

Tritium Laboratory
April 24, 2006



SWAB REPORT #409

SWAB DATE: 4 April 2006

R/V Laurence M. Gould



Dr. James D. Happell
Research Associate Professor

Distribution:
SWAB Committee
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COMMENTS TO SWAB REPORTS

10 October 2001

Technical data below applies unless otherwise indicated.

Typical instrument background for tritium and C14: 7 and 15 cpm, respectively. All data are means of at least three runs and are expressed in dpm/m² extracted; machine and wash solution blanks have been subtracted. Typical error: .10% or .50 dpm/m², whichever is larger, for both tritium and C14.

Category	Recommendations		
	Tritium (dpm/m ²)	C14 (dpm/m ²)	
A	< 500	< 500	No action
B *	500-10,000	500-10,000	Needs cleaning before <u>natural tracer</u> work. No health hazard. Does not apply to Radiation Vans
C **	10,000-100,000	10,000-50,000	Must be cleaned before any use. Includes Radiation Vans
D ***	>100,000	>50,000	May be a health hazard. Notify local Radiation Safety Official

Note: C14 and S35 have peak energies of 156 and 167 KeV, respectively; thus S35 will be registered as C14 by our counting techniques.

Recommended Cleaning Procedure

Wearing ordinary household rubber gloves:

Tritium: Wash and scrub with radioactive cleanup detergent such as COUNT-OFF (50 ml or 1/4 cup COUNT-OFF to 1 gallon of water), using sponges to distribute solution and reabsorb it.

C14: Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing ¹⁴CO₂). Follow up with wash as if for tritium.

Disposal of Cleaning Materials (gloves, sponges, etc.)

Categories A and B: Dispose as ordinary garbage.
C and D: Dispose in radiation waste system.

Note: In case Category C or D is encountered, we try to notify the institution promptly by telephone.

REPORT FOR SWAB # 409

LOCATION : Punta Arenas, Chile
 TECHNICIAN: Cecilia Roig
 VESSEL/LAB: R/V L M Gould

DATE : 4 April 2006
 STATUS: SEE COMMENTS

SAMPLE SAMPLE IDENTIFICATION
 #

NET ACTIVITY EXTRACTED
 25 dpm/m² 140 dpm/m²

Hydro Lab (See Figure #1)

3	Deck between sink area and workbench	138	0
4	Workbench next to port workbench	86	0
5	Deck in front of freezer	106	0
6	Deck in front of fwd. freezer	94	0
7	Deck in front of entrance to Wet Lab	82	0
8	Inside fume hood	166	0
9	Inside Kenmore freezer (no number)	112	0
10	Inside Kenmore freezer RPS 00010411	85	0
11	Frost from inside Revco	38	0
12	Deck in front of icemaker	101	0
13	Workbench across from sink	94	0

Dry Lab (See Figure #1)

14	Inside bottom Kenmore RPS 00010415	0	0
15	Inside bottom Kenmore RPS 00010416	96	0
16	Inside Sindelen freezer top	79	0
17	Inside Sindelen refrigerator bottom	101	0
18	Deck in front of refrigerator	70	0
19	Deck in front of port sink	97	0
20	Inside fume hood	97	0
21	Deck in front of fume hood	128	0
22	Deck in front of entrance to CTD room	164	0
23	Workbench aft of sink	102	20
24	Deck in front of freezers fwd. of Change Room	0	0
25	Deck in front of double door entrance	0	0

Wet Lab (See Figure #1)

26	Inside fume hood	68	0
27	Deck in front of sink	33	0
28	Frost inside Revco	76	0
29	Bottom of Percival Scientific	47	0
30	Deck in front of sinks	0	0
31	Workbench across from aft sink	166	0
32	Deck in front of aft sink	45	0
33	Workbench port of aft sink	96	0
34	Inside Kenmore RPS 00010413	66	0

Passageways (See Figure #1)

35	Deck inside Dark Room	92	0
36	Deck inside Enviro Room	42	20
37	Deck outside door to stairs to Container Room	35	0
38	Deck inside Change Room	86	0
39	Final Bucket blank C.O. #1	24	0

SAMPLE #	SAMPLE IDENTIFICATION	NET ACTIVITY EXTRACTED	
		3H dpm/m2	14C dpm/m2
<i>NBP DATA From Rpt #408</i>			
38	Deck in front of door to passageway	86	0
39	Deck in front of passageway door to Workshop	83	0
40	Deck in front of door to stbd.	143	0
41	Deck in front of door to Helo Pad	0	12
42	Deck in front of door to Workshop	87	0
43	Final Bucket blank C.O. #1	110	0
44	Final Bucket blank C.O. #2	93	0
45	Ice from Kenmore 15 chest freezer	102	0
46	Ice from Ultima II NSF 016981	78	0
47	Inside bottom of glass door Kelvinator Scientific	93	253
48	Inside top of Siemens Sika frost Combi	64	102
49	Inside bottom of Siemens Sika frost Combi	50	0
<u>USAP Van # 7 (See Figure 5) <i>TMC/Garage Van</i></u>			
50	Workbench right of sink	149	0
51	Workbench across from sink	44	17
52	Deck below sink	66	0
53	Deck inside door	12	0
<u>USAP Van # 1 (See Figure 6) <i>LMG Tritium Van #1</i></u>			
54	Inside fume hood	8,575*	0
55	Workbench left of sink	15,570**	0
56	Workbench across fume hood	4,718*	0
57	Inside Consul 230 freezer top	4,731*	0
58	Inside Consul 230 refrigerator bottom	76,686**	0
59	Deck inside door	53,998**	0
60	Deck left of workbench	11,455**	0
61	Deck in front of fume hood	36,119**	1
62	Workbench right of sink	2,587*	0
63	Drawer/basket inside Consul 230	1,044,151***	129
64	Final Bucket blank C.O. #2	24	0

COMMENTS

All areas test free of 14C contamination. The ship, warehouse freezers and Van #7 were clean of tritium contamination. Tritium contamination was found in Van #1, at levels that require cleanup before any use. We suggest that Van #1 be decontaminated using the enclosed procedure because there are areas in Van #1 above 10,000 dpm/m2 and there appears to be widespread tritium throughout the van, including deck areas. The heaviest contamination is in the Consul 230 refrigerator/freezer, we recommend thorough cleaning of the Consul 230 refrigerator/freezer and disposal of the drawer/basket at the bottom.

SAMPLE SAMPLE IDENTIFICATION
#

NET ACTIVITY EXTRACTED
3H dpm/m2 14C dpm/m2

SAMPLE #	SAMPLE IDENTIFICATION	3H dpm/m2	14C dpm/m2
<u>USAP 0002 (See Figure #2)</u> <i>LMG 14C Van</i>			
40	Initial Bucket blank C.O. #2	104	0
41	Workbench across fume hood	0	0
42	GE freezer top	240	0
43	GE refrigerator bottom	964*	0
44	Workbench left of sink	56	0
45	Inside fume hood		
48	Deck inside door	212	36
<u>USAP 0005 (See Figure #3)</u> <i>USCG/14C/3H Multi USE Van</i>			
49	Inside fume hood	195	0
50	Workbench right of fume hood	122	0
51	Workbench left of sink	176	0
52	Inside bottom of refrigerator below workbench	1,180*	2,140*
53	Deck below LSC	393	49
54	Deck below sink	887*	177
55	Deck inside door	629*	28
56	Workbench right of sink	166	0
57	Intermediate bucket blank	37	0
<u>USAP 0004 (See Figure #4)</u> <i>NBP 14C Van</i>			
58	Inside fume hood	274	40
59	Top of LSC	244	0
60	Workbench across sink	396	154
61	Workbench left of sink	388	464
62	Refrigerator bottom (furthest from sink)	459	0
63	Refrigerator bottom (closest to sink)	6,655*	114
64	Deck below ladder	328	124
65	Deck between fume hood and LSC	411	573*
66	Deck inside door	249	676*
<u>USAP 0003 (See Figure #5)</u> <i>NBP 3H Van</i>			
67	Inside fume hood	3,133*	0
68	Top of LSC	457	0
69	Workbench left of sink	1,179*	0
70	Refrigerator bottom (furthest from sink)	110	0
71	Refrigerator bottom (closest to sink)	18,082**	132
72	Deck below ladder	2,737*	39
73	Deck between fume hood and LSC	678*	72
74	Workbench across from sink	1,175*	0
75	Deck inside door	461	23
76	Final Bucket blank C.O.#2	64	0

COMMENTS

The ship is clean of both tritium and 14C contamination. Van # 2 has tritium contamination inside the refrigerator bottom. Van #s 5 and 4 have both tritium and 14C contamination in the refrigerator and some deck areas. Van # 3 has no 14C contamination but it has high tritium contamination in the bottom of the refrigerator, we suggest that this refrigerator be decontaminated using the enclosed procedure.

Figure 1.
SWAB #409
4 April 2006

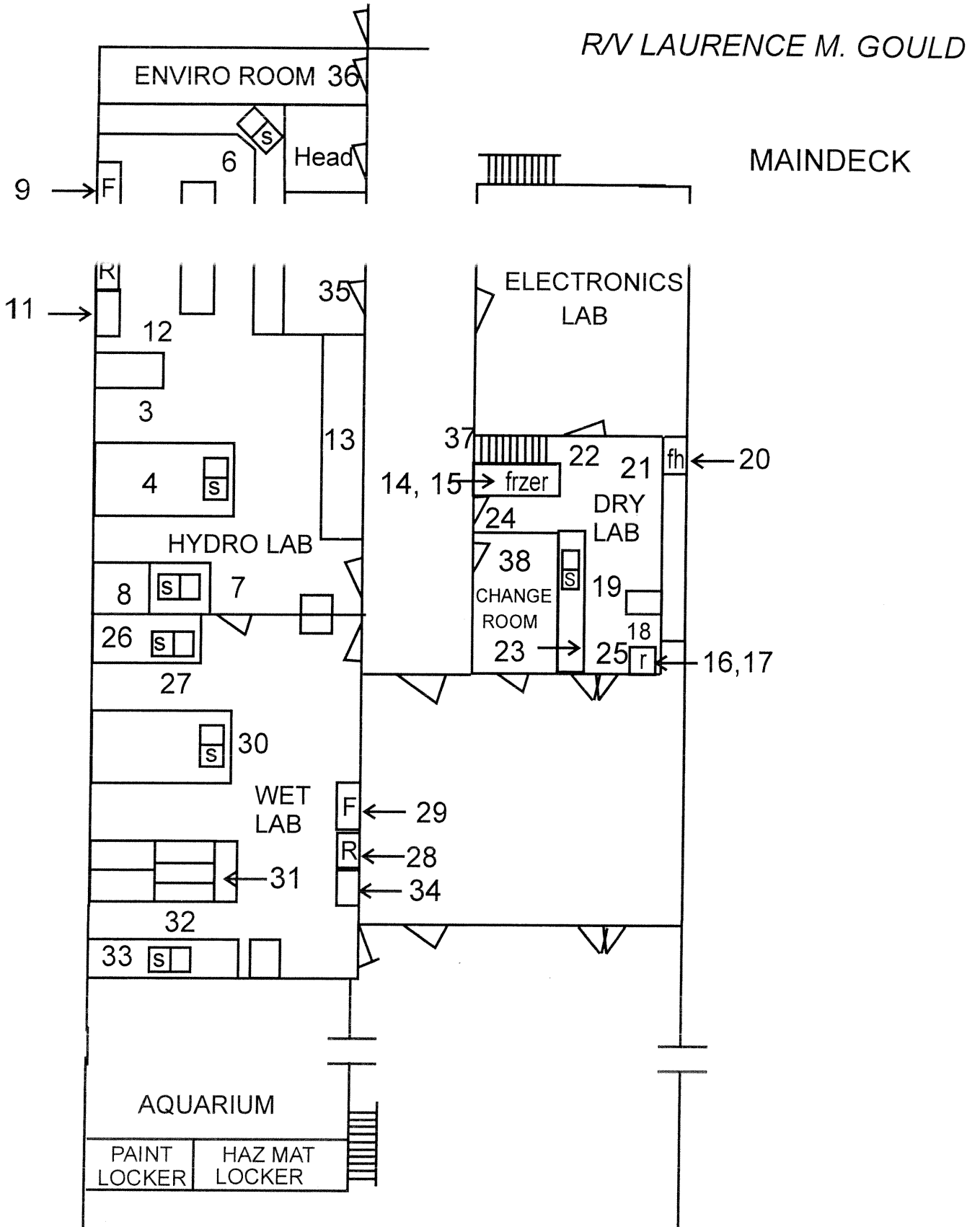
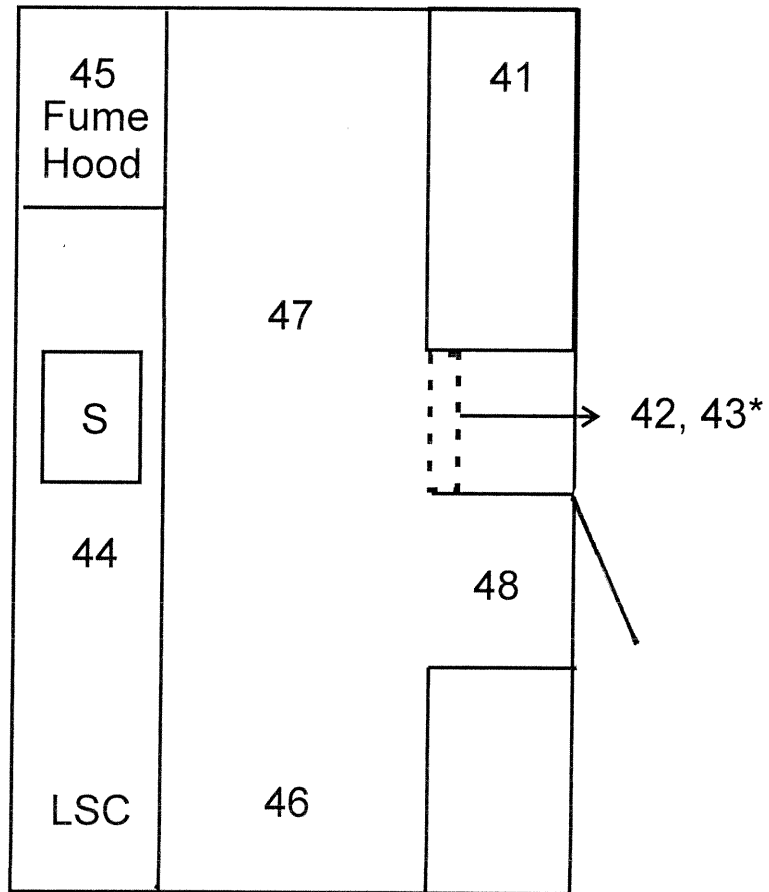


Figure 2
SWAB #409
4 April 2006



USAP RADIOISOTOPE VAN # 5

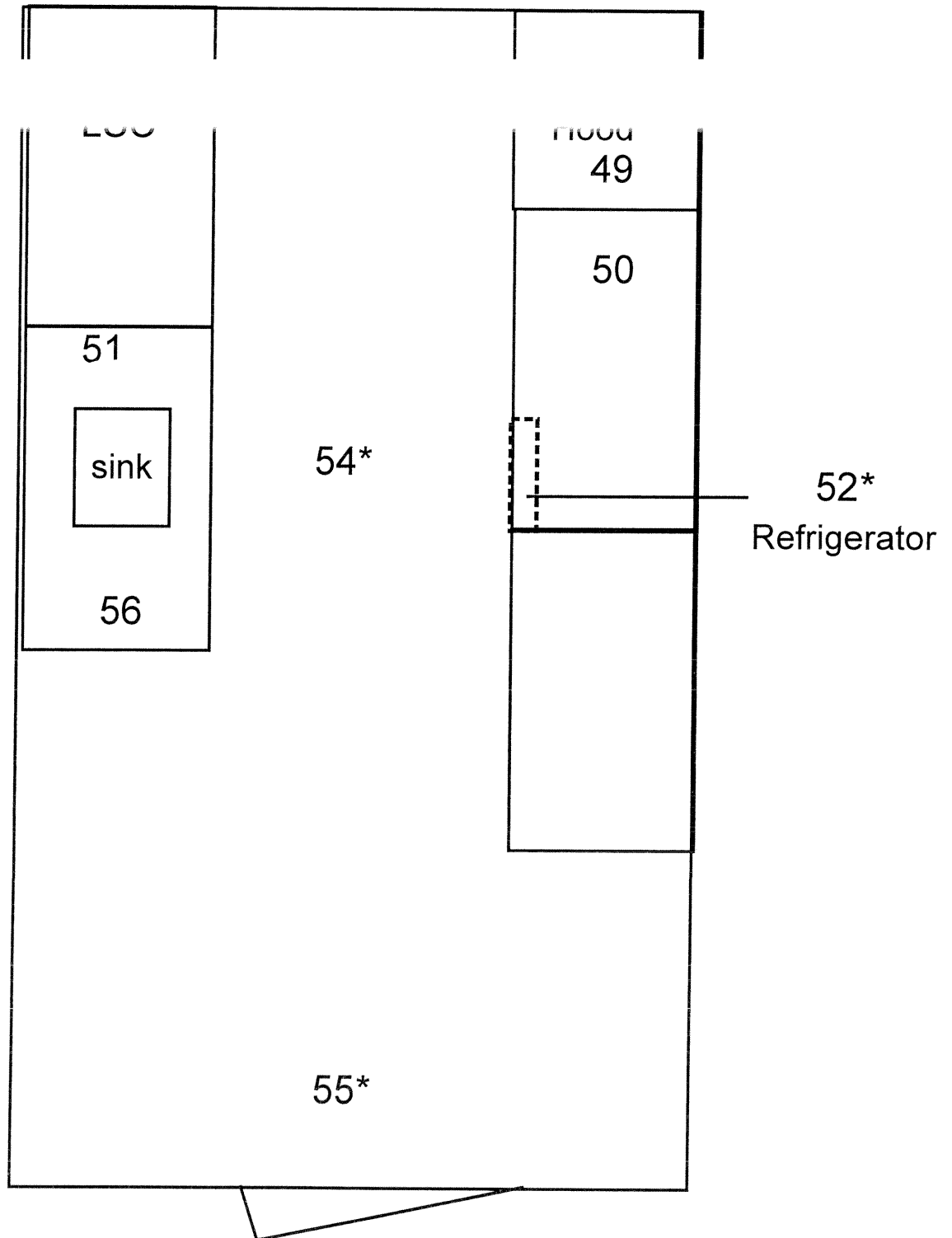


Figure 4
SWAB #409
4 April 2006

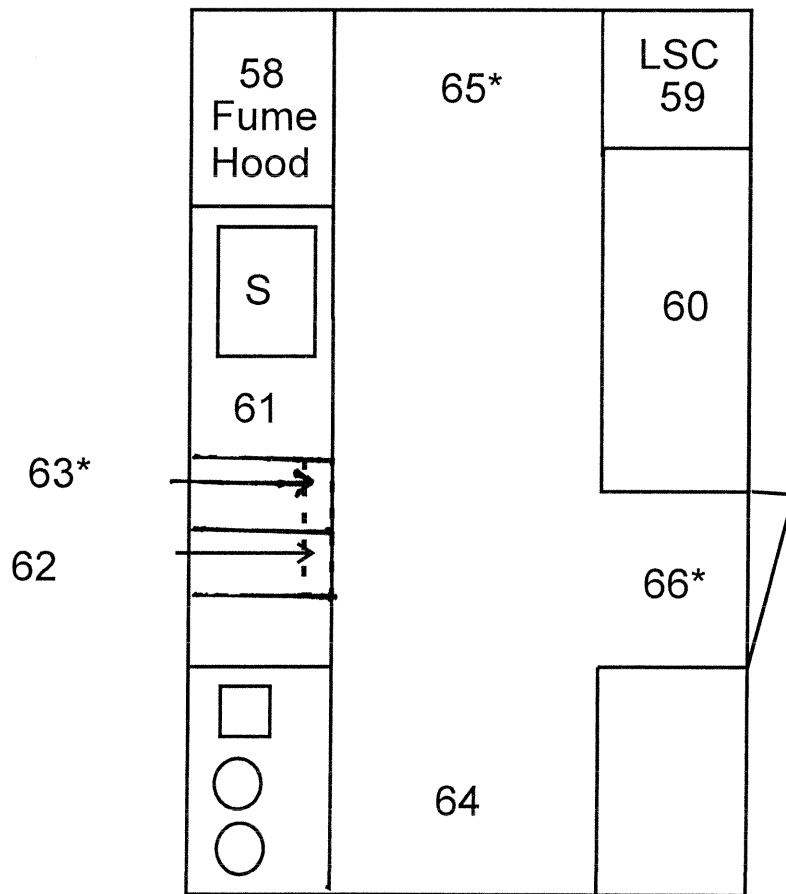
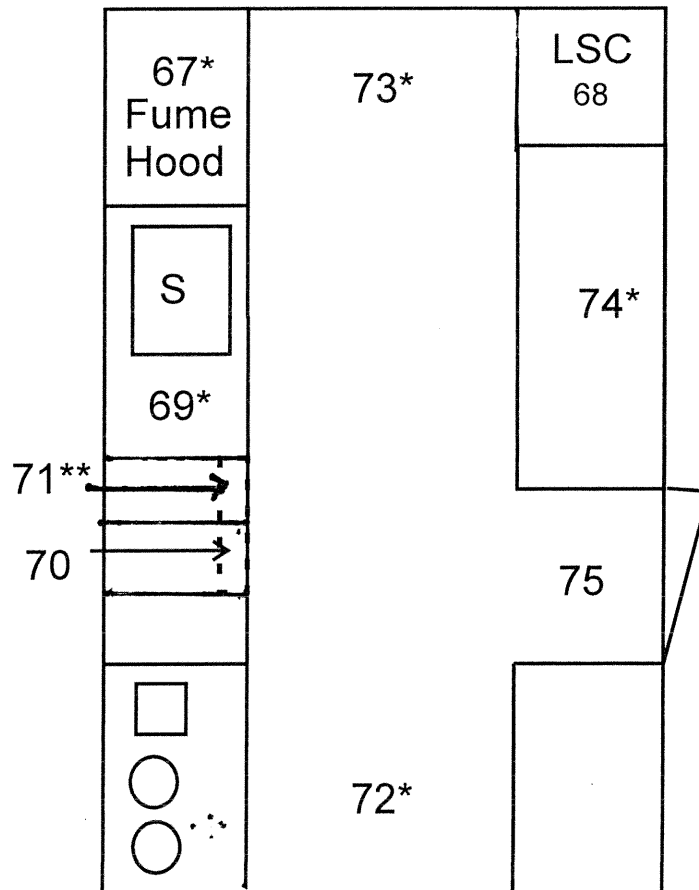


Figure 5
SWAB #409
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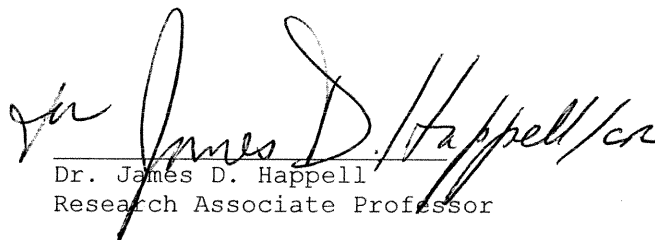
Tritium Laboratory
May 8, 2006



SWAB REPORT #408 - Amendment

SWAB DATE: 5 April 2006 (USAP Van #1)
5 May 2006 (Tritium Laboratory)

R/V Nathaniel B. Palmer

A handwritten signature in black ink that reads "Dr. James D. Happell/cr". The signature is written in a cursive style with a horizontal line underneath the name.
Dr. James D. Happell
Research Associate Professor

Distribution:
SWAB Committee
Bob Kluckhohn ✓

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All data are means of at least three runs and are expressed in dpm/m² extracted;

Criteria for SWAB Results

Category	Tritium (dpm/m ²)	C14 (dpm/m ²)	Recommendations
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B *	500-10,000	500-10,000	Needs cleaning before natural tracer work. No health hazard. Does not apply to Radiation Vans
C **	10,000-100,000	10,000-50,000	Must be cleaned before any use. Includes Radiation Vans
D ***	>100,000	>50,000	May be a health hazard. Notify local Radiation Safety Official

Note: C14 and S35 have peak energies of 156 and 167 KeV, respectively; thus S35 will be registered as C14 by our counting techniques.

Recommended Cleaning Procedure

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Tritium: Wash and scrub with radioactive cleanup detergent such as COUNT-OFF (50 ml or 1/4 cup COUNT-OFF to 1 gallon of water), using sponges to distribute solution and reabsorb it.

C14: Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing 14CO₂). Follow up with wash as if for tritium.

Disposal of Cleaning Materials (gloves, sponges, etc.)

Categories A and B: Dispose as ordinary garbage.
C and D: Dispose in radiation waste system.

Note: In case Category C or D is encountered, we try to notify the institution promptly by telephone.

REPORT FOR SWAB # 408 - Addendum

LOCATION : Punta Arenas, Chile & Miami, Florida DATE : 4/5/06, 5/5/06
 TECHNICIAN: Cecilia Roig STATUS: Van #1 has
 VESSEL/LAB: USAP Van #1 & Tritium Lab benchtop tritium contamination,
 Tritium Lab benchtop did not
 show isotope spills.

SAMPLE	SAMPLE IDENTIFICATION	NET ACTIVITY EXTRACTED	
1	Machine Blank	-	-
<u>USAP Van # 1</u>			
54	Inside fume hood	8,450*	0
55	Workbench left of sink	15,971**	0
56	Workbench across fume hood	4,565*	0
57	Inside Consul 230 freezer top	4,737*	0
58	Inside Consul 230 refrigerator bottom	77,484**	0
59	Deck inside door	53,646**	6
60	Deck left of workbench	11,506**	0
61	Deck in front of fumehood	36,183**	0
62	Workbench right of sink	2,468*	0
63	Drawer/basket inside Consul 230	1,054,535***	118
64	Final Bucket blank C.O. #2	0	0
<u>Tritium Laboratory</u>			
65	Initial Bucket blank	0	0
66	Initial laboratory benchtop swab	30	16
67	Laboratory benchtop after use of Windex	0	0
68	Laboratory benchtop after use of Dow	116	17
69	Laboratory benchtop after use of both Windex and Dow	13	0
70	Final Bucket blank	0	0

COMMENTS

USAP had concerns regarding accuracy of numbers reported for samples collected on USAP Van #1 (SWAB Report #408). All samples collected in USAP Van #1 were reprocessed using new LSC vials and recounted (each new vial was recounted fourteen times). The results concur with numbers reported in SWAB Report #408. The outcome shows the same areas in Van #1 contaminated, at the same levels, after running the second set of LSC vials. The possibility of household cleaners (Windex and Dow) affecting the samples was also brought up. Swab tests were done at the Tritium Laboratory using these cleaners. Areas swabbed at the Tritium Laboratory with the cleaners were not contaminated.