

From: Robert M Sweeney, CNMT RSO  
License Number: 24-32391-01


Bryan Parker,

Enclosed is the close out Survey performed by Robert M Sweeney, CNMT RSO for Midwest Health Professional's office location 11520 St. Charles Rock Road, Suite 106, Bridgeton MO 63044. Please remove this location from our license. Our office location at 8793 Watson Rd, Webster Groves, MO 63119 will be the only address remaining on the license. I believe all required information has been included. In the event of any questions, please call me at 314-799-5648.

Sincerely,



Robert M Sweeney, CNMT RSO  
Midwest Health Professionals  
8793 Watson Rd,  
Webster Groves, MO 63119



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Survey locations:

- 1) Dose Preparation Area
- 2) Dose Calibrator
- 3) Computer
- 4) Camera Gantry
- 5) Hot Lab Floor
- 6) Detector
- 7) Imaging Table
- 8) Injection Table
- 9) Treadmill Floor
- 10) Treadmill
- 11) Extra: Floor
- 12) Extra: Dose Receiving
- 13) Extra: Flood Source Area
- 14) Extra: Waste Area

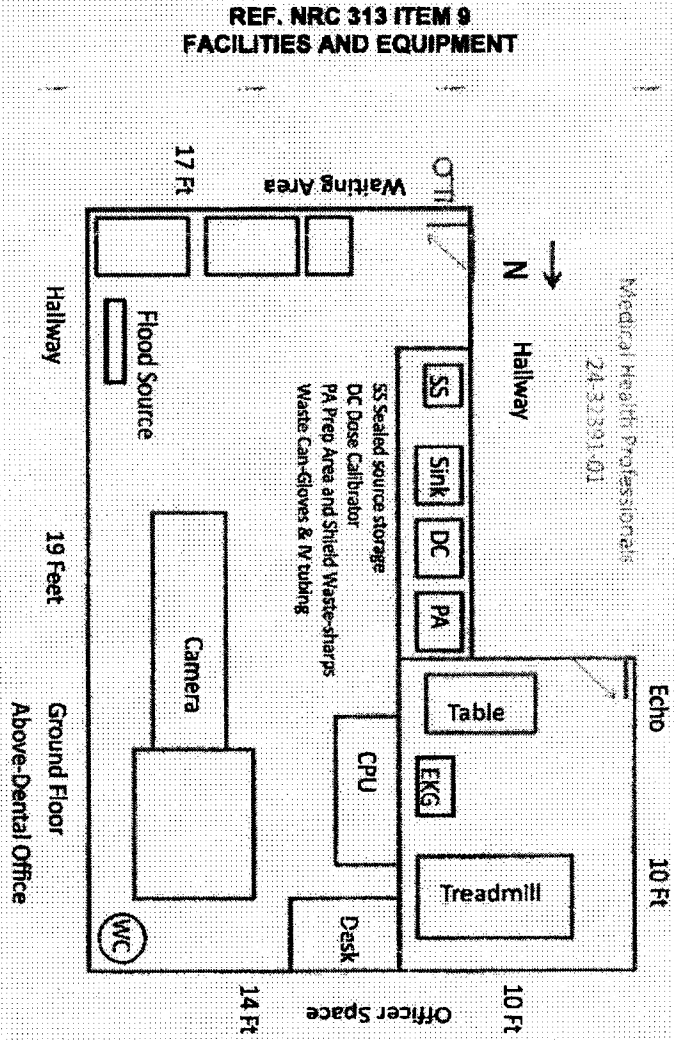
Area surveys and wipes were performed on three separate occasions.

On 9/25/2015, Midwest Health Professionals ceased radioactive isotope use of the Nuclear Medicine Department. All sealed sources at that time were put into storage. The department had received only  $Tc^{99m}$  labeled radiopharmaceuticals over the previous year. The results of all surveys were indistinguishable from background and all wipes were less than 200 dpm.

On 1/6/2016, Midwest Health Professionals removed the camera and most equipment from 11520 St. Charles Rock Road. All sealed sources remained in storage locked in the under-sink cabinet securely affixed to the wall. The department had received only  $Tc^{99m}$  labeled radiopharmaceuticals over the previous year and at the time of removal for the camera and other equipment greater than 10 half lives of  $Tc^{99m}$  had elapsed. Surveys and wipes were repeated prior to equipment removal. The results of all surveys were indistinguishable from background and all wipes were less than 200 dpm.

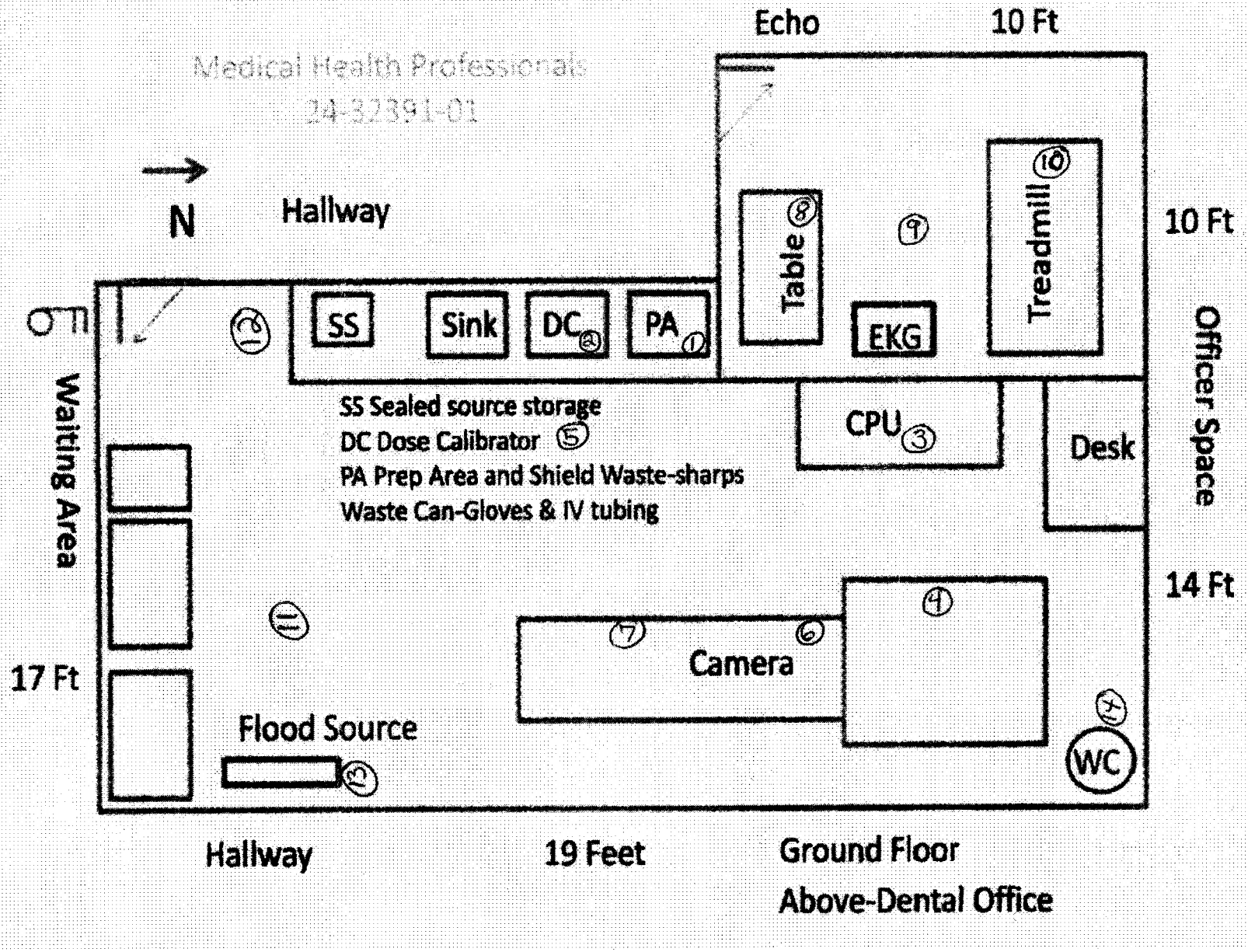
On 6/7/2016, Midwest Health Professionals performed leak testing of the sealed sources which had remained locked in storage within the under-sink cabinet. Leak Testing consistent with Appendix Q of *NUREG - 1556, Vol. 9, Rev. 2* revealed no removable activity greater than the Minimum Detectable Activity. Surveys and wipes were repeated prior to source removal. The results of all surveys were indistinguishable from background and all wipes were less than 200 dpm. Sources were moved by Dr. Kayembe and placed in storage at 8793 Watson Road where they are also locked in an under-sink cabinet for storage.

A room diagram from the previous office relocation to 11520 St. Charles Rock Road follows:



Lead shielding will be used in the dose preparation, sealed source and waste storage areas. Adequate lead syringe shields are available for use. Door to the camera room will be locked when unoccupied.

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Key to Areas wiped for Closeout Survey:

<b>GM Meter</b>		Ludlum 14C #188339			
<b>Last Calibrated:</b>		6/3/2016 by Stain A. Huber Consultants Inc.			
<b>Well Counter:</b>		SpecTec ST-350 #2173			
<b>Last Calibrated:</b>		5/21/2015	<b>Efficiency:</b>	84.70% by Stan A. Huber Consultants Inc	
<b>End of Use</b>					
<b>Date</b>	9/25/2015				
<b>Area</b>	<b>Name</b>	<b>Survey</b>	<b>Wipe cpm</b>	<b>Net dpm</b>	
	1 Dose Prep Area	0.02	445	-5	
	2 Dose Calibrator	0.02	413	-43	
	3 Computer	0.02	381	-80	
	4 Gantry	0.02	455	7	
	5 Hot Lab Floor	0.02	419	-35	
	6 Detector	0.02	483	40	
	7 Imaging Table	0.02	481	38	
	8 Injection Table	0.02	503	64	
	9 Treadmill Floor	0.02	444	-6	
	10 Treadmill	0.02	510	72	
<b>Check</b>		0.4	45373		
<b>Bkg</b>		0.02	449		
<b>Camera Remove</b>					
<b>Date</b>	1/6/2016				
<b>Area</b>	<b>Name</b>	<b>Survey</b>	<b>Wipe cpm</b>	<b>Net dpm</b>	
	1 Dose Prep Area	0.02	412	22	
	2 Dose Calibrator	0.02	410	20	
	3 Computer	0.02	448	65	
	4 Gantry	0.02	431	45	
	5 Hot Lab Floor	0.02	395	2	
	6 Detector	0.02	391	-2	
	7 Imaging Table	0.02	363	-35	
	8 Injection Table	0.02	383	-12	
	9 Treadmill Floor	0.02	394	1	
	10 Treadmill	0.02	474	96	
<b>Check</b>		0.4	45213		
<b>Bkg</b>		0.02	393		

Closeout *						
Date	6/7/2016					
Area	Survey	Wipe cpm **	Net dpm	Activity (µCi)		
1 Dose Prep Area	0.02	288	-1	-2.36E-04		
2 Dose Calibrator Area	0.02	289	0	-2.34E-04		
3 Computer Area	0.02	303	17	-2.14E-04		
4 Gantry Area	0.02	287	-2	-2.37E-04		
5 Hot Lab Floor	0.02	287	-2	-2.37E-04		
6 Detector Area	0.02	298	11	-2.21E-04		
7 Imaging Table Area	0.02	282	-8	-2.44E-04		
8 Injection Table Area	0.02	286	-4	-2.39E-04		
9 Treadmill Floor	0.02	270	-22	-2.62E-04		
10 Treadmill Area	0.02	292	4	-2.30E-04		
11 Extra: Floor	0.02	282	-8	-2.44E-04		
12 Extra: Dose Receiving	0.02	278	-13	-2.50E-04		
13 Extra: Flood Source Area	0.02	293	5	-2.28E-04		
14 Extra: Waste Area	0.02	313	28	-1.99E-04		
<b>Check</b>	0.4	44697				
<b>Bkg</b>	0.02	289				
<b>Minimum Detectable Activity</b>	33.1 cpm					
<b>Eff (cpm / microcurie)</b>	683,200					
* Equipment removed, surveys and wipes were performed in the area where equipment used to be, if applicable.						
** Counts were accumulated for 10 minutes and converted into counts per minute.						

Date: 6/7/2016

# Leak Testing

## Midwest Health Professionals Leak Testing

Testing will utilize the **Well Counter**: SpecTec ST-350 #2173 Last Calibrated: 5/21/2015 to have an Efficiency of 84.7% by Stan A. Huber Consultants Inc.

Sealed Sources in Lab:

<b>Manufacturer</b>	<b>Model No.</b>	<b>Nuc</b>	<b>Calibrated Act</b>	<b>Calibration Date</b>	<b>Calculated Activity<sup>1,2</sup></b>	<b>In Storage?</b>	<b>Requires Leak Test?</b>
<b>Serial No.</b>							
<b>Isotope Prod.</b>							
934-66-7	Vial	Ba-133	235.7 µCi	10/1/2002	< 100 µCi	y	n
<b>RadQual</b>							
934-57-14	Vial	Cs-137	197.5 µCi	10/1/2002	144.2 µCi	y	y
<b>Spectrum Tech.</b>							
2173	Rod	Cs-137	0.09 µCi	1/14/2002	< 100 µCi	n	n
<b>Isotope Prod.</b>							
1549-115	NES392	Co-57	10 mCi	12/1/2011	144.7 µCi	y	y
<b>RadQual</b>							
BM06057e13261107	Vial	Co-57	5.42 mCi	9/23/2013	429.0 µC	y	y
<b>RadQual</b>							
BM021013265102	BM02-10	Co-57	10 mCi	10/22/2013	852.7 µCi	y	y

A wet wipe with an alcohol pad will be performed for each sealed source. Wearing gloves, a separate alcohol pad will be used for each wipe. Alcohol pads will be placed in numbered sample vials for identification. Wipes will be performed at the most accessible area of each sealed source.

**Background Count Rate:** 2868 counts / 10 minutes = 289 cpm

**Counts Per Minute, Standard:** 446,973 counts / 10 minutes = 44,697 cpm

**Serial Number:** Spectrum Tech #2173

**Standard Calibration Activity:** 0.091 microcuries

**Standard Calibration Date:** 1/14/2002

**Standard Isotope:** Cs<sup>137</sup>

**Standard Half-Life:** 30.07 yr

**Date of Measurement:** 6/7/2016

**Calculated<sup>1</sup> Elapsed Time:** 5,258 days

**Calculated<sup>2</sup> Activity:** 0.065 microcuries

$$\text{Efficiency} = \frac{[(44,697) - (289)]}{(0.065)} = 683,200 \text{ cpm / microcurie}$$

$$\text{Minimal Detectable Activity} = (3 + 4.65(289\text{cpm}/10\text{m})^{1/2}) / 0.847 \text{ counts per disintegration}) \\ = 33.1 \text{ disintegrations per minute}$$

**Counts for 0.005  $\mu\text{Ci}$ :**

Removable Contamination of 0.005  $\mu\text{Ci}$  = Net Counts / Eff in counts per microcurie

Net Counts for 0.005  $\mu\text{Ci}$  = 683,200 cpm \* 0.005 = 3,416 counts

**Results:**

Wipe Num	(10 Min) Counts - Bkg	CPM	Removable Activity	Manufacturer Serial No.	Model No.	Nuc	Calculated Act
1	36	4	< MDA	<i>Isotope Prod.</i> 934-66-7	Vial	Ba-133	< 100 $\mu\text{Ci}$
2	9	1	< MDA	<i>RadQual</i> 934-57-14	Vial	Cs-137	144.2 $\mu\text{Ci}$
3	n/a	n/a	n/a	<i>Spectrum Tech.</i> 2173	Rod	Cs-137	< 100 $\mu\text{Ci}$
4	64	6	< MDA	<i>Isotope Prod.</i> 1549-115	NES392	Co-57	179.0 $\mu\text{Ci}$
5	-49	<0	< MDA	<i>RadQual</i> BM06057e13261107	Vial	Co-57	530.9 $\mu\text{C}$
6	-62	<0	< MDA	<i>RadQual</i> BM021013265102	BM02-10	Co-57	1.05 mCi

Leak Test Completed: 6/7/2016

Results: All samples passed.

Robert M Sweeney, CNMT RSO



<sup>1</sup> <http://www.timeanddate.com/date/durationresult.html?m1=1&d1=14&y1=2002&m2=3&d2=16&y2=2016>

<sup>2</sup> [https://www.ehs.washington.edu/rso/calculator/activity\\_calc.shtm](https://www.ehs.washington.edu/rso/calculator/activity_calc.shtm)



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