

UNIVERSITY OF MIAMI

ROSENSTIEL  
SCHOOL of MARINE &  
ATMOSPHERIC SCIENCE



Tritium Laboratory

24 June 2024

Tritium Laboratory  
4600 Rickenbacker Causeway  
Miami, Florida 33149-1031

Ph: 305-421-4100  
Fax: 305-421-4112  
E-mail: Tritium@rsmas.miami.edu

SWAB REPORT # 1097

SWAB DATE: 14 June 2024

*Isotope Van # 625.3.08*

---

Dr. James D. Happell  
Associate Research Professor

Distribution:  
SWAB Committee  
Joe Lachmann  
Tim Deering

## COMMENTS TO SWAB REPORTS

15 December 2021

The LSC is now a Quantulus GCT 6220, with the SWAB counting assay having background cpm of 0.3 & 1.2 for  $^3\text{H}$  &  $^{14}\text{C}$ . This replaces an LSC with background cpm of 1.6 & 5.5 for  $^3\text{H}$  &  $^{14}\text{C}$ .

All samples are counted for 60 minutes, the instrument background is subtracted, and activities are reported in  $\text{dpm}/\text{m}^2$ . Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in  $\text{dpm}/\text{m}^2$ . An error larger than the activity indicates that the activity is not significantly different from zero. All activities significantly above background will be in **bold**.

### Criteria for SWAB Results

| Category | $^3\text{H}$ ( $\text{dpm}/\text{m}^2$ ) | $^{14}\text{C}$ ( $\text{dpm m}^2$ ) | Recommendations   |
|----------|--|--------------------------------------|---|
| A        | <500                                     | <50                                  | No action   |
| B*       | 500-10,000                               | 50-10,000                            | Needs cleaning before any natural tracer work. Decks in radiation vans with activities above $1000 \text{ dpm}/\text{m}^2$ should be cleaned. |
| C**      | 10,000-100,000                           | 10,000-50,000                        | Must be cleaned before any use.   |
| D***     | >100,000                                 | >50,000                              | May be a health hazard. Notify local radiation safety official.   |

Note:  $^{14}\text{C}$  and  $^{35}\text{S}$  have peak energies of 156 and 167 KeV, respectively; thus  $^{35}\text{S}$  will be registered as  $^{14}\text{C}$  by our counting techniques. Categories A, B and C are not a health hazard.

### Recommended Cleaning Procedure

Wearing ordinary household rubber gloves:

$^3\text{H}$ : Wash and scrub with radioactive cleanup detergent such as COUNT-OFF (50 ml COUNT-OFF to 4 liters of water), using sponges to distribute solution and reabsorb it.

$^{14}\text{C}$ : Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing  $^{14}\text{CO}_2$ ). Follow up with wash as if for  $^3\text{H}$ .

### Disposal of Cleaning Materials (gloves, sponges, etc)

Categories A & B dispose as ordinary garbage, C & D contact your institution's radiation safety office.

Note: If category C or D is encountered, we try to notify the institution promptly by phone or email.

REPORT FOR SWAB # 1097

LOCATION: Lewes, DE

DATE: 14 June 2024

VESSEL: *Isotope Van # 625.3.08*

TECHNICIAN: Joe Lachmann

| Sample # | Sample Identification                    | <sup>3</sup> H dpm/m <sup>2</sup> |             | <sup>14</sup> C dpm/m <sup>2</sup> |             |
|----------|--|-----------------------------------|-------------|------------------------------------|-------------|
|          |  | activity                          | error       | activity                           | error       |
| 1        | 1st Vial Bkgnd                           | 0                                 | ± 0         | 0                                  | ± 0         |
| 2        | Initial bucket blank                     | <b>24</b>                         | ± <b>11</b> | <b>52</b>                          | ± <b>15</b> |
| 3        | Deck near entrance                       | -175                              | ± 13        | <b>3082</b>                        | ± <b>74</b> |
| 4        | Center deck                              | -106                              | ± 12        | <b>1472</b>                        | ± <b>52</b> |
| 5        | Deck near double doors                   | -7                                | ± 1         | <b>1170</b>                        | ± <b>46</b> |
| 6        | Top of LSC                               | <b>40</b>                         | ± <b>19</b> | <b>18</b>                          | ± <b>12</b> |
| 7        | Inside fume hood stainless steel tray    | -2                                | ± 102       | 5                                  | ± 13        |
| 8        | Small sink & counter stainless steel tra | <b>138</b>                        | ± <b>34</b> | 3                                  | ± 4         |
| 9        | Stainless steel tray above freezer       | <b>37</b>                         | ± <b>17</b> | <b>22</b>                          | ± <b>13</b> |
| 10       | Inside freezer                           | 14                                | ± 18        | 0                                  | ± 2         |
| 11       | Inside refrigerator                      | 20                                | ± 16        | 8                                  | ± 12        |
| 12       | Final bucket blank                       | 29                                | ± 17        | 10                                 | ± 11        |

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. Reports may now contain values less than zero. Decay counting background samples will be distributed about the background vial, which means that negative values are possible. In the past we rounded the negative values to zero. Values are only significantly above background when they are positive and larger than the error. Please note that we are now using a Quantulus 6220 LSC which counts very near natural background. While the cleanup standards have not changed all values above background will now be in bold. This Isotope van was last used on the R/V Walton Smith in February and March of 2024 (see SWAB #1082). This van and the Walton Smith were contaminated with either <sup>14</sup>C or <sup>35</sup>S during this cruise.

Figure 1  
SWAB # 1097  
14 June 2024

# UNOLS Rad Van 625.3.08

