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Tritium Laboratory
13 October 2014

SWAB REPORT #743

SWAB DATE: 23 September 2014

R/V *Blue Heron* and Radiation Van

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Distribution:
SWAB Committee
Timothy Deering

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 institution promptly by phone or email.

REPORT FOR SWAB # 743

LOCATION: Duluth, MN
VESSEL: R/V *Blue Heron*

DATE: 6 October 2014
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 | 16 | ± 58 | 0 | ± 0 |
| | <u>Dry Lab (Figure 1)</u> | | | | |
| 3 | Deck in front of passage to lazarette | 0 | ± 0 | 0 | ± 0 |
| 4 | Inside chest freezer | 9 | ± 30 | 12 | ± 34 |
| 5 | Starboard benchtop | 3 | ± 0 | 0 | ± 0 |
| 6 | Center benchtop | 16 | ± 66 | 0 | ± 0 |
| 7 | Benchtop adjacent to sink | 26 | ± 43 | 7 | ± 30 |
| 8 | Deck in front of sink | 7 | ± 54 | 0 | ± 0 |
| 9 | Deck in front of stairs to main deck | 30 | ± 40 | 16 | ± 32 |
| | <u>Wet Lab & Galley/Mess deck (Figure 2)</u> | | | | |
| 10 | Inside freezer | 2 | ± 26 | 3 | ± 34 |
| 11 | Inside refrigerator | 160 | ± 57 | 3 | ± 8 |
| 12 | Deck in front of stairs to dry lab | 32 | ± 60 | 0 | ± 0 |
| 13 | Deck in front of aft door | 5 | ± 25 | 9 | ± 35 |
| 14 | Galley/mess deck by aft door | 0 | ± 0 | 3 | ± 40 |
| 15 | Deck in galley | 16 | ± 178 | 0 | ± 0 |
| 16 | Deck under table | 26 | ± 61 | 0 | ± 0 |
| 17 | Benchtop forward of starboard sink | 10 | ± 52 | 0 | ± 0 |
| 18 | Benchtop aft of port sink | 2 | ± 39 | 1 | ± 32 |
| 19 | Deck center of lab | 10 | ± 62 | 0 | ± 0 |
| 20 | Forward benchtop | 0 | ± 0 | 20 | ± 37 |
| | <u>Whaleback Deck (Figure 3)</u> | | | | |
| 21 | Deck inside pilot house | 0 | ± 0 | 9 | ± 40 |
| 22 | Deck in fron of pilot house | 58 | ± 58 | 0 | ± 0 |
| 23 | Deck by hrdro winch | 7 | ± 49 | 0 | ± 0 |
| | <u>Main Deck (Figure 2)</u> | | | | |
| 24 | Deck under A-frame | 19 | ± 47 | 0 | ± 2 |
| 25 | Deck near door to lab | 18 | ± 49 | 0 | ± 0 |
| 26 | Deck below entrance to rad van | 0 | ± 0 | 6 | ± 44 |
| 27 | Intermediate bucket blank | 12 | ± 48 | 0 | ± 0 |

| Sample # | Sample Identification | ³ H dpm/m ² | | ¹⁴ C dpm/m ² | |
|----------|--|-----------------------------------|-------|------------------------------------|-------|
| | | activity | error | activity | error |
| | <u>UMN Radioisotope Van (Figure 4)</u> | | | | |
| 28 | Inside fume hood | 116 | ± 55 | 11 | ± 23 |
| 29 | Benchtop adjacent to LSC | *589 | ± 80 | 15 | ± 12 |
| 30 | Sink area | 25 | ± 50 | 0 | ± 0 |
| 31 | Inside refrigerator near single door | 52 | ± 59 | 0 | ± 0 |
| 32 | Inside refrigerator next to LSC | 384 | ± 66 | 22 | ± 18 |
| 33 | Deck in front of LSC | 48 | 54 | 0 | ± 0 |
| 34 | Deck inside single door entrance | 171 | ± 55 | 26 | ± 27 |
| 35 | Final bucket blank | 22 | ± 122 | 0 | ± 0 |

Comments

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

All areas on tested on the ship were free of radioisotope contamination that requires cleaning.

Minor ³H contamination was found in the Rad Van. No action is required.

R/V Blue Heron Lower Deck

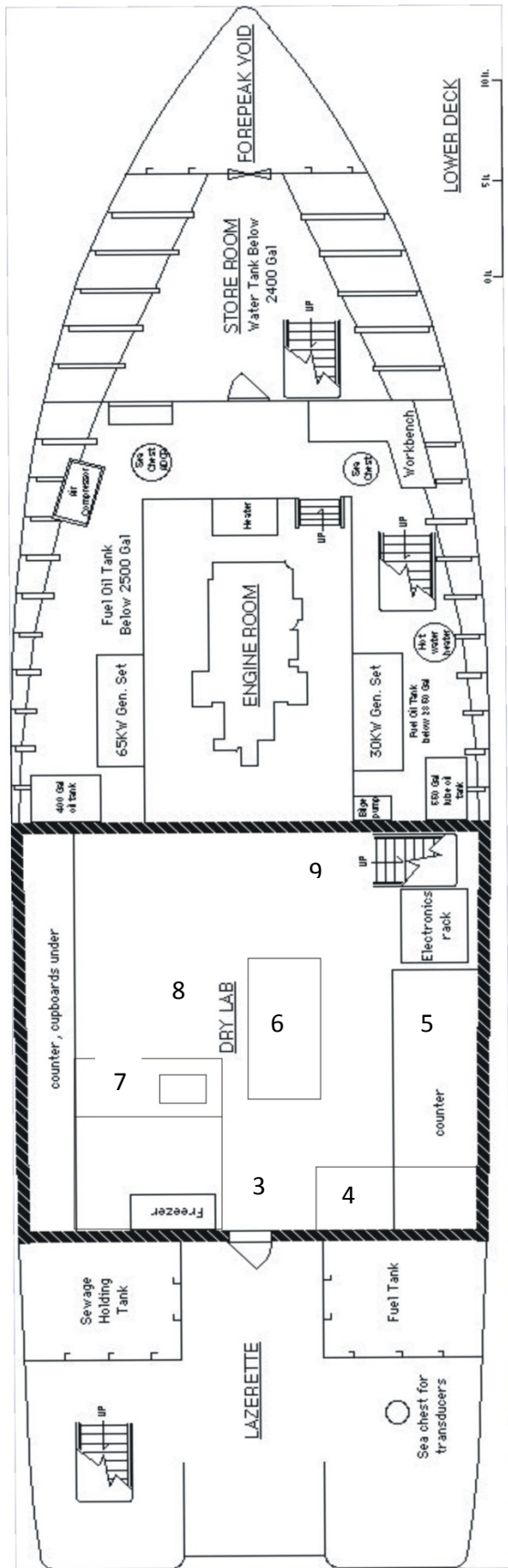


Figure 1
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R/V Blue Heron Main Deck

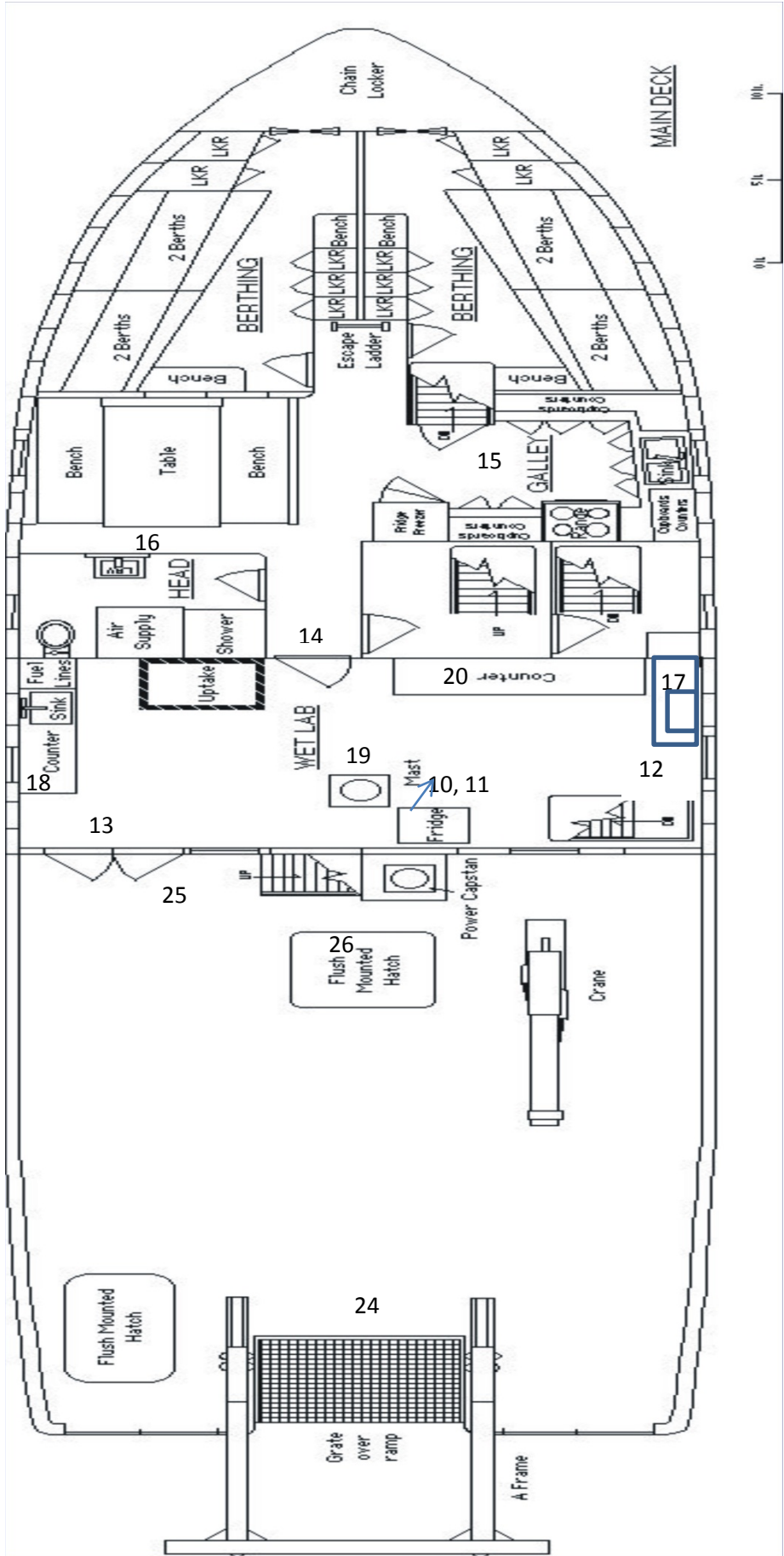


Figure 2
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R/V Blue Heron Whaleback Deck

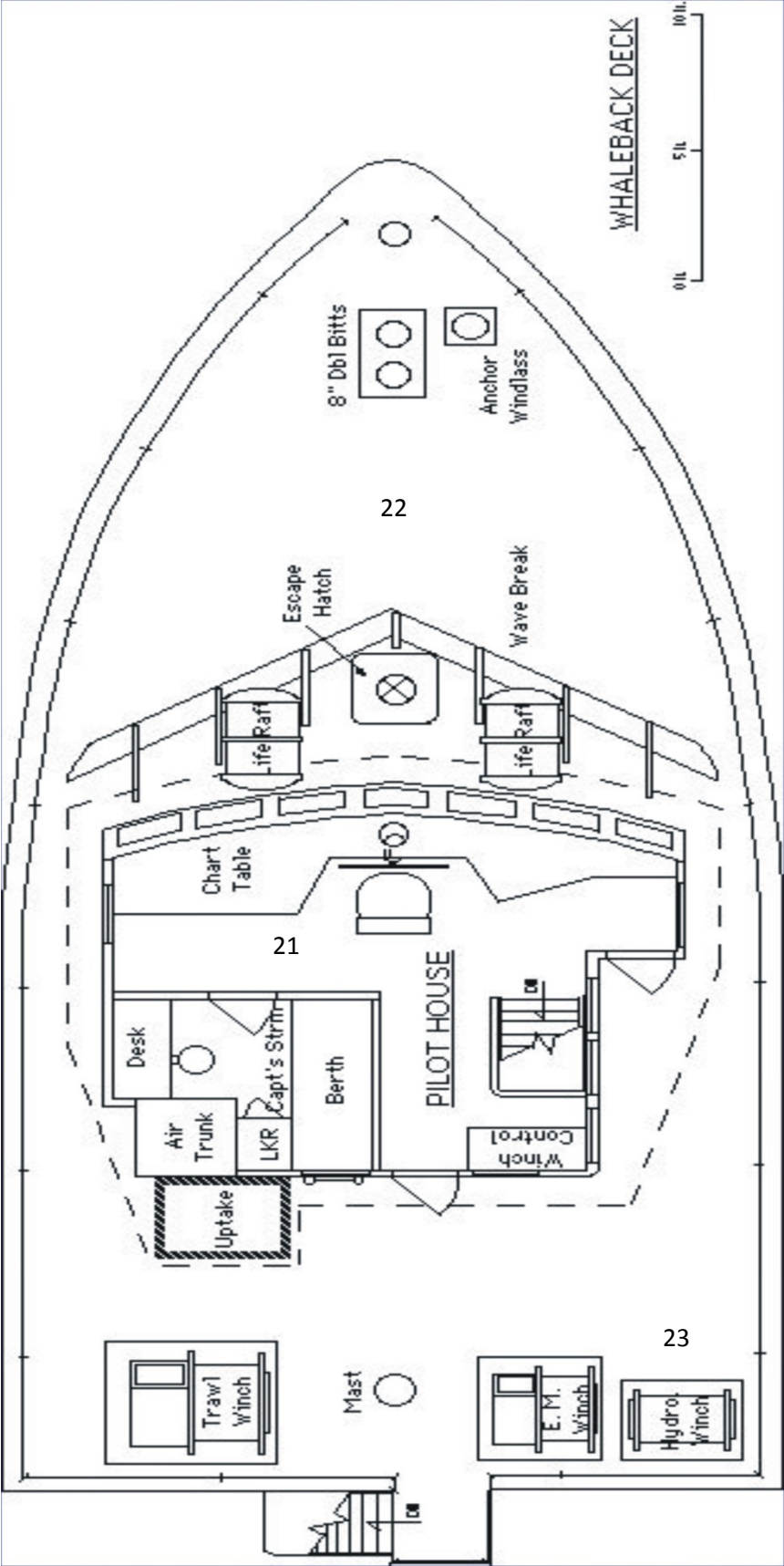


Figure 3
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U. of MN. Radioisotope Van

