HOWARD
UNIVERSITY

OFFICE OF THE SENIOR VICE PRESIDENT
AND EXECUTIVE DEAN FOR HEALTH SCIENCES
RADIATION SAFETY OFFICE

June 12, 2012

Betsy Ullrich, MS, CHP
Senior Health Physicist, RI
U.S. Nuclear Regulatory Commission
2100 Renaissance Blvd
King of Prussia, PA 19406
(610) 337-5040

SUBJECT: AMEND LICENSE 08-00386-19 TO REMOVE RADIOACTIVE WASTE STORAGE FACILITY COLLEGE STREET 510 – ADDITIONAL INFORMATION

Dear Ms. Ullrich:

In response to your letter dated May 25, 2012, I am providing the additional information to support my previous request for an amendment to the Howard University License Number 08-00386-19 to remove the Waste Facility 510 College Street from the license. The amendment is requested because the Waste Facility is no longer being used for the storage of radioactive waste generated by the research labs at Howard University. The address of the facility is as follows:

Waste Facility at 510 College Street
Howard University - Washington, DC 20060

Please accept the following additional information, per your request, to complete our request to amend License 08-00386-19 to remove the radioactive waste storage facility at 510 College Street:

1. Explanations on each item are as follows:

   a. Provide a description of the facility, including items such as dimensions; type of flooring and wall surfaces; sinks, drains and other permanent fixtures; any remaining equipment associated with radiation safety such as hoods or other containment or ventilation systems.

      - Our records indicate that the communication was facilitated back in 1980, and the authorization to use this facility to store radioactive waste took place thereafter. The dimension of this facility is about 3.2 ft. x 12 ft. (~38 ft^2), verified by measurements. To my knowledge, three walls are composed of drywall materials and one exterior wall is built with brick. The floor is made of concrete. There are no sinks, drains,

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permanent fixtures or hoods in the facility. The drain is located outside the authorized facility. The room diagram is shown in Figure 1.

b. Provide a brief history of the use of this facility. Be sure to include when use of the facility began; the types, forms, and quantities of radionuclides used or stored here; and any activities such as packaging, compacting, sewer disposal, etc.

- History

  The storage area in 510 College Street was established for placing radioactive waste material generated in research labs on the campus of Howard University. Material was placed inside 55 gal metal drums, 35 gal metal drums and in recent years 55 gal poly drums for liquid waste. The drums were placed on 2x4 boards to keep the drums off the floor surface and heavy gaged plastic bags were placed inside each drum. Then bags of waste were placed inside the heavy gaged plastic bags.

  The primary use of the radioactive waste storage facility was to house the radioactive waste in our decay and storage management program. Isotopes with a half-life less than 90 days were stored in the area for 10 half-lives, then surveyed and released (i.e. P-32, P-33, I-125 and S-35). The storage area was also used to fill drums of C-14 and H-3. Once filled, the drums were moved to the waste facility at 500 College St. until they could be disposed by a radioactive waste vendor.

  All items found by RSO, Inc. during their cleaning efforts were submitted to your office before with the initial amendment request.

  Routine radioactive monitoring surveys, consisting of loose contamination and dose rate surveys, were conducted on a weekly and quarterly basis during the period of authorization to house the radioactive material.

c. Release surveys must address both total residual contamination, and removable residual contamination. The Alternate Simplified Method requires a minimum of 30 such sample points. Sample points should include floor and wall surfaces. The removable contamination survey performed by your contractor shows only 20 sample points, all on floor or table surfaces. There does not appear to be any static measurements of total residual contamination by the contractor.

- Please see the attached survey results

d. The Alternate Simplified Method requires a 100% scan survey of the facility. There does not appear to be a radiation scan of the facility by the contractor.

- Please see the attached survey results

e. The Close Out Surveys included in the amendment request appear to be performed by the Radiation Safety staff. These surveys include removable contamination surveys assessed by liquid scintillation and gamma counting methods, and ambient radiation level surveys. These surveys do not appear to include static measurements for total residual contamination or scan surveys of all surfaces.

- Total residual contamination is performed using a count rate meter. The count was taken for about one minute in each location (results attached).

2. Provide survey results for any permanent fixtures such as drains, hoods, ductwork, vacuum systems, etc. that could have residual contamination from activities in the Building 510 basement waste storage facility. Based on a review of our inspection records, it appears that a Hot Sink was located in one of your waste facilities for disposal of liquids into the sanitary sewerage system.

- As discussed above in section (a), this room does not have any drains, hoods, ductwork, and vacuum system. There is no hot sink in this room for disposing liquids into the sanitary sewerage system.

Thank you for your time and consideration in this matter. Please feel free to contact me directly should you need any additional information.

Sincerely,

Satya Ranjan Bose

Satya R. Bose, Ph.D., DABR
Director of Radiation Safety
& Radiation Safety Officer

Cc: Sergei A. Nekhai, Ph.D.
Chair, Radiation Safety Committee
Department of Medicine, Associate Professor
Center for Sickle Cell Disease, Co-Director

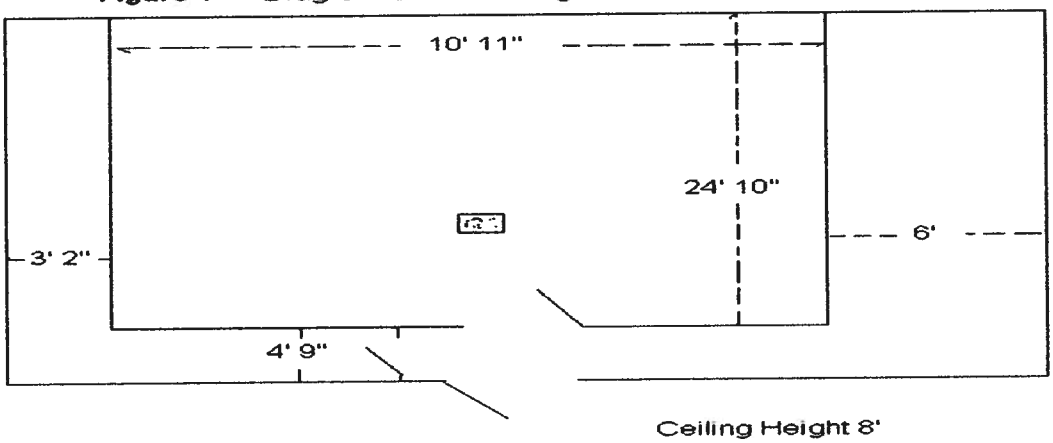
Alice A. Mahan
Department Executive Officer for Radiology,
Radiation Oncology & the Cancer Center

Wayne A. I. Frederick, M.D., F.A.C.S., MBA
Deputy Vice-Provost for Health Sciences
Howard University

Close Out Survey

510 College Street

Figure 1 Diagram of 510 College Street



Summary

Close-Out Survey Report for Radioactive Waste Storage Facility 510 College Street

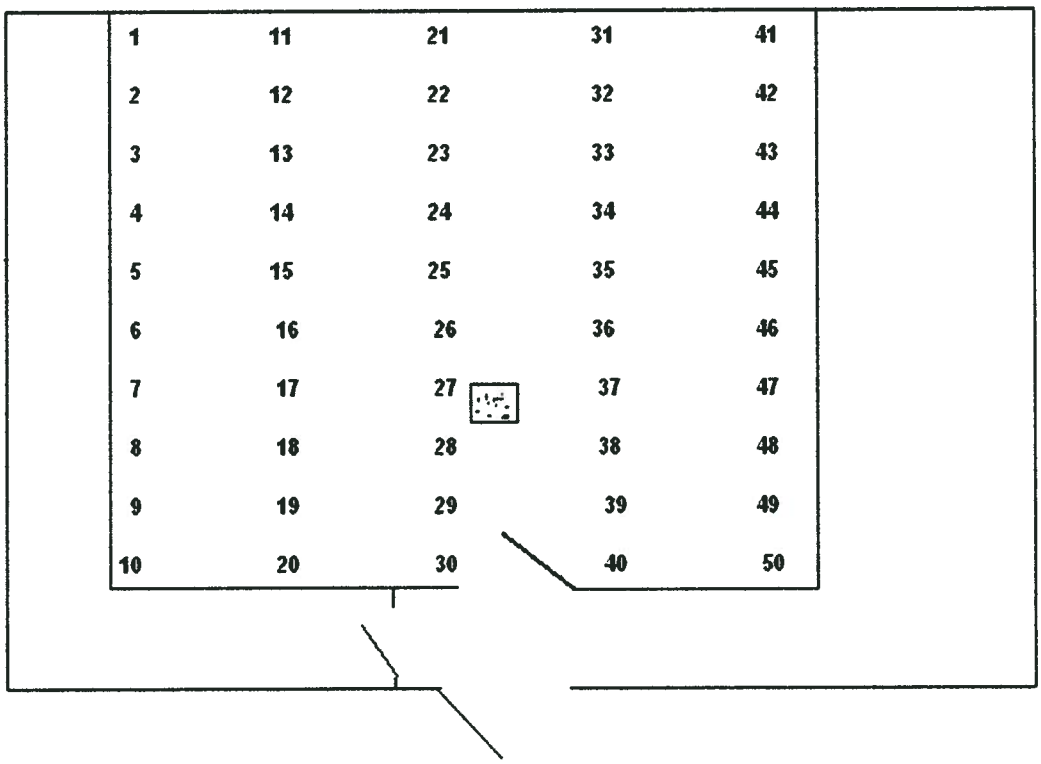
History :
The storage area in 510 College Street was established for placing radioactive waste material generated in research labs on the campus of Howard University. Material was placed inside 55 gal metal drums, 35 gal metal drums and in recent years 55 gal poly drums for liquid waste. The drums were places on 2x4 broads to keep the drums off the floor surface and heavy gaged plastic bags were placed inside each drum and then bags of waste were placed inside the heavy gaged plastic bags.
The primary use of the radioactive waste storage facility was to house the radioactive waste in our decay and storage management program. Isotopes with a half-life less than 90 days were stored in area for 10 half-lives and then surveyed and released i.e. P-32, P-33, I-125 and S-35. The storage area was also used to fill drums of C-14 and H-3, once filled the filled drums were moved to 500 College St waste facility until disposed by a radioactive waste vendor.

Routine Radioactive Monitoring Routine surveys were conducted on a weekly and quarterly basis during the period of authorization to house radioactive material and consisted of a loose contamination and dose rate survey.

Close Out Survey

Dose Rate and Count Rate Survey

510 College St Survey Points



Comments: A comprehenive dose rate and fixed contamination radiation survey was conducted using a exposure rate survey meter and a count rate survey meter with a scintilation probe. Survey locations are indicated on map and survey results follow on results spreadsheet. Count Rate rteadings were taken 3inches above ground level and each reading was taken after a minute count. A 100% scan of the surface area was conducted using a count rate meter with scintilation probe attached. Dose Rate readings were taken at 4 feet above ground level. Background count rate reading is 300cpm, background general area dose rate reading is <0.01mR/hr.

Surveyor: _____ Date: 6/4/12

Michael W. Smith
Radiation Safety Technician

Surveyor: _____ Date: 06/04/12

Oluimide Owoade
Radiation Safety Technician

Reviewed By: _____ Date: 6/12/12

Dr. Satya Bose Ph.D.

Radiation Safety Officer

Reading Results

Sample #	CPM Reading	Dose Rate Reading mR/hr
1	300	<0.01
2	300	<0.01
3	300	<0.01
4	320	<0.01
5	320	<0.01
6	300	<0.01
7	300	<0.01
8	300	<0.01
9	300	<0.01
10	300	<0.01
11	300	<0.01
12	300	<0.01
13	300	<0.01
14	300	<0.01
15	300	<0.01
16	300	<0.01
17	300	<0.01
18	300	<0.01
19	300	<0.01
20	300	<0.01
21	300	<0.01
22	340	<0.01
23	360	<0.01
24	300	<0.01
25	300	<0.01

Sample #	CPM Reading	Dose Rate Reading mR/hr
26	300	0.01
27	300	<0.01
28	300	<0.01
29	300	<0.01
30	300	<0.01
31	360	0.01
32	360	0.01
33	400	0.01
34	300	<0.01
35	300	<0.01
36	300	<0.01
37	300	<0.01
38	300	<0.01
39	300	<0.01
40	300	<0.01
41	300	<0.01
42	400	0.01
43	450	0.01
44	300	<0.01
45	300	<0.01
46	300	<0.01
47	300	<0.01
48	300	<0.01
49	300	<0.01
50	300	<0.01

Survey Meters Used		
Meter		**Calibration Date**
Fixed Contamination Ludlum #59790		4/26/2012
Dose Rate Meter Ludlum #72726		1/4/2012

Surveyor: _____ Date: 6/4/12

Michael W. Smith
Radiation Safety Technician

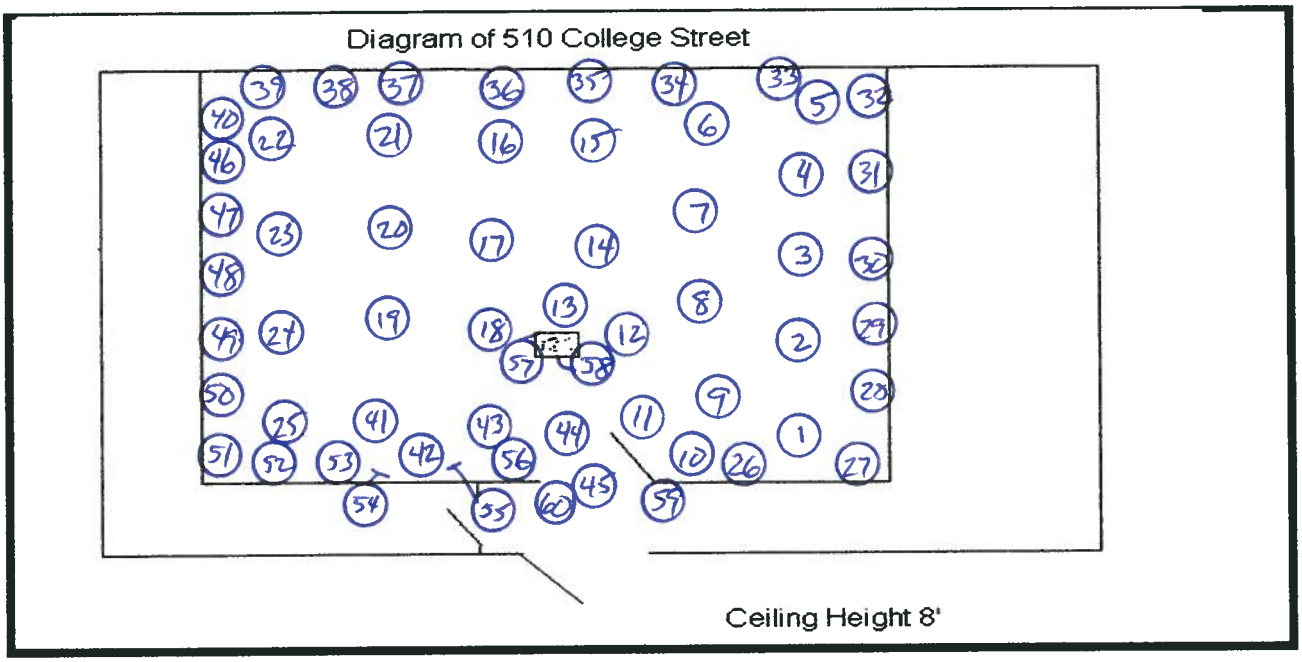
Surveyor: _____ Date: 06/04/12

Oluimide Owoade
Radiation Safety Technician

Reviewed By: _____ Date: 6/12/12

Dr. Satya Bose Ph.D.
Radiation Safety Officer

Close Out Survey



Comments: A comprehensive loose contamination survey was conducted in 510 College St. Survey locations are indicated on map followed by results for each location indicated on spreadsheet. Swipes were counted in a well counter for gamma radiation and on a LSC for low level beta radiation. There is no history of alpha emitters being stored in this area during the use. Types of radioactive waste stored in 510 College Street: I-125, P32, P-33, S-35, H-3, and C-14

Survey Meters Used		
Meter		Calibration Date
Biodex Atomlab MCA, Model 187-225		
Perkin LSC Counter		
Fixed Contamination Ludlum #59790		4/26/2012
Dose Rate Meter Ludlum #72726		1/4/2012

Surveyor: _____ Date: 6/1/12

Michael W. Smith
Radiation Safety Technician

Reviewed By: Satya Kanaya Bose Date: 6/12/12

Dr. Satya Bose Ph.D.
Radiation Safety Officer

Loose Contamination Results

Location of Measurement	Swipe #	Gamma Counter Results CPM	Gamma Counter Results *DPM	LSC Counter Results CPM	LSC Counter Results *DPM
Floor	1	-8	-22.4	4	10.1
Floor	2	-10	-28.0	-2	-5.0
Floor	3	2	5.6	0	0.0
Floor	4	-14	-39.2	4	10.1
Floor	5	2	5.6	4	10.1
Floor	6	9	25.2	-1	-2.5
Floor	7	-12	-33.6	-1	-2.5
Floor	8	-3	-8.4	-2	-5.0
Floor	9	11	30.8	-2	-5.0
Floor	10	5	14.0	-6	-15.1
Floor	11	-17	-47.6	0	0.0
Floor	12	-4	-11.2	4	10.1
Floor	13	-10	-28.0	7	17.6
Floor	14	-26	-72.7	-9	-22.6
Floor	15	1	2.8	-4	-10.1
Floor	16	-2	-5.6	1	2.5
Floor	17	-2	-5.6	-3	-7.5
Floor	18	-3	-8.4	9	22.6
Floor	19	17	47.6	-5	-12.6
Floor	20	0	0.0	-4	-10.1

DPM = (cpm-backgroundcpm)/meter efficiency

Survey Meters Used		
Meter	Efficiency	
Biodex Atomlab MCA, Model 187-225	36%	
Perkin LSC Counter (Dr. Nekhai)	39%	

Surveyor: _____ Date: 6/1/12

Michael W. Smith
Radiation Safety Technician

Reviewed By: _____ Date: 6/12/12

Dr Satya Bose Ph.D.
Radiation Safety Officer

Loose Contamination Results

Location of Measurement	Swipe #	Gamma Counter Results CPM	Gamma Counter Results *DPM	LSC Counter Results CPM	LSC Counter Results *DPM
Floor	21	-14	-39.2	1	2.5
Floor	22	1	2.8	-6	-15.1
Floor	23	1	2.8	-7	-17.6
Floor	24	-1	-2.8	0	0.0
Floor	25	-14	-39.2	-2	-5.0
Wall	26	-5	-14.0	9	22.6
Wall	27	2	5.6	-3	-7.5
Wall	28	-16	-44.8	-8	-20.1
Wall	29	-15	-42.0	-2	-5.0
Wall	30	-10	-28.0	5	12.6
Wall	31	1	2.8	-8	-20.1
Wall	32	4	11.2	0	0.0
Wall	33	-1	-2.8	5	12.6
Wall	34	-6	-16.8	-3	-7.5
Wall	35	9	25.2	3	7.5
Wall	36	-14	-39.2	9	22.6
Wall	37	-2	-5.6	5	12.6
Wall	38	-13	-36.4	-1	-2.5
Wall	39	-3	-8.4	0	0.0
Wall	40	-7	-19.59	-8	-20.10

DPM = (cpm-backgroundcpm)/meter efficiency

Survey Meters Used		
Meter	Efficiency	
Biodex Atomlab MCA, Model 187-225	36%	
Perkin LSC Counter (Dr. Nekhai)	39.8%	

Surveyor: _____ Date: 6/1/12

Michael W. Smith
Radiation Safety Technician

Reviewed By: Satya Ranjan Bose Date: 6/12/12

Dr Satya Bose Ph.D.
Radiation Safety Officer

Loose Contamination Results

Location of Measurement	Swipe #	Gamma Counter Results CPM	Gamma Counter Results *DPM	LSC Counter Results CPM	LSC Counter Results *DPM
Floor	41	-17	-47.6	-5	-12.6
Floor	42	-2	-5.6	-5	-12.6
Floor	43	2	5.6	11	27.6
Floor	44	-6	-16.8	2	5.0
Floor	45	4	11.2	-6	-15.1
Wall	46	4	11.2	10	25.1
Wall	47	-12	-33.6	7	17.6
Wall	48	-4	-11.2	-1	-2.5
Wall	49	-21	-58.8	-6	-15.1
Wall	50	1	2.8	15	37.7
Wall	51	0	0.0	1	2.5
Wall	52	8	22.4	-1	-2.5
Wall	53	-18	-50.4	15	37.7
Wall	54	4	11.2	-2	-5.0
Wall	55	0	0.0	-9	-22.6
Wall	56	-17	-47.6	1	2.5
Wall	57	-13	-36.4	7	17.6
Wall	58	-16	-44.8	8	20.1
Wall	59	-14	-39.2	-9	-22.6
Wall	60	-1	-2.8	-2	-5.0

DPM = (cpm-backgroundcpm)/meter efficiency

Survey Meters Used		
Meter	Efficiency	
Biodex Atomlab MCA, Model 187-225	36%	
Perkin LSC Counter (Dr. Nekhai)	39%	

Surveyor: _____ Date: 6/1/12

Michael W. Smith
Radiation Safety Technician

Reviewed By: Satya Ranjan Bose Date: 6/12/12

Dr Satya Bose Ph.D.

Radiation Safety Officer

Manual Report

Counting Results

DATE	DETECTOR	ISOTOPE	ENERGY (kev)	TIME (sec)	ROI COUNTS	ROI CPM	
06/01/12 12:10	Well	Wide	19 to 1499	60	362746	362746	
06/01/12 12:12	Well	Wide	19 to 1499	60	79	79	- Blks
06/01/12 12:14	Well	Wide	19 to 1499	60	71	71	-1
06/01/12 12:15	Well	Wide	19 to 1499	60	69	69	-2
06/01/12 12:16	Well	Wide	19 to 1499	60	81	81	-3
06/01/12 12:17	Well	Wide	19 to 1499	60	65	65	-4
06/01/12 12:19	Well	Wide	19 to 1499	60	81	81	-5
06/01/12 12:20	Well	Wide	19 to 1499	60	88	88	-6
06/01/12 12:21	Well	Wide	19 to 1499	60	67	67	-7
06/01/12 12:22	Well	Wide	19 to 1499	60	76	76	-8
06/01/12 12:24	Well	Wide	19 to 1499	60	90	90	-9
06/01/12 12:25	Well	Wide	19 to 1499	60	84	84	-10
06/01/12 12:26	Well	Wide	19 to 1499	60	62	62	-11
06/01/12 12:27	Well	Wide	19 to 1499	60	75	75	-12
06/01/12 12:29	Well	Wide	19 to 1499	60	69	69	-13
06/01/12 12:30	Well	Wide	19 to 1499	60	53	53	-14
06/01/12 12:31	Well	Wide	19 to 1499	60	80	80	-15
06/01/12 12:32	Well	Wide	19 to 1499	60	77	77	-16
06/01/12 12:34	Well	Wide	19 to 1499	60	77	77	-17
06/01/12 12:36	Well	Wide	19 to 1499	60	76	76	-18
06/01/12 12:38	Well	Wide	19 to 1499	60	96	96	-19
06/01/12 12:40	Well	Wide	19 to 1499	60	79	79	-20
06/01/12 12:41	Well	Wide	19 to 1499	60	65	65	-21
06/01/12 12:42	Well	Wide	19 to 1499	60	80	80	-22
06/01/12 12:44	Well	Wide	19 to 1499	60	80	80	-23
06/01/12 12:45	Well	Wide	19 to 1499	60	78	78	-24
06/01/12 12:46	Well	Wide	19 to 1499	60	65	65	-25
06/01/12 12:48	Well	Wide	19 to 1499	60	74	74	-26
06/01/12 12:49	Well	Wide	19 to 1499	60	81	81	-27
06/01/12 12:50	Well	Wide	19 to 1499	60	63	63	-28
06/01/12 12:52	Well	Wide	19 to 1499	60	64	64	-29
06/01/12 12:53	Well	Wide	19 to 1499	60	69	69	-30
06/01/12 12:54	Well	Wide	19 to 1499	60	80	80	-31

Technologist:

Comments:

Physician: _____ **Date:** _____

Software version 3.42

Manual Report

Counting Results

DATE	DETECTOR	ISOTOPE	ENERGY (kev)	TIME (sec)	ROI COUNTS	ROI CPM
06/01/12 12:56	Well	Wide	19 to 1499	60	83	83 -32
06/01/12 12:57	Well	Wide	19 to 1499	60	78	78 -33
06/01/12 12:59	Well	Wide	19 to 1499	60	73	73 -34
06/01/12 01:00	Well	Wide	19 to 1499	60	88	88 -35
06/01/12 01:01	Well	Wide	19 to 1499	60	65	65 -36
06/01/12 01:02	Well	Wide	19 to 1499	60	77	77 -37
06/01/12 01:04	Well	Wide	19 to 1499	60	66	66 -38
06/01/12 01:05	Well	Wide	19 to 1499	60	76	76 -39
06/01/12 01:07	Well	Wide	19 to 1499	60	72	72 -40
06/01/12 01:08	Well	Wide	19 to 1499	60	62	62 -41
06/01/12 01:09	Well	Wide	19 to 1499	60	77	77 -42
06/01/12 01:10	Well	Wide	19 to 1499	60	81	81 -43
06/01/12 01:12	Well	Wide	19 to 1499	60	73	73 -44
06/01/12 01:13	Well	Wide	19 to 1499	60	83	83 -45
06/01/12 01:15	Well	Wide	19 to 1499	60	83	83 -46
06/01/12 01:16	Well	Wide	19 to 1499	60	67	67 -47
06/01/12 01:17	Well	Wide	19 to 1499	60	75	75 -48
06/01/12 01:19	Well	Wide	19 to 1499	60	58	58 -49
06/01/12 01:20	Well	Wide	19 to 1499	60	80	80 -50
06/01/12 01:22	Well	Wide	19 to 1499	60	79	79 -51
06/01/12 01:23	Well	Wide	19 to 1499	60	87	87 -52
06/01/12 01:24	Well	Wide	19 to 1499	60	61	61 -53
06/01/12 01:26	Well	Wide	19 to 1499	60	83	83 -54
06/01/12 01:27	Well	Wide	19 to 1499	60	79	79 -55
06/01/12 01:30	Well	Wide	19 to 1499	60	62	62 -56
06/01/12 01:31	Well	Wide	19 to 1499	60	66	66 -57
06/01/12 01:32	Well	Wide	19 to 1499	60	63	63 -58
06/01/12 01:33	Well	Wide	19 to 1499	60	65	65 -59
06/01/12 01:35	Well	Wide	19 to 1499	60	78	78 -60

Technologist:
Comments:

Physician: _____ **Date:** _____

Software version 3.42

Protocol #: 8 Name:P32(open)/H3/C14 01-Jun-2012 13:53
Region A: LL-UL= 0.0-2000 Lcr= 0 Bkg= 0.00 %2 Sigma=0.00
Region B: LL-UL= 0.0-18.0 Lcr= 0 Bkg= 0.00 %2 Sigma=0.00
Region C: LL-UL=18.0-50.0 Lcr= 0 Bkg= 0.00 %2 Sigma=0.00
Time = 1.00 QIP = SIS

S#	TIME	CPMA	SIS	FLAG
1	1.00	127352.	32.226	- source Check
2	1.00	87170.0	20.332	- source Check
3	1.00	32.00	19.851	— Bkg
4	1.00	36.00	13.999	- 1
5	1.00	30.00	8.507	- 2
6	1.00	32.00	17.209	- 3
7	1.00	36.00	18.127	- 4
8	1.00	36.00	15.011	- 5
9	1.00	31.00	11.034	- 6
10	1.00	31.00	10.272	- 7
11	1.00	30.00	23.183	- 8
12	1.00	30.00	25.466	- 9
13	1.00	26.00	29.349	- 10
14	1.00	32.00	10.934	- 11
15	1.00	36.00	13.342	- 12
16	1.00	39.00	16.711	- 13
17	1.00	23.00	11.342	- 14
18	1.00	28.00	13.375	- 15
19	1.00	33.00	14.529	- 16
20	1.00	29.00	18.157	- 17
21	1.00	41.00	16.853	- 18
22	1.00	27.00	16.139	- 19
23	1.00	28.00	11.636	- 20
24	1.00	33.00	13.424	- 21
25	1.00	26.00	19.661	- 22
26	1.00	25.00	21.243	- 23
27	1.00	32.00	14.846	- 24
28	1.00	30.00	13.843	- 25
29	1.00	41.00	9.164	- 26
30	1.00	29.00	20.742	- 27
31	1.00	24.00	20.163	- 28
32	1.00	30.00	11.089	- 29
33	1.00	37.00	18.694	- 30
34	1.00	24.00	11.235	- 31
35	1.00	32.00	12.557	- 32
36	1.00	37.00	8.292	- 33
37	1.00	29.00	19.929	- 34
38	1.00	35.00	15.543	- 35
39	1.00	41.00	15.831	- 36
40	1.00	37.00	12.904	- 37
41	1.00	31.00	10.371	- 38
42	1.00	32.00	15.121	- 39
43	1.00	24.00	14.177	- 40
44	1.00	27.00	11.904	- 41
45	1.00	27.00	13.642	- 42
46	1.00	43.00	17.053	- 43
47	1.00	34.00	16.967	- 44
48	1.00	26.00	13.642	- 45
49	1.00	42.00	15.362	- 46
50	1.00	39.00	17.254	- 47

S#	TIME	CPMA	SIS	FLAG
51	1.00	31.00	14.728	-48
52	1.00	26.00	15.362	-~~50~~ 49
53	1.00	47.00	17.388	-~~51~~ 50
54	1.00	33.00	16.130	-~~52~~ 51
55	1.00	31.00	11.128	-~~53~~ 52
56	1.00	47.00	18.430	-~~54~~ 53
57	1.00	30.00	31.699	-~~55~~ 54
58	1.00	23.00	20.687	-~~56~~ 55
59	1.00	33.00	21.066	-~~57~~ 56
60	1.00	39.00	14.267	-~~58~~ 57
61	1.00	40.00	15.301	58
62	1.00	23.00	10.432	59
63	1.00	30.00	10.533	60