JOHNSON HALL

(SURVEY UNIT 149)

Johnson Hall includes Room 222. The floors of this room were classified as a Class 2 MARSSIM area. A figure (including sample locations) is included in Attachment A-15-1. The SU is based on MARSSIM-recommended size constraints. (See data in Table A15.1).

Overview of Surveys Performed. Ludlum Model 43-89 dual phosphor ZnS detectors coupled with Ludlum Model 2360 scalers were used for the collection of quantitative alpha/beta scan surveys and fixed-point (i.e., static) measurements. The alpha/beta static measurements were performed at systematic locations for the MARSSIM Class 2 area. Given that scan surveys did not detect the presence of activity that was elevated with respect to the investigation level, biased fixed-point measurements were not necessary.) Removable contamination measurements (i.e., swipes) were also collected at each static location to quantify residual removable activity. The swipes were counted using a Ludlum Model 43-10-1 alpha/beta sample counter. QA/QC information relative to the instruments used is contained in Section 5.0 of the main text and in Appendix C.

Table A15.1. Johnson Hall Summary Table

Room Number / Description	Floor Area (m ²)	Floors		
		Included (Yes/No)	MARSSIM Classification	
Room 222	34	Yes	Class 2	

Fixed-Point Measurements. Fixed-point measurements were obtained from MARSSIM Class 2 (systematic - random start triangular grid) locations. Results of the static measurements are listed in Table A15.2, and locations are shown on Figure A15.1. All alpha results were below the site-specific alpha DCGL of 1,160 dpm/100 cm² for Am-241. Residual beta activity was compliant with both the Cs-137 surface contamination level of 5,000 dpm/100 cm² specified in AEC Regulatory Guide 1.86 (AEC 1974) and the NRC screening level DCGL of 28,000 dpm/100 cm² cited in Table 5.19 of NUREG-5512 (NRC 1999) for Cs-137 on structures.

 Table A15.2. SU-149 Room 222 Class 2 Floor Measurements

Sample Number	Survey Surface	Location	Total Alpha Activity (dpm/100 cm ²)	Total Beta Activity (dpm/100 cm ²)	Removable Alpha Activity (dpm/100 cm ²)	Removable Beta Activity (dpm/100 cm ²)
1	Linoleum	222	7	882	3	23
2	Linoleum	222	22	451	-1	-14
3	Linoleum	222	7	1,056	3	0
4	Linoleum	222	22	851	3	6
5	Linoleum	222	7	913	3	0
6	Linoleum	222	37	738	-1	14
7	Linoleum	222	22	851	-1	-23
8	Linoleum	222	7	933	-1	-17

The MDC is the minimum detectable concentration on a surface that an instrument is expected to detect with 95 percent confidence. The instrument MDCs for fixed measurements 1-8 are 82 dpm/100 cm² (alpha) and 234 dpm/100 cm² (beta); and the MDCs for removable samples 1-8 are 14 dpm/100 cm² (alpha) and 74 dpm/100 cm² (beta).

Negative results indicate results that are below background for the respective building material.

Summary. Residual levels of radioactivity in Johnson Hall clearly demonstrate that residual concentrations of radionuclide COPCs achieve the site-specific alpha DCGL of 1,160 dpm/100 cm²

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and the most restrictive beta DCGL of $5,000 \text{ dpm}/100 \text{ cm}^2$ for Cs-137. In addition, the actual percentage of removable activity was determined to be approximately 3 percent.

Given these results, it is clearly demonstrated that the null hypothesis (i.e., that Johnson Hall exceeds DCGLs) is rejected. Review of survey data supports the conclusion that Johnson Hall contains an adequate number of samples; a sufficient percentage has been scanned; and it has been appropriately classified consistent with MARSSIM requirements using the process noted in Section 4.0 of the main text of this document. All scan and fixed measurement results collected from Johnson Hall at Southeast were below the DCGL. As such, formal assessment using the Sign Test is not required.

Conclusion. Levels of radioactivity in Johnson Hall achieve criteria for unrestricted release consistent with the provisions of 10 *CFR* 20, Subpart E.

ATTACHMENT A-15-1

FIGURES

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