

July 6, 2018

Mike LaFranzo
Senior Health Physicist
Region III - Division of Nuclear Materials and Safety
US Nuclear Regulatory Commission
2443 Warrenville Road, Suite 210
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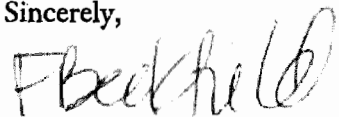
Re: Dose Assessment for Proposed Decommissioning Activities of Research Park Development
Building and Garage - License No. 24-00513-32, Docket No 030-02278

Dear Mr. LaFranzo:

As requested in the May 1, 2018 decommissioning site visit, please see the enclosed dose assessment for the proposed decommissioning activities of the Research Park Development Building and Garage. The University of Missouri has plans for the property where the building and garage are located and would like to begin demolition of the buildings by October 1, 2018. Therefore, the University of Missouri requests an expedited review by July 31, 2018 in order to plan accordingly for the project.

If you have any questions, please do not hesitate to contact me at (573) 882-7018.

Sincerely,



Felicity Beckfield, MS, CHP
Radiation Safety Officer

cc: Todd Houts, Director, MU Environmental Health & Safety

enclosure: RPDB Dose Assessment

RPDB Dose Assessment

RPDB Garage Radiological Status

There are three areas of legacy residual radioactive material in the RPDB Garage. Radium-226 was spilled in the RPDB garage in and near the two storage wells that measure 2 ft x 2 ft each and are 3 ft deep. Residual fixed contamination can be found in the north storage well and on the floor near the edges of the storage wells. The total area of contamination is approximately 30 square feet in the north storage well and 6 square feet on the floor surface near the storage well openings. Maximum total contamination in the north storage well on the floor is approximately 40,000 dpm/100 cm² gross alpha with 61 dpm/100 cm² removable. A scan of the storage well wall surfaces indicates total contamination at 1-2% of the maximum location. The south storage well had detectable alpha measurements at 148 dpm/100 cm². The surfaces around the storage wells have detectable alpha contamination as well. The maximum total surface activity around the storage wells was approximately 14,700 dpm/100 cm² with a maximum removable activity of 17 dpm/100cm² for an area of approximately 1 square foot. An additional 2 square foot area has total surface activity of approximately 500 dpm/100 cm².

The RPDB Garage Storage Locker had one location of residual alpha activity detected in the scoping survey at 335 dpm/100 cm² with no detectable removable activity.

The projected total alpha activity in and around the storage wells is approximately 0.7 μ Ci based on the gross alpha measurements described above. Laboratory results indicate that the activity is Ra-226 which has 4.2 alphas per decay of Ra-226 and progeny. When corrected for the number of alphas per decay, the total estimated activity of Ra-226 is reduced to 0.17 μ Ci or 28% of the inhalation ALI from 10CFR20 Appendix B, Table 1, Column 2.

RPDB Garage Remediation Dose Assessment

The potential dose to the public, untrained worker, and trained rad worker is considered to be insignificant for the RPDB garage. Basic OSHA engineering controls required for concrete demolition (i.e., water spray and/or HEPA enclosures) will prevent the radioactive materials from becoming an airborne hazard.

The maximum quantity of radioactive material that may be expected to be disturbed during remediation of the concrete is conservatively assumed to be 10% because the primary remediation method will be jackhammering with a minor amount of concrete scarification. It can be reasonably expected that 10% or less of the disturbed radioactivity will become airborne without engineering controls. A 10% value is a very conservative assumption when compared to the NRC's suggested Resuspension Factor (RF) of 1E-6 as shown in NUREG-1720 for dose modeling purposes. In an environment with no OSHA mandated silica controls, the maximum internal exposure would be 0.28% of the Ra-226 ALI if all airborne activity were respirable and inhaled by a single worker.

OSHA mandated engineering controls for controlling silica inhalation hazards during concrete demolition (along with no emissions from the enclosed work area) will keep doses to the public and environment to non-detectable levels. Therefore, remediation of the concrete (approximately 30 sf) will not create doses that are significantly greater than normal operations of storing radioactive material and waste in the garage.

Personal and general area air sampling will occur to monitor the remediation of the storage wells and members of the public will not be allowed near the remediation activities.

RPDB Main Building

The only location of elevated residual radioactivity within the main building is in the Lab 11 hood and ductwork. The maximum total beta activity was 64,485 dpm/100 cm² with 600 dpm/100 cm² removable in the C-14 channel of the liquid scintillation counter (LSC). There were no detectable alpha measurements in the RPDB main building during the scoping survey. The hood and ductwork are projected to be removed as radioactive waste. Roof surveys were not conducted during the scoping survey, however, areas of the roof near the hood exhaust will be included in the characterization and FSS.

RPDB Main Building Remediation Dose Assessment

Remediation in the main building will consist of removal of the contaminated hood and associated ductwork. The total estimated activity of C-14 in the equipment is less than 1 μ Ci. The ALI for C-14 inhalation is 2,000 μ Ci for the most restrictive class. The maximum potential dose without the use of engineering controls is less than 2.5 mrem. There is no external exposure hazard.