January 8, 2007 NMSB2

RECEIVED REGION I
2007 JAN 17 PM 2: 37

Nuclear Regulatory Commission
Region I
475 Allandale Road
King of Prussia, PA 19106

License # 45-25516-01 03035377

Dear NRC:

I am writing to inform you that we have closed the radioactive materials location listed as site C on our most current amendment which is Halifax Heart Center, 2232 Wilborn Ave Suite A, South Boston, VA. The last day of operations at this site was December 15, 2006. Sealed sources from this site were transported to our location listed as site F, Carilion Cardiology Associates, 1107B Brookdale ST, Martinsville, VA 24112. The sealed sources will NOT be used at this location but only stored, inventoried, and leak tested. The sealed sources were transported in approved containers and marked with appropriate radioactive labels. The most recent leak tests were shipped with the sources along with the shippers certificates. All patients administration records located at the South Boston location were left at the location and Halifax Heart Center has been instructed to keep these records for at least 3 years. We used only Technetium 99 as unsealed radioactive material at this location.

The hot lab equipment has been removed from the site and the areas listed below have been wipe tested and surveyed. The wipe test counter used was a Ludlum Model 2200 Scaler Ratemeter SN# 202949. The Geiger counter used was a Ludlum Model 14C Serial number 203096. The meter was last calibrated on February 20, 2006. Please find attached the meter calibration report, sealed source leak tests, sealed source inventory and well counter evaluation. Wipe tests results include cpm multiplied by the conversion factor for the Ludlum well counter which is 1.06 to convert to DPM.

| LOCATION | WIPE TEST CPM | | DPM | SURVEY READINGS |
|---|---|---|---|---|
| Background readings | 423 | X1.06= | 448 | .02mr/hr |
| Waste | 452 | X1.06 = | 31 | .01mr/hr |
| Patient prep area | 450 | X1.06= | 29 | .02 mr/hr |
| Prep counter | 433 | X1.06= | 11 | .01mr/hr |
| Bed Scanner | 480 | X1.06 | 61 | .02mr/hr |
| Bed floor | 450 | X1.06 | 29 | .01mr/hr |
| Sink | 453 | X1.06 | 32 | .02mr/hr |
| Long life store | 468 | X1.06 | 48 | .01mr/hr |
| Waste needle | 459 | X1.06 | 38 | .01mr/hr |
| Hot lab floor | 460 | X1.06 | 40 | .02mr/hr |
| Door handles | 437 | X1.06 | 15 | .01mr/hr |
| Dose cal counter | 484 | X1.06 | 65 | .01mr/hr |

139973

| | | | | |
|---|---|---|---|---|
| Floor @ doorway | 423 | X1.06 | 0 | .01mr/hr |
| Computer desk | 455 | X1.06 | 34 | .02mr/hr |
| Computer keyboard | 460 | X1.06 | 40 | .01mr/hr |

We would also like to delete as authorized users on our license Douglas Davies, MD and Richard Goulah MD.

Please amend our radioactive materials license as listed above and should you have any questions please do not hesitate to call me at (540) 563-9840 or Ms. Denise Phillips at (276) 634-3308 or cell (540) 798-3732.

Sincerely,

Martin Hellkamp, President
Odyssey Imaging
Roanoke, VA
License Mailing Address:
Carilion Cardiology Associates
Attn: Ms Denise Phillips
1107B Brookdale St
Martinsville, VA 24112

# SEALED SOURCE LEAK TEST

Halifax Heart Center, P.C. South Boston, Virginia Date: November 7, 2006

| Co-57 Reference Source Data | | | | | | | mm | dd | yyyy (e.g. 1997) |
|---|---|---|---|---|---|---|---|---|---|
| Reference Source | | Co-57 | Std. $T_{(½)}$ | min* | | Assay date | 11 | 12 | 2003 |
| Vendor | | Benchmark | | hr* | | Today's date | 11 | 7 | 2006 |
| Ser. Num. | | BM085701 | | day* | 270 | Time difference (y) | | -3.0e+00 | |
| Original Activity | µCi* | .1063 | | yy* | | Std. $T_{(½)}$ (y) | | 7.39e-01 | |
| | mCi* | | →→→→→→→→→ | | | Activity (mCi) | | 1.06e-04 | |

Today's Activity (mCi) 6.46e-06

| 122 keV photon em. rate = | 6.46e-06 | 3.70e+07 | 1.0 | 60 |
|---|---|---|---|---|
| dpm = | mCi | Bq/mCi | em/dis. | sec/min |
| Emission rate (dpm) = | | 14,348 | | |

*All counting performed with a wide open window.*

| Reference Source (cpm) | 13,797 | EFFICIENCY = | 96.16% | Sensitivity, CF (CPM/µCi) | 2,134,798 |
|---|---|---|---|---|---|

| 1 min. BKG reading = | 576 | | | Source Counter:- |
|---|---|---|---|---|
| Min. Det. Act. (*MDA*) = | $k_n$*√(bg)/CF = | 5.37e-05 | µCi | Model:- Ludlum 2200 |
| where $k_n$ = 3.0 (related to count stats standard deviation) | | | | Ser. Num.: |

*Sealed Source Leak Test Data*

| Sealed Source & ref. # | CPM | DPM | Act.'y (µCi) | Source & ref. # | CPM | DPM | Act.'y (µCi) |
|---|---|---|---|---|---|---|---|
| Co-57 Flood BM02100220 10.0 mCi 3/22/2004 | 0 | 0 | 0.00e+00 | | | 0 | 0.00e+00 |
| | | | | | | | |

Not required for <100 µCi sources. **ACTION LEVEL --> $5*10^{-3}$ µCi**. The above source was leak tested and proved to be less than 0.005 uCi in removable contamination.

Performed by: Richard W. Bur 11/7/06
Name Date

Radiation Safety Officer: Charles Anthony Giordano MS
Charles Anthony Giordano, MS

# SEALED SOURCE LEAK TEST

Halifax Heart Center, P.C. South Boston, Virginia Date: November 7, 2006

*Cs-137 Reference Source Data*

| | | | | | | | mm | dd | yyyy (e.g. 1997) |
|---|---|---|---|---|---|---|---|---|---|
| Reference Source | | Cs-137 | Std. $T_{(x)}$ | min# | | Assay date | 2 | 3 | 2004 |
| Vendor | | RadQual | | hr# | | Today's date | 11 | 7 | 2006 |
| Ser. Num. | | BM0837- | | day# | | Time difference (y) | -2.8e+00 | | |
| Original Activity | µCi* | .104 | | yy# | 30 | Std. $T_{(x)}$ (y) | 3.00e+01 | | |
| | mCi* | | →→→→→→→→→→ | | | Activity (mCi) | 1.04e-04 | | |

Today's Activity (mCi) 9.76e-05

| | | | | | |
|---|---|---|---|---|---|
| 660 keV photon em. rate = | 9.76e-05 | 3.70e+07 | 1.0 | 60 | *All counting performed with a wide open window.* |
| dpm = | mCi | Bq/mCi | em/dis. | sec/min | |
| Emission rate (dpm) = | | 216,611 | | | |

| | | | | |
|---|---|---|---|---|
| Reference source (cpm) | 52,040 | EFFICIENCY = 24.02% | Sensitivity, CF (CPM/µCi) | 533,346 |

| | | | |
|---|---|---|---|
| 1 min. BKG reading = | 576 | | Source Counter:- |
| Min. Det. Act. (*MDA*) = | $\#_s$*√(bg)/CF = | 1.35e-04 µCi | Model:- Ludlum 2200 |
| where $\#_s$ ~ 3.0 (related to count stats standard deviation) | | | Ser. Num.: |

*Sealed Source Leak Test Data*

| Sealed Source & ref. # | CPM | DPM | Act.'y (µCi) | Source & ref. # | CPM | DPM | Act.'y (µCi) |
|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0.00e+00 | Cs-137 B-Vial BM0637-005-18 202 uCi 12/17/2003 | 0 | 0 | 0.00e+00 |
| | | | | | | | |

Not required for <100 µCi sources. **ACTION LEVEL --> $5*10^{-3}$ µCi.** The above source was leak tested and proved to be less than 0.005 uCi in removable contamination.

Performed by: Name Date 11/06

Radiation Safety Officer: Charles Anthony Giomuso, MS

## MEDICAL PHYSICS SURVEY
## SEALED SOURCE INVENTORY

**FACILITY:** Halifax Heart Center, P.C. **LOCATION:** South Boston, Virginia

| Nuclide: | Cs-137 | Cs-137 | Co-57 | Co-57 | Cs-137 |
|---|---|---|---|---|---|
| Type: | Vial | Rod | Sheet | Button | Button |
| Location: | Hot Lab | Hot Lab | Hot Lab | Hot Lab | CM |
| Assay: | 202 uCi | 104 nCi | 10 mCi | 90 uCi | 1 uCi |
| Date: | 12/17/2003 | 2/5/2004 | 3/22/2004 | 2/18/2004 | 2/2004 |
| Mfgr: | RadQual | RadQual | RadQual | RadQual | Spectrum Tech. |
| Serial No.: | BM0637-005-18 | BM0837-004-03 | BM02100220 | BM03-100 | #60 |
| Model: | | | | | |
| Date | | | | | |
| 5/18/2006 | X | X | X | X | X |
| 8/2/2006 | X | X | X | X | X |
| 11/7/2006 | X | X | X | X | X |
| | | | | | |
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| | | | | | |
| | | | | | |

* See Report
X - Indicates Source Inventoried
1. - Returned to Vendor

Performed by: [signature] 11/7/06
Name Date

RSO Signature [signature]

## MEDICAL PHYSICS SURVEY
## SCINTILLATION WELL EVALUATION

**FACILITY:** Halifax Heart Center, P.C. **LOCATION:** South Boston, Virginia

**MODEL NO.** Ludlum Model 2200 **Serial Number:**

| Date: | (A) NUCLIDE | Background (050 - out) | (B) H.V. | CPM | (C) RESOL. | (D) CHI2 | (E) EFFICIENCY |
|---|---|---|---|---|---|---|---|
| 5/18/2006 | Cs-137 | 522 | 252 | | | | Co-57 94.7% Cs-137 23.5% |
| 8/2/2006 | Cs-137 | 471 | 253 | | | | Co-57 94.7% Cs-137 23.5% |
| 11/7/2006 | Cs-137 | 576 | 254 | | | | Co-57 96.16% Cs-137 24.02% |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |
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| | | | | | | | |

* See Report

A. Cs-137 Tube source (104 nCi on 2/3/2004).
B. Threshold = 652 window = 020
C. Normal Value 7-12%
D. Normal Value for 5 counts .711 - 9.44
E. Efficiency performed with Co-57 Rod. Efficiency was calculated to be 95%

**MEDICAL HEALTH PHYSICS REPORT**
**SURVEY METER REPORT**

**FACILITY:** Halifax Heart Center, P.C. **LOCATION:** South Boston, Virginia

| Meter | A | B |
|---|---|---|
| Type | GM | |
| Manufacturer | Ludlum | |
| Meter Model | 14 C | |
| Probe Model | 44-9 | |
| Meter Serial No. | 203096 | |
| Probe Serial No. | PR209823 | |
| Check Source and Geometry | Integral red cap off / on | |
| Calibrated | February 14, 2005 | |
| Calibrated | February 20, 2006 | |
| Calibrated | | |
| Calibrated | | |
| Date | Battery / High Voltage / mR/hr | Battery / High Voltage / mR/hr |
| 5/18/2006 | OK / N/A / 1.3 Cap Off | |
| 8/2/2006 | OK / N/A / 1.4 Cap Off | |
| 11/7/2006 | OK / N/A / 1.4 Cap Off | |
| | | |
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**CardinalHealth**
**Nuclear Pharmacy Services**

# CERTIFICATE OF CALIBRATION

FACILITY: **Halifax Heart Center - So. Boston** Location # : **2217**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| METER MAKE: | Ludlum | MODEL: | 14c | S/N: | 203096 | TYPE: | GM |
| PROBE MAKE: | Ludlum | MODEL: | 44-9 | S/N: | 209823 | TYPE: | PGM |

BATTERY: **OK**

CHECK SOURCE READING: **1.4 mR/hr**

Calibration Date: **20-Feb-06**

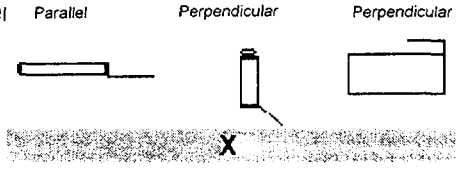
HIGH VOLTAGE: **900**

WINDOW: OPENED CLOSED FIXED
X

Forsyth Medical Cei

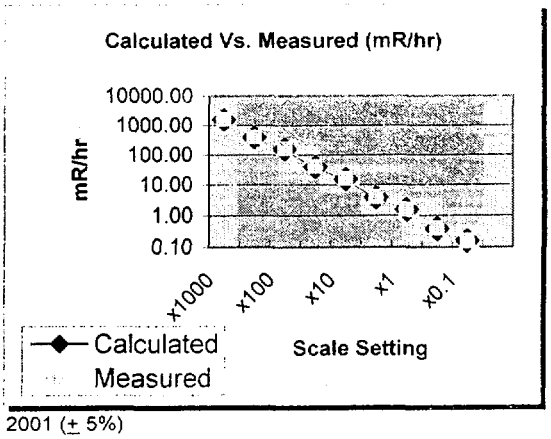
RADIATION FIELD DIRECTION

CALIBRATION GEOMETRY:




ATTENUATION FACTOR: 1=1, 2=2.08, 3=4.38, 4=10.9, 5=116

| Scale Setting | Attn. Factor | Distance cm | Calculated mR/hr | Measured mR/hr | Correction Factor | % Error |
|---|---|---|---|---|---|---|
| x1000 | 1 | 37.3 | 1574.59 | 1600.00 | 0.98 | 1.61% |
| x1000 | 2 | 51.8 | 392.52 | 400.00 | 0.98 | 1.91% |
| x100 | 3 | 56.4 | 157.24 | 160.00 | 0.98 | 1.76% |
| x100 | 3 | 113 | 39.17 | 40.00 | 0.98 | 2.12% |
| x10 | 4 | 113 | 15.74 | 16.00 | 0.98 | 1.65% |
| x10 | 5 | 69.5 | 3.91 | 4.00 | 0.98 | 2.31% |
| x1 | 5 | 109.5 | 1.58 | 1.60 | 0.98 | 1.58% |
| x1 | 5 | 219.5 | 0.39 | 0.40 | 0.98 | 2.05% |
| x0.1 | Mini-pulser | Parallel off"1" | 0.16 | 0.16 | 1.00 | 0.00% |
| x0.1 | Mini-pulser | Parallel off"1" | 0.04 | 0.04 | 1.00 | 0.00% |




Calibration Source: 1 Ci of Cs-137; Radiation output 243 mR/hr at 100 cm on August 27, 2001 (± 5%)
J.L. Shepherd, Model 28-6A - SN10066. Cs-137 Amersham type X.19 Capsule. Ludlum Mini Pulser, Model 500.

## CALIBRATION NOTES AND COMMENTS

[X] RADIATION LEVELS ARE BASED ON STANDARDS WHOSE CALIBRATION ARE TRACEABLE TO THE N.I.S.T. THE FORMULA FOR % ERROR IS: (Measured reading - calculated reading)/calculated reading/100
ALL READINGS ARE CORRECTED FOR BACKGROUND RADIATION.
ANY CORRECTIONS MADE TO THE SURVEY INSTRUMENT (e.g. ENERGY DEPENDENCE) ARE UP TO THE USER TO APPLY. CARE MUST BE USED IN APPLYING ANY SUCH FACTORS. DURING CALIBRATION THE FRONTSIDE OF THE PGM PROBE WAS POSITIONED PERPENDICULAR TO THE BEAM AXIS WITH THE BETA SHIELD CLOSED UNLESS NOTED.

[X] CHECK SOURCE MEASUREMENT MADE WITH BETA SHIELD OPEN.
[X] MEASUREMENT MADE WITH BACKSIDE OF THE PGM PROBE ARE VALID EXPOSURE RATE MEASUREMENTS. MEASUREMENT MADE WITH THE FACE OF THE PGM PROBE ARE AN OVER REPRESENTATION OF THE ACTUAL RADIATION FIELD. THE PGM PROBE FACE WILL PROVIDE THE MOST SENSITIVE CONTAMINATION SURVEY.
[ ] IN Cs-137 RADIATION FIELD THE PROBE(S) READ ABOUT: _____ CPM FOR 1mR/hr.

Calibrated by: Richard Freyer
Reviewed by: Richard Freyer
Support Service Supervisor
Radioactive Material License # 060-0794-2

**PASS**

**Next Due Date 20-Feb-07**

This is to acknowledge the receipt of your letter/application dated

1/8/2007, and to inform you that the initial processing which includes an administrative review has been performed.

AMEND. 45-25516-01

☑ There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☐ Please provide to this office within 30 days of your receipt of this card

_____.

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 139973.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(8-96)

Sincerely,
Licensing Assistance Team Leader