

UNIVERSITY OF MIAMI
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Tritium Laboratory

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SWAB REPORT # 666

SWAB DATE: 17 December 2012

R/V Atlantic Explorer and UNOLS Van #2409.01

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Distribution:
SWAB Committee
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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 # 666

LOCATION: St. George, Bermuda
VESSEL: *R/V Atlantic Explorer*

DATE: 17 December 2012
TECHNICIAN: Charlene Grall

Sample #	Sample Identification	^3H dpm/m ²		^{14}C dpm/m ²	
		activity	error	activity	error
1	1st Vial Bkgnd	0	± 0	0	± 0
2	Initial bucket blank #1	0	± 0	31	± 35
	<u>Aft/Wet Lab (Figure 1)</u>				
3	Inside fume hood	3	± 22	7	± 33
4	Deck at entrance to fume hood room	0	± 0	20	± 34
5	Benchtop fwd of sink	0	± 0	40	± 35
6	Inside Roper freezer top	13	± 33	15	± 32
7	Inside Roper refrigerator bottom	4	± 17	17	± 33
8	Shelves of door of GE freezer	0	± 0	33	± 36
9	Inside small black GE refrigerator	0	± 0	15	± 35
10	Sink area	0	± 0	26	± 34
11	Fwd benchtop	1	± 0	0	± 0
12	Center benchtop	0	± 0	10	± 39
13	Deck below freezers	0	± 0	0	± 0
14	Deck at aft entrance	5	± 19	15	± 33
	<u>Forward Lab (Figure 1)</u>				
15	Deck at stbd entrance	0	± 0	37	± 35
16	Fwd benchtop	0	± 0	20	± 36
17	Benchtop fwd of sink	0	± 0	32	± 36
18	Ice inside VWR freezer	16	± 36	9	± 30
19	Center benchtop	5	± 12	34	± 34
20	Benchtop aft of sink	0	± 0	23	± 37
21	Deck in Enviro Room	7	± 20	23	± 33
22	Benchtop in Enviro Room	0	± 0	23	± 36
	<u>Main Lab (Figure 1)</u>				
23	Main Lab-Port fwd freezer melt	20	± 65	0	± 0
24	Stbd fwd freezer melt	0	± 0	10	± 40
25	Deck below freezers	0	± 0	11	± 35
26	Aft metal benchtop	0	± 0	4	± 33
27	Stbd benchtop aft of clean air bench	0	± 0	0	± 0
28	Deck in front of stbd benchtop	0	± 0	14	± 34
29	Deck at aft entrance	0	± 0	0	± 0

Sample #	Sample Identification	³ H dpm/m ²		¹⁴ C dpm/m ²	
		activity	error	activity	error
30	Center benchtop	0	± 0	11	± 35
31	Benchtop aft of sink	0	± 0	27	± 36
32	Benchtop fwd of sink	18	± 35	13	± 31
33	Shelf in CTD garage	0	± 0	1	± 45
34	Deck in companionway between Lounge and Galley	3	± 22	7	± 32
<u>UNOLS Shared Use Van 2409.01 (Figure 2)</u>					
35	Sink area	42	± 40	24	± 31
36	Benchtop next to LSC	*736	± 83	*51	± 21
37	Inside fume hood	**13934	± 309	*284	± 17
38	Top of LSC	*1124	± 99	47	± 16
39	Deck between LSC and fume hood	*668	± 78	*68	± 24
40	Inside Danby refrigerator	*2138	± 119	*1433	± 69
41	Fwd clean benchtop	90	± 48	15	± 25
42	Deck inside entrance	250	± 58	42	± 27
43	Final bucket blank	0	± 0	9	± 40

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 or ¹⁴C contamination that requires cleaning.

Minor to moderate ³H and minor ¹⁴C contamination found in the van. The fume hood and inside Danby refrigerator needs to be cleaned before any further use.

Cleaning of deck is recommended to prevent tracking contamination out of van.

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Figure 2

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