER									
1. EMERGENCY TELEPHONE NUMBER (866) 220-1555									
ORGANIZATION EnergySolutions / Brad Miller Attn: EDO									
2. IS THIS AN "EXCLUSIVE USE" SHIPMENT? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO									
3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST 1									
4. DOES EPA REG. 161.10 REQUIRE A MANIFEST ACCOMPANY THIS SHIPMENT? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO If "Yes", provide Manifest Number: 003719181 JJK									
5. SHIPPER - NAME AND ADDRESS Abertsen Proving Ground C/O: EnergySolutions PO Box 108 Gainesville, MO 21010-0108 SHIPMENT NUMBER 110618 DBSI SHIPPER ID NUMBER 110618 DBSI COLLECTOR <input checked="" type="checkbox"/> GENERATOR TYPE <input type="checkbox"/> PROCESSOR TELEPHONE NUMBER (440) 300-2240 CONTACT Pat Eures									
6. CARRIER - Name and Address Hillman Transport Services 1540 Bear Creek Road Oak Ridge, TN 37830 EPA ID NUMBER TN0987780045 TRUCK # 8437 TRAILER # Q16632 SHIPPING DATE 11/06/18 TELEPHONE (865) 481-0322 CONTACT Karen Kirby DATE 11/6/18									
7. FORM 540 AND 540A FORM 541 AND 541A FORM 542 AND 542A ADDITIONAL INFORMATION 8. CONSIGNEE - Name and Facility DSSI 667 Gallaher Rd Kington, TN 37763 CONTACT Tammy Monday TELEPHONE (865) 376-0084 DATE 11/7/18									
9. CERTIFICATION The undersigned hereby certifies that the herein named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and are also certifies that the materials are classified, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of 10 CFR Parts 20 and 61, or equivalent state regulations.									
10. US DEPARTMENT OF TRANSPORTATION DESCRIPTION (including proper shipping name, hazard class, ID number, and any additional information) UN1993 Waste Flammable Liquid, n.o.s., (Toluene) 3 (7), PG II Limited Quantity Radioactive Material 1-Plastic Drum Vials									
11. US DEPARTMENT OF TRANSPORTATION DESCRIPTION (including proper shipping name, hazard class, ID number, and any additional information) UN1993 Waste Flammable Liquid, n.o.s., (Toluene) 3 (7), PG II Limited Quantity Radioactive Material 1-Plastic Drum Vials									
12. TRANSPORT INDEX NA									
13. UO/LAND "RADIOACTIVE" NA									
14. PHYSICAL AND CHEMICAL FORM Liquid Metal Oxides									
15. INDIVIDUAL RADIOISOTOPES Am-241 C-14 H-3 H-43									
16. TOTAL PACKAGE ACTIVITY mCi 1.8611E+03									
17. TOTAL WEIGHT OR VOLUME (Use appropriate units) 100 LBS; 4.01 FT3									
18. IDENTIFICATION NUMBER OF PACKAGE APG 1									
19. DATE 11/6/18									
20. GENERATOR CERTIFICATION STATEMENT A) Radiactive Materials: Certification is hereby made to EnergySolutions, Inc. that the shipment of low level radioactive materials waste has been prepared in accordance with the Tennessee waste management program which has been approved by the Nuclear Regulatory Commission or an Agreement State regulatory agency and with the criteria set forth in the EnergySolutions Material Acceptance Criteria. B) Hazardous Materials: Generator hereby certifies that this material does not contain a hazardous waste as defined in 40 CFR 261.11. C) Date: Generator hereby certifies that all data set forth in this (UNIFORM LOW LEVEL RADIOACTIVE WASTE MANIFEST) are true and correct in all respects and in accordance with applicable governmental laws, rules, regulations and EnergySolutions, Inc. State of Tennessee Radioactive Material Licenses. Signature: <i>Pat Eures</i> Date: <i>11/6/18</i> Print Name: <i>Pat Eures</i>									
FOR CONSIGNEE USE ONLY TENNESSEE LICENSE FOR DELIVERY NO SOUTH CAROLINA TRANSPORT PERMIT NO US ECOLOGY GENERATOR NO US ECOLOGY PERMIT NO FORM 640 (10-94)									

Date Sent: 11/17/18

ACKNOWLEDGMENT OF RECEIPT OF RADIOACTIVE WASTE

This is to certify that the radioactive material described below was received at the Diversified Scientific Services, Inc. (DSSI) facility in Kingston, Tennessee. This certification satisfies the requirements of Title 10 Code of Federal Regulations Part 20, Appendix G and the Tennessee "State Regulations for Protection Against Radiation". This letter acknowledges receipt of the waste only. Waste analysis has not been completed. If any discrepancies exist after waste analysis is complete, you will be contacted by separate correspondence.

Manifest Number: APG 2018-001

Shipment Authorization #: DSSI-18-135

Generator Name: Aberdeen Proving Ground

Address: P.O. Box 105

Gunpowder, MD 21010-0105

Attention: Pat Eures

Shipper: Hittman Transport Services

Date Received: 11/7/18

Waste Tracking Specialist Signature: 

Date: 11/17/18

Discrepancies (if any):

APG Inventory Bar Code #	Description	Serial #	NN	QTY	Isotope	Activity mCi	Total Activity mCi	Special Instructions	Waste Storage Location	Date Received	Generator	POC	JMC Project #	Shipment Date	Disposal Package #	Manifest / Tracking Number	Disposal Facility
00052937	Gammaline triphosphate, Sulfin-33 (3 vials)			3	S-35	2.50E+01	7.50E+01	Liquid, 0.06 ml	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052938	H2 in water			1	H-3	2.50E+02	2.50E+02	Liquid, 1 gram	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052939	Microscope slide w/ H-3 labeling			1	H-3	1.00E+02	1.00E+02	Solids, 109 grams	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052940	ABC 146A (P), C-14 standard plated on Leucosceles			4	C-14	2.00E+02	8.00E+02	Solids, 109 grams	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (APG-65)	T183694	EnergySolutions - Bear Creek Operations (material)
00052941	Leucosceles, C-14, 250 mCi on x4 stock vials, each in water			4	C-14	2.50E+01	1.00E+00	Liquid, 10 ml total	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052942	H-3 stock vials, 2 ea.			2	H-3	1.00E+00	2.00E+00	Liquid, < 5 ml	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052943	Cs-46 in stock vial			1	Cs-46	1.00E+00	1.00E+00	Liquid, < 1 ml	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052944	Valine C-14 in EtOH/water			1	C-14	2.50E+01	2.50E+01	Liquid, 2.5 ml	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052945	Glycine H-3 in EtOH/water Agencies w/ some undissolved solids at bottom c (0.45 mCi H-3; 0.45 mCi H-3, 0.45 mCi C-14) Cs-46 (~500 mCi H-3; ~500 mCi C-14, and 10 mCi Cs-46)			1	H-3	5.00E+00	5.00E+00	Liquid, 2.5 ml	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052946	Unquenched standards, vials based, 3 ea.			1	Mult	1.01E+00	1.01E+00	Liquid, 3 liters	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052947	MIXED WASTE			3	Mult	1.35E+03	4.05E+03	Liquid, 60 ml total, MIXED WASTE	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	APG-1	AK2018-4001HW00371511DQ2S1 - Permit/FX	EnergySolutions - Bear Creek Operations (material)
00052948	MIXED WASTE			1	H-3	5.00E+01	5.00E+01	Liquid, 1.5 ml, MIXED WASTE	Shipped for Disposal	06/01/16	MRCD	Ben Casole	APG 2014-001	11/06/18	APG-1	AK2018-4001HW00371511DQ2S1 - Permit/FX	EnergySolutions - Bear Creek Operations (material)
00052949	Gammaline triphosphate, Sulfin-35			1	S-35	8.80E+02	8.80E+02	Liquid, < 1 ml	Shipped for Disposal	08/24/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052950	Valine, stock vials, C-14			1	C-14	6.22E+01	6.22E+01	Liquid, < 1 ml	Shipped for Disposal	08/24/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052951	Edaphazine (Pentechamox), stock vial, H-3 Phosphoric acid, 100 mg (Diluted 5%) stock vial, H-3			1	H-3	2.27E+01	2.27E+01	Liquid, < 1 ml	Shipped for Disposal	08/24/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052952	DAMGO, peptides, stock vial, H-3			1	H-3	2.26E+01	2.26E+01	Liquid, < 1 ml	Shipped for Disposal	08/24/16	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052953	ICAM	Z47-M-00030		1	N-63	1.00E+01	1.00E+01	Liquid, < 1 ml	Shipped for Disposal	08/17/19	MRCD	Ben Casole	APG 2014-001	11/06/18	18-000366 (ESUU 2020)2	T183694	EnergySolutions - Bear Creek Operations (material)
00052957	GID-3 M22 ACADA (Model# 016-2500A)	GY1 965-D-00047G		1	N-63	1.00E+01	1.00E+01	Both sources in same device	Shipped for Disposal	08/17/19	MRCD	Ben Casole	USA 2014-053	08/19/19	FedEx 776016054963	Pine Bluff Arsenal	EnergySolutions - Bear Creek Operations (material)
00052967	GID-3 M22 ACADA (Model# 016-2500A)	GY1 965-D-00047H		1	N-63	1.00E+01	1.00E+01	Both sources in same device	Shipped for Disposal	08/17/19	MRCD	Ben Casole	USA 2014-053	08/19/19	FedEx 776016054963	Pine Bluff Arsenal	EnergySolutions - Bear Creek Operations (material)
00052969	APD2000	2977		1	N-63	1.00E+01	1.00E+01		Shipped for Disposal	08/17/19	MRCD	Ben Casole	USA 2014-053	08/19/19	FedEx 77601619628	Consolidation Facility	EnergySolutions - Bear Creek Operations (material)
00052441	Cs-137 check source	764		1	Cs-137	1.00E+03	1.00E+03		Shipped for Disposal	08/19/19	MRCD	Travis Landeshad	APG 2020-002	12/15/20		7988-718-T203642	EnergySolutions - Bear Creek Operations (material)
00052442	Tc-99 check source	1148		1	Tc-99	4.50E+00	4.50E+00		Shipped for Disposal	08/19/19	MRCD	Travis Landeshad	APG 2020-002	12/15/20		7988-718-T203642	EnergySolutions - Bear Creek Operations (material)
00052521	C-14 vials with saline solution and ultra gold			1	C-14	1.00E+02	1.00E+02		B-5111	08/13/21	MRCD	Travis Landeshad					EnergySolutions - Bear Creek Operations (material)
00052562	Umyk Acetate, 1 Gal			1	U-238	1.00E+03	1.00E+03	1 gallon polyethylene bottle	B-5111	10/15/21	MRCD	Travis Landeshad					EnergySolutions - Bear Creek Operations (material)



CERTIFICATE OF DISPOSITION OF MATERIALS

Estimated burden per response to comply with this mandatory collection request: 30 minutes. This submittal is used by NRC as part of the basis for its determination that the facility is released for unrestricted use. Send comments regarding burden estimate to the FOIA, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0028), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oir_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

Licensee Name and Address

U.S Army Research Institute of Chemical Defense
8350 Ricketts Pt Rd
APG Edgewood, MD 21010

License Number

19-00294-24

Expiration Date

30 June 2021

Docket Number

03031110

A. LICENSE STATUS (Check the appropriate box)

☒ This license has expired.☐ This license has not yet expired; please terminate it.

B. DISPOSAL OF RADIOACTIVE MATERIAL

(Check the appropriate boxes and complete as necessary. If additional space is needed, provide attachments)

The licensee, or any individual executing this certificate on behalf of the licensee, certifies that:

☐ 1. No radioactive materials have ever been procured or possessed by the licensee.☒ 2. All activities authorized by this license have ceased, and all radioactive materials procured and/or possessed by the licensee under this license number cited above have been disposed of in the following manner.☐ a. Transfer of radioactive materials to the licensee listed below:☒ b. Disposal of radioactive materials:☐ 1. Directly by the licensee:☒ 2. By licensed disposal site:

Energy Solutions Bear Creek, Clive, UT

☒ 3. By waste contractor:

Energy Solutions Bear Creek Operation, Oak Ridge, TN

☒ c. All radioactive materials have been removed such that any remaining residual radioactivity is within the limits of 10 CFR Part 20, Subpart E, and is ALARA.

C. SURVEYS PERFORMED AND REPORTED

☒ 1. A radiation survey was conducted by the licensee. The survey confirms:☐ a. the absence of licensed radioactive materials☒ b. that any remaining residual radioactivity is within the limits of 10 CFR 20, Subpart E, and is ALARA.☒ 2. A copy of the radiation survey results:☒ a. is attached; or ☐ b. is not attached (Provide explanation); or ☐ c. was forwarded to the NRC on: _____

Date

☒ 3. A radiation survey is not required as only sealed sources were ever possessed under this license, and☐ a. The results of the latest leak test are attached; and/or ☒ b. No leaking sources have ever been identified.

The person to be contacted regarding the information provided on this form:

Name
Travis LindebladTitle
RSOTelephone (Include Area Code)
(410) 436-1831E-mail Address
travis.w.lindeblad.civ@health.mil

Mail all future correspondence regarding this license to:

U.S Army Research Institute of Chemical Defense 8350 Ricketts Pt Rd APG Edgewood MD 21010

C. CERTIFYING OFFICIAL

I CERTIFY UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT

Printed Name and Title

Jade Makfinsky, Safety and Occupational
Health Manager USAMIRCD

Signature

MAKFINSKY.JADE.L.13
87975965
Digitally signed by
MAKFINSKY.JADE.L.1387975965
Date: 2022.12.20 13:31:34 -05'00'

Date

12/20/2022

WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL AND/OR CRIMINAL PENALTIES. NRC REGULATIONS REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECT. 18 U.S.C. SECTION 1001 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFICATE OF DISPOSITION OF MATERIALS

PLEASE READ THESE INSTRUCTIONS BEFORE COMPLETING NRC FORM 314.

Subpart E of 10 CFR Part 20 establishes the radiological criteria for license terminations/decommissioning of facilities licensed under 10 CFR Parts 30, 40, 50, 60, 61, 70, and 72, as well as other facilities subject to the Commission's jurisdiction under the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended.

INSTRUCTIONS

Section B, Item 2.

Licensees should describe the specific radioactive material transfer actions. If radioactive wastes were generated in terminating this license, the licensee should describe the disposal actions taken, including the disposition of low-level radioactive waste, mixed waste, greater-than-Class-C waste, and sealed sources.

Section B, Item 2.a.

The information provided concerning the transfer of radioactive material to another licensee should specify the date of the transfer, the name of the licensee recipient, an individual contact name and telephone number for the licensee recipient, and the recipient's NRC or Agreement State license number.

Section B, Item 2.b.

For disposal of radioactive materials, licensees should describe the specific disposal method or procedure (e.g., decay-in-storage). For those cases when radioactive materials are disposed of by a licensed disposal site or by a waste contractor, the licensee should specify the name, address, and telephone number of the licensed disposal site operator or waste contractor.

Section B, Item 2.c.

"Residual radioactivity," as defined in 10 CFR 20.1003, means radioactivity in 'areas' (structures, materials, soils, etc.) remaining as a result of activities (licensed and unlicensed) under the licensee's control from sources used by the licensee, excluding background radiation. ALARA is defined in 10 CFR 20.1003.

FILE CERTIFICATES AS FOLLOWS:

IF YOU ARE LOCATED IN:

ALABAMA, CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, FLORIDA, GEORGIA, KENTUCKY, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, PENNSYLVANIA, PUERTO RICO, RHODE ISLAND, SOUTH CAROLINA, TENNESSEE, VERMONT, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA.

SEND CERTIFICATES TO:

LICENSING ASSISTANCE TEAM
DIVISION OF RADIOLOGICAL SAFETY AND SECURITY
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD, SUITE 102
KING OF PRUSSIA, PA 19406-1415
R1DRSSMail.Resource@nrc.gov

*Note: The preferred method to submit NRC Form 314 is e-mail.

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND CERTIFICATES TO:

MATERIALS LICENSING BRANCH
DIVISION OF RADIOLOGICAL SAFETY AND SECURITY
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352
R3-DRSSMail.Resource@nrc.gov

*Note: The preferred method to submit NRC Form 314 is e-mail.

IF YOU ARE LOCATED IN:

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MISSISSIPPI, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING.

SEND CERTIFICATES TO:

MATERIALS LICENSING BRANCH
DIVISION OF RADIOLOGICAL SAFETY AND SECURITY
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
1600 E. LAMAR BOULEVARD
ARLINGTON, TX 76011-4511
r4licensingactionsubmittals@nrc.gov

*Note: The preferred method to submit NRC Form 314 is e-mail.



DEPARTMENT OF THE ARMY
JOINT MUNITIONS COMMAND
SAFETY AND RISK MANAGEMENT DIRECTORATE
MORRIS CONSOLIDATION FACILITY
BUILDING 170, 3336 BECK AVENUE
ROCK ISLAND, IL 61299-5000

REPLY TO
ATTENTION OF:

AMSJM-SF

09 Aug 2019

MEMORANDUM FOR Patrick Eures6642 Pistol Road, Building 5115 Aberdeen Proving Ground, MD 21005

SUBJECT: Receipt of Radioactive Material Shipment

Authorization number: RI9221-570
Received on: 8/28/2019
Project number: USA 2019-053

1. We received the inventory of items listed in the table below. The Joint Munitions Command Morris Consolidation Facility is authorized to receive the radioactive materials as described under the authority of U.S. Nuclear Regulatory Commission license number 12-00722-15, expiration 31 January 2023.

Isotope	Quantity	Actual(mCi)	Total(mCi)	Weight(g)	Item Info
Ni63	1	10	10		6665-01-564-1834 APD 2000

2. Please direct questions or comments to Mr. Calvin Brownlow, DSN 793-1046 or (309) 782-1046, email calvin.brownlow2.civ@mail.mil; or Tyler Werke at 309-782-0723, email tyler.a.werke.civ@mail.mil.

CALVIN BROWNLOW, Jr.
Radiation Safety Officer
Morris Consolidation Facility

Estimated burden per response to comply with this information collection request: 45 minutes. This uniform manifest is required by NRC to meet reporting requirements of Federal and State Agencies for the safe transportation and disposal of low-level waste. Send comments regarding burden estimate to the Records and Compliance Services Branch (1-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20540-0001, or by internet e-mail to inrcoservices@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NRCOS-10202, (3150-0164), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FORM 540 Energy Solutions / Bear Creek Operations UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST SHIPPING PAPER		SHIPPER - NAME AND FACILITY Aberdeen Proving Grounds C/O EnergySolutions 6642 Pistol Road Building #5115 Aberdeen Proving Grounds, MD 21005		SHIPMENT ID NUMBER 1183694		FORM 540 AND 540A FORM 541 AND 541A FORM 542 AND 542A ADDITIONAL INFORMATION		MANIFEST NUMBER (Use the number on all continuation pages) 1183694	
1. EMERGENCY TELEPHONE NUMBER (Include Area Code) 865-220-1555		USER PERMIT NUMBER T-TN012418		SHIPMENT NUMBER T183694		PROCESOR (Specify)		CONTACT Fred Schulz Energy Solutions / Bear Creek Operations Operated By EnergySolutions 1560 Bear Creek Road Oak Ridge, TN 37830 (865) 481-0222	
2. IS THIS AN "EXCLUSIVE USE" SHIPMENT? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST 3		6. CARRIER - Name and Address Hittman Transport Services 1560B Bear Creek Road Oak Ridge, TN 37830		TRUCK #: 5437 TRAILER #: Q55652		TELEPHONE NUMBER (Include Area Code) (410) 306-2268	
4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If "Yes", provide Manifest Number HERE		EPA MANIFEST NUMBER N/A		8. CARRIER - Name and Address Hittman Transport Services 1560B Bear Creek Road Oak Ridge, TN 37830		TRUCK #: 5437 TRAILER #: Q55652		TELEPHONE NUMBER (Include Area Code) (410) 306-2268	
11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (Including proper shipping name, hazard class, UN ID number, and any additional information)		12. DOT LABEL "RADIOACTIVE"		13. TRANSPORT INDEX		14. PHYSICAL AND CHEMICAL FORM		15. INDIVIDUAL RADIOISOTOPES	
UN321, RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), BIOLOGICAL, DAW, LIQUID		NA		NA		SOLIDMETAL OXIDES		C-14 : CA-45 : CS-137 : H-3 : RR-85 : NI-63 : RA-226 : S-35 : SR-90 : TH-230 : TH-232 : U (NAT)	
1 - METAL BOX		Yellow II		1		SOLIDMETAL OXIDES		AM-241 : C-14 : CD-108 : CO-57 : CO-60 : CR-51 : CS-137 : PB-210 : RA-226 : SR-85 : SR-90 : TC-99 : TH-230 : TL-204 : U-238 : Y-88	
UN2915, RADIOACTIVE MATERIAL, TYPE A PACKAGE NON-SPECIAL FORM, 7		Yellow II		1		SOLIDMETAL OXIDES		AM-241 : C-14 : CD-108 : CO-57 : CO-60 : CR-51 : CS-137 : PB-210 : RA-226 : SR-85 : SR-90 : TC-99 : TH-230 : TL-204 : U-238 : Y-88	
1 - METAL DRUM		NA		NA		SOLIDMETAL OXIDES		C-14	
Non-Radioactive per DOT SEALED SOURCES		NA		NA		SOLIDMETAL OXIDES		C-14	
1 - METAL DRUM		NA		NA		SOLIDMETAL OXIDES		C-14	
FOR CONSIGNEE USE ONLY		20. Generator Certification Statement		21. Signature		22. Title		23. Date	
Tennessee "License For Delivery" No. _____		A) Radioactive Materials. Certification is hereby made that this shipment of low-level radioactive waste has been prepared in accordance with the requirements of the Department of Energy, and that the waste is properly packaged, labeled, and marked in accordance with the requirements of the Department of Transportation.		_____		_____		11/6/18	
South Carolina Transport Permit No. _____		B) Hazardous Materials. Generator hereby certifies that this waste is properly packaged, labeled, and marked in accordance with the requirements of the Department of Transportation.		_____		_____		11/6/18	
US Ecology Generator No. _____		C) Data. Generator hereby represents and warrants that all data set forth in this (UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST) are true and correct in all material respects.		_____		_____		11/6/18	
US Ecology Permit No. _____		D) Waste. Generator hereby represents and warrants that this waste is properly packaged, labeled, and marked in accordance with the requirements of the Department of Transportation.		_____		_____		11/6/18	

FORM 541

1. MANIFEST TOTALS				SPECIAL NUCLEAR MATERIAL (grams)		2. MANIFEST NUMBER	
NUMBER OF PACKAGES FOR DISPOSAL CONTAINERS	NET WASTE VOLUME	NET WASTE WEIGHT					
3	m ³ 5.407 kg 191.000 lb	5955.10 13120.00	U-233 NP	U-235 NP	Pu NP	TOTAL NP	3. PAGE 1 OF 2 (PAGE(S)) 4. SHIPPER NAME Abenden Strong Grounds/O Energy Solution
ALL NUCLIDES			ACTIVITY (MBq/mCi) (LD UNITS IN uCi/g)		C-14 Te-99 I-139		

DISPOSAL CONTAINER DESCRIPTION										SHIPMENT ID NUMBER			
										MBq	mCi		
										1.852E+04	5.099E+02		
										8.6140E+03	2.3894E+02		
										2.482E+03	6.737E+01		
										1.8500E+04	5.0000E+08		
										NP	NP		
										kg	lb		
										4.2108E+01	9.2832E+01		
										T16894			
										16. WASTE CLASSIFICATION			
										AS CLASS A UN - Class A Unstable B - Class B C - Class C			
5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15. RADIOLOGICAL DESCRIPTION		16.	
CONTAINER IDENTIFICATION NUMBER/GENERATOR NUMBER	CONTAINER ID (See Note 1) PROCESS REQUESTED BULK/AUTOPACK (See Note 2A)	VOLUME m ³	WASTE AND CONTAINER WEIGHT lb	SURFACE RADIATION LEVEL mSv/hr	SURFACE CONTAMINATION MBq/100 cm ² dpm/100 cm ²	WASTE DESCRIPTION (See Note 2)	APPROXIMATE WASTE VOLUME IN CONTAINER m ³	SOLIDIFICATION OR STABILIZATION MEDIA (See Note 3)	CHEMICAL FORM/ CHELATING AGENT	WEIGHT % CHELATING AGENT IF > 0.1%	INDIVIDUAL RADIONUCLIDES AND ACTIVITY AND CONTAINER TOTAL OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT	CLASSIFICATION	
# - Inventory Container 16-003965 (ESU) 202032	2 O - PROCESS TO BE DETERMINED E	36.246	8318.84	1.000E-02	< 1.6700E-06 < 1.000E+02 < 1.000E+03	59(CAW) 42 25	4.983	100	SOLID METAL OXIDES / NP	NP	RADIONUCLIDES	AU	
											C-14	2.4109E+03	6.5152E+01
											CA-45	5.3102E+03	1.4352E+02
											CS-137	1.1102E+00	3.0001E-02
											H-3	9.6140E+03	2.5864E+02
											KR-85	3.7000E-04	1.0000E-06
											NI-63	4.2108E+02	1.1390E-03
											PO-226	2.2594E+00	6.2147E-02
											S-35	3.5160E+01	9.5000E+01
											SR-90	1.0944E-01	2.9308E-03
TH-230	1.9880E-02	5.4000E-04											
TH-232	[2.6223E-08 kg] 1.7058E-02	4.8098E+00											
U (NAT)	[4.2075E+01 kg] 4.4000E-04	1.2000E-05											
	[1.6901E-05 kg]												
Sub Total													

* - Indicates Cross Contamination

Estimated burden per response to comply with this information collection request: 45 minutes. This uniform manifest is required by NRC to meet reporting requirements of Federal and State Agencies for the safe transportation and disposal of low-level waste. Send comments regarding burden estimate to the Records and FOIA/Privacy Services Branch (T-5 F32), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to infocollection@nrc.gov and to the Desk Officer for the Department of Energy, Washington, DC 20585-0102, (3130-0103). Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

NRC FORM 542
(7-2001)

Energy Solutions / Bear Creek Operations
UNIFORM LOW-LEVEL RADIOACTIVE
WASTE MANIFEST

MANIFEST INDEX AND REGIONAL COMPACT TABULATION

List all original "PROCESSED WASTE" generators (if any)
before "COLLECTED WASTE" generators

1. WASTE COLLECTOR/PROCESSOR		2. MANIFEST NUMBER	
NAME Aberdeen Proving Grounds/CO Energy Solutions	SHIPPER USE ONLY	T163694	
IDENTIFICATION NUMBER 718		PAGE 1 OF 1 PAGE(S)	
SHIPPING DATE 11/08/2018			

4. GENERATOR IDENTIFICATION NUMBER	5. GENERATOR NAME PERMIT NUMBER (IF APPLICABLE), AND TELEPHONE NUMBER	6. GENERATOR FACILITY ADDRESS	7. PREPROCESSED WASTE (OR MATERIAL) VOLUME m ³	8. MANIFEST NUMBERS UNDER WHICH WASTE (OR MATERIAL) RECEIVED AND DATE OF RECEIPT	9. WASTE CODE PREPROCESSED C-COLLECTED	10. ORIGINATING REGION OR STATE	11. A. SOURCE MATERIAL (kg) B. SNM (g) C. ACTIVITY MBq D. VOLUME m ³
718	Aberdeen Proving Grounds EPA #: (410) 306-2268	6642 Placid Road Building #6115 Aberdeen Proving Grounds, MD 21005	5.408	Onsite Generation 11/03/2018	C	MD	4.2108E+01 NP 1.8522E+04 5.407
TOTALS OF ALL PAGES (FORMS 542 AND 542A)							4.2108E+01 NP 1.8522E+04 5.407

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST ISOTOPIC SUMMARY

For Manifest # T183694

Energy Solutions / Bear Creek Operations

Isotope	Total Activity		(Ci)	Total SNM		Total Source
	(MBq)	(mCi)		(gm)	(lb)	
AM-241	3.8480E+01	1.0400E+00	1.0400E-03	.0000E+00	.0000E+00	
C-14	2.4905E+03	6.7312E+01	6.7312E-02	.0000E+00	.0000E+00	
CA-45	5.3102E+03	1.4352E+02	1.4352E-01	.0000E+00	.0000E+00	
CD-109	2.2728E-01	6.1426E-03	6.1426E-06	.0000E+00	.0000E+00	
CO-57	8.5100E+02	2.3000E+01	2.3000E-02	.0000E+00	.0000E+00	
CO-60	4.3290E+00	1.1700E-01	1.1700E-04	.0000E+00	.0000E+00	
CR-51	1.3585E-01	3.6717E-03	3.6717E-06	.0000E+00	.0000E+00	
CS-137	1.8870E+00	5.1001E-02	5.1001E-05	.0000E+00	.0000E+00	
H-3	9.6140E+03	2.5984E+02	2.5984E-01	.0000E+00	.0000E+00	
KR-85	3.7000E-04	1.0000E-05	1.0000E-08	.0000E+00	.0000E+00	
NI-63	4.2106E-02	1.1380E-03	1.1380E-06	.0000E+00	.0000E+00	
PB-210	2.6851E-02	7.2570E-04	7.2570E-07	.0000E+00	.0000E+00	
RA-226	4.5651E+00	1.2338E-01	1.2338E-04	.0000E+00	.0000E+00	
S-35	3.5150E+01	9.5000E-01	9.5000E-04	.0000E+00	.0000E+00	
SR-85	4.7434E-03	1.2820E-04	1.2820E-07	.0000E+00	.0000E+00	
SR-90	1.0880E-01	2.9405E-03	2.9405E-06	.0000E+00	.0000E+00	
TC-99	1.8500E-04	5.0000E-06	5.0000E-09	.0000E+00	.0000E+00	
TH-230	2.5697E-02	6.9450E-04	6.9450E-07	.0000E+00	7.4351E-08	
TH-232	1.7056E+02	4.6098E+00	4.6098E-03	.0000E+00	9.2760E+01	
TL-204	4.8100E-04	1.3000E-05	1.3000E-08	.0000E+00	.0000E+00	
U (NAT)	4.4400E-04	1.2000E-05	1.2000E-08	.0000E+00	3.7261E-05	
U-238	4.0364E-01	1.0915E-02	1.0915E-05	.0000E+00	7.1650E-02	
Y-88	5.6170E-02	1.5181E-03	1.5181E-06	.0000E+00	.0000E+00	
Totals:	1.8522E+04	5.0059E+02	5.0059E-01	.0000E+00	9.2832E+01	

General Emergency Response Procedure

Emergency Response Information

24 Hour Emergency Contact

These instructions apply to the following:

- Radioactive material, excepted package-articles, 7, UN2911
- Radioactive material, low specific activity (LSA-I), *non fissile or fissile-excepted*; 7: UN2912
- ✓ Radioactive material, low specific activity (LSA-II), *non fissile or fissile-excepted*; 7: UN3321
- Radioactive material, surface contaminated objects (SCO-I or SCO-II), *non fissile or fissile-excepted*; 7: UN2913
- ✓ Radioactive material, Type A package, *non-special form, non fissile or fissile-excepted*; 7: UN2915
- Radioactive material, Type A package, special form, *non fissile or fissile-excepted*; 7: UN3332
- Radioactive material, excepted package-limited quantity of material; 7: UN2910
- Radioactive material, excepted package-instruments or articles; 7: UN2917
- Radioactive material, excepted package-empty packaging; 7: UN2908

POTENTIAL HAZARDS

Health Hazards

- External radiation hazard from unshielded radioactive material.
- Internal radiation hazard from inhalation, ingestion or breaks in skin.
- Radioactive material; degree of hazard will vary greatly, depending on type and quantity of radioactive material and type of packaging.
- Materials in special Form or in Type B Packagings are not expected to cause contamination in accidents.
- Some radioactive materials cannot be detected by commonly available instruments.
- Runoff from fire control or dilution water may cause pollution.

FIRE OR EXPLOSION

Some of materials may burn, but none of them ignites readily. Radioactivity does not change flammability or other properties of the materials.

EMERGENCY ACTION

- Keep unnecessary people at least 150 feet upwind of spill; greater distances may be necessary for people downwind, or if advised by Radiation Authority.
- Isolate hazard area and deny entry.
- Response actions may be performed prior to any measurement of radiation; limit entry to shortest possible time.
- Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection.
- Notify Radiation Authority of accident conditions.
- Detain uninjured persons, isolate equipment with suspected contamination and delay cleanup until instruction of Radiation Authority.
- Call EnergySolutions at (865) 220-1555 for EMERGENCY ASSISTANCE. If water pollution occurs, notify the appropriate authorities.

FIRE

Do not move damaged containers; move undamaged containers out of fire zone.

Small Fires: Dry Chemical, CO₂, water spray, or regular foam.

Large Fires: Water spray, fog (flooding amounts).

For massive fire in cargo area, use unmanned hose holder or monitor nozzles.

SPILL OR LEAK

Do not touch damaged containers or spilled material.

Damage to outer container may not affect primary inner container.

Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.

Large Spills: Dike far ahead to collect runoff water.

FIRST AID

- Use First Aid treatment according to the nature of the injury.
- If not affecting injury, remove and isolate suspected contaminated clothing and shoes; wrap victim in sheet or blanket before transporting.
- If there is no injury, remove and isolate suspected contaminated clothing and shoes; assist person to shower with soap and water, and notify Radiation Authority of Action.
- Advise medical personnel that victim may be contaminated with radioactive material.

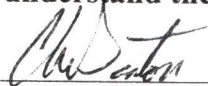
Exclusive Use Instructions
Radioactive Material Shipment

- This shipment of radioactive material has been designated as an "Exclusive Use" as defined by DOT in 49 CFR 173.403.
- EnergySolutions is the shipper of all materials contained on this vehicle. The vehicle is authorized to make pickups at the following location where all loading, unloading and securing will be conducted under the direct supervision of trained EnergySolutions personnel.

1. <u>Aberdeen Proving Grounds</u>	2. _____
3. _____	4. _____
5. _____	6. _____
7. _____	8. _____

- If at any time, containers with surface dose rates in excess of 200mr/hr are loaded onto the vehicle, no further loading or rearranging of cargo is authorized.
- All containers will be secured to prevent shifting or movement during transit.
- Radioactive placards will be applied to all four sides of the vehicle whenever any quantity of Radioactive Material LSA, UN2912 or Radioactive Material SCO, UN2913 consigned as exclusive use in accordance with 173.427 or any package bearing a Radioactive Yellow III is loaded onto the vehicle.
- Vehicle driver is required to maintain placards intact and clean during transit.
- Radiation levels on the vehicle will be maintained below the following:
Surface <200mr/hr 2 meters <10mr/hr Cab <2mr/hr
- Any loading, unloading, or shifting of cargo will be followed by a vehicle survey to ensure that vehicle radiation limits have not been exceeded.
- The material loaded on this vehicle may not be transferred to another vehicle.
- In the event of an accident, implement the actions detailed in the attached General Emergency Response Procedures.
- These instructions must be carried with the shipping papers and shall be regarded as an attachment to the shipping papers.

I have read and understand these instructions.

Driver Signature  Date 11/6/18

Shipment Number(s) T183694, T183790, 110618-Bien, 110618-ASST

FULL VEHICLE SURVEY FORM

SURVEY NUMBER 2 -TRAN- 2

CONTACT 2M 4.5 CONTACT 2M 4.5 CONTACT 2M 4.5

Contact 2m 4.5

CONTACT 2M 4.5 CONTACT 2M 4.5 CONTACT 2M 4.5

DOSE RATE UNDER TRAILER 4.5

ALL DOSE RATES IN mR/Hr AS NOTED

SMEAR RESULTS @ DPM/100CM2

LOC BETA / GAMMA ALPHA

1 <1000 <100

2

3

4

5

6

7

8

9

10

11

12

13

RWP # _____

DATE: 11/6/18 TIME: _____
SHIPMENT NUMBER: 1183694, 1183790, 110618-D55I

TRACTOR #: 5437 TRAILER #: _____

INCOMING: FULL _____

OUTGOING: FULL X

TRUCKING COMPANY: ES

TRAILER TYPE: FLAT ✓ RAGTOP _____ VAN _____
RAIL FRAME _____ CASK _____

DOSE RATE INSTRUMENT

TYPE: 14C
SERIAL NUMBER: 35121
CAL. DUE DATE: 6/5/19

CONTAMINATION SURVEY INST. - BETA / GAMMA

TYPE: Model 3
SERIAL NUMBER: 87482
CAL. DUE DATE: 6/5/19

CONTAMINATION SURVEY INST. - ALPHA

TYPE: Model 12
SERIAL NUMBER: 91058
CAL. DUE DATE: 6/5/19

SHIPPING & RECEIVING TECHNICIAN: CD

Initials

REVIEWED BY: Chris Denton

CIRCLED NUMBER ON THE ABOVE DRAWING INDICATES SWIPED LOCATION.



DEPARTMENT OF THE ARMY
JOINT MUNITIONS COMMAND
SAFETY AND RISK MANAGEMENT DIRECTORATE
MORRIS CONSOLIDATION FACILITY
BUILDING 170, 3336 BECK AVENUE
ROCK ISLAND, IL 61299-5000

REPLY TO
ATTENTION OF:

AMSJM-SF

09 Aug 2019

MEMORANDUM FOR Patrick Eures6642 Pistol Road, Building 5115 Aberdeen Proving Ground, MD 21005

SUBJECT: Shipping Instructions for Excessed Radioactive Items, Authorization Number RI9221-570, Project Number USA 2019-053

1. We have reviewed your submitted inventory of excessed radioactive items and approve the items on the attached inventory for shipment to the Joint Munitions Command (JMC) Morris Consolidation Facility (MCF) for processing and disposition. Ship only the approved items.
2. We have assigned authorization number RI9221-570 to your shipment. Annotate this number on all correspondence, forms, and shipping documents and mark the authorization number on the shipping container(s).
3. You must ship the items by 23 Sep 2019 or obtain an extension from Mr. Calvin Brownlow, MCF Radiation Safety Officer, or the JMC project manager listed below. Per 49 CFR 172.704(c), the shipper must complete initial and/or recurrent Department of Transportation radioactive material shipping training before shipment of the container(s).
4. Please direct questions to the JMC Safety and Risk Management Directorate, AMSJM-SF, Project Manager, Tyler Werke, at 309-782-0723, email tyler.a.werke.civ@mail.mil or Mr. Calvin Brownlow, DSN 793-1046 or commercial (309) 782-1046, email calvin.brownlow2.civ@mail.mil.

Calvin Brownlow Jr.
CALVIN BROWNLOW Jr.
MCF Radiation Safety Officer
Risk Management Division

Encl
CF: Mike Kurth, AMSJM-SFR

AMSJM-SF

SUBJECT: Shipping Instructions for Excessed Radioactive Items, Authorization Number RI9221-570, Project Number USA 2019-053

GENERAL INSTRUCTIONS

You are authorized to ship the listed items on the attached inventory. **DO NOT** add items without prior approval from the JMC project manager.

DO NOT ship the container(s) without the authorization number, project number, complete inventory, and your installation point of contact (POC) with telephone number on the shipping paperwork. Your shipment may be rejected and returned if this information is not provided.

DO NOT ship the radioactive material with other hazardous material such as chemicals, heavy metals, or explosives.

DO NOT ship liquids in other than incidental amounts such as leveling vials on fire control devices.

DO NOT ship biological materials.

Specific guidelines for shipping your excepted package as an Instrument or Article or a Limited Quantity to the MCF are provided in the appendix, "Excepted Package Shipment Quality Assurance Checklist."

Pack your approved inventory of items in an excepted package(s), such as a metal drum or fiberboard/cardboard box. You may use an inner container(s) to place in an outer shipping container.

The dose rate measured from the external surface of the shipping container must be less than or equal to 0.005 mSv/hr (0.5 mrem/hr). Removable contamination levels on the shipping container external surface cannot exceed Department of Transportation limits in 49 CFR, 173.443, Table 9:

Beta/gamma
Alpha

240 dpm/cm²
24 dpm/cm²

AMSJM-SF

SUBJECT: Shipping Instructions for Excessed Radioactive Items, Authorization Number RI9221-570, Project Number USA 2019-053

Ship the package(s) to the following address:

Joint Munitions Command
Morris Consolidation Facility
RI9221-570
AMSJM-SF, Building 170
3336 Beck Avenue
Rock Island, IL 61299-5000

Note: Do not use the U.S. Postal Service (USPS) to mail your shipment. Do ensure your carrier knows you are shipping radioactive material.

Within 24 hours of shipping the container(s), please notify Mr. Brownlow at DSN 793-1046 or commercial (309) 782-1046, and send email notification to calvin.brownlow2.civ@mail.mil and the JMC project manager listed in the cover memorandum.

The carrier must call the MCF at (309) 782-1046 before delivery to ensure personnel are on-site to accept the shipment.

Authorized Items

Isotope	Quantity	Actual(mCi)	Total(mCi)	Weight(g)	Item Info
Ni63	1	10	10	0	6665-01-564-1834 APD 2000

AMSJM-SF

SUBJECT: Shipping Instructions for Excessed Radioactive Items, Authorization Number RI9221-570, Project Number USA 2019-053

APPENDIX I

Excepted Package Shipment Quality Assurance Checklist

Joint Munitions Command (JMC)
Morris Consolidation Facility (MCF)

April 2017

Date: 8/19/19

Shipping Installation: ABERDEEN PROVINT 6-ROVND

MCF Authorization Number: RI9221-570

Completion of this checklist does not relieve the shipper of 49 CFR Transportation Subpart H training requirements. The shipper must submit the completed checklist to the JMC project manager or MCF personnel listed on the MCF Authorization before scheduling shipment. Contact the JMC project manager if you answer any questions as "No," or if you need assistance completing the checklist.

Yes No

TRAINING

- ☒ ☐ Has the person preparing this shipment received radioactive material shipping training within the last 3 years? (49 CFR 172.704)
- ☒ ☐ Have you provided the JMC project manager your certificate of training?

Yes No

PACKAGING

- ☒ ☐ For each package, has the content total activity per radionuclide been compared to and is less than, limits applicable to instruments and articles, and limited quantities set forth in 49 CFR 173.425 Table 4? (see 49 CFR 173.435 table of A₁ and A₂ values for radionuclides)

NOTE: If there are multiple radionuclides in the same package, perform the unity calculation to ensure compliance. (49 CFR 173.433)

- ☒ ☐ Are you using new or unused container(s) for the shipment? If not, have you verified the previously used container(s) are below the Department of Transportation removable contamination limits: less than 240 dpm/cm² beta and gamma emitters and low toxicity alpha emitters; and less than 24 dpm/cm² for all other alpha emitters? (49 CFR, 173.443, Table 9)
- ☒ ☐ Have all removable non-radioactive components associated with the radioactive device been removed, e.g., batteries, lanyards attached to compasses, carrying case housing the device, canvas or nylon covers, tripods for fire control devices, non-radioactive parts of a kit such as RADIAC meters without check sources, and excess packing material?

AMSJM-SF

SUBJECT: Shipping Instructions for Excessed Radioactive Items, Authorization Number RI9221-570, Project Number USA 2019-053

NOTE: DO NOT DISASSEMBLE THE COMMODITY TO REMOVE THE RADIOACTIVE SOURCE.

☒ ☐ Are the radioactive items properly cushioned in the shipping container(s) to minimize shifting and prevent breakage during transport? **DO NOT** use dispersible packing material/dunnage such as Styrofoam peanuts or vermiculite.

☒ ☐ Inspect all devices for physical integrity. For suspected broken, leaking, or contaminated items, is the item double bagged in plastic, such as a clear Ziploc bag, and the condition of the item written (using Sharpie-type pen) on the outside bag?

☒ ☐ If your shipment contains radium-226 (Ra226), are those items packed in a separate container? For example, you can put the Ra226 items in a paint can with sealed lid and marked with contents and place that in the middle of the larger shipping container. Check "Yes" if there is no Ra226 in the shipment.

☒ ☐ Does each package include an accurate inventory of its contents? Affix an inventory of the container contents to the outside of the package in a document holder or equivalent.

RADIATION SURVEY RESULTS

Survey Instrument Used: *DSM-500*

Manufacturer:

Model: *DSM-400*

Serial Number: *10003*

Calibration Date: *13-SEP-18*
Due: 8-SEP-19

Highest Surface Reading (all sides, including bottom, of package) Beta/Gamma: *2.0* *uR/hr* *mrem/hr*

Yes No

☒ ☐ Are the radiation levels on the external surface of the package ≤ 0.005 mSv/hr (0.5 mrem/hr)?

☒ ☐ Is the radiation level at 10 cm (4 in) from any point on the external surface of any unpackaged instrument or article ≤ 0.1 mSv/hr (10 mrem/hr)?

Yes No

PACKAGE MARKINGS

☒ ☐ Is the UN identification number affixed to the side of the package (UN 2911 for Instrument or Article, or UN2910 for Limited Quantity)?

☒ ☐ Have you marked the gross weight in kilograms on packed containers?

Note: 2.2 lb = 1kg. Divide weight in lb by 2.2 to obtain kg.

☒ ☐ Are the return address, POC, email, and telephone number affixed to the package?

☒ ☐ Is the MCF authorization number affixed to the exterior of the package(s)?

Printed On  Recycled Paper

For Official Use Only

AMSJM-SF

SUBJECT: Shipping Instructions for Excessed Radioactive Items, Authorization Number RI9221-570, Project Number USA 2019-053

☒ ☐ Is the ship-to address the exact address provided in the MCF authorization?

IMPORTANT: If you checked "No" for any item above, contact your JMC project manager for further instructions.

As the trained person who prepared the shipment and completed this checklist, your signature verifies the above information is valid and accurate.

Printed Name: *PATRICK EVANS*

Signature:



NOTE: Your shipment to the MCF will be inspected for compliance with Department of Transportation requirements. The contents of each container will be verified for agreement with your container inventory and the shipment inventory on the MCF authorization. Any radioactive item received that was not approved for shipment, may be returned to you. JMC will provide a written report of discrepancies.

SHIPPER INVENTORY - INSPECTION- AND SURVEY FORM

SHIPMENT NUMBER: USA 2019-053 Page Number 1 Of 1

PKG NUMBER: APG-1 CONTAINER WEIGHT: 7.9 Lbs

RADIATION LEVEL ON CONTAINER SURFACE (Mr/HR OR MsV/HR): 3.0 UR/HR

RADIOACTIVE CONTAMINATION LEVEL ON CONTAINER SURFACE <24 / <240 (dpm/100 cm2)

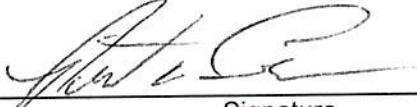
TYPE OF CONTAINER LABELS: UN2911

No.	Nomenclature	NSN	QTY	Isotope	Activity mCi	Total Act. mCi	Weight lbs	Volume cu ft	Other info (as needed)
1	APD2000		1	Ni-63	10	10		1.5	Serial #: 2977
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13				Total	10	mCi			
14					3.70E+02	MBq			
15									
16									
17									
18									
19									
20									

INSTRUMENT TYPE: DSM-460 CALIBRATION DATE: 13-SEP-18
8-SEP-19

INSPECTED BY: Patrick A. Eures

As Installation Radiation Safety Officer or designee, I certify based on direct observation or performance, that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous materials (such as lead paint) are present.


 Signature

8/19/19
 Date



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
UNITED STATES ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND
6501 EAST 11 MILE ROAD
WARREN, MICHIGAN 48397-5000

AMSTA-LCS-CPD

13 August 2019

MEMORANDUM FOR:

SUBJECT: Disposition instructions for Improved Chemical Agent Monitor (ICAM), Modified Chemical Agent Monitor (MCAM), Chemical Agent Monitor (CAM), LIN C05701

Reference

Turn-in Document Number	NSN	Serial Number	QTY
-------------------------	-----	---------------	-----

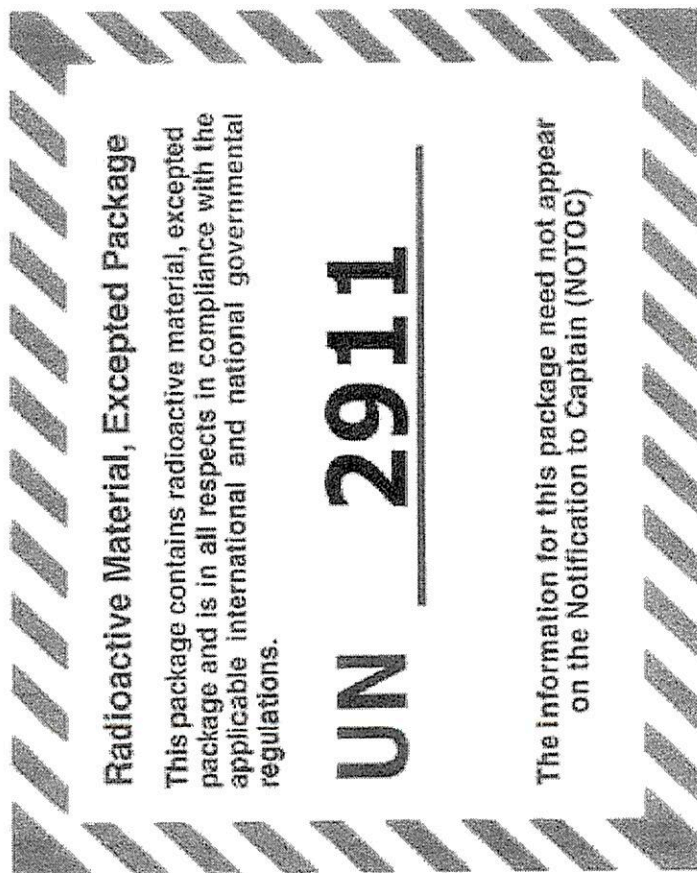
The turn in standard for the ICAM/MCAM/CAM is "as is" condition. Basic Issue Items (BII) and Components of End Items (COEI) as listed in Chapter 5 of Technical Manual (TM) 3-6665-343-10 (dated 13 February 2004) may be turned in, if on hand.

1. Remove the lithium-sulfur dioxide battery from the body of the monitor before shipping. Lithium-sulfur dioxide batteries are hazardous material and must be disposed of through your environmental coordinators office.
2. The person preparing the shipment MUST be certified in shipping radioactive material in accordance with 49 CFR Transportation, Part 172, subpart H, Training. The transportation officer, installation radiation safety officer (RSO), or unit RSO at shipping origin MUST be certified in making radioactive shipments.
3. Contact your installation/mission Radiation Safety Officer (RSO) and the TACOM LCMC System Safety Office Nuclear Regulatory Commission (NRC) License Manager /RSO in paragraph 17 for coordination in shipping the radioactive commodities. The installation/mission RSO will be responsible for assuring the devices are properly packaged and shipped in accordance with 49 CFR, Part 173.424 and Part 172.
4. Government Bill of Lading (GBL) is the preferred method of shipping freight within the military supply system. The GBL must list the items being shipped to include quantity. The government contracted carrier must have a method of tracking the shipment. A loss of any shipment containing CDE is a reportable event to the NRC.
5. The alternative method of shipment is by FedEx Express package or Express freight services. FedEx shipments require a US Air bill form. Ensure weight of package does not exceed weight limit established by shipping carrier. Freight for Fed Ex shipment is limited to 150 lbs per package. Whenever possible use FED Ex Airbill shipments. Shipment must be made by traceable means.
6. The losing unit is responsible for ensuring the CAM /MCAM/ICAM is removed from the local hand receipt and property book record in GCSS ARMY/DPAS. The PBO must initiate an "asset adjustment" in GCSS ARMY/DPAS, generating a 1348-1A ISSUE RELEASE/RECIEPT DOCUMENT, which is to be included in all shipments. The removal from GCSS ARMY/DPAS will occur when PBA returns a signed 1348-1 back to the submitting organization. PBA verifies received shipment before CAMs/MCAMs/ICAMs are removed from GCSS ARMY/DPAS. The submitting organization must include a valid e-mail and name on the submitted 1348-1's so that a signed 1348-1 can be provided to them. Also, all shipping documentation to include the 1348's will be with the shipment. Submitting organizations can also e-mail the documentation, but they have to have documentation with the shipment.

7. If possible, consolidate unit shipments at installations and garrisons or at higher command levels to reduce manpower commitments and reduce shipment issues.
8. Place the commodity(s) into a new shipping container. Package must be designed so that:
 - a. It can be easily handled and properly secured in or on transport conveyance.
 - b. As far as practicable, external surface must be free from protruding features and easily decontaminated.
 - c. Outer layer of packaging avoids pockets or crevices where water might collect.
 - d. It can withstand acceleration and vibration without causing deterioration
 - e. Add packaging material if needed to prevent the devices from being jostled during shipment.
9. Label each shipping package with a clear **ship to** and **ship from** address. The DODAAC must be included on the ship to address.
10. Each shipping container must have a "UN 2911" label attached on opposite sides of the shipping container. See Attachment 1.
11. Shipping documents must indicate the following Department of Transportation (DOT) shipping name: "UN 2911, RADIOACTIVE MATERIALS, INSTRUMENTS, EXCEPTED PACKAGE"
12. If devices are being shipped **from** a depot, the Serialization Officer must assure an "S" (shipping) transaction is entered into the DODRATTS database Unique Item Tracking (UIT) through LOGSA. The serial numbers of each device (Z16-M or Z47-M) and accompanying radioactive sealed sources (Z16-C or Z47-C) must be listed on the shipping papers.
13. Ensure a Radioactive Material Movement Form (RMMF), Attachment 2, is filled out by the unit RSO or Garrison installation RSO prior to shipment and is provided with the shipment. A copy of the RMMF must be maintained by the RSO.
14. **Owning Units are responsible for the cost of turn in.**
15. Shipping information:

DODAAC: W41CE8
ATTN: Sheila Bishop (Com) (870) 540-3438
ARMY FIELD SERVICE ACCT
CRSP, BLDG 53-990, 507TH STREET
PINE BLUFF AR 71602-9500
16. TACOM LCMC (Warren) POC is Carol Karl, AMSTA-LCS-CPD, DSN 786-7098 or COM 586-282-7098, email: carol.l.karl2.civ@mail.mil.
17. TACOM-RI LCMC (Warren) NRC License Manager / RSO is Earl (Joe) Hart, AMSJM-SF, DSN 793-1124, commercial (309) 782-1124, email earl.j.hart.civ@mail.mil

Carol Karl
Contamination Avoidance Team
TACOM LCMC (Warren)
DSN 789-7098 Com 586-282-7098



Attachment 2

RADIOACTIVE MATERIAL MOVEMENT FORM

SHIP TO:

DODAAC: W41CE8
 ATTN: Sheila Bishop (Comm 870-540-3438)
 Army Field Service Acct.
 CRSP, Bldg. 507th Street
 Pine Bluff, AR 71602-9500

SHIP FROM:

US Army Aberdeen Proving Ground
 for MRICD
 6642 Pistol Road
 APG, MD 21005

(Check one only).

NOMENCLATURE/

DEVICE: M8A1/M43A1	ISOTOPE: Americium 241	Form: Solid	Sealed Source	Special Form
M22/M88	Nickel 63	Form: Solid	Sealed Source	Special Form
MCAM/ CAM / ICAM	Nickel 63	Form: Solid	Sealed Source	Special Form

MODE OF SHIPMENT: Air _____ Rail _____ Parcel Post _____
 Truck _____ Water _____ Other FedEx

PACKAGE CONTENT(S): 6665-01-357-8507 1 ea. ICAM
 1. NSN: 6665-00-859-2215 NOUN: 1 ea. GID-3 M22 ACADA

SERIAL NUMBERS: ICAM: Z47-M-00030,
 ACADA: GY1 965-D-00047G, GY1-965-D-00047H

2. Activity (TBq) in each device: M8A1/M43A1=9.25E-06TBq M22/M88=1.11E-03TBq MCAM/CAM/ICAM=5.55E-04 TBq

Total Activity (TBq) of Packages: # _____ M8A1/M43A1 x 9.25E-06 TBq = _____ TBq

1 M22 / M88 x 1.11E-03 TBq = 7.4E-4 TBq

1 CAM / ICAM x 5.55E-04 TBq 3.7E-4 TBq

3. Unpackaged device reading at 4": see below Packaged surface Reading: see below
 (Less than 0.1 mSv/hr OR 10mrem/hr) (Less than 0.005mSv/hr OR 0.5mrem/hr)

4. Removable radioactive contamination of package is in accordance with 49 CFR Part 173.443 Table 9.

Note: Transport wipe test of package is not required if a new package is used for shipment
 Contamination limits: Less than 4 Bq/cm² or 240dpm/cm² for beta and gamma emitters and low toxicity alpha emitters, and less than 0.4 Bq/cm² or 24dpm/cm² for all other alpha emitting radio-nuclides.

5. Ensure package is marked with DOT "UN2911" (red boarder) label and complete "ship to" and "ship from" mailing address.

6. Proper shipping name: "UN2911, EXCEPTED PACKAGE, INSTRUMENTS, & ARTICLES 7"

7. Approving official Printed & Signature Patrick A. Eures
 (INSTALLATION/UNIT RADIATION SAFETY OFFICER OR TRANSPORTATION OFFICER)

Date: 8/19/19
8/15/19 EMERGENCY PHONE NUMBER: (TACOM LCMC NRC LICENSEE)
 Commercial (586)282-7635 /6194 DSN prefix (786)

SHIPPER INVENTORY - INSPECTION- AND SURVEY FORM

SHIPMENT NUMBER: USA 2019-053-PBA Page Number 1 Of 1
 PKG NUMBER: APL-1 CONTAINER WEIGHT: 18.0 Lbs, 8.2 kg
 RADIATION LEVEL ON CONTAINER SURFACE (Mr/HR OR MsV/HR): 3 uR/hr
 RADIOACTIVE CONTAMINATION LEVEL ON CONTAINER SURFACE <24 / <240 (dpm/100 cm²)
 TYPE OF CONTAINER LABELS: UN2911

No.	Nomenclature	NSN	QTY	Isotope	Activity mCi	Total Act. mCi	Weight lbs	Volume cu ft	Other info (as needed)
1	ICAM		1	Ni-63	10	10	18	1.5	Z47-M-00030
2	M22 ACADA		1	Ni-63	20	20			GY1 965-D-00047G
3									GY1 965-D-00047H
4									
5									
6									
7									
8									
9									
10									
11									
12									
13				Total	30	mCi			
14					1.11E+03	MBq			
15									
16									
17									
18									
19									
20									

INSTRUMENT TYPE: DSM-460 CALIBRATION DATE: 13-SEP-18
DOE 8-SEP-19
 INSPECTED BY: Patrick A. Eures

As Installation Radiation Safety Officer or designee, I certify based on direct observation or performance, that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous materials (such as lead paint) are present.


 Signature

8/19/19
 Date