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Tritium Laboratory
2 June 2025

SWAB REPORT # 1118

SWAB DATE: 29 May 2025

R/V Atlantic Explorer
UNOLS Radioisotope Van #2408-04

James Happell Digitally signed by James Happell Date: 2025.06.02 11:04:09 -04'00'

James D. Happell

Distribution:
SWAB Committee
Capt. Rick Verlini
Rod Johnson
Rory O'Connell

COMMENTS TO SWAB REPORTS 15 December 2021

The LSC is now a Quantulus GCT 6220, with the SWAB counting assay having background cpm of 0.3 & 1.2 for ^{3}H & ^{14}C. This replaces an LSC with background cpm of 1.6 & 5.5 for ^{3}H & ^{14}C.

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. All activities significantly above background will be in **bold**.

Criteria for SWAB Results

Category	^{3}H (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 Proceedure

Wearing ordinary household rubber gloves:

^{3}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}C: Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing $^{14}CO_2$). Follow up with wash as if for ^{3}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 insitution promptly by phone or email.

REPORT FOR SWAB # 1118

LOCATION: St. Georges, Bermuda
DATE: 29 May 2025
VESSEL: *R/V Atlantic Explorer*
TECHNICIAN: Jim Happell

Sample #	Sample Identification	^{3}H dpm/m^{2} activity		error	^{14}C dpm/m^{2} activity		error
1	1st Vial Bkgnd	0	±	0	0	±	0
2	Initial bucket blank	10	±	156	-18	±	60
	Forward Lab (Figure 1)						
3	Forward benchtop	27	±	33	-10	±	35
4	Port benchtop forward of sink	-7	±	107	-5	±	17
5	Deck inside starboard entrance	0	±	2	-13	±	45
6	Port sink area	-8	±	121	-16	±	55
7	Center benchtop	-28	±	33	-8	±	28
8	Port benchtop aft of sink	36	±	37	-19	±	63
9	Deck outside Enviro Room	-11	±	55	-2	±	8
10	Deck in front of sink	-12	±	61	-1	±	3
	Main Lab (Figure 1)						
11	Deck inside forward entrance	36	±	40	-19	±	65
12	Port sink area	-29	±	34	-2	±	5
13	Benchtop inside laminar flow hood	-4	±	69	-21	±	71
14	Deck inside aft entrances	-27	±	31	-16	±	55
15	Deck in front of water sample rack	-4	±	62	-10	±	35
16	Inside Thermo freezer	5	±	77	-13	±	45
17	Inside Thermo refigerator	37	±	44	-27	±	90
18	Deck in front of Thermo freezer	-9	±	133	-12	±	40
19	Port benchtop forward of sink	-17	±	85	-19	±	64
20	Center benchtop	-2	±	26	-22	±	74
21	Port benchtop aft of sink	-4	±	63	-1	±	4
	Aft Lab (Figure 1)						
22	Deck inside forward entrance	1	±	17	-16	±	54
23	Port benchtop	17	±	81	-24	±	82
24	Inside -80^{o}C freezer #2	-13	±	66	-7	±	22
25	Inside fume hood	-15	±	72	-13	±	43
26	Port sink area	-22	±	26	-4	±	13
27	Deck inside starboard aft entrance	-13	±	62	-11	±	36
28	Center benchtop	4	±	64	-18	±	62
29	Inside dead Cospolich freezer	-32	±	37	-6	±	20
30	Inside dead Cosopolich refrigerator	-6	±	90	-33	±	110

Sample #	Sample Identification	^{3}H dpm/m^{2} activity	error	^{14}C dpm/m^{2} activity	error
31	Inside live Cospolich refrigerator	-41	± 48	-16	± 53
32	Inside live Cospolich freezer	-42	± 49	6	± 21
33	Deck in front of -80°C freezers	6	± 93	-21	± 69
34	Inside -80°C freezer #1	-8	± 126	-13	± 43
35	Forward benchtop	10	± 69	-13	± 44
36	CTD Bay port benchtop	-27	± 32	-6	± 21
	Radioisotope Van #2408-04 (Figure 2)				
37	Benchtop adjacent to sink	**401**	**± 61**	**9**	**± 5**
38	Benchtop adjacent to fume hood	**393**	**± 60**	**6**	**± 4**
39	Inside fume hood	***744**	**± 63**	-2	± 1
40	Top of LSC	**88**	**± 35**	-3	± 21
41	Inside freezer	12	± 26	-10	± 34
42	Inside refrigerator	***637**	**± 71**	***73**	**± 14**
43	Benchtop adjacent to LSC	**82**	**± 35**	2	± 5
44	Deck in front of fume hood	**254**	**± 48**	**37**	**± 13**
45	Sink area	**77**	**± 34**	1	± 2
46	Benchtop across from sink	**69**	**± 34**	-9	± 30
47	Deck in center of van	**231**	**± 48**	4	± 4
48	Deck inside entrance	**94**	**± 36**	6	± 9
49	Final bucket blank	-23	± 28	-5	± 16

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. Reports may now contain values less than zero. 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. Please note that we are now using a Quantulus 6220 LSC which counts very near natural background. While the cleanup standards have not changed all values above background will now be in bold. All areas sampled inside the ship were free from isotope contamination requiring cleaning. Minor ^{3}H and ^{14}C contamination was found in the Rad van. No action is necessary.

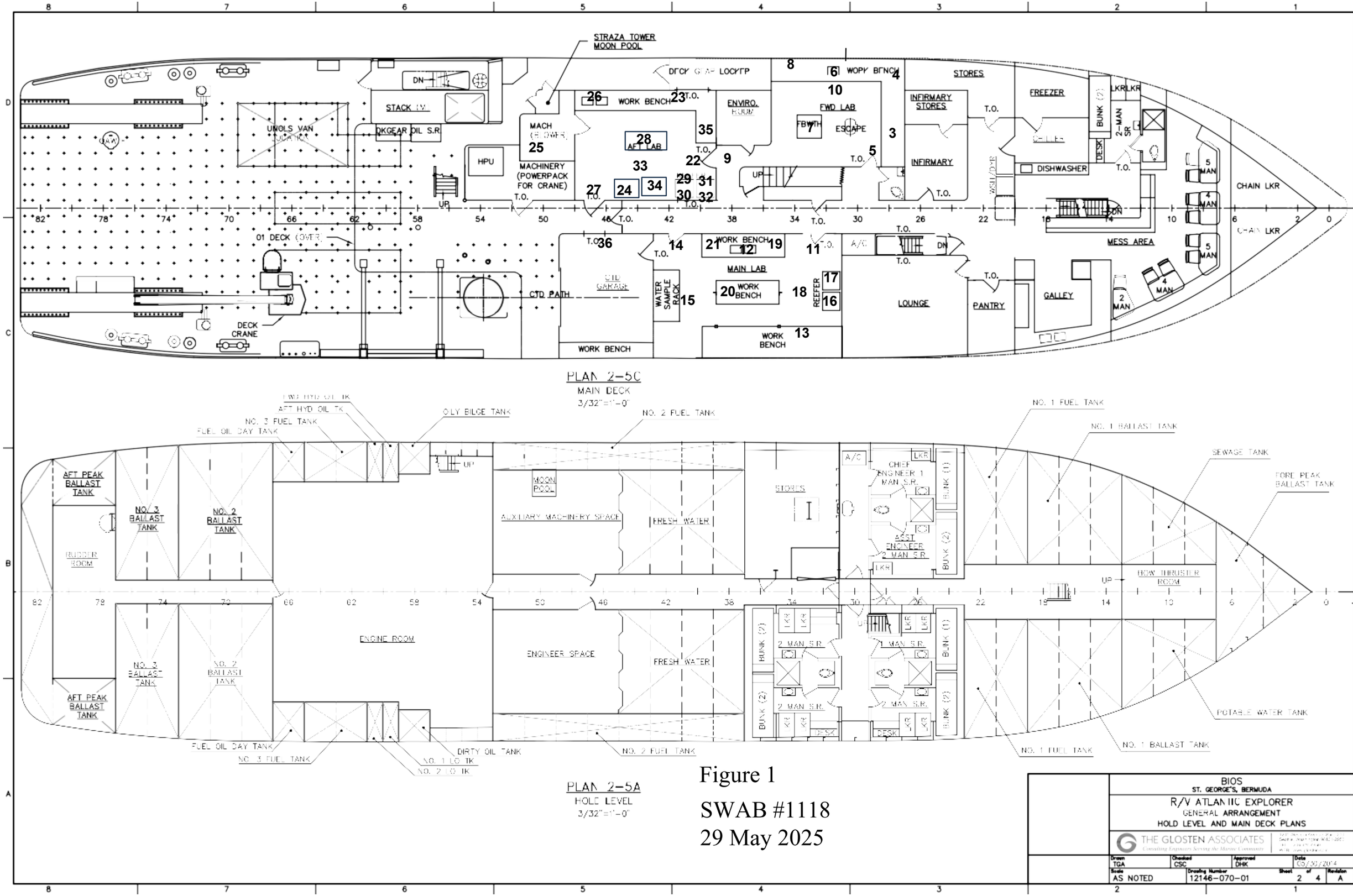

Figure 1

SWAB #1118

29 May 2025

BIOS
ST. GEORGE'S, BERMUDA

R/V ATLANTIC EXPLORER
GENERAL ARRANGEMENT
HOLD LEVEL AND MAIN DECK PLANS

THE GLOSTEN ASSOCIATES
Consulting Engineers Serving the Marine Community

Drawn	Checked	Approved	Date
TGA	CSC	DHK	05/30/2014

Scale	Drawing Number	Sheet	of	Revision
AS NOTED	12146-070-01	2	4	A

UNOLS Rad Van 2408-04

Figure 2
SWAB #1118
29 May 2025