

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Tritium Laboratory

10 May 2021

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SWAB REPORT # 1000

SWAB DATE: 27 April 2021

R/V Atlantic Explorer and Van #625.5.02

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Distribution:
SWAB Committee
Quentin Lewis
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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 institution promptly by phone or email.

REPORT FOR SWAB # 1000

LOCATION: St. Georges, Bermuda, BIOS Dock
VESSEL: *R/V Atlantic Explorer*

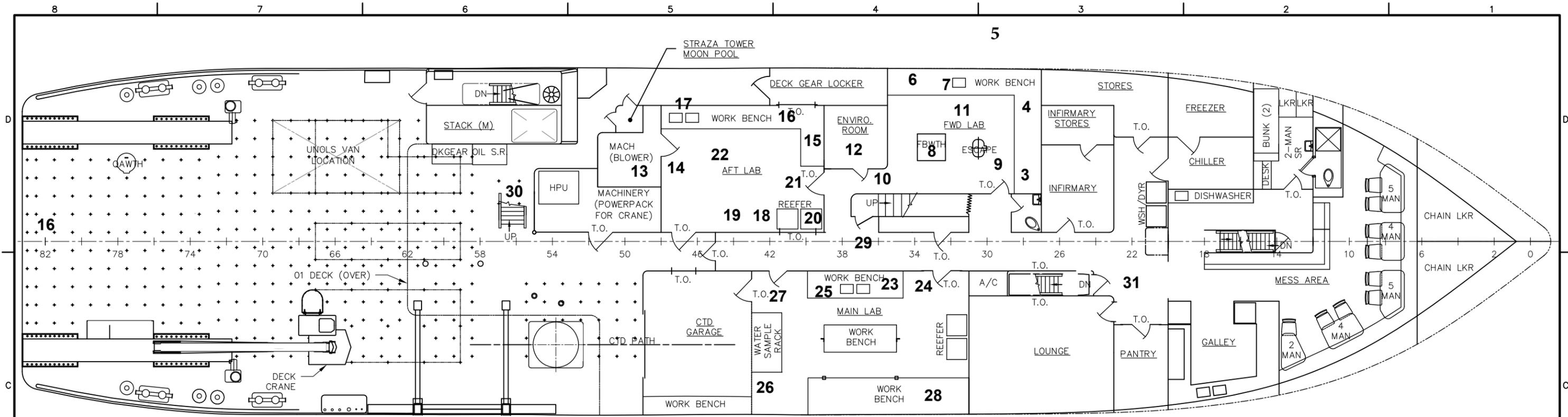
DATE: 27 April 2021
TECHNICIAN: Claire Medley, Emily Davey

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	17	± 585	-38	± 41
<u>Forward Lab (Figure 1)</u>				
3 Forward benchtop on starboard side	-21	± 85	4	± 51
4 Foward benchtop below pCO2 measuring system	-10	± 40	-29	± 56
5 Port benchtop forward of sink	-35	± 46	20	± 42
6 Port benchtop aft of sink	245	± 67	-3	± 11
7 Sink area	-26	± 104	21	± 41
8 Center benchtop	-1	± 17	-26	± 51
9 Deck inside starboard entrance	5	± 113	-6	± 65
10 Deck inside aft entrance	-23	± 92	-11	± 21
11 Deck in front of sink	-30	± 122	-7	± 78
12 Deck inside enviro room	-19	± 76	-40	± 43
<u>Aft Lab (Figure 1)</u>				
13 Inside fume hood	2	± 42	-28	± 55
14 Deck in front of fume hood	12	± 406	-22	± 43
15 Forward benchtop	-4	± 100	-23	± 45
16 Benchtop forward of sink	-23	± 92	3	± 65
17 Port sink area	-36	± 47	-18	± 35
18 Inside -80°C freezer #1	4	± 102	-31	± 59
19 Inside -80°C freezer #2	-59	± 78	4	± 186
20 Inside Cospolich refrigerator	-29	± 119	0	± 6
21 Deck below Cospolich refrigerator	-20	± 83	-12	± 23
22 Center benchtop	-8	± 30	-7	± 83

Sample #	Sample Identification	^3H dpm/m ²		^{14}C dpm/m ²	
		activity	error	activity	error
<u>Main Lab (Figure 1)</u>					
23	Port sink area	-38	± 50	38	± 41
24	Deck inside forward entrance	1	± 22	-16	± 31
25	Deck under sink area and bench aft of sink	-34	± 138	-5	± 58
26	Deck below end of water drain	-18	± 74	-36	± 39
27	Deck inside aft entrances	-46	± 61	7	± 59
28	Starboard clean benchtop	-18	± 71	-13	± 25
29	Deck at base of stairs to 01 deck	-27	± 111	-21	± 41
30	Three lower steps of aft stair outside	13	± 400	-25	± 48
31	Deck outside lounge	10	± 39	7	± 35
32	Intermediate bucket blank	-23	± 92	-21	± 40
<u>Radiation Van #625.5.02 (Figure 2)</u>					
33	Sink area	67	± 53	7	± 25
34	Benchtop adjacent to sink	213	± 66	-2	± 6
35	Inside fume hood and adjacent bench	*603	± 84	1	± 1
36	Benchtop adjacent to fumehood	161	± 63	-11	± 21
37	Top of LSC	48	± 63	-15	± 29
38	Inside freezer	-12	± 47	5	± 43
39	Inside refrigerator	*1199	± 96	*495	± 48
40	Benchtop adjacent to LSC	98	± 56	12	± 26
41	Deck in front of and below fume hood	140	± 61	12	± 24
42	Deck between LSC and freezer	95	± 58	2	± 12
43	Deck in front of sink and refrigerator	365	± 74	48	± 29
44	Benchtop across from sink	65	± 64	-19	± 37
45	Deck inside entrance	213	± 68	0	± 1
46	Deck outside entrance	-50	± 66	-25	± 49
47	Final bucket blank	-16	± 63	-12	± 24

Comments

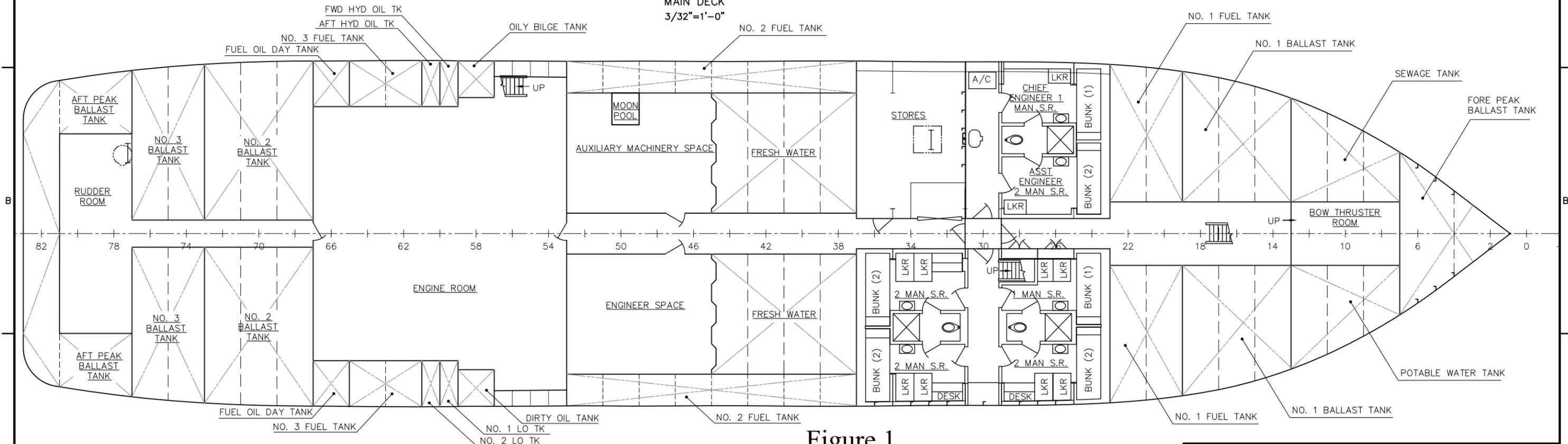
Please note that the error reported for each isotope is the two-standard deviation counting error. The reports may now contain values less than zero. When decay counting background samples will be distributed about the background vial, which means that negative values are possible. In the past we rounded the negative values to zero. Values are only significantly above background when they are positive and larger than the error. All areas tested on the ship were free from isotope contamination that requires cleaning. However, sample #6 from the forward lab does have ^3H above background and we suggest cleaning this area. Minor ^3H and ^{14}C contamination was found in Van # 625.5.02, but no action is necessary.



PLAN 2-5C

MAIN DECK

3/32"=1'-0"



PLAN 2-5A

HOLD LEVEL

3/32"=1'-0"

Figure 1
SWAB #1000
27 April 2021

BIOS ST. GEORGE'S, BERMUDA			
R/V ATLANTIC EXPLORER GENERAL ARRANGEMENT HOLD LEVEL AND MAIN DECK PLANS			
THE GLOSTJEN ASSOCIATES <i>Consulting Engineers Serving the Marine Community</i>		1201 Western Avenue, Suite 200 Seattle, Washington 98101-2953 TEL: 206.624.7850 WEB: www.glostjen.com	
Drawn TGA	Checked CSC	Approved DHK	Date 05/30/2014
Scale AS NOTED	Drawing Number 12146-070-01	Sheet 2	of 4
		Revision A	