UNIVERSITY OF MIAMI ROSENSTIEL SCHOOL of MARINE & ATMOSPHERIC SCIENCE



5 June 2013

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SWAB REPORT # 681

SWAB DATE: 5 April 2013

R/V Nathaniel B. Palmer Radioisotope Van #4

James D. Happell

Distribution: **SWAB** Committee Phil Spindler Amy Westman

Typical LSC instrument background values for ³H and ¹⁴C 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/m². Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in dpm/m². 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: ¹⁴C and ³⁵S have peak energies of 156 and 167 KeV, respectively; thus ³⁵S will be registered as ¹⁴C by our counting techniques. Categories A, B and C are not a health hazard.

<u>Recommended Cleaning Proceedure</u> 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.

¹⁴C: Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing ¹⁴CO₂). Follow up with wash as if for ³H.

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 # 681

LOCATION: Punta Arenas, Chile

DATE: 5 April 2013 TECHNICIAN: Amy Westman VESSEL/LAB: R/V Nathaniel B. Palmer

Sample # Sa	ample # Sample Identification		³ H dpm/m ²			¹⁴ C dpm/m ²		
-	Frankra rammana		activity error		activity error			
1 1s	t Vial Bkgnd	0	±	0	0	±	0	
2 In	itial bucket blank	41	土	49	0	±	0	
Ra	adioisotope Van #4 (Figure 1)							
3 Ins	side fume hood	393	\pm	71	45	\pm	25	
4 Be	enchtop left of sink	286	\pm	61	*94	\pm	33	
5 Si	nk area	*934	\pm	96	49	\pm	19	
6 W	aste collection area	479	\pm	29	*3963	\pm	111	
7 To	op of LSC	187	\pm	54	*65	\pm	32	
8 Be	enchtop across from sink	397	±	70	9	土	10	
9 Be	enchtop across from freezer	276	\pm	47	*342	\pm	44	
10 In:	side freezer	*1472	\pm	113	*169	\pm	29	
11 In:	side refridgerator	*4982	\pm	190	*765	±	47	
12 De	eck in front of fume hood	*625	±	81	*62	\pm	24	
13 De	eck under escape hatch	292	±	55	*195	土	39	
14 De	eck inside entrance	244	±	57	*88	土	33	
15 In	termediate bucket blank	0	±	0	32	±	36	
02	2 Deck (Figure 2)							
16 W	aste storage area	19	±	48	3	土	25	
17 De	eck outside rad van door	33	±	39	25	土	32	
18 To	op of incubator	0	土	0	35	±	35	
<u>He</u>	elo Hangar & Workshop (Figure 2)							
19 De	eck by chem van	5	\pm	22	15	\pm	34	
20 Bc	ottom of rad refrigerator, inside	0	\pm	0	25	\pm	35	
21 To	op of rad refrigerator, inside	5	\pm	13	29	\pm	35	
22 De	eck by sink	0	\pm	0	57	\pm	37	
23 De	eck by rad refrigerator	0	\pm	0	14	\pm	38	
24 In:	side rad freezer	0	±	0	27	\pm	35	
25 En	ntrance to Helo Hangar	10	土	36	9	±	32	
<u>Bi</u>	io Lab (Figure 3)							
26 De	eck inside entrance	0	±	0	18	土	35	
27 De	eck by fwd entrance	0	±	0	11	\pm	41	
	eck by aft hood	24	±	54	0	\pm	0	
29 De	eck in front of refrigerators	45	\pm	59	0	\pm	0	
	utboard sink	50	±	43	30	\pm	32	
	board sink	41	±	34	*53	±	34	

32 Inside fivd fume hood	Sample #	nple # Sample Identification		³ H dpm/m ²			¹⁴ C dpm/m ²		
33 Inside aft fume hood 34 Big Antarctica - sink area 35 Little Antarctica - benchtop by sink 0 ± 0 6 ± 4 12 ± 34 35 Little Antarctica - benchtop by sink 0 ± 0 6 ± 44 50 Deck outside Big Antarctica door 22 ± 75 0 ± 0 Aft Dry Lab (Figure 4) 36 Top of Reveo chest freezer 29 ± 89 0 ± 0 37 Deck by Reveo chest freezer 38 Inside inboard incubator 0 ± 0 16 ± 33 39 Deck between tables 0 0 0 29 37 40 Port sink 0 0 0 20 38 41 Deck by aft door 42 Deck to Baltic Room 4 ± 28 7 ± 33 43 Aft sink area 15 57 0 0 0 44 Deck inside fived door 45 Intermediate bucket blank 46 Inside Fisher freezer 47 Inside outboard incubator 48 Outboard incubator 49 Deck by aft sink 50 0 0 2 9 37 48 Outboard involvator 51 Entrance to fived Dry Lab 53 Deck by hallway entrance to Baltic Room 54 Fwd door deck to Hydro Lab 55 Intermediate bucket blank 56 Inside Sinker freezer 57 Inside Figure S) 56 Inside Summit refrigerator 57 Inside Figure S) 56 Inside Summit refrigerator 57 Inside Figure S) 56 Inside Summit refrigerator 57 Inside Figure S) 56 Deck inside fived door 66 Deck inside port doors 66 Deck inside stod doors 67 Deck inside port doors 66 Deck inside port doors 66 Deck inside port doors 67 Deck inside port doors 68 Deck inside port doors 68 Deck inside port doors 69 Deck inside port doors 60 Deck inside port doors	_	-				activity	(error	
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60 Deck by aft sink $0 \pm 0 \qquad *52 \pm 37$ 61 Deck by stbd sink $0 \pm 0 \qquad 21 \pm 35$ $\frac{\text{Wet Lab (Figure 6)}}{\text{Deck inside fwd door}}$ 62 Deck inside fwd door $0 \pm 0 \qquad 34 \pm 36$ 63 Aft sink area $0 \pm 0 \qquad 3 \pm 101$ 64 Stbd benchtop $0 \pm 0 \qquad 10 \pm 38$ 65 Deck inside port doors $0 \pm 0 \qquad 27 \pm 38$ 66 Deck inside stbd doors $0 \pm 0 \qquad 40 \pm 36$								37	
61 Deck by stbd sink		1					土	36	
Wet Lab (Figure 6)62 Deck inside fwd door 0 ± 0 34 ± 36 63 Aft sink area 0 ± 0 3 ± 101 64 Stbd benchtop 0 ± 0 10 ± 38 65 Deck inside port doors 0 ± 0 27 ± 38 66 Deck inside stbd doors 0 ± 0 40 ± 36				\pm	0		土	37	
62 Deck inside fwd door 63 Aft sink area 64 Stbd benchtop 65 Deck inside port doors 66 Deck inside stbd doors $0 \pm 0 \\ 0 \pm 0 \\ 0 \pm 0$ $0 \pm 0 \\ 0 \pm 38$ $0 \pm 0 \\ 0 \pm 38$ $0 \pm 0 \\ 0 \pm 38$	61	Deck by stbd sink	0	±	0	21	±	35	
63 Aft sink area $0 \pm 0 3 \pm 101$ 64 Stbd benchtop $0 \pm 0 10 \pm 38$ 65 Deck inside port doors $0 \pm 0 27 \pm 38$ 66 Deck inside stbd doors $0 \pm 0 40 \pm 36$		Wet Lab (Figure 6)							
64 Stbd benchtop $0 \pm 0 \\ 65 \text{ Deck inside port doors} \\ 66 \text{ Deck inside stbd doors} \\ 0 \pm 0 \\ 0 \pm 38 \\ 0 \pm 36 \\ 0 \pm$	62	Deck inside fwd door	0	\pm	0	34	\pm	36	
65 Deck inside port doors $0 \pm 0 \\ 0 \pm 0 \\ 0 \pm 36$ 66 Deck inside stbd doors $0 \pm 0 \\ 0 \pm 36$	63	Aft sink area	0	\pm	0	3	±	101	
66 Deck inside stbd doors $0 \pm 0 \pm 36$	64	Stbd benchtop	0	\pm	0	10	±	38	
66 Deck inside stbd doors $0 \pm 0 \pm 36$	65	Deck inside port doors	0	\pm	0	27	±	38	
		=	0	\pm	0	40	±	36	
1 · · · · · · · · · · · · · · · · · · ·			26	±			±	31	
]	1			_				

Sample # Sample Identification	³ H dpm/m ² activity error	¹⁴ C dpm/m ² activity error		
Aquarium Room (Figure 7)	•	·		
68 Deck by entrance to Aquarium room	0 ± 0	1 ± 0		
69 Final bucket blank	0 ± 0	5 ± 42		

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 activity that requires cleaning. However, there was a small amount of radiocarbon in the inboard sink in the Bio Lab and on the deck by the sink in the Hydro Lab.

These should be cleaned before any natural tracer work is done. Tritium and radiocarbon contamination was also found in the radiation van, however no action is needed.

R/V Nathaniel B. Palmer

Radioisotope Van #4

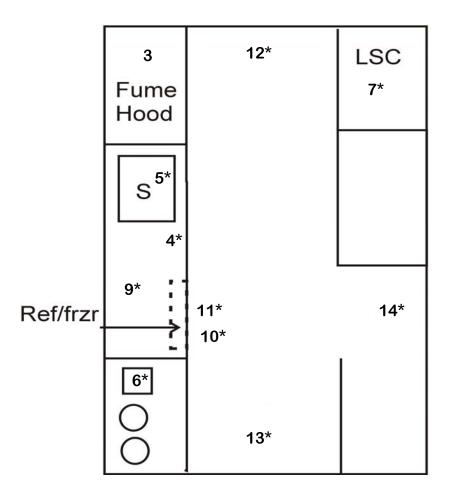
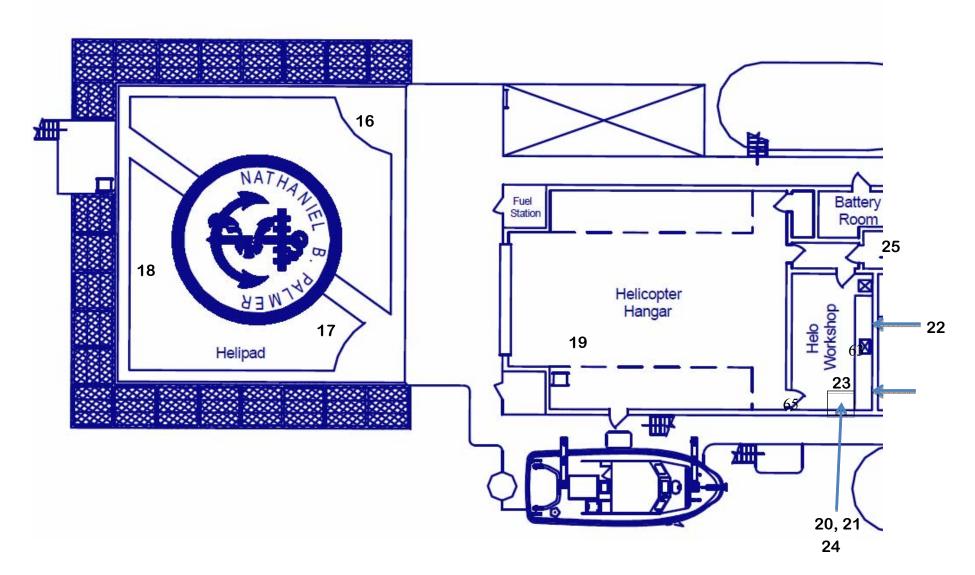
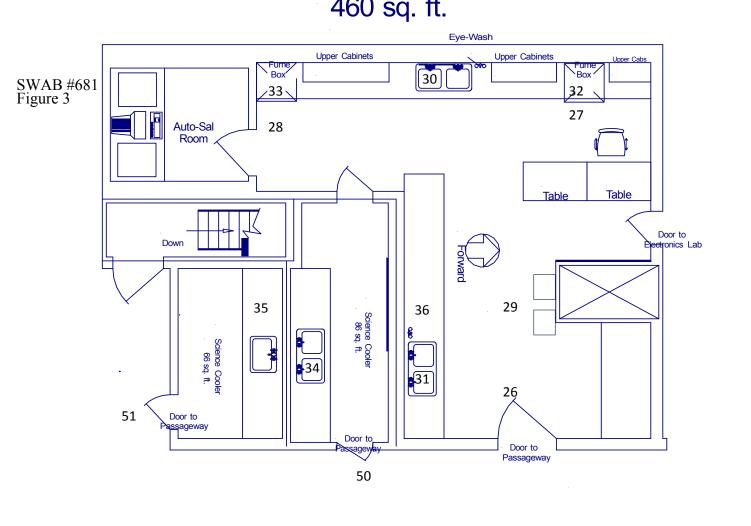


Figure 2 SWAB #681 Nathaniel B. Palmer



Bio Lab 460 sq. ft.



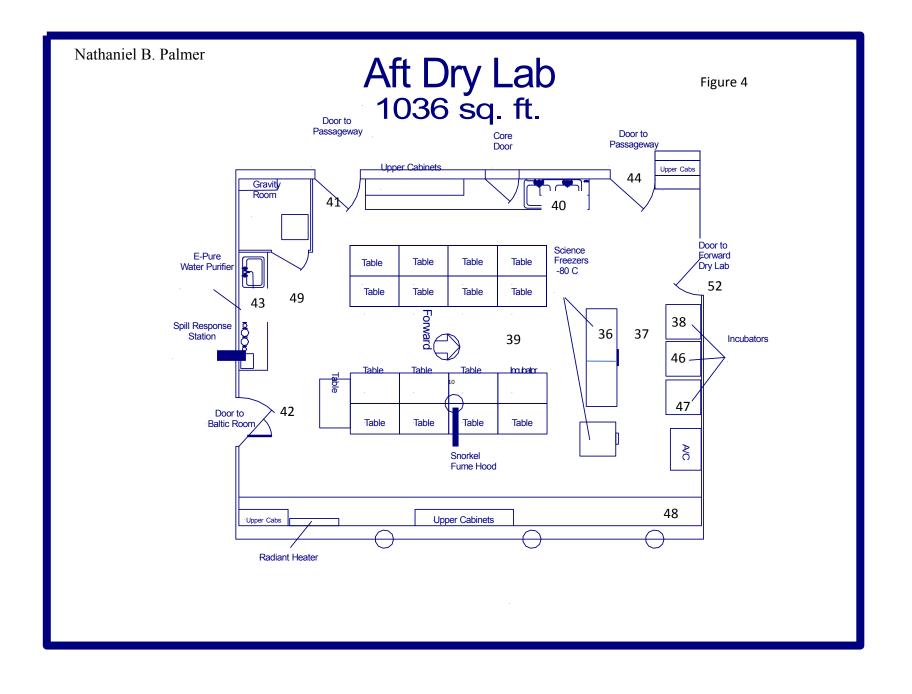
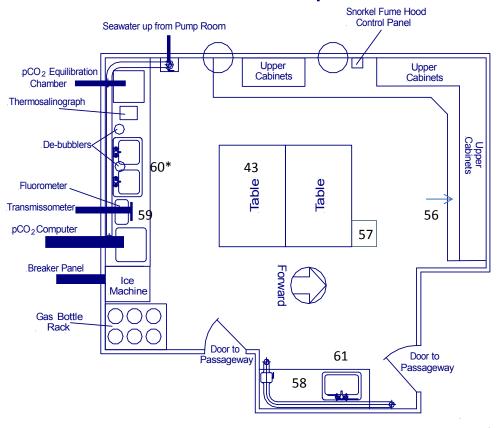
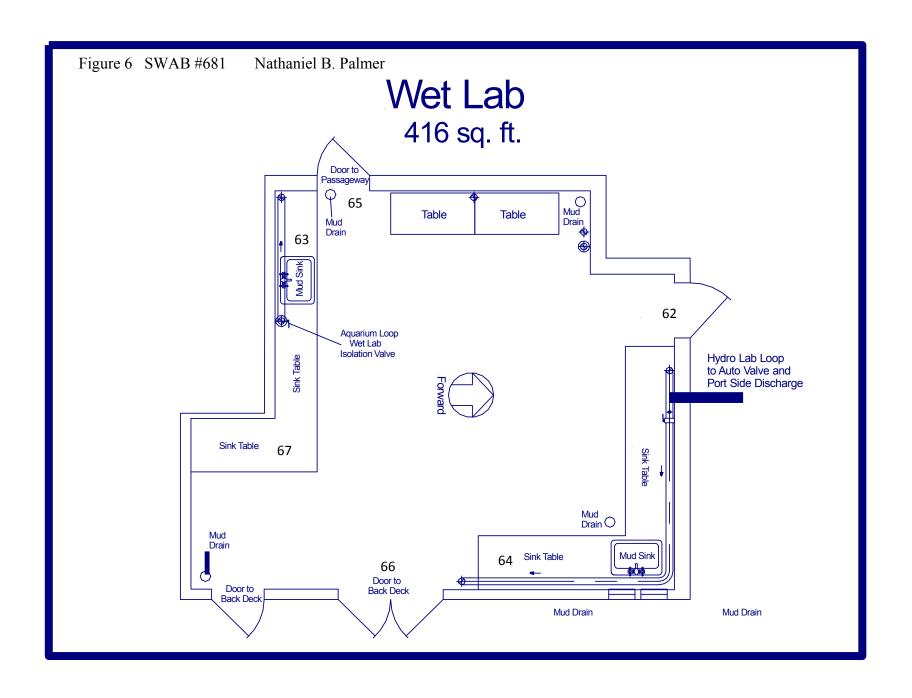


Figure 5 SWAB #681 Nathaniel B. Palmer

Hydro Lab 445 sq. ft.





Aquarium Room 298 sq. ft. Figure 7 SWAB #681 6/5/13 Elevated 68 Dri Deck Door to HazMat Storage Fiberglass **Tank** Door to MT Shop Fiberglass Spaces for Three Tank **Additional Tanks** Flooring is 3.5" Raised Dri-Deck Raised Hatch 3.5" Raised Dri Deck