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17 October 2011

SWAB REPORT # 602

SWAB DATE: 8 October 2011

R/V Melville

James Happell

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James D. Happell

Distribution:
SWAB Committee
Gary Lain

COMMENTS TO SWAB REPORTS 23 November 2010

Typical LSC instrument background values for ^{3}H 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	^{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/m2 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 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 # 602

LOCATION: Bridgetown, Barbados
VESSEL/LAB: *R/V Melville*

DATE: 8 October 2011
TECHNICIAN: Jim Happell

Sample #	Sample Identification	^{3}H dpm/m^{2} activity		^{3}H dpm/m^{2} error	^{14}C dpm/m^{2} activity		^{14}C dpm/m^{2} error
1	1st Vial Bkgnd	0	±	0	0	±	0
2	Initial bucket #1 blank	0	±	0	0	±	0
	Main Lab (see Figure 1)						
3	Bench top across & aft of port sink	52	±	58	0	±	0
4	Bench top aft of port sink	1	±	3	27	±	39
5	Aft deck in front of phone	51	±	61	0	±	0
6	Deck in aft hanger outside lab entrance	5	±	0	0	±	0
7	Deck in front of aft stairs	0	±	0	0	±	0
8	Deck next to Sanyo -80^{o}C freezer	2	±	14	12	±	38
9	Deck beween stbd. entrance & Kelvinator	16	±	81	0	±	0
10	Deck in front of forward passage	54	±	76	0	±	0
11	Deck in front of computer benchtops	0	±	0	0	±	0
12	Deck across from starboard entrance	22	±	157	0	±	0
13	Center bench top	0	±	0	*921	±	64
	Analytical Lab (see Figure 1)						
14	Deck inside aft entrance	40	±	69	0	±	0
15	Inside fume hood	*829	±	96	0	±	0
16	Forward bench top	25	±	93	0	±	0
17	Sink area	7	±	0	0	±	0
18	Deck in front of sink	1	±	0	0	±	0
19	Bench top across from sink	63	±	50	22	±	33
20	Bench top in aft hanger	10	±	0	0	±	0
	01 Deck (see Figure 1)						
21	Bench top in aft hanger	0	±	0	0	±	0
22	Deck near res tech shop	0	±	0	7	±	42
23	Deck near starboard A-frame	48	±	42	33	±	36
24	Deck under aft A-frame	0	±	0	5	±	41
	02 Deck (see Figure 1)						
25	Deck at stairs to 01 deck	45	±	55	2	±	18
26	Deck near rad van entrance	0	±	0	32	±	41

Sample #	Sample Identification	^{3}H dpm/m^{2} activity		error	^{14}C dpm/m^{2} activity		error
Dark Room (see Figure 1)							
27	Sink area	6	±	31	8	±	36
28	Bench top across from sink	0	±	0	0	±	0
29	Deck inside aft entrance	57	±	51	16	±	32
Miscellaneous Areas (see Figure 1)							
30	Deck at aft entrance to mess	8	±	30	12	±	37
31	Deck at forward entrance to mess	0	±	0	7	±	39
32	final bucket #1 blank	0	±	0	4	±	52
33	initial bucket #2 blank	0	±	0	0	±	0
34	Upper lab deck in front of printer	27	±	94	0	±	0
35	Deck outside library	0	±	0	1	±	60
SIO Rad Van #12 (see Figure 2)							
36	Bench top opposite sink	0	±	0	*2242	±	88
37	Fume hood	0	±	0	*616	±	56
38	Freezer	*1200	±	83	*1332	±	70
39	Refrigerator	0	±	0	*3096	±	101
40	Bench top above refrigerator	402	±	59	*320	±	46
41	Bench top above freezer	54	±	6	*1721	±	79
42	Sink area	169	±	26	*771	±	60
43	Deck in front of entrance by fume hood	*652	±	55	*1475	±	74
44	Deck in front of entrance by sink	376	±	46	*825	±	60
45	Intermediate bucket #2 blank	0	±	0	0	±	0
UNOLS Shared Use Van 2408-04 (See Figure 3)							
46	Sink area	53	±	39	*52	±	38
47	Bench top above refrigerator	76	±	37	*104	±	40
48	Bench top above freezer	81	±	37	*108	±	40
49	Fume hood	36	±	36	39	±	37
50	Bench top opposite freezer	0	±	0	*427	±	51
51	Bench top opposite sink	0	±	0	*52	±	40
52	Deck at large door	*2331	±	107	*3429	±	104
53	Deck at small door	222	±	30	*852	±	61
54	Freezer	153	±	57	26	±	30
55	Refrigerator	0	±	0	*2430	±	91
56	Final bucket #2 blank	0	±	0	0	±	0

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. Most areas tested on the ship were free from radioisotope contamination, except for the fume hood in the analytical lab which had ^{3}H contamination,and the center bench top in the main lab, which had ^{14}C contamination. These two areas require cleaning before any additional use. The two Rad Vans had minor ^{3}H nad ^{14}C contamination. Althpugh no action is required we recommend cleaning of the decks to help prevent tracking contamination into the ship.

Figure 1.
SWAB #602
8 October 2011

R/V MELVILLE

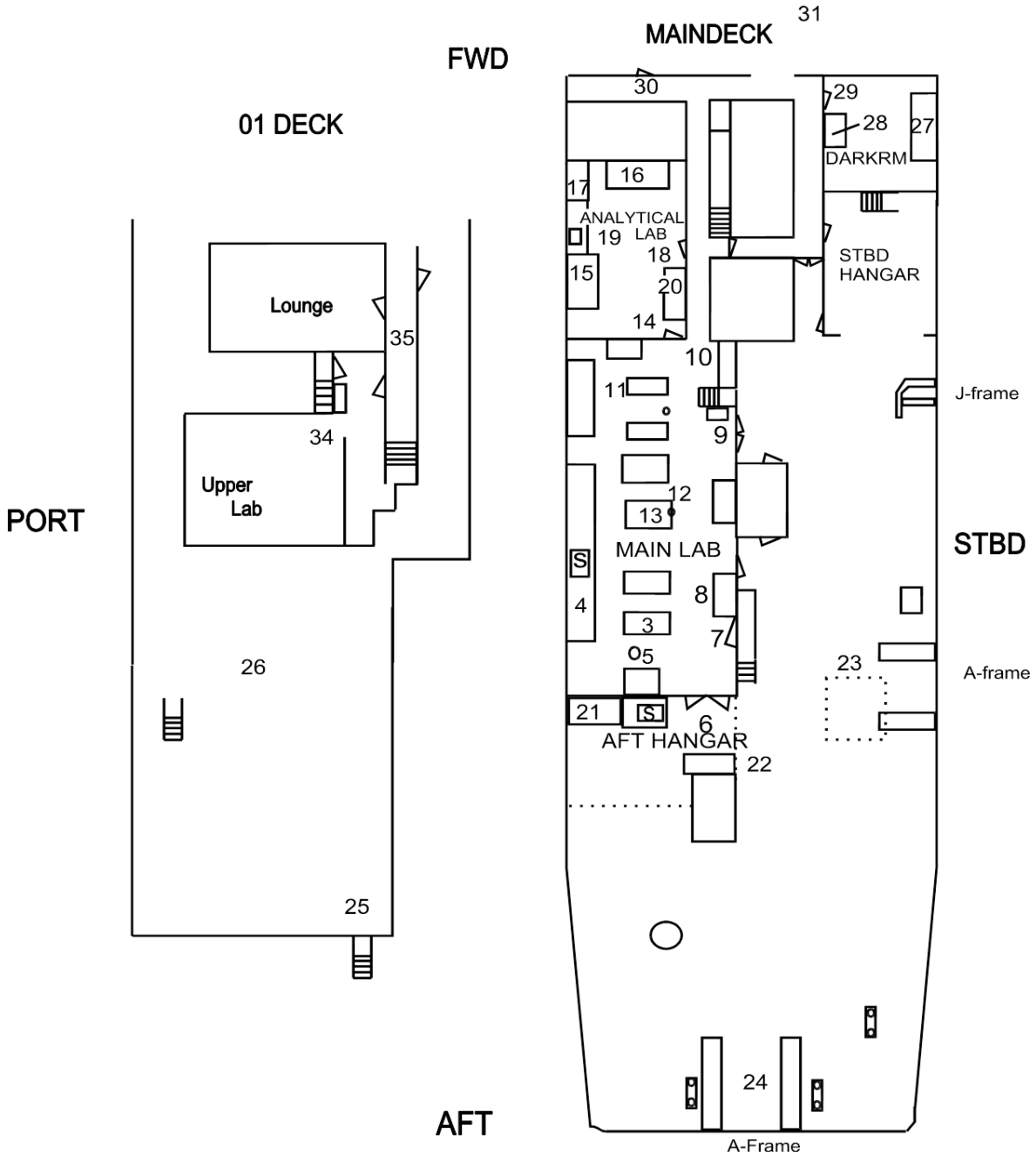

Figure 2
SWAB #602
8 October 2011

RADIOISOTOPE VAN

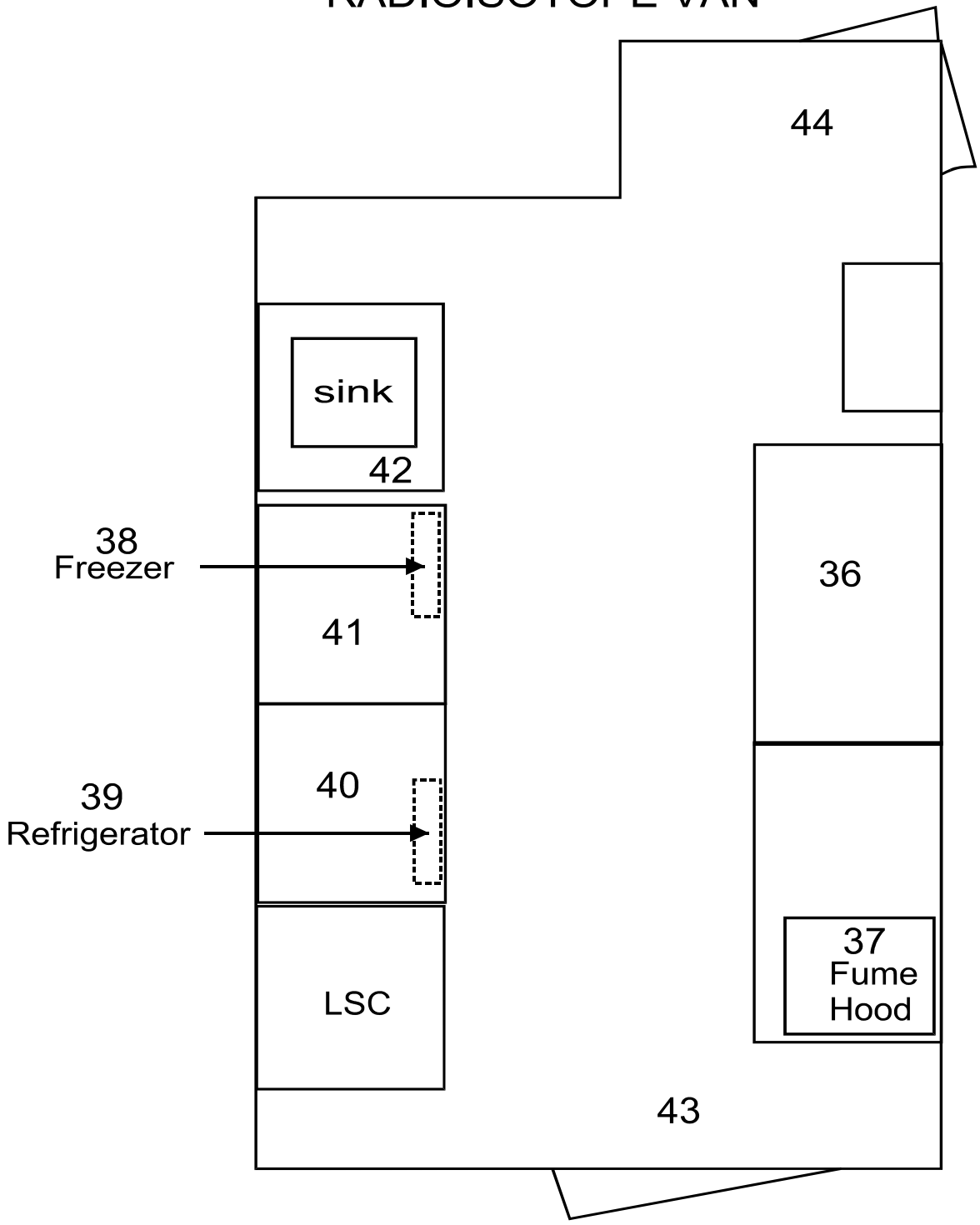

Figure 3.
SWAB #602
8 October 2011

UNOLS VAN 2408-04