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Tritium Laboratory
24 June 2024

SWAB REPORT #1096

SWAB DATE: 16 June 2024

R/V Atlantis, Rad Vans #625.6.03 & #625.1.05

James Happell Digitally signed by James Happell
Date: 2024.06.24 11:57:31 -04'00'

James D. Happell
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Distribution:
SWAB Committee
Sarah Fuller

COMMENTS TO SWAB REPORTS 12 May 2014

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/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 #1096

LOCATION: Astoria, OR
VESSEL/LAB: *R/V Atlantis*

DATE: 16 June 2024
TECHNICIAN: Charlene Grall

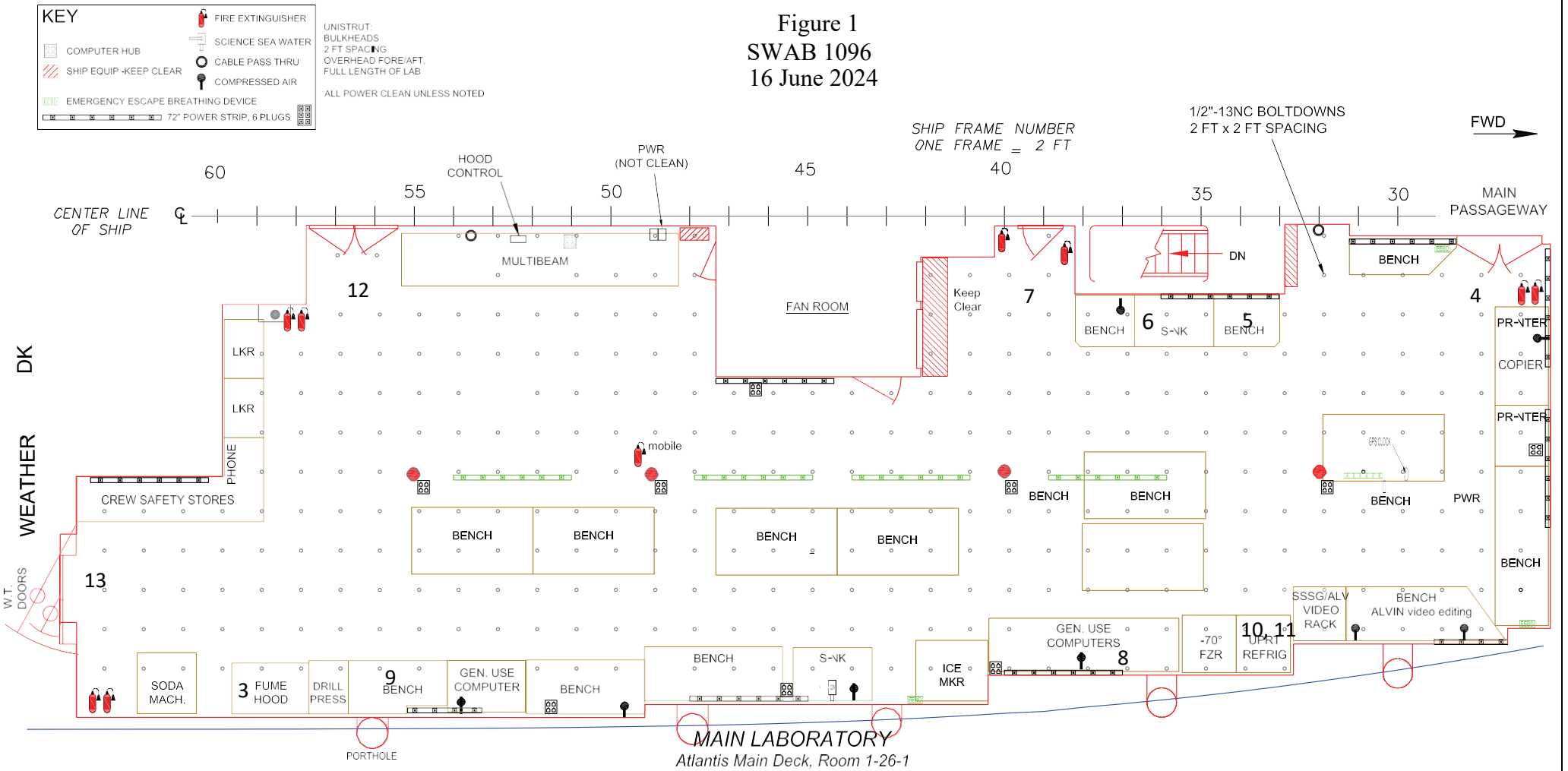
Sample #	Sample Identification	^{3}H dpm/m^{2} activity	±	^{3}H dpm/m^{2} error	^{14}C dpm/m^{2} activity	±	^{14}C dpm/m^{2} error
1	1st Vial Bkgnd	0	±	0	0	±	0
2	Initial bucket blank	-15	±	20	6	±	16
	<u>Main Lab (Figure 1)</u>						
3	Inside fume hood	34	±	30	-5	±	15
4	Deck inside forward port entrance	**26**	±	**13**	***88**	±	**18**
5	Benchtop adjacent to port sink	-3	±	5	-19	±	53
6	Port sink area	-10	±	13	-19	±	52
7	Deck inside port entrance located aft of sink	14	±	8	***98**	±	**19**
8	Starboard benchtop forward of ice machine	-16	±	22	3	±	20
9	Starboard benchtop forward of fume hood	-6	±	8	-17	±	46
10	Inside Frigidaire freezer	2	±	3	-6	±	17
11	Inside Frigidaire refrigerator	-3	±	4	-16	±	44
12	Deck inside aft port entrance	**6**	±	**2**	***200**	±	**23**
13	Deck inside aft entrance	-30	±	32	***119**	±	**20**
	<u>Bio-Analytical Lab (Figure 2)</u>						
14	Benchtop across from forward sink	-76	±	12	***877**	±	**41**
15	Benchtop adjacent to aft sink	-30	±	13	***232**	±	**24**
16	Benchtop across from forward sink	**9**	±	**8**	***50**	±	**17**
17	Deck inside aft entrance	-49	±	13	***418**	±	**30**
18	Aft sink area	-242	±	31	***1560**	±	**53**
19	Inside Cospolich refrigerator	-22	±	85	***60**	±	**17**
20	Inside Cospolich freezer	-44	±	6	***994**	±	**43**
21	Inside Frigidaire refrigerator	-2933	±	63	****39007**	±	**257**
22	Inside Frigidaire freezer	-54	±	38	***198**	±	**23**
23	Forward sink area	-4	±	3	***115**	±	**20**
24	Deck in front of refrigerators	-79	±	9	***1393**	±	**51**
25	Deck inside starboard entrance	-35	±	10	***370**	±	**29**
26	Port benchtop	-60	±	39	***225**	±	**24**
27	Inside fume hood	-93	±	20	***638**	±	**36**
28	Forward benchtop	4	±	5	**34**	±	**16**
29	Starboard benchtop	-20	±	27	**21**	±	**16**
30	Deck in front of fume hood	-115	±	16	***1228**	±	**48**
	<u>Miscellaneous Areas (Figure 3)</u>						
31	Deck of Science Office	-25	±	34	**40**	±	**17**
32	Deck between walk in coolers	-40	±	47	***135**	±	**21**
33	Deck inside entrance of Science Storeroom	-42	±	37	***154**	±	**22**

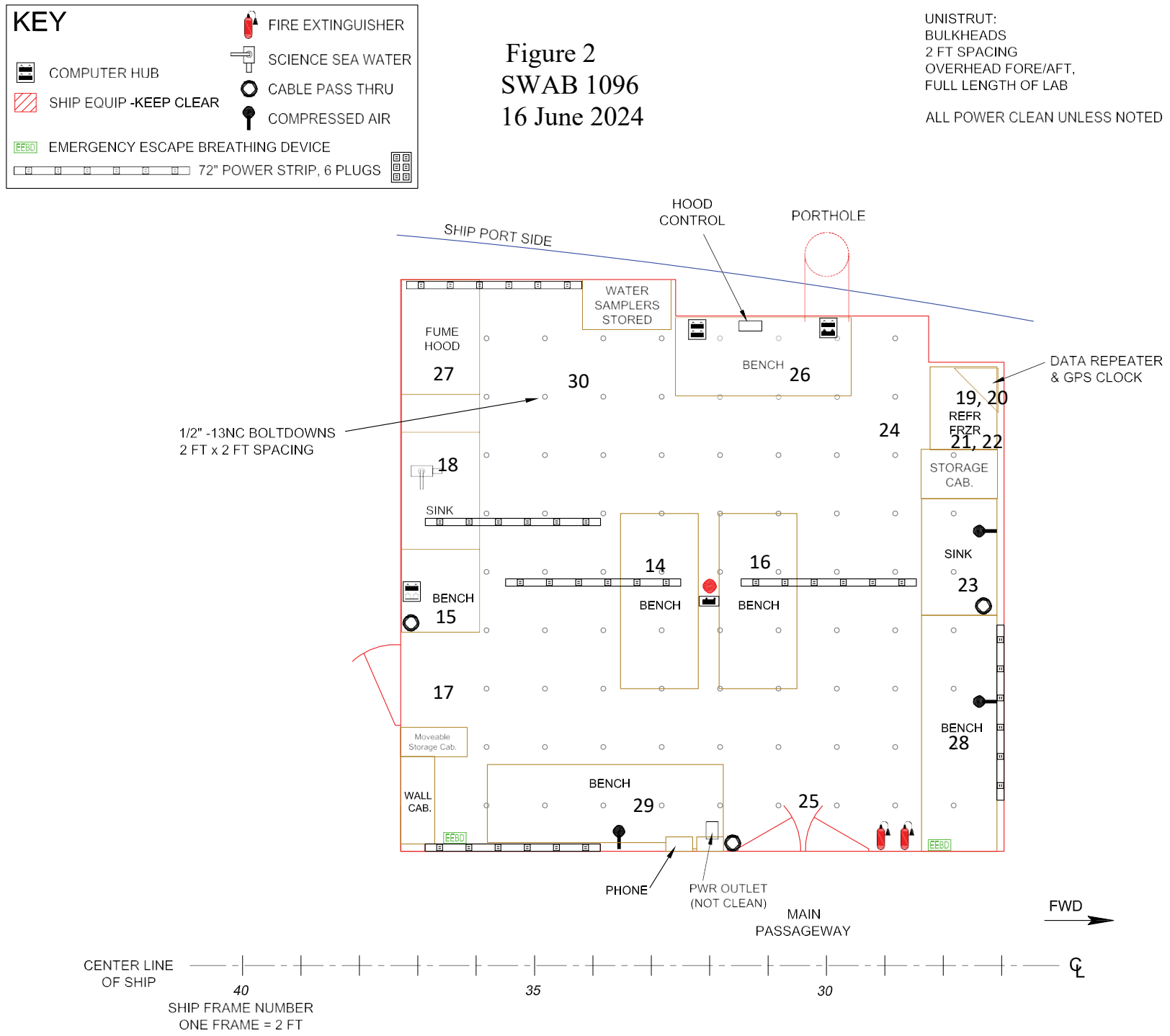
Sample #	Sample Identification	^{3}H dpm/m^{2} activity	error	^{14}C dpm/m^{2} activity	error
	Hydro Lab (Figure 4)				
34	Deck inside starboard entrance	5	3	***86**	**18**
35	Deck in front of port sink	-33	51	***104**	**19**
36	Deck between starboard sink and fume hood	1	2	**25**	**15**
37	Inside fume hood	-11	15	-9	24
38	Intermediate bucket sample	-33	44	-13	35
	Wet Lab (Figure 5)				
39	Starboard benchtop	-22	30	-5	13
40	Inside fume hood	-14	19	-4	11
41	Port benchtop	-21	95	***57**	**17**
42	Forward sink area with wood benchtops	-2	3	4	15
43	Deck in center of lab	-88	15	***857**	**41**
	Radioisotope Van #625.6.03 (Figure 6)				
44	Inside Hotpoint refrigerator	***689**	**67**	***303**	**25**
45	Inside Hotpoint freezer	**383**	**57**	**24**	**9**
46	Inside ATVIO refrigerator under bench	**349**	**55**	**27**	**10**
47	Inside fume hood	**119**	**34**	**42**	**15**
48	Inside Haier refrigerator	**414**	**58**	***54**	**13**
49	Benchtop above ATVIO Haier refrigerator	**60**	**13**	***315**	**27**
50	Sink area	**188**	**39**	***86**	**17**
51	Benchtop across from refrigerator	**145**	**36**	***55**	**15**
52	Benchtop across from fume hood	**249**	**48**	**17**	**9**
53	Deck in front of fume hood	**376**	**52**	***155**	**20**
54	Benchtop across from fume hood	**124**	**30**	***120**	**19**
55	Deck inside van entrance	**122**	**32**	***110**	**19**
	Radioisotope Van #625.1.05 (Figure 7)				
56	Sink area	-66	11	***819**	**40**
57	Benchtop next to sink	-44	8	***745**	**38**
58	Benchtop next to fume hood	-80	11	***1179**	**47**
59	Fume hood	**33**	**5**	***743**	**38**
60	Deck in front of fume hood	***685**	**35**	***4469**	**88**
61	Benchtop next to LSC	***1828**	**114**	***238**	**20**
62	Inside refrigerator	-183	22	***1599**	**54**
63	Inside freezer	**328**	**40**	***467**	**31**
64	Deck inside entrance	***538**	**31**	***3616**	**79**
65	Final bucket sample	14	28	-2	8

COMMENTS

Please note that the error reported for each isotope is the two-standard deviation counting error. The reports may now contain values less than zero. When 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. Many areas on the ship, especially in the Bioanalytical Lab show contamination in the 14C channel, The sources appears to be whatever was brought into the refrigerator in the Bioanalytical Lab. The Frigidaire refrigeraor had 39000 dpm m^{-2}. ^{35}S was used in addition to ^{14}C. ^{35}S is counted as ^{14}C in our method. Large negative ^{3}H values are usually seen with ^{35}S contamination, but not with ^{14}C contamination. The observed contamination is believe to be ^{35}S. It is recommend that the contaminated areas be cleaned, because we cannot tell for certain if its ^{35}S until we wait a couple of months and count the samples again (^{35}S half-life is 88 days). Once we do the recount we will issue an updated report. Both Rad Vans had minor ^{3}H and ^{14}C (or ^{35}S) contamination. No action is necessary, but we recommend cleaning the deck of van #625.1.05.

Figure 1
SWAB 1096
16 June 2024





BIOLOGICAL/ANALYTICAL CLEAN LABORATORY

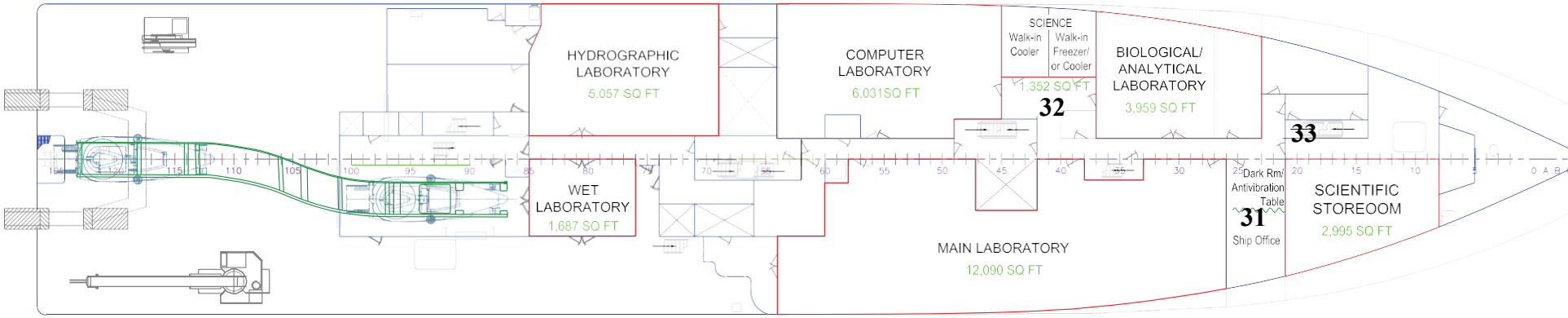


Figure 3
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Atlantis Laboratories and Scientific Storeroom General Locations

SHIP EQUIP -KEEP CLEAR

COMPRESSED AIR

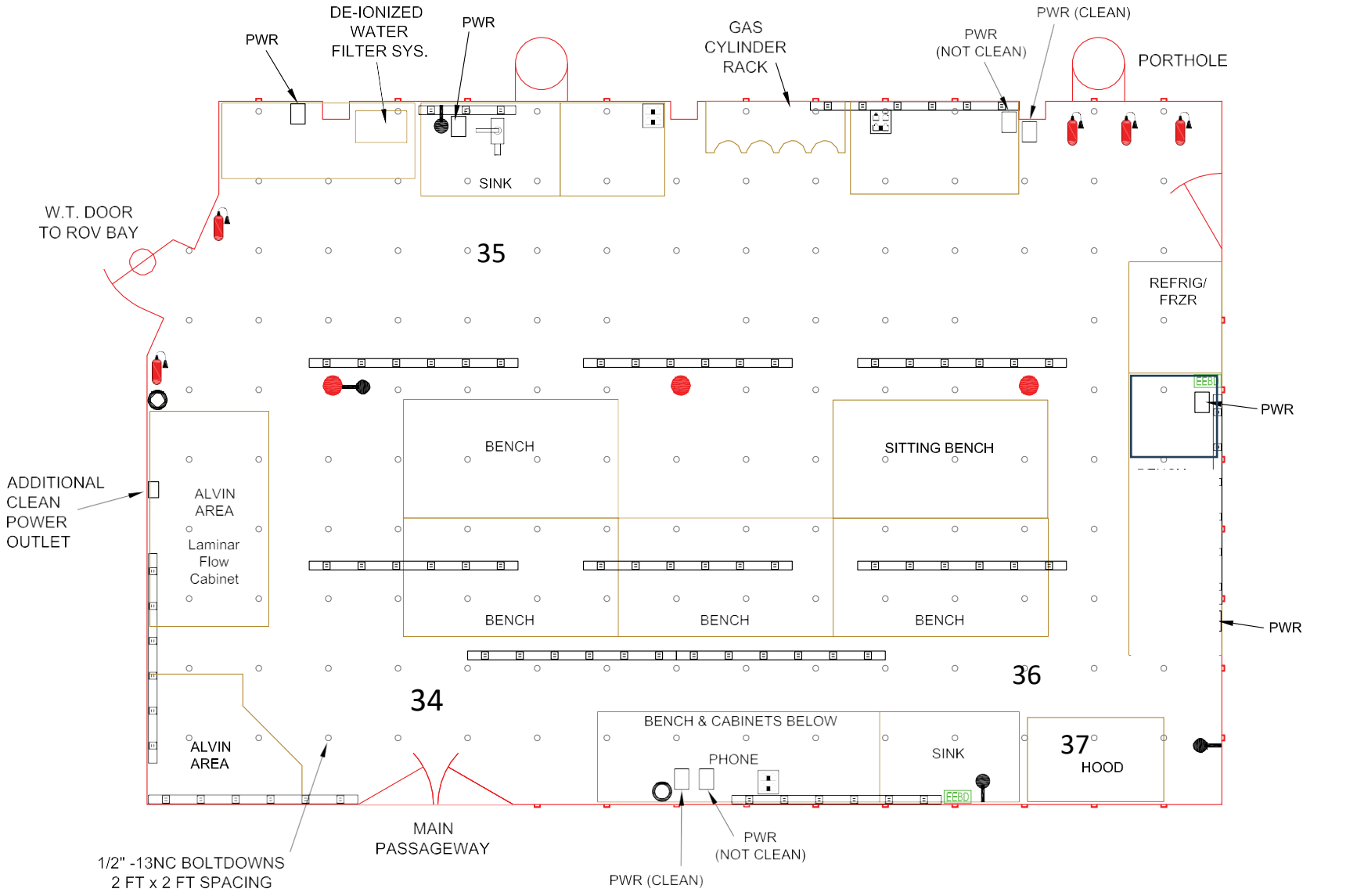
EEBD EMERGENCY ESCAPE BREATHING DEVICE

72" POWER STRIP, 6 PLUGS

FULL LENGTH OF LAB

ALL POWER CLEAN UNLESS NOTED

Figure 4
SWAB 1096
16 June 2024



HYDROGRAPHIC LABORATORY

Atlantis Main Deck, Room 1-64-2

12/30/2013

Figure 5
SWAB 1096
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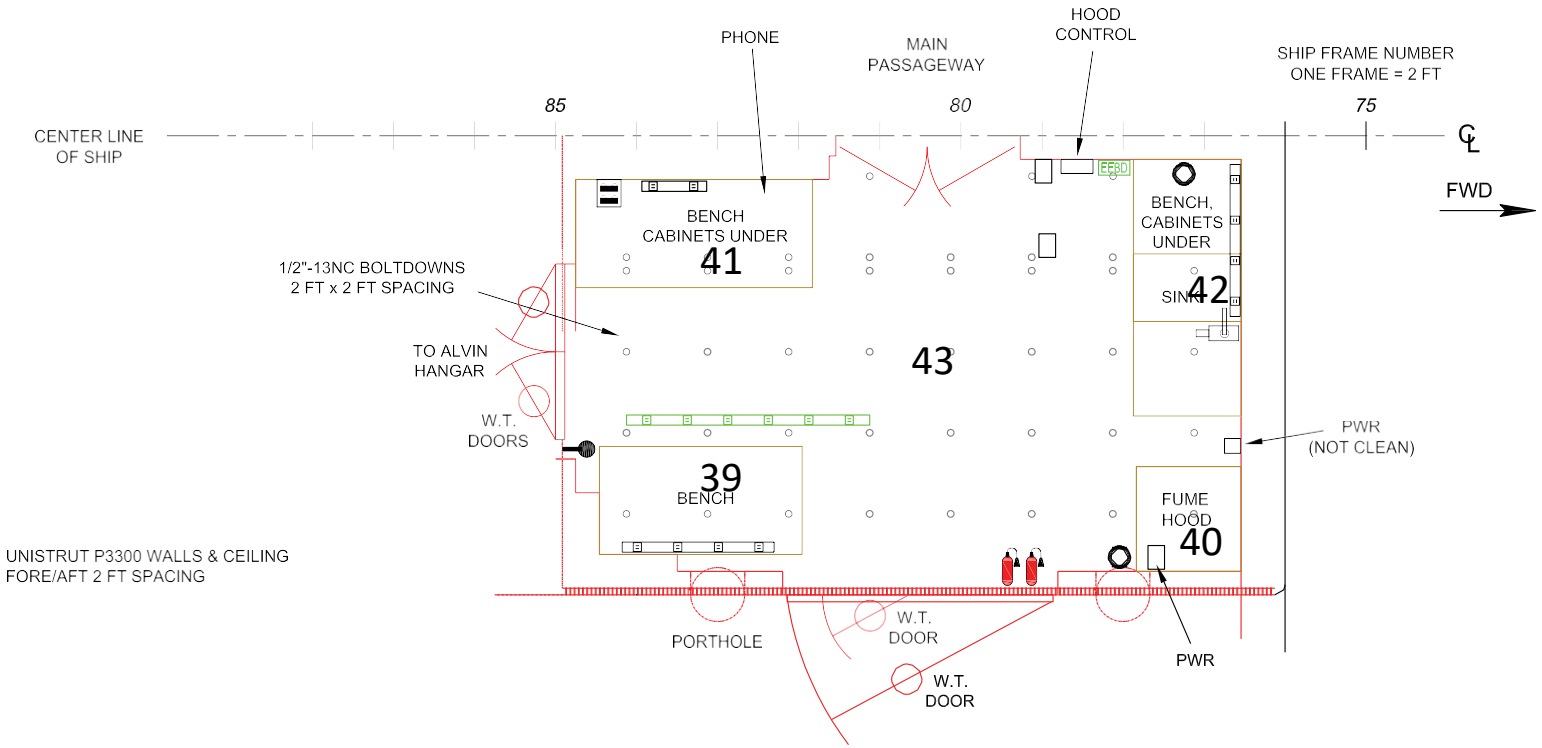
KEY

- FIRE EXTINGUISHER
- SCIENCE SEA WATER
- CABLE PASS THRU
- COMPRESSED AIR
- COMPUTER HUB
- SHIP EQUIP -KEEP CLEAR
- EEBD EMERGENCY ESCAPE BREATHING DEVICE
- 72" POWER STRIP, 6 PLUGS

UNISTRUT:
BULKHEADS
2 FT SPACING
OVERHEAD FORE/AFT,
FULL LENGTH OF LAB

ALL POWER CLEAN UNLESS NOTED



WET LABORATORY

Atlantis Main Deck, Rm 1-76-1

12/30/2013

Figure 6
SWAB # 1096
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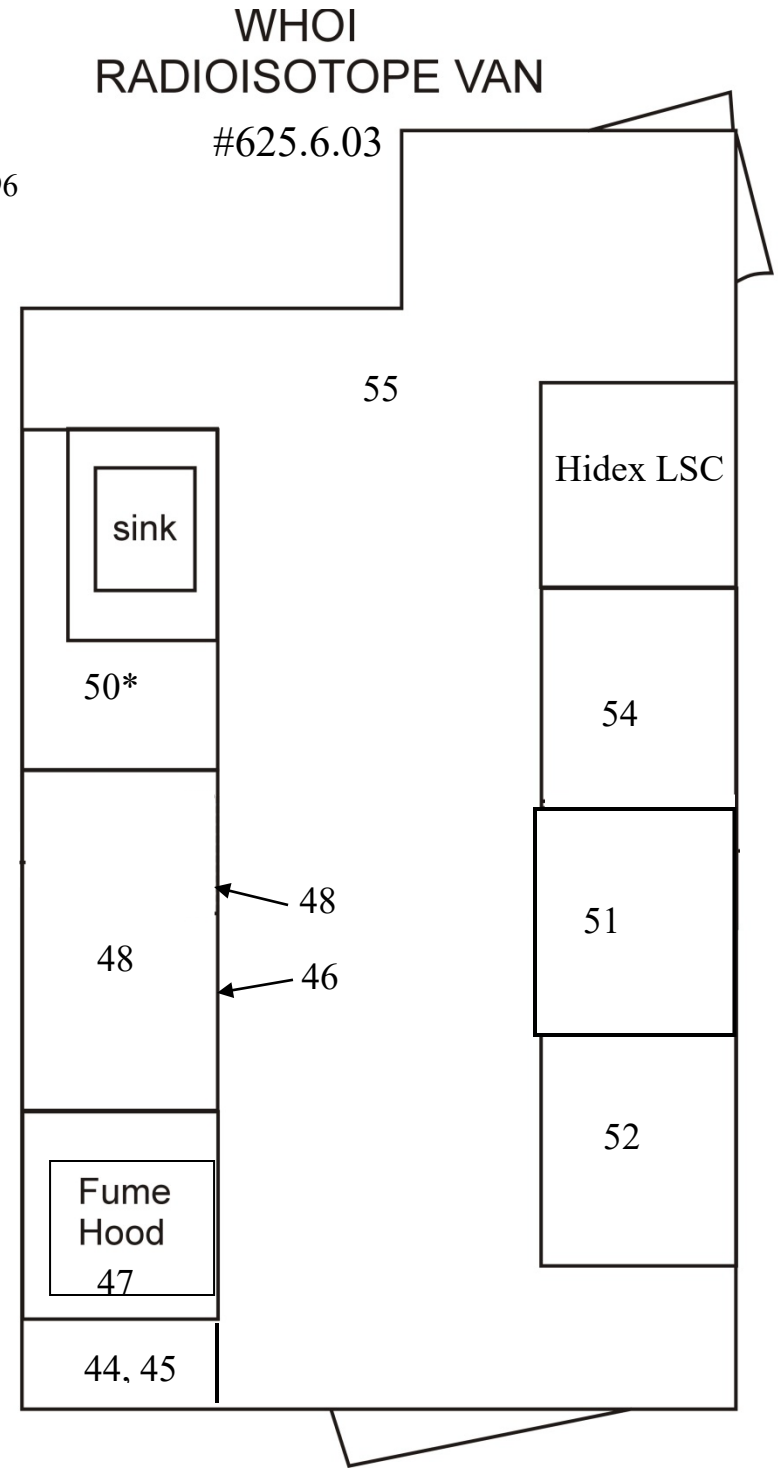

Figure 7
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UNOLS Rad Van 625.1.05-1
(aka R5)