

Inst.#1490 Microrem Gamma Source		
QC Daily Source		
Date	Result (µrem/hr)	P/F
2/26/2008	1100	Pass
2/27/2008	1050	Pass
2/28/2008	1050	Pass
2/29/2008	1100	Pass
3/3/2008	1050	Pass
3/4/2008	1100	Pass
3/5/2008	1100	Pass
3/6/2008	1050	Pass
3/7/2008	1100	Pass
3/10/2008	1100	Pass
3/11/2008	1100	Pass
3/12/2008	1100	Pass
3/13/2008	1050	Pass
3/14/2008	1100	Pass
3/17/2008	1100	Pass
3/18/2008	1100	Pass
3/19/2008	1100	Pass
3/20/2008	1100	Pass
3/21/2008	1100	Pass
3/24/2008	1100	Pass
3/25/2008	1000	Pass
3/26/2008	1100	Pass
3/27/2008	1100	Pass
3/28/2008	1100	Pass
3/31/2008	1100	Pass
4/1/2008	1100	Pass
4/2/2008	1100	Pass
4/3/2008	1100	Pass

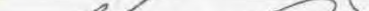
Inst.#1490 Microrem Gamma		Source Ser. #	1451
Initial Source Readings		Nuclide	Cs-137
Date	Result (µrem/hr)		
2/25/2008	1100		
2/25/2008	1100		
2/25/2008	1050		
2/25/2008	1100		
2/25/2008	1100		
2/25/2008	1100		
2/25/2008	1050		
2/25/2008	1100		
2/25/2008	1100		
2/25/2008	1100		
2/25/2008	1100		
	Average		
	1090		



This Certificate will be accompanied by Calibration Charts or Readings where Applicable

Statement of Certification

MJW Technical Services, Inc certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of ANSI/NC SL 2540-1-1994 and ANSI N323. The instrument listed above was inspected prior to shipment and it met all the manufacturer's published operating specifications. (MJW technical Services is not responsible for damage incurred during shipment or use of this instrument).

Instrument		
Calibrated By: 	Reviewed By: Gina M. Lund	Date: 2/14/07
Calibration Date: 02/14/2007	Calibration Due: 02/14/2008	



Designer and Manufacturer
of
Scientific and Industrial
Instruments

CERTIFICATE OF CALIBRATION

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

CUSTOMER **CABRERA SERVICES**

ORDER NO. **279885/315168**

Mfg. **Ludlum Measurements, Inc.** Model **2360** Serial No. **184938**
Mfg. **Ludlum Measurements, Inc.** Model **43-37** Serial No. **PR-178371**
Cal. Date **19-Jul-07** Cal Due Date **19-Jul-08** Cal. Interval **1 Year** Meterface **202-855**

Check mark ☒ applies to applicable instr. and/or detector IAW mfg. spec. T. **74** °F RH **51** % Alt **700.8** mm Hg

- ☐ New Instrument ☐ Instrument Received ☐ Within Toler. $\pm 10\%$ ☐ 10-20% ☐ Out of Tol. ☒ Requiring Repair ☐ Other-See comments
- ☒ Mechanical ck. ☒ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☐ F/S Resp. ck. ☒ Reset ck. ☒ Window Operation ☒ Geotropism
☒ Audio ck. ☐ Alarm Setting ck. ☒ Batt. ck. (Min. Volt) **2.2** VDC
☒ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 02/07/97.

Instrument Volt Set **1675** V

☒ HV Readout (2 points) Ref./Inst. **500** / **510** V Ref./Inst. **1500** / **1500** V

Firmware Version: **39010n25**

Alpha Threshold: **100mv**

Beta Threshold: **4mv**

Beta Window: **40mv**

Overload **Checked but not set**

Instrument calibrated with a **5'** cable.

High voltage set with detector **disconnected**

(EEPROM Settings)

User Time: **1.0**

Alpha Alarm: **50000**

Beta Alarm: **50000**

A/B Alarm: **50000**

Model 2360 Date: **7/19/07**

Calibration Date Due: **7/19/08**

COMMENTS:

Eff. for Tc99sn:5280-04A, Eff. $\approx 32\%4\pi$, Source count $\approx 30499\text{cpm}$ - 685cpm background, Source size = 93200dpm
Eff. for Th230sn:1495, Eff. $\approx 18\%4\pi$, Source count $\approx 3556\text{cpm}$ - 3cpm background, Source size = 19800dpm
Eff. for Sr90Y90sn:5281-04, Eff. $\approx 30\%4\pi$, Source count $\approx 34718\text{cpm}$ - 685cpm background, Source size = 111222dpm
Eff. for Ni63sn:, Eff. $\approx 4.5\%4\pi$, Source count $\approx 13853\text{cpm}$ - 685cpm background, Source size = 288558dpm

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

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

*Uncertainty within $\pm 10\%$ C.F. within $\pm 20\%$

ALL Range(s) Calibrated Electronically

REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout			Log Scale		
400kcpm	N/A	39841 (2)			
40kcpm		3968			
4kcpm		399			
400cpm		40			
40cpm		4			

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques.

The calibration system conforms to the requirements of ANSI/NCIS Z540-1-1994 and ANSI N323-1978

State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M585 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ 720 ☐ 734 ☐ 1616 ☐ Neutron Am-241 Be S/N T-304

☒ Alpha S/N **Th230sn:1495** ☒ Beta S/N **Sr90Y90sn:5281-04, Ni63sn:4017** ☐ Other **Tc99sn:5280-04A**

☒ m 500 S/N **50800** ☐ Oscilloscope S/N ☒ Multimeter S/N **83990502**

Calibrated By:

Charles Chisik

Date

19 July 07

Reviewed By:

Rhonda Harris

Date

19 Jul 07



Designer and Manufacturer
of
Scientific and Industrial
Instruments

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

Bench Test Data For Detector

Detector 43-37 Serial No. PR-178371 Order # 279885/315168
Customer CABRERA SERVICES
Counter 2360 Serial No. 184938 Alpha Input Sensitivity 100 mV
Count Time 1Minute Beta Input Sensitivity 4 mV
Other Calibrated w/5' cable Beta Window 40 mV
Distance Source to Detector Surface

High Voltage	Background		Isotope <u>Th 230</u> Size <u>19800 dpm</u>		Isotope <u>Tc 99</u> Size <u>93200 dpm</u>		Isotope <u>Sr 90Y 90</u> Size <u>111222 dpm</u>	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
<u>1650</u>	<u>2</u>	<u>470</u>	<u>3308</u>	<u>1672</u>	<u>19</u>	<u>28551</u>	<u>5</u>	<u>29999</u>
<u>1675</u>	<u>3</u>	<u>685</u>	<u>3556</u>	<u>1823</u>	<u>29</u>	<u>30534</u>	<u>1</u>	<u>34718</u>
<u>1700</u>	<u>6</u>	<u>812</u>	<u>3708</u>	<u>2034</u>	<u>48</u>	<u>30489</u>	<u>18</u>	<u>38648</u>
<u>1725</u>	<u>2</u>	<u>1026</u>	<u>3854</u>	<u>2161</u>	<u>128</u>	<u>28658</u>	<u>84</u>	<u>40086</u>

- ☐ Gas Proportional detector count rate decreased $\leq 10\%$ after 15 hour static test using 39" cable.
☒ Gas proportional detector count rate decreased $\leq 10\%$ after 5 hour static test using 39" cable and alpha/beta counter.

Signature Charles Lisk

Date 19 July 07



Designer and Manufacturer
of
Scientific and Industrial
Instruments

CERTIFICATE OF CALIBRATION

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

CUSTOMER CABRERA SERVICES

ORDER NO. 269548 / 309434

Mfg. Ludlum Measurements, Inc. Model 2224 Serial No. 183048

Mfg. Ludlum Measurements, Inc. Model 43-68 Serial No. PR-161781

Cal. Date 18-Jan-07 Cal Due Date 18-Jan-08 Cal. Interval 1 Year Meterface 202-783

Check mark ☒ applies to applicable instr. and/or detector IAW mfg. spec. T. 76 °F RH 20 % Alt 705.8 mm Hg

☐ New Instrument ☐ Instrument Received ☒ Within Toler. $\pm 10\%$ ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☒ Mechanical ck. ☒ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity

☐ F/S Resp. ck. ☒ Reset ck. ☒ Window Operation ☒ Geotropism

☒ Audio ck. ☐ Alarm Setting ck. ☒ Batt. ck. (Min. Volt) 2.2 VDC

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

Instrument Volt Set 1625 V Input Sens. Comments mV Det. Oper. 1625 V at Comments mV Threshold 1995 mV

☒ HV Readout (2 points) Ref./Inst. 500 / 505 V Ref./Inst. 2000 / 1995 V

COMMENTS:

Input Sensitivity: Alpha = 120mV
Beta = 3.5mV
Beta WIN = 50mV

Firmware: 390063
Overload checked but not set.
Calibrated using 5' C-cable.

4pi Efficiencies:

Th230: Source size = 19,800 dpm, Background = 0 cpm, Source count = 3,963 cpm, Efficiency = 20.02%
Tc99: Source size = 33,200 dpm, Background = 256 cpm, Source count = 11,502 cpm, Efficiency = 33.87%
Ni-63: Source size = 289,557 dpm, Background = 256 cpm, Source count = 21,442 cpm, Efficiency = 7.32%
SrY90: Source size = 112,569 dpm, Background = 256 cpm, Source count = 41,465 cpm, Efficiency = 36.61%

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

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

*Uncertainty within $\pm 10\%$ C.F. within $\pm 20\%$

ALL Range(s) Calibrated Electronically

REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
400k cpm	39930(0)	39930(0)			
40k cpm	3994	3994			
4k cpm	399	399			
400 cpm	40	40			
40 cpm	4	4			

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques.

The calibration system conforms to the requirements of ANSI/NCCL Z540-1-1994 and ANSI N323-1978

State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources: ☐ S-394 ☐ 1122 ☐ 781

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

☒ Alpha S/N Th230 s/n 121495 ☒ Beta S/N Ni-63 s/n 99Ni2204617 ☐ Other Tc99 s/n 5296 SrY90 s/n 5231

☒ m 500 S/N 81084 ☐ Oscilloscope S/N ☒ Multimeter S/N 78401030

Calibrated By: Sebastien Ceballos Date 18-Jan-07

Reviewed By: Rhonda Harris Date 19 Jan 07

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.
FORM C22A 06/02/2006

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

Bench Test Data For Detector

Detector 43-68 Serial No. PR-161781

Order #. 269548 / 309434

Customer CABRERA SERVICES

Alpha Input Sensitivity 120 mV

Counter 2224 Serial No. 183048

Beta Input Sensitivity 3.5 mV

Count Time 1Minute

Beta Window 50 mV

Other _____

Distance Source to Detector *Surface*[illegible]

- | | | |
|-------------------------------------|--|--|
| <input type="checkbox"/> | Gas Proportional detector count rate decreased | ≤ 10% after 15 hour static test using 39" cable. |
| <input checked="" type="checkbox"/> | Gas proportional detector count rate decreased | ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter. |

Signature Sebastian Gebauer

Date 18-Jan-07



A Division of RSCS, Inc.

Customer: Chuck Mikaitis
Cabrera Services, Inc.
473 Silver Lane
East Hartford, CT 06118-

Instrument
Ludlum Model 2-001R

Serial Number
95952

Probe Model
Ludlum 44-6

Serial Number
051218

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
4.00 mR/hr	4.00 mR/hr	4.00 mR/hr	4.00 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
X10	40 mR/Hr	40 mR/Hr	40 mR/Hr
X10	10 mR/Hr	10 mR/Hr	10 mR/Hr
X1	4 mR/Hr	4 mR/Hr	4 mR/Hr
X1	1 mR/Hr	1 mR/Hr	1 mR/Hr
X0.1	0.4 mR/Hr	0.5 mR/Hr *	0.40 mR/Hr
X0.1	0.1 mR/Hr	0.5 mR/Hr *	0.10 mR/Hr

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10% of Target value

Outer Physical Check: Pass Mechanical Zero: Pass
Internal Check: Pass
Geotropism Check: Pass

Calibrated by:

QA
Review:

Calibration Date: 06/25/2007
Expires: 06/25/2008

Atmospheric Conditions - Temperature: 76°F Humidity: 30% Barometric Pressure: 29.56"hg
This calibration was performed by RSCS Inc. 91 Portsmouth ave, Stratham NH 03885 using a NIST Traceable radiation source, in conformance to the following standards: ANSI N323A (1997) RSCS New Hampshire Radioactive Material License Number: 381R. RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedure 2.4. This calibration certificate shall not be reproduced except in full without the express written consent of RSCS, Inc

Radiation Safety and Control Services, Inc.
91 Portsmouth Ave, Stratham, NH 03885
1-800-525-8339 (603) 778-2871 Fax (603) 778-6879 www.radsafety.com



This Certificate will be accompanied by Calibration Charts or Readings where Applicable

Statement of Certification

MJW Technical Services, Inc certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of ANSI/NCCL 2540-1-1994 and ANSI N323. The Instrument listed above was inspected prior to shipment and it met all the manufacturer's published operating specifications. (MJW technical Services is not responsible for damage incurred during shipment or use of this instrument).

Instrument

Calibrated By:

Reviewed By:

Date 7/5/07

Calibration Date: 07/05/2007



Calibration Due: 07/05/2008



This Certificate will be accompanied by Calibration Charts or Readings where Applicable

Statement of Certification

MJW Technical Services, Inc certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of ANS/NCSL Z540-1-1994 and ANSI N323. The Instrument listed above was inspected prior to shipment and it met all the manufacturer's published operating specifications. (MJW technical Services is not responsible for damage incurred during shipment or use of this instrument).

Instrument		
Calibrated By: 	Reviewed By: 	Date 7/5/07
Calibration Date: 07/05/2007	Calibration Due: 07/05/2008	



EBERLINE
SERVICES

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# 6500
P.O.# 07-006

Description of Standard:

Model No. DNS-11 Serial No. 99TH470 0992 Isotope Th-230

Electroplated on polished Ni disc, 0.79 mm thick.

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

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

Measurement Method:

The 2pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolute counting of alpha particles emitted in the hemisphere above the active surface was verified by counting above, below, and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrated alpha source S/N 4001-02.

Measurement Result:

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

2,570 ± 128

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

5,070 ± 253 (0.00228 μ Ci)

The uncertainty of the measurement is 5%, which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: ART REUST

Reviewed by: [Signature]

Calibration Technician: Art Reust

Q.A. Representative: Anthony W. Toth

Calibration Date: 7-18-2006

Reviewed Date: 7-27-06



EBERLINE
SERVICES

CERTIFICATE OF CALIBRATION

Electroplated Beta Standard

S.O.# 6652

P.O.# 07-870

Description of Standard:

Model No. DNS-12 Serial No. 5803-07 Isotope Tc-99

Electroplated on polished SS disc, 0.79 mm thick.

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

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

Measurement Method:

The 2pi beta emission rate was measured using an internal gas flow proportional chamber. Absolute counting of beta particles emitted in the hemisphere above the active surface was verified by counting above, below, and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrated beta source S/N 4002-02.

Measurement Result:

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

8,710 ± 261

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

13,900 ± 417 (0.00627 μ Ci)

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

Calibrated by: ART REUST Reviewed by: [Signature]

Calibration Technician: [Signature] Q.A. Manager: Anthony W. Toth

Calibration Date: 7-26-2007 Reviewed Date: 7-26-07

Source Manufacturing Lab
7021 Pan American Freeway NE
Albuquerque, New Mexico 87109-4238
(505) 761-5413 Fax (505) 761-5416
areust@eberlineservices.com

CERTIFICATE OF CALIBRATION (AIR SAMPLER)



RSA Laboratories, Inc.

19 Pendleton Drive, P.O. Box 61
Hebron, Connecticut 06248
(860) 228-0721 Fax (860) 228-4402

Customer and Contact: Cabrera Services, Inc., Attn: Larry Pawlus (860) 569-0095
Customer Address: 809 Main Street, East Hartford, CT 06108

Inst. Mfr. F&J Specialty Products
Reference Inst. F&J Venturi D-812

Inst. Model LV-1

Inst. s/n 2802
Inst. s/n 2541

Cal. Date 04 February 2008

Due Date 04 February 2009

Cal. Interval 1 year

Barometric Press: Actual 30.00 in. Hg

Temperature: Actual 72°F

Corrected to: 29.78 in. Hg

Corrected to: 70.9°F

Filters Used: ☒Particulate ☐Charcoal/silver zeolite ☐Other:

Measurement	Air Sampler Flow Rate (LPM)	Ref. Inst. Flow Rate (LPM)	Percent Deviation
1	19.60	19.94	1.69
2	39.20	38.88	-0.83
3	50.00	47.85	-2.40
4	58.80	56.82	-3.48
5	78.39	74.76	-4.86
6			
7			
8			
9			
10			
11			
12			

****Average percent deviation across the range = -1.98**

This is to certify that RSA Laboratories, Inc. of Hebron, Connecticut, has on this date certified this air sampler to be within the accuracy specified above. The Reference Flow Device bears Letters of Certification traceable to the National Institute of Science and Technology. RSA Laboratories, Inc. ID# 11643.

Calibrated by: Kurt D. Newton

Date: 04 February 2008

CERTIFICATE OF CALIBRATION

(AIR SAMPLER)

Facility: RSA Laboratories, Inc. Customer: Cabrera Services, Inc.

Air Sampler Model F&J LV-1
Calibrator Model F&J Venturi D-812

Air Sampler Serial No. 2802
Calibrator Serial No. 2541

Measurement	AIR SAMPLER					CALIBRATOR		
	Inlet Temp. (°F)	Inlet Press (In-Hg)	Gauge Press (In-Hg)	Indicated Flow (LPM)	Temp/Press Correction Factor	Corrected Flow (LPM)	Indicated Flow (LPM)	Temp/Press Correction Factor
1	70.9	29.78	1	20	0.980	19.60	20	0.997
2	70.9	29.78	1	40	0.980	39.20	39	0.997
3	70.9	29.78	1	50	0.980	50.00	48	0.997
4	70.9	29.78	1	60	0.980	58.80	57	0.997
5	70.9	29.78	1	80	0.980	78.39	75	0.997
6								
7								
8								
9								
10								
11								
12								

$$\text{Air Sampler Temp/Press Corr Factor} = \sqrt{\frac{530^{\circ}\text{R}}{\text{Inlet temp } (^{\circ}\text{F}) + 460^{\circ}\text{R}}} \times \frac{(\text{Inlet Press} - \text{Gauge Press})}{29.92 \text{ in. Hg}}$$

$$\text{Calibrator Temp/Press Corr Factor} = \sqrt{\frac{530^{\circ}\text{R}}{\text{Inlet temp } (^{\circ}\text{F}) + 460^{\circ}\text{R}}} \times \frac{\text{Inlet Press}}{29.92 \text{ in. Hg}}$$

$$\% \text{ Deviation} = \frac{\text{Corrected Flow} - \text{Sampler Flow}}{\text{Corrected Flow}} \times 100$$

$$\text{Corrected Flow} = (\text{Indicated Flow}) \times (\text{Temp/Press Corr Factor})$$

Calibrated by: Kurt D. Newton

Date: 04 February 2008

CERTIFICATE OF CALIBRATION (AIR SAMPLER)



RSA Laboratories, Inc.

19 Pendleton Drive, P.O. Box 61
Hebron, Connecticut 06248
(860) 228-0721 Fax (860) 228-4402

Customer and Contact: **Cabrera Services, Inc., Attn: Larry Pawlus (860) 569-0095**
Customer Address: **809 Main Street, East Hartford, CT 06108**

Inst. Mfr. **F&J Specialty Products**
Reference Inst. **F&J Venturi D-812**

Inst. Model **LV-1**

Inst. s/n **2772**
Inst. s/n **2541**

Cal. Date **04 February 2008**

Due Date **04 February 2009**

Cal. Interval **1 year**

Barometric Press: Actual **30.00** in. Hg

Temperature: Actual **72°F**

Corrected to: **29.78** in. Hg

Corrected to: **70.9°F**

Filters Used: ☒Particulate ☐Charcoal/silver zeolite ☐Other:

Measurement	Air Sampler Flow Rate (LPM)	Ref. Inst. Flow Rate (LPM)	Percent Deviation
1	19.60	19.94	1.69
2	39.20	38.88	-0.83
3	50.00	47.85	-2.40
4	58.80	56.82	-3.48
5	78.39	74.76	-4.86
6			
7			
8			
9			
10			
11			
12			

****Average percent deviation across the range = -1.98**

This is to certify that RSA Laboratories, Inc. of Hebron, Connecticut, has on this date certified this air sampler to be within the accuracy specified above. The Reference Flow Device bears Letters of Certification traceable to the National Institute of Science and Technology. RSA Laboratories, Inc. ID# **11642**.

Calibrated by: **Kurt D. Newton**

Date: **04 February 2008**

CERTIFICATE OF CALIBRATION

(AIR SAMPLER)

Facility: RSA Laboratories, Inc. Customer: Cabrera Services, Inc.

Air Sampler Model F&J LV-1

Calibrator Model F&J Venturi D-812

Air Sampler Serial No. 2772

Calibrator Serial No. 2541

AIR SAMPLER						CALIBRATOR		
Measurement	Inlet Temp. (°F)	Inlet Press (In-Hg)	Gauge Press (In-Hg)	Indicated Flow (LPM)	Temp/Press Correction Factor	Corrected Flow (LPM)	Indicated Flow (LPM)	Temp/Press Correction Factor
1	70.9	29.78	1	20	0.980	19.60	20	0.997
2	70.9	29.78	1	40	0.980	39.20	39	0.997
3	70.9	29.78	1	50	0.980	50.00	48	0.997
4	70.9	29.78	1	60	0.980	58.80	57	0.997
5	70.9	29.78	1	80	0.980	78.39	75	0.997
6								
7								
8								
9								
10								
11								
12								

$$\text{Air Sampler Temp/Press Corr Factor} = \sqrt{\frac{530^{\circ}\text{R}}{\text{Inlet temp } (^{\circ}\text{F}) + 460^{\circ}\text{R}}} \times \frac{(\text{Inlet Press} - \text{Gauge Press})}{29.92 \text{ in. Hg}}$$

$$\text{Calibrator Temp/Press Corr Factor} = \sqrt{\frac{530^{\circ}\text{R}}{\text{Inlet temp } (^{\circ}\text{F}) + 460^{\circ}\text{R}}} \times \frac{\text{Inlet Press}}{29.92 \text{ in. Hg}}$$

$$\% \text{ Deviation} = \frac{\text{Corrected Flow} - \text{Sampler Flow}}{\text{Corrected Flow}} \times 100$$

$$\text{Corrected Flow} = (\text{Indicated Flow}) \times (\text{Temp/Press Corr Factor})$$

Calibrated by: Kurt D. Newton

Date: 04 February 2008



Designer and Manufacturer
of
Scientific and Industrial
Instruments

CERTIFICATE OF CALIBRATION

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

CUSTOMER CABRERA SEVICES

ORDER NO. 277310/313701

Mfg. Ludlum Measurements, Inc. Model 2360 Serial No. 193675

Mfg. Ludlum Measurements, Inc. Model 43-37 Serial No. PR-216984

Cal. Date 30-May-07 Cal Due Date 30-May-08 Cal. Interval 1 Year Meterface 202-855

Check mark ☒ applies to applicable instr. and/or detector IAW mfg. spec. T. 75 °F RH 50 % Alt 698.8 mm Hg

☐ New Instrument ☐ Instrument Received ☒ Within Toler. $\pm 10\%$ ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☒ Mechanical ck. ☒ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity

☐ F/S Resp. ck. ☒ Reset ck. ☒ Window Operation ☒ Geotropism

☒ Audio ck. ☐ Alarm Setting ck. ☒ Batt. ck. (Min. Volt) 2.2 VDC

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

Instrument Volt Set 1675 V

☒ HV Readout (2 points) Ref./Inst. 500 / 502 V Ref./Inst. 1500 / 1500 V

Firmware Version: 39010n27

Alpha Threshold: 100 mV

Beta Threshold: 4 mV

Beta Window: 40 mV

Overload Checked but not set

Instrument calibrated with a 5' cable.

High voltage set with detector disconnected

(EEPROM Settings)

User Time: 1.0

Alpha Alarm: 50000

Beta Alarm: 50000

A/B Alarm: 50000

Model 2360 Date: 05/30/07

Calibration Date Due: 05/30/08

COMMENTS:

Eff. for Th230sn: 1495, Eff. $\approx 17.6\%$ 4pi

Eff. for Tc99sn: 5279-04, Eff. $\approx 31.7\%$ 4pi

Eff. for Sr90y90sn: 5281-04, Eff. $\approx 28.5\%$ 4pi

Eff. for Ni63sn: 4017, Eff. $\approx 4.7\%$ 4pi

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

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

*Uncertainty within $\pm 10\%$ C.F. within $\pm 20\%$

ALL Range(s) Calibrated Electronically

REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout					
400kcpm	<u>39796</u> (67)	<u>39796</u> (67)			
40kcpm	<u>3979</u>	<u>3979</u>			
4kcpm	<u>398</u>	<u>398</u>			
400cpm	<u>40</u>	<u>40</u>			
40cpm	<u>4</u>	<u>4</u>			

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques.

The calibration system conforms to the requirements of ANSI/NCSS Z540-1-1994 and ANSI N323-1978

State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

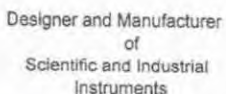
Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ 720 ☐ 734 ☐ 1616 ☐ Neutron Am-241 Be S/N T-304

☐ Alpha S/N ☐ Beta S/N ☐ Other

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

Calibrated By: Charles Ash Date 30 May 07

Reviewed By: Rhonda Harris Date 30 May 07



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

Distance Source to Detector Surface[illegible]

- ☐ Gas Proportional detector count rate decreased \leq 10% after 15 hour static test using 39" cable.
- ☒ Gas proportional detector count rate decreased \leq 10% after 5 hour static test using 39" cable and alpha/beta counter.

Date _____

3 May 07



Designer and Manufacturer
of
Scientific and Industrial
Instruments

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

Bench Test Data For Detector

Detector 43-37 Serial No. PR-216984 Order # 277310/313701
Customer CABRERA SEVICES
Counter 2360 Serial No. 193675 Alpha Input Sensitivity 100 mV
Count Time 1Minute Beta Input Sensitivity 4 mV
Other w/5' cable Beta Window 40 mV
Distance Source to Detector Surface

High Voltage	Background		Isotope Size <u>NI63</u>		Isotope Size		Isotope Size	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
<u>1625</u>	<u>8</u>	<u>345</u>	<u>3</u>	<u>11178</u>				
<u>1650</u>	<u>7</u>	<u>467</u>	<u>10</u>	<u>13419</u>				
<u>1675</u>	<u>5</u>	<u>598</u>	<u>13</u>	<u>14340</u>				
<u>1700</u>	<u>6</u>	<u>847</u>	<u>5</u>	<u>14662</u>				

- ☐ Gas Proportional detector count rate decreased \leq 10% after 15 hour static test using 39" cable.
☒ Gas proportional detector count rate decreased \leq 10% after 5 hour static test using 39" cable and alpha/beta counter.

Signature

Charles Ash

Date

3 May 07



Designer and Manufacturer
of
Scientific and Industrial
Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.

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

CUSTOMER **CABRERA SERVICES**

ORDER NO. **279885/315168**

Mfg. **Ludlum Measurements, Inc.** Model **2360**

Serial No. **184938**

Mfg. **Ludlum Measurements, Inc.** Model **43-37**

Serial No. **PR-178371**

Cal. Date **19-Jul-07** Cal Due Date **19-Jul-08** Cal. Interval **1 Year** Meterface **202-855**

Check mark ☒ Applies to applicable instr. and/or detector IAW mfg. spec. T. **74** °F RH **51** % Alt **700.8** mm Hg

☐ New Instrument ☐ Instrument Received ☐ Within Toler. $\pm 10\%$ ☐ 10-20% ☐ Out of Tol. ☒ Requiring Repair ☐ Other-See comments

☒ Mechanical ck. ☒ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity

☐ F/S Resp. ck. ☒ Reset ck. ☒ Window Operation ☒ Geotropism

☒ Audio ck. ☐ Alarm Setting ck. ☒ Batt. ck. (Min. Volt) **2.2** VDC

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

Instrument Volt Set **1675** V

☒ HV Readout (2 points) Ref./Inst. **500** / **510** V Ref./Inst. **1500** / **1500** V

Firmware Version: **39010n25**

(EEPROM Settings)

Alpha Threshold: **100mv**

User Time: **1.0**

Beta Threshold: **4mv**

Alpha Alarm: **50000**

Beta Window: **40mv**

Beta Alarm: **50000**

Overload **Checked but not set**

A/B Alarm: **50000**

Instrument calibrated with a **5'** cable.

Model 2360 Date: **7/19/07**

High voltage set with detector **disconnected**

Calibration Date Due: **7/19/08**

COMMENTS:

Eff. for Tc99sn:5280-04A, Eff. $\approx 32\%4\pi$, Source count $\approx 30499\text{cpm}$ - 685cpm background, Source size = 93200dpm
Eff. for Th230sn:1495, Eff. $\approx 18\%4\pi$, Source count $\approx 3556\text{cpm}$ - 3cpm background, Source size = 19800dpm
Eff. for Sr90Y90sn:5281-04, Eff. $\approx 30\%4\pi$, Source count $\approx 34718\text{cpm}$ - 685cpm background, Source size = 111222dpm
Eff. for Ni63sn:, Eff. $\approx 4.5\%4\pi$, Source count $\approx 13853\text{cpm}$ - 685cpm background, Source size = 288558dpm

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

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

*Uncertainty within $\pm 10\%$ C.F. within $\pm 20\%$

ALL Range(s) Calibrated Electronically

REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout	400kcpm	N/A	Log Scale		
	40kcpm	39841 (2)			
	4kcpm	3968			
	400cpm	399			
	40cpm	40			
		4			

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

Reference Instruments and/or Sources:

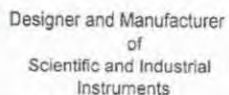
☐ S-394/1122 ☐ 1131 ☐ 781
Cs-137/Gamma S/N ☐ 1162 ☐ G112 ☐ M585 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ 720 ☐ 734 ☐ 1616 ☐ Neutron Am-241 Be S/N T-304

☒ Alpha S/N **Th230sn:1495** ☒ Beta S/N **Sr90Y90sn:5281-04, Ni63sn:4017** ☐ Other

☒ m 500 S/N **50800** ☐ Oscilloscope S/N ☒ Multimeter S/N **83990502**

Calibrated By: **Charles Disk** Date **19 July 07**

Reviewed By: **Rhonda Ham** Date **19 Jul 07**



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

Detector	<u>43-37</u>	Serial No.	<u>PR-178371</u>	Order #.	<u>279885/315168</u>
Customer	<u>CABRERA SERVICES</u>			Alpha Input Sensitivity	<u>100</u> mV
Counter	<u>2360</u>	Serial No.	<u>184938</u>	Beta Input Sensitivity	<u>4</u> mV
Count Time	<u>1Minute</u>			Beta Window	<u>40</u> mV
Other	<u>Calibrated w/5' cable</u>			Distance Source to Detector	<u>Surface</u>

[illegible]

- | | |
|--|--|
| <input type="checkbox"/> Gas Proportional detector count rate decreased | ≤ 10% after 15 hour static test using 39" cable. |
| <input checked="" type="checkbox"/> Gas proportional detector count rate decreased | ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter. |

Signature _____

Date _____



Designer and Manufacturer
of
Scientific and Industrial
Instruments

CERTIFICATE OF CALIBRATION

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

CUSTOMER CABRERA SERVICES

ORDER NO. 288887 / 320260

Mfg. Ludlum Measurements, Inc. Model 2224 Serial No. 183048
Mfg. Ludlum Measurements, Inc. Model 43-68 Serial No. PR-161781
Cal. Date 19-Dec-07 Cal Due Date 19-Dec-08 Cal. Interval 1 Year Meterface 202-783

Check mark ☒ applies to applicable instr. and/or detector IAW mfg. spec. T. 76 °F RH 20 % Alt 700.8 mm Hg
☐ New Instrument ☐ Instrument Received ☒ Within Toler. $\pm 10\%$ ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments
☒ Mechanical ck. ☒ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☐ F/S Resp. ck. ☒ Reset ck. ☒ Window Operation ☒ Geotropism
☒ Audio ck. ☐ Alarm Setting ck. ☒ Batt. ck. (Min. Volt) 2.2 VDC
☒ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 02/07/97.
Instrument Volt Set 1625 V Input Sens. Comments mV Det. Oper. 1625 V at Comments mV Threshold Dial Ratio = mV
☒ HV Readout (2 points) Ref./Inst. 500 / 506 V Ref./Inst. 1500 / 1995 V

COMMENTS:

Input Sensitivity: Alpha = 120mV
Beta = 4mV
Beta WIN = 50mV

Firmware: 390063
Overload checked but not set.
Calibrated using 5' C-cable.

4pi Efficiencies:

Th230: Source size = 19,800 dpm, Background = 4 cpm, Source count = 3,965 cpm, Efficiency $\approx 20.01\%$
Tc99: Source size = 33,200 dpm, Background = 222 cpm, Source count = 10,741 cpm, Efficiency $\approx 31.68\%$
Ni-63: Source size = 287,723 dpm, Background = 222 cpm, Source count = 19,356 cpm, Efficiency $\approx 6.65\%$
SrY90: Source size = 110,076 dpm, Background = 222 cpm, Source count = 41,131 cpm, Efficiency $\approx 37.16\%$

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

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

*Uncertainty within $\pm 10\%$ C.F. within $\pm 20\%$

ALL Range(s) Calibrated Electronically

REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout			Log Scale		
400k cpm	400274	400274			
40k cpm	40028	40028			
4k cpm	4001	4001			
400 cpm	401	401			
40 cpm	40	40			

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques.

The calibration system conforms to the requirements of ANSI/NCCL Z540-1-1994 and ANSI N323-1978

State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources: ☐ S-394/1122 ☐ 1131 ☐ 781

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

☒ Alpha S/N Th230 s/n 121495 ☒ Beta S/N Ni-63 s/n 49N:2204017 ☐ Other

☒ m 500 S/N 114520 ☐ Oscilloscope S/N ☒ Multimeter S/N 78401030

Calibrated By: Sebasti Caballero

Date 19-Dec-07

Reviewed By: Rhonda Harwin

Date 20 Dec 07

Bench Test Data For Detector

Detector 43-68 Serial No. PR-161781
Customer CABRERA SERVICES
Counter 2224 Serial No. 183048
Count Time 1Minute
Other _____

Order #. 288887 / 320260

Alpha Input Sensitivity 120 mV

Beta Input Sensitivity 4 mV

Beta Window 50 mV

Distance Source to Detector Surface[illegible]

- | | | |
|-------------------------------------|--|--|
| <input type="checkbox"/> | Gas Proportional detector count rate decreased | ≤ 10% after 15 hour static test using 39" cable. |
| <input checked="" type="checkbox"/> | Gas proportional detector count rate decreased | ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter. |

Signature Sebastián Ceballos

Date 19-Dec-07



243 Root St.
Suite 100
Olean, New York 14760
Voice: (716) 372-5300
Fax: (716) 372-5307

Certificate Of Calibration

This Certificate will be accompanied by Calibration Charts or Readings where Applicable


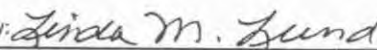
Customer		Instrument	
Customer Name: Cabrera Services Inc		Manufacturer: Ludlum Measurements, Inc.	
Address: 473 Silver Lane East Hartford, CT 06118		Model: 3	Serial Number: 166511
		Detector Manufacturer: Ludlum Measurements, Inc.	
Contact Name: Chuck Mikaitis		Det. Model: 44-9	Serial Number: PR073107
Customer PO/ CC. Number: 08-1090	Work Order Number: 2007-347	Meterface: 202-002	Calibration Method: Electronic
Instrument Received: <input checked="" type="checkbox"/> Within Toler. +/-10% <input type="checkbox"/> 10-20% <input type="checkbox"/> Out of Tol. <input type="checkbox"/> Requiring Repair <input type="checkbox"/> Other (See Comments)			
<input checked="" type="checkbox"/> Geotropism <input checked="" type="checkbox"/> Meter Zero <input checked="" type="checkbox"/> Mech. Ck. <input type="checkbox"/> HV Readout <input checked="" type="checkbox"/> Battery Check <input checked="" type="checkbox"/> Reset			
<input checked="" type="checkbox"/> Audio <input type="checkbox"/> Window Status <input checked="" type="checkbox"/> FS Response <input type="checkbox"/> Linearity <input type="checkbox"/> Background Subtract <input type="checkbox"/> Alarm Set			
Temperature: 71.2 F Humidity: 61 % Pressure: 726.4 mm Hg Altitude: 1455 ft			

Instrument Calibration

Multiplier/Range	Calibration Point	Instrument Response		Reference instruments and / or Sources			
		Before Calibration	After Calibration				
X 0.1	100 cpm	95 cpm	100 cpm	Pulser: LUD500-2	220099		
X 0.1	400 cpm	395 cpm	400 cpm	Th-230	C7-643	C-14	C7-804
X 1	1 Kcpm	1 Kcpm	1 Kcpm	SrY-90	C7-661	Tc-99	C7-641
X 1	4 Kcpm	4 Kcpm	4 Kcpm	Comments Inst. Voltage: 900 V Input Sensitivity: 36 mV 4 Pi Efficiency @ 1/4 inch Th-230 4.0% C-14 2.4% Tc-99 11.0% SrY-90 27.3%			
X 10	10 Kcpm	10 Kcpm	10 Kcpm				
X 10	40 Kcpm	40 Kcpm	40 Kcpm				
X 100	100 Kcpm	100 Kcpm	100 Kcpm				
X 100	400 Kcpm	400 Kcpm	400 Kcpm				

Statement of Certification

MJW Technical Services, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323. The instrument listed above was inspected prior to shipment and it met all the manufacturer's published operating specifications. (MJW technical Services is not responsible for damage incurred during shipment or use of this instrument).

Instrument	Calibrated By: 	Reviewed By:  Date: 10/3/07
Calibration Date: 10/02/2007		Calibration Due: 10/02/2008



This Certificate will be accompanied by Calibration Charts or Readings where Applicable

Statement of Certification

MJW Technical Services, Inc certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of ANSI/NC SL Z540-1-1994 and ANSI N323. The instrument listed above was inspected prior to shipment and it met all the manufacturer's published operating specifications. (MJW technical Services is not responsible for damage incurred during shipment or use of this instrument).

Instrument

Calibrated By:

Reviewed By:

Date _____

12/5/07

Calibration Date: 12/05/2007

Calibration Due: 12/05/2008



243 Root St.
Suite 100
Olean, New York 14760
Voice: (716) 372-5300
Fax: (716) 372-5307

Certificate Of Calibration

This Certificate will be accompanied by Calibration Charts or Readings where Applicable

Customer		Instrument			
Customer Name: Cabrera Services Inc		Manufacturer: Ludlum Measurements, Inc.			
Address: 473 Silver Lane East Hartford, CT 06118		Model: 2929	Serial Number: 129566		
		Detector Manufacturer: Ludlum Measurements, Inc.			
Contact Name: Chuck Mikaitis		Det. Model: 43-10-1	Serial Number: PR132720		
Customer PO/ CC. Number: 08-1170	Work Order Number: 2007-440	Meterface: Analog / Digital	Calibration Method: Electronic		
Instrument Received: <input checked="" type="checkbox"/> Within Toler. +/-10% <input type="checkbox"/> 10-20% <input type="checkbox"/> Out of Tol. <input type="checkbox"/> Requiring Repair <input type="checkbox"/> Other (See Comments)					
<input type="checkbox"/> Geotropism <input checked="" type="checkbox"/> Meter Zero <input checked="" type="checkbox"/> Mech. Ck. <input checked="" type="checkbox"/> HV Readout <input type="checkbox"/> Battery Check <input type="checkbox"/> Reset					
<input checked="" type="checkbox"/> Audio <input type="checkbox"/> Window Status <input type="checkbox"/> FS Response <input type="checkbox"/> Linearity <input type="checkbox"/> Background Subtract <input type="checkbox"/> Alarm Set					
Temperature: 70.9 F		Humidity: 28 %	Pressure: 723.9 mm Hg		
			Altitude: 1455 ft		
Instrument Calibration					
Multiplier\Range	Calibration Point	Instrument Response		Reference Instruments and / or Sources	
		Before Calibration	After Calibration		
Alpha	40 cpm	41 cpm	39 cpm	Pulser: LUD500-2	220110
Alpha	400 cpm	401 cpm	399 cpm	Th-230	C7-644
Alpha	4000 cpm	4019 cpm	3990 cpm	C-14	C7-804
Alpha	40000 cpm	40070 cpm	39900 cpm	SrY-90	C7-630
Alpha	400000 cpm	400430 cpm	398720 cpm	Comments Inst. Voltage: 800 V Amplifier gain: As found = 20, As Left = 25 Window status: Beta threshold - 4 mV Beta window - 50 mV Alpha threshold - 175 mV Instrument Voltage set @ 800 = 3.27 on High Voltage dial Alpha background is 1 cpm, Beta background is 76 cpm Alpha crosstalk in the Beta channel is <10% with insert in place Beta crosstalk in the Alpha channel is <1% with insert in place 4 pi Efficiency Pu239 = 34.8% C14 = 7.5% SrY90 = 26.4% Th230 = 33.3% Tc99 = 20.4%	
Beta-Gamma	40 cpm	40 cpm	40 cpm		
Beta-Gamma	400 cpm	401 cpm	398 cpm		
Beta-Gamma	4000 cpm	4010 cpm	3990 cpm		
Beta-Gamma	40000 cpm	40060 cpm	39780 cpm		
Beta-Gamma	400000 cpm	400450 cpm	398395 cpm		

Statement of Certification

MJW Technical Services, Inc certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of ANSI/NCSS Z540-1-1994 and ANSI N323. The instrument listed above was inspected prior to shipment and it met all the manufacturer's published operating specifications. (MJW technical Services is not responsible for damage incurred during shipment or use of this instrument).

Instrument

Calibrated By: 

Reviewed By: 

Date

1/4/08

Calibration Date: 01/03/2008

Calibration Due: 01/03/2009



EBERLINE
SERVICES

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# 6481

P.O.# 06-735

Description of Standard:

Model No. DNS-11 Serial No. 2888-01 Isotope Th-230

Electroplated on polished SS disc, 0.79 mm thick.

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

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

Measurement Method:

The 2pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolute counting of alpha particles emitted in the hemisphere above the active surface was verified by counting above, below, and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrated alpha source S/N 4001-02.

Measurement Result:

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

9.720 ± 388

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

19.200 ± 766 (0.00863 µCi)

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

Calibrated by: ART REUST

Reviewed by: Anthony W. Toth

Calibration Technician: Art Reust

Q.A. Representative: Anthony W. Toth

Calibration Date: 6-14-2006

Reviewed Date: 6-15-06



EBERLINE
SERVICES

CERTIFICATE OF CALIBRATION

Electroplated Beta Standard

S.O.# 3759
P.O.# 01-325

Description of Standard:

Model No. DNS-12 Serial No. 2898-01 Isotope Tc-99
Electroplated on polished SS disc, 0.79 mm thick.
Total diameter of 4.77 cm and an active diameter of 4.45 cm.

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

Measurement Method:

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

Measurement Result:

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

10,800 + 432

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

17,300 + 692 (0.00780 μ Ci)

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

Calibrated by: ART REUST

Reviewed by: Barbara M. Frisberg

Calibration Technician: Art Reust

Q.A. Representative: Lucy J.

Calibration Date: 6-05-2001

Reviewed Date: 6/11/01

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



Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

CALIBRATION CERTIFICATE

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION			INSTRUMENT INFORMATION		
Customer Name: EnergySolutions- Instrument Services			Manufacturer: Bicron		
Address: 628 Gallaher Road Kingston, TN 37763			Model: micro rem	Serial Number: 1490	
Contact Name: Tony Riggs			Probe: N/A	Serial Number: N/A	
Customer Purchase Order Number: N/A		Work Order Number: 2007-04697	Calibration Method: Electronic and Source		
INSTRUMENT CALIBRATION INFORMATION					
Instrument Range	Calibration Standard Value $\mu\text{Rem/hr}$	Instrument Response ($\pm 10\%$ of Calibration Standard Values)		Comments	
		Before Calibration	After Calibration	Calibration performed in accordance with CP-IN-WI-209, Rev. 0	
		$\mu\text{Rem/hr}$	$\mu\text{Rem/hr}$	Pulser: 762	Cal Due: 03/02/08
X1000	160,000	155,000	155,000	DVM: 94710023	Cal Due: 09/18/08
X1000	40,000	40,000	40,000	D-814: 2551	Cal Due: 10/18/07
X 100	16,000	16,500	16,500	Humidity: 958670	Cal Due: 05/09/08
X 100	4,000	4,200	4,200	Temp: 21.8°C	Humidity: 49%
X 10	1,600	1,550	1,550	Pressure: 742mmHg	
X 10	400	400	400	BAT: SAT	Mech Zero: SAT
X 1	160	160	160	Geotropism: SAT	Over range: SAT
X 1	40 (Pulsed)	40	40	Reset: SAT	Audio: N/A
X 0.1	16.0 (Pulsed)	16.0	16.0	Response Test: N/A	
X 0.1	4.0 (Pulsed)	4.0	4.0	"HV ok" check As Found: UNSAT	
Mech Zero	0	0	0	"HV ok" check As Left: SAT	
Precision Test (mR/hr)---Reading #1:40 #2: 40 #3:40 Mean:40 Precision Test: SAT					
NUCLIDE	SOURCE ID	CERTIFICATION DATE	CERTIFICATION DUE	**Indicates use of Pulser to electronically generate calibration points shown**	
Cs ¹³⁷	019701	8/09/07	8/09/08		
Cs ¹³⁷	049711	7/19/07	7/19/08		
STATEMENT OF CERTIFICATION					
We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).					
Instrument		Calibrated By: Mike Pauli		Reviewed By: Jeff Robinson	
Calibration Date: 10/03/07		Date: 10/3/07		Calibration Due: 10/03/08	



CALIBRATION CERTIFICATE

Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION			DETECTOR INFORMATION		
Customer Name: Duratek Instrument Services			Manufacturer: Ludlum		
Address: 628 Gallaher Road, Kingston, TN 37763			Detector Model: 43-68		
Contact Name: Tony Riggs			Serial Number: 120548		
Customer Purchase: Order Number: N/A		Work Order Number: 2007-04776	Evaluation Method: Source		
DETECTOR EVALUATION INFORMATION					
Source Nuclide	Serial Number	Activity (dpm)	Net Response (cpm)	Efficiency (%)	
Th^{230}	119702	20,580	1,194	5.8%	
Tc^{99}	099608	21,312	3,901	18.3%	
SCALER INFORMATION			DETECTOR INFORMATION		
Model	Serial Number	Due Date	Background (cpm)	Operating Voltage	Threshold
2360	193667	08/15/2008	0	1700V	Alpha (120mV)
2360	193667	08/15/2008	156	1700V	Beta (3.5-30mV)
ATTACHMENTS					
Voltage Plateau: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		MDA/Cross Talk Evaluation: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
COMMENTS		Linearity Test (Gross Counts)			
Calibrated with 25 foot cable Detector has two layers of Mylar (0.8mg/cm ²) total Precision test performed with Tc^{99} #099608. Calibrated in accordance with original equipment technical manual. 5 minute background performed		Heel	3,955		
		Center	4,257		
		Toe	3,960		
		Average	4,057		
		Pass/Fail	PASS (+/-10% Tolerance)		
STATEMENT OF CERTIFICATION					
We Certify that the detector listed above was evaluated for proper operation prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this detector).					
Detector					
Certified By: <i>Mike Paul</i>	Reviewed By: <i>Jeff Dickinson</i>	Date: 11/15/07			
Certification Date: 11/15/07		Certification Due: 11/15/08			



Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION				INSTRUMENT INFORMATION				
Customer Name: Duratek Instrument Services				Manufacturer: Ludlum				
Address: 628 Gallaher Road, Kingston, TN 37763				Model: 2360	Serial Number: 193667			
Contact Name: Tony Riggs				Probe: N/A	Serial Number: N/A			
Customer Purchase Order Number: N/A		Work Order Number: 2007-04596		Calibration Method: Electronic				
INSTRUMENT CALIBRATION INFORMATION								
Instrument Range	Calibration Standard Value	Ratemeter Response ($\pm 10\%$)		Calibration Standard Value CPM	Time Base (minutes)	Tolerances (cpm) $\pm 2\%$	Scaler Response	
		As Found	As Left				As Found	As Left
X 1	100	100	100	40,000 CPM	0.1	3920- 4080	4026	4018
X 1	400	400	400	40,000 CPM	0.5	19.6k - 20.4k	20,130	20,130
X 10	1,000	1,000	1,000	40,000 CPM	1.0	39.2k- 40.8k	40,258	40,258
X 10	4,000	4,000	4,000					
X 100	10,000	10,000	10,000					
X 100	40,000	40,000	40,000					
X 1000	100,000	100,000	100,000					
X 1000	400,000	400,000	400,000					
Calibrated in accordance with OEM Technical Manual								
STATEMENT OF CERTIFICATION								
We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).								
Instrument				Reviewed By: <i>[Signature]</i> Date: 08/15/07				
Calibrated By: <i>[Signature]</i>				Calibration Due: 08/15/2008				
Calibration Date: 08/15/2007								



Eckert & Ziegler

Isotope Products

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010

Fax 661•257•8303

CERTIFICATE OF CALIBRATION MULTINUCLIDE STANDARD SOURCE

Customer: CABRERA SERVICES, INC.
P.O. No.: 08-1006
Catalog No.: EG-ML

Source No.: 1263-8-3
Reference Date: 1-Sep-07 12:00 PST
Contained Radioactivity: 3.093 μ Ci 114.4 kBq

Physical Description:

A. Capsule type: 1L Marinelli beaker (190G)
B. Nature of active deposit: Multinuclide distributed in 1.5 g/cc epoxy matrix
C. Active diameter/volume: Approximately 1000mL (1500 grams)
D. Backing: Plastic
E. Cover: Plastic

Gamma-Ray Energy (keV)	Nuclide	Half-life	Branching Ratio (%)	Activity (μ Ci)	Gammas per second	Total Uncert.
60	Am-241	432.17 \pm 0.66 years	36.0	0.09017	1201	3.0 %
88	Cd-109	462.6 \pm 0.7 days	3.63	1.273	1710	3.0 %
122	Co-57	271.79 \pm 0.09 days	85.6	0.04716	1494	3.0 %
166	Ce-139	137.640 \pm 0.023 days	79.9	0.06073	1795	3.0 %
279	Hg-203	46.595 \pm 0.013 days	81.5	0.1809	5455	3.0 %
392	Sn-113	115.09 \pm 0.04 days	64.9	0.2268	5446	3.0 %
514	Sr-85	64.849 \pm 0.004 days	98.4	0.2885	10500	3.0 %
662	Cs-137	30.17 \pm 0.16 years	85.1	0.1960	6171	3.0 %
898	Y-88	106.630 \pm 0.025 days	94.0	0.4772	16600	3.0 %
1173	Co-60	5.272 \pm 0.001 years	99.86	0.2523	9322	3.0 %
1333	Co-60	5.272 \pm 0.001 years	99.98	0.2523	9333	3.0 %
1836	Y-88	106.630 \pm 0.025 days	99.4	0.4772	17550	3.0 %

Method of Calibration:

This source was prepared from weighed aliquots of solutions whose concentrations in μ Ci/g were determined by gamma spectrometry.

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from IAEA-TECDOC-619, 1991.
- Overall uncertainty is calculated at the 99% confidence level.
- This source has a working life of 1 year.

Daniel James Van Dahlen
Quality Control

26-Jul-07
Date

IPL Ref. No.: 1263-8

ISO 9001 CERTIFIED

Medical Imaging Laboratory

24937 Avenue Tibbitts Valencia, California 91355

Industrial Gauging Laboratory

1800 North Keystone Street Burbank, California 91504

DAILY WELD LOG Instrument QC

 units are $\text{cpm} \mu\text{r/hr}$

Make	Model	S/N	Probe	S/N	DOC						
Ludlum	2224-1	227246	43-93	PR244549	12/05/02						
Bkgd Count	Source Count	Source #1 ID	Source #2 ID	Source #3 ID	CDD						
1 min	1 min	Th ²³⁰ 1149	Tc ⁹⁹ 1130	NA	12/05/08						
Date	2/25/08										
Intial QC's	1	2	3	4	5	6	7	8	9	10	Tech
Bkgd	0/148	0/155	1/160	0/180	0/156	0/154	1/156	0/161	1/156	0/164	RLS
Source #1	4383	4251	4323	4403	4280	4321	4343	4384	4436	4298	RLS
Source #2	1932	1837	1856	1886	1873	1970	1976	1869	1930	1911	RLS
Source #3	N/A										

Daily QC's						
Date	Bkgd	Source #1 (Th ²³⁰) $\alpha/\beta/\gamma$	Source #2 (Tc ⁹⁹) $\alpha/\beta/\gamma$	Source #3 () $\alpha/\beta/\gamma$	Battery OK	Tech
2/26/08	1/152	4322	1925	NA	Yes/No	RLS
2/27/08	0/142	4267	1945		Yes/No	RLS
2/28/08	0/152	4343	1992		Yes/No	RLS
2/29/08	0/143	4228	1917		Yes/No	RLS
3/3/08	1/159	4425	1914		Yes/No	KMA
3/4/08	1/160	4161	1980		Yes/No	KMA
3/5/08	0/163	4259	1918		Yes/No	KMA
3/6/08	1/141	4223	1913		Yes/No	RLS
3/7/08	0/162	4191	1955		Yes/No	KMA
3/10/08	0/173	4235	1969		Yes/No	KMA
3/11/08	0/143	4233	1910		Yes/No	KMA
3/12/08	1/159	4276	1970		Yes/No	KMA
3/13/08	0/160	4244	1977		Yes/No	KMA
3/14/08	0/166	4394	1939		Yes/No	KMA
3/17/08	1/159	4143	1904		Yes/No	KMA
3/18/08	1/152	4259	1919		Yes/No	KMA

DAILY FIELD LOG Instrument QC

units are cpm or ur/hr

Make	Model	S/N	Probe	S/N	DOC						
Ludlum	Model 3	166511	44-9	PR 073107	10/02/07						
Bkgd Count	Source Count	Source #1 ID	Source #2 ID	Source #3 ID	CDD						
1 MIN	1 MIN	TC - 99 #1130			10/02/08						
Date	02/25/08										
Intial QC's	1	2	3	4	5	6	7	8	9	10	Tech
Bkgd	40	50	55	50	35	40	55	35	30	35	KMA
Source #1	1750	1800	1700	1650	1750	1850	1800	1650	1800	1750	KMA
Source #2	N/A										
Source #3	N/A										

Daily QC's						
Date	Bkgd	Source #1 (Te 99) $\alpha/\beta/\gamma$	Source #2 () $\alpha/\beta/\gamma$	Source #3 () $\alpha/\beta/\gamma$	Battery OK	Tech
02/25/08	35	1700	—	—	Yes/No	KMA
02/26/08	30-35 ^{OB} 2/26/08	1650	—	—	Yes/No	KMA
02/27/08	45	1750	—	—	Yes/No	KMA
02/28/08	40	1700	—	—	Yes/No	KMA
02/29/08	40	1800	—	—	Yes/No	KMA
3/3/08	45	1700	—	—	Yes/No	KMA
3/4/08	50	1750	—	—	Yes/No	KMA
3/5/08	45	1700	—	—	Yes/No	KMA
3/6/08	40	1700	—	—	Yes/No	RLS
3/7/08	40	1750	—	—	Yes/No	KMA
3/10/08	35	1700	—	—	Yes/No	KMA
3/11/08	40	1650	—	—	Yes/No	KMA
3/12/08	45	1800	—	—	Yes/No	KMA
3/13/08	40	1650	—	—	Yes/No	KMA
3/14/08	40	1700	—	—	Yes/No	KMA
3/17/08	45	1700	—	—	Yes/No	KMA



units are cpm or $\mu\text{r/hr}$

Page 2 of 6

DAILY FIELD LOG
Instrument QC

units are cpm or ur/hr

Make	Model	S/N	Probe	S/N	DOC						
LUDLUM	2929	129566	43-10-1	PR 132720	01/03/08						
Bkgd Count	Source Count	Source #1 ID	Source #2 ID	Source #3 ID	CDD						
20 MIN	1 MIN	Th-230 -1149	Tc-99 -1136	N/A	01/03/09						
Date	02/25/08										
Intial QC's	1	2	3	4	5	6	7	8	9	10	Tech
Bkgd	15/1602	20/1387	7/1616	11/1509	9/1483	9/1542	8/1461	7/1503	9/1587	13/1518	KMA
Source #1	5820	6404	6048	5974	5989	5912	6176	5922	5863	6144	GB
Source #2	2828	2688	2722	2769	2919	2718	2714	2949	2727	2860	GB
Source #3	←				N/A					→	KMA

Daily QC's						
Date	Bkgd	Source #1 (Th-230) α/β/γ	Source #2 (Tc-99) α/β/γ	Source #3 () α/β/γ	Battery OK	Tech
02/26/08	7/1487	6116	2876	—	N/A Yes/No	GB
02/27/08	9/1491	6276	2790	—	Yes/No	KMA
02/28/08	8/1495	6053	2817	—	Yes/No	KMA
02/29/08	8/1530	6172	2660	—	Yes/No	KMA
3/3/08	5/1509	6042	2984	—	Yes/No	KMA
3/4/08	6/1558	6255	2870	—	Yes/No	KMA
3/5/08	7/1626	6641 6162	2717	—	Yes/No	KMA
3/6/08	10/1676	6236	2671	—	Yes/No	RLS
3/7/08	9/1495	6213	2756	—	Yes/No	KMA
3/10/08	11/1460	6485	2751	—	Yes/No	KMA
performed background count again					Yes/No	
3/11/08	15/1443	6390	2790	—	Yes/No	KMA
3/12/08	6/1416	6407	2737	—	Yes/No	KMA
3/13/08	9/1582	6079	2704	—	Yes/No	KMA
3/14/08	10/1504	6065	2664	—	Yes/No	KMA
3/17/08	11/1409	6084	2700	—	Yes/No	KMA

DAILY LD LOG Instrument QC

units are cpm or ur/hr

Daily QC's						
Date	Bkgd	Source #1 (91-130) $\alpha / \beta / \gamma$	Source #2 (92-99) $\alpha / \beta / \gamma$	Source #3 (N/A) $\alpha / \beta / \gamma$	Battery OK	Tech
3/18/08	5 / 1343	5979	2702	✓	<u>Yes</u> / No	KMA
3/19/08	5 / 1415	6054	2774	—	<u>Yes</u> / No	KMA
3/20/08	8 / 1469	6182	2767	—	<u>Yes</u> / No	KMA
3/21/08	9 / 1431	6293	2870	—	<u>Yes</u> / No	KMA
3/24/08	10 / 1401	6164	2830	—	<u>Yes</u> / No	KMA
3/25/08	7 / 1392	6417	2658	—	<u>Yes</u> / No	KMA
3/26/08	4 / 1402	6094	2738	—	<u>Yes</u> / No	KMA
3/27/08	13 / 1432	6247	2687	—	<u>Yes</u> / No	KMA
3/28/08	11 / 1442	6414	2661	—	<u>Yes</u> / No	KMA
3/31/08	13 / 1449	5908	2732	—	<u>Yes</u> / No	KMA
04/01/08	2 / 1415 5/1390 04/01/08	6074	2688	—	<u>Yes</u> / No	KMA
04/02/08	9 / 1615	6178	2812	—	<u>Yes</u> / No	KMA
04/03/08	6 / 1380	6292	2886	—	<u>Yes</u> / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	
					Yes / No	

DAILY FIELD LOG

Instrument QC

units are cpm or ur/hr

Make	Model	S/N	Probe	S/N	DOC						
Thermo Electron	Micro Rem	1490	NA	NA	10/03/07						
Bkgd Count	Source Count	Source #1 ID	Source #2 ID	Source #3 ID	CDD						
1 min	1 min	Cs ¹³⁷	NA	NA	10/03/08						
Date	2/25/08										
Initial QC's	1	2	3	4	5	6	7	8	9	10	Tech
Bkgd	5	6	4	5	4	6	5	4	5	5	RLS
Source #1	1,100	1,100	1,050	1,100	1,100	1,100	1,050	1,100	1,100	1,100	RLS
Source #2	<hr/>										
Source #3	<hr/>										

Daily QC's						
Date	Bkgd	Source #1 (Cs ¹³⁷) α / β / γ	Source #2 () α / β / γ	Source #3 () α / β / γ	Battery OK	Tech
2/26/08	5	1,100	—	—	<u>Yes</u> / No	RLS
2/27/08	5	1,050	—	—	<u>Yes</u> / No	KMA
2/28/08	5	1,050	—	—	<u>Yes</u> / No	RLS
2/29/08	5	1,100	—	—	<u>Yes</u> / No	KMA
3/3/08	5	1,050	—	—	<u>Yes</u> / No	KMA
3/4/08	5	1,100	—	—	<u>Yes</u> / No	KMA
3/5/08	5	1,100	—	—	<u>Yes</u> / No	KMA
3/6/08	5	1,050	—	—	<u>Yes</u> / No	RLS
3/7/08	5	1,100	—	—	<u>Yes</u> / No	KMA
3/10/08	5	1,100	—	—	<u>Yes</u> / No	KMA
3/11/08	5	1,100	—	—	<u>Yes</u> / No	KMA
3/12/08	5	1,100	—	—	<u>Yes</u> / No	KMA
3/13/08	5	1,050	—	—	<u>Yes</u> / No	KMA
3/14/08	5	1,100	—	—	<u>Yes</u> / No	KMA
3/17/08	5	1,050	—	—	<u>Yes</u> / No	KMA
3/18/08	5	1,100	—	—	<u>Yes</u> / No	KMA