

June 4, 2014

Br. 2  
J6

REC'R G1 06/17/14 AM 11:50

Dennis Lawyer, Senior Health Physicist  
U.S. Nuclear Regulatory Commission, Region I  
2100 Renaissance Boulevard Suite 100  
King of Prussia, Pennsylvania 19406-2713

License No. 47-23035-01  
Docket No. 03020199

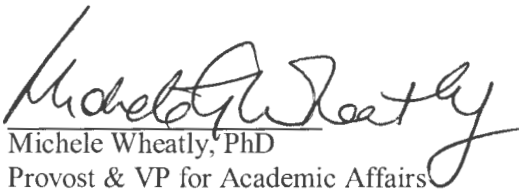
Subject: License Amendment and Amended Certification of Financial Assurance

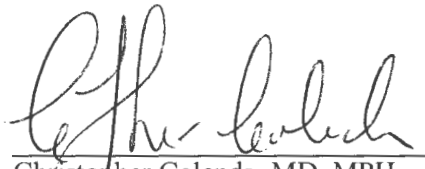
Dear Mr. Lawyer,

Enclosed is the letter requesting an amendment to change the amount of the possession limit of Sodium-22 from 20mCi to 3.5mCi and "Certification of Financial Assurance" that included Sodium-22 in the list with a new value of 3.5 mCi. Enclosed also are the Na-22 decommissioning documents for West Virginia University laboratories that previously used Sodium-22 isotope. Currently no labs use any unsealed form of Na-22 isotopes. As the result indicated, all the areas are free of contamination.

Please feel free to contact the Radiation Safety Officer, Nasser Razmianfar, if any further information is needed.

Sincerely,

  
Michele Wheatly, PhD  
Provost & VP for Academic Affairs

  
Christopher Colenda, MD, MPH  
Chancellor for Health Sciences Center

Enclosed: Amendment Request Letter  
Certification of Financial Assurance  
Survey Results of Sodium-22 Areas

Cc: Fred Butcher, VP for Planning and Operations  
Glen Dillon, VP for Health Sciences Research & Graduate Education  
Nasser Razmianfar, Director & RSO  
Radiation Safety Committee

583674

584143

June 4, 2014

J6

US Nuclear Regulatory Commission  
Attn: Licensing Assistance Team  
475 Allendale Road  
King of Prussia, PA 19406-1415

REC RG 1 06 17 14 AM 11 50

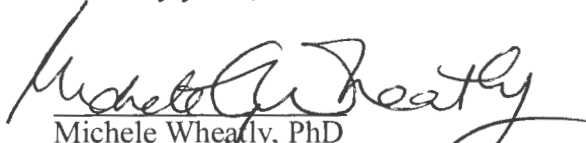
Re: West Virginia University  
NRC License No. 47-23035-01, Docket 030-20199

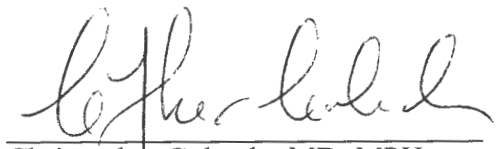
Subject: License Amendment

West Virginia University is requesting to amend its US NRC Broad Scope license to decrease the amount of Sodium-22 from 20mCi to 3.5mCi. Hence, the amendment being requested shall reflect the following changes:

6. <u>Byproduct sources, and/or Special nuclear material</u>	7. <u>Chemical and/or physical Form</u>	8. <u>Max. Amount that licensee may possess at any one time under this license</u>
D. Na-22	Any	3.5 mCi

Sincerely yours,

  
Michele Wheatly, PhD  
Provost & VP for Academic Affairs

  
Christopher Colenda, MD, MPH  
Chancellor for Health Sciences Center

Cc: Nasser Razmianfar, Director and Radiation Safety Officer

584143

Na-22 Decommissioning documents for a hood that was used to temporarily stage materials and the cabinets under the hood that were used to store materials between experiments.

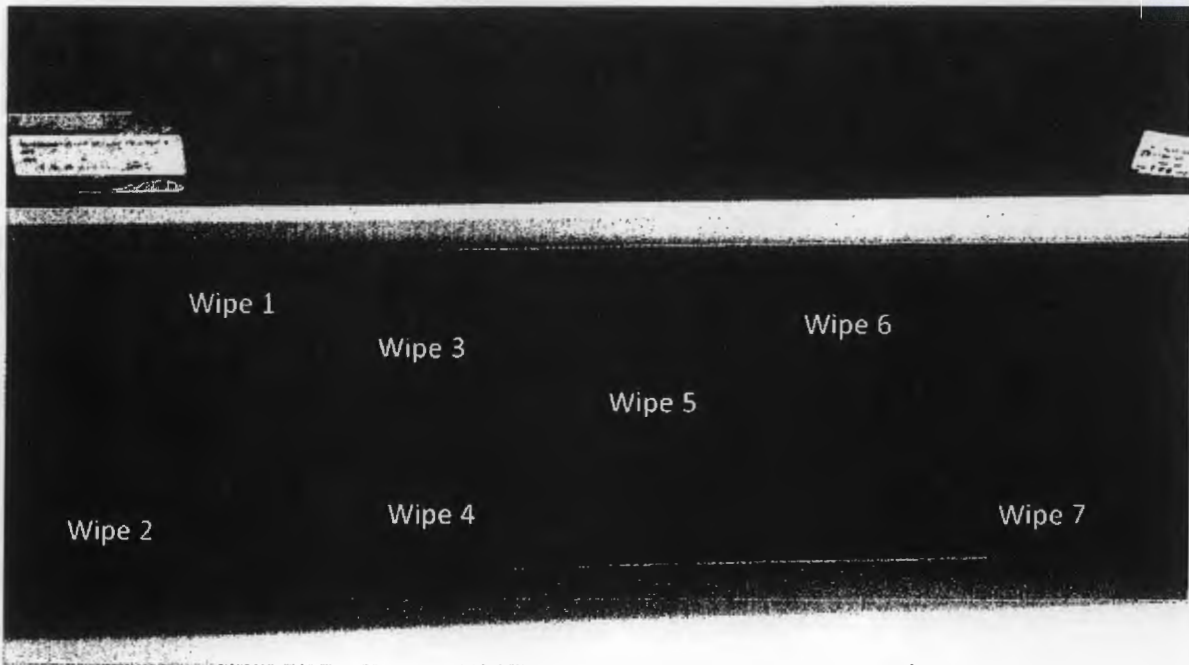
All wipes and test results were less than 200 dpm/100 cm<sup>2</sup>, all GM readings were found to be at background levels

Meter Used: Ludlum 3      Serial Number: 81198

Calibration Due: 11/1/2013

Background: 0.02 mR/hr

Prior to 5/23/2013 this hood was a temporary staging area for Na-22



Location:	GM reading:
Wipe 1:	0.02 mR/hr
Wipe 2:	0.02 mR/hr
Wipe 3:	0.02 mR/hr
Wipe 4:	0.02 mR/hr
Wipe 5:	0.02 mR/hr
Wipe 6:	0.02 mR/hr
Wipe 7:	0.02 mR/hr

**Gamma Counter DPM Calculation Spreadsheet:**

<b>Counter % Efficiency:</b>	0.65
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<b>Standard Used:</b>	I-129
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<b>Background Count (CPM):</b>	351
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<b>Sample Area</b>	<b>Sample Number</b>	<b>Sample Count (CPM)</b>	<b>Sample Count (DPM)</b>
<b>Lab Hood</b>	1	354	4.6
	2	383	49.2
	3	362	16.9
	4	373	33.8
	5	406	84.6
	6	341	0.0
	7	369	27.7

**Gamma Contamination Survey Results:** All samples less than 200dpm/100cm<sup>2</sup>

END OF COUNTING  
COUNTING

470, program 3.4

ASSAY

28-May-2013 15:31:27

protocol id 99 WIPES  
time limit 60  
count limit 99999999  
isotope Open  
protocol date 06-Aug-2008 12:10:01  
run id. 10

POS	RACK	DET	BATCH	TIME	COUNTS	CPM	ERROR %
1	1	1	1	60	74935	75139.6	0.37 - Stable
2	1	1	2	60	351	0.0	45.49 - Background

16	2	1	16	60	354	0.0	48.86
17	2	1	17	60	383	0.0	158.09
18	2	1	18	60	362	0.0	60.71
19	2	1	19	60	373	0.0	90.11
20	2	1	20	60	406	9.4	234.35
21	3	1	21	60	341	0.0	36.87
22	3	1	22	60	369	0.0	76.71

} Hood

END OF ASSAY

END OF COUNTING

PROTOCOL : 0 Easy Count  
DATE : 2013/05/29  
TIME : 09:54  
ID : F00AS029

Wallac 1400 DSA ver 2.50 S/N 4090949  
Counting mode : DFM  
Quench index : SOP(E)  
Isotope(s) : H3,C14  
H3 = ,12.43 y  
C14 = ,5730.00 y  
Protocol name : Easy Count  
Counting time : 60  
Repeats : 1  
Cycles : 1  
Replicates : 1  
2 sigma % : 0.01  
Minimum cpm : 0.00 Checking time: 10  
Sp. library of isotope H3 : Wallac  
Sp. library of isotope C14 : Wallac  
Vial type : Clear  
Liquid system : HiSafe  
Output to Printer :  
FDS,CTIME,SQPE,DFM1,DFM2,COL,VOL,FNCT1,SAGUM,CLMM  
Additions to Printer : Listing,Header  
Spectrum : Beta  
FNCT1 = EFF : (EFF1+EFF2)

DATE : 11/11/87  
 ID : F00AS029

Wallac 1400 DSA ver 2.50 S/N 4090949  
 Counting mode : DPM  
 Quench index : SQP(E)  
 Isotope(s) : H3,C14  
 H3 = ,12.43 y  
 C14 = ,5730.00 y  
 Protocol name : Easy Count  
 Counting time : 60  
 Repeats : 1  
 Cycles : 1  
 Replicates : 1  
 2 sigma % : 0.01  
 Minimum cpm : 0.00 Checking time: 10  
 Sp. library of isotope H3 : Wallac  
 Sp. library of isotope C14 : Wallac  
 Vial type : Clear  
 Liquid system : HiSafe  
 Output to Printer :  
 POS,CTIME,SQPE,DFM1,DFM2,COL,VOL,FNCT1,SAQUM,CLM2M  
 Additions to Printer : Listing,Header  
 Spectrum : Beta  
 FNCT1 = EFF : (EFF1+EFF2)

Unknown samples:

Pos	CTime	SQPE	H3_DPM	C14_DPM	Color	Volume	EFF	SAQUM	CLM2M	
1	60	829.56	261597.5	0.0	1.05	736.55	49.97	98	0.0	- H3 Standard
2	60	844.40	0.0	99759.6	1.05	752.57	94.93	96	0.0	- C14 Standard
3	60	844.95	0.0	31.8	1.05	754.01	94.98	55	0.0	- Blank
4	60	800.89	0.0	23.8	1.08	706.05	92.87	46	0.0	- Background

Pos	CTime	SQPE	H3 DPM	C14 DPM	Color	Volume	EFF	SAQUM	CLM2M	
18	60	794.73	0.0	26.1	1.12	695.09	92.40	55	0.0	} Hood
19	60	793.04	0.0	21.8	1.10	691.48	92.41	44	0.0	
20	60	792.80	0.0	28.4	1.17	692.06	92.04	55	0.0	
21	60	787.77	0.0	24.1	1.13	689.26	92.04	49	0.0	
22	61	791.68	0.0	73.4	1.11	687.85	92.30	68	0.0	
23	60	790.47	0.0	20.8	1.12	691.65	92.18	49	0.0	
24	60	791.98	0.0	26.1	1.11	693.05	92.33	46	0.0	



Prior to 5/23/2013 these cabinets below the hood were the storage areas for Na-22



**Hood cabinet readings:**

**Left side cabinet in image:**

Location:	GM reading:
Wipe 1 wall, ceiling of cabinet:	0.02 mR/hr
Wipe 2, walls of cabinet:	0.02 mR/hr
Wipe 3, cabinet floor:	0.02 mR/hr
Wipe 4, cabinet floor:	0.02 mR/hr
Wipe 5, cabinet floor:	0.02 mR/hr
Wipe 6, cabinet floor:	0.02 mR/hr

**Right side cabinet in image:**

Location:	GM reading:
Wipe 1 wall, ceiling of cabinet:	0.02 mR/hr
Wipe 2, walls of cabinet, shelf:	0.02 mR/hr
Wipe 3, cabinet floor:	0.02 mR/hr
Wipe 4, cabinet floor:	0.02 mR/hr
Wipe 5, cabinet floor:	0.02 mR/hr
Wipe 6, cabinet floor:	0.02 mR/hr

**Gamma Counter DPM Calculation Spreadsheet:**

<b>Counter % Efficiency:</b>	0.65
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<b>Standard Used:</b>	I-129
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<b>Background Count (CPM):</b>	353
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<b>Sample Area</b>	<b>Sample Number</b>	<b>Sample Count (CPM)</b>	<b>Sample Count (DPM)</b>
<b>Bottom Left Hood cabinet</b>	1	335	0.0
	2	389	55.4
	3	392	60.0
	4	346	0.0
	5	370	26.2
	6	362	13.8
<b>Bottom Right Hood cabinet</b>	1	345	0.0
	2	367	21.5
	3	346	0.0
	4	367	21.5
	5	361	12.3
	6	400	72.3

**Gamma Contamination Survey Results:** All samples less than 200dpm/100cm<sup>2</sup>

COUNTING

470, program 3.4

SSAY

28-May-2013 11:58:48

rotocol id 99 WIPES  
ime limit 60  
ount limit 99999999  
sotope Open  
rotocol date 06-Aug-2008 12:10:01  
un id. 9

POS	RACK	DET	BATCH	TIME	COUNTS	CPM	ERROR %	
1	1	1	1	60	75347	75558.4	0.37	- Standard
2	1	1	2	60	353	0.0	47.69	- Background
6	1	1	6	60	335	0.0	33.04	Hood bottom left cabinets
7	1	1	7	60	389	0.0	284.73	
8	1	1	8	60	392	0.0	471.94	
9	1	1	9	60	346	0.0	40.76	
10	1	1	10	60	370	0.0	79.69	Hood bottom right cabinets
11	2	1	11	60	362	0.0	60.71	
12	2	1	12	60	345	0.0	39.92	
13	2	1	13	60	367	0.0	71.37	
14	2	1	14	60	346	0.0	40.76	
15	2	1	15	60	367	0.0	71.37	
16	2	1	16	60	361	0.0	58.94	
17	2	1	17	60	400	3.4	643.89	

PROTOCOL : 0 Easy Count  
 DATE : 2013/05/28  
 TIME : 15:04  
 ID : 00000000

Model: 1000 DSA ver 2.30 SW: 1000000  
 Counting mode : OFF  
 Quench index : 0.000  
 Temperature : 40.000  
 PC : 0.000  
 TSS : 0.000  
 Protocol name : Easy Count  
 Counting time : 0.0  
 Repeats : 1  
 Cycles : 1  
 Replicates : 1  
 2 sigma ? : 0.00  
 Window top : 1.00 (matching time 0.0)  
 Sp. library for isotope 03 : Waller  
 Sp. library for isotope 04 : Waller  
 Vial type : Clear  
 Liquid system : HiSafe  
 Output to Printer :  
 (05,07,08,09,0E,0F,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30)  
 Additional to Printer : Listing, Header  
 Spectrum : Beta  
 FACTS EFF : (EFF:MGFF2)

Unknown samples:

Pos	ETime	SOPE	HI_DPM	014_DPM	Color	Volume	EFF	SOPE	CLIST
1	60	825.95	2471.79	0.0	1.05	736.72	95.24	92	0.0
2	60	843.71	0.0	99674.6	1.05	751.28	94.92	9	0.0
3	60	845.23	0.0	24.4	1.05	734.67	94.45	50	0.0
4	60	850.56	0.0	30.4	1.05	704.53	93.54	52	0.0
5	60	792.41	0.0	17.1	1.11	693.58	92.25	60	0.0
6	60	793.81	0.0	37.6	1.12	697.87	92.17	69	0.0
7	60	790.86	0.0	23.1	1.10	693.93	92.28	77	0.0
8	60	793.28	0.0	19.7	1.14	692.12	92.12	51	0.0
9	60	794.53	0.0	25.4	1.11	691.29	92.46	64	0.0
10	60	782.94	0.0	18.1	1.14	679.94	91.73	30	0.0
11	60	791.05	0.0	21.9	1.12	692.35	92.20	34	0.0
12	60	790.68	0.0	27.3	1.11	692.47	92.24	32	0.0
13	60	790.17	0.0	25.1	1.11	692.53	92.23	31	0.0
14	60	790.56	0.0	15.0	1.17	692.06	92.15	43	0.0
15	60	791.99	0.0	26.2	1.14	695.85	92.19	40	0.0
16	60	792.32	0.0	46.8	1.12	698.34	92.29	43	0.0

- to sound  
 - Cry standard  
 - Blank  
 - Background

Head Bottom left cabinet

Head Bottom right cabinet

# Na-22 Decommissioning documents for the workstation of a laboratory that was used for Na-22 experiments

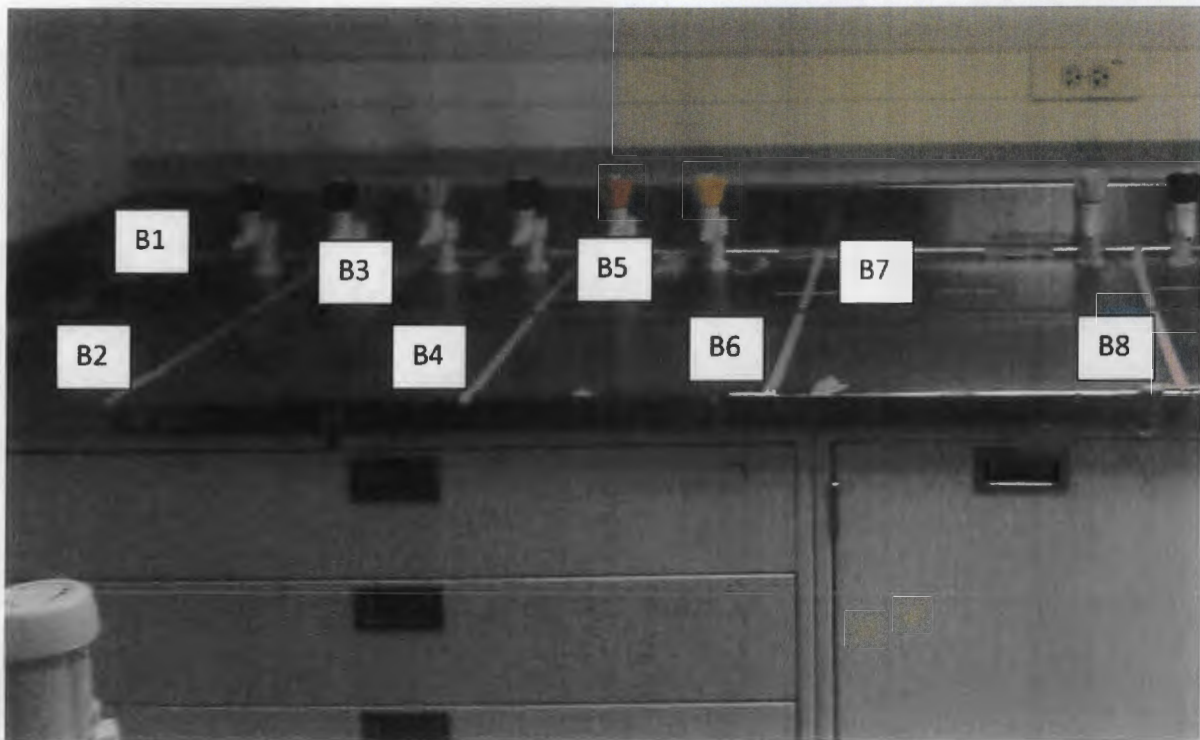
All wipes and test results were less than 200 dpm/100 cm<sup>2</sup>, all GM readings were found to be at background levels

Meter Used: Ludlum 3      Serial Number: 81198

Calibration Due: 11/1/2013

Background: 0.02 mR/hr

Prior to 5/23/2013 this was the workstation/area for Na-22



Readings:

Location:	GM reading:
Location 1:	0.02 mR/hr
Location 2:	0.02 mR/hr
Location 3:	0.02 mR/hr
Location 4:	0.02 mR/hr
Location 5:	0.02 mR/hr
Location 6:	0.02 mR/hr
Location 7:	0.02 mR/hr
Location 8:	0.02 mR/hr

**Gamma Counter DPM Calculation Spreadsheet:**

<b>Counter % Efficiency:</b>	0.65
------------------------------	------

<b>Standard Used:</b>	I-129
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<b>Background Count (CPM):</b>	387
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<b>Sample Area</b>	<b>Sample Number</b>	<b>Sample Count (CPM)</b>	<b>Sample Count (DPM)</b>
<b>Bench/workspace</b>	1	341	0.0
	2	369	0.0
	3	368	0.0
	4	400	20.0
	5	354	0.0
	6	379	0.0
	7	392	7.7
	8	381	0.0

**Gamma Contamination Survey Results:** All samples less than 200dpm/100cm<sup>2</sup>

PROTOCOL : 0 Easy Count  
 DATE : 2013/05/23  
 TIME : 08:54  
 ID : P00A8021

Wallac 1400 DSA ver 2.50 S/N 4090749

Counting mode : DPM  
 Quench index : SEP(E)  
 Isotope(s) : H3,C14  
 H3 = ,12.43 y  
 C14 = ,5730.00 y  
 Protocol name : Easy Count  
 Counting time : 60  
 Repeats : 1  
 Cycles : 1  
 Replicates : 1  
 2 sigma % : 0.01  
 Minimum cps : 0.00 Checking times: 10  
 Sp. library of isotope H3 : Wallac  
 Sp. library of isotope C14 : Wallac  
 Vial type : Clear  
 Liquid system : HiSafe  
 Output to Printer :  
 POS,CTIME,SEPF,DFM1,DFM2,COL,VOL,FMCT1,SAMM1,CLM1  
 Additions to Printer : Listing,Header  
 Spectrum : Beta  
 FMCT1 = EFF : (EFF1+EFF2)

Unknown samples:

Pos	CTime	SEPF	H3_DPM	C14_DPM	Color	Volume	EFF	SAMM1	CLM1	
1	60	829.08	262779.7	0.0	1.05	735.84	92.82	98	0.0	- H <sub>3</sub> Standard
2	61	843.58	0.0	100036.0	1.05	751.98	94.91	97	0.0	- C14 Standard
3	60	845.00	0.0	31.8	1.05	752.99	94.97	64	0.0	- Blank
4	60	800.75	0.0	29.3	1.08	705.19	92.86	32	0.0	- Background
5	60	793.48	0.0	39.2	1.09	693.69	92.47	61	0.0	- Bench / table #1
6	61	772.46	0.0	18.2	1.10	694.63	92.36	49	0.0	- 2
7	60	791.25	0.0	18.5	1.10	693.61	92.31	50	0.0	- 3
8	60	791.93	0.0	24.0	1.14	655.38	92.15	47	0.0	- 4
9	60	789.93	0.0	21.6	1.10	691.83	92.23	37	0.0	- 5
10	60	789.44	0.0	28.4	1.14	652.47	92.08	50	0.0	- 6
11	60	789.63	0.0	43.3	1.11	692.41	92.22	50	0.0	- 7
12	60	791.88	0.0	27.3	1.14	694.74	92.17	51	0.0	- 8



COUNTING

470, program 3.4

SSAY

22-May-2013 15:20:39

rotocol id 99 WIPES  
ime limit 60  
ount limit 99999999  
sotope Open  
rotocol date 06-Aug-2008 12:10:01  
un id. 5

POS	RACK	DET	BATCH	TIME	COUNTS	CPM	ERROR %
1	1	1	1	60	75413	75625.5	0.37 - <i>B Standard</i>
2	1	1	2	60	387	0.0	224.93 - <i>Background</i>
3	1	1	3	60	341	0.0	36.87 - <i>Background</i>
4	1	1	4	60	369	0.0	76.71 - <i>2</i>
5	1	1	5	60	368	0.0	73.95 - <i>3</i>
6	1	1	6	60	400	3.4	643.89 - <i>4</i>
7	1	1	7	60	354	0.0	48.86 - <i>5</i>
8	1	1	8	60	379	0.0	121.63 - <i>6</i>
9	1	1	9	60	392	0.0	471.94 - <i>7</i>
10	1	1	10	60	381	0.0	137.53 - <i>8</i>

## Na-22 Decommissioning documents for the waste storage area of a laboratory that was used for Na-22 experiments

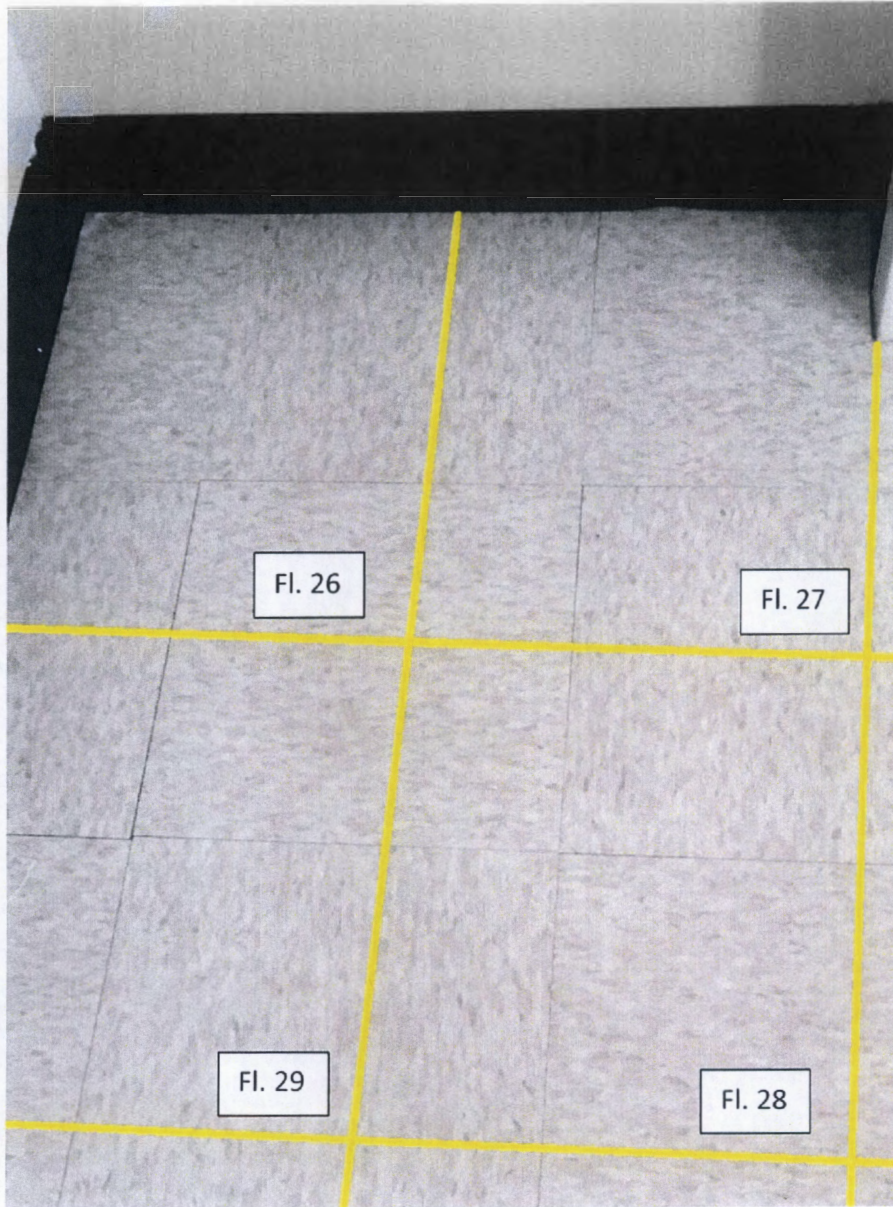
All wipes and test results were less than 200 dpm/100 cm<sup>2</sup>, all GM readings were found to be at background levels

Meter Used: Ludlum 3      Serial Number: 81198

Calibration Due: 11/1/2013

Background: 0.02 mR/hr

Prior to 5/23/2013 this was the waste storage area for Na-22



**Readings:**

Location:	GM reading:
Location FI. 26:	0.02 mR/hr
Location FI. 27:	0.02 mR/hr
Location FI. 28:	0.02 mR/hr
Location FI. 29:	0.02 mR/hr

**Gamma Counter DPM Calculation Spreadsheet:**

<b>Counter % Efficiency:</b>	0.65
------------------------------	------

<b>Standard Used:</b>	I-129
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<b>Background Count (CPM):</b>	387
--------------------------------	-----

<b>Sample Area</b>	<b>Sample Number</b>	<b>Sample Count (CPM)</b>	<b>Sample Count (DPM)</b>
Floor, waste area	F26	341	0.0
	F27	369	0.0
	F28	368	0.0
	F29	400	20.0

**Gamma Contamination Survey Results:** All samples less than 200dpm/100cm<sup>2</sup>

Parameters used : 0.00 checking times 10  
 Sp. library of isotope H3 : Wallac  
 Sp. library of isotope C14 : Wallac  
 Vial type : Clear  
 Liquid system : HiSafe  
 Output to Printer :  
 POS,CTIME,SOPE,DPH1,DPH2,COL,VOL,FUNCT1,SACUM,CLTIM  
 Additions to Printer : Listing,Header  
 Spectrum : Beta  
 FUNCT1 = EFF : (EFF1+EFF2)

Unknown samples:

Pos	CTime	SOPE	H3_DPH1	C14_DPH1	Color	Volume	EFF	SaCum	CLTIM	
1	60	828.46	263127.3	0.0	1.05	736.06	99.62	98	0.0	- H <sub>3</sub> standard
2	60	843.41	0.0	99295.1	1.05	751.55	94.89	97	0.0	- C14 standard
3	60	874.72	0.0	28.6	1.03	751.92	94.96	54	0.0	- blank
4	60	893.09	0.0	25.3	1.08	704.67	92.81	58	0.0	- Background

30	60	798.80	0.0	38.2	1.13	690.60	92.05	34	0.0	#26 floor
31	60	799.31	0.0	12.0	1.13	690.24	92.07	33	0.0	#27
32	60	789.34	0.0	21.9	1.11	692.30	92.17	41	0.0	#28
33	60	788.46	0.0	26.2	1.13	691.60	92.04	46	0.0	#29

COUNTING  
END OF COUNTING

COUNTING

470, program 3.4

SSAY 22-May-2013 10:55:28

rotocol id 99 WIPES  
time limit 60  
count limit 99999999  
isotope Open  
rotocol date 06-Aug-2008 12:10:01  
run id. 3

POS	RACK	DET	BATCH	TIME	COUNTS	CPM	ERROR %
1	1	1	1	60	75567	75781.9	0.37 - Standard
2	1	1	2	60	359	0.0	55.68 - Bulgina

28	3	1	28	60	375	0.0	98.68 #26 Flour
29	3	1	29	60	336	0.0	33.63 #27
30	3	1	30	60	365	0.0	66.70 #28
31	4	1	31	60	358	0.0	54.17 #29

Na-22 Decommissioning documents for the  
storage area of a laboratory that was used for  
Na-22 experiments

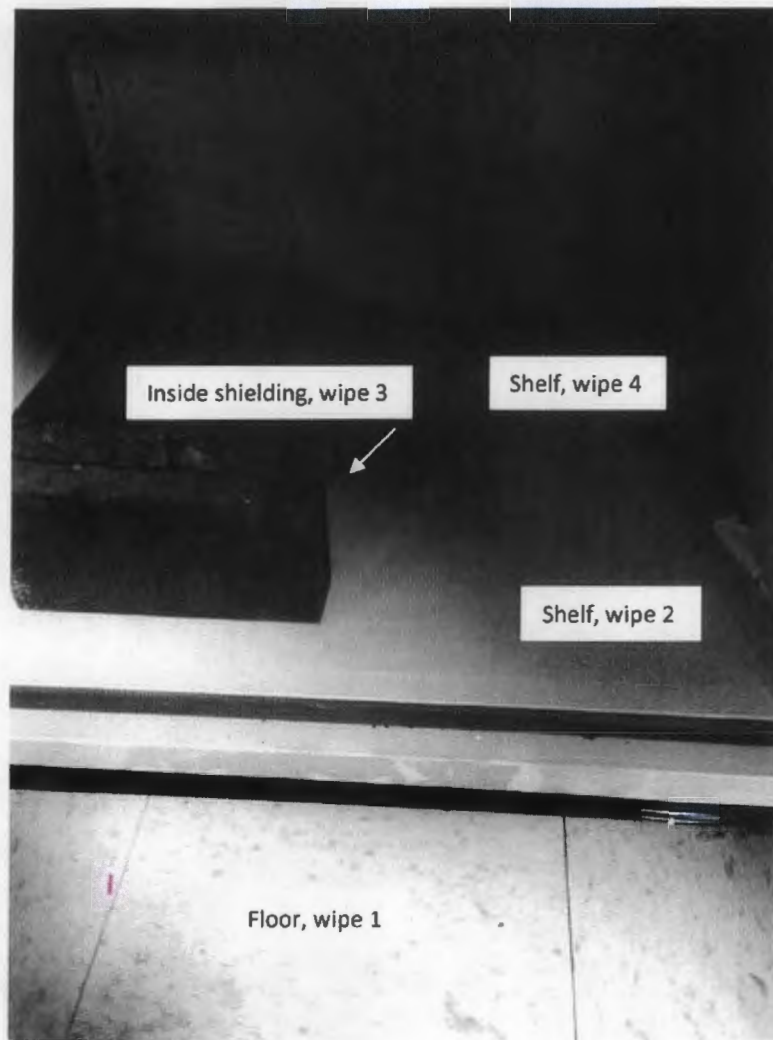
All wipes and test results were less than 200 dpm/100 cm<sup>2</sup>, all GM readings were found to be at background levels

Meter Used: Ludlum 3      Serial Number: 86845

Calibration Due: 6/26/2014

Background: 0.02 mR/hr

This area was a former storage area for Na-22



**Results:**

Floor, wipe area 1: 0.02 mR/hr

Shelf, wipe area 2: 0.02 mR/hr

Inside shielding, wipe area 3: 0.02 mR/hr

Shelf, wipe area 4: 0.02 mR/hr



**Gamma Counter DPM Calculation Spreadsheet:**

**Counter % Efficiency:** 0.65

**Standard Used:** I-129

**Background Count (CPM):** 415

Sample Area	Sample Number	Sample Count (CPM)	Sample Count (DPM)
Floor	1	369	0.0
Shelf	2	384	0.0
Inside Shielding	3	377	0.0
Shelf	4	353	0.0

**Gamma Contamination Survey Results:** All samples less than 200dpm/100cm<sup>2</sup>

COUNTING

1470, program 3.4

ASSAY

14-May-2014 14:57:34

Protocol id 99 WIPES  
Time limit 60  
Count limit 99999999  
Isotope Open  
Protocol date 06-Aug-2008 12:10:01  
Run id. 37

POS	RACK	DET	BATCH	TIME	COUNTS	CPM	ERROR %	
1	1	1	1	60	75044	75280.5	0.37	<i>Background Standard</i>
2	1	1	2	60	415	48.4	45.66	<i>Background</i>
3	1	1	3	60	369	2.4	876.28	<i>#1 Flour</i>
4	1	1	4	60	384	17.4	122.90	<i>#2 shelf</i>
5	1	1	5	60	377	10.4	204.04	<i>#3 Inside shielding</i>
6	1	1	6	60	353	0.0	151.81	<i>#4 shelf</i>

END OF ASSAY

END OF COUNTING

Protocol# 1 - 3H-UG DPM INIT.lsa

User: DATA

**Assay Definition**

## Assay Description:

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140514\_1504  
Raw Results Path: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140514\_1504\20140514\_1504.results  
Comma-Delimited File Name: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140514\_1504\Report1.txt  
Assay File Name: C:\Packard\TriCarb\Assays\3H-UG DPM INIT.lsa

**Count Conditions**

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

**Background Subtract**

Background Subtract: On - Manual  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

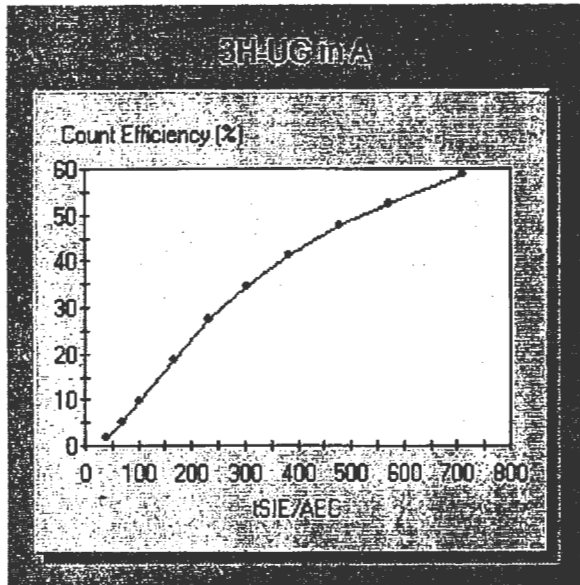
Regions	LL	UL	Bkg Subtract
A	0.0	2000.0	0.00
B	0.0	2000.0	0.00
C	0.0	18.6	0.00

**Count Corrections**

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

Cycle 1 Results

**Quench Curve Block Data**



Date Acquired: 06/14/2013  
 Date Modified:  
 3H-UG in A

tSIE/AEC	Count Efficiency (%)
708.90	58.71
571.72	52.35
479.11	47.61
385.02	41.31
304.05	34.68
232.38	27.42
164.76	18.66
102.75	9.86
67.58	5.03
40.23	1.85

S#	Count Time	CPMA	DPML	SIS	tSIE	MESSAGES
1	1.00	23	38	1312.34	760.24	E - Background
2	1.00	32	55	1070.94	688.62	- #1 Floor
3	1.00	15	26	1502.49	679.50	- #2 Shelf
4	1.00	36	62	1178.63	703.74	- #3 Inside shielding
5	1.00	32	56	1197.48	686.14	- #4 Shelf

Na-22 Decommissioning documents for the  
workstation area of a laboratory that was used  
for Na-22 experiments

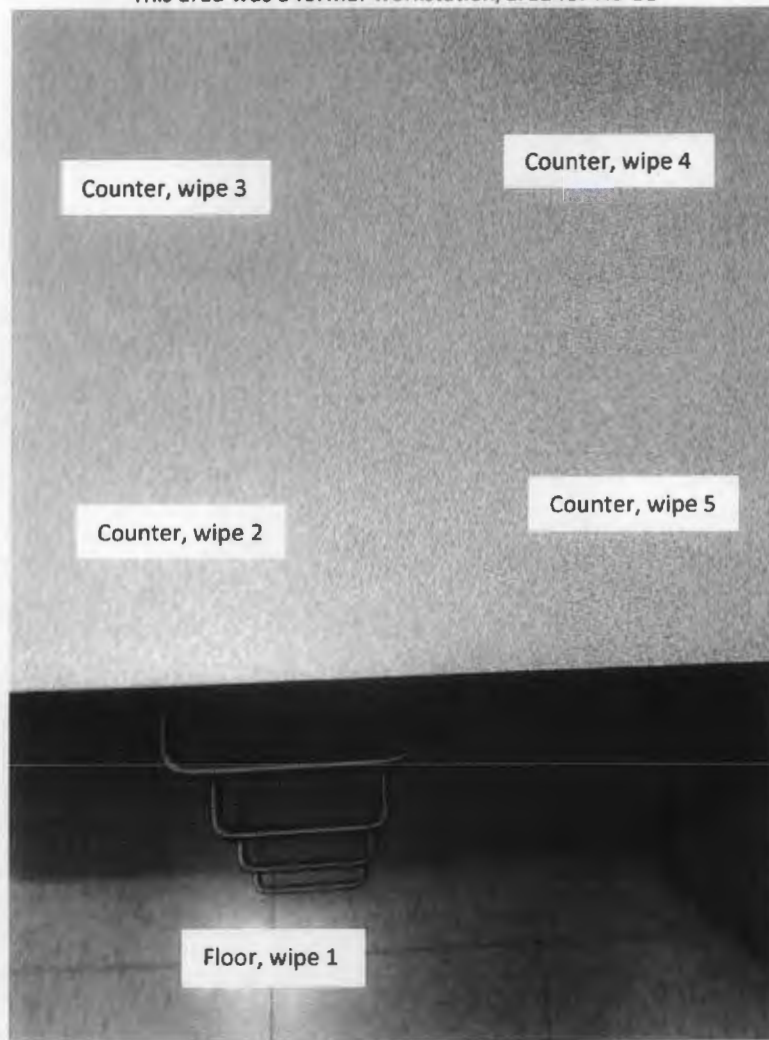
All wipes and test results were less than 200 dpm/100 cm<sup>2</sup>, all GM readings were found to be at background levels

Meter Used: Ludlum 3      Serial Number: 229328

Calibration Due: 6/5/2014

Background: 0.02 mR/hr

This area was a former workstation/area for Na-22



Background in room: 0.02 mR/hr

Meter: Ludlum 3, # 229328

Calibration Due: 6/5/2014

**Results:**

Floor, wipe area 1: 0.02 mR/hr

Counter, wipe area 2: 0.02 mR/hr

Counter, wipe area 3: 0.02 mR/hr

Counter, wipe area 4: 0.02 mR/hr

Counter, wipe area 5: 0.02 mR/hr

**Gamma Counter DPM Calculation Spreadsheet:**

<b>Counter % Efficiency:</b>	0.65
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<b>Standard Used:</b>	I-129
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<b>Background Count (CPM):</b>	372
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<b>Sample Area</b>	<b>Sample Number</b>	<b>Sample Count (CPM)</b>	<b>Sample Count (DPM)</b>
Floor	1	325	0.0
Counter	2	386	21.5
Counter	3	374	3.1
Counter	4	367	0.0
Counter	5	330	0.0

**Gamma Contamination Survey Results:** All samples less than 200dpm/100cm<sup>2</sup>

COUNTING

1470, program 3.4

ASSAY

14-May-2014 12:14:39

Protocol id 99 WIPES  
Time limit 60  
Count limit 99999999  
Isotope Open  
Protocol date 06-Aug-2008 12:10:01  
Run id. 35

POS	RACK	DET	BATCH	TIME	COUNTS	CPM	ERROR %
1	1	1	1	60	75337	75578.3	0.37 - Standard
2	1	1	2	60	372	5.4	390.77 - Background
3	1	1	3	60	325	0.0	47.97 - #1 - Floor
4	1	1	4	60	386	19.4	110.47 - #2 - Corridor
5	1	1	5	60	374	7.4	285.80 - #3 - Counter
6	1	1	6	60	367	0.4	5245.85 - #4 - Counter
7	1	1	7	60	330	0.0	54.87 - #5 - Counter

END OF ASSAY

END OF COUNTING



Protocol# 1 - 3H-UG DPM INIT.lsa

User: DATA

**Assay Definition**

## Assay Description:

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140514\_1237  
Raw Results Path: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140514\_1237\20140514\_1237.results  
Comma-Delimited File Name: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140514\_1237\Report1.txt  
Assay File Name: C:\Packard\TriCarb\Assays\3H-UG DPM INIT.lsa

**Count Conditions**

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

**Background Subtract**

Background Subtract: On - Manual  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

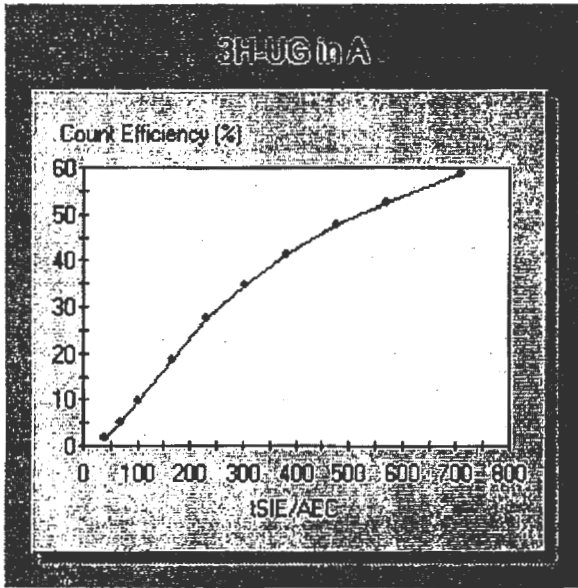
Regions	LL	UL	Bkg Subtract
A	0.0	2000.0	0.00
B	0.0	2000.0	0.00
C	0.0	18.6	0.00

**Count Corrections**

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

Cycle 1 Results

**Quench Curve Block Data**



Date Acquired: 06/14/2013  
 Date Modified:  
 3H-UG in A

tSIE/AEC	Count Efficiency (%)
708.90	58.71
571.72	52.35
479.11	47.61
385.02	41.31
304.05	34.68
232.38	27.42
164.76	18.66
102.75	9.86
67.58	5.03
40.23	1.85

S#	Count Time	CPMA	DPMI	SIS	tSIE	MESSAGES
1	1.00	36	59	1581.66	751.67	E - Background
2	1.00	41	70	1142.28	714.91	E - Floor - #1
3	1.00	24	41	1078.96	696.63	- counter - #2
4	1.00	33	56	1150.43	716.97	E - counter - #3
5	1.00	27	46	1281.91	721.94	E - counter - #4
6	1.00	30	51	917.51	706.65	- counter - #5

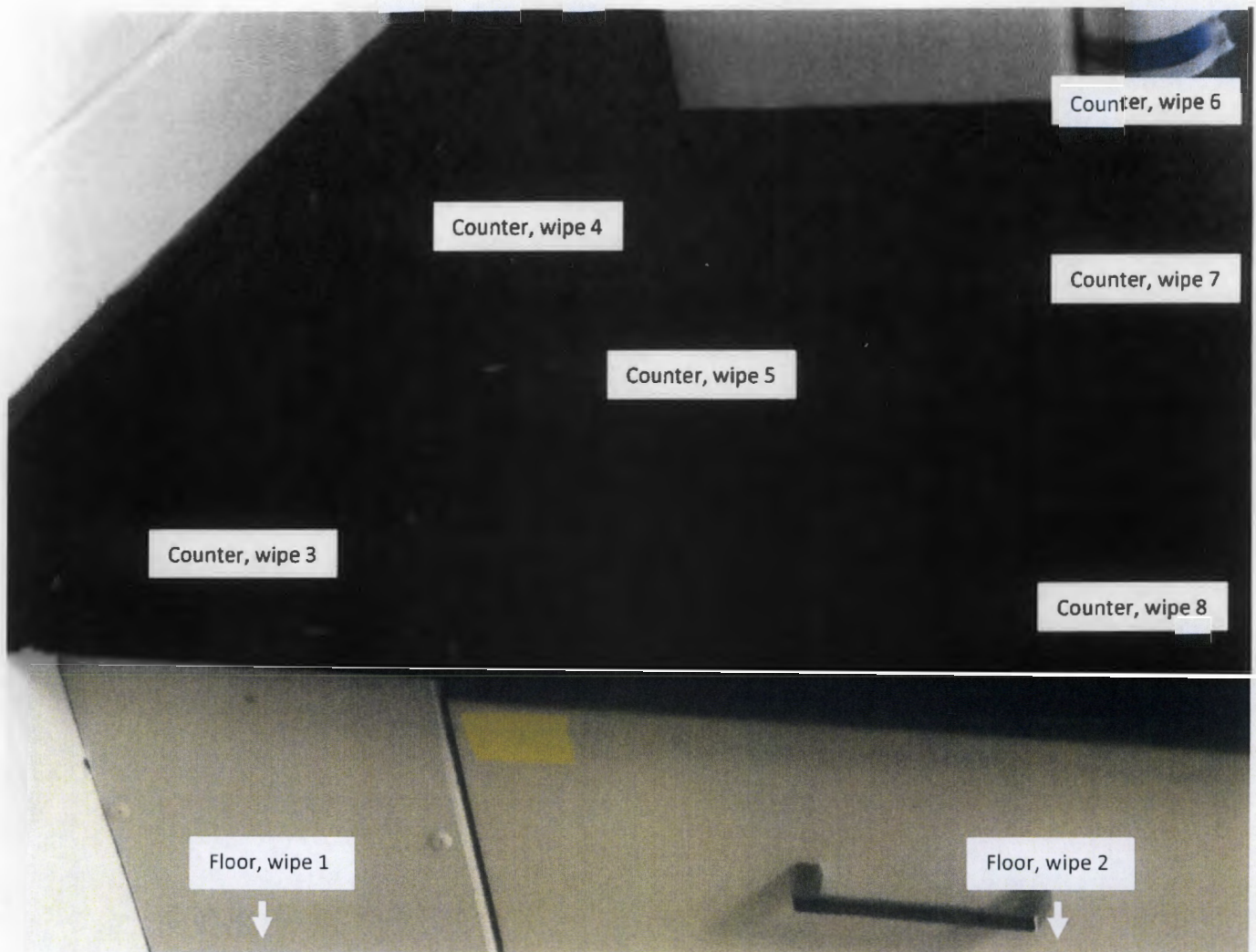
## Na-22 Decommissioning documents for the workstation area of a laboratory that was used for Na-22 experiments

All wipes and test results were less than 200 dpm/100 cm<sup>2</sup>, all GM readings were found to be at background levels

Meter Used: Ludlum 3      Serial Number: 191532

Calibration Due: 10/16/2014

Background: 0.02 mR/hr



**Results:**

Floor, wipe area 1: 0.02 mR/hr

Floor, wipe area 2: 0.02 mR/hr

Counter, wipe area 3: 0.02 mR/hr

Counter, wipe area 4: 0.02 mR/hr

Counter, wipe area 5: 0.02 mR/hr

Counter, wipe area 6: 0.02 mR/hr

Counter, wipe area 7: 0.02 mR/hr

Counter, wipe area 8: 0.02 mR/hr

**Gamma Counter DPM Calculation Spreadsheet:**

<b>Counter % Efficiency:</b>	0.65
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<b>Standard Used:</b>	I-129
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<b>Background Count (CPM):</b>	364
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Sample Area	Sample Number	Sample Count (CPM)	Sample Count (DPM)
	1	388	36.9
	2	394	46.2
	3	353	0.0
	4	348	0.0
	5	389	38.5
	6	358	0.0
	7	371	10.8
	8	384	30.8

**Gamma Contamination Survey Results:** All samples less than 200dpm/100cm<sup>2</sup>

COUNTING

1470, program 3.4

ASSAY

08-May-2014 15:50:32

Protocol id 99 WIPES  
Time limit 60  
Count limit 99999999  
Isotope Open  
Protocol date 06-Aug-2008 12:10:01  
Run id. 30

POS	RACK	DET	BATCH	TIME	COUNTS	CPM	ERROR %
1	1	1	1	60	74703	74934.0	0.37 - <i>Standard</i>
2	1	1	2	60	364	0.0	804.28 - <i>Background</i>
3	1	1	3	60	388	21.4	100.36 - <i>wipe 1</i>
4	1	1	4	60	394	27.4	78.89 - <i>wipe 2</i>
5	1	1	5	60	353	0.0	151.81 - <i>wipe 3</i>
6	1	1	6	60	348	0.0	110.35 - <i>wipe 4</i>
7	1	1	7	60	389	22.4	95.99 - <i>wipe 5</i>
8	1	1	8	60	358	0.0	241.48 - <i>wipe 6</i>
9	1	1	9	60	371	4.4	479.05 - <i>wipe 7</i>
10	1	1	10	60	384	17.4	122.90 - <i>wipe 8</i>

END OF ASSAY

END OF COUNTING

Assay Definition

Assay Description:

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140509\_0914  
Raw Results Path: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140509\_0914\20140509\_0914.results  
Comma-Delimited File Name: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140509\_0914\Report1.txt  
Assay File Name: C:\Packard\TriCarb\Assays\3H-UG DPM INIT.lsa

Count Conditions

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

Background Subtract

Background Subtract: On - Manual  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

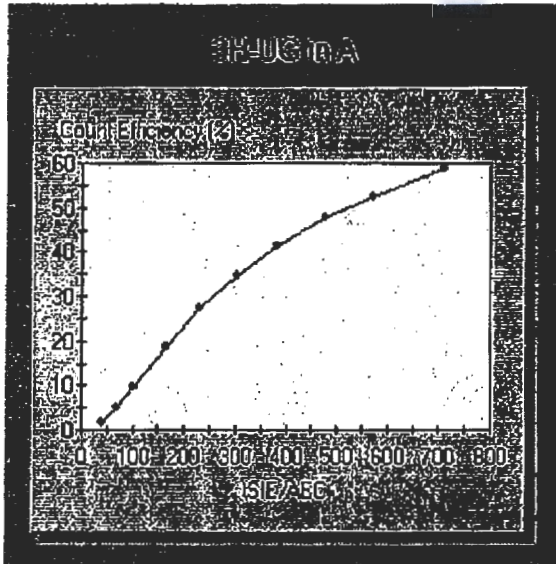
Regions	LL	UL	Bkg Subtract
A	0.0	2000.0	0.00
B	0.0	2000.0	0.00
C	0.0	18.6	0.00

Count Corrections

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

Cycle 1 Results

Quench Curve Block Data



Date Acquired: 06/14/2013  
 Date Modified:  
 3H-UG in A

tSIE/AEC	Count Efficiency (%)
708.90	58.71
571.72	52.35
479.11	47.61
385.02	41.31
304.05	34.68
232.38	27.42
164.76	18.66
102.75	9.86
67.58	5.03
40.23	1.85

S#	Count Time	CPMA	DFMI	SIS	tSIE	MESSAGES
1	1.00	31	51	1269.18	759.04	E-Background
2	1.00	38	66	1171.73	676.02	- wipe # 1
3	1.00	30	53	1681.95	670.81	- wipe # 2 } Floor
4	1.00	30	52	1092.00	697.47	- wipe # 3
5	1.00	35	61	941.90	678.06	- wipe # 4
6	1.00	35	61	1115.04	674.37	- wipe # 5
7	1.00	32	56	1356.20	677.83	wipe # 6
8	1.00	30	52	1061.32	678.06	wipe # 7
9	1.00	25	44	979.32	672.90	wipe # 8



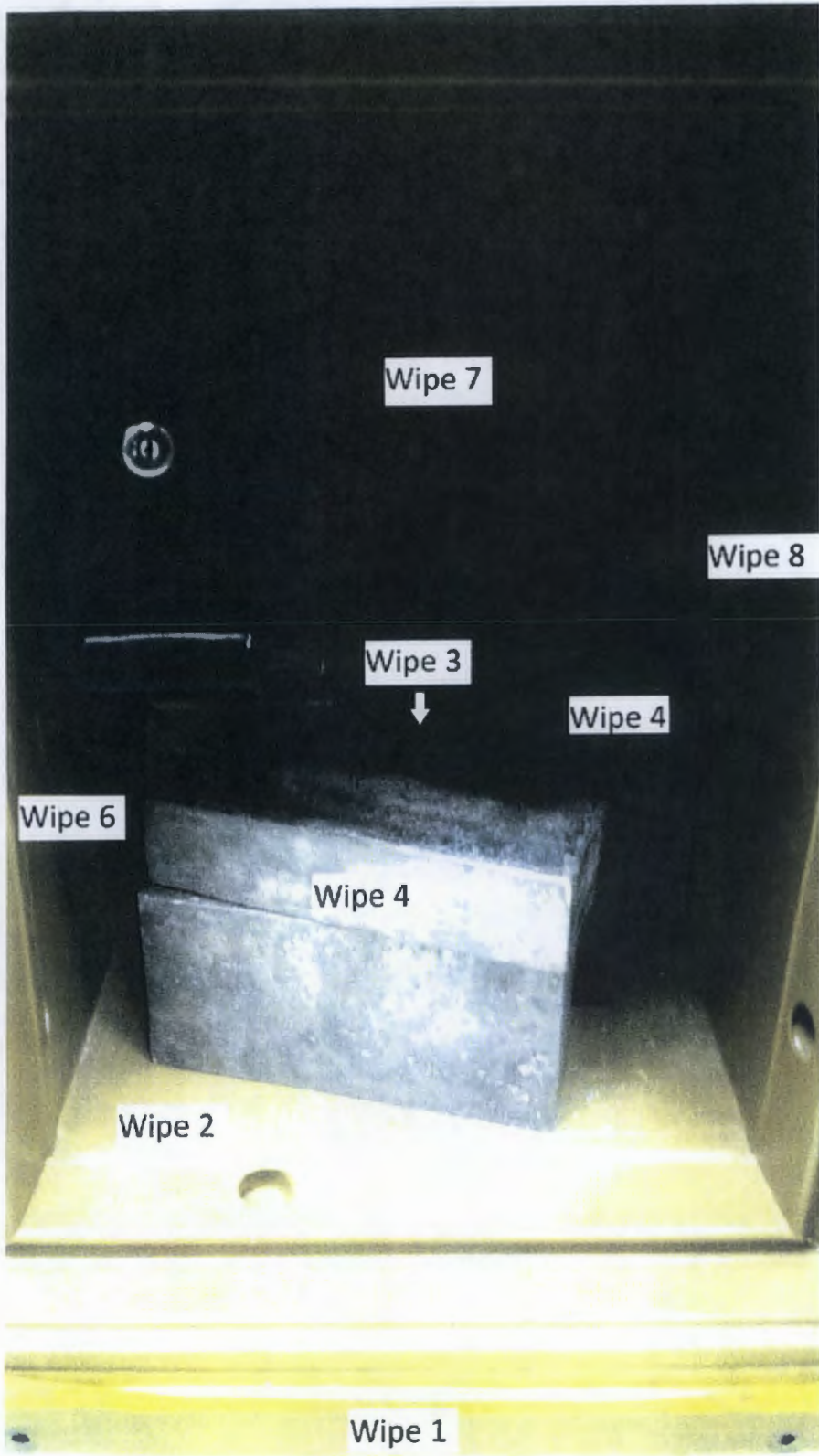
Na-22 Decommissioning documents for the  
storage area of a laboratory that was used for  
Na-22 experiments

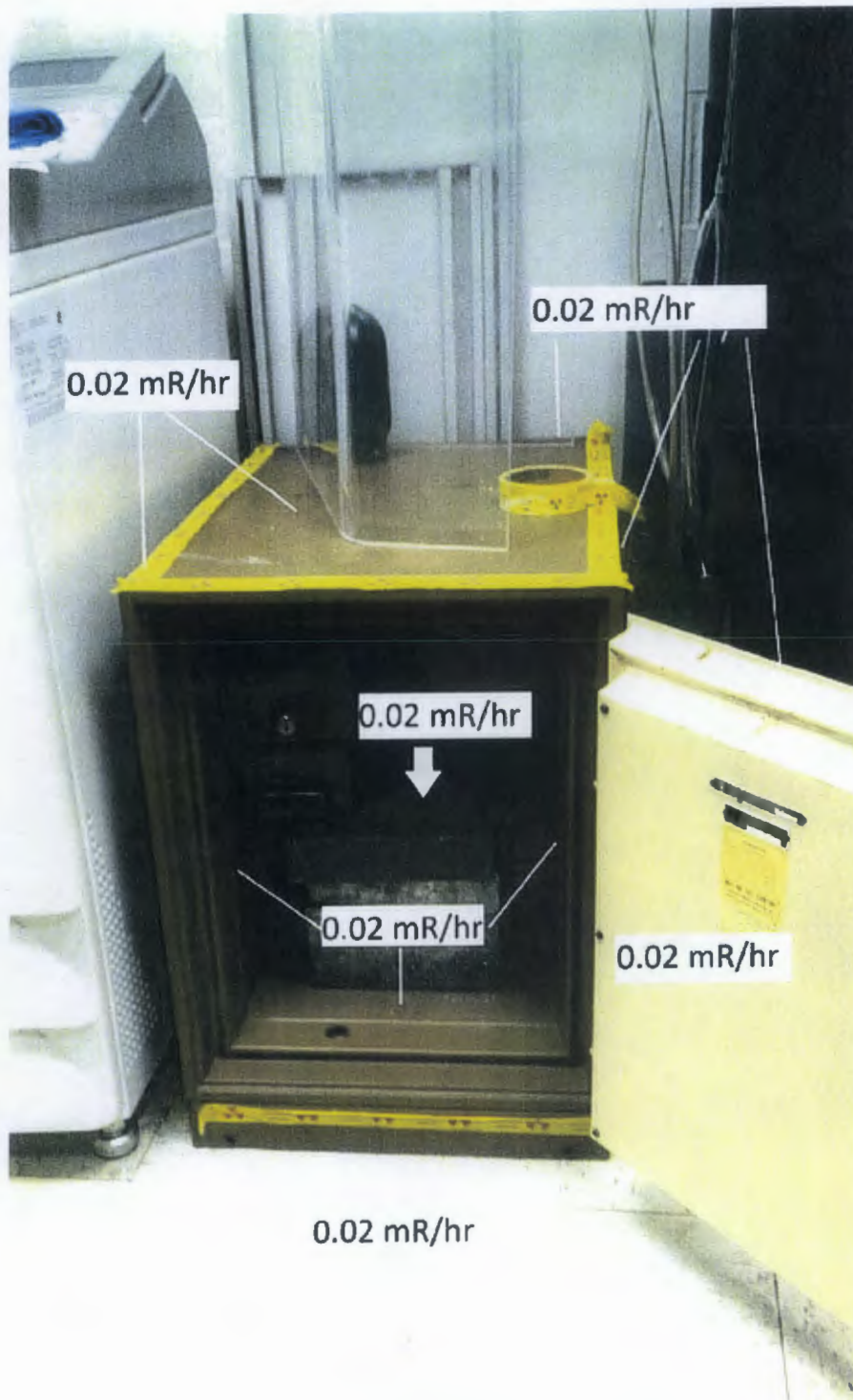
All wipes and test results were less than 200 dpm/100 cm<sup>2</sup>, all GM readings were found to be at background levels

Meter Used: Ludlum 3      Serial Number: 191532

Calibration Due: 10/16/2014

Background: 0.02 mR/hr





0.02 mR/hr

0.02 mR/hr

0.02 mR/hr

0.02 mR/hr

0.02 mR/hr

0.02 mR/hr



Wipe 5

Wipe 5

Wipe 1

Protocol# 1 - 3H-UG DPM INIT.lsa

User: DATA

Assay Definition

## Assay Description:

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140424\_1537  
Raw Results Path: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140424\_1537\20140424\_1537.results  
Comma-Delimited File Name: C:\Packard\Tricarb\Results\DATA\3H-UG DPM INIT\20140424\_1537\Report1.txt  
Assay File Name: C:\Packard\TriCarb\Assays\3H-UG DPM INIT.lsa

Count Conditions

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

Background Subtract

Background Subtract: On - Manual  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

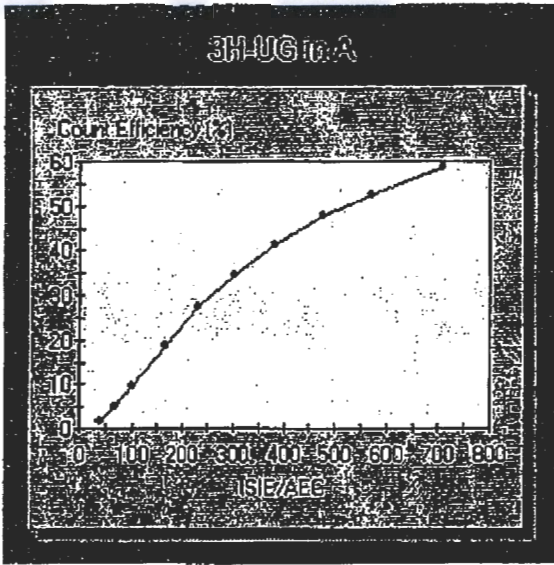
Regions	LL	UL	Bkg Subtract
A	0.0	2000.0	0.00
B	0.0	2000.0	0.00
C	0.0	18.6	0.00

Count Corrections

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

## Cycle 1 Results

Quench Curve Block Data



Date Acquired: 06/14/2013  
 Date Modified:  
 3H-UG in A

tSIE/AEC	Count Efficiency (%)
708.90	58.71
571.72	52.35
479.11	47.61
385.02	41.31
304.05	34.68
232.38	27.42
164.76	18.66
102.75	9.86
67.58	5.03
40.23	1.85

S#	Count Time	CPMA	DPMI	SIS	tSIE	MESSAGES
1	1.00	29	48	1654.98	745.47	E
2	1.00	26	45	1721.67	679.38	
3	1.00	31	55	1068.17	655.12	
4	1.00	35	62	868.37	652.64	
5	1.00	27	48	1394.77	659.90	
6	1.00	32	57	749.53	643.61	
7	1.00	27	47	1506.49	671.29	
8	1.00	32	56	597.47	680.71	
9	1.00	26	45	900.81	693.68	

COUNTING

1470, program 3.4

ASSAY

24-Apr-2014 11:24:06

Protocol id 99 WIPES  
Time limit 60  
Count limit 99999999  
Isotope Open  
Protocol date 06-Aug-2008 12:10:01  
Run id. 23

POS	RACK	DET	BATCH	TIME	COUNTS	CPM	ERROR %
1	1	1	1	60	75217	75456.3	0.37
2	1	1	2	60	354	0.0	164.05
3	1	1	3	60	367	0.4	5245.85
4	1	1	4	60	336	0.0	66.11
5	1	1	5	60	387	20.4	105.17
6	1	1	6	60	358	0.0	241.48
7	1	1	7	60	318	0.0	40.70
8	1	1	8	60	345	0.0	94.69
9	1	1	9	60	354	0.0	164.05
10	1	1	10	60	387	20.4	105.17

END OF ASSAY

END OF COUNTING

**Gamma Counter DPM Calculation Spreadsheet:**

**Counter % Efficiency:** 0.65

**Standard Used:** I-129

**Background Count (CPM):** 354

Sample Area	Sample Number	Sample Count (CPM)	Sample Count (DPM)
	1	367	20.0
	2	336	0.0
	3	387	50.8
	4	358	6.2
	5	318	0.0
	6	345	0.0
	7	354	0.0
	8	387	50.8

**Gamma Contamination Survey Results:** All samples less than 200dpm/100cm<sup>2</sup>