MAGILL HALL BASEMENT

(SURVEY UNITS 83 THROUGH 102)

The Magill Hall Basement includes Rooms 001, 002, 003, 011, 015, 016, 017, 019, 021, 021A, 023, 023A, 026, and 029. The floors and walls within these areas were classified as MARSSIM Class 2 and Class 3 areas, respectively (see Table A8.1). Figures (including sample locations) are included in Attachment A-8-1. Radiologically impacted areas were divided into SUs based on MARSSIM-recommended size constraints, resulting in a total of 20 SUs (SU-83 through SU-102) in the area identified herein as Magill Hall Basement. Survey data from the floors and walls are located in Tables A8.2 through A8.22.

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 MARSSIM Class 2 areas and at randomly generated locations for Class 3 areas. 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 A8.1. Magill Hall Basement Summary Table

Room Number/ Description	Area (m^2)	Walls[a]		Floors	
		Included (Yes/No)	MARSSIM Classification	Included (Yes/No)	MARSSIM Classification
Vestibule 001	25	Yes	Class 3	Yes	Class 2
Corridor 002	62				
Vestibule 003	4			Yes	Class 2
Lab 016	29				
Storage 011	13			Yes	Class 2
Storage 015	26			Yes	Class 2
Lab 017	16			Yes	Class 2
Storage 019	13			Yes	Class 2
Storage 021	8			Yes	Class 2
Storage 021A	7				
Storage 023	7			Yes	Class 2
Storage 023A	6				
Storage 026	11			Yes	Class 2
Storage 028	19			Yes	Class 2
Storage 029	37			Yes	Class 2
Storage 025	42	Yes	Class 3	Yes	Class 2
Mechanical 013	82	Yes	Class 3	Yes	Class 2
Corridor 013B	20			Yes	Class 2
Electrical 018	16			Yes	Class 2
Storage 019A	13	Yes	Class 3	Yes	Class 2

[a] All areas were combined for the MARSSIM Class 3 Wall Survey.

Fixed-Point Measurements. Fixed-point measurements were obtained from MARSSIM Class 2 (systematic - random start triangular grid) or MARSSIM Class 3 (random) locations. Class 3 fixed-point measurements were obtained from random locations, with emphasis on areas with a greater likelihood of residual activity. Results of the static measurements are listed in Tables A8.2 through A8.22, and locations are shown on Figures A8.1 through A8.21. All alpha

results were below the site-specific alpha DCGL of 1,160 dpm/100 cm^2 for Am-241. Residual beta activity was compliant with both the Cs-137 surface contamination level of 5,000 dpm/100 cm^2 specified in AEC Regulatory Guide 1.86 (AEC 1974) and the NRC screening level DCGL of 28,000 dpm/100 cm^2 cited in Table 5.19 of NUREG-5512 (NRC 1999) for Cs-137 on structures.

Soil Samples. Soil samples were collected from a MARSSIM Class 2 (systematic - random start triangular grid) area beneath the seismograph pedestal in Room 21. See Table A8.9 for sample analytical results.

Table A8.2. SU-83 Rooms 1 and 2 Class 2 Floor Measurement Results

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	2	7	1,221	3	42
2	Linoleum	2	7	1,405	3	65
3	Linoleum	2	22	1,436	-1	20
4	Linoleum	2	22	1,251	-1	0
5	Linoleum	2	52	1,456	6	54
6	Linoleum	2	7	985	3	20
7	Linoleum	1	7	523	3	39
8	Linoleum	1	7	451	-1	34
9	Linoleum	1	7	769	-1	17
10	Linoleum	1	-7	574	-1	23
11	Linoleum	2	67	1,272	-1	45
12	Linoleum	2	22	1,467	-1	14
13	Linoleum	2	7	1,179	-1	56
14	Linoleum	2	22	1,190	-1	17
15	Linoleum	2	7	1,169	3	23

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 1-15 are 82 dpm/100 cm^2 (alpha) and 234 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-15 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.3. SU-84 Rooms 3 and 16 Class 2 Floor Measurement Results

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	16	-7	305	-1	-18
2	Linoleum	16	7	266	-1	9
3	Linoleum	3	22	267	3	6
4	Linoleum	16	22	284	-1	3
5	Linoleum	16	37	288	-1	29
6	Linoleum	3	52	292	-1	-29
7	Linoleum	16	7	312	-1	23
8	Linoleum	16	22	272	3	29
9	Linoleum	16	52	283	-1	0
10	Linoleum	16	7	283	-1	-3
11	Linoleum	16	22	314	-1	47
12	Linoleum	16	7	303	-1	3

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 1-12 are 82 dpm/100 cm^2 (alpha) and 234 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-12 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.4. SU-85 Room 11 Class 2 Floor Measurement Results

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	11	22	1,436	3	6
2	Linoleum	11	37	1,405	-1	3
3	Linoleum	11	37	1,149	-1	8
4	Linoleum	11	22	1,477	-1	-14
5	Linoleum	11	67	1,508	-1	-6
6	Linoleum	11	97	1,395	-1	3
7	Linoleum	11	22	1,333	-1	-31
8	Linoleum	11	37	1,631	3	-8
9	Linoleum	11	22	1,313	-1	-3
10	Linoleum	11	7	1,456	-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 1-10 are 82 dpm/100 cm^2 (alpha) and 234 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-10 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.5. SU-86 Room 15 Class 2 Floor Measurement Results

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	15	22	1,138	-1	-3
2	Linoleum	15	7	769	3	20
3	Linoleum	15	37	1,231	6	-11
4	Linoleum	15	7	1,713	-1	6
5	Linoleum	15	-7	1,241	-1	0
6	Linoleum	15	22	1,662	9	-6
7	Linoleum	15	67	1,426	6	-14
8	Linoleum	15	22	1,395	-1	-39
9	Linoleum	15	37	1,364	-1	-25
10	Linoleum	15	7	1,641	-1	-6

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 1-10 are 82 dpm/100 cm^2 (alpha) and 234 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-10 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.6. SU-87 Room 17 Class 2 Floor Measurement Results

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	17	7	1,128	6	28
2	Linoleum	17	-7	585	-1	11
3	Linoleum	17	7	267	-1	42
4	Linoleum	17	-7	615	-1	37
5	Linoleum	17	22	554	-1	59
6	Linoleum	17	7	513	-1	42
7	Linoleum	17	7	533	-1	65
8	Linoleum	17	37	728	-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 cm^2 (alpha) and 234 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-8 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.7. SU-88 Room 19 Class 2 Floor Measurement Results

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	19	7	1,128	-1	59
2	Linoleum	19	7	1,487	-1	3
3	Linoleum	19	-7	1,395	3	11
4	Linoleum	19	37	1,744	-1	56
5	Linoleum	19	37	985	3	20
6	Linoleum	19	37	1,641	-1	23
7	Linoleum	19	22	1,364	-1	48
8	Linoleum	19	52	1,518	3	3
9	Linoleum	19	22	1,364	-1	73
10	Linoleum	19	7	1,128	-1	11

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 1-10 are 82 dpm/100 cm^2 (alpha) and 234 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-10 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.8. SU-89 Rooms 21 and 21A Class 2 Floor Measurement Results

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	21	22	1,703	-1	-11
2	Linoleum	21	22	1,672	3	23
3	Linoleum	21	82	1,456	3	39
4	Linoleum	21	82	1,487	-1	23
5	Linoleum	21	22	1,774	-1	34
6	Linoleum	21A	-7	1,682	-1	42
7	Linoleum	21A	-7	1,518	-1	65
8	Linoleum	21A	-7	1,682	-1	25

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 cm^2 (alpha) and 234 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-8 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Eight soil samples were collected from the floor area below the seismograph pedestal.

Table A8.9. SU-90 Room 21 Soil Sample Results

Sample Name	Am-241					Type
	Location	Result (pCi/g)	Error (pCi/g)	MDC (pCi/g)	Validation Qualifier	
SEMO-262	Soil Floor	0.36	0.10	0.10	=	Systematic
SEMO-263	Soil Floor	-0.04	0.17	0.32	U	Systematic
SEMO-264	Soil Floor	0.03	0.10	0.17	U	Systematic
SEMO-265	Soil Floor	0.03	0.08	0.13	U	Systematic
SEMO-266	Soil Floor	-0.01	0.24	0.47	U	Systematic
SEMO-267	Soil Floor	0.04	0.10	0.18	U	Systematic
SEMO-268	Soil Floor	0.19	0.13	0.23	U	Systematic
SEMO-269	Soil Floor	0.06	0.10	0.18	U	Systematic

"=" Positive result was obtained.

"U" The material was analyzed for a COPC, but it was not detected above the level of the associated value.

Table A8.10. SU-91 Rooms 23 and 23A Class 2 Floor Measurement Results

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	23	37	1,744	9	42
2	Linoleum	23	22	1,672	-1	20
3	Linoleum	23	37	1,682	-1	28
4	Linoleum	23	82	1,928	-1	14
5	Linoleum	23	7	1,908	-1	45
6	Linoleum	23	7	1,969	-1	23
7	Linoleum	23A	-7	1,323	-1	59
8	Linoleum	23A	7	1,579	3	-3
9	Linoleum	23A	37	1,949	-1	79
10	Linoleum	23A	7	1,056	-1	51

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 1-10 are 82 dpm/100 cm^2 (alpha) and 234 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-10 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.11. SU-92 Room 26 Class 2 Floor Measurement Results

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	26	37	2,656	3	-12
2	Linoleum	26	52	2,913	3	0
3	Linoleum	26	7	3,210	-1	6
4	Linoleum	26	22	2,841	-1	-6
5	Linoleum	26	52	3,087	-1	9
6	Linoleum	26	-7	2,708	-1	6
7	Linoleum	26	37	2,318	6	-12
8	Linoleum	26	67	3,497	3	-15
9	Linoleum	26	97	2,708	3	12
10	Linoleum	26	37	3,354	3	12

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 1-10 are 58 dpm/100 cm (alpha) and 233 dpm/100 cm^2 (beta); and the MDCfor removable samples 1-10 s are 15 dpm/100 cm (alpha) and 75 dpm/100 cm^2 (beta).

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

Table A8.12. SU-93 Room 28 Class 2 Floor Measurement Results

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	Concrete	28	-7	1,805	-1	-15
2	Concrete	28	-7	1,600	-1	44
3	Concrete	28	7	1,426	-1	3
4	Concrete	28	-7	1,836	-1	-3
5	Concrete	28	7	1,733	-1	15
6	Concrete	28	97	2,246	-1	50
7	Concrete	28	7	2,082	-1	12
8	Concrete	28	22	2,595	-1	20
9	Concrete	28	52	2,441	-1	-3
10	Concrete	28	82	2,421	-1	9

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 1-10 are 582 dpm/100 cm^2 (alpha) and 234 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-10 are 15 dpm/100 cm^2 (alpha) and 75 dpm/100 cm^2 (beta).

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

Table A8.13. SU-94 Room 29 Class 2 Floor Measurement Results

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	29	82	1,538	-1	-25
2	Linoleum	29	67	995	-1	6
3	Linoleum	29	67	1,292	-1	0
4	Linoleum	29	82	1,097	-1	-42
5	Linoleum	29	52	1,149	-1	23
6	Linoleum	29	52	1,610	3	-3
7	Linoleum	29	82	1,149	-1	-6
8	Linoleum	29	127	1,077	3	8

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 cm^2 (alpha) and 234 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-8 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

The walls of Rooms 001, 002, 003, 011, 016, 015, 017, 019, 021, 021A, 023, 023A, 026, 028, and 028A were surveyed as one MARSSIM Class 3 SU. The area of this SU is 550 m^2.

Table A8.14. SU-95 Basement Class 3 Wall Measurement Results

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	Drywall	11	37	390	-1	17
2	Drywall	2	7	318	-1	-31
3	Drywall	2	22	769	-1	-3
4	Drywall	2	7	236	-1	3
5	Drywall	16	22	2,718	-1	14
6	Drywall	15	-7	2,164	-1	-17
7	Drywall	3	7	687	3	8
8	Drywall	2	-7	974	-1	-11
9	Drywall	1	7	605	-1	-14
10	Drywall	26	37	1,313	-1	0
11	Drywall	17	-7	462	-1	11
12	Drywall	28	7	574	-1	-11
13	Drywall	23	7	1,067	-1	-20
14	Drywall	21A	7	954	-1	-6
15	Drywall	2	-7	903	-1	8
16	Drywall	2	22	-205	3	-6
17	Drywall	2	7	1,241	-1	-8
18	Drywall	2	7	1,149	-1	-3
19	Drywall	2	-7	1,015	3	-6
20	Drywall	2	7	933	-1	-8

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 cm^2 (alpha) and 234 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-8 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.15. SU-96 Room 25 Class 2 Floor Measurement Results

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	Concrete	25	-7	831	-1	6
2	Concrete	25	52	995	3	-6
3	Concrete	25	-7	1,221	-1	-3
4	Concrete	25	22	862	-1	-14
5	Concrete	25	7	1,179	-1	-23

Table A8.15. SU-96 Room 25 Class 2 Floor Measurement Results (Continued)

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)
6	Concrete	25	22	913	-1	-8
7	Concrete	25	7	1,087	-1	6
8	Concrete	25	22	1,528	-1	-20
9	Concrete	25	-7	872	-1	-3
10	Concrete	25	37	1,272	-1	-11

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 1-10 are 79 dpm/100 cm^2 (alpha) and 267 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-10 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.16. SU-97 Room 25 Class 2 Wall Measurement Results

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	Concrete	25	-7	503	-1	14
2	Concrete	25	7	1,877	-1	0
3	Concrete	25	-7	1,159	-1	6
4	Concrete	25	7	1,405	-1	23
5	Concrete	25	37	1,385	-1	-11
6	Concrete	25	-7	841	3	17
7	Concrete	25	7	533	-1	-28
8	Concrete	25	22	615	-1	25
9	Concrete	25	7	-103	-1	11
10	Concrete	25	-7	421	-1	6

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 1-10 are 79 dpm/100 cm^2 (alpha) and 267 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-10 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.17. SU-98 Room 13 and 13B Class 2 Floor Measurement Results

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	Concrete	13	67	1,005	-1	-8
2	Concrete	13	22	1,149	-1	3
3	Concrete	13	37	1,221	-1	-11
4	Concrete	13	37	410	-1	17
5	Concrete	13	22	892	-1	-34
6	Concrete	13	37	144	-1	-3
7	Concrete	13	67	1,108	-1	17
8	Concrete	13	22	1,149	-1	8
9	Concrete	13	52	697	-1	-34
10	Concrete	13	7	1,005	-1	-3
11	Concrete	13B	67	1,303	-1	-3
12	Concrete	13B	37	1,190	3	17
13	Concrete	13B	7	964	3	-45
14	Concrete	13B	37	933	-1	-37
15	Concrete	13B	22	851	-1	20
16	Concrete	13B	37	779	-1	17
17	Concrete	13B	52	923	-1	23

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 1-10 are 79 dpm/100 cm^2 (alpha) and 267 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-10 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.19. SU-99 Room 18 Class 2 Floor Measurement Results

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	Concrete	18	22	307	-1	-121
2	Concrete	18	52	280	-1	-115
3	Concrete	18	22	274	-1	-121
4	Concrete	18	7	292	-1	-124
5	Concrete	18	52	307	-1	-115
6	Concrete	18	37	292	3	-118
7	Concrete	18	-7	307	-1	-127
8	Concrete	18	37	310	3	-118
9	Concrete	18	37	307	-1	-118

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 1-9 are 79 dpm/100 cm^2 (alpha) and 267 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-9 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

The walls of Rooms 013, 013B and 018 were surveyed as one MARSSIM Class 3 SU. The area of this SU is 190 m^2.

Table A8.20. SU-100 Room 13, 13B and 18 Class 3 Wall Measurement Results

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	Concrete	13	7	595	-1	11
2	Concrete	13B	22	308	-1	-31
3	Concrete	18	7	215	3	17
4	Concrete	18	22	677	-1	-11
5	Concrete	18	22	410	-1	0
6	Concrete	18	37	369	-1	-17
7	Concrete	13B	22	492	-1	28
8	Concrete	13B	37	256	3	6
9	Concrete	13B	52	267	-1	28
10	Concrete	13	37	492	-1	-11
11	Concrete	13	52	379	-1	-8
12	Concrete	13	-7	246	-1	6
13	Concrete	13	7	1,692	-1	-25
14	Concrete	13	7	769	-1	3
15	Concrete	13	7	1,672	-1	17
16	Concrete	13	52	2,287	-1	3
17	Concrete	13	52	2,338	-1	20
18	Concrete	13	22	462	-1	8
19	Concrete	13	7	3,097	-1	-11
20	Concrete	13	37	2,903	3	-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 1-20 are 79 dpm/100 cm^2 (alpha) and 267 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-20 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Table A8.21. SU-101 Room 19A Class 2 Floor Measurement Results

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	Concrete	19A	22	974	-1	9
2	Concrete	19A	22	964	3	-29
3	Concrete	19A	97	1,036	-1	26
4	Concrete	19A	7	1,282	-1	15
5	Concrete	19A	37	1,518	3	-6
6	Concrete	19A	7	1,282	-1	50
7	Concrete	19A	82	923	3	-20
8	Concrete	19A	37	1,087	-1	23

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 79 dpm/100 cm^2 (alpha) and 267 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-8 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

The walls of Room 19A were surveyed as one MARSSIM Class 3 SU. The area of this SU is 45 m^2.

Table A8.22. SU-102 Room 19A Class 2 Wall Measurement Results

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	Concrete	19A	52	390	-1	0
2	Concrete	19A	37	882	6	3
3	Concrete	19A	-7	544	-1	-9
4	Concrete	19A	7	267	3	-12
5	Concrete	19A	7	503	-1	-15
6	Concrete	19A	7	369	3	-18
7	Concrete	19A	52	554	-1	-6
8	Concrete	19A	37	164	-1	-41
9	Concrete	19A	82	544	-1	-3
10	Concrete	19A	22	-533	-1	29

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 1-10 are 79 dpm/100 cm^2 (alpha) and 267 dpm/100 cm^2 (beta); and the MDCs for removable samples 1-10 are 14 dpm/100 cm^2 (alpha) and 74 dpm/100 cm^2 (beta).

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

Summary. Residual levels of radioactivity in the Magill Hall Basement clearly demonstrate that residual concentrations of radionuclide COPCs achieve the site-specific alpha DCGL of 1,160 dpm/100 cm^2 and the most restrictive beta DCGL of 5,000 dpm/100 cm^2 for Cs-137. In addition, removable activity measurements were within the range of background variability and, as such, demonstrated that the associated RESRAD inputs were sufficiently conservative.

Given these results, it is clearly demonstrated that the null hypothesis (i.e., that the Magill Hall Basement exceeds DCGLs) is rejected. Review of survey data supports the conclusion that the rooms in the Magill Hall Basement contain an adequate number of samples; a sufficient percentage have been scanned; and they have 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 the Magill Hall Basement at Southeast were below the $DCGL_W$. As such, formal assessment using the Sign Test is not required.

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

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ATTACHMENT A-8-1

FIGURES

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