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Tritium Laboratory
20 October 2021

SWAB REPORT # 1016

SWAB DATE: 15 October 2021

R/V Savannah

James D. Happell

Distribution:
SWAB Committee
John Bichy

COMMENTS TO SWAB REPORTS

12 May 2014

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/m^2 . Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in dpm/m^2 . 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 $1000 \text{ dpm}/\text{m}^2$ 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}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 contact your institution's radiation safety office.

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

REPORT FOR SWAB # 1016

LOCATION: Savannah, GA
VESSEL: R/V Savannah

DATE: 15 October 2021
TECHNICIAN: Jim Happell

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	-50 ±	0	-7 ±	0
	<u>Dry Lab (Figure 1)</u>				
3	Inside fume hood	missing		missing	
4	Benchtop next to fume hood	*5125 ±	201	*80 ±	11
5	Deck in front of fume hood	192 ±	66	2 ±	6
6	Benchtop aft of sink	-26 ±	90	18 ±	40
7	Benchtop forward of sink	-89 ±	31	8 ±	94
8	Center benchtop	-59 ±	204	-9 ±	112
9	Deck at aft entrance	-58 ±	198	16 ±	45
10	Forward deck	-40 ±	139	11 ±	45
	<u>Miscellaneous Areas (Figure 1)</u>				
11	Deck under water fountain	-24 ±	83	-14 ±	37
12	Deck at bottom of stairs	-48 ±	165	25 ±	41
13	Deck inside forward door	-22 ±	76	-7 ±	82
14	Deck at top of stairs	-33 ±	114	-12 ±	51
	<u>Wet Lab (Figure 1)</u>				
15	Port benchtop	-30 ±	102	15 ±	41
16	Benchtop forward of sink	-42 ±	143	20 ±	41
17	Benchtop aft of sink	-18 ±	63	11 ±	40
18	Inside Thermo refrigerator	-26 ±	91	6 ±	47
19	Inside Isotemp freezer	-22 ±	75	-10 ±	117
20	Deck at aft entrance	-18 ±	64	-12 ±	52
21	Deck inside port entrance	18 ±	63	-9 ±	108
	<u>Aft Deck (Figure 1)</u>				
22	Deck near incubator	-33 ±	114	20 ±	40
23	Deck near CTD	-2 ±	9	-23 ±	37
24	Final bucket blank	-30 ±	103	3 ±	70

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. The reports may now contain values less than zero. When 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. Unfortunately sample #3 from the fume hood never made it back to the Tritium lab for analysis. The benchtop next to the fumehood had minor ^3H contamination. There was above background ^3H detected on the deck below this counter and fumehood. The fume hood is a designated location to use elevated ^3H solutions and both samples taken in the surrounding areas have measurable ^3H , so it is suggested fume hood, adjacent benchtop and deck be cleaned. It also appears that there is minor ^{14}C contamination in the sample with the greatest ^3H . This is probably an artifact due to "spill over" because the ^3H and ^{14}C spectra overlap slightly when trying to count both isotopes in a single sample.

Figure 1
 SWAB #1016
 15 October 2021

