

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Tritium Laboratory

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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 # 672

SWAB DATE: 28 March 2013

R/V Kilo Moana

Dr. James D. Happell
Associate Research Professor

Distribution:
SWAB Committee
Scott Ferguson

COMMENTS TO SWAB REPORTS

23 November 2010

Typical LSC instrument background values for ^3H and ^{14}C are 2 and 5 cpm, respectively. The LSC is a Tricarb 2910 TR with the low level counting option.

All samples are counted for 60 minutes, the instrument background is subtracted, and activities are reported in dpm/m². Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in dpm/m². An error larger than the activity indicates that the activity is not significantly different from zero.

Criteria for SWAB Results

| Category | ^3H (dpm/m ²) | ^{14}C (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 dpm/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}C and ^{35}S have peak energies of 156 and 167 KeV, respectively; thus ^{35}S will be registered as ^{14}C by our counting techniques. Categories A, B and C are not a health hazard.

Recommended Cleaning Procedure

Wearing ordinary household rubber gloves:

^3H : 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}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 ^3H .

Disposal of Cleaning Materials (gloves, sponges, etc)

Categories A & B dispose as ordinary garbage, C & D dispose in radiation waste system.

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

REPORT FOR SWAB # 672

LOCATION: Honolulu, HI
VESSEL: R/V Kilo Moana

DATE: 28 March 2013
TECHNICIAN: Charlene Grall

| Sample # | Sample Identification | ³ H dpm/m ² | | ¹⁴ C dpm/m ² | |
|----------|--|-----------------------------------|-------|------------------------------------|-------|
| | | activity | error | activity | error |
| 1 | 1st Vial Bkgnd | 0 | ± 0 | 0 | ± 0 |
| 2 | Initial bucket blank | 0 | ± 0 | 8 | ± 43 |
| | <u>Lab #2</u> | 0 | ± 0 | 36 | ± 37 |
| 3 | Deck inside entrance | 0 | ± 0 | 15 | ± 38 |
| 4 | Aft stbd sink area | 0 | ± 0 | 17 | ± 36 |
| 5 | Deck in center of lab | 0 | ± 0 | 18 | ± 39 |
| 6 | Fwd sink area | 0 | ± 0 | 26 | ± 37 |
| 7 | Aft port sink area | 0 | ± 0 | 6 | ± 39 |
| 8 | Port benchtop center section | 0 | ± 0 | 48 | ± 37 |
| 9 | Deck in front of fwd sink | 0 | ± 0 | 0 | ± 0 |
| 10 | Deck in front of port aft sink | 0 | ± 0 | 0 | ± 0 |
| | <u>Chemistry Lab</u> | | | | |
| 11 | Inside fume hood | 7 | ± 35 | 6 | ± 32 |
| 12 | Fwd sink area | 25 | ± 34 | 28 | ± 34 |
| 13 | Aft sink area | 0 | ± 0 | 14 | ± 39 |
| 14 | Deck inside entrance | 0 | ± 0 | 32 | ± 36 |
| 15 | Deck between aft sink and fume hood | 29 | ± 39 | 21 | ± 33 |
| 16 | Inside small Kenmore fridge | 99 | ± 59 | 4 | ± 15 |
| 17 | Stbd benchtop center section | 21 | ± 31 | 29 | ± 34 |
| | <u>Hydro Lab</u> | | | | |
| 18 | Deck between fwd and port entrance | 43 | ± 63 | 0 | ± 0 |
| 19 | Aft sink area | 0 | ± 0 | 3 | ± 48 |
| 20 | Aft benchtop | 0 | ± 0 | *255 | ± 44 |
| 21 | Center benchtop | 0 | ± 0 | 16 | ± 37 |
| 22 | Fwd benchtop | 0 | ± 0 | 3 | ± 87 |
| 23 | Stbd benchtop | 0 | ± 0 | 6 | ± 76 |
| 24 | Deck between center and stbd benchtops | 18 | ± 36 | 18 | ± 33 |
| | <u>Wet Lab</u> | | | | |
| 25 | Benchtop right of sink | 0 | ± 0 | 0 | ± 0 |
| 26 | Deck inside fwd entrance | 0 | ± 0 | 13 | ± 44 |
| 27 | Deck in center of lab | 0 | ± 0 | 24 | ± 39 |

| Sample # | Sample Identification | ³ H dpm/m ² | | ¹⁴ C dpm/m ² | |
|----------|--|-----------------------------------|-------|------------------------------------|-------|
| | | activity | error | activity | error |
| | <u>Lab #1</u> | | | | |
| 28 | Deck at fwd entrance | 0 | ± 0 | 0 | ± 0 |
| 29 | Stbd benchtop | 0 | ± 0 | 9 | ± 48 |
| 30 | Deck below sink | 0 | ± 0 | 12 | ± 45 |
| | <u>Scientific Storage</u> | | | | |
| 31 | Inside Cospolich #1 | 62 | ± 50 | 9 | ± 25 |
| 32 | Inside Cospolich #2 top | 52 | ± 55 | 0 | ± 0 |
| 33 | Inside Cospolich #2 bottom | 27 | ± 50 | 4 | ± 25 |
| 34 | Inside Cospolich #3 top | 0 | ± 2 | 22 | ± 35 |
| 35 | Inside Cospolich #3 bottom | 22 | ± 4 | *906 | ± 61 |
| 36 | Top of stbd Kenmore freezer | 0 | ± 0 | 17 | ± 40 |
| 37 | Top of center Kenmore freezer | 0 | ± 0 | 20 | ± 38 |
| 38 | Top of port Kenmore freezer | 261 | ± 64 | 11 | ± 15 |
| 39 | Final bucket blank (CO #1) | 0 | ± 0 | 5 | ± 50 |
| | <u>Miscellaneous Areas</u> | | | | |
| 40 | Initial bucket blank (CO #2) | 0 | ± 0 | 7 | ± 45 |
| 41 | Deck below water fountain | 0 | ± 0 | 0 | ± 0 |
| 42 | Deck inside Clean Power Room | 0 | ± 0 | 0 | ± 0 |
| 43 | 01 Deck Port deck where Rad Van sits | 0 | ± 0 | 12 | ± 46 |
| 44 | 01 Deck Stbd deck where Rad Van sits | 0 | ± 0 | 15 | ± 40 |
| 45 | Deck inside Library entrance from Mess | 0 | ± 0 | 0 | ± 0 |
| 46 | Deck inside I-Met Lab | 0 | ± 0 | 15 | ± 39 |
| 47 | Deck below coffee station in mess | 0 | ± 0 | 24 | ± 42 |
| 48 | Final bucket blank | 0 | ± 0 | 1 | ± 0 |

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error.

All areas tested in the ship were free from ³H contamination that requires cleaning. Minor ¹⁴C contamination was detected in the Hydro Lab on aft benchtop, and was also found in the Cospolich refrigerator #3, bottom section. These areas need to be cleaned before any natural tracer work.

