

UNIVERSITY OF MIAMI  
ROSENSTIEL  
SCHOOL of MARINE &  
ATMOSPHERIC SCIENCE



Tritium Laboratory

17 August 2020

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 # 987

SWAB DATE: 2 August 2020

*R/V Atlantic Explorer*

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Dr. James D. Happell  
Associate Research Professor

Distribution:  
SWAB Committee  
Quentin Lewis  
Rod Johnson

## COMMENTS TO SWAB REPORTS

12 May 2014

Typical LSC instrument background values for  $^3\text{H}$  and  $^{14}\text{C}$  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  $\text{dpm}/\text{m}^2$ . 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.

### 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 # 987

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

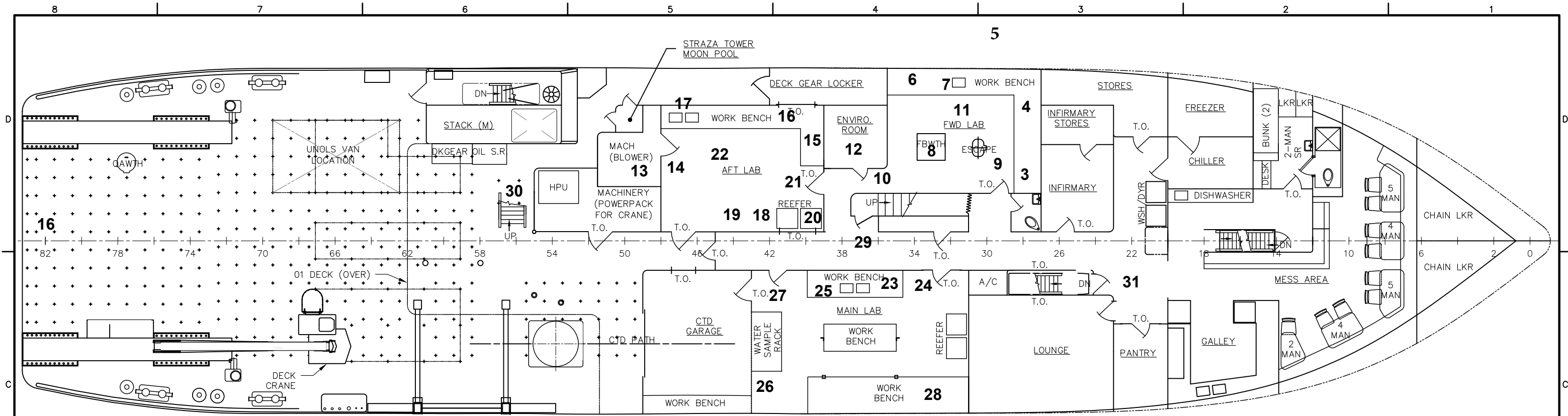
DATE: 2 August 2020  
TECHNICIAN: Rod Johnson

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	-11	±	0	-1	±	0
<u>Forward Lab (Figure 1)</u>						
3 Forward benchtop on starboard side	-9	±	149	-11	±	40
4 Forward benchtop below pCO <sub>2</sub> measuring system	-13	±	225	16	±	39
5 Port benchtop forward of sink	-5	±	31	-8	±	44
6 Port benchtop aft of sink	-19	±	66	-14	±	43
7 Sink area	-26	±	26	19	±	40
8 Center benchtop	-3	±	143	1	±	46
9 Deck inside starboard entrance	-25	±	25	6	±	47
10 Deck inside aft entrance	-16	±	58	-2	±	105
11 Deck in front of sink	-9	±	147	10	±	39
12 Deck inside Enviro Room	-5	±	29	29	±	38
<u>Aft Lab (Figure 1)</u>						
13 Inside fume hood	-27	±	27	-1	±	75
14 Deck in front of fume hood	-27	±	26	-1	±	45
15 Forward benchtop	-70	±	42	11	±	57
16 Benchtop forward of sink	-35	±	96	-1	±	65
17 Port sink area	-15	±	53	16	±	39
18 Inside -80°C freezer #1	-2	±	34	10	±	37
19 Inside -80°C freezer #2	-47	±	129	27	±	41
20 Inside Cospolich refrigerator (H <sub>2</sub> O only)	0	±	0	-15	±	47
21 Deck below Cospolich refrigerator	-10	±	179	29	±	38
22 Center benchtop	-16	±	57	4	±	46

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
<u>Main Lab (Figure 1)</u>					
23	Port sink area	-12	± 186	-9	± 53
24	Deck inside forward entrance	5	± 224	-8	± 42
25	Deck under sink area and bench aft of sink	-44	± 123	9	± 50
26	Deck below end of aft water drain	-23	± 23	-11	± 42
27	Deck inside aft entrances	-30	± 84	15	± 42
28	Starboard clean benchtop	-32	± 89	29	± 40
29	Deck at base of stairs to 01 Deck	17	± 60	-5	± 38
30	Three lower steps of aft stair outside	-25	± 25	11	± 42
31	Deck outside Lounge	-3	± 185	9	± 38
32	Intermediate bucket blank	-52	± 144	15	± 46
<u>Radiation Van #625.5.02 (Figure 2)</u>					
33	Sink area	91	± 52	20	± 30
34	Benchtop adjacent to sink	145	± 62	-12	± 45
35	Benchtop adjacent to fume hood	-14	± 50	20	± 39
36	Inside fume hood and adjacent bench	275	± 67	16	± 19
37	Top of LSC	325	± 67	*61	± 31
38	Inside freezer	-43	± 118	15	± 44
39	Inside refrigerator	229	± 53	*171	± 40
40	Benchtop adjacent to LSC	87	± 52	20	± 30
41	Deck in front of and below fume hood	92	± 47	*52	± 35
42	Deck between LSC and freezer	29	± 29	*57	± 38
43	Deck in front of sink and refrigerator	118	± 52	*51	± 34
44	Benchtop across from sink	25	± 70	-13	± 38
45	Deck inside entrance	403	± 77	23	± 20
46	Deck outside entrance	9	± 146	-13	± 36
47	Final bucket blank	5	± 230	-23	± 20

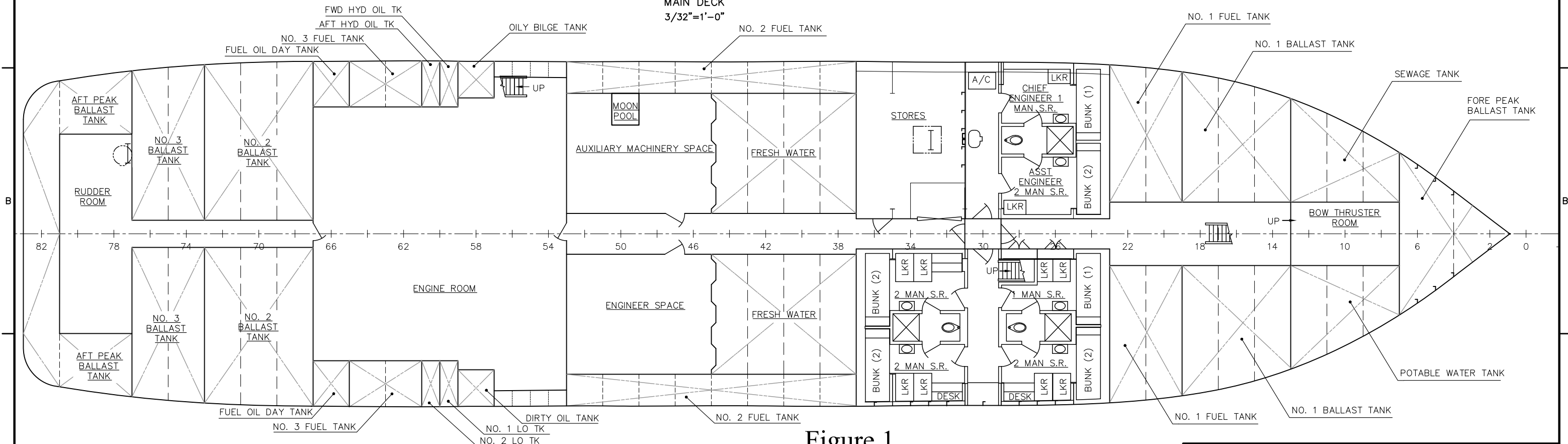
### Comments

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. Minor <sup>14</sup>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 #987**  
**2 August 2020**

<b>BIOS</b> ST. GEORGE'S, BERMUDA			
<b>R/V ATLANTIC EXPLORER</b> GENERAL ARRANGEMENT HOLD LEVEL AND MAIN DECK PLANS			
<b>THE GLOSTEN ASSOCIATES</b> Consulting Engineers Serving the Marine Community		1201 Western Avenue, Suite 200 Seattle, Washington 98101-2953 TEL: 206.624.7850 WEB: www.glosten.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

UNOLS Rad Van #625.5.02

Figure 2  
SWAB #987  
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