



Tritium Laboratory  
6 May 2019

SWAB REPORT #944

SWAB DATE: 25 April 2019

*R/V Atlantis and WHOI Rad Van #625.6.03*

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Distribution:  
SWAB Committee  
David Fisichella

## COMMENTS TO SWAB REPORTS

12 May 2014

Typical LSC instrument background values for  $^3\text{H}$  and  $^{14}\text{C}$  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  $\text{dpm}/\text{m}^2$ . Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in  $\text{dpm}/\text{m}^2$ . An error larger than the activity indicates that the activity is not significantly different from zero.

### Criteria for SWAB Results

Category	$^3\text{H}$ ( $\text{dpm}/\text{m}^2$ )	$^{14}\text{C}$ ( $\text{dpm m}^2$ )	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 $1000 \text{ dpm}/\text{m}^2$ 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:  $^{14}\text{C}$  and  $^{35}\text{S}$  have peak energies of 156 and 167 KeV, respectively; thus  $^{35}\text{S}$  will be registered as  $^{14}\text{C}$  by our counting techniques. Categories A, B and C are not a health hazard.

### Recommended Cleaning Procedure

Wearing ordinary household rubber gloves:

$^3\text{H}$ : 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.

$^{14}\text{C}$ : Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing  $^{14}\text{CO}_2$ ). Follow up with wash as if for  $^3\text{H}$ .

### 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 institution promptly by phone or email.

REPORT FOR SWAB # 944

LOCATION: San Diego, CA  
VESSEL/LAB: R/V Atlantis

DATE: 25 April 2019  
TECHNICIAN: Charlene Grall

Sample #	Sample Identification	<sup>3</sup> H dpm/m <sup>2</sup>		<sup>14</sup> C dpm/m <sup>2</sup>	
		activity	error	activity	error
1	1st Vial Bkgnd	0	± 0	0	± 0
2	Initial bucket blank	-26	± 28	42	± 38
	<u>Main Lab (Figure 1)</u>				
3	Port sink area	-45	± 48	37	± 39
4	Port entrance aft of sink	-42	± 46	47	± 39
5	Port entrance forward of sink	-1	± 5	18	± 36
6	Starboard freezer	-24	± 26	44	± 38
7	Starboard refrigerator bottom only	-33	± 35	30	± 39
8	Deck in front of -80C freezers	6	± 14	30	± 36
9	Benchtop betw ice machine and -80C freez	-23	± 25	36	± 38
10	Benchtop across from port sink	-49	± 53	43	± 39
11	Starboard sink area	-8	± 106	24	± 37
12	Inside fume hood	0	± 2	18	± 36
13	Deck inside aft entrance	-5	± 15	41	± 37
14	Deck inside aft port entrance	-36	± 40	47	± 39
15	Center aft benchtop	-43	± 46	48	± 39
16	Benchtop across from port sink	-4	± 13	9	± 37
17	Deck in front of port sink	-13	± 31	16	± 38
18	Benchtop across from port entrance aft of sink	-27	± 30	23	± 39
19	Deck in front of starboard sink	-19	± 46	36	± 38
20	Deck between benchtop and power station	-7	± 23	47	± 38
	<u>Bio Analytical Lab (Figure 2)</u>				
21	Deck inside aft entrance	-27	± 30	28	± 38
22	Aft sink area	5	± 12	36	± 37
23	Inside fume hood	-11	± 28	*65	± 38
24	Inside forward refrigerator	-28	± 30	20	± 39
25	Inside forward freezer	-8	± 27	-3	± 11
26	Deck between fume hood and aft sink	4	± 10	32	± 37
27	Forward sink area	-57	± 61	17	± 44
28	Forward benchtop	-44	± 47	19	± 41
29	Deck inside starboard entrance	1	± 2	46	± 37
30	Starboard benchtop	-8	± 26	10	± 37

Sample #	Sample Identification	$^3\text{H}$ dpm/m <sup>2</sup>		$^{14}\text{C}$ dpm/m <sup>2</sup>	
		activity	error	activity	error
<u>Walk-in Coolers (Figure 3)</u>					
31	Deck outside of forward freezer	-38	± 41	27	± 39
32	Floor of aft freezer	-5	± 15	48	± 38
33	Deck at entrance to computer lab	40	± 43	24	± 34
<u>Computer Lab (Figure 3)</u>					
34	Deck inside starboard entrance	8	± 188	-11	± 46
<u>Hydro Lab (Figure 4)</u>					
35	Deck below port sink area	-43	± 47	12	± 44
36	Deck below stbd sink area	-11	± 73	36	± 37
37	Inside fume hood	-28	± 30	9	± 42
38	Deck inside starboard entrance	-20	± 22	37	± 38
39	Inside Frigidaire freezer	-30	± 33	22	± 39
40	Inside Frigidaire refrigerator	-27	± 29	41	± 38
41	Inside Cospolich freezer	13	± 35	12	± 34
<u>Wet Lab (Figure 5)</u>					
42	Forward sink area	-22	± 24	17	± 39
43	Port benchtop	-6	± 43	26	± 37
44	Starboard benchtop	-57	± 62	5	± 86
45	Deck in center of lab	15	± 27	30	± 36
46	Final bucket blank CO #1	-20	± 22	9	± 40
<u>WHOI Rad Van 625.6.03 (Figure 6)</u>					
47	Initial bucket blank CO #2	-1	± 6	22	± 36
48	Deck outside port entrance	-102	± 110	27	± 46
49	Deck outside aft door	-32	± 123	*82	± 40
50	Inside Haier refrigerator	187	± 19	*1750	± 79
51	Benchtop across from sink	64	± 38	*68	± 36
52	Sink area	156	± 37	*291	± 45
53	Benchtop adjacent to sink	131	± 34	*265	± 44
54	Inside fume hood	95	± 34	*162	± 40
55	Inside fridge	369	± 71	*61	± 29
56	Inside freezer	62	± 43	43	± 35
57	Benchtop adjacent to LSC	76	± 42	*63	± 36
58	Benchtop across from Haier refrigerator	317	± 65	*89	± 33
59	Deck below fume hood	*661	± 75	*374	± 45
60	Deck between sink and entrance	464	± 61	*464	± 49

### Comments

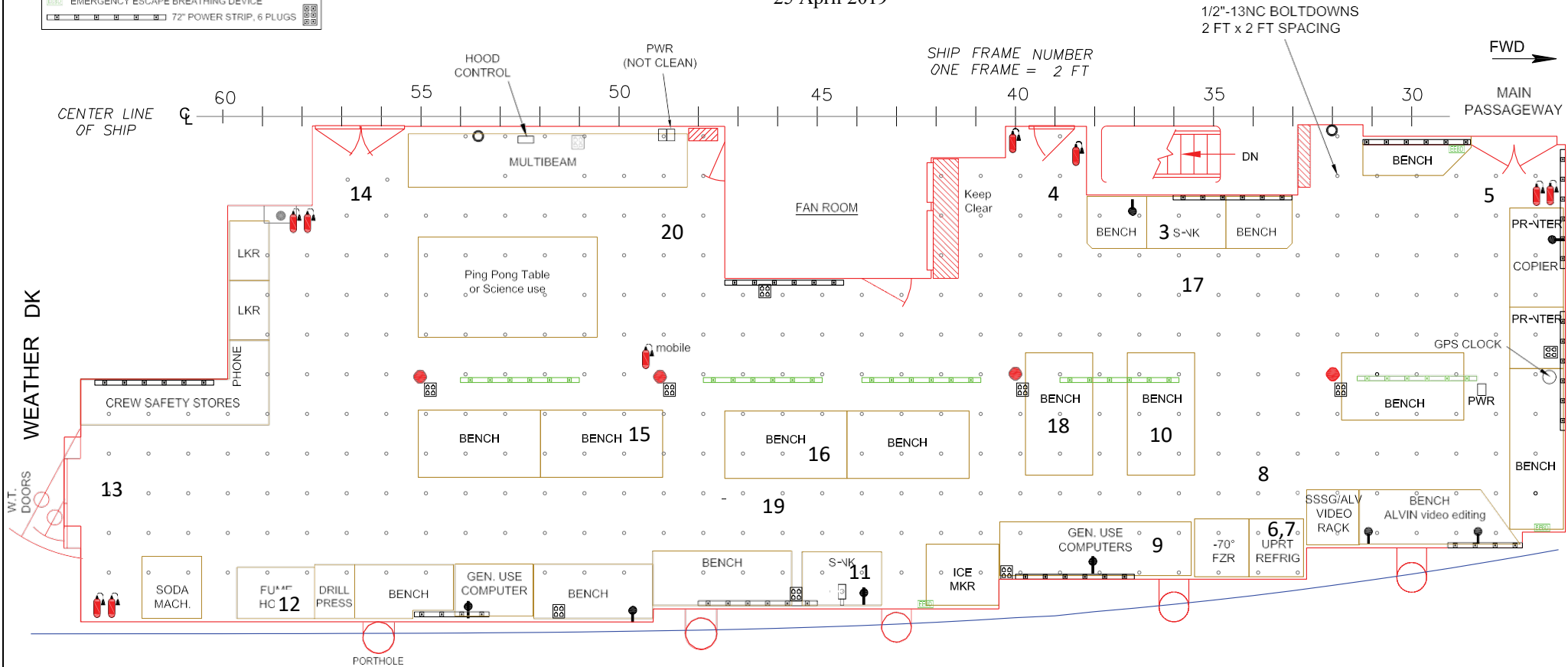
Please note that the error reported for each isotope is the two-standard deviation counting error. The reports may now contain values less than zero. When decay counting background samples will be distributed about the background vial, which means that negative values are possible. In the past we rounded the negative values to zero. Values are only significantly above background when they are positive and larger than the error. Minor  $^{14}\text{C}$  contamination was found in the fume hood in the Bioanalytical lab and on the deck outside the aft door of the Rad Van. These areas should be cleaned ASAP. Minor  $^{14}\text{C}$  and  $^3\text{H}$  contamination was found in the Rad Van. No action is needed in the Rad Van.

**KEY**

- FIRE EXTINGUISHER
- SCIENCE SEA WATER
- SHIP EQUIP - KEEP CLEAR
- 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

Figure 1  
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**MAIN LABORATORY**  
 Atlantis Main Deck, Room 1-26-1

**KEY**









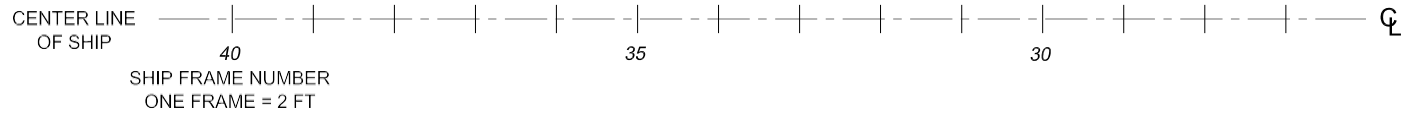
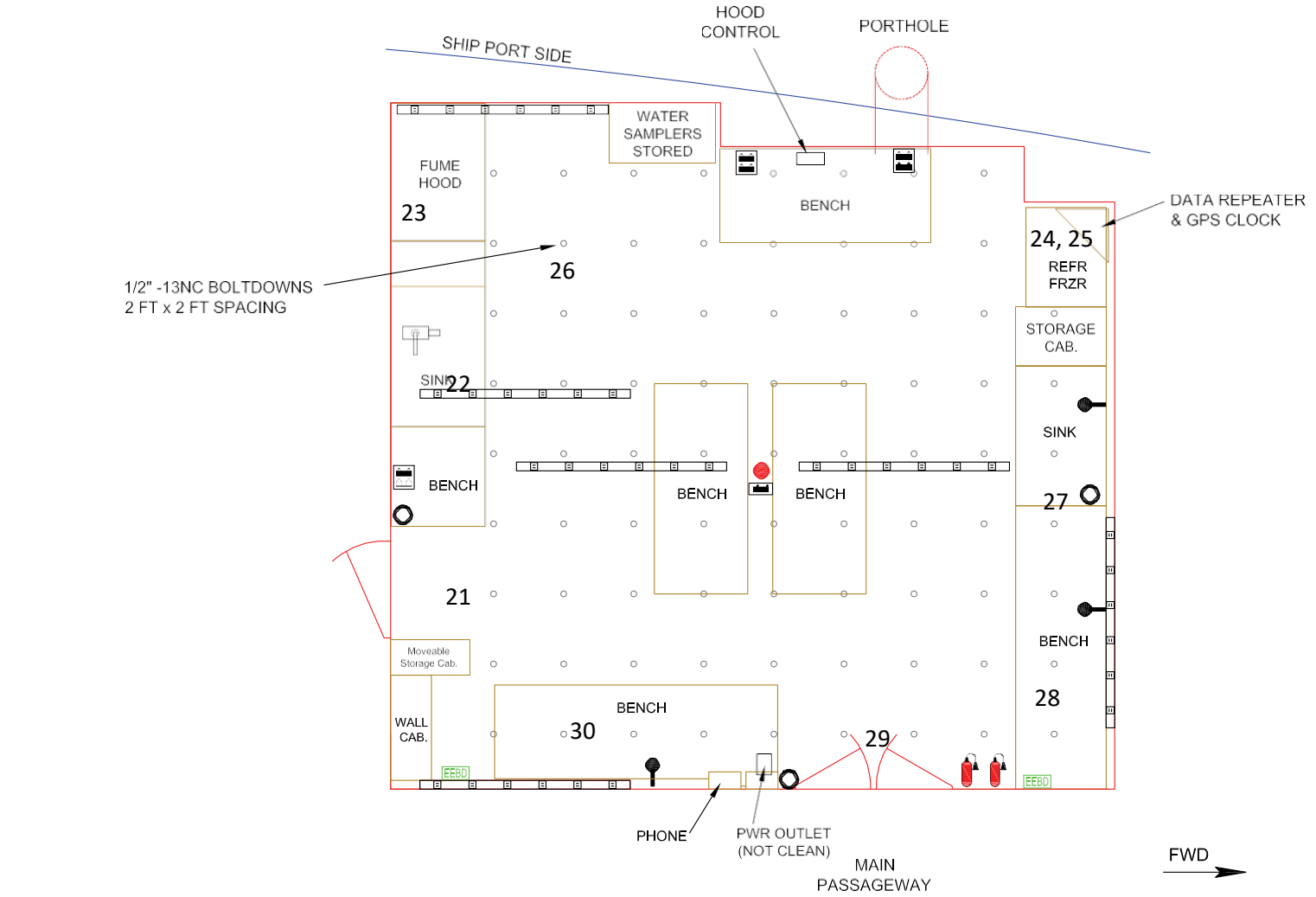
-  COMPUTER HUB
-  SHIP EQUIP -KEEP CLEAR
-  EMERGENCY ESCAPE BREATHING DEVICE
-  72" POWER STRIP, 6 PLUGS
-  FIRE EXTINGUISHER
-  SCIENCE SEA WATER
-  CABLE PASS THRU
-  COMPRESSED AIR

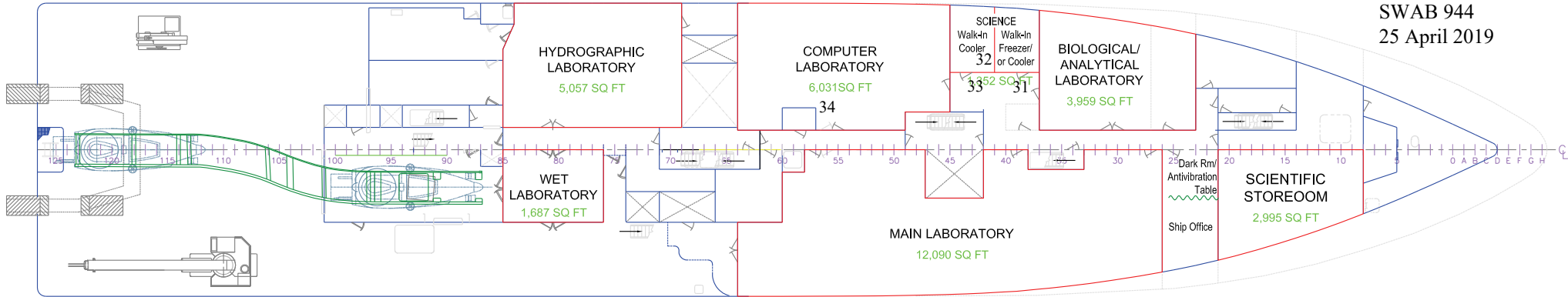
Figure 2  
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UNISTRUT:  
BULKHEADS  
2 FT SPACING  
OVERHEAD FORE/AFT,  
FULL LENGTH OF LAB  
  
ALL POWER CLEAN UNLESS NOTED



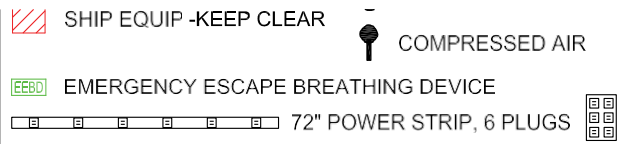
**BIOLOGICAL/ANALYTICAL CLEAN LABORATORY**  
*Atlantis Main Deck, Room 1-27-2*

Figure 3  
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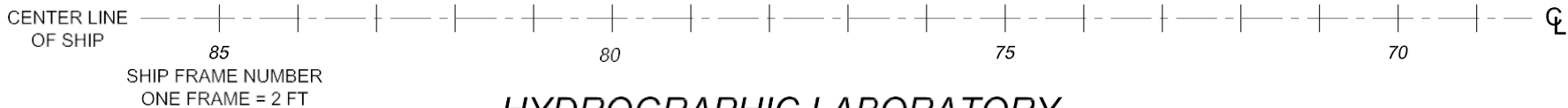
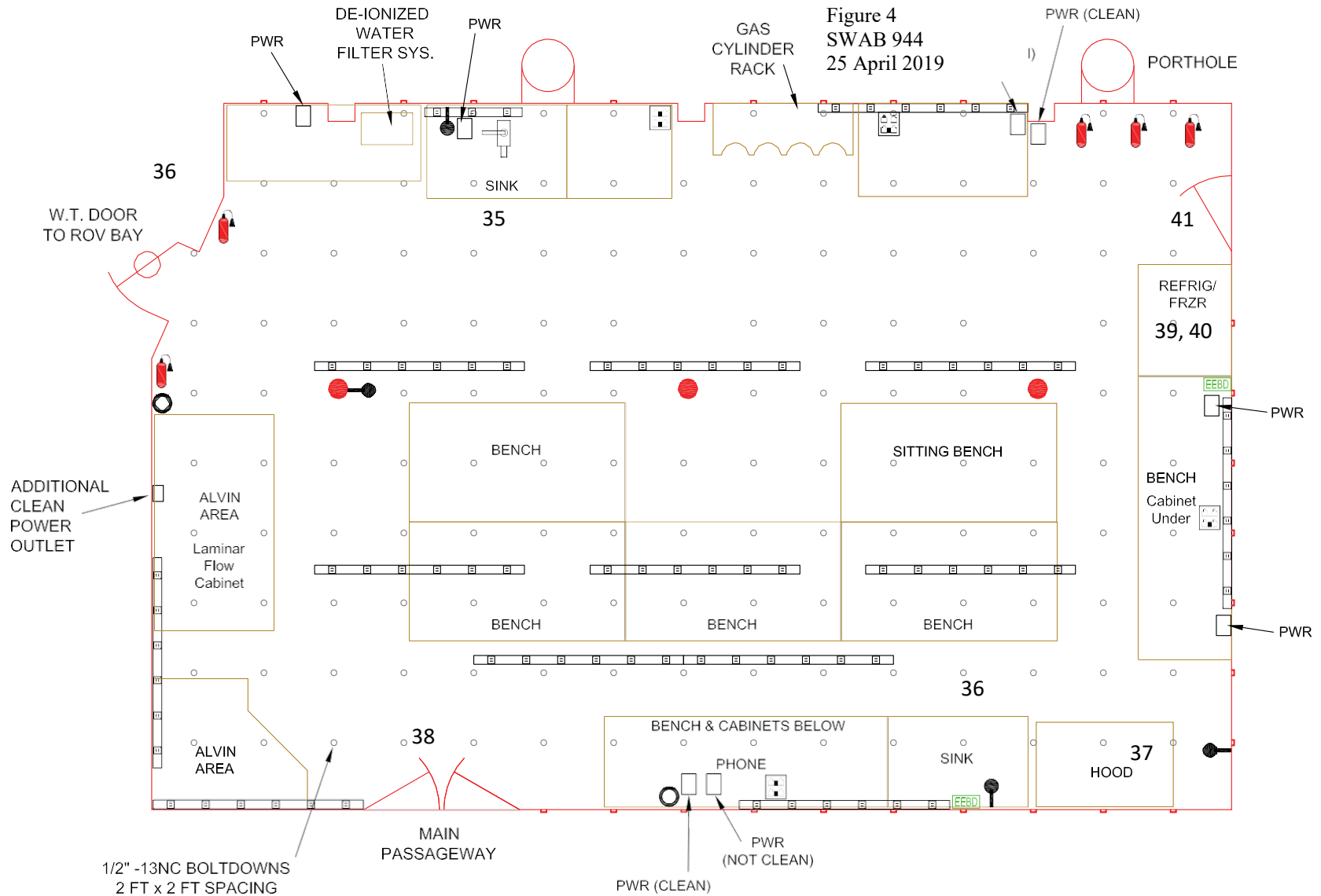
*Laboratories & Scientific Storeroom General Locations  
 Atlantis Main Deck*





FULL LENGTH OF LAB  
ALL POWER CLEAN UNLESS NOTED

Figure 4  
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**HYDROGRAPHIC LABORATORY**  
*Atlantis Main Deck, Room 1-64-2*


FWD →

**KEY**


 COMPUTER HUB

 SHIP EQUIP -KEEP CLEAR


 EMERGENCY ESCAPE BREATHING DEVICE

 72" POWER STRIP, 6 PLUGS

 FIRE EXTINGUISHER

 SCIENCE SEA WATER

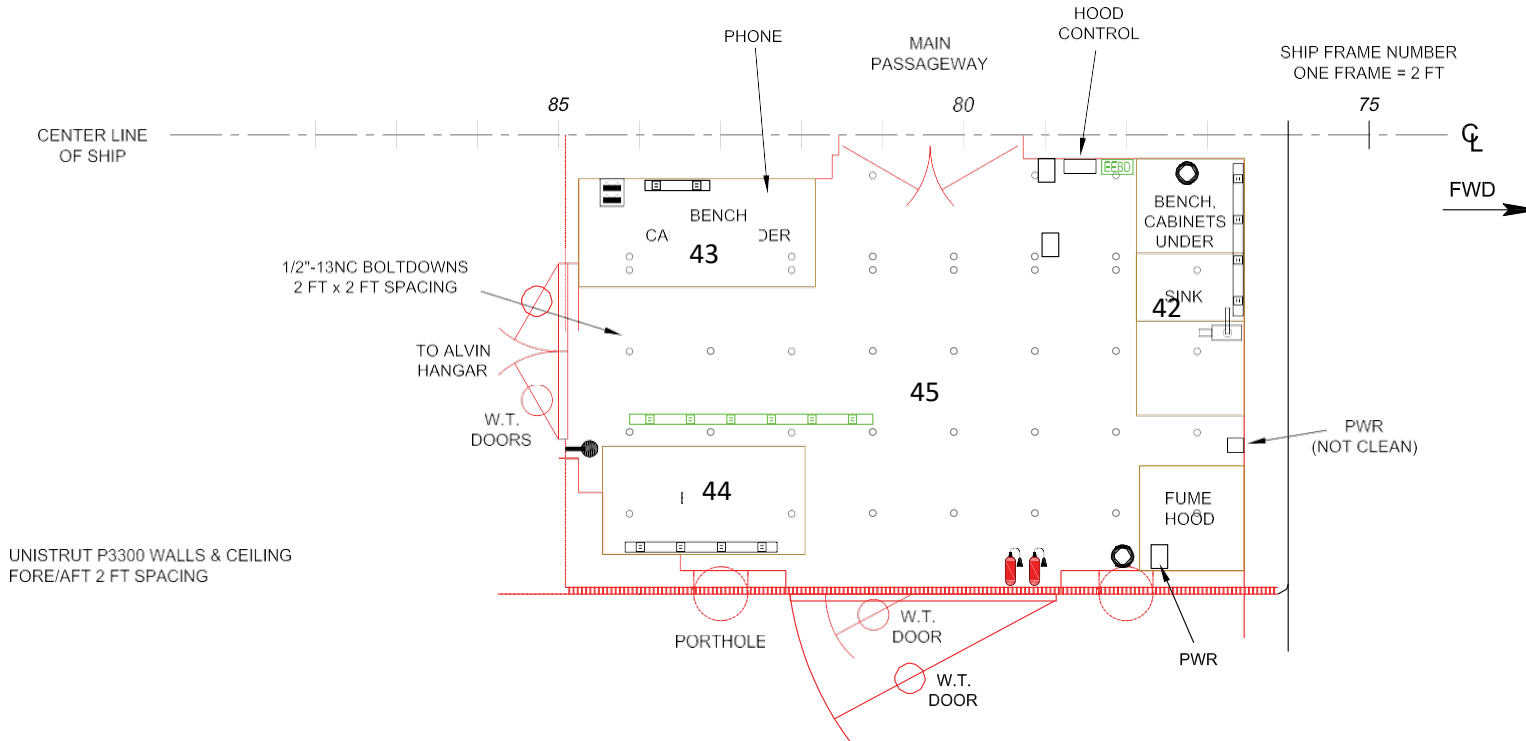
 CABLE PASS THRU

 COMPRESSED AIR

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

ALL POWER CLEAN UNLESS NOTED

Figure 5  
SWAB 944  
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UNISTRUT P3300 WALLS & CEILING  
FORE/AFT 2 FT SPACING

**WET LABORATORY**  
*Atlantis Main Deck, Rm 1-76-1*

# WHOI RADIOISOTOPE VAN

#625.6.03

Figure 6  
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