

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Tritium Laboratory

29 March 2016

Tritium Laboratory
4600 Rickenbacker Causeway
Miami, Florida 33149-1031

Ph: 305-421-4100
Fax: 305-421-4112
E-mail: Tritium@rsmas.miami.edu

SWAB REPORT # 808

SWAB DATE: 20 February 2016

R/V Laurence M. Gould

Dr. James D. Happell
Associate Research Professor

Distribution:
SWAB Committee
Jamee Johnson
Tim McGovern

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 # 808

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

DATE: 20 February 2016
TECHNICIAN: Kate Ruck

| Sample # | Sample Identification | ^3H dpm/m ² | | ^{14}C dpm/m ² | |
|----------|-------------------------------------|---------------------------------|-------|------------------------------------|-------|
| | | activity | error | activity | error |
| 1 | 1st Vial Bkgnd | 0 | ± 0 | 0 | ± 0 |
| 2 | Initial bucket blank | -16 | ± 103 | 21 | ± 39 |
| | <u>Rad Van #2 (Figure 1)</u> | | | | |
| 3 | Floor inside door | 88 | ± 44 | *53 | ± 36 |
| 4 | Floor in front of LSC | 415 | ± 71 | *92 | ± 33 |
| 5 | Floor in front of hood | 204 | ± 28 | *1054 | ± 68 |
| 6 | Bench across from hood | 37 | ± 17 | *174 | ± 43 |
| 7 | Bench inside hood | 41 | ± 33 | 49 | ± 37 |
| 8 | Bottom of fridge | *793 | ± 80 | *263 | ± 41 |
| 9 | Bench next to waste | 27 | ± 14 | *154 | ± 42 |
| 10 | Bench next to sink | 89 | ± 11 | *1309 | ± 71 |
| 11 | Cabinet left of hood | -3 | ± 1 | *396 | ± 50 |
| 12 | Metal tray near waste | 142 | ± 19 | *904 | ± 62 |
| 13 | Bucket blank | 25 | ± 64 | -17 | ± 32 |
| | <u>Rad Van #1 (Figure 2)</u> | | | | |
| 14 | Top of LSC | *684 | ± 81 | 9 | ± 8 |
| 15 | Bench across from hood | *743 | ± 84 | 23 | ± 14 |
| 16 | Floor in front of LSC | *1335 | ± 107 | *85 | ± 23 |
| 17 | Bench next to hood | *871 | ± 92 | 34 | ± 17 |
| 18 | Floor in front of hood | *7662 | ± 243 | *132 | ± 13 |
| 19 | Bench next to LSC | *1058 | ± 95 | *55 | ± 20 |
| 20 | Floor in front of door | *1325 | ± 111 | 19 | ± 9 |
| 21 | Bucket blank | 37 | ± 45 | 0 | ± 1 |
| | <u>Wet Lab (Figure 3)</u> | | | | |
| 22 | Floor in front of door to Main Deck | 49 | ± 44 | 24 | ± 34 |
| 23 | Floor in front of 80 | 38 | ± 44 | 16 | ± 34 |
| 24 | Middle bench | 62 | ± 60 | 3 | ± 19 |
| 25 | Floor in front of door to Hydro | 74 | ± 64 | -6 | ± 80 |
| 26 | Sink under DI machine | -16 | ± 102 | 0 | ± 1 |
| 27 | Hallway floor outside of wetlab | -25 | ± 54 | 4 | ± 55 |

| Sample # | Sample Identification | ^3H dpm/m ² | | ^{14}C dpm/m ² | |
|----------|--|---------------------------------|-------|------------------------------------|-------|
| | | activity | error | activity | error |
| | <u>Hydro Lab (Figure 4)</u> | | | | |
| 28 | Hood | 8 | ± 495 | -14 | ± 26 |
| 29 | Benchspace across from sink | -41 | ± 48 | 16 | ± 45 |
| 30 | Benchspace across from 80 | 40 | ± 39 | 26 | ± 35 |
| 31 | Floor across from sink | 30 | ± 50 | 10 | ± 33 |
| 32 | Floor in front of 80 | 21 | ± 40 | 17 | ± 36 |
| 33 | Sink below DI | -11 | ± 64 | 18 | ± 39 |
| | <u>Dry Lab (Figure 5)</u> | | | | |
| 34 | Floor inside of door | 44 | ± 45 | 19 | ± 34 |
| 35 | Floor in between table | 135 | ± 62 | -4 | ± 64 |
| 36 | Table top | 6 | ± 400 | -15 | ± 28 |
| 37 | Floor across from table | 315 | ± 79 | 29 | ± 26 |
| 38 | Benchtop next to hood | -4 | ± 40 | 17 | ± 38 |
| 39 | Inside fridge | 209 | ± 60 | 12 | ± 19 |
| 40 | E-Lab under aft computer | 40 | ± 53 | -1 | ± 83 |
| | <u>Environmental Room (Figure 6)</u> | | | | |
| 41 | Outside door | 18 | ± 118 | -22 | ± 41 |
| 42 | Benchtop | -22 | ± 46 | -22 | ± 41 |
| 43 | Floor in front of benchtop | 27 | ± 57 | -4 | ± 59 |
| | <u>Miscellaneous Areas (No Figure)</u> | | | | |
| 44 | Galley in front of dish drop off | 15 | ± 90 | -8 | ± 12 |
| 45 | Lounge floor in front of door to hall | 28 | ± 56 | -9 | ± 13 |
| 46 | 01 Deck in front of AV gas | 5 | ± 48 | 2 | ± 33 |
| 47 | Gym under Sat phone | 14 | ± 202 | -22 | ± 32 |
| 48 | 02 Deck where waste containers stored | -2 | ± 17 | 16 | ± 38 |
| 49 | 01 Deck floor in front of stair | 11 | ± 68 | -28 | ± 39 |
| 50 | 01 Deck Chief sci bathroom | -27 | ± 50 | -5 | ± 66 |
| 51 | 01 Deck head across from lounge | 20 | ± 50 | -1 | ± 39 |
| 52 | Final bucket blank | 14 | ± 37 | 5 | ± 32 |

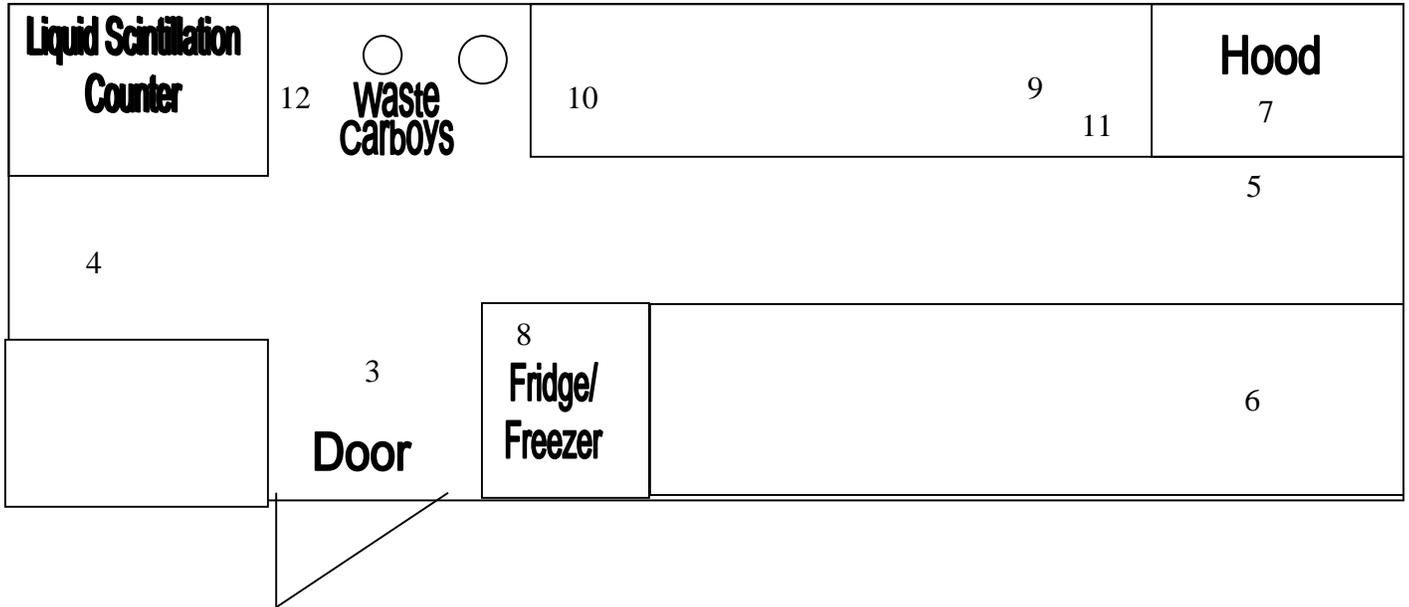
Comments

Please note that the error reported for each isotope is the two-standard deviation counting error.

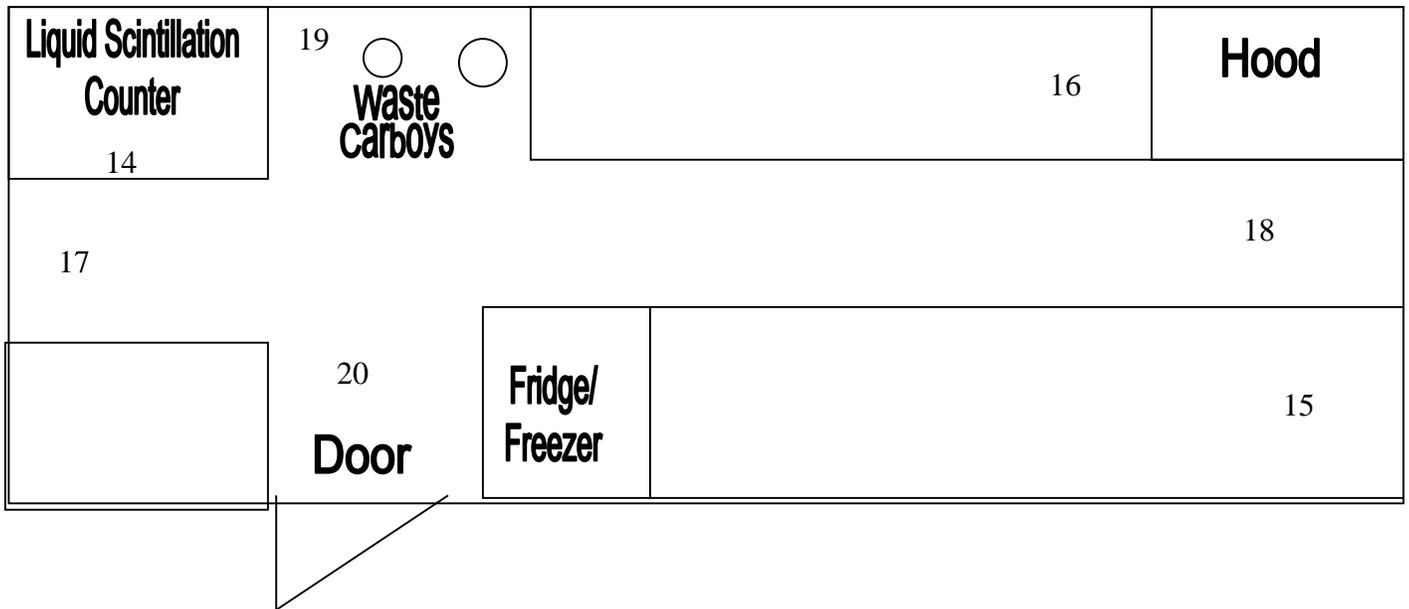
The reports may now contain values less than zero. When decay counting background samples will be distributed about the background vial, which means that negative values are possible. In the past we rounded the negative values to zero. Values are only significantly above background when they are positive and larger than the error. All areas tested on the ship were free from contamination that requires cleaning.

Minor ^{14}C and ^3H contamination was found in the rad vans. No action is necessary.

USAP Van #2
SWAB #808
20 February 2016
Figure 1



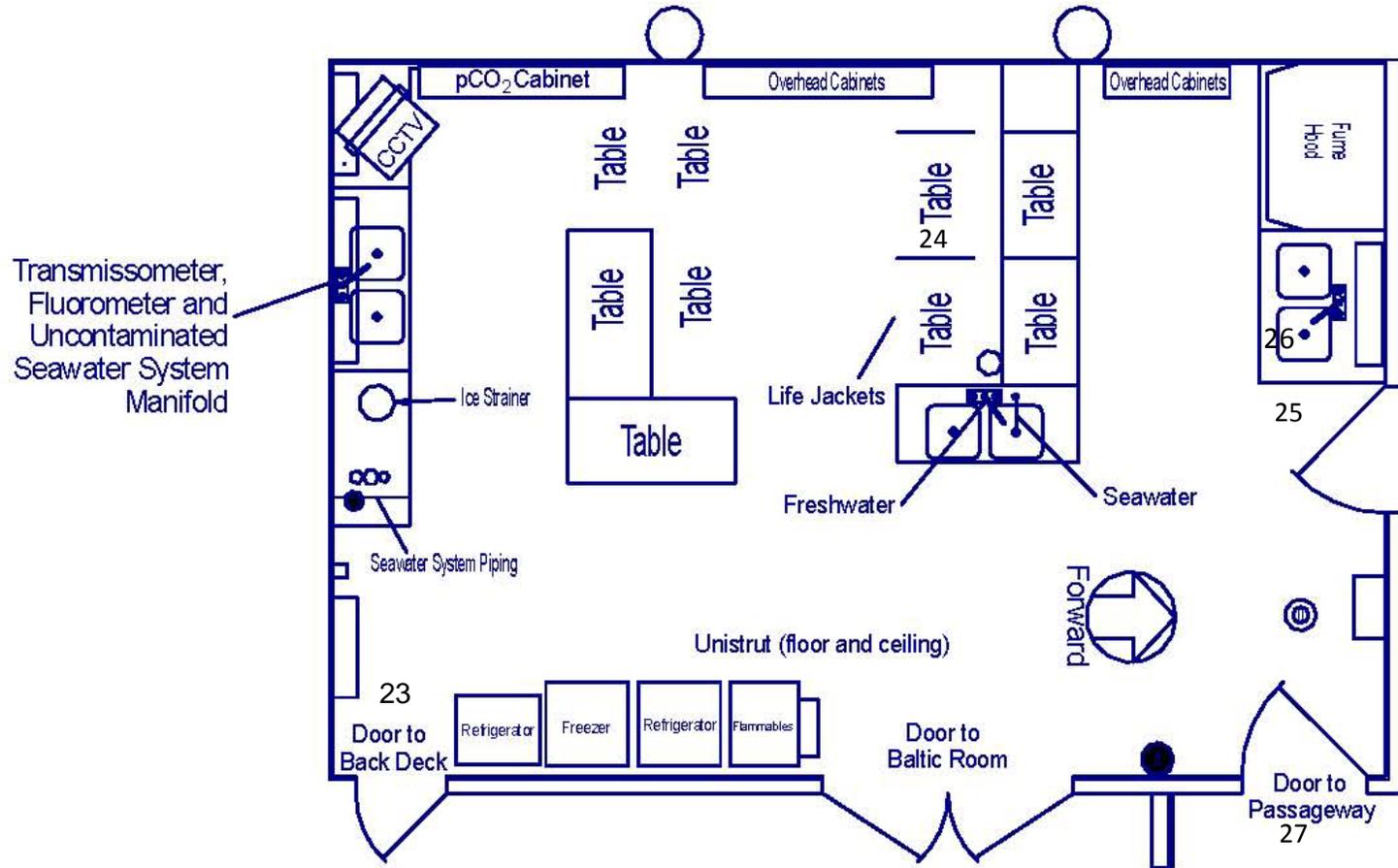
USAP Van #1
SWAB #808
20 February 2016
Figure 2



Laurence M. Gould
SWAB #808
20 February 2016
Figure 3

Wet Lab

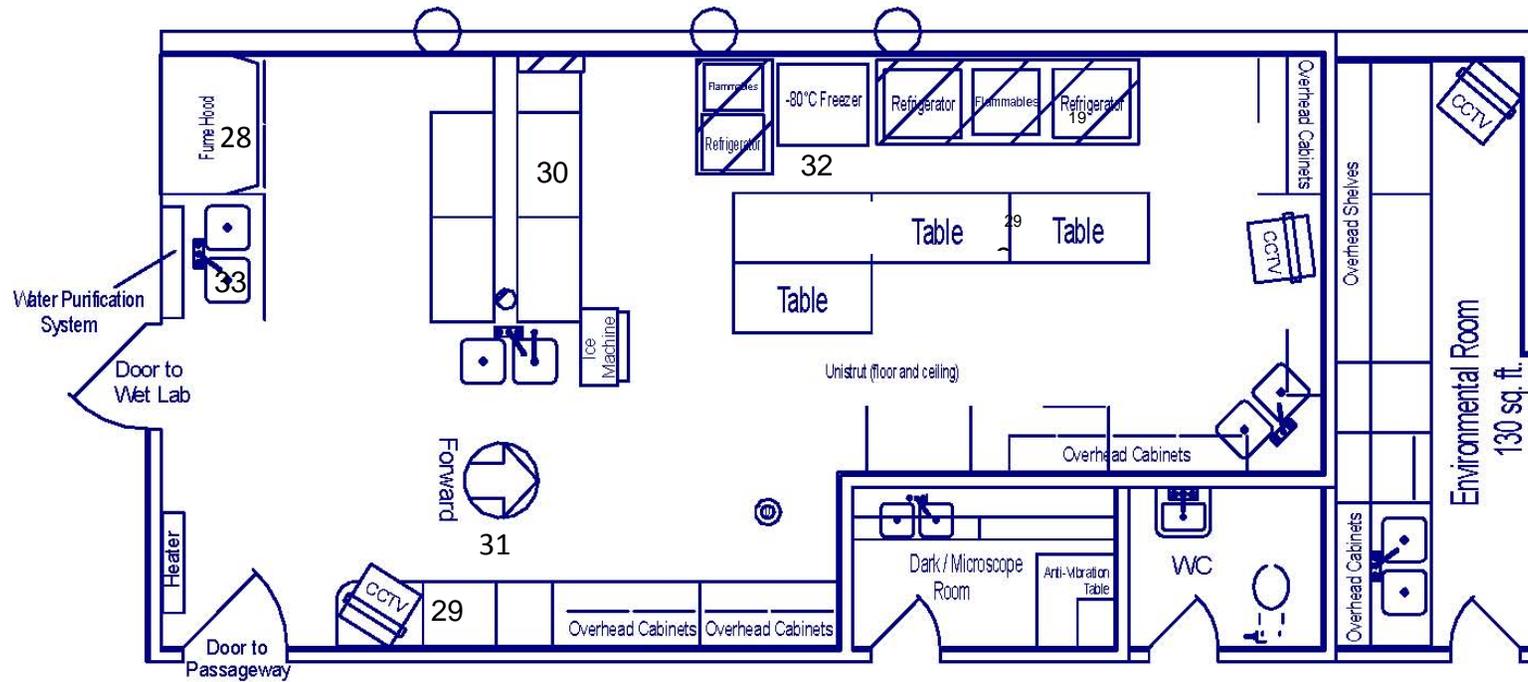
425 sq. ft.



Laurence M. Gould
SWAB #808
20 February 2016
Figure 4

Hydro Lab

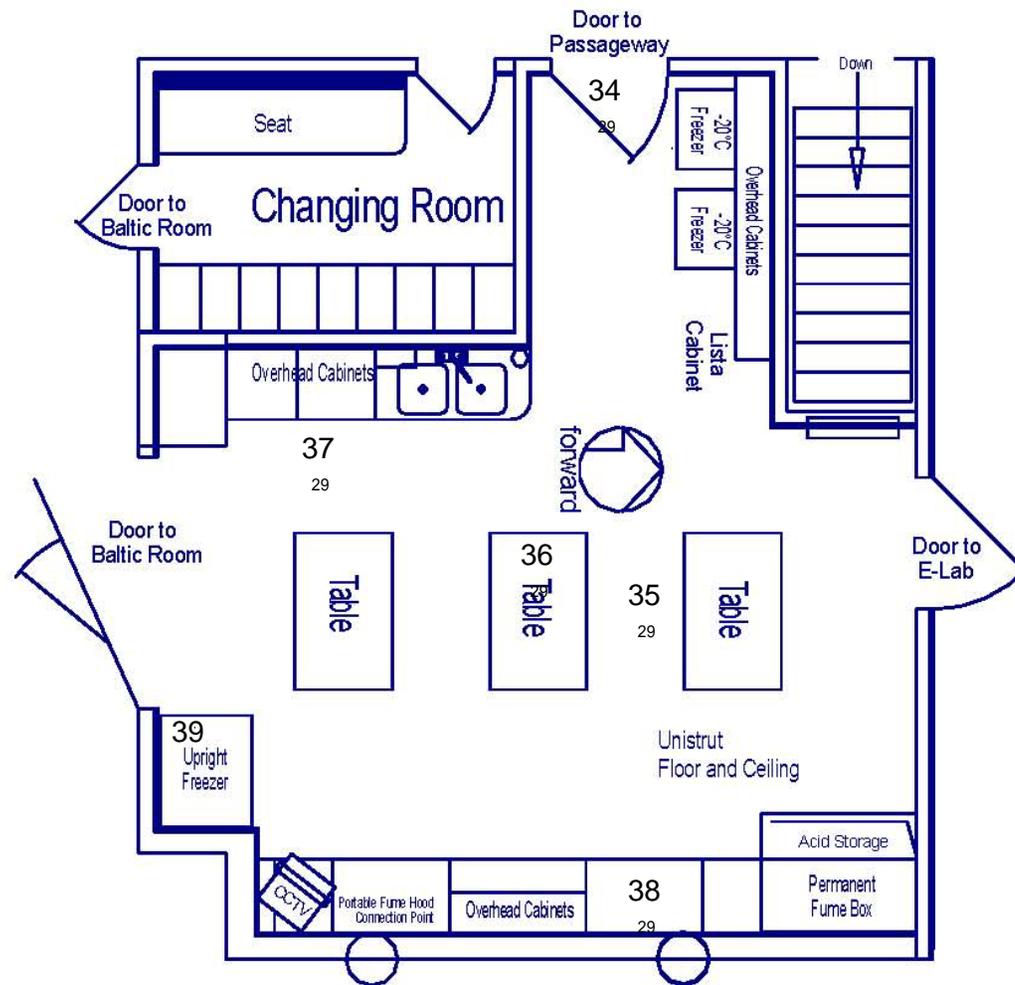
526 sq. ft.



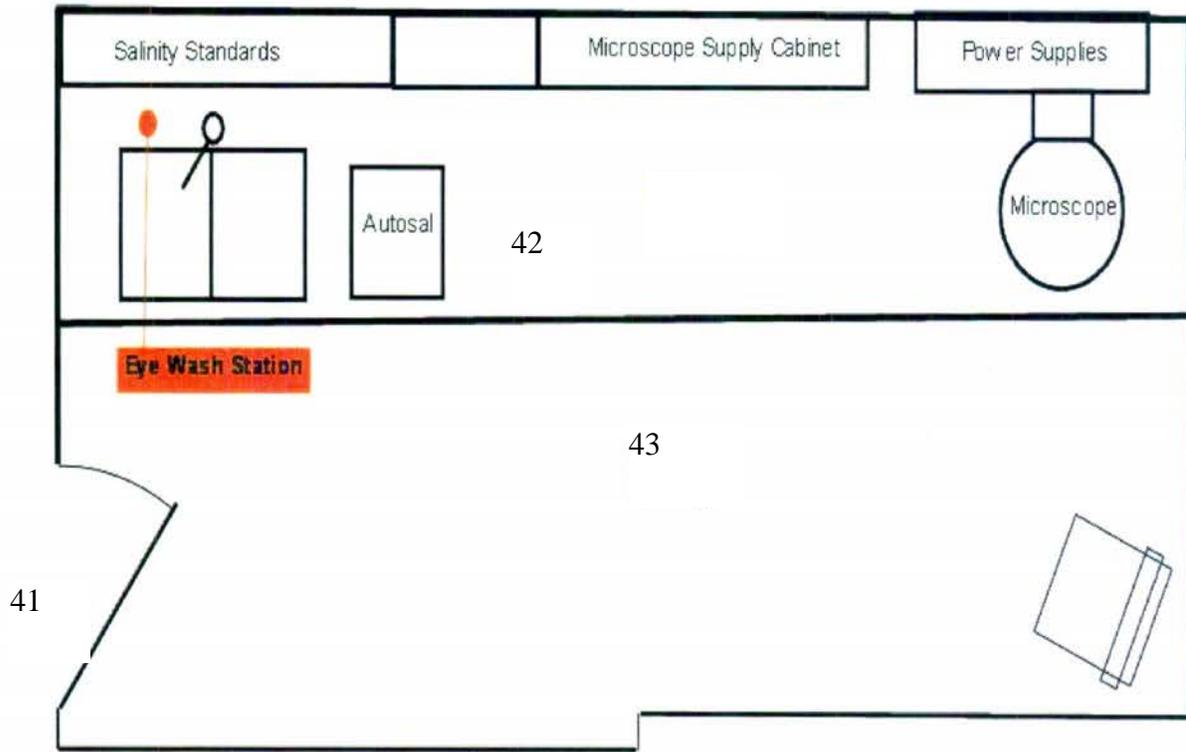
Laurence M. Gould
SWAB #808
20 February 2016
Figure 5

Dry Lab

356 sq. ft.



Laurence M. Gould
SWAB # 808
20 February 2016
Figure 6



ENVIRONMENTAL ROOM