

UNIVERSITY OF MIAMI  
ROSENSTIEL  
SCHOOL of MARINE &  
ATMOSPHERIC SCIENCE



Tritium Laboratory  
15 November 2017

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SWAB REPORT # 879

SWAB DATE: 5 November 2017

*R/V Laurence M. Gould*  
and Radioisotope Van #1

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Dr. James D. Happell  
Associate Research Professor

Distribution:  
SWAB Committee  
Jamee Johnson

## 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 insitution promptly by phone or email.

REPORT FOR SWAB # 879

LOCATION: Punta Arenas, Chile  
VESSEL: *R/V Laurence M Gould*

DATE: 5 November 2017  
TECHNICIAN: Charlene Grall

Sample #	Sample Identification	$^3\text{H}$ dpm/m <sup>2</sup>		$^{14}\text{C}$ dpm/m <sup>2</sup>	
		activity	error	activity	error
1	1st Vial Background	0	± 0	0	± 0
2	Initial bucket blank	-3	± 41	-11	± 38
	<u>Dry Lab (Figure 1)</u>				
3	Deck inside port entrance	22	± 90	-18	± 36
4	Deck in front of Isotemp -20 freezer	16	± 838	-29	± 33
5	Port sink area and adjacent bench	-7	± 55	-25	± 68
6	Inside fume hood	55	± 94	-54	± 43
7	Deck inside door to Electronic Lab	-70	± 98	10	± 63
8	Inside Consul freezer (top)	145	± 64	-36	± 41
9	Inside Consul refrigerator (bottom)	19	± 41	9	± 35
10	Starboard benchtop aft section near refrigerator	-28	± 41	-27	± 71
11	Starboard benchtop Foreward section near fume hood	-44	± 56	-9	± 50
12	Deck inside aft Baltic Room door	9	± 17	-36	± 62
13	Aft center benchtop	-19	± 36	-25	± 32
14	Forward center benchtop	-9	± 10	-7	± 162
	<u>Electronics Lab (Figure 2)</u>				
15	Deck inside port entrance	23	± 56	-1	± 14
16	Deck aft of plotter	-22	± 11	-5	± 23
	<u>Hydro Lab (Figure 3)</u>				
17	Aft sink area	-16	± 53	-28	± 66
18	Inside fume hood	9	± 101	-26	± 81
19	Deck between fume hood sink and aft bench	-22	± 98	-42	± 25
20	Aft benchtop across from fume hood	-6	± 32	-33	± 48
21	Center sink area and adjacent benchtops	-12	± 113	-38	± 66
22	Aft benchtop aft of -80 Revco freezer	-20	± 44	-34	± 34
23	Port benchtop aft of -80 Revco freezer	30	± 80	-24	± 51
24	Inside port Fischer Scientific refrigerator	-10	± 60	-33	± 19
25	Port benchtop forward of port refrigerator	-7	± 64	-33	± 80
26	Forward sink area	2	± 214	-26	± 55
27	Deck below forward sink	-6	± 54	-38	± 47
28	Benchtop adjacent to forward sink	-7	± 47	3	± 44

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
29	Starboard Kenmore refrigerator	-4	19	-23	26
30	Deck just starboard of ice machine	-6 ±	66	-32 ±	12
31	Foward section of starboard benchtop	2 ±	74	-4 ±	45
32	Aft section of starboard benchtop	4 ±	98	-25 ±	35
33	Deck between aft and starboard entrances	14 ±	84	-44 ±	48
<u>Wet Lab (Figure 4)</u>					
34	Forward sink area	14 ±	159	-21 ±	33
35	Inside fume hood	21 ±	283	-37 ±	11
36	Deck between forward and starboard entrances	-5 ±	25	-39	22
37	Benchtop across from fume hood	-19 ±	66	-16 ±	64
38	Center sink area	7 ±	45	-24 ±	28
39	Final bucket sample (C.O.#1)	48 ±	86	-43 ±	26
40	Initial bucket sample (C.O.#2)	8 ±	91	-29 ±	38
41	Inside small Fischer Scientific freezer	-50 ±	22	-11 ±	19
42	Port side of center benchtop	2 ±	38	-28 ±	83
43	Aft center benchtop adjacent to refrigerator	4 ±	74	-28 ±	36
44	Aft sink area	12 ±	229	-21 ±	39
45	Deck in front of aft sink	-32 ±	29	-20 ±	41
46	Deck in front of -80 Freezer and incubator	10 ±	46	-20 ±	53
<u>Miscellaneous Areas (Figure 5)</u>					
47	Deck of Enviro Room	-37 ±	62	-37 ±	59
48	Deck of Changing Room	-9 ±	90	-33 ±	12
49	Aft 01 deck where Rad waste is stored	392 ±	53	*70 ±	31
<u>Radioisotope Van #1 (Figure 6)</u>					
51	Bench across from fume hood	218 ±	64	-25 ±	32
52	Inside fume hood	*1535 ±	117	13 ±	6
53	Inside Consul refrigerator (brand new)	276 ±	65	-12 ±	128
54	Inside Consul freezer (brand new)	202 ±	67	-35 ±	71
55	Benchtop adjacent to fume hood	319 ±	68	-16 ±	613
56	Benchtop adjacent to Consul refrigerator	*808 ±	90	-26 ±	57
57	Benchtop between LSC and sink	186 ±	65	-48 ±	69
58	Deck in center of van	*754 ±	113	-10 ±	15
59	Deck below LSC	207 ±	80	-33 ±	22
60	Deck inside entrance	386 ±	74	-29 ±	47
50	Final bucket blank (C.O.#4)	-7 ±	19	-32 ±	88

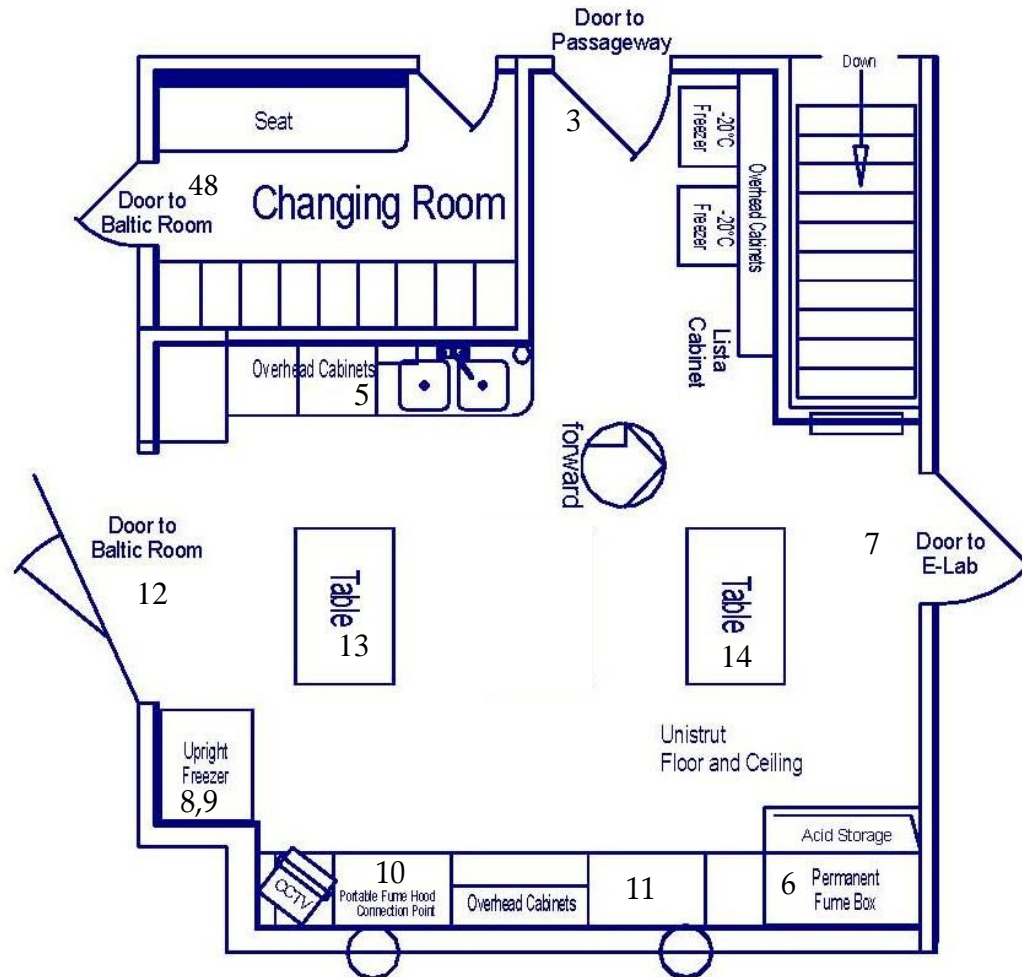
### **Comments**

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. The deck area on the 01 deck when the rad waste is stored had minor  $^{14}\text{C}$  contamination. This area should be cleaned before any addition use. Rad Van #1 had minor  $^3\text{H}$  contamination in several spots but no action is necessary.

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Figure 1

# Dry Lab

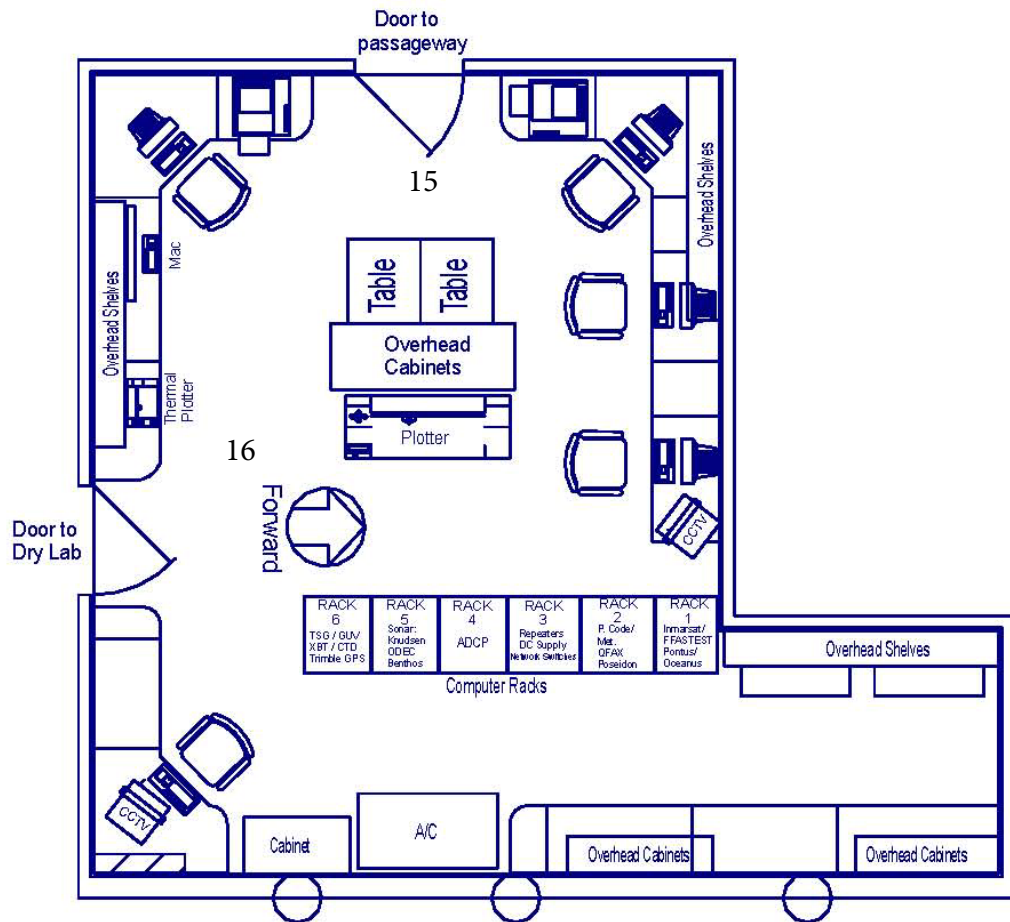
356 sq. ft.



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 Figure 2

# Electronics Lab

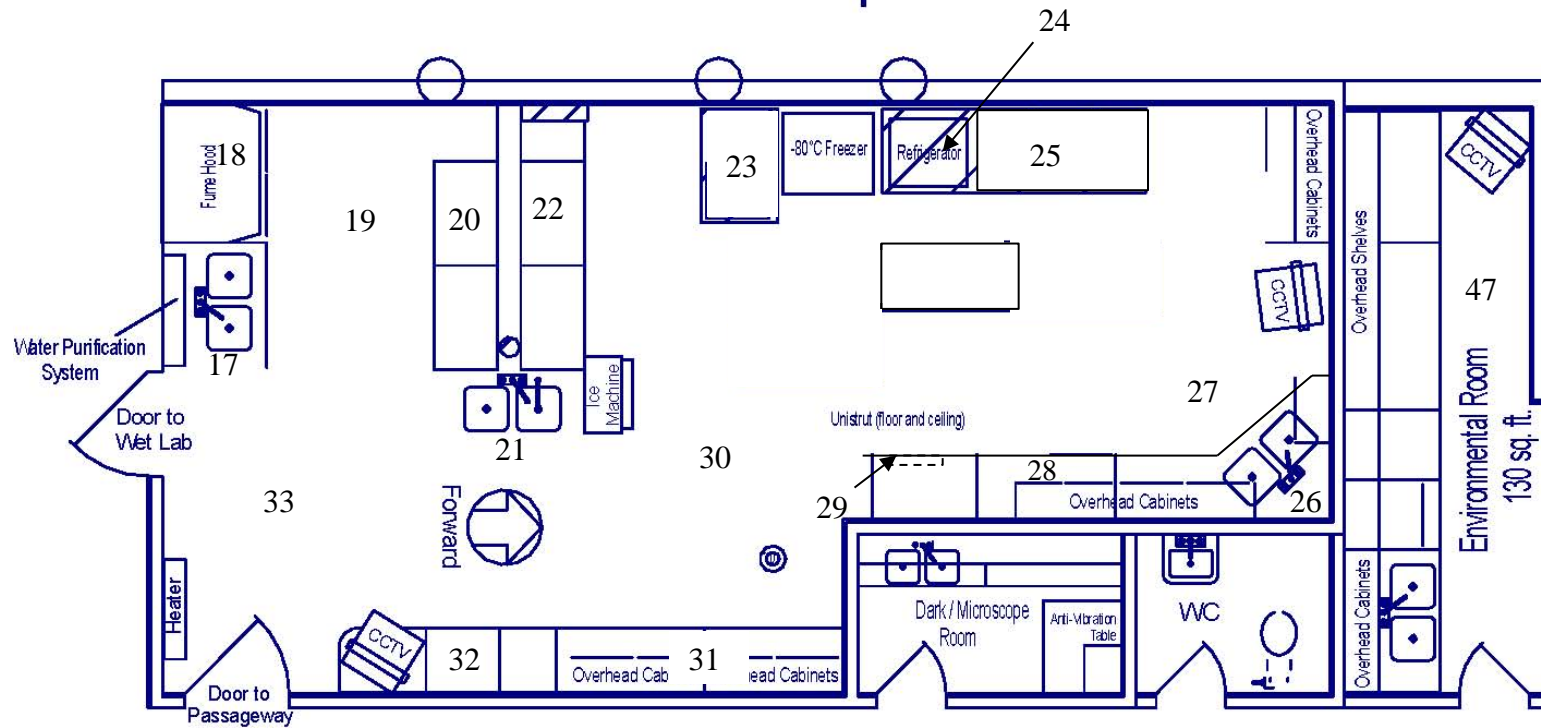
460 sq. ft.



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Figure 3

# Hydro Lab

526 sq. ft.

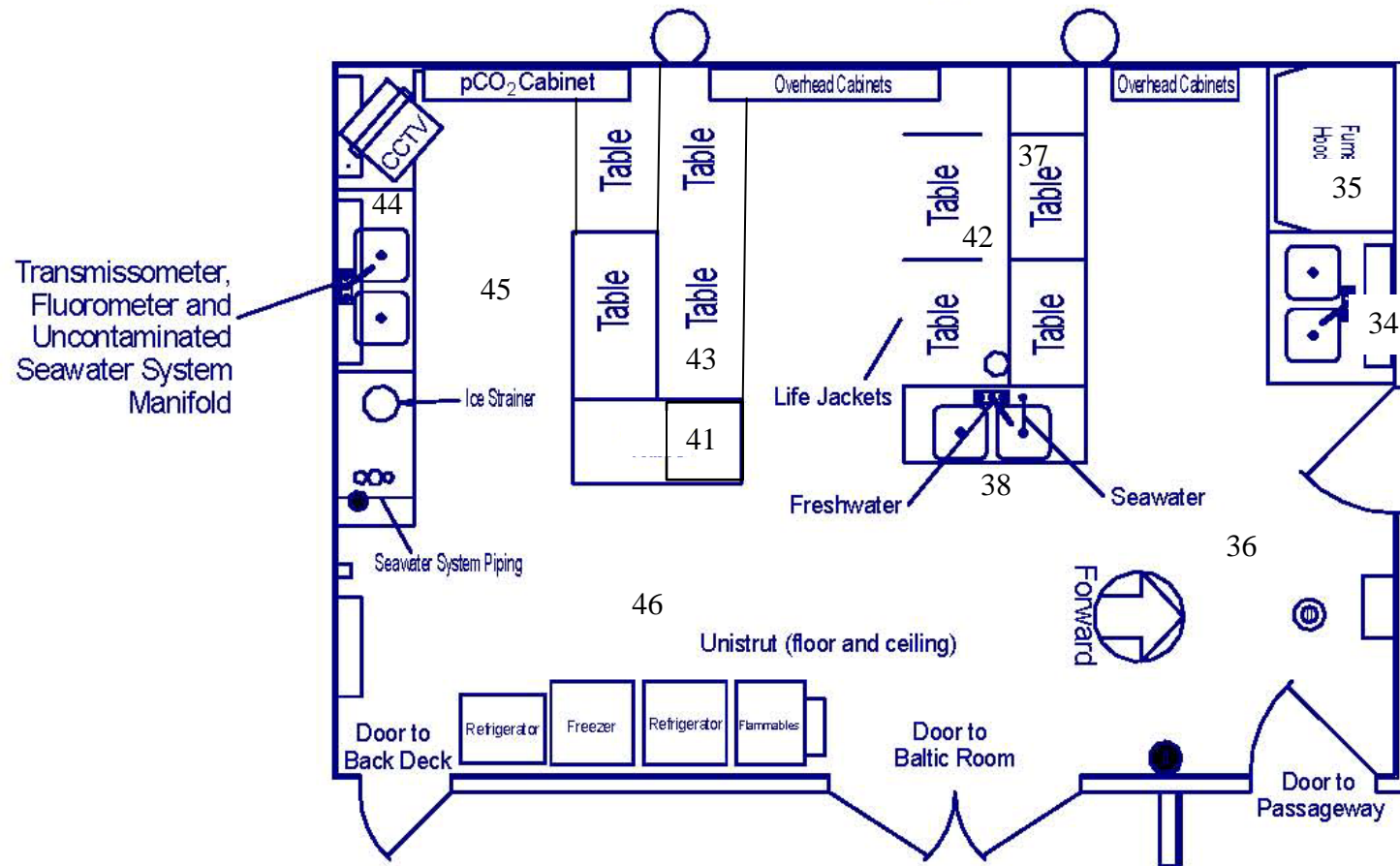




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Figure 4

# Wet Lab

425 sq. ft.

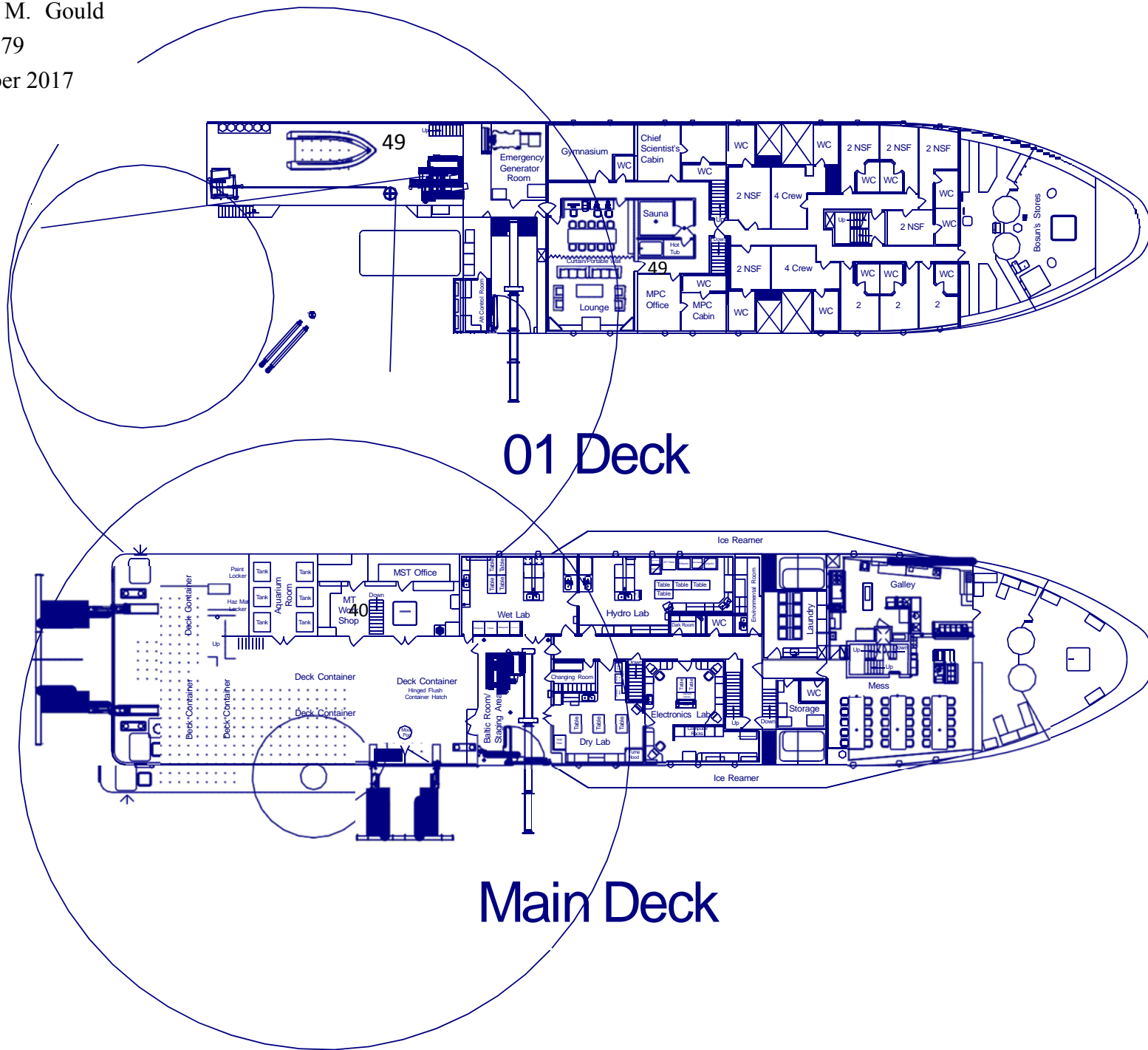


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Figure 5



USAP Van #1  
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Figure 6

