



May 8, 2020

Mr. Frank P.D. Tran  
Health Physicist  
NRC Region III Material Licensing Branch  
**Mail Control 618689**  
2443 Warrenville Road, Suite 210  
Lisle, IL 60532

RE: Response to your request for additional information for materials license 21-11315-02 for removing room # S6 (walk-in freezer).

Dear Mr. Tran:

This is in response to your letter dated April 22, 2020; request for more information on the room S6 (walk-in freezer).

The S6 walk-in freezer was used for storing radioactive animal carcasses with C-14 and H-3. The freezer has no history of any leaks, and never held sources of any kind. This freezer was last used six years ago (2013) due to an electrical malfunction. At this time the freezer would not hold the temperature and we could no longer store carcasses in it. The carcasses were removed from the freezer, and it has been inactive at least six years.

Please see the attachment of the close-out surveys, instruments used, and wipe test results.

Please contact me at 269-668-3336 extension 2136 if there are any questions, or if further information is required.

Best Regards,

Aura Kozminske  
Senior Manager Radiation  
Charles River Laboratories  
Aura.kozminske@crl.com



Alex Hamm

Charles River Laboratories

10 April 2020

### **Description of S-6 Freezer Radiation and Contamination Surveys**

The wipe tests and contamination surveys for the defunct walk-in freezer in room S-6 were as follows. First, the shelving inside the freezer was tested thoroughly, as well as the door. Wipe tests were taken of every square foot (wiping the entire square foot of surface) for each horizontal shelf and on the inside of the door, along with smaller areas that were wipe tested including the exterior handle and the light switch. None of the wipe tests came back as over 220 dpm when analyzed by LSC for  $^{14}\text{C}$  and  $^3\text{H}$ , which is the threshold that CRL maintains for loose surface contamination by  $^{14}\text{C}$ . Furthermore, tests with a Ludlum Model 3 counter fitted with a model 44-9 pancake probe did not differ from background counts per minute significantly on any surface. Lastly, a Ludlum 9DP ion chamber did not detect any significant difference from background radiation when compared to any of the space inside the freezer. As such, the shelving units were removed and disposed as non-radioactive.

Because the samples had previously rested upon the horizontal shelves, the areas where contamination was most likely to be had already been tested. To make sure that there was no missed radioactive material, some spot checks were performed on two shelves that had been resting vertically without having any material upon them in the intervening years since the freezer had been used. The wipe tests (4 per side per shelf) did not indicate any loose contamination of  $^3\text{H}$  or  $^{14}\text{C}$ , and as such, were disposed of as non-radioactive. Then, all walls of the freezer were wiped with wet Swiffer mop fittings. The fittings, when picking up the dust and dirt from the inside of the freezer, didn't show any significant counts above background when tested with the Ludlum Model 3 with a pancake probe attached.

Lastly, wipe tests were collected from each wall of the freezer, including the floor, ceiling, and attached fans. None of these wipe tests indicated any contamination by  $^3\text{H}$  or  $^{14}\text{C}$ , and they easily met the conditions that CRL keeps for  $100\text{ cm}^2$  when the surveyed area for each wipe spanned approximately  $1\text{ ft}^2$ . The exterior room of S-6 was also wipe tested and the results did not indicate any contamination from  $^3\text{H}$  or  $^{14}\text{C}$ .

As such, it is the opinion of Charles River Mattawan radiation safety that this area is free from radioactive contamination and ready to be safely removed from the site.

# General Survey Map

Date/Time: 18:05 27 Mar 2020 Location: Outside S-6 freezer Surveyed by (Initials/Date): AKL 27 Mar 2020

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125 ☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☐ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☒ Other De commission

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>QDP</u> ID #: <u>MSR-320</u>	Model: <u>Model 3</u> ID #: <u>MSR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>5.7</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> $\mu$ R/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> _____	Probe: <input type="checkbox"/> Gamma (44-2) <input type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

Wipe results (dpm/100 cm<sup>2</sup>)

1. 6220  
 2. 6220  
 3. 6220  
 4. 6220  
 5. 6220  
 6. 6220  
 7. 6220  
 8. 6220  
 9. 6220  
 10. 6220  
 11. \_\_\_\_\_  
 12. \_\_\_\_\_  
 13. \_\_\_\_\_  
 14. \_\_\_\_\_  
 15. \_\_\_\_\_  
 16. \_\_\_\_\_  
 17. \_\_\_\_\_  
 18. \_\_\_\_\_  
 19. \_\_\_\_\_  
 20. \_\_\_\_\_  
 21. \_\_\_\_\_  
 22. \_\_\_\_\_  
 23. \_\_\_\_\_  
 24. \_\_\_\_\_  
 25. \_\_\_\_\_  
 26. \_\_\_\_\_  
 27. \_\_\_\_\_  
 28. \_\_\_\_\_

MAP LEGEND:  $\nabla$  = Radiation survey # = Contamination survey 1 = Wipe

Additional Comments: See results 118-127

Note: Releasing an item as non-rad must be done with a contamination probe.

Review by ACK 10 April 2020

# General Survey Map

Date/Time: 1400 27 March 2020 Location: S-6 Walking Freezer Surveyed by (Initials/Date): ACK 3/27/2020

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☒ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Month) (Year)  
 (Circle one) (Year) ☐ Other \_\_\_\_\_

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>9DP</u> ID #: <u>MTR-320</u>	Model: <u>26</u> ID #: <u>MTR-190</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>10/22/2020</u>
Background: <u>8.2</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> $\mu$ R/hr	Background: <u>40 cpm</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> <u>NA</u>	Probe: <input type="checkbox"/> Gamma (44-2) <input type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

Using The Swipher and Scanned  
 using MTR-190 Model 26 cal due 10/22/2020  
 nothing found above background.

MAP LEGEND:  $\nearrow$  = Radiation survey # = Contamination survey 1 = Wipe

Wipe results (dpm/100 cm<sup>2</sup>)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_
16. \_\_\_\_\_
17. \_\_\_\_\_
18. \_\_\_\_\_
19. \_\_\_\_\_
20. \_\_\_\_\_
21. \_\_\_\_\_
22. \_\_\_\_\_
23. \_\_\_\_\_
24. \_\_\_\_\_
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_

Additional Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Note: Releasing an item as non-rad must be done with a contamination probe.

# General Survey Map

Date/Time: 15:00 27 Mar 2020 Location: S-6 Freezer Surveyed by (Initials/Date): QIT 27 Mar 2020

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☒ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☒ Other \_\_\_\_\_ Decommission

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>9DP</u> ID #: <u>MTR-320</u>	Model: <u>Model 3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>5.7</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> $\mu$ R/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> <u>NA</u>	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

MAP LEGEND: ↑ = Radiation survey # = Contamination survey 1 = Wipe

Wipe results (dpm/100 cm<sup>2</sup>)

1. <220
2. <220
3. <220
4. <220
5. <220
6. <220
7. <220
8. <220
9. <220
10. <220
11. <220
12. <220
13. <220
14. <220
15. <220
16. <220
17. \_\_\_\_\_
18. \_\_\_\_\_
19. \_\_\_\_\_
20. \_\_\_\_\_
21. \_\_\_\_\_
22. \_\_\_\_\_
23. \_\_\_\_\_
24. \_\_\_\_\_
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_

Additional Comments: See results 102-117

Note: Releasing an item as non-rad must be done with a contamination probe.

# General Survey Map

Date/Time: 17<sup>00</sup> 27 Mar 2020 Location: S-6 Freezer Surveyed by (Initials/Date): ACK & AN 27 Mar 2020  
3/27/20

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☒ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Month) (Year)  
 (Circle one) ☒ Other \_\_\_\_\_ Decommission

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>9DP</u> ID #: <u>MTR-320</u>	Model: <u>Model 3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>4.6</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> µR/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> <u>NA</u>	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

	Wipe results (dpm/100 cm <sup>2</sup> )
	1. <u>6220</u>
	2. <u>6220</u>
	3. <u>6220</u>
	4. <u>6220</u>
	5. <u>6220</u>
	6. <u>6220</u>
	7. <u>6220</u>
	8. <u>6220</u>
	9. <u>6220</u>
	10. <u>6220</u>
	11. <u>6220</u>
	12. <u>6220</u>
	13. <u>6220</u>
	14. <u>6220</u>
	15. <u>6220</u>
	16. <u>6220</u>
	17. <u>6220</u>
	18. <u>6220</u>
	19. <u>6220</u>
	20. <u>6220</u>
	21. _____
	22. _____
	23. _____
	24. _____
	25. _____
	26. _____
	27. _____
28. _____	

MAP LEGEND: ↑ = Radiation survey # = Contamination survey 1 = Wipe

Additional Comments: See results 2-21

Note: Releasing an item as non-rad must be done with a contamination probe.

# General Survey Map

Date/Time: 27 Mar 2020 17:13 Location: S-6 Freezer Surveyed by (Initials/Date): ACK 3/27/2020  
 Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☒ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Circle one) (Year) ☒ Other \_\_\_\_\_ Decommission (Month) (Year)

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>9DP</u> ID #: <u>MTR-320</u>	Model: <u>Model 3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>7.8</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> µR/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> <u>NA</u>	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>①</p> <p>③</p> <p>⑤</p> <p>⑦</p> <p>⑨</p> </div> <div style="text-align: center;"> <p>Wall # 2</p> <p>②</p> <p>④</p> <p>⑥</p> <p>⑧</p> <p>⑩</p> </div> </div>	Wipe results (dpm/100 cm <sup>2</sup> )
	1. <u>4220</u>
	2. <u>4220</u>
	3. <u>4220</u>
	4. <u>4220</u>
	5. <u>4220</u>
	6. <u>4220</u>
	7. <u>4220</u>
	8. <u>4220</u>
	9. <u>4220</u>
10. <u>4220</u>	
11. _____	
12. _____	
13. _____	
14. _____	
15. _____	
16. _____	
17. _____	
18. _____	
19. _____	
20. _____	
21. _____	
22. _____	
23. _____	
24. _____	
25. _____	
26. _____	
27. _____	
28. _____	

MAP LEGEND: ↗ = Radiation survey # = Contamination survey ① = Wipe

Additional Comments: See results 22-31

Note: Releasing an item as non-rad must be done with a contamination probe.



# General Survey Map

Date/Time: 17:20 27 May 2020 Location: S-6 Freezer Surveyed by (Initials/Date): ACK & AD 27 May 2020  
3/21/20

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☒ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☒ Other \_\_\_\_\_ Decommission

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>9DP</u> ID #: <u>MTR-320</u>	Model: <u>Model 3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>4.6</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> µR/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> <u>NA</u>	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

Wipe results (dpm/100 cm <sup>2</sup> )
1. <u>6220</u>
2. <u>6220</u>
3. <u>6220</u>
4. <u>6220</u>
5. <u>6220</u>
6. <u>6220</u>
7. <u>6220</u>
8. <u>6220</u>
9. <u>6220</u>
10. <u>6220</u>
11. <u>6220</u>
12. <u>6220</u>
13. <u>6220</u>
14. <u>6220</u>
15. <u>6220</u>
16. <u>6220</u>
17. <u>6220</u>
18. <u>6220</u>
19. <u>6220</u>
20. <u>6220</u>
21. _____
22. _____
23. _____
24. _____
25. _____
26. _____
27. _____
28. _____

Additional Comments: see results 32-51

Note: Releasing an item as non-rad must be done with a contamination probe.

# General Survey Map

Date/Time: 17:35 27 Mar 2020 Location: S-6 Surveyed by (Initials/Date): ACK 3/27/20

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

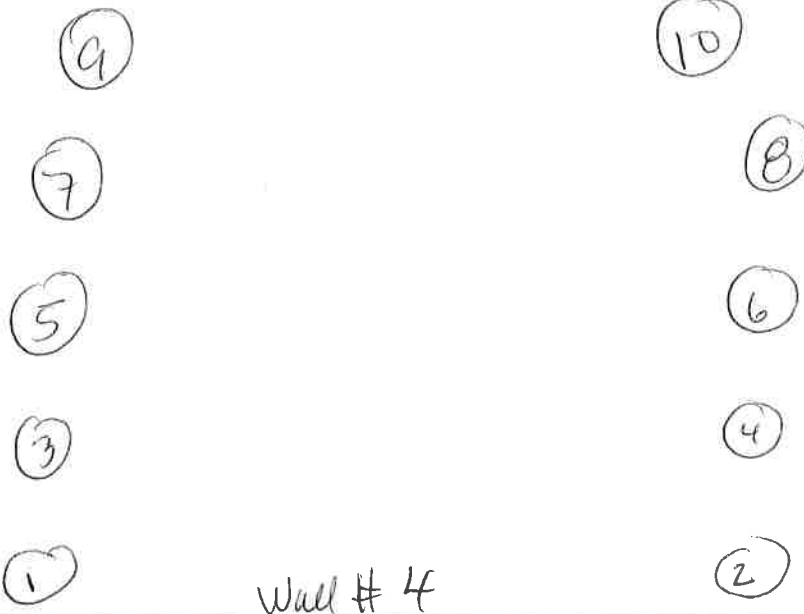
Reason:

☐ Receipt of RAM ☒ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☐ Other \_\_\_\_\_

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>9DD</u> ID #: <u>MTR-320</u>	Model: <u>3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>6.2</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> µR/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> <u>NA</u>	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92) <input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

Wipe results (dpm/100 cm<sup>2</sup>)

1. 1220
2. 1220
3. 1220
4. 1220
5. 1220
6. 1220
7. 1220
8. 1220
9. 1220
10. 1220
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_
16. \_\_\_\_\_
17. \_\_\_\_\_
18. \_\_\_\_\_
19. \_\_\_\_\_
20. \_\_\_\_\_
21. \_\_\_\_\_
22. \_\_\_\_\_
23. \_\_\_\_\_
24. \_\_\_\_\_
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_



MAP LEGEND: ↗ = Radiation survey # = Contamination survey 1 = Wipe

Additional Comments: See results 02-61

Note: Releasing an item as non-rad must be done with a contamination probe.

# General Survey Map

Date/Time: 1745 27 MAR 2020 Location: S-6 Surveyed by (Initials/Date): ACK JAW 27 Mar 2020  
3/27/20

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☒ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Month) (Year)  
 (Circle one) (Year)

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>95P</u> ID #: <u>MTR-320</u>	Model: <u>3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>4.8</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> µR/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> <u>NA</u>	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92) <input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

Ceiling

MAP LEGEND: ↗ = Radiation survey # = Contamination survey 1 = Wipe

Wipe results (dpm/100 cm<sup>2</sup>)

1. < 220
2. < 220
3. < 220
4. < 220
5. < 220
6. < 220
7. < 220
8. < 220
9. < 220
10. < 220
11. < 220
12. < 220
13. < 220
14. < 220
15. < 220
16. < 220
17. < 220
18. < 220
19. < 220
20. < 220
21. \_\_\_\_\_
22. \_\_\_\_\_
23. \_\_\_\_\_
24. \_\_\_\_\_
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_

Additional Comments: see results 62-81

Note: Releasing an item as non-rad must be done with a contamination probe.

# General Survey Map

Date/Time: 17:50 27 Mar 2020 Location: S-6 Surveyed by (Initials/Date): ACK 3/27/20

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☒ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☐ Other \_\_\_\_\_

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>95D</u> ID #: <u>MTR-320</u>	Model: <u>3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>4.8</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> µR/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> <u>NA</u>	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92) <input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

Floor

MAP LEGEND: ↗ = Radiation survey # = Contamination survey 1 = Wipe

Wipe results (dpm/100 cm<sup>2</sup>)

1. 6220
2. 6220
3. 6220
4. 6220
5. 6220
6. 6220
7. 6220
8. 6220
9. 6220
10. 6220
11. 6220
12. 6220
13. 6220
14. 6220
15. 6220
16. 6220
17. 6220
18. 6220
19. 6220
20. 6220
21. \_\_\_\_\_
22. \_\_\_\_\_
23. \_\_\_\_\_
24. \_\_\_\_\_
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_

Additional Comments: see results 82-101

Note: Releasing an item as non-rad must be done with a contamination probe.

# Assay Definition-

## Assay Description:

Assay Type: DPM (Dual)

Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\

Raw Results Path: C:\Packard\Tricarb\Results\A\_Hamm\3H\_14C\_UG\20200327\_1751\20200327\_1751.results

Assay File Name: C:\Packard\TriCarb\Assays\3H\_14C\_UG.lsa

## Count Conditions-

Nuclide: 3H-14C

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H Ultima Gold

Mid Energy: 14C Ultima Gold

Count Time (min): 1.00

Count Mode: Normal

Assay Count Cycles: 1

Repeat Sample Count: 1

#Vials/Sample: 1

Calculate % Reference: Off

Background Subtract: Off

Low CPM Threshold: Off

2 Sigma % Terminator: Off

Regions	LL	UL
A	0.0	12.0
B	12.0	156.0
C	0.0	0.0

Q11  
 27 Mar 2020

## Count Corrections-

Static Controller: On

Luminescence Correction: Off

Colored Samples: Off

Heterogeneity Monitor: n/a

Coincidence Time (nsec): 18

Delay Before Burst (nsec): 75

## Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

## Cycle 1 Results

S#	DPM1	DPM2	Count	Time	CPMA	CPMB	SIS	tSIE	MESSAGES
1	22	10	1.00	11	9	69.34	606.28	475.49	-blank
2	33	13	1.00	14	12	68.83	475.49	467.85	
3	18	12	1.00	8	11	57.40	442.18	442.18	
4	21	22	1.00	10	19	42.53	53.85	447.27	
5	9	17	1.00	5	14	53.85	62.01	412.25	
6	17	26	1.00	8	22	62.01	55.43	365.32	
7	22	21	1.00	9	18	55.43	72.67	429.94	
8	8	26	1.00	6	21	72.67	48.84	346.72	
9	18	25	1.00	8	21	48.84	38.92	452.35	
10	28	18	1.00	12	16	38.92			

S-6 Freezer Decommission 27 March 2020

AD  
27 Mar 2020

11	31	17	1.00	13	15	46.37	440.64
12	16	27	1.00	9	23	67.46	445.36
13	51	40	1.00	18	34	40.59	319.10
14	25	24	1.00	9	20	41.37	316.70
15	25	15	1.00	8	13	38.25	303.61
16	15	19	1.00	7	16	34.79	392.34
17	15	24	1.00	6	20	53.77	281.66
18	15	19	1.00	8	16	78.24	493.62
19	36	10	1.00	7	9	31.90	213.03
20	27	11	1.00	12	10	34.36	474.12
21	27	16	1.00	13	14	54.01	526.94
22	31	20	1.00	15	18	40.68	562.66
23	24	16	1.00	11	15	55.06	504.67
24	22	22	1.00	11	19	69.92	482.01
25	14	22	1.00	8	19	86.76	500.78
26	6	26	1.00	6	22	67.93	527.24
27	27	13	1.00	12	12	35.18	484.51
28	18	9	1.00	8	8	42.23	502.97
29	11	19	1.00	7	16	92.29	574.15
30	28	19	1.00	14	17	53.13	546.13
31	27	16	1.00	13	14	67.14	530.72
32	18	14	1.00	9	12	52.54	547.63
33	11	21	1.00	7	18	62.05	555.54
34	52	19	1.00	23	18	40.93	527.28
35	23	17	1.00	11	15	62.10	510.41
36	34	15	1.00	16	14	60.78	554.38
37	15	8	1.00	7	7	40.35	545.44
38	12	17	1.00	7	15	55.37	533.10
39	19	16	1.00	10	14	57.85	575.01
40	19	20	1.00	10	18	68.10	499.77
41	22	18	1.00	11	16	56.32	558.62
42	22	13	1.00	10	12	58.51	530.82
43	24	15	1.00	11	13	42.27	486.09
44	20	26	1.00	11	22	54.84	505.81
45	31	14	1.00	14	13	41.34	512.48
46	22	16	1.00	11	14	46.77	524.40
47	24	19	1.00	13	16	77.62	567.15
48	23	11	1.00	11	10	54.84	537.26
49	38	15	1.00	17	14	36.89	525.05
50	37	13	1.00	16	12	38.00	473.07
51	32	23	1.00	14	20	47.87	445.71
52	10	12	1.00	5	10	96.67	466.91
53	25	13	1.00	12	12	59.05	552.67
54	31	15	1.00	14	14	46.77	504.25
55	12	17	1.00	7	15	59.90	545.61
56	32	27	1.00	16	24	46.91	517.41
57	11	23	1.00	6	19	67.06	381.49
58	26	17	1.00	13	15	72.45	538.75
59	39	16	1.00	18	15	58.34	542.54
60	31	9	1.00	14	8	30.57	523.09
61	33	13	1.00	15	12	49.84	530.18
62	19	20	1.00	9	17	36.48	421.30
63	25	15	1.00	12	14	53.03	554.40
64	16	10	1.00	8	9	58.39	575.35
65	23	22	1.00	12	19	45.48	542.92
66	37	14	1.00	16	13	35.17	492.36
67	13	21	1.00	8	18	58.03	539.48
68	16	23	1.00	9	20	58.75	507.99
69	15	15	1.00	8	13	54.30	535.24
70	33	24	1.00	17	21	58.54	562.30
71	19	29	1.00	8	24	47.40	305.29
72	22	12	1.00	10	11	41.89	503.48
73	26	17	1.00	13	15	53.31	526.27

wall #1

wall #2

wall #3

wall #4

ceiling

## S-6 Freezer Decommission 27 March 2020

74	37	11	1.00	17	11	40.25	565.59
75	39	7	1.00	17	7	32.97	535.02
76	35	19	1.00	17	17	36.58	551.62
77	19	18	1.00	10	16	41.61	523.36
78	23	16	1.00	12	14	56.30	584.59
79	26	14	1.00	13	13	32.59	580.46
80	41	16	1.00	20	15	38.71	581.77
81	24	11	1.00	11	10	60.42	551.77
82	23	21	1.00	12	18	42.96	555.98
83	22	12	1.00	11	11	50.27	580.96
84	27	17	1.00	14	15	48.90	586.44
85	39	15	1.00	18	14	52.01	543.35
86	24	19	1.00	13	17	51.31	584.05
87	23	24	1.00	13	21	64.27	595.99
88	34	19	1.00	17	17	64.20	580.24
89	26	20	1.00	14	17	57.70	569.16
90	22	16	1.00	10	14	43.54	472.19
91	30	11	1.00	10	10	34.99	355.45
92	26	16	1.00	11	14	56.91	441.60
93	30	19	1.00	14	17	36.53	495.63
94	21	8	1.00	8	7	36.33	416.13
95	35	12	1.00	15	11	62.66	483.97
96	26	22	1.00	12	19	74.22	440.27
97	26	11	1.00	10	10	45.26	412.04
98	17	25	1.00	9	21	54.41	453.29
99	16	15	1.00	6	13	33.83	338.60
100	44	18	1.00	14	16	42.59	331.98
101	30	21	1.00	11	18	39.10	363.75
102	45	20	1.00	18	18	54.96	435.27
103	14	14	1.00	6	12	46.19	392.02
104	3	25	1.00	3	19	42.90	211.37
105	47	28	1.00	11	23	36.49	225.51
106	22	12	1.00	7	11	38.79	323.01
107	29	18	1.00	10	16	40.87	333.45
108	22	11	1.00	9	10	55.79	444.00
109	2	21	1.00	3	16	36.70	243.51
110	32	20	1.00	10	17	34.09	297.88
111	32	16	1.00	9	14	35.90	276.89
112	16	17	1.00	6	14	51.68	319.39
113	38	13	1.00	15	12	39.20	449.75
114	29	18	1.00	10	15	43.24	328.68
115	4	24	1.00	4	19	48.39	288.80
116	54	18	1.00	13	16	30.91	257.98
117	33	21	1.00	11	18	48.34	325.36
118	64	21	1.00	13	18	23.95	222.25
119	33	19	1.00	14	17	45.58	446.31
120	16	20	1.00	7	17	51.76	347.19
121	27	29	1.00	12	25	54.29	393.21
122	7	21	1.00	5	18	73.03	467.79
123	45	15	1.00	19	14	40.93	476.76
124	36	15	1.00	17	14	36.84	564.68
125	29	12	1.00	11	11	33.51	412.84
126	30	13	1.00	12	12	38.92	438.26
127	54	14	1.00	22	13	34.78	461.09

Ceiling, cond.

Floor

S-6 Freezer  
ShelvesC.H.  
27 Mar 2020Outside S-6  
Freezer

# General Survey Map

Date/Time: 6 Mar 2020 14:45 Location: S-6 Freezer Surveyed by (Initials/Date): elt 5 Mar 2020

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☐ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☒ Other \_\_\_\_\_ Decommission

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>9DP</u> ID #: <u>MTR-320</u>	Model: <u>Model 3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>5.7</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> $\mu$ R/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> _____	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

20 cpm

40 cpm

bottom level, double shelf

6.0  $\mu$ R/hr

MAP LEGEND: ↗ = Radiation survey # = Contamination survey (1) = Wipe

Wipe results (dpm/100 cm<sup>2</sup>)

1. 4220
2. 4220
3. 4220
4. 4220
5. 4220
6. 4220
7. 4220
8. 4220
9. 4220
10. 4220
11. 4220
12. 4220
13. 4220
14. 4220
15. 4220
16. 4220
17. 4220
18. 4220
19. 4220
20. 4220
21. 4220
22. 4220
23. 4220
24. 4220
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_

Additional Comments: 1 ft<sup>2</sup> wipes

Note: Releasing an item as non-rad must be done with a contamination probe.



# General Survey Map

Date/Time: 5 Mar 2020 15:06 Location: S-6 Freezer Surveyed by (Initials/Date): ALH 5 Mar 2020

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☐ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☒ Other \_\_\_\_\_ Decommission

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>9DP</u> ID #: <u>MTR-320</u>	Model: <u>Model 3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>5.7</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> $\mu$ R/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> _____	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

MAP LEGEND: ↑ = Radiation survey # = Contamination survey 1 = Wipe

Wipe results (dpm/100 cm<sup>2</sup>)

1. 6220
2. 6220
3. 6220
4. 6220
5. 6220
6. 6220
7. 6220
8. 6220
9. 6220
10. 6220
11. 6220
12. 6220
13. 6220
14. 6220
15. 6220
16. 6220
17. 6220
18. 6220
19. 6220
20. 6220
21. 6220
22. 6220
23. 6220
24. 6220
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_

Additional Comments: 1 ff<sup>2</sup> wipes

Note: Releasing an item as non-rad must be done with a contamination probe.

# General Survey Map

Date/Time: 5 Mar 2020 15:35 Location: S-6 Freezer Surveyed by (Initials/Date): AB 5 Mar 2020

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☐ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☒ Other \_\_\_\_\_ Decommission

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>9DP</u> ID #: <u>MTR-320</u>	Model: <u>Model 3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>5.7</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> $\mu$ R/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> _____	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

MAP LEGEND: ↗ = Radiation survey # = Contamination survey (1) = Wipe

Wipe results (dpm/100 cm<sup>2</sup>)

1. 4220
2. 4220
3. 4220
4. 4220
5. 4220
6. 4220
7. 4220
8. 4220
9. 4220
10. 4220
11. 4220
12. 4220
13. 4220
14. 4220
15. 4220
16. 4220
17. 4220
18. 4220
19. 4220
20. 4220
21. 4220
22. 4220
23. 4220
24. 4220
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_

Additional Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Note: Releasing an item as non-rad must be done with a contamination probe.

Assay Definition-

Assay Description:

Assay Type: DPM (Dual)  
Report Name: Report1  
Output Data Path: C:\Packard\Tricarb\Results\a\_hamm\3H14C Wipe Test\20200305\_1724  
Raw Results Path: C:\Packard\Tricarb\Results\a\_hamm\3H14C Wipe Test\20200305\_1724\20200305\_1724.results  
RTF File Name: C:\Packard\Tricarb\Results\a\_hamm\3H14C Wipe Test\20200305\_1724\Report1.rtf  
Assay File Name: C:\Packard\TriCarb\Assays\3H14C Wipe Test.lsa

Count Conditions-

Nuclide: 3H14C-UG  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2s%  
Pre-Count Delay (min): 0.00  
Quench Sets:  
Low Energy: 14C Ultima Gold  
Mid Energy: 3H Ultima Gold  
Count Time (min): 1.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL
A	0.0	12.0
B	12.0	156.0
C	0.0	0.0

Count Corrections-

Static Controller: On Luminescence Correction: Off  
Colored Samples: Off Heterogeneity Monitor: n/a  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

Cycle 1 Results

S#	Count	Time	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	MESSAGES
1	1.00		9	15	18	15	50.56	572.44	-blank
2	1.00		17	15	15	82	29.69	229.40	
3	1.00		45	19	14	205	17.93	254.30	
4	1.00		2	10	13	5	23.94	198.20	
5	1.00		30	19	17	204	17.25	181.08	
6	1.00		29	21	21	125	23.82	257.07	
7	1.00		35	20	18	151	24.12	262.12	
8	1.00		25	25	27	107	31.52	244.80	
9	1.00		31	22	21	207	16.43	182.95	

Protocol# 22 - 3H14C Wipe Test.lsa

User: a\_hamm

Freezer Decommission 5 Mar 2020

10	1.00	9	17	20	41	38.58	213.06
11	1.00	26	20	20	113	32.52	254.38
12	1.00	32	27	27	162	22.16	222.82
13	1.00	4	12	15	15	41.23	212.62
14	1.00	22	25	27	146	30.14	178.70
15	1.00	19	24	26	111	29.13	194.42
16	1.00	12	21	25	58	24.54	200.31
17	1.00	23	29	32	311	19.29	113.10
18	1.00	25	30	33	191	21.40	159.03
19	1.00	21	14	13	85	33.91	278.31
20	1.00	8	12	14	55	29.61	165.77
21	1.00	5	13	16	26	38.79	175.19
22	1.00	6	16	20	22	41.37	226.33
23	1.00	3	15	19	5	49.12	241.10
24	1.00	14	12	12	60	18.95	253.83
25	1.00	7	12	14	29	22.51	232.26
26	1.00	7	7	7	45	14.67	194.29
27	1.00	2	10	13	5	37.45	194.95
28	1.00	5	16	20	19	36.80	204.89
29	1.00	8	18	21	38	37.41	200.29
30	1.00	5	13	16	22	28.80	198.06
31	1.00	10	19	23	50	37.44	198.51
32	1.00	7	10	11	39	31.20	191.93
33	1.00	3	18	23	5	32.75	189.12
34	1.00	6	9	10	28	20.60	217.54
35	1.00	6	18	22	22	44.61	222.17
36	1.00	6	19	24	20	51.58	222.51
37	1.00	8	14	16	32	34.58	250.92
38	1.00	7	6	6	36	39.72	218.67
39	1.00	5	13	16	18	31.30	233.14
40	1.00	7	13	15	27	38.68	244.18
41	1.00	6	17	21	23	29.62	213.31
42	1.00	7	15	18	33	39.98	202.88
43	1.00	3	21	27	3	56.84	192.25
44	1.00	14	10	9	69	23.14	233.92
45	1.00	5	14	18	20	26.65	186.64
46	1.00	7	9	10	38	26.18	208.32
47	1.00	12	14	15	65	30.00	203.71
48	1.00	5	14	17	15	50.39	246.61
49	1.00	2	15	20	1	35.64	163.70
50	1.00	5	12	15	21	45.46	209.95
51	1.00	8	17	20	28	28.92	274.20
52	1.00	5	11	13	18	34.71	242.34
53	1.00	11	17	20	41	32.85	259.33
54	1.00	9	9	10	37	31.74	249.69
55	1.00	4	5	6	15	30.41	252.49
56	1.00	11	13	14	42	33.70	272.15
57	1.00	6	15	18	19	41.39	261.77
58	1.00	8	11	12	39	40.00	214.23
59	1.00	8	16	18	28	43.20	273.90
60	1.00	16	17	18	58	37.72	287.56
61	1.00	5	17	21	10	38.59	296.03
62	1.00	6	10	12	30	33.91	205.11
63	1.00	4	18	22	8	40.20	257.22
64	1.00	4	11	13	13	41.89	246.21
65	1.00	6	12	14	24	40.93	250.51
66	1.00	5	9	10	18	39.09	267.10
67	1.00	6	17	20	18	44.70	286.35
68	1.00	4	16	20	8	41.01	248.77
69	1.00	2	16	20	0	42.35	222.50
70	1.00	6	14	17	19	54.49	245.50
71	1.00	5	15	19	17	41.77	223.99
72	1.00	8	18	22	25	52.41	254.44

bottom shelf  
cont.all  
5 Mar 2020middle  
shelf

Shelves 1 &amp; 5

73	1.00	2	20	26	0	44.21	184.45	- shelves [eS, cond.
----	------	---	----	----	---	-------	--------	----------------------

at

5 Mar 2020

# General Survey Map

Date/Time: 18 May 2020 10:40 Location: S-6 Freezer Surveyed by (Initials/Date): RA 18 May 2020

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☐ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☒ Other \_\_\_\_\_ Decommission

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>9DP</u> ID #: <u>MTR-320</u>	Model: <u>Model 3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>5.9</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> $\mu$ R/hr	Background: <u>1.7</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> _____	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

MAP LEGEND: ↗ = Radiation survey # = Contamination survey 1 = Wipe

Wipe results (dpm/100 cm<sup>2</sup>)

1. 2220
2. 2220
3. 2220
4. 2220
5. 2220
6. 2220
7. 2220
8. 2220
9. 2220
10. 2220
11. 2220
12. 2220
13. 2220
14. 2220
15. 2220
16. 2220
17. 2220
18. 2220
19. 2220
20. 2220
21. 2220
22. 2220
23. 2220
24. 2220
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_

Additional Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Note: Releasing an item as non-rad must be done with a contamination probe.

# General Survey Map

Date/Time: 18 May 2020 11:00 Location: S-6 Freezer Surveyed by (Initials/Date): QA 18 May 2020

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☐ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☒ Other \_\_\_\_\_ Decommission

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>9DP</u> ID #: <u>MTR-320</u>	Model: <u>Model 3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>5.1</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> $\mu$ R/hr	Background: <u>10</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> _____	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

MAP LEGEND: ↑ = Radiation survey # = Contamination survey 1 = Wipe

Wipe results (dpm/100 cm<sup>2</sup>)

1. 1220
2. 1220
3. 1220
4. 1220
5. 1220
6. 1220
7. 1220
8. 1220
9. 1220
10. 1220
11. 1220
12. 1220
13. 1220
14. 1220
15. 1220
16. 1220
17. 1220
18. 1220
19. 1220
20. 1220
21. 1220
22. 1220
23. 1220
24. 1220
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_

Additional Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Note: Releasing an item as non-rad must be done with a contamination probe.

# Assay Definition-

## Assay Description:

Assay Type: DPM (Dual)

Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\

Raw Results Path: C:\Packard\Tricarb\Results\A\_Hamm\3H\_14C\_UG\20200318\_1538\20200318\_1538.results

Assay File Name: C:\Packard\TriCarb\Assays\3H\_14C\_UG.lsa

## Count Conditions-

Nuclide: 3H-14C

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H Ultima Gold

Mid Energy: 14C Ultima Gold

Count Time (min): 1.00

Count Mode: Normal

Assay Count Cycles: 1

#Vials/Sample: 1

Repeat Sample Count: 1

Calculate % Reference: Off

Background Subtract: Off

Low CPM Threshold: Off

2 Sigma % Terminator: Off

Regions	LL	UL
A	0.0	12.0
B	12.0	156.0
C	0.0	0.0

## Count Corrections-

Static Controller: On

Luminescence Correction: Off

Colored Samples: Off

Heterogeneity Monitor: n/a

Coincidence Time (nsec): 18

Delay Before Burst (nsec): 75

## Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

## Cycle 1 Results

S#	DPM1	DPM2	Count	Time	CPMA	CPMB	SIS	tSIE	MESSAGES
1	18	17	1.00	10	15	82.02	597.06	597.06	-blank
2	12	21	1.00	4	17	46.35	236.07	236.07	
3	7	26	1.00	4	21	59.10	245.97	245.97	
4	0	18	1.00	0	14	78.53	275.63	275.63	
5	12	23	1.00	5	19	59.45	271.83	271.83	
6	22	21	1.00	8	18	44.75	316.06	316.06	
7	16	17	1.00	5	14	47.01	255.62	255.62	
8	16	14	1.00	5	12	40.46	268.60	268.60	
9	9	16	1.00	4	13	62.08	308.88	308.88	
10	5	11	1.00	2	9	33.92	233.03	233.03	

Ahm

18 Mar 2020

A+P  
shelf



# General Survey Map

Date/Time: 3 Mar 2020 14:35 Location: S-6 Freezer Door Surveyed by (Initials/Date): ALH 3 Mar 2020

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

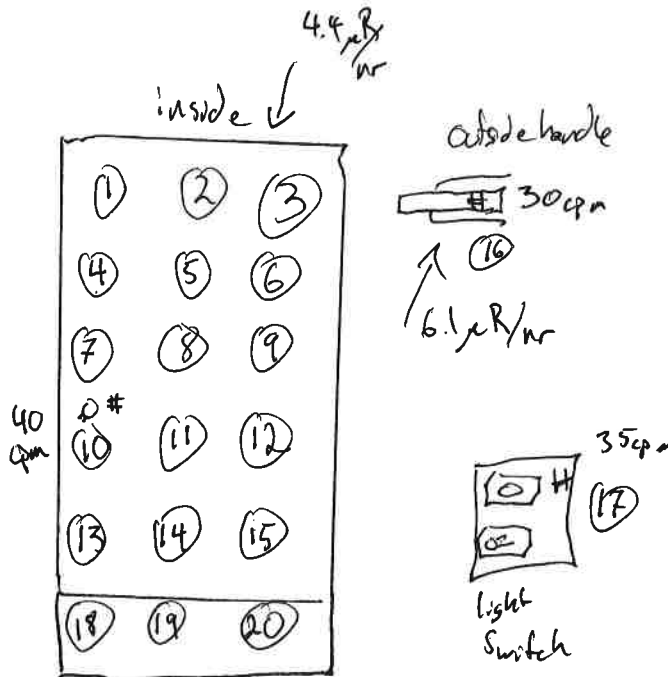
Reason:

☐ Receipt of RAM ☐ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☒ Other Decommission

<b>Radiation Surveys</b> ( <input type="checkbox"/> Not performed) Model: <u>9DP</u> ID #: <u>MTR-320</u> Calibration Due: <u>9 May 2020</u> Background: <u>3.0</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> $\mu$ R/hr Probe: <input type="checkbox"/> _____	<b>Contamination Surveys</b> ( <input type="checkbox"/> Not performed) Model: <u>Model 3</u> ID #: <u>MTR-100</u> Calibration Due: <u>13 Dec 2020</u> Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92) <input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____
--	---

Wipe results (dpm/100 cm<sup>2</sup>)

1. 4220
2. 4220
3. 4220
4. 4220
5. 4220
6. 4220
7. 4220
8. 4220
9. 4220
10. 4220
11. 4220
12. 4220
13. 4220
14. 4220
15. 4220
16. 4220
17. 4220
18. 4220
19. 4220
20. 4220
21. \_\_\_\_\_
22. \_\_\_\_\_
23. \_\_\_\_\_
24. \_\_\_\_\_
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_



MAP LEGEND:  $\nearrow$  = Radiation survey # = Contamination survey 1 = Wipe

Additional Comments: wipes 1-15, 18-20 are 1 ft<sup>2</sup> area

Note: Releasing an item as non-rad must be done with a contamination probe.

# General Survey Map

Date/Time: 3 Mar 2020 15:00 Location: S-6 Freezer, Shelving Surveyed by (Initials/Date): QAL 3 Mar 2020

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

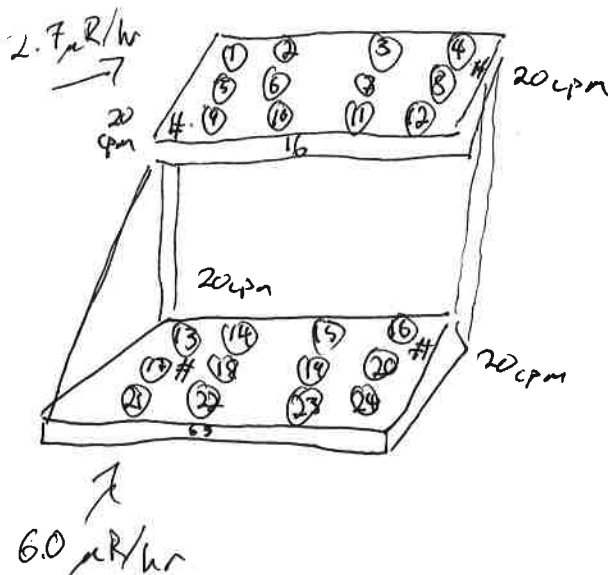
Reason:

☐ Receipt of RAM ☐ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_ (Month) (Year)  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Year) ☒ Other Decommission

Radiation Surveys ( <input type="checkbox"/> Not performed)	Contamination Surveys ( <input type="checkbox"/> Not performed)
Model: <u>1DP</u> ID #: <u>MTR-320</u>	Model: <u>Model 3</u> ID #: <u>MTR-100</u>
Calibration Due: <u>9 May 2020</u>	Calibration Due: <u>13 Dec 2020</u>
Background: <u>3.0</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> $\mu$ R/hr	Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm
Probe: <input type="checkbox"/> _____	Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92)
	<input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____

Wipe results (dpm/100 cm<sup>2</sup>)

1. 220
2. 220
3. 220
4. 220
5. 220
6. 220
7. 220
8. 220
9. 220
10. 220
11. 220
12. 220
13. 220
14. 220
15. 220
16. 220
17. 220
18. 220
19. 220
20. 220
21. 220
22. 220
23. 220
24. 220
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_



MAP LEGEND:  $\nearrow$  = Radiation survey # = Contamination survey 1 = Wipe

Additional Comments: shelves 63 + 16 1 ft<sup>2</sup> wipes

Note: Releasing an item as non-rad must be done with a contamination probe.

# General Survey Map

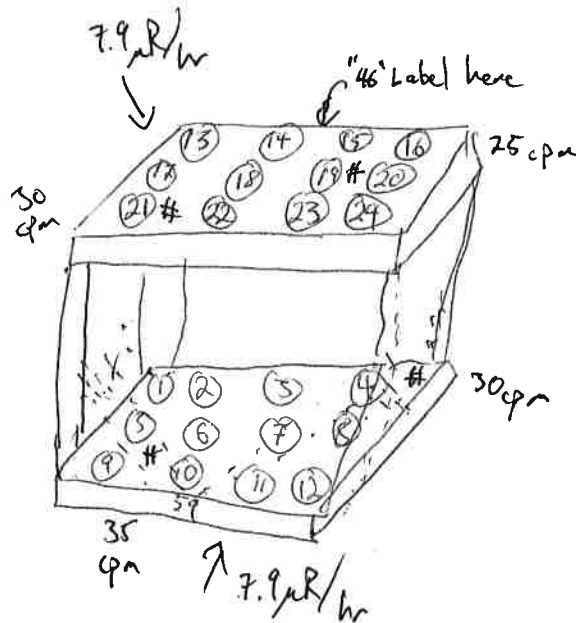
Date/Time: 3 Mar 2020 15:30 Location: S-6 Freezer Surveyed by (Initials/Date): alt 3 Mar 2020

Isotopes Expected: ☒ H-3 ☐ C-11 ☒ C-14 ☐ F-18 ☐ Cu-64 ☐ Zr-89 ☐ Tc-99m ☐ In-111 ☐ I-124 ☐ I-125  
☐ Pb-203 ☐ Ac-225 ☐ Other(specify): \_\_\_\_\_

Reason:

☐ Receipt of RAM ☐ Release as Non-Radioactive ☐ Daily Survey ☐ Weekly Survey ☐ Monthly Survey for \_\_\_\_\_  
☐ Quarterly Survey for 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> Quarter of \_\_\_\_\_ (Month) (Year)  
☒ Other Recommission

<b>Radiation Surveys</b> ( <input type="checkbox"/> Not performed) Model: <u>9 DP</u> ID #: <u>MTR-320</u> Calibration Due: <u>9 May 2020</u> Background: <u>30</u> Units: <input type="checkbox"/> mR/hr <input checked="" type="checkbox"/> $\mu$ R/hr Probe: <input type="checkbox"/> _____	<b>Contamination Surveys</b> ( <input type="checkbox"/> Not performed) Model: <u>Model 3</u> ID #: <u>MTR-100</u> Calibration Due: <u>13 Dec 2020</u> Background: <u>30</u> Units: <input checked="" type="checkbox"/> cpm <input type="checkbox"/> dpm Probe: <input type="checkbox"/> Gamma (44-2) <input checked="" type="checkbox"/> Beta (44-9) <input type="checkbox"/> Alpha (43-92) <input type="checkbox"/> Low-E Gamma (44-3) <input type="checkbox"/> Other _____
--	---



Wipe results (dpm/100 cm<sup>2</sup>)

1. 6220
2. 6220
3. 6220
4. 6220
5. 6220
6. 6220
7. 6220
8. 6220
9. 6220
10. 6220
11. 6220
12. 6220
13. 6220
14. 6220
15. 6220
16. 6220
17. 6220
18. 6220
19. 6220
20. 6220
21. 6220
22. 6220
23. 6220
24. 6220
25. \_\_\_\_\_
26. \_\_\_\_\_
27. \_\_\_\_\_
28. \_\_\_\_\_

MAP LEGEND:  $\nearrow$  = Radiation survey # = Contamination survey 1 = Wipe

Additional Comments: Shelves 59 & 46 1 ft<sup>2</sup> wiper

Note: Releasing an item as non-rad must be done with a contamination probe.

Protocol# 22 - 3H14C Wipe Test.lsa

User: a\_hamm

## S-6 Freezer Decommission

## Assay Definition-

## Assay Description:

Assay Type: DPM (Dual)

Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\a\_hamm\3H14C Wipe Test\20200303\_1642

Raw Results Path: C:\Packard\Tricarb\Results\a\_hamm\3H14C Wipe Test\20200303\_1642\20200303\_1642.results

RTF File Name: C:\Packard\Tricarb\Results\a\_hamm\3H14C Wipe Test\20200303\_1642\Report1.rtf

Assay File Name: C:\Packard\TriCarb\Assays\3H14C Wipe Test.lsa

## Count Conditions-

Nuclide: 3H14C-UG

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

## Quench Sets:

Low Energy: 14C Ultima Gold

Mid Energy: 3H Ultima Gold

Count Time (min): 1.00

Count Mode: Normal

Assay Count Cycles: 1

Repeat Sample Count: 1

#Vials/Sample: 1

Calculate % Reference: Off

Background Subtract: Off

Low CPM Threshold: Off

2 Sigma % Terminator: Off

Regions	LL	UL
A	0.0	12.0
B	12.0	156.0
C	0.0	0.0

## Count Corrections-

Static Controller: On

Luminescence Correction: Off

Colored Samples: Off

Heterogeneity Monitor: n/a

Coincidence Time (nsec): 18

Delay Before Burst (nsec): 75

## Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

## Cycle 1 Results

S#	Count	Time	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	MESSAGES
1	1.00		6	16	19	9	63.62	569.26	- blank
2	1.00		23	33	37	86	27.24	264.65	
3	1.00		21	19	19	138	20.54	183.18	
4	1.00		55	19	14	196	16.68	324.55	
5	1.00		25	21	22	72	35.08	373.52	S-6
6	1.00		25	19	19	71	26.81	390.42	Freezer Pan
7	1.00		45	24	22	126	23.90	411.88	
8	1.00		23	19	20	59	39.44	420.82	
9	1.00		32	21	22	82	38.47	438.35	

Protocol# 22 - 3H14C Wipe Test.lsa

User: a\_hamm

## S-6 Freezer Decommission

10	1.00	37	26	27	93	34.97	450.32
11	1.00	20	19	20	51	37.64	440.42
12	1.00	18	16	17	44	49.09	444.60
13	1.00	18	20	22	41	55.54	470.27
14	1.00	26	16	16	73	24.99	400.39
15	1.00	36	21	21	96	43.41	427.31
16	1.00	14	17	19	33	36.42	448.29
17	1.00	9	12	13	26	42.84	347.65
18	1.00	10	11	12	25	34.28	411.83
19	1.00	14	15	16	40	33.07	360.77
20	1.00	19	16	17	57	36.43	357.09
21	1.00	17	20	22	48	39.28	368.82
22	1.00	19	34	40	102	30.84	195.72
23	1.00	5	12	14	27	24.97	186.28
24	1.00	7	15	18	30	38.81	218.55
25	1.00	5	21	27	18	33.83	183.41
26	1.00	7	22	27	24	33.73	216.29
27	1.00	7	8	9	29	32.47	254.18
28	1.00	10	14	17	67	29.69	166.97
29	1.00	9	8	9	37	20.82	258.22
30	1.00	16	14	14	69	21.45	251.69
31	1.00	15	13	13	61	33.48	266.80
32	1.00	17	17	18	89	24.34	211.14
33	1.00	3	15	19	9	24.61	172.96
34	1.00	3	21	28	11	31.97	138.60
35	1.00	10	18	21	39	40.58	243.47
36	1.00	5	9	11	39	27.86	148.34
37	1.00	5	14	17	18	35.94	221.46
38	1.00	5	15	20	25	41.01	150.21
39	1.00	3	7	9	15	43.66	188.70
40	1.00	8	15	18	35	36.60	222.07
41	1.00	2	15	19	0	66.04	257.67
42	1.00	7	18	23	28	37.78	204.97
43	1.00	3	9	12	7	21.13	244.58
44	1.00	5	6	7	18	61.79	292.38
45	1.00	8	15	18	28	29.06	243.39
46	1.00	6	15	18	23	42.76	239.45
47	1.00	6	11	13	20	27.99	258.15
48	1.00	15	15	15	58	33.97	283.80
49	1.00	12	13	14	41	33.29	300.03
50	1.00	6	18	22	17	45.14	264.66
51	1.00	8	14	16	27	39.40	283.29
52	1.00	3	10	12	9	52.41	243.41
53	1.00	5	8	9	21	36.51	233.40
54	1.00	4	13	16	12	52.45	241.98
55	1.00	8	17	20	26	36.43	261.30
56	1.00	11	22	26	51	40.59	206.95
57	1.00	8	12	14	42	25.12	202.50
58	1.00	1	13	19	0	32.90	132.44
59	1.00	5	8	9	18	17.10	267.66
60	1.00	10	25	29	35	46.02	250.86
61	1.00	4	22	28	7	44.08	225.12
62	1.00	2	11	14	5	44.88	186.38
63	1.00	6	13	16	34	37.46	170.92
64	1.00	1	19	24	0	53.93	226.24
65	1.00	7	13	15	22	49.56	293.41
66	1.00	4	12	15	11	38.82	266.40
67	1.00	7	14	18	31	28.62	198.82
68	1.00	4	12	15	15	31.30	212.86
69	1.00	7	11	13	25	37.90	274.21

S-6  
Freezer door  
Cont.Shelves  
16+63at  
5/4/2020Shelves  
59+46