

REPORT DOCUMENTATION PAGE				<i>Form Approved</i> OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 2 Oct 2015		2. REPORT TYPE Consultative Letter		3. DATES COVERED (From – To) 11-13 March 2015	
4. TITLE AND SUBTITLE Final Status Survey of Bunkers 738A and 825A at Spangdahlem AB, Germany				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) SSgt Emily Arceo				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) USAF School of Aerospace Medicine Occupational and Environmental Health Dept/OEC 2510 Fifth St. Wright-Patterson AFB, OH 45433-7913				8. PERFORMING ORGANIZATION REPORT NUMBER AFRL-SA-WP-CL-2015-0025	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSORING/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2015-4768, 2 Oct 2015					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT The United States Air Force School of Aerospace Medicine, Consultative Services Division (USAFSAM/OEC), performed a final status survey (FSS) of two former depleted uranium (DU) storage bunkers located on Spangdahlem AB, Germany. Laboratory analysis of swipe samples showed that residual removable activity did not exceed the derived concentration guideline level (DCGL) of 1,000 disintegrations per minute/100 square centimeters (dpm/100 cm ²). Floor scanning and static measurements showed that total activity did not exceed the DCGL of 5,000 dpm/100 cm ² . Based on these findings, both bunkers met the criteria for unrestricted release as specified in AFI 48-148.					
15. SUBJECT TERMS Depleted uranium, DU, Uranium, floor monitor survey, floor scan survey, removable contamination, Spangdahlem, bunker					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR	18. NUMBER OF PAGES 128	19a. NAME OF RESPONSIBLE PERSON SSgt Emily Arceo
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U			19b. TELEPHONE NUMBER (include area code)



DEPARTMENT OF THE AIR FORCE
USAF SCHOOL OF AEROSPACE MEDICINE (AFMC)
WRIGHT-PATTERSON AFB OHIO 45433

2 October 2015

MEMORANDUM FOR AFMSA/SG3PB

ATTN: Maj Daniel Shaw
7700 Arlington Blvd., Suite 5151
Falls Church, VA 22042

FROM: USAFSAM/OEC

2510 Fifth Street

Wright-Patterson AFB, OH 45433-7913

SUBJECT: Consultative Letter, AFRL-SA-WP-CL-2015-0025, Final Status Survey of
Bunkers 738A and 825A at Spangdahlem AB, Germany

1. EXECUTIVE SUMMARY: At the request of the United States Air Force Radioisotope Committee Secretariat, the United States Air Force School of Aerospace Medicine, Consultative Services Division (USAFSAM/OEC) performed a final status survey (FSS) of two former depleted uranium (DU) storage bunkers located on Spangdahlem AB, Germany, from 11-13 March 2015. The objective of this survey was to determine if the bunkers meet the criteria for unrestricted release, as specified in Air Force Instruction (AFI) 48-148, *Ionizing Radiation Protection*, Table A4.2. USAFSAM/OEC performed alpha and beta static measurements and floor scanning and collected swipe samples for laboratory analysis. Laboratory analysis of the swipe samples showed that residual removable activity did not exceed the derived concentration guideline level (DCGL) of 1,000 disintegrations per minute/100 square centimeters (dpm/100 cm²). Floor scanning and static measurements showed that total activity did not exceed the DCGL of 5,000 dpm/100 cm². Based on these findings, both bunkers met the criteria for unrestricted release as specified in AFI 48-148.

2. INTRODUCTION

a. *Purpose:* The purpose of USAFSAM/OEC's health risk assessment was to provide an independent evaluation of the final radiological conditions within the bunkers (buildings 738A and 825A), with uranium-238 as the primary radionuclide of concern. USAFSAM/OEC surveyed both buildings to determine if removable activity levels complied with the DCGL of 1,000 dpm/100 cm² and total activity levels complied with the DCGL of 5,000 dpm/100 cm² as outlined in AFI 48-148, Table A4.2. The Nuclear Regulatory Guide 1575, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*, Rev 1, specifies the techniques and procedures used during this final status survey.

b. *Background:* Spangdahlem AB previously hosted A-10 aircraft and their corresponding DU munitions. The A-10 mission and DU munitions moved to Camp Darby, Italy, shortly before USAFSAM was contacted for this survey. The 52nd Munitions Maintenance Group used buildings 738A and 825A for the storage of DU munitions.

c. *Survey Personnel:*

- (1) Capt Nathan Krzyaniak, Health Physicist, USAFSAM/OEC
- (2) SSgt Emily Arceo, Health Physics Technician, USAFSAM/OEC

d. *Personnel Contacted:*

- (1) Lt Col Scott Steigerwald, Flight Commander, 52 AMDS/SGPB
- (2) Mr. Craig Refosco, Health Physicist, AFMSA/SG3PB
- (3) Capt Vivien Miller, Chief, Bioenvironmental Eng Operations, HQ USAFE/SGPB

e. *Equipment (Table 1):*

Table 1. Survey Instrument Information

Make and Model of Detector and Probe	Serial Number	Calibration Date	Calibration Due
Ludlum Model 2360 meter with Ludlum Model 43-89 detector	Meter – 141306 Detector – PR154733	20 May 2014	20 May 2015
Ludlum Model 2360 meter with Ludlum Model 43-89 detector	Meter – 145472 Detector – PR154734	18 July 2014	18 July 2015
Ludlum Model 2224-1 meter with Ludlum Model 43-37-1 detector	Meter – 125659 Detector – PR143637	18 June 2014	18 June 2015

3. METHODOLOGY

a. *Overview:* USAFSAM/OEC took static measurements, performed a floor scan survey, and collected swipe samples as part of this final status survey. Survey personnel performed 1-minute static alpha and beta count rate measurements and dry swipe samples at each sample point to determine fixed and removable contamination levels. USAFSAM/OEC predetermined sample points for static measurements and swipe samples with the software Visual Sampling Plan. USAFSAM/OEC also took background static measurements, floor monitor measurements, and swipes in a reference area bunker where DU munitions had never been stored. The survey team performed instrument function checks at the start and end of each workday to ensure the instrument response was within a $\pm 20\%$ tolerance. (See Attachment 1 for the documentation of these function checks. See Attachment 2 for the calibration certificates for all instruments used during this survey.) The goal of the floor scan survey was to identify areas of elevated radiation measurements that would require additional static measurements and swipe samples.

b. *Alpha/Beta Static Measurements:* Survey personnel performed 1-minute static alpha and beta counts at each sample location by holding the Ludlum 43-89 probe face approximately 1/8

inch from the bunker floor. USAFSAM/OEC acquired these measurements in the same location as dry swipe samples to assess fixed and removable contamination. Survey personnel collected 48 static measurements in building 738A, 30 static measurements in building 825A, and 12 static measurements in the reference area bunker. USAFSAM/OEC converted count rates, recorded as counts per minute (cpm), to activity in units of dpm, utilizing background count rates and efficiency corrections.

c. *Alpha/Beta Floor Scan Survey:* In each survey unit in buildings 738A and 825A, USAFSAM/OEC's goal was to conduct a floor scan of 100% of the bunker floors with a Ludlum 2224-1 rate meter connected to a Ludlum 43-37-1 detector. Survey personnel pushed the detector at a rate of approximately 6 inches per second for 30 seconds, with the probe face positioned approximately 1/8 inch above the floor surface.

d. *Swipe Samples:* USAFSAM/OEC assessed removable contamination by collecting swipe samples at each static measurement location, plus one biased swipe sample (see paragraph 5b). Survey personnel took swipe samples using 4.25-cm-diameter (1.75-inch-diameter) Whatman #41 filter disks. Personnel swiped approximately 100 cm² for each sample. USAFSAM's Radioanalytical Laboratory then analyzed the filter papers using a thin window gas proportional counter for gross alpha and beta emitting contamination. In total, USAFSAM's Radioanalytical Laboratory processed 91 swipe samples for this survey. Refer to Attachment 3 for maps of swipe sample locations.

4. RESULTS: All measurements produced results below the established DCGLs. The highest swipe sample from building 738A had a removable beta activity of 48.17 dpm/100 cm², while the highest swipe sample from building 825A had a removable beta activity of 21.22 dpm/100 cm². The highest static measurement in building 738A revealed a total beta activity of 2452.55 dpm/100 cm², while the highest static measurement in building 825A revealed a total beta activity of 613.14 dpm/100 cm². Please note: The complete data in Attachments 4-7 include negative numbers (measurements that were below background). This is normal and MARSSIM 2.3.5 states that personnel should record all measurement values so as not to distort the statistical analysis.

a. *Alpha/Beta Static Measurements:* Static survey measurements in buildings 738A and 825A showed that total activity did not exceed the DCGL in either building. Refer to Attachment 4 for complete static measurement data. The efficiencies used to calculate activity were 37.2% (alpha) and 13.7% (beta) (these include surface efficiencies of 0.25 and 0.5 for alpha and beta, respectively, with a 125-cm² detector surface area).

b. *Alpha/Beta Floor Scan Survey:* Floor scan measurements in buildings 738A and 825A did not reveal any locations that warranted further investigation. Refer to Attachment 5 for complete floor scan survey data. The efficiencies used to calculate activity were 19.8% (alpha) and 36.4% (beta) (these include surface efficiencies of 0.25 and 0.5 for alpha and beta, respectively, with a 425-cm² detector surface area).

c. *Swipe Samples*: Swipe sample results showed that residual removable activity did not exceed the DCGL in either building. Refer to Attachments 6 and 7 for complete swipe sample data. USAFSAM/OEC assumed 10% swipe efficiency to calculate the total removable activity.

5. DISCUSSION

a. *Alpha/Beta Static Measurements*: USAFSAM/OEC did not document which Ludlum model 2360 meter with Ludlum model 43-89 detector they used for each measurement. Therefore, personnel used the most conservative of the two probe efficiencies to calculate activity.

b. *Alpha/Beta Floor Scan Survey*: OEC performed floor scanning to help identify locations for biased swipe sample collection. Survey personnel collected one biased swipe sample in an area where the floor monitor operator identified a possible increase in the floor monitor's counts. However, laboratory analysis showed that the biased swipe sample did not contain elevated levels of radioactive contamination.

The floor monitor failed the quality control (QC) check at the start of the second day (slightly outside of the acceptable range), but OEC continued to use this instrument. Floor monitor measurements are not compared to a regulatory limit, and the QC failure had no impact on the final release recommendations for these buildings. After survey personnel scanned approximately 74% of the floor surface in building 825A, a small piece of debris punctured the mylar probe face on the Ludlum model 43-37-1 floor monitor. Due to this issue, USAFSAM/OEC was unable to accomplish 100% floor scan coverage in building 825A with the floor monitor. However, survey personnel scanned the remaining floor surface with a Ludlum model 43-89 and did not find any areas of elevated contamination.

c. *Swipe Samples*: No further discussion is required for the swipe samples.

6. CONCLUSIONS AND RECOMMENDATIONS: Based on laboratory results and static measurements, buildings 738A and 825A meet the criteria for unrestricted release as stated in AFI 48-148 (Table A4.2). If you have any questions or need further information, please contact the ESOH Service Center at 1-888-232-3764 (DSN 798-3764) or <https://hpws.afrl.af.mil/dhp/OE/ESOHSC/>.



EMILY C. ARCEO, SSgt, USAF
Radiation Health Consultant

7 Attachments:

1. Daily Instrument QC Log
2. Instrument Calibration Sheets
3. Maps
4. Alpha/Beta Static Measurements
5. Alpha/Beta Floor Scan Measurements
6. Swipe Sample Results
7. Lab Swipe Sample Results (Raw Data)

Attachment 1
Daily Instrument QC Log

Model	Serial Number	Date/Time	HV/Cable/ Battery Check	Check Source Reading	Acceptable Range ± 20%
Ludlum 2224-1 43-37-1 Probe	125659 PR143637	11 Mar 15 0906	1600/good/good	Cs 4 alpha/53990 beta	Cs 3 - 5 alpha 43192 – 64788 beta
				Th 1285 alpha/5377 beta	Th 1028 – 1542 alpha 4302-6452
Ludlum 2224-1 43-37-1 Probe	125659 PR143637	11 Mar 15 1440	1600/good/good	Cs 3 alpha/48584 beta	Cs 3 - 5 alpha 43192 – 64788 beta
				Th 1367 alpha/5861 beta	Th 1028 – 1542 alpha 4302-6452 beta
Ludlum 2360 43-89 Probe	145472 PR154734	11 Mar 15 0906	800/good/good	Th 1649 alpha 10485 beta	Th 1319-1979 alpha 8388-12582 beta
Ludlum 2360 43-89 Probe	145472 PR154734	11 Mar 15 1430	800/good/good	Th 1636 alpha 10312 beta	Th 1319-1979 alpha 8388-12582 beta
Ludlum 2360 43-89 Probe	141306 PR154733	11 Mar 15 0906	600/good/good	Th 1643 alpha 12245 beta	Th 1314-1972 alpha 9796-14694 beta
Ludlum 2360 43-89 Probe	141306 PR154733	11 Mar 15 1430	600/good/good	Th 1644 alpha 11913 beta	Th 1314-1972 alpha 9796-14694 beta
Ludlum 2360 43-89 Probe	141306 PR154733	13 Mar 15 0930	600/good/good	Th 1786 alpha 13049 beta	Th 1314-1972 alpha 9796-14694 beta
Ludlum 2360 43-89 Probe	141306 PR154733	13 Mar 15 1207	600/good/good	Th 1580 alpha 11900 beta	Th 1314-1972 alpha 9796-14694 beta
Ludlum 2360 43-89 Probe	145472 PR154734	13 Mar 15 0935	800/good/good	Th 1661 alpha 12119 beta	Th 1319-1979 alpha 8388-12582 beta
Ludlum 2360 43-89 Probe	145472 PR154734	13 Mar 15 1213	800/good/good	Th 1667 alpha 11802 beta	Th 1319-1979 alpha 8388-12582 beta
Ludlum 2224-1 43-37-1 Probe*	125659 PR143637	13 Mar 15 1000	1600/good/good	Cs 7 alpha/40594 beta	Cs 3 - 5 alpha 43192 – 64788 beta
				Th 1223 alpha/5735 beta	Th 1028 – 1542 alpha 4302-6452 beta

*Personnel could not perform a QC on the floor monitor at the end of 13 March due to a puncture in the mylar probe face.

Check Source Type: Th-232 check source from ADM 300 E-Kit

Check Source Activity: 45 nCi (1980)

Check Source Type: Cs-137 check source from ADM 300 E-Kit

Check Source Activity: 8 mCi (1996)

Attachment 2
Instrument Calibration Sheets



DEPARTMENT OF THE AIR FORCE
USAF SCHOOL OF AEROSPACE MEDICINE (AFMC)
OCCUPATIONAL ENVIRONMENTAL HEALTH
WRIGHT-PATTERSON AFB OHIO
CERTIFICATE OF CALIBRATION

Mfg. Ludlum Model 2224-1 Serial # 125659 Index # 05538 Date: 18-Jun-14
Mfg. Ludlum Model 43-37-1 Serial # PR143637 Index # N/A Cal. Due Date: 18-Jun-15

TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT

NIST Traceable Check Sources

Isotope	Serial #	Cert. Date	EPM
Pu-239	K-827	02-Mar-89	3217
Tc-99	MJ858	30-Sep-04	29751

Reference Instruments

Mfg.	Model	Serial #	Cal. Due Date
Ludlum	500-1	102952	4 DEC 2014

Measurement Standards and test equipment used are traceable to the National Institute of Standards and Technology, to the extent allowed by the Institute's calibration facilities.

☒ Battery Ck ☒ Mechanical Ck ☒ Meter Zeroed ☒ Reset Ck ☒ Geotropism Ck ☒ Window Op. ☒ Audio Ck

As Found HV 1,625 VDC Temperature 69.10 °F Relative Humidity 68.10 %

Volt. Set 1650 V Beta Threshold 4 mV Beta Window 30 mV Alpha Threshold 90 mV

HV Readout (3 points) Reference: 500 V Reference: 1500 V
Inst. Readout: 500 V $\pm 2\%$ Inst. Readout: 1,500 V $\pm 2\%$

RANGE MULTIPLIER	REFERENCE CAL. POINT	"AS FOUND" READING	CORRECTED READING
x 1000	400 CPM	400,000 CPM	400,000 CPM
x 1000	100 CPM	100,000 CPM	100,000 CPM
x 100	400 CPM	40,000 CPM	40,000 CPM
x 100	100 CPM	10,000 CPM	10,000 CPM
x 10	400 CPM	4,000 CPM	4,000 CPM
x 10	100 CPM	1,000 CPM	1,000 CPM
x 1	400 CPM	400 CPM	400 CPM
x 1	100 CPM	100 CPM	100 CPM

DIGITAL SCALER READOUT

CAL. REF. POINT	AS FOUND READING	CORRECTED READING
40,000 CPM	40,021 CPM	40,021 CPM

*UNCERTAINTY WITHIN $\pm 10\%$ CORRECTION FACTOR WITHIN $\pm 20\%$

COMMENTS: Calibration Interval = 1 year
CPM#2: Emission Rate per Min

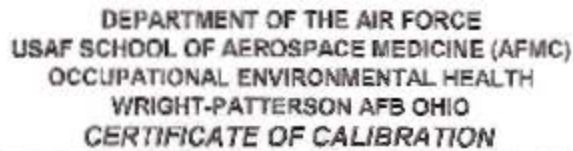
Procedural Authority - ICP#22241000

Calibrated By: *Mark Shatt*

Date: 18-Jun-14

Reviewed By: *Mark Patterson*

Date: 18-Jun-14



TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT

NIST Traceable Check Sources

Reference Instruments

Measurements standards and test equipment used are traceable to the National Institute of Standards and Technology, to the extent allowed by the Institute's authorizing facilities.

HIGH VOLTAGE DETERMINATION

Final High Voltage Setting 1650

Date: 18 June 14



**DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE FOR OPERATIONAL HEALTH (AFMC)
OCCUPATIONAL ENVIRONMENTAL HEALTH
WRIGHT-PATTERSON AFB OHIO
CERTIFICATE OF CALIBRATION**

Mfg. Ludlum	Model 2224-1	Serial # 125658	Index # 65556	Date: 18-Jun-14
Mfg. Ludlum	Model 43-37-1	Serial # FR 43637	Index # N/A	Cal. Due Date: 18-Jun-15

TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT

NIST Traceable Check Sources

Isotope	Serial #	Cal. Date	DPM
Pu-239	K-827	02-Mar-89	3217
Tc-99	M1858	28-Sep-04	39751

Reference Instruments

Mfg.	Model	Serial #	Cal. Due Date
Ludlum	500-1	102952	4 DEC 2014

Measurement Standards and test equipment used are traceable to the National Institute of Standards and Technology, to the extent allowed by the institute's calibration facilities.

DETECTOR UNIFORMITY AND EFFICIENCY

Source Location	Source -α Pu-239	Source -α	Source -β Tc-99	Source -β
	3217 DPM	DPM	39751 DPM	DPM
Position 1	617 CPM	CPM	11324 CPM	CPM
Position 2	638 CPM	CPM	11580 CPM	CPM
Position 3	688 CPM	CPM	11316 CPM	CPM
Position 4	610 CPM	CPM	10716 CPM	CPM
Position 5	652 CPM	CPM	10895 CPM	CPM
Position 6	633 CPM	CPM	10766 CPM	CPM
Position 7	628 CPM	CPM	10567 CPM	CPM
Position 8	640 CPM	CPM	9495 CPM	CPM
Average	638 CPM	CPM	10832 CPM	CPM
211 Efficiency	19.8 %	%	36.4 %	%

EFFICIENCY = ((GCPM - BCPM) ÷ DPM) × 100%

Front

7	5	3	1
8	6	4	2

Back

COMMENTS: Calibration Interval = 1 year
 EPM=2π Emission Rate per Min
 Surface Area of Detector: 435 Active area cm²

Calibrated By: Art Strick

Date: 18-Jun-14

Reviewed By: [Signature]

Date: 18 June 14



USAF SCHOOL OF AEROSPACE MEDICINE (AFMC)
OCCUPATIONAL ENVIRONMENTAL HEALTH
WRIGHT-PATTERSON AFB OHIO
CERTIFICATE OF CALIBRATION

Mfg. Ludlum Model 2360 Serial # 145472 Index # 05099 Date: 18-Jul-14
Mfg. Ludlum Model 43-89 Serial # PR154734 Index # N/A Cal. Due Date: 18-Jul-15

TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT

NIST Traceable Check Sources

Isotope	Serial #	Cert. Date	EPM
Am-241	RP3076	30 Sep 04	21381
Tc-99	RP3073	28 Sep 04	28780

Reference Instruments

Mfg.	Model	Serial #	Cal. Due Date
Ludlum	500-1	10N51	4 DEC 20 4

Measurement standards and test equipment used are traceable to the National Institute of Standards and Technology, to the extent allowed by the instrument's calibration facilities.

☒ Battery Ch. ☒ Mechanical Ch. ☒ Motor Zorood ☒ Fuse: Ch. ☐ N/A Alarms Ch.
☒ Audio Ch. ☒ Geotopium Ch. ☐ N/A FS Reso. Ch. ☒ Window Op.

As Found HV 815 VDC Temperature 88.3 °F Relative Humidity 63.2 %

Volt. Set 800 V Beta Threshold 3.5 mV Beta Window 30 mV Alpha Threshold 120 mV

HV Readout (2 points) Reference: 500 V
Inst. Readout: 500 V $\pm 2\%$ Reference: 1000 V
Inst. Readout: 1.100 V $\pm 2\%$

RANGE MULTIPLIER	REFERENCE CAL. POINT	'AS FOUND' READING	CORRECTED READING
x 1000	400 CPM	400,000 CPM	400,000 CPM
x 1000	100 CPM	99,000 CPM	99,000 CPM
x 100	400 CPM	40,000 CPM	40,000 CPM
x 100	100 CPM	9,000 CPM	9,000 CPM
x 10	400 CPM	4,000 CPM	4,000 CPM
x 10	100 CPM	1,000 CPM	1,000 CPM
x 1	400 CPM	400 CPM	400 CPM
x 1	100 CPM	100 CPM	100 CPM

DIGITAL SCALER READOUT

CAL. REF. POINT	AS FOUND READING	CORRECTED READING
40,000 CPM	40,024 CPM	40,024 CPM

*UNCERTAINTY WITHIN $\pm 10\%$ CORRECTION FACTOR WITHIN $\pm 20\%$

COMMENTS: Calibration Interval = 1 year

EPM=2x Emission Rate per Min

α Eff: 37.2% $\pm 2\sigma @ 1/4"$

β Eff: 13.7% $\pm 2\sigma @ 1/4"$

Procedural Authority - ICP#23604389

Calibrated By: Karl Shuts

Date: 18-Jul-14

Reviewed By: Mantelofat

Date: 21 July '14



USAF SCHOOL OF AEROSPACE MEDICINE (AFMC)
OCCUPATIONAL ENVIRONMENTAL HEALTH
WRIGHT-PATTERSON AFB OHIO
CERTIFICATE OF CALIBRATION

Mfg. Ludlum Model 2360 Serial # 141206 Index # 05094 Date: 20-May-14
Mfg. Ludlum Model 43 89 Serial # PR154720 Index # N/A Cal. Due Date: 20-May-15

TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT

NIST Traceable Check Sources

Isotope	Serial #	Cert. Date	EPM
Am-241	RP3076	30 Sep 04	21337
Tc-99	RP3073	28 Sep 04	28751

Reference Instruments

Mfg.	Model	Serial #	Cal. Due Date
Ludlum	500-1	306481	20 SEP 2014

Measurement Standards and test equipment used are traceable to the National Institute of Standards and Technology, to the extent allowed by the business's exclusive facilities.

☒ Battery Ck. ☒ Mechanical Ck. ☒ Meter Zeroed ☒ Resistor Ck. ☐ Alarm Ck.
☒ Audio Ck. ☒ Geopream Ck. ☐ FGS Resp. Ck. ☒ Window Ck.

As Found HV 620 VDC Temperature 67.8 °F Relative Humidity 39.3 %

Volt. Set 630 V Beta Threshold 3.5 mV Beta Window 30 mV Alpha Threshold 120 mV

HV Readout (2 points) Reference: 500 V Reference: 1000 V
Inst. Readout: 500 V $\pm$ 2% Inst. Readout: 1,040 V $\pm$ 2%

RANGE MULTIPLIER	REFERENCE CAL. POINT	"AS FOUND" READING	CORRECTED READING
x 1000	400 CPM	420,000 CPM	400,000 CPM
x 1000	100 CPM	100,000 CPM	100,000 CPM
x 100	400 CPM	40,000 CPM	40,000 CPM
x 100	100 CPM	10,000 CPM	10,000 CPM
x 10	400 CPM	4,000 CPM	4,000 CPM
x 10	100 CPM	1,100 CPM	1,100 CPM
x 1	400 CPM	400 CPM	400 CPM
x 1	100 CPM	100 CPM	100 CPM

DIGITAL SCALER READOUT

CAL. REF. POINT	AS FOUND READING	CORRECTED READING
40,000 CPM	40,148 CPM	40,148 CPM

*UNCERTAINTY WITHIN $\pm$ 10% CORRECTION FACTOR WITHIN $\pm$ 20%

COMMENTS Calibration Interval = 1 year

EPM=2: Emission Rate per Min

α Eff. 36.8% $\pm$ 2% @ 1/4"

β Eff. 18.8% $\pm$ 2% @ 1/4"

Procedural Authority - ICP#23604369

Calibrated By: Walt Shotts

Date: 20-May-14

Reviewed By: [Signature]

Date: 20-May-14



DEPARTMENT OF THE AIR FORCE
USAF SCHOOL OF AEROSPACE MEDICINE (AFMC)
OCCUPATIONAL ENVIRONMENTAL HEALTH
WRIGHT-PATTERSON AFB OHIO
CERTIFICATE OF CALIBRATION

Mfg Ludlum Model 2360 Serial # 141306 Index # 05094 Date: 20-May-14
Mfg Ludlum Model 43-89 Serial # PR154752 Index # N/A Cal Due Date: 20-May-15

TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT

NIST Traceable Check Sources

Isotope	Serial #	Cert. Date	EPM
Am-241	RP3076	30 Sep 04	21387
Tc-99	RP3073	28 Sep 04	20751

Reference Instruments

Mfg	Model	Serial #	Cal. Due Date
Ludlum	500-1	330481	20 SEP 2014

Measurement Standards and test equipment used are traceable to the National Institute of Standards and Technology to the extent allowed by the Institute's calibration facilities.

As Found HV 620 VDC Temperature 67.8 °F Relative Humidity 39.3 %
Volt. Set 630 V Beta Threshold 3.5 mV Beta Window 30 mV Alpha Threshold 120 mV
Count Time 80 sec Distance from Source to Detector 114" in.

HIGH VOLTAGE DETERMINATION

High Voltage	Background		Alpha Source		Alpha CrossTalk		Beta Source		Beta CrossTalk	
	Alpha	Beta	Alpha	Beta	cross talk	% eff.	Alpha	Beta	cross talk	% eff.
605	1	101	7804	504	5.2%	26.5%	1	3552	0.00%	11.6%
630	1	154	7978	880	9.1%	37.3%	5	5353	0.07%	17.5%
655	0	154	8331	2095	22.6%	39.0%	0	7252	0.00%	23.7%

Final High Voltage Setting 630 VDC

DETECTOR UNIFORMITY AND EFFICIENCY

Source Location	Alpha Source		Beta Source		Other
	21387	EPM	20751	EPM	EPM
Heel	7786	CPM	6338	CPM	CPM
Center	7978	CPM	5353	CPM	CPM
Toe	7850	CPM	5593	CPM	CPM
Average	7,672.0	CPM	5,761.3	CPM	CPM
Instrument Efficiency	38.8%		18.8%		

$$\text{EFFICIENCY} = ((\text{GCPM} - \text{BCPM}) \div \text{EPM}) \times 100$$

COMMENTS: Calibration Interval = 1 year

EPM=2π Emission Rate per Min

Surface Area of Detector: 125 Active area cm²

Calibrated By: Karl Shuts

Date: 20-May-14

Reviewed By: W. Paul Shuts

Date: 20 May 14

Attachment 3
Maps

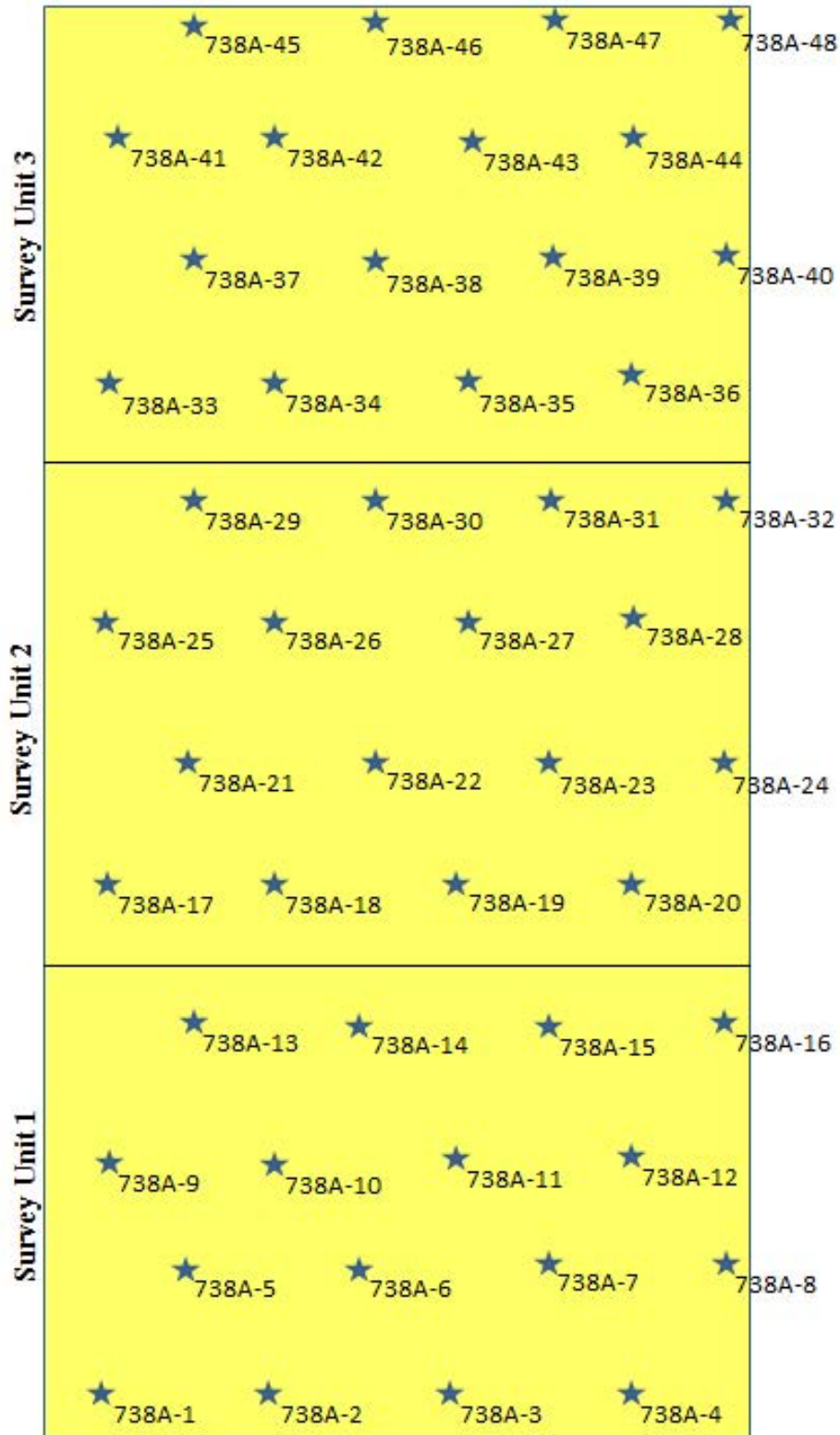


Figure A3-1. Building 738A Swipe and Static Measurement Locations

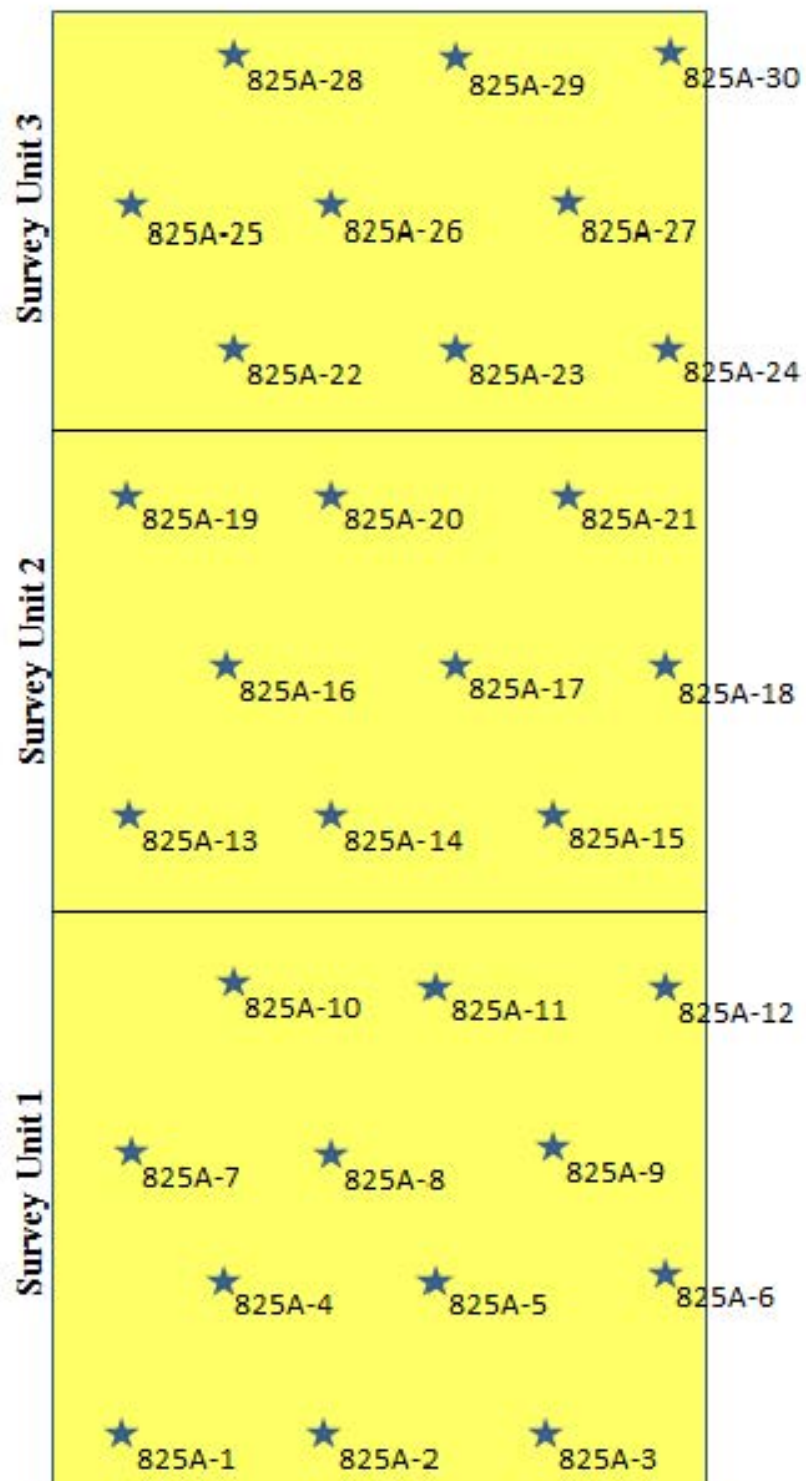


Figure A3-2. Building 825A Swipe and Static Measurement Locations

Attachment 4
Alpha/Beta Static Measurements

Table A4-1. Static Measurements Building 738A Survey Unit 1

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
738A-1	-10.75	321.17
738A-2	10.75	-306.57
738A-3	43.01	277.37
738A-4	-21.51	2452.55
738A-5	0.00	-175.18
738A-6	-21.51	14.60
738A-7	-32.26	14.60
738A-8	-21.51	1153.28
738A-9	-10.75	1372.26
738A-10	-10.75	218.98
738A-11	-32.26	-262.77
738A-12	-21.51	525.55
738A-13	-21.51	189.78
738A-14	0.00	145.99
738A-15	-10.75	540.15
738A-16	-21.51	540.15

Table A4-2. Static Measurements Building 738A Survey Unit 2

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
738A-17	10.75	656.93
738A-18	-21.51	554.74
738A-19	-32.26	233.58
738A-20	-21.51	686.13
738A-21	-32.26	554.74
738A-22	-10.75	218.98
738A-23	-32.26	43.80
738A-24	-21.51	102.19
738A-25	-32.26	583.94
738A-26	0.00	496.35
738A-27	-21.51	467.15
738A-28	-21.51	1518.25
738A-29	-10.75	0.00
738A-30	-10.75	-87.59
738A-31	-10.75	1328.47
738A-32	-10.75	832.12

Table A4-3. Static Measurements Building 738A Survey Unit 3

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
738A-33	0.00	277.37
738A-34	0.00	248.18
738A-35	-32.26	496.35
738A-36	-21.51	496.35
738A-37	-21.51	773.72
738A-38	-10.75	540.15
738A-39	-21.51	306.57
738A-40	-32.26	-2788.32
738A-41	-10.75	642.34
738A-42	-32.26	554.74
738A-43	-32.26	832.12
738A-44	-32.26	496.35
738A-45	-32.26	700.73
738A-46	-10.75	715.33
738A-47	-21.51	1080.29
738A-48	-21.51	1313.87

Table A4-4. Static Measurements Building 825A Survey Unit 1

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
825A-1	21.51	408.76
825A-2	21.51	350.36
825A-3	32.26	569.34
825A-4	-10.75	321.17
825A-5	0.00	510.95
825A-6	-21.51	262.77
825A-7	-21.51	-189.78
825A-8	0.00	131.39
825A-9	0.00	-204.38
825A-10	0.00	540.15
825A-11	-10.75	-437.96
825A-12	-21.51	160.58

Table A4-5. Static Measurements Building 825A Survey Unit 2

Measurement Number	Alpha Total Activity (dpm/100cm ²)	Beta Total Activity (dpm/100cm ²)
825A-13	-10.75	72.99
825A-14	-32.26	-43.80
825A-15	0.00	204.38
825A-16	0.00	14.60
825A-17	-21.51	452.55
825A-18	-10.75	-131.39
825A-19	-32.26	-58.39
825A-20	-32.26	-218.98
825A-21	-10.75	613.14

Table A4-6. Static Measurements Building 825A Survey Unit 3

Measurement Number	Alpha Total Activity (dpm/100cm ²)	Beta Total Activity (dpm/100cm ²)
825A-22	10.75	-14.60
825A-23	-10.75	321.17
825A-24	-21.51	248.18
825A-25	21.51	467.15
825A-26	10.75	-350.36
825A-27	-21.51	175.18
825A-28	32.26	569.34
825A-29	0.00	-102.19
825A-30	21.51	-291.97

Table A4-7. Static Measurements Reference Area

Measurement Number	Alpha Total Activity (dpm/100cm ²)	Beta Total Activity (dpm/100cm ²)
1	75.27	-14.60
2	53.76	379.56
3	-10.75	-248.18
4	-10.75	540.15
5	0.00	-102.19
6	-10.75	-116.79
7	21.51	-189.78
8	0.00	-102.19
9	-10.75	-364.96
10	21.51	613.14
11	10.75	423.36
12	32.26	277.37

Attachment 5
Alpha/Beta Floor Scan Measurements

Table A5-1. Floor Scan Measurements Building 738A Survey Unit 1

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
47	-161.62	-1280.22
48	-181.82	-1021.98
49	-181.82	-791.21
50	-141.41	-664.84
51	-40.40	-824.18
52	121.21	-346.15
53	-20.20	-494.51
54	-101.01	-274.73
55	-181.82	-620.88
56	-141.41	-538.46
57	-202.02	-598.90
58	-161.62	-538.46
59	-121.21	-423.08
60	-80.81	-752.75
61	-181.82	-708.79
62	-222.22	-494.51
63	-141.41	-401.10
64	-60.61	-549.45
65	-121.21	-428.57
66	-101.01	-241.76
67	-141.41	-87.91
68	-161.62	-467.03
69	-141.41	-598.90

Table A5-2. Floor Scan Measurements Building 738A Survey Unit 2

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
24	-222.22	-1258.24
25	-161.62	-1098.90
26	-181.82	-1109.89
27	-40.40	-758.24
28	-121.21	-510.99
29	-40.40	-225.27
30	-242.42	-631.87
31	-101.01	-274.73
32	-161.62	-582.42
33	-101.01	-692.31
34	-121.21	-521.98
35	-181.82	-659.34
36	-121.21	-686.81
37	-202.02	-736.26
38	-101.01	-692.31
39	-202.02	-780.22
40	-80.81	-631.87
41	-181.82	-351.65
42	-121.21	-659.34
43	-121.21	-653.85
44	-121.21	-692.31
45	-101.01	-527.47
46	-222.22	-505.49

Table A5-3. Floor Scan Measurements Building 738A Survey Unit 3

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
1	-80.81	-1104.40
2	-121.21	-934.07
3	-40.40	-692.31
4	-161.62	-395.60
5	-161.62	-148.35
6	-181.82	-87.91
7	-80.81	-137.36
8	80.81	340.66
9	-141.41	-489.01
10	-222.22	49.45
11	-161.62	-379.12
12	-141.41	-653.85
13	-121.21	-225.27
14	-202.02	-368.13
15	-161.62	-714.29
16	-181.82	-450.55
17	-222.22	-565.93
18	-141.41	-626.37
19	-141.41	-318.68
20	-60.61	-516.48
21	-181.82	-362.64
22	-202.02	-472.53
23	40.40	-170.33

Table A5-4. Floor Scan Measurements Building 825A Survey Unit 1

Measurement Number	Alpha Total Activity (dpm/100cm ²)	Beta Total Activity (dpm/100cm ²)
31 ¹	<141.41	
32 ¹	<141.41	
33 ¹	<141.41	
34 ¹	<141.41	
35 ¹	<141.41	
36 ¹	<141.41	
37	-101.01	-390.11
38	-80.81	-203.30
39	0.00	-346.15
40	-60.61	-142.86
41	40.40	-225.27
42	-60.61	-274.73
43	-20.20	-269.23
44	60.61	-82.42
45	-40.40	-164.84

Note 1: This area was scanned by hand with the Ludlum 43-89, see paragraph 5b.

Table A5-5. Floor Scan Measurements Building 825A Survey Unit 2

Measurement Number	Alpha Total Activity (dpm/100cm ²)	Beta Total Activity (dpm/100cm ²)
16 ¹	<141.41	
17 ¹	<141.41	
18 ¹	<141.41	
19 ¹	<141.41	
20 ¹	<141.41	
21 ¹	<141.41	
22	-141.41	-538.46
23	-60.61	-373.63
24	-40.40	-368.13
25	-101.01	-324.18
26	-80.81	-181.32
27	80.81	-104.40
28	0.00	-137.36
29	-101.01	-291.21
30	-20.20	-87.91

Note 1: This area was scanned by hand with the Ludlum 43-89, see paragraph 5b.

Table A5-6. Floor Scan Measurements Building 825A Survey Unit 3

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
1	-60.61	-307.69
2	60.61	-236.26
3	20.20	-329.67
4	40.40	-510.99
5	0.00	-582.42
6	80.81	-401.10
7	60.61	-142.86
8	-101.01	-285.71
9	101.01	-302.20
10	20.20	54.95
11	60.61	-263.74
12	-101.01	-175.82
13	-101.01	-313.19
14	-141.41	-54.95
15	-121.21	-230.77

Table A5-7. Floor Scan Measurements Reference Area

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
1	222.22	-27.47
2	20.20	406.59
3	101.01	115.38
4	0.00	98.90

Attachment 6
Swipe Sample Results

Table A6-1. Swipe Sample Results Building 738A Survey Unit 1

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
WW150143	8.21 ± 1.02	-2.60 ± 1.38
WW150144	-0.75 ± 0.07	-2.60 ± 1.38
WW150145	-0.75 ± 0.07	3.91 ± 1.56
WW150146	5.22 ± 0.83	42.85 ± 2.40
WW150147	-0.75 ± 0.07	-4.77 ± 1.31
WW150148	-0.75 ± 0.07	3.91 ± 1.56
WW150149	-0.75 ± 0.07	8.24 ± 1.67
WW150150	5.22 ± 0.83	1.73 ± 1.50
WW150151	11.21 ± 1.17	-6.93 ± 1.24
WW150152	-0.75 ± 0.07	-11.26 ± 1.09
WW150175	-1.34 ± 0.09	-3.80 ± 1.38
WW150176	-1.34 ± 0.09	0.54 ± 1.51
WW150177	-1.34 ± 0.09	-10.28 ± 1.17
WW150178	-1.34 ± 0.09	9.19 ± 1.73
WW150179	-1.34 ± 0.09	-1.62 ± 1.45
WW150180	7.61 ± 1.02	9.19 ± 1.73

Table A6-2. Swipe Sample Results Building 738A Survey Unit 2

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
WW150153	4.64 ± 0.83	-1.62 ± 1.45
WW150154	-1.34 ± 0.09	-12.45 ± 1.09
WW150155	-1.34 ± 0.09	-12.45 ± 1.09
WW150156	-1.34 ± 0.09	7.04 ± 1.68
WW150157	1.64 ± 0.59	11.37 ± 1.78
WW150158	-1.34 ± 0.09	0.54 ± 1.51
WW150159	4.64 ± 0.83	48.17 ± 2.51
WW150160	-1.34 ± 0.09	-16.78 ± 0.91
WW150161	-1.34 ± 0.09	-8.13 ± 1.25
WW150162	7.61 ± 1.02	-10.28 ± 1.17
WW150181	-1.34 ± 0.09	-14.61 ± 1.01
WW150182	-1.34 ± 0.09	-3.80 ± 1.38
WW150183	1.64 ± 0.59	-3.80 ± 1.38
WW150184	-1.34 ± 0.09	2.71 ± 1.57
WW150185	1.64 ± 0.59	15.70 ± 1.88
WW150186	1.64 ± 0.59	4.86 ± 1.62

Table A6-3. Swipe Sample Results Building 738A Survey Unit 3

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
WW150163	1.64 ± 0.59	7.04 ± 1.68
WW150164	1.64 ± 0.59	-10.28 ± 1.17
WW150165	-1.34 ± 0.09	-3.80 ± 1.38
WW150166	-1.34 ± 0.09	2.71 ± 1.57
WW150167	-1.34 ± 0.09	-3.80 ± 1.38
WW150168	-1.34 ± 0.09	-5.95 ± 1.31
WW150169	-1.34 ± 0.09	-12.45 ± 1.09
WW150170	-1.34 ± 0.09	-3.80 ± 1.38
WW150171	-1.34 ± 0.09	0.54 ± 1.51
WW150172	4.64 ± 0.83	-3.80 ± 1.38
WW150173	-1.34 ± 0.09	-10.28 ± 1.17
WW150174	-1.34 ± 0.09	13.54 ± 1.83
WW150187	1.64 ± 0.59	-1.62 ± 1.45
WW150188	4.64 ± 0.83	-10.28 ± 1.17
WW150189	4.64 ± 0.83	4.86 ± 1.62
WW150190	1.64 ± 0.59	7.04 ± 1.68
WW150191	1.64 ± 0.59	2.71 ± 1.57

Table A6-4. Swipe Sample Results Building 825A Survey Unit 1

Measurement Number	Alpha Total Activity (dpm/100cm²)	Beta Total Activity (dpm/100cm²)
WW150113	-0.75 ± 0.07	-9.10 ± 1.17
WW150114	-0.75 ± 0.07	8.24 ± 1.67
WW150115	-0.75 ± 0.07	6.06 ± 1.62
WW150116	5.22 ± 0.83	14.72 ± 1.83
WW150117	-0.75 ± 0.07	-4.77 ± 1.31
WW150118	-0.75 ± 0.07	-0.43 ± 1.44
WW150119	-0.75 ± 0.07	-0.43 ± 1.44
WW150120	-0.75 ± 0.07	3.91 ± 1.56
WW150121	-0.75 ± 0.07	8.24 ± 1.67
WW150122	-0.75 ± 0.07	14.67 ± 1.83
WW150123	2.24 ± 0.59	1.73 ± 1.50
WW150124	-0.75 ± 0.07	1.73 ± 1.50

Table A6-5. Swipe Sample Results Building 825A Survey Unit 2

Measurement Number	Alpha Total Activity (dpm/100cm ²)	Beta Total Activity (dpm/100cm ²)
WW150125	2.24 ± 0.59	-2.60 ± 1.38
WW150126	5.22 ± 0.83	-4.77 ± 1.31
WW150127	2.24 ± 0.59	6.06 ± 1.62
WW150128	5.22 ± 0.83	6.06 ± 1.62
WW150129	-0.75 ± 0.07	-2.60 ± 1.38
WW150130	-0.75 ± 0.07	-9.10 ± 1.17
WW150131	-0.75 ± 0.07	3.91 ± 1.56
WW150132	-0.75 ± 0.07	-0.43 ± 1.44
WW150142	5.22 ± 0.83	8.24 ± 1.67

Table A6-6. Swipe Sample Results Building 825A Survey Unit 3

Measurement Number	Alpha Total Activity (dpm/100cm ²)	Beta Total Activity (dpm/100cm ²)
WW150133	-0.75 ± 0.07	12.57 ± 1.78
WW150134	-0.75 ± 0.07	-4.77 ± 1.31
WW150135	2.24 ± 0.59	-4.77 ± 1.31
WW150136	-0.75 ± 0.07	10.39 ± 1.77
WW150137	5.22 ± 0.83	1.73 ± 1.50
WW150138	5.22 ± 0.83	-9.10 ± 1.17
WW150139	5.22 ± 0.83	-6.93 ± 1.24
WW150140	2.24 ± 0.59	3.91 ± 1.56
WW150141	17.18 ± 1.44	21.22 ± 1.98

Table A6-7. Swipe Sample Results Building Reference Area

Measurement Number	Alpha Total Activity (dpm/100cm ²)	Beta Total Activity (dpm/100cm ²)
WW15B101	-0.75 ± 0.07	16.89 ± 1.88
WW15B102	2.24 ± 0.59	-9.10 ± 1.17
WW15B103	-0.75 ± 0.07	3.91 ± 1.56
WW15B104	5.22 ± 0.83	-6.93 ± 1.24
WW15B105	-0.75 ± 0.07	-6.93 ± 1.24
WW15B106	8.21 ± 1.02	36.41 ± 2.29
WW15B107	2.24 ± 0.59	-6.93 ± 1.24
WW15B108	2.24 ± 0.59	-4.77 ± 1.31
WW15B109	-0.75 ± 0.07	-15.58 ± 0.91
WW15B110	2.24 ± 0.59	-6.93 ± 1.24
WW15B111	-0.75 ± 0.07	-0.43 ± 1.44
WW15B112	-0.75 ± 0.07	3.91 ± 1.56

Attachment 7
Lab Swipe Sample Results (Raw data)



MEMORANDUM FOR: SSgt Emily Arceo
USAFSAM/OEC
2510 Fifth St. Bldg. 840
WRIGHT-PATTERSON AFB, OH 45433

4/28/2015 8:59:34 AM

FROM: USAFSAM OE Industrial Hygiene
2510 Fifth Street, Bldg 20840, Room W327
Wright Patterson Air Force Base, OH 45433-7913

REF: Order No.: S1503033

Dear SSgt Emily Arceo:

Enclosed are the sample reports from 91 samples received on 3/23/2015.

Samples, not consumed in analysis, will be held according to the appropriate regulatory authority unless you specifically request otherwise. Should you choose to reproduce this report, we recommend you do so in its entirety so that the integrity of the data package is kept intact.

If you have questions, or if we may be of further assistance to you, please do not hesitate to contact us.

Sincerely,

CRYSTAL C. BROWN, Capt, USAF
Analytical Services Program Manager
Tel: (937) 938-2523 (DSN Prefix: 798)
<https://hpws.afrl.af.mil/dhp/OE/ESOHSC/pages/index.cfm?id=742>

Note: Sample analysis performed by: USAFSAM/OE Radioanalytical Division

This report is intended solely for the purpose of the person to whom it is addressed. If received in error, please notify the Program Manager listed above.

USAFSAM OE Industrial Hygiene

CLIENT: USAFSAM/OEC

Project:

Lab Work Order: S1503033

CASE NARRATIVE

There were no problems associated with the samples or analysis except where noted below. Unless otherwise noted, sample results are not blank corrected, and all quality control associated with the samples were within acceptable limits.

These results relate only to the items tested.



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B101
Lab Sample ID: S1503033-01A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		7.61E-01	8.47E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 1845	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 1845	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B102
Lab Sample ID: S1503033-02A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-4.10E-01	5.26E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 1855	7877
Gross Alph		1.01E-01	2.65E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 1855	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B103
Lab Sample ID: S1503033-03A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.76E-01	7.04E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 1905	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 1905	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B104
Lab Sample ID: S1503033-04A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-3.12E-01	5.60E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 1916	7877
Gross Alph		2.35E-01	3.74E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 1916	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B105
Lab Sample ID: S1503033-05A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-3.12E-01	5.60E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 1926	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 1926	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B106
Lab Sample ID: S1503033-06A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.64E+00	1.03E+00	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 1936	7877
Gross Alph		3.70E-01	4.58E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 1936	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B107
Lab Sample ID: S1503033-07A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-3.12E-01	5.60E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 1946	7877
Gross Alph		1.01E-01	2.65E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 1946	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B108
Lab Sample ID: S1503033-08A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-2.15E-01	5.91E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 1957	7877
Gross Alph		1.01E-01	2.65E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 1957	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B109
Lab Sample ID: S1503033-09A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-7.02E-01	4.11E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2007	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2007	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B110
Lab Sample ID: S1503033-10A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-3.12E-01	5.60E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2017	7877
Gross Alph		1.01E-01	2.65E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2017	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B111
Lab Sample ID: S1503033-11A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.95E-02	6.50E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2028	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2028	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW15B112
Lab Sample ID: S1503033-12A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.76E-01	7.04E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2038	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2038	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150113
Lab Sample ID: S1503033-13A
Matrix: Wipe/Swipe
Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-4.10E-01	5.26E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2048	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2048	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150114
Lab Sample ID: S1503033-14A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		3.71E-01	7.54E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2058	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2058	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150115
Lab Sample ID: S1503033-15A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		2.73E-01	7.30E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2109	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2109	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150116
Lab Sample ID: S1503033-16A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		6.63E-01	8.25E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2129	7877
Gross Alph		2.35E-01	3.74E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2129	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150117
Lab Sample ID: S1503033-17A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-2.15E-01	5.91E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2140	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2140	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150118
Lab Sample ID: S1503033-18A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.95E-02	6.50E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2150	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2150	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150119
Lab Sample ID: S1503033-19A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.95E-02	6.50E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2200	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2200	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150120
Lab Sample ID: S1503033-20A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.76E-01	7.04E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2210	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2210	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150121
Lab Sample ID: S1503033-21A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		3.71E-01	7.54E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2221	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2221	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150122
Lab Sample ID: S1503033-22A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		6.63E-01	8.25E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2231	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2231	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150123
Lab Sample ID: S1503033-23A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		7.80E-02	6.77E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2241	7877
Gross Alph		1.01E-01	2.65E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2241	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150124
Lab Sample ID: S1503033-24A
Matrix: Wipe/Swipe
Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		7.80E-02	6.77E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2251	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2251	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150125
Lab Sample ID: S1503033-25A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.17E-01	6.21E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2302	7877
Gross Alph		1.01E-01	2.65E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2302	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150126
Lab Sample ID: S1503033-26A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-2.15E-01	5.91E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2312	7877
Gross Alph		2.35E-01	3.74E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2312	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150127
Lab Sample ID: S1503033-27A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		2.73E-01	7.30E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2322	7877
Gross Alph		1.01E-01	2.65E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2322	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150128
Lab Sample ID: S1503033-28A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		2.73E-01	7.30E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2333	7877
Gross Alph		2.35E-01	3.74E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2333	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150129
Lab Sample ID: S1503033-29A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.17E-01	6.21E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2343	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2343	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150130
Lab Sample ID: S1503033-30A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-4.10E-01	5.26E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/15/15 2353	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/15/15 2353	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150131
Lab Sample ID: S1503033-31A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.76E-01	7.04E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 003	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 003	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150132
Lab Sample ID: S1503033-32A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.95E-02	6.50E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 014	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 014	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150133
Lab Sample ID: S1503033-33A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		5.66E-01	8.02E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 024	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 024	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150134
Lab Sample ID: S1503033-34A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-2.15E-01	5.91E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 034	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 034	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150135
Lab Sample ID: S1503033-35A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-2.15E-01	5.91E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 055	7877
Gross Alph		1.01E-01	2.65E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 055	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150136
Lab Sample ID: S1503033-36A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		4.68E-01	7.78E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 105	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 105	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150137
Lab Sample ID: S1503033-37A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		7.80E-02	6.77E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 115	7877
Gross Alph		2.35E-01	3.74E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 115	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150138
Lab Sample ID: S1503033-38A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-4.10E-01	5.26E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 126	7877
Gross Alph		2.35E-01	3.74E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 126	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150139
Lab Sample ID: S1503033-39A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-3.12E-01	5.60E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 136	7877
Gross Alph		2.35E-01	3.74E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 136	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150140
Lab Sample ID: S1503033-40A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.76E-01	7.04E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 146	7877
Gross Alph		1.01E-01	2.65E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 146	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150141
Lab Sample ID: S1503033-41A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		9.56E-01	8.90E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 156	7877
Gross Alph		7.74E-01	6.48E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 156	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150142
Lab Sample ID: S1503033-42A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		3.71E-01	7.54E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 207	7877
Gross Alph		2.35E-01	3.74E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 207	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150143
Lab Sample ID: S1503033-43A
Matrix: Wipe/Swipe
Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.17E-01	6.21E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 217	7877
Gross Alph		3.70E-01	4.58E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 217	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150144
Lab Sample ID: S1503033-44A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.17E-01	6.21E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 227	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 227	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150145
Lab Sample ID: S1503033-45A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.76E-01	7.04E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 238	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 238	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150146
Lab Sample ID: S1503033-46A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.93E+00	1.08E+00	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 248	7877
Gross Alph		2.35E-01	3.74E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 248	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150147
Lab Sample ID: S1503033-47A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-2.15E-01	5.91E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 258	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 258	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150148
Lab Sample ID: S1503033-48A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.76E-01	7.04E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 308	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 308	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150149
Lab Sample ID: S1503033-49A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		3.71E-01	7.54E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 319	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 319	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150150
Lab Sample ID: S1503033-50A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		7.80E-02	6.77E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 329	7877
Gross Alph		2.35E-01	3.74E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 329	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150151
Lab Sample ID: S1503033-51A
Matrix: Wipe/Swipe
Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-3.12E-01	5.60E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 339	7877
Gross Alph		5.05E-01	5.29E-01	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 339	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150152
Lab Sample ID: S1503033-52A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-5.07E-01	4.91E-01	5.50E-01	1.36E+00	pCi/Swipe	TDR	04/16/15 349	7877
Gross Alph		-3.36E-02	2.96E-02	1.13E-01	5.91E-01	pCi/Swipe	TDR	04/16/15 349	7877

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150153
Lab Sample ID: S1503033-53A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-7.31E-02	6.51E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1621	7878
Gross Alph		2.09E-01	3.75E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1621	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150154
Lab Sample ID: S1503033-54A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-5.61E-01	4.92E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1631	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1631	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150155
Lab Sample ID: S1503033-55A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-5.61E-01	4.92E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1642	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1642	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150156
Lab Sample ID: S1503033-56A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		3.17E-01	7.55E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1652	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1652	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150157
Lab Sample ID: S1503033-57A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		5.12E-01	8.02E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1702	7878
Gross Alph		7.40E-02	2.67E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1702	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150158
Lab Sample ID: S1503033-58A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		2.44E-02	6.78E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1712	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1712	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150159
Lab Sample ID: S1503033-59A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		2.17E+00	1.13E+00	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1723	7878
Gross Alph		2.09E-01	3.75E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1723	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150160
Lab Sample ID: S1503033-60A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-7.56E-01	4.12E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1733	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1733	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150161
Lab Sample ID: S1503033-61A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-3.66E-01	5.61E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1743	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1743	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150162
Lab Sample ID: S1503033-62A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-4.63E-01	5.27E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1753	7878
Gross Alph		3.43E-01	4.59E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1753	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150163
Lab Sample ID: S1503033-63A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		3.17E-01	7.55E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1804	7878
Gross Alph		7.40E-02	2.67E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1804	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150164
Lab Sample ID: S1503033-64A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-4.63E-01	5.27E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1814	7878
Gross Alph		7.40E-02	2.67E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1814	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150165
Lab Sample ID: S1503033-65A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.71E-01	6.22E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1824	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1824	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150166
Lab Sample ID: S1503033-66A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.22E-01	7.05E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1835	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1835	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150167
Lab Sample ID: S1503033-67A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.71E-01	6.22E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1845	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1845	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150168
Lab Sample ID: S1503033-68A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-2.68E-01	5.92E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1855	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1855	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150169
Lab Sample ID: S1503033-69A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-5.61E-01	4.92E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1916	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1916	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150170
Lab Sample ID: S1503033-70A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.71E-01	6.22E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1926	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1926	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150171
Lab Sample ID: S1503033-71A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		2.44E-02	6.78E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1936	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1936	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150172
Lab Sample ID: S1503033-72A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.71E-01	6.22E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1946	7878
Gross Alph		2.09E-01	3.75E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1946	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150173
Lab Sample ID: S1503033-73A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-4.63E-01	5.27E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 1957	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 1957	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150174
Lab Sample ID: S1503033-74A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/11/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		6.10E-01	8.25E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2007	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2007	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150175
Lab Sample ID: S1503033-75A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.71E-01	6.22E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2017	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2017	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150176
Lab Sample ID: S1503033-76A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		2.44E-02	6.78E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2028	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2028	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150177
Lab Sample ID: S1503033-77A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-4.63E-01	5.27E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2038	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2038	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150178
Lab Sample ID: S1503033-78A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		4.14E-01	7.79E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2048	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2048	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150179
Lab Sample ID: S1503033-79A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-7.31E-02	6.51E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2058	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2058	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150180
Lab Sample ID: S1503033-80A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		4.14E-01	7.79E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2109	7878
Gross Alph		3.43E-01	4.59E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2109	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150181
Lab Sample ID: S1503033-81A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-6.58E-01	4.54E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2119	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2119	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150182
Lab Sample ID: S1503033-82A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.71E-01	6.22E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2129	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2129	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150183
Lab Sample ID: S1503033-83A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-1.71E-01	6.22E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2140	7878
Gross Alph		7.40E-02	2.67E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2140	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150184
Lab Sample ID: S1503033-84A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.22E-01	7.05E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2150	7878
Gross Alph		-6.05E-02	3.97E-02	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2150	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150185
Lab Sample ID: S1503033-85A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		7.07E-01	8.47E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2200	7878
Gross Alph		7.40E-02	2.67E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2200	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150186
Lab Sample ID: S1503033-86A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		2.19E-01	7.30E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2210	7878
Gross Alph		7.40E-02	2.67E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2210	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150187
Lab Sample ID: S1503033-87A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-7.31E-02	6.51E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2221	7878
Gross Alph		7.40E-02	2.67E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2221	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150188
Lab Sample ID: S1503033-88A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		-4.63E-01	5.27E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2241	7878
Gross Alph		2.09E-01	3.75E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2241	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150189
Lab Sample ID: S1503033-89A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		2.19E-01	7.30E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2251	7878
Gross Alph		2.09E-01	3.75E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2251	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150190
Lab Sample ID: S1503033-90A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		3.17E-01	7.55E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2302	7878
Gross Alph		7.40E-02	2.67E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2302	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radioanalytical Services Laboratory
2510 Fifth St, Area B Bldg 0840 WPAFB, OH 45433 - (937) 938-2523

Certificate of Analysis

Company: USAFSAM/OEC
Address: 2510 Fifth St Bldg 840
Report Date: 4/28/2015 8:59:34 AM
WRIGHT-PATTERSON AFB OH, 45433
Contact: SSgt Emily Arceo
Client Sample ID: WW150191
Lab Sample ID: S1503033-91A
Matrix: Wipe/Swipe Client ID: 0206OC
Collection Date: 3/13/2015
Receive Date: 3/23/2015
Collector: Client

Parameter	Qualifier	Activity	Uncertainty	Lc	MDA	Units	Analyst	Date/Time	Batch
Gross Alpha/Beta									
Gross Beta		1.22E-01	7.05E-01	5.63E-01	1.39E+00	pCi/Swipe	RJP	03/30/15 2312	7878
Gross Alph		7.40E-02	2.67E-01	1.52E-01	6.68E-01	pCi/Swipe	RJP	03/30/15 2312	7878

BRIAN J STROH, Maj, USAF
Chief, Radioanalytical Laboratory

AURELIE M SOREFAN, DR-II, PhD, DAF
Technical Director, Radioanalytical Laboratory



Radiation Qualifier List

Qualifier	Qualifier Description
A	Identification Rejected
B	(ELAP) Blank Contamination
C	Inconclusive
D	Misidentification
E	False Positive
F	Consistent with False Positive
G	Qualitatively consistent with detector background
H	Quantitatively consistent with detector background
I	Inconsistent energy shift
J	(ELAP) The reported results is an estimated value
N	(ELAP) Non-target analyte
Q	(ELAP) One or more quality control criteria failed
U	(ELAP) Analyte was not detected and is reported as less than the LOD
K	Inconsistent Full Width Half Max (FWHM)
L	Hold time exceeded
M	Results invalid