

Environmental Health & Safety Policy Manual

Issue Date: 11/12/2010

Policy # EHS-100.07

Radiation Survey – Wipe Test Policy and Procedures

1.0 PURPOSE:

To provide guidance on conducting routine wipe test surveys to ensure no radiation contamination is present in labs.

2.0 SCOPE:

All laboratory personnel who use radioactive materials must be familiar with and adhere to this policy.

3.0 RESPONSIBILITIES:

3.1 Radiation Safety Officer shall:

- Perform quarterly wipe tests in all labs labeled for radioisotope use.
- Keeps records of the lab inspections for Louisiana State Department of Environmental Quality (DEQ) audits.

3.2 Principal Investigators shall:

- Ensure wipe test surveys are being performed.

3.3 Lab Personnel shall:

- Perform wipe test after each radioisotope experiment use.
- Maintain all wipe test survey records for the current fiscal year and the previous three fiscal years.

4.0 OPERATING PROCEDURES:

4.1 Frequency

Wipe Tests are performed:

- Upon receipt of package deliveries to Radiation Safety Office by Radiation Safety Officer (RSO).
- After use of **H3, C14 and S35** in laboratory experiments (**mandatory** due to low beta emission).
- During quarterly lab inspections performed by RSO

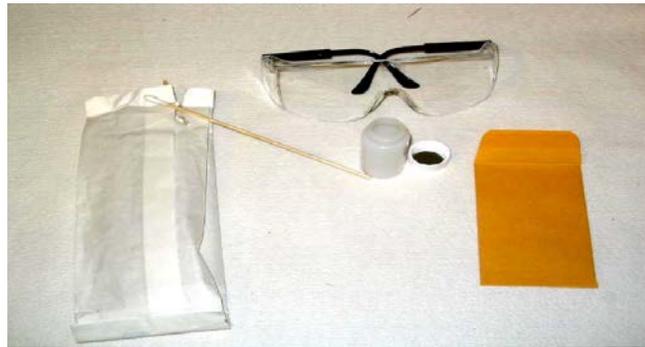
4.2 Instrumentation needed

Wipe Tests are performed using the following items:

- Scintillation vials to place samples into
- Pen Marker and Gloves
- Scintillation machine

4.3 Procedure

- 1) A cotton swab or filter paper should be used to wipe the surface of the target area. Gloves and eye protection are required to perform the survey safely. Plastic scintillation vials are recommended.



- 2) Perform the wipe test on all designated areas of concern using a new swab/filter paper for each location.
- 3) Use Appendix A, Radiation Survey Wipe Test Form, for documentation. Complete the form and draw schematic on where wipes are to be performed and label locations.
- 4) Moisten the swab/filter paper and wipe approximately 100 cm². (Note: this is equivalent to a 4" x 4" square or a large S motion with your arm)



- 5) Place the swabs/filter papers into scintillation vials and label cap top with location number.



- 6) After obtaining all samples, add biodegradable scintillation fluid to each vial.



- 7) Place a zero background sample/standard in the tray bay first then add rest of vials and count using a counting window program appropriate for the nuclear substance for which you are surveying if assistance is needed, contact the RSO.



- 8) Reviewing the **(DPM) disintegrations per minute** data recorded is the preferable means to analyze true radiation contamination by the scintillation machine. If not available, **CPM (counts per minute)** will have to suffice.
- 9) An area must be cleaned and retested if the removable contamination level exceeds **200 DPM**, or if the exposure rate exceeds approximately **three times CPM** of background reading (see Appendix A, Example Scintillation Report).
- 10) Record all values on the Appendix B, Radiation Survey and Wipe Test Form, and keep in a folder located in the lab available for RSO and DEQ review.

5.0 RECORDKEEPING:

All wipe test records for the current fiscal year and the previous three fiscal years shall be kept in the laboratories in which they were taken and stored in a folder for review.

6.0 APPENDICES:

- A. Example Scintillation Report
- B. Radiation Survey and Wipe Test Form

Example Scintillation Report

```

ID:H3 - C14 DPM
USER: 4 COMMENT:
PRESET TIME : 3.00
DATA CALC : DL DPM H# :YES SAMPLE REPEATS: 1 PRINTER :EDIT
COUNT BLANK : YES IC# : NO REPLICATES : 1 RS232 : OFF
TWO PHASE : NO AQC :YES CYCLE REPEATS : 1
SCINTILLATOR: LIQUID LUMEX: NO LOW SAMPLE REJ: 0
LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

ISOTOPE 1: 3H %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0
ISOTOPE 2: 14C %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

BACKGROUND QUENCH CURVE: Off COLOR QUENCH CORRECTION: Off

Quench Limits Low:18.520 High:321.90
  
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| SAM NO | POS | TIME MIN | H# | 3H | | 14C | | 3H DPM | 14C DPM | 3H | | 14C | | RATIO | LUMEX % | ELAPSED TIME |
|--------|------|----------|------|---|--------|----------|--------|---------------|----------|--------|-------|-------|-------|--------|---------|--------------|
| | | | | CPM | %ERROR | CPM | %ERROR | | | EFF-1 | EFF-2 | EFF-1 | EFF-2 | | | |
| B1 | 1-1 | 3.00 | 1.6 | 16.67 | 28.28 | 5.00 | 51.64 | 22.70 | 6.03 | 68.57 | 0.82 | 18.24 | 79.86 | 3.766 | 0.45 | 3.55 |
| B2 | 1-2 | 3.00 | 35.6 | 37.00 | 18.98 | 5.00 | 51.64 | 58.32 | 5.89 | 61.59 | 0.70 | 18.32 | 78.02 | 9.905 | 50.94 | 7.27 |
| B3 | 1-3 | 3.00 | 55.7 | 26.33 | 22.50 | 7.00 | 43.64 | 43.37 | 8.71 | 57.01 | 0.66 | 18.43 | 77.10 | 4.979 | 55.09 | 10.88 |
| B4 | 1-4 | 3.00 | 57.9 | 23.00 | 24.00 | 9.33 | 37.80 | 36.85 | 11.01 | 56.51 | 0.65 | 18.44 | 77.01 | 3.121 | 47.67 | 14.48 |
| B5 | 1-5 | 3.00 | 38.1 | 24.00 | 15.57 | 5.67 | 48.51 | 88.15 | 6.49 | 61.04 | 0.69 | 18.33 | 77.90 | 13.577 | 14.28 | 18.05 |
| B6 | 1-6 | 3.00 | 61.0 | 32.00 | 20.41 | 6.67 | 44.72 | 54.65 | 8.21 | 55.78 | 0.65 | 18.46 | 76.87 | 6.656 | 40.85 | 21.65 |
| B7 | 1-7 | 3.00 | 38.9 | 24.67 | 23.25 | 7.67 | 41.70 | 37.67 | 9.51 | 60.85 | 0.69 | 18.33 | 77.85 | 3.960 | 34.22 | 25.23 |
| B8 | 1-8 | 3.00 | 38.7 | 24.00 | 23.57 | 5.33 | 50.00 | 37.44 | 6.52 | 60.91 | 0.69 | 18.33 | 77.87 | 5.745 | 23.85 | 28.80 |
| B9 | 1-9 | 3.00 | 51.4 | 21.00 | 25.20 | 6.33 | 45.88 | 33.68 | 7.91 | 58.03 | 0.66 | 18.40 | 77.29 | 4.261 | 32.79 | 32.39 |
| B10 | 1-10 | 3.00 | 47.3 | 15.67 | 29.17 | 7.67 | 41.70 | 23.55 | 9.69 | 58.97 | 0.67 | 18.38 | 77.47 | 2.429 | 28.82 | 35.97 |
| B11 | 1-11 | 3.00 | 41.8 | 22.00 | 24.62 | 6.00 | 47.14 | 34.28 | 7.42 | 60.21 | 0.68 | 18.35 | 77.72 | 4.620 | 25.35 | 39.56 |
| B12 | 1-12 | 3.00 | 43.9 | 19.00 | 26.49 | 4.67 | 53.45 | 30.04 | 5.75 | 59.75 | 0.68 | 18.36 | 77.63 | 5.224 | 30.89 | 43.25 |
| B13 | 1-13 | 3.00 | 42.3 | 20.33 | 25.61 | 4.00 | 57.74 | 32.35 | 4.86 | 60.09 | 0.68 | 18.35 | 77.70 | 6.651 | 44.83 | 46.83 |
| B14 | 1-14 | 3.00 | 49.5 | 17.67 | 27.47 | 5.67 | 48.51 | 27.99 | 7.00 | 58.47 | 0.67 | 18.39 | 77.37 | 3.952 | 23.95 | 50.42 |
| B15 | 1-15 | 3.00 | 52.9 | 26.00 | 22.65 | 7.33 | 42.64 | 42.16 | 9.14 | 57.68 | 0.66 | 18.41 | 77.22 | 4.615 | 28.23 | 53.99 |
| B16 | 1-16 | 3.00 | 52.9 | 16.67 | 28.28 | 8.67 | 39.22 | 25.38 | 11.01 | 57.68 | 0.66 | 18.41 | 77.22 | 2.306 | 27.17 | 57.59 |
| B17 | 1-17 | 3.00 | 47.6 | 17.67 | 27.47 | 5.67 | 48.51 | 27.79 | 7.00 | 58.89 | 0.67 | 18.38 | 77.46 | 3.928 | 21.95 | 61.17 |
| B18 | 1-18 | 3.00 | 38.4 | 12.33 | 32.88 | 11.33 | 34.30 | 15.90 | 14.41 | 60.96 | 0.69 | 18.33 | 77.88 | 1.103 | 20.21 | 64.84 |
| B19 | 1-1 | 3.00 | 71.3 | 39.00 | 18.49 | 7.33 | 28.57 | 65.94 | 20.82 | 53.29 | 0.64 | 18.52 | 76.45 | 3.168 | 42.43 | 68.58 |
| B20 | 1-2 | 3.00 | 44.7 | 15.00 | 29.81 | 4.67 | 53.45 | 23.40 | 5.81 | 59.55 | 0.68 | 18.37 | 77.59 | 4.027 | 21.39 | 72.14 |
| B21 | 1-3 | 3.00 | 38.8 | 13.33 | 31.62 | 6.33 | 45.88 | 19.51 | 7.96 | 60.88 | 0.69 | 18.33 | 77.86 | 2.450 | 17.48 | 75.82 |
| B22 | 1-4 | 3.00 | 39.4 | 14.00 | 30.86 | 8.00 | 40.82 | 20.00 | 10.10 | 60.75 | 0.69 | 18.34 | 77.83 | 1.980 | 15.81 | 79.39 |
| B23 | 1-5 | 3.00 | 36.9 | 18.33 | 26.97 | 5.00 | 51.64 | 28.07 | 6.16 | 61.30 | 0.69 | 18.32 | 77.95 | 4.553 | 18.34 | 82.96 |
| | | | | Blank Average DPM for 3H : | | 36.05 | | COEF. OF VAR: | | 47.117 | | | | | | |
| | | | | Blank Average DPM for 14C : | | 8.62 | | COEF. OF VAR: | | 40.563 | | | | | | |
| 2 | 1-8 | 3.00 | -1.3 | 61059.67 | 0.47 | 669.67 | 4.46 | 88312.35 | -92.94 | 69.13 | 0.83 | 18.24 | 80.04 | -950.2 | 0.00 | 86.90 |
| | | | | WARNING: QUENCH VALUE IS OUTSIDE QUENCH LIMIT | | | | | | | | | | | | |
| 3 | 1-9 | 1.40 | 1.4 | 7620.00 | 1.94 | 34044.29 | 0.92 | -260.59 | 42615.93 | 68.63 | 0.82 | 18.24 | 79.87 | -0.006 | 0.00 | 89.17 |
| | | | | WARNING: QUENCH VALUE IS OUTSIDE QUENCH LIMIT | | | | | | | | | | | | |

Radioactive Material Laboratory Survey and Wipe Test Form

PI: _____ Department: _____ Building & Lab #: _____

Gamma Counter - Manufacturer/Model/Serial #: _____

LSC – Manufacturer/Model/Serial #: _____

Note: LSC must be used to protect H₂ & C₁₄.

Survey Meter – Manufacturer/Model/Serial # _____

Background: _____ mR/Hr or cpm Battery Check: _____ Calibration Date: _____

Counter Information Type (Check one) gamma counter or LSC:

Isotopes used in Lab: (Check all that apply)

C-14 Ch-51 H-3 P-32 I-125 S-35 _____

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20

Rewipe of # _____ Rewipe of # _____

(* Results should read less than twice background in cpm.)
Inform the Radiation Safety Officer if it exceeds this amount.
(Contaminated areas must be decontaminated immediately and documented)

Performed By: _____ Date: _____