

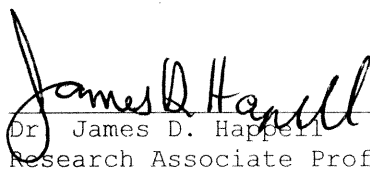
Tritium Laboratory
March 3, 2005



SWAB REPORT #381

SWAB DATE: 16-17 February 2005

R/V Nathaniel B. Palmer



Dr. James D. Happell
Research Associate Professor

Distribution:
SWAB Committee
Bob Kluckhohn

Rosenstiel School of Marine and Atmospheric Science
Tritium Laboratory
4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: (305) 361-4100
Fax: (305) 361-4112
email: tritium@rsmas.miami.edu

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.

Criteria for SWAB Results

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 # 381

LOCATION : Christchurch, New Zealand
 TECHNICIAN: Cecilia Roig
 VESSEL/LAB: R/V Nathaniel B. Palmer

DATE: 16-17 February 2005
 STATUS: See **COMMENTS**.

SAMPLE #	SAMPLE IDENTIFICATION	NET ACTIVITY EXTRACTED	
		3H dpm/m2	14C dpm/m2
1	Machine Blank	-	-
2	Initial bucket blank C.O. #1	87	0
<u>Hydro Lab (See Figure #1)</u>			
3	Stbd. sink area	144	0
4	Deck below stbd. sink area	243	0
5	Deck below icemaker and sink	76	0
6	Sink area	107	0
<u>Wet Lab (See Figure #1)</u>			
7	Deck inside double door entrance	182	0
8	Workbench aft of sink	0	0
9	Deck between Hydro Lab and Wet Lab	20	0
<u>Dry Lab (See Figure #2)</u>			
10	Aft workbench/sink area	48	0
11	Inside Percival Sci. # 016613	81	0
12	Ice from Fisher Freezer #0011622	129	0
13	Inside Percival Sci. # 00011176	29	21
14	Inside So-Low small refrigerator, bottom	112	0
15	Deck in front of freezer	31	0
16	Desk area behind equipment block in computer	34	0
17	Desk area on computer lab part of Dry Lab	61	0
<u>Bio Lab (See Figure #3)</u>			
18	Fume hood aft of port sink	126	0
19	Fume hood fwd. of port sink	716*	0
20	Deck just outside Themo Kool door	97	0
21	Inside #00011163 refrigerator bottom	79	0
22	Inside #00011164 freezer top tray	71	0
23	Inside #00011164 refrigerator bottom	30	0
24	Deck below aft sink	101	0
25	Deck below fwd. fume hood	79	0
26	Workbench port of aft sink	0	0
<u>02 Deck/Helo Deck (See Figure #4)</u>			
27	Deck in front of door to stbd.	300	0
28	Deck in front of door to Helo Pad	21	1
29	Deck in front of door to Workshop	719*	8
30	Deck in front of door to Passageway	309	0
31	Deck in front of passageway door to Workshop	111	0
32	Workbench stbd. of sink in shop	1,157*	0
33	Deck below sink	1,300*	3
34	Ice from Baxter Cryo-Fridge freezer top	13,896**	6

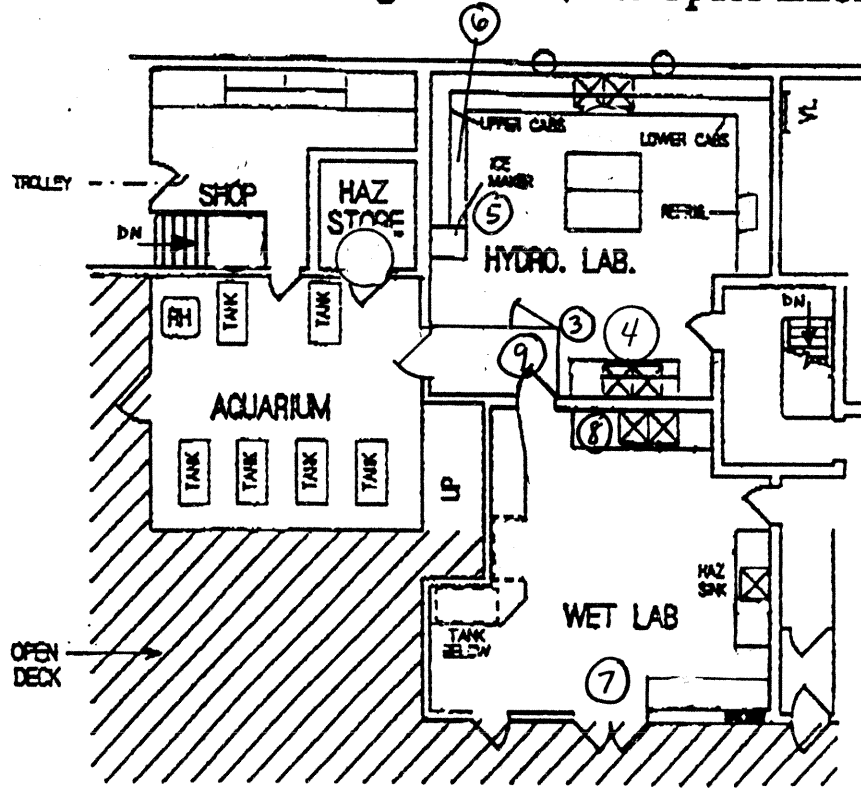
SAMPLE #	SAMPLE IDENTIFICATION	NET ACTIVITY EXTRACTED	
		3H dpm/m2	14C dpm/m2
35	Inside Baxter Cryo-Fridge bottom	133	0
36	Deck below Baxter Cryo-Fridge	729*	24
37	Workbench port of sink in shop	1,094*	0
38	Final bucket blank C.O. #1	24	0
39	Initial bucket blank C.O. #2	82	0
40	Helicopter deck in front of door to Van #4	113	0
57	Helicopter deck, port passageway	84	5
58	Helicopter deck in front of door to Van #7	202	3
59	Helicopter deck, stbd. passageway	72	0
60	Aft side of Helicopter deck	114	0
<u>Radioisotope Van # 4 (See Figure #5)</u>			
41	Deck in front of disposal area	599*	2
42	Inside fume hood	773*	0
43	Deck between fume hood and LSC	555*	16
44	Top of LSC	71	0
45	Workbench left of sink	255	3
46	Inside bottom aft SubZero freezer	466	51
47	Inside bottom fwd. SubZero refrigerator	382	0
48	Deck in front of door	1,016*	0
49	Workbench across sink	249	0
<u>Radioisotope Van # 7 (See Figure #6)</u>			
50	Inside fume hood	87	0
51	Top of LSC	90	0
52	Inside bottom of SubZero #00011626	132	0
53	Inside top of Baxter Cryo-Fridge #00011181	69	8
54	Inside bottom of Baxter Cryo-Fridge #00011181	132	38
55	Deck between fume hood and sink	2,897*	46
56	Deck in front of entrance	5,836*	102
<u>Radioisotope Van # 3 (See Figure #7)</u>			
61	Inside fume hood	6,357*	0
62	Workbench across from sink	648	0
63	Workbench next to door	11,923**	0
64	Inside SubZero #00011627, top tray	5,160*	0
65	Inside SubZero #00011627, bottom	1,719*	11
66	Deck below fume hood	1,141*	0
67	Deck below hatch	1,731*	0
68	Deck below sink	1,866*	8
69	Deck in front of door	1,335*	3
70	Final bucket blank, C.O. #2	101	0

COMMENTS

All areas test free of 14C contamination. Tritium contamination was found in all radioisotope vans. The contamination levels in Vans #4 and #7 do not require cleanup. We suggest that Van #3 be decontaminated using the enclosed procedure because there is area in Van #3 above 10,000 dpm/m2 and there appears to be widespread tritium throughout the van. There is also tritium contamination in the Helicopter workshop. It appears that tritium was stored and/or spilled in the freezer portion

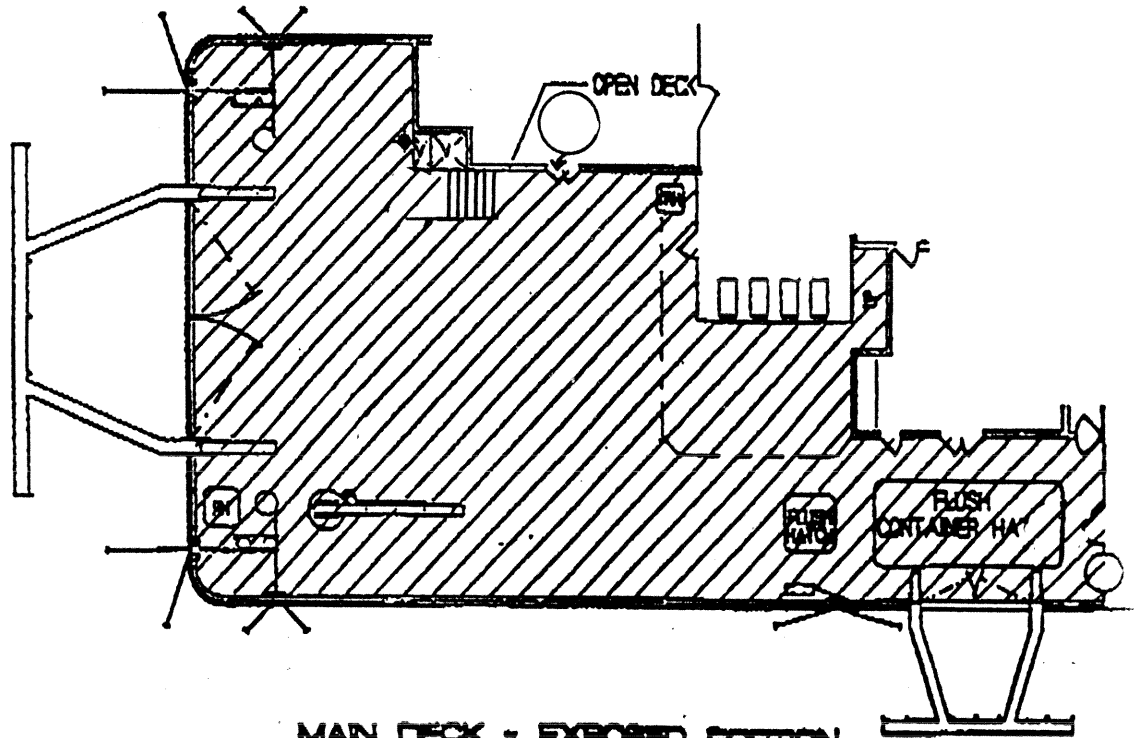
of the Baxter Cryo-Fridge. We suggest that the helicopter workshop and especially the freezer should be thoroughly decontaminated as soon as possible. UNOLS recommends that all radioisotope work be conducted in radioisotope vans in order to minimize the spread of radioisotopes throughout the main areas of the ship.

Section 8: NBP Deck Diagrams and Lab Space Information



HYDRO LAB, WET LAB & AQUARIUM

SCALE (FEET)



MAN DECK - EXPOSED PORTION

SCALE (FEET)



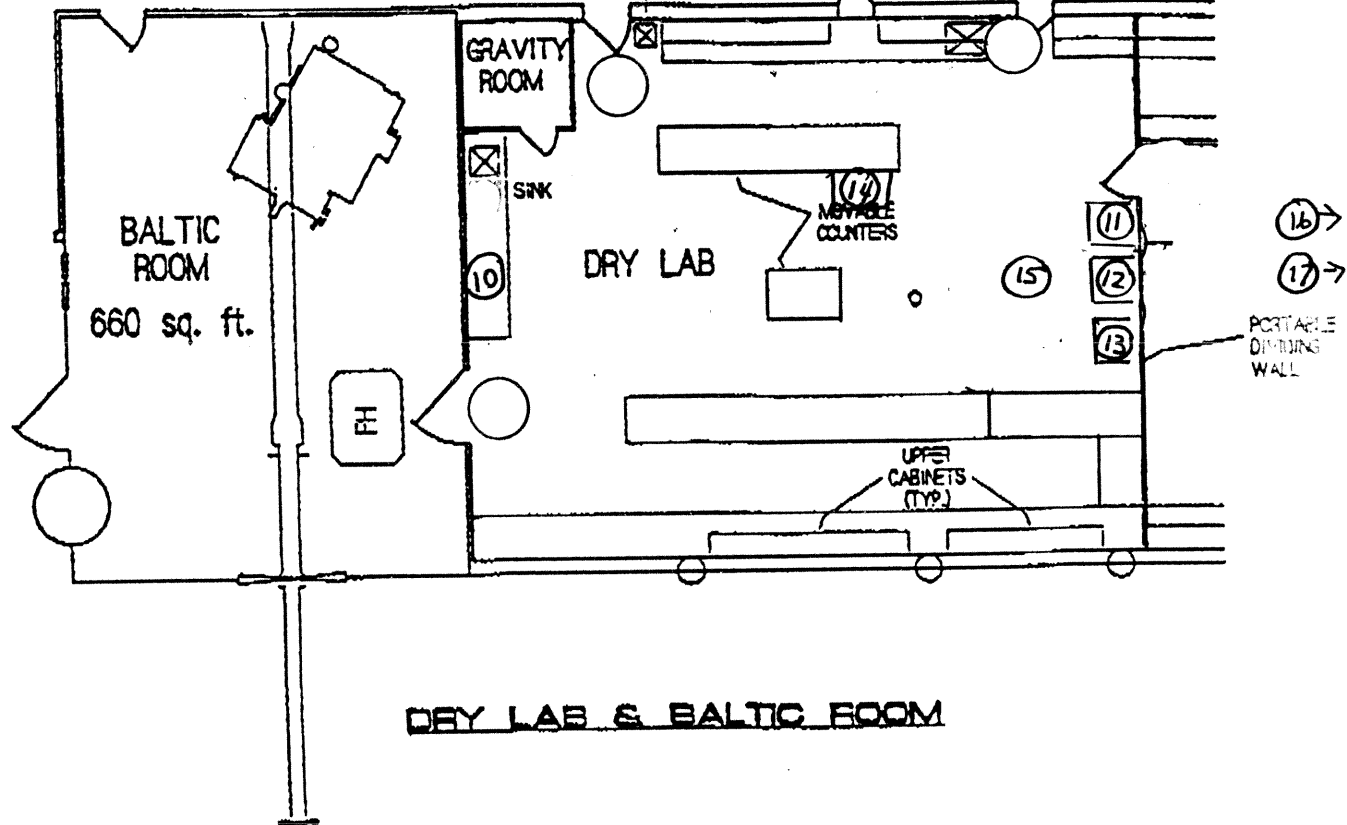
URINAL
FOUNTAIN

ICE COPE
PASS-THRU

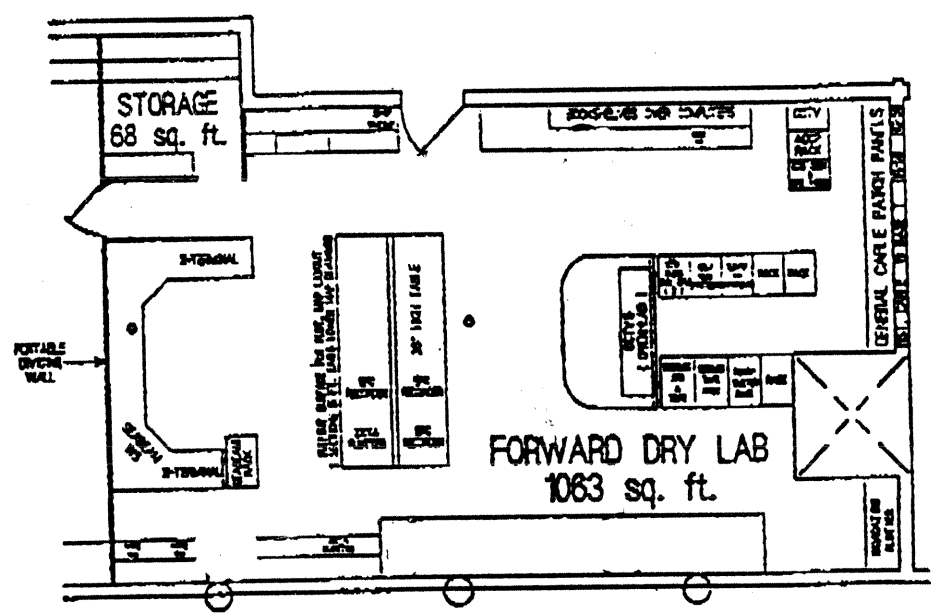
Figure 2

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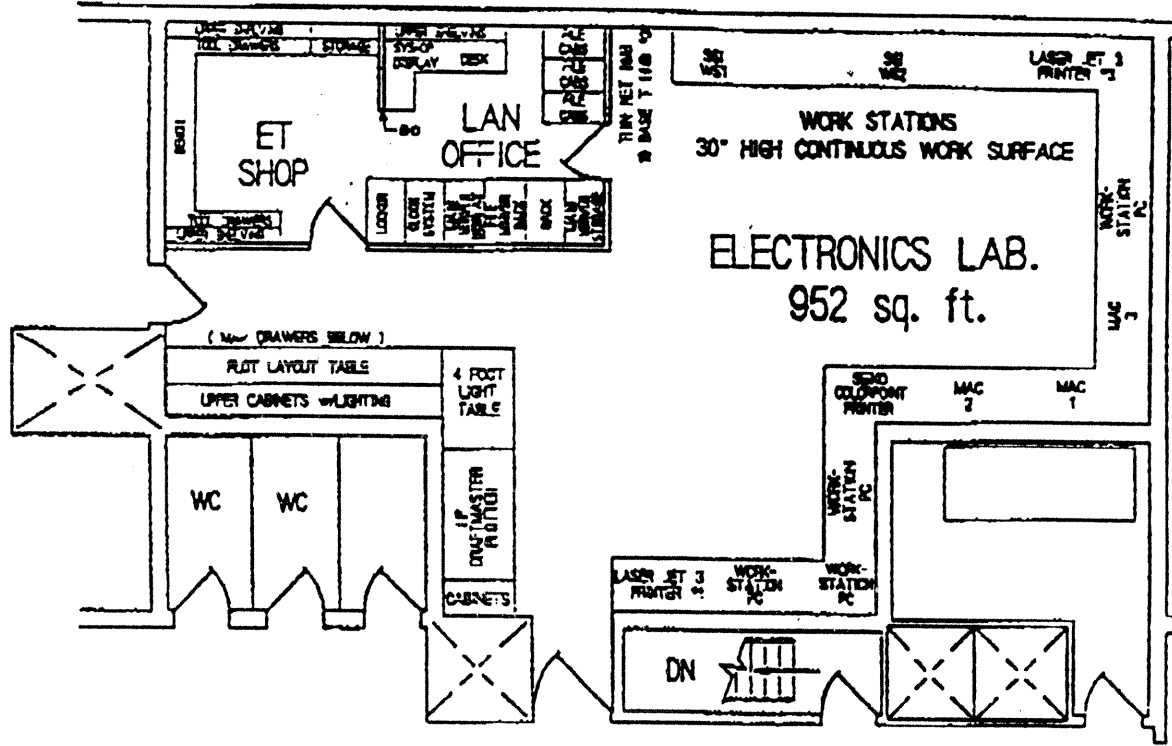
DRY LAB & BALTIC ROOM



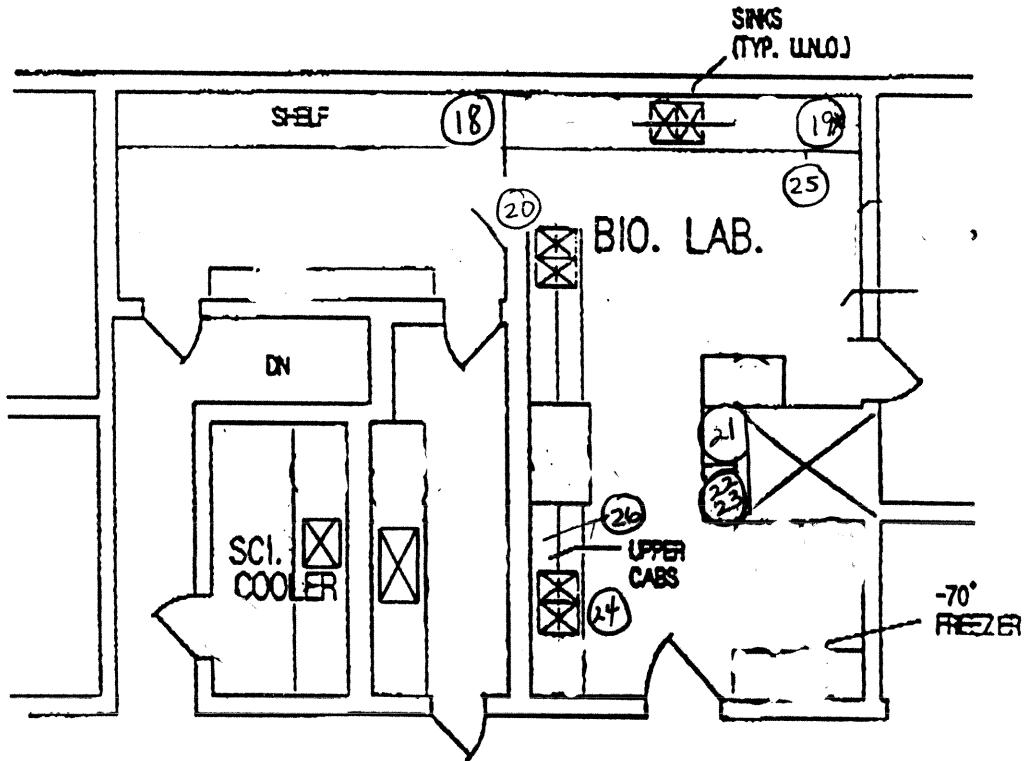
FORWARD DRY LAB

SCALE (FEET)





ELECTRONICS LAB, ET SHOP & LAN OFFICE



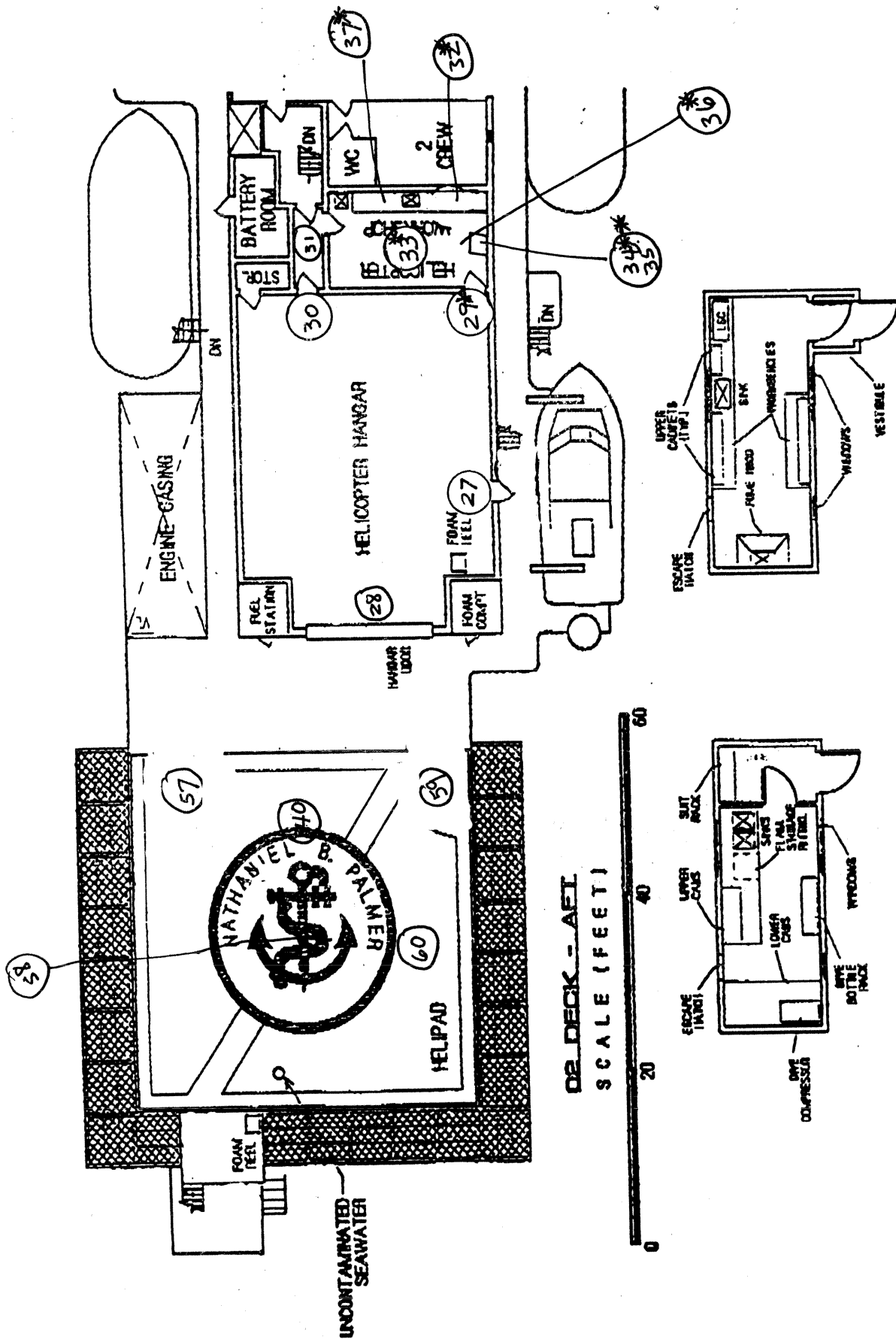
BIO LAB, SCIENCE FREEZER & SCIENCE COOLERS

SCALE (FEET)



Section 8: NBP Deck Diagrams and Lab Space Information

Figure 4
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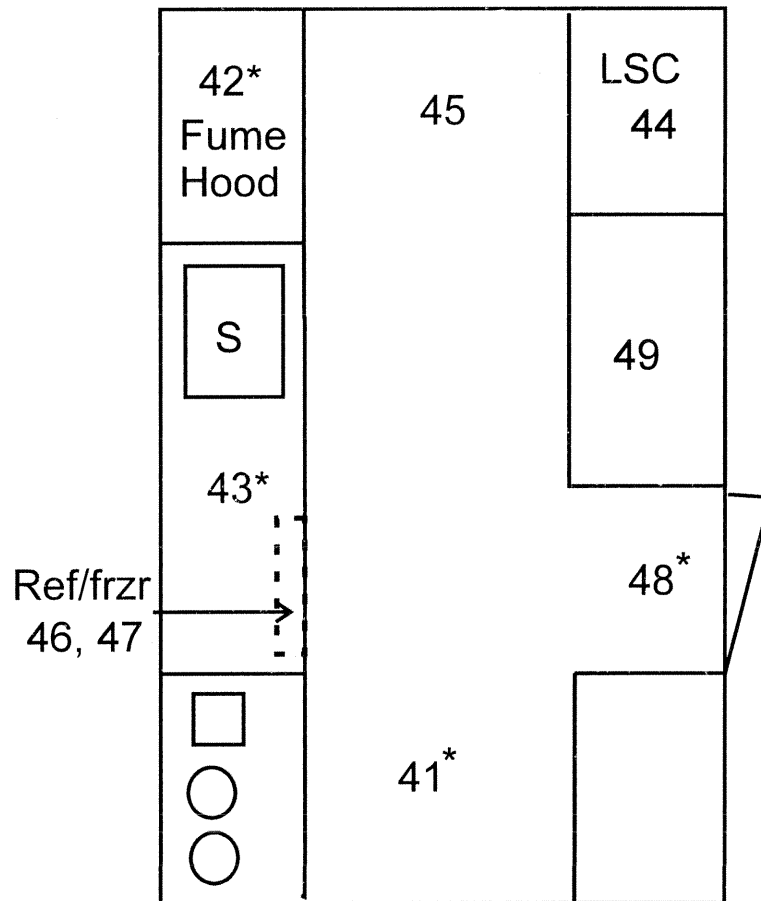
RADIOTOPE VAN

GENERAL RUBEROSE VAN

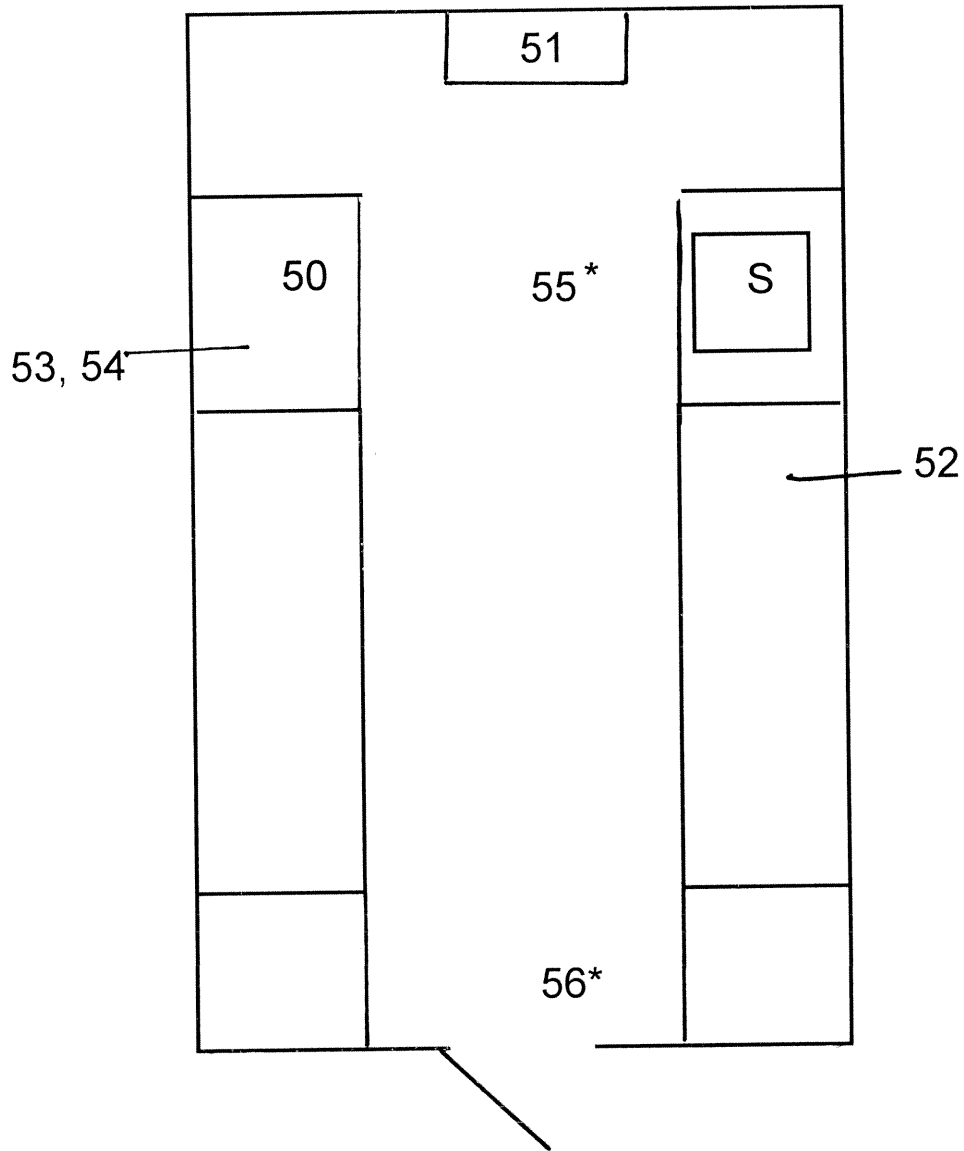
SCALE (FEET)

R/V Nathaniel B. Palmer

Radioisotope Van #4



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Radioisotope Van # 7



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Radioisotope Van #3

