Hill, Carol

From: Simmons, Michelle
Sent: Thursday, February 28, 2019 9:17 AM
To: Hill, Carol
Subject: FW: Amendment Deficiency response (Mail control number 610951)
Attachments: Anderson Building Response Feb 2019.pdf; Amendment Request Deficiency

Carol,

Please add this to ADAMS. Deficiency letter and response. Public nonsensitive. ✓

From: Tracey Martinson [mailto:tamartinson@alaska.edu]
Sent: Wednesday, February 20, 2019 5:23 PM
To: Simmons, Michelle <Michelle.Simmons@nrc.gov>
Subject: [External_Sender] Amendment Deficiency response (Mail control number 610951)

Dear Michelle,

Please find attached our response to your request for additional information related to Mail Control Number 610951.

Sincerely,
Tracey

--
Tracey Martinson, PhD, MPH
Industrial Hygienist/Radiation Safety Officer
Environmental Health, Safety, & Risk Management
University of Alaska Fairbanks
1855 Marika Road
(907) 474-6771

PUBLIC
☐ Immediate Release
☒ Normal Release

NON-PUBLIC
☐ A.3 Sensitive-Security Related
☐ A.7 Sensitive Internal
☐ Other: _____

Reviewer: RLR Date: 3/4/19

Hill, Carol

From: Simmons, Michelle
Sent: Monday, January 28, 2019 3:04 PM
To: tmartinson@alaska.edu
Subject: Amendment Request Deficiency
Attachments: 50-02430-07C.pdf

Good afternoon,

Please see the attached letter concerning the additional information that is required to continue our review of your request. Please feel free to contact me if you have any questions.

Thanks

Michelle Simmons
Health Physicist
1600 East Lamar Blvd.
Arlington, Texas 76011
817-200-1590

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 E. LAMAR BLVD
ARLINGTON TX 76011-4511

January 28, 2019

Tracey A. Martinson, Ph.D.
Radiation Safety Officer
University of Alaska Fairbanks
Environmental Health, Safety, and Risk Management
P.O. Box 758145
Fairbanks, AK 99775-8145

SUBJECT: AMENDMENT DEFICIENCY MAIL CONTROL NUMBER 610951

Dear Dr. Martinson:

In your letter dated December 17, 2018, you requested to remove the "Anderson Building" location from your NRC license. In order to continue our review, additional information is needed.

- For disposals via sanitary sewer, show the calculation of how much time was required for flushing the sink with water.
- Please perform wipe tests of the sink traps where the material was disposed and submit the results to the NRC for review.
- Demonstrate how you calculated the lower limit of detection (LLD) for the liquid scintillation counter.

Please provide this information by February 11, 2019. Please reference mail control number 610951 in your response. Your response should be on letterhead, sign and dated. You may submit your response by email as a pdf. attachment. If you have any questions, please feel free to send me an e-mail or call me at 817-200-1590.
Thank you for your cooperation.

Sincerely,

/RA/

Michelle Simmons, Health Physicist
Materials Licensing and Inspection Branch

Docket: 030-01179
License: 50-02430-07
Control: 610951

Enclosure: As stated

UNIVERSITY OF ALASKA FAIRBANKS
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February 20, 2019

Nuclear Regulatory Commission
Region IV
1600 E. Lamar Blvd.
Arlington, TX 76011-4511

Subject: Amendment Deficiency Mail Control Number 610951

Dear Ms. Simmons,

In your letter dated January 28, 2019, you requested additional information regarding the use of iron-55 at the Anderson Building in Juneau, Alaska. Our responses are as follows:

1. For disposals via sanitary sewer, show the calculation of how much time was required for flushing the sink with water.

   The maximum effluent concentration permitted for iron-55 is 1x 10^{-4} µCi per milliliter per 10 CFR 20 Part B, Table 2. Iron-55 was disposed on ten occasions between July 9, 2012 and April 9, 2013, and once in May 2018. The daily sewer discharge from the Anderson Building is approximately 504 gallons per day, including laboratories and restroom facilities.

Date	Activity disposed (µCi)	Effluent concentration (µCi/mL-day)	Fraction of allowable concentration
7/9/2012	23.52	1.26×10^{-5}	0.126
7/10/2012	23.52	1.26×10^{-5}	0.126
7/11/2012	4.9	2.62×10^{-6}	0.026
7/17/2012	43.2	2.52×10^{-5}	0.252
7/24/2012	38	2.10×10^{-5}	0.210
7/30/2012	38	2.10×10^{-5}	0.210
3/7/2013	7.41	4.09×10^{-6}	0.041
3/12/2013	7.41	4.09×10^{-6}	0.041
7/14/2012	7.41	4.09×10^{-6}	0.041
4/9/2013	5.51	3.04×10^{-6}	0.030
May 2018	205.7	1.08×10^{-4}	1.080

   For each disposal, the sink was flushed for 5-10 minutes. The disposal of all remaining isotope in May 2018 was slightly over the effluent limit.

2. Please perform wipe tests of the sink traps where the material was disposed and submit the results to the NRC for review.

Wipe tests of the sink and P-trap were taken. The P-trap could not be disassembled and wiped as the pipe fittings are glued together. The wipes were taken from the entire surface of the plug and from the inside of the P-trap pipe to the best of our ability.

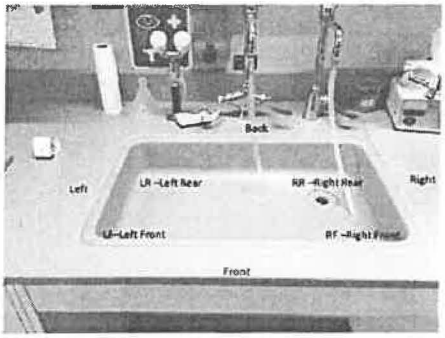

Photo showing locations of sink wipe tests.


Photo showing the sink trap and plug.


Photo of the sink plug. The entire plug was wiped.

Wipes were counted on a Beckman LS 6500 liquid scintillation counter for 5 minutes using a wide window, and the efficiency of counting was estimated to be 35% (estimate provided in Beckman literature). The wipe test results are shown in the following table.

Location	Area (cm^2)	Wide (cpm)	Wide (cpm) blank corrected	Wide (dpm)	dpm per 100 cm^2
Blank	N/A	45.6	--	--	--
Front side (sink)	100	66.4	20.8	59.43	59.43
Right front sink	100	417.4	371.8	1062.29	1062.29
Right rear sink	100	933.6	590	1685.71	1685.71
Right side	100	65.6	20	57.14	57.14
Back side	100	88.6	43	122.86	122.86
Left side	100	61.8	16.2	46.29	46.29
Left rear sink	100	858.8	813.2	2323.43	2323.43
Left front sink	100	712.2	666.6	1904.57	1904.57
Plug 1	~10	932.2	886.6	2533.14	25331.43
Plug 2	~10	343.6	298	851.43	8514.29
Trap 1	~10	1386.8	1341.2	3832.0	38320.0
Trap 2	~10	2164	2118.4	6052.57	60525.71
Trap 3	~10	1232.6	1187	3391.43	33914.29

The results show that the removable surface contamination does not exceed the limit of 4,500,000 dpm per 100 cm^2 for iron-55 as specified in NUREG 1757, Appendix B, Table B.1.

3. Demonstrate how you calculated the lower limit of detection (LLD) for the liquid scintillation counter.

   Over the course of the work involving iron-55, two different scintillation counters were used. One was located in Juneau, and was used to count routine wipe tests and samples during the research activities. The other counter is located in Fairbanks, and was used to count the final wipe tests for the sink, trap, and plug.

   The LLD for both liquid scintillation counters was calculated using the equation: LLD = (4.66 x σ_b) + 3 (from Cember and Johnson, Introduction to Health Physics), which is based on the assumption that both α and ß errors were 0.5% and that counting times are equal for both the samples and the blank. For the liquid scintillation counter located in Juneau, the standard deviation of the blank (σ_b) for the liquid scintillation counter was estimated from 28 different blank wipe samples that were counted between June 2013 and June 2018. Counts were 1 minute in duration. The average for the wipes was 23.15 cpm, and the σ_b was 6.95, resulting in an LLD of 35.41 cpm. For the liquid scintillation counter located in Fairbanks, 10 blank wipes were counted for 5 minutes each. The average for these wipes was 53.26 cpm, and the σ_b was 7.54, resulting in an LLD of 38.12 cpm.

If you have any additional questions, please do not hesitate to contact me.

Sincerely,

Tracey Martinson

Tracey Martinson
Radiation Safety Officer