



Tritium Laboratory
16 September 2019

SWAB REPORT #959

SWAB DATE: 7 September 2019

R/V Atlantis and WHOI Rad Van #625.6.03

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Associate Research Professor

Distribution:
SWAB Committee
David Fisichella

COMMENTS TO SWAB REPORTS

12 May 2014

Typical LSC instrument background values for ^3H 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	^3H (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 $1000 \text{ dpm}/\text{m}^2$ 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}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 Procedure

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.

^{14}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 ^3H .

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 # 959

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

DATE: 7 September 2019
TECHNICIAN: Jim Happell

Sample #	Sample Identification	³ H dpm/m ²		¹⁴ C dpm/m ²	
		activity	error	activity	error
1	1st Vial Bkgnd	0	± 0	0	± 0
2	Initial bucket blank	-42	± 71	-30	± 47
	<u>Main Lab (Figure 1)</u>				
3	Port sink area	-60	± 102	-15	± 29
4	Port entrance aft of sink	9	± 50	3	± 34
5	Port entrance forward of sink	-7	± 41	-8	± 63
6	Starboard freezer	-45	± 75	-6	± 49
7	Starboard refrigerator bottom only	-36	± 60	7	± 53
8	Deck in front of -80C freezers	-15	± 79	3	± 55
9	Benchtop betw ice machine and -80C freez	-22	± 116	8	± 45
10	Benchtop across from port sink	-46	± 77	21	± 44
11	Starboard sink area	-39	± 65	-13	± 25
12	Inside fume hood	-133	± 224	18	± 62
13	Deck inside aft entrance	-23	± 124	-12	± 23
14	Deck inside aft port entrance	-26	± 139	-4	± 29
15	Center aft benchtop	-11	± 61	-4	± 33
16	Benchtop across from port sink	-29	± 152	2	± 13
17	Deck in front of port sink	32	± 55	2	± 23
18	Benchtop across from port entrance aft of sink	-46	± 78	-17	± 33
19	Deck in front of starboard sink	0	± 7	3	± 39
20	Deck between benchtop and power station	-5	± 30	-1	± 6
	<u>Bio Analytical Lab (Figure 2)</u>				
21	Deck inside aft entrance	-28	± 151	-21	± 41
22	Aft sink area	-14	± 76	-15	± 30
23	Inside fume hood	-47	± 79	-4	± 31
24	Inside forward refrigerator	-11	± 58	-30	± 47
25	Inside forward freezer	-31	± 52	-4	± 33
26	Deck between fume hood and aft sink	-36	± 60	-9	± 71
27	Forward sink area	-54	± 92	2	± 12
28	Forward benchtop	-17	± 91	-23	± 45
29	Deck inside starboard entrance	-30	± 50	-19	± 38
30	Starboard benchtop	-12	± 63	-19	± 37

Sample #	Sample Identification	^3H dpm/m ²		^{14}C dpm/m ²	
		activity	error	activity	error
<u>Walk-in Coolers (Figure 3)</u>					
31	Deck outside of forward freezer	-6	± 32	-14	± 27
32	Floor of aft freezer	*503	± 83	-7	± 14
33	Deck at entrance to computer lab	-17	± 89	-6	± 48
<u>Computer Lab (Figure 3)</u>					
34	Deck inside starboard entrance	16	± 87	-12	± 25
<u>Hydro Lab (Figure 4)</u>					
35	Deck below port sink area	-7	± 38	-8	± 64
36	Deck below stbd sink area	-36	± 60	-13	± 27
37	Inside fume hood	-20	± 108	-28	± 44
38	Deck inside starboard entrance	24	± 196	-34	± 54
39	Inside Frigidaire freezer	-76	± 128	-4	± 33
40	Inside Frigidaire refrigerator	-8	± 41	-4	± 32
41	Inside Cospolich freezer	-57	± 95	-16	± 31
<u>Wet Lab (Figure 5)</u>					
42	Forward sink area	-51	± 86	-14	± 29
43	Port benchtop	-31	± 52	-31	± 49
44	Starboard benchtop	-47	± 79	-18	± 36
45	Deck in center of lab	-51	± 86	13	± 49
46	Wet lab fume hood	61	± 102	-29	± 46
<u>WHOI Rad Van 625.6.03 (Figure 6)</u>					
47	Intermediate bucket blank	-34	± 57	-10	± 20
48	Deck outside port entrance	-21	± 110	3	± 59
49	Deck outside aft door	114	± 62	19	± 30
50	Inside Haier refrigerator	**74690	± 792	*1470	± 36
51	Benchtop across from sink	*833	± 101	*62	± 25
52	Sink area	*902	± 97	*122	± 32
53	Benchtop adjacent to sink	**22020	± 438	*603	± 28
54	Inside fume hood	342	± 75	*82	± 35
55	Inside fridge	*657	± 49	*4168	± 148
56	Inside freezer	*1866	± 106	*2140	± 84
57	Benchtop adjacent to LSC	*971	± 101	*199	± 36
58	Benchtop across from Haier refrigerator	407	± 73	*88	± 33
59	Deck below fume hood	*4932	± 207	*333	± 31
60	Deck between sink and entrance	*1642	± 122	*299	± 38
61	Final bucket blank	27	± 53	-3	± 25

Comments

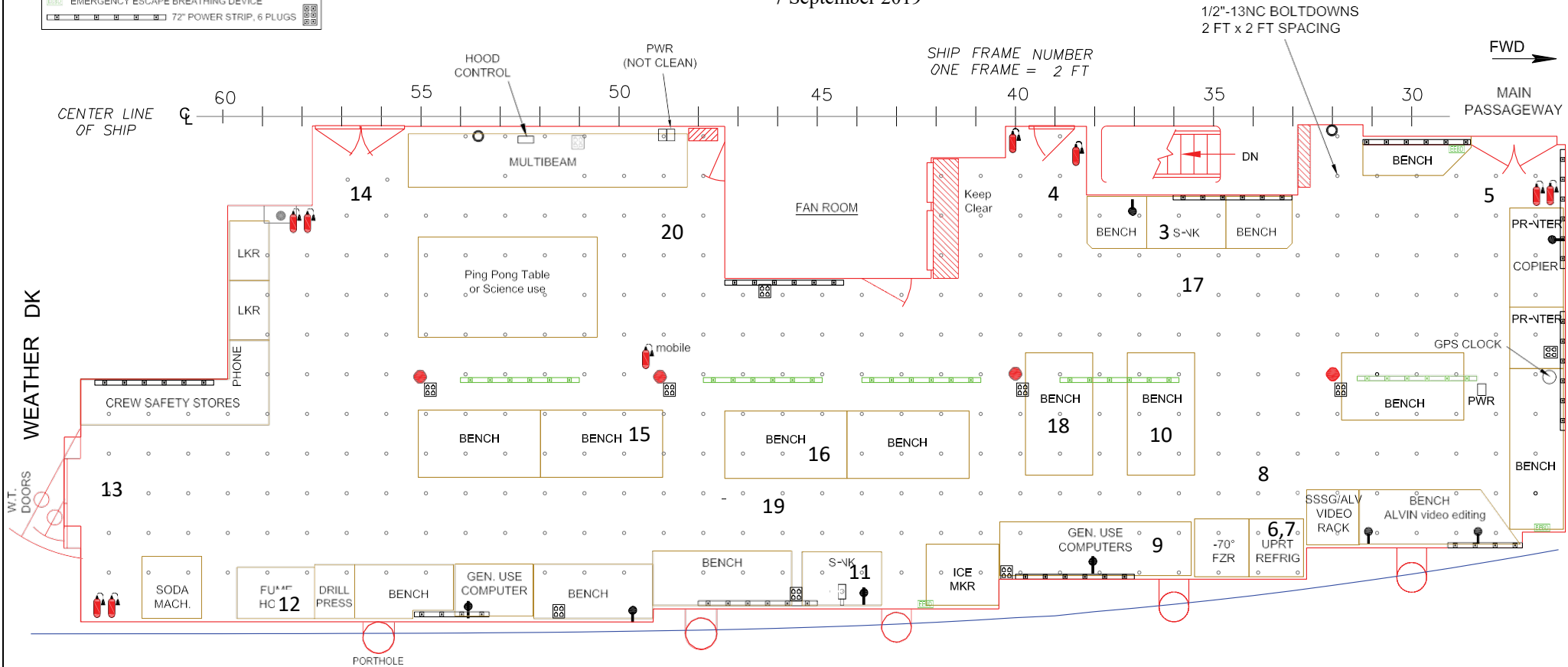
Please note that the error reported for each isotope is the two-standard deviation counting error. The reports may now contain values less than zero. When decay counting background samples will be distributed about the background vial, which means that negative values are possible. In the past we rounded the negative values to zero. Values are only significantly above background when they are positive and larger than the error. Minor ^3H contamination was found on the deck in the aft walk-in refrigerator. This area should be cleaned. Minor ^{14}C and minor to moderate ^3H contamination was found in the Rad Van. The inside of the Haier refrigerator and the benchtop adjacent to the sink need to be cleaned. We also recommend cleaning the deck of the van to help prevent tracking contamination outside.

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









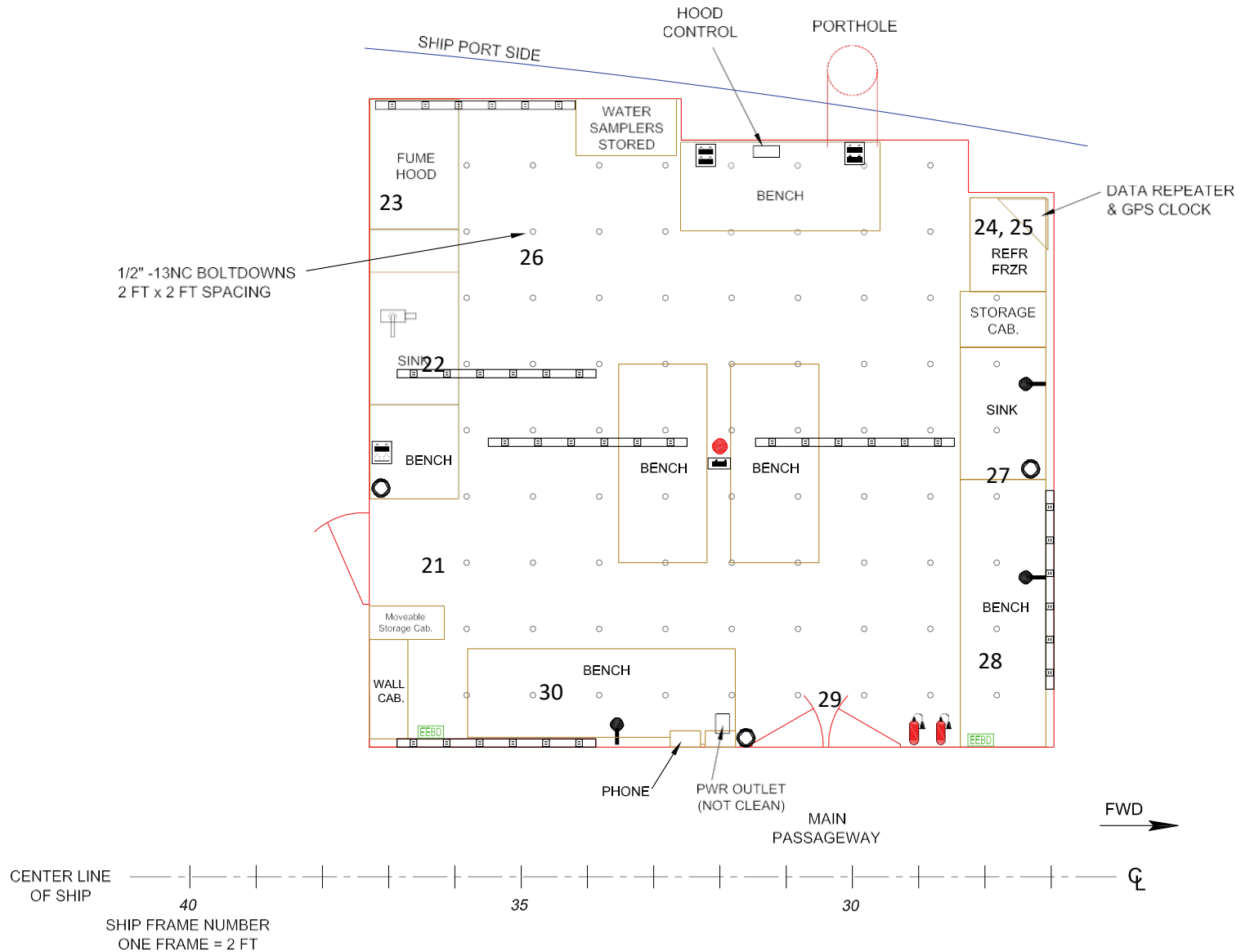
-  COMPUTER HUB
-  SHIP EQUIP -KEEP CLEAR
-  EMERGENCY ESCAPE BREATHING DEVICE
-  72" POWER STRIP, 6 PLUGS
-  FIRE EXTINGUISHER
-  SCIENCE SEA WATER
-  CABLE PASS THRU
-  COMPRESSED AIR

Figure 2
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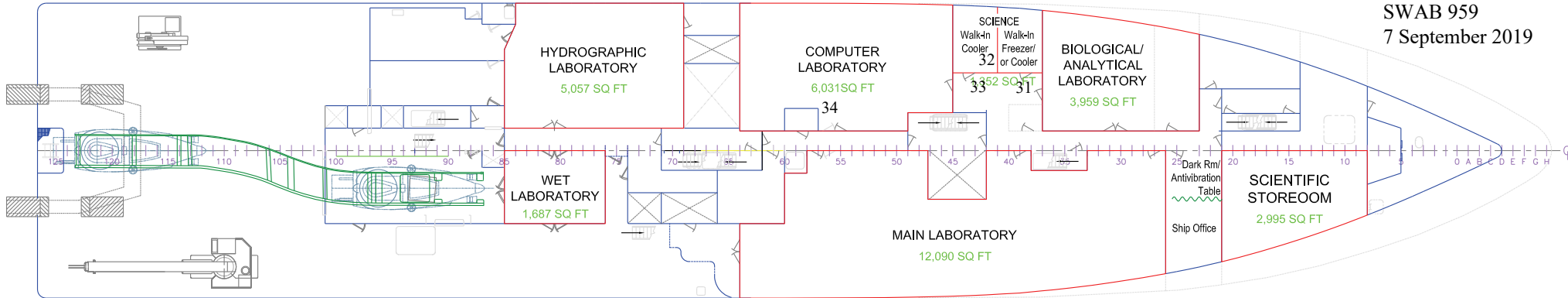
UNISTRUT:
BULKHEADS
2 FT SPACING
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FULL LENGTH OF LAB

ALL POWER CLEAN UNLESS NOTED



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

Figure 3
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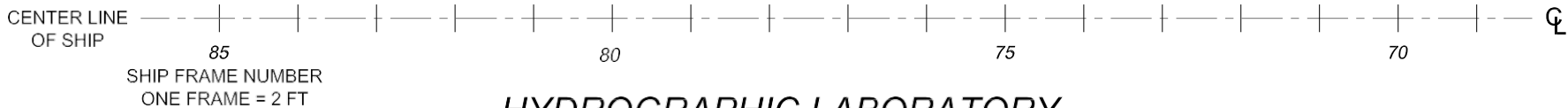
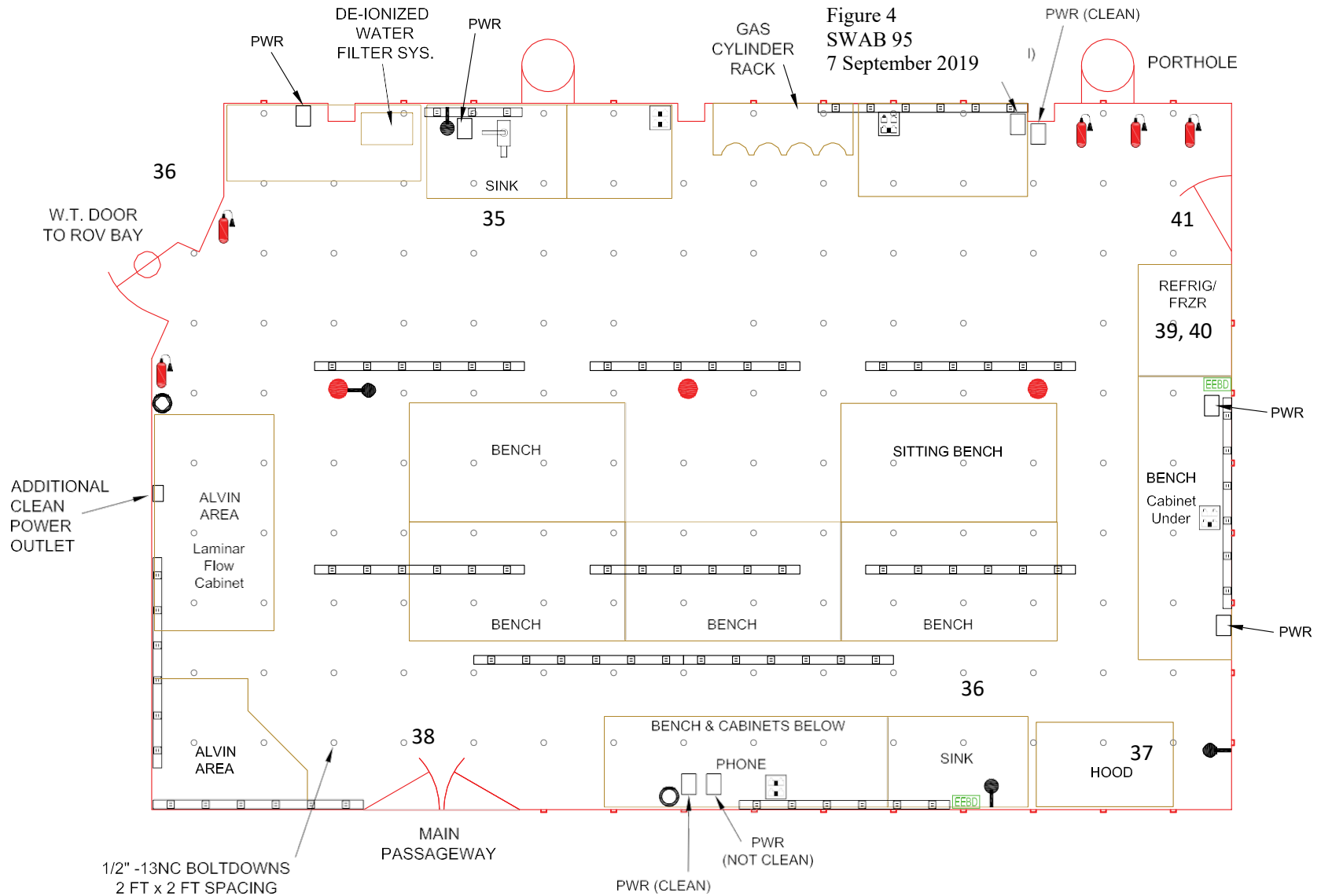


*Laboratories & Scientific Storeroom General Locations
 Atlantis Main Deck*











FULL LENGTH OF LAB
ALL POWER CLEAN UNLESS NOTED

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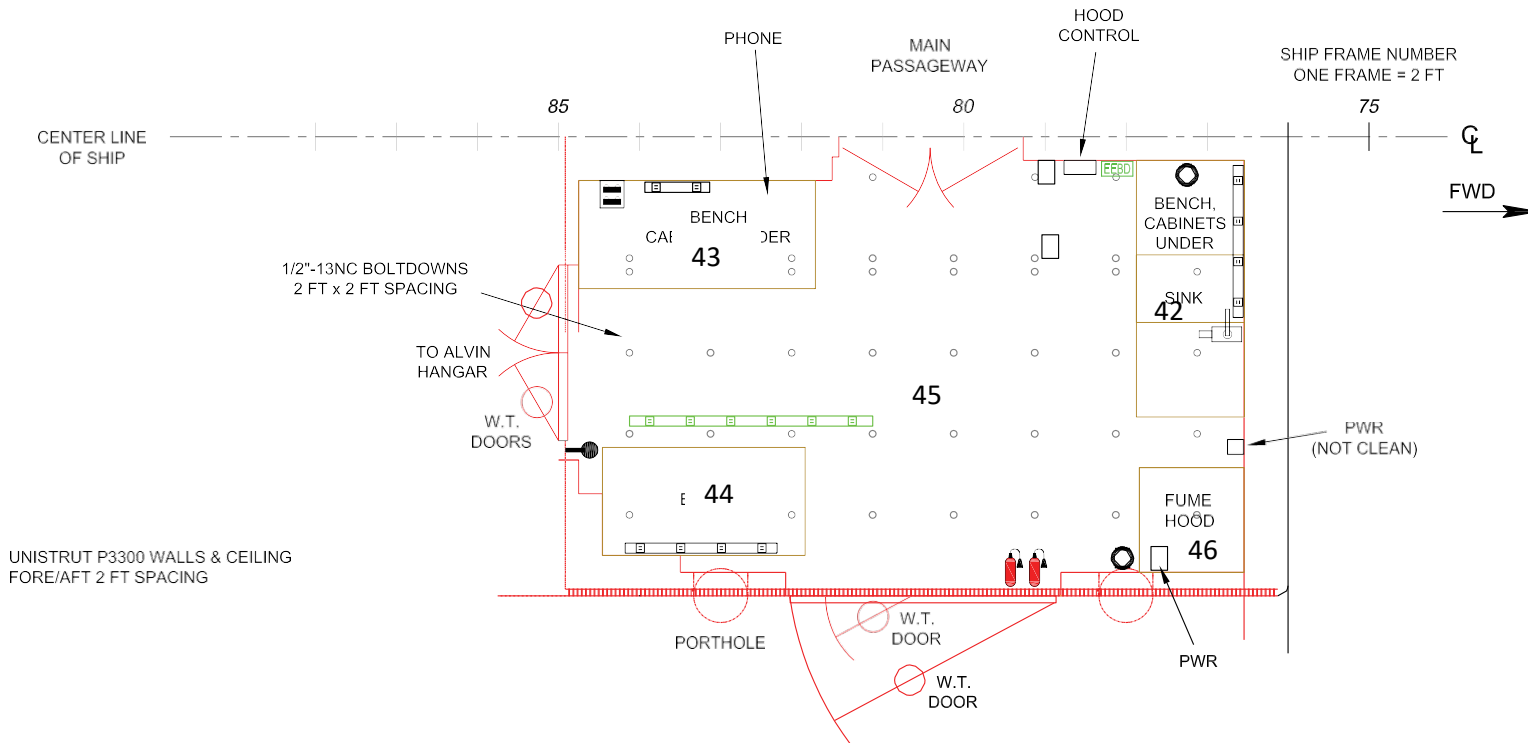
HYDROGRAPHIC LABORATORY
Atlantis Main Deck, Room 1-64-2

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

WHOI RADIOISOTOPE VAN

#625.6.03

Figure 6
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