

January 11, 2012

Mr. John Nicholson
U. S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

**SUBJECT: ORISE CONTRACT NO. DE-AC05-06OR23100
LETTER REPORT FOR ANALYTICAL RESULTS FOR FIFTEEN SOIL
SAMPLES FROM ABB, INC., WINDSOR, CONNECTICUT
[TAC NO. U01836/U01837] (RFTA NO. 12-001)
DCN: 2016-LR-17-0**

Dear Mr. Nicholson:

The Oak Ridge Institute for Science and Education (ORISE) received 15 soil samples on December 23, 2011 from ABB, Inc. in Windsor, Connecticut. The "Sample Name and Description" column on the NRC Form 303A for sample ABB-11-31-3 was labeled as FSS-25-02. The sample label, however, was labeled FSS-25-02-3. The samples were analyzed according to the NRC Form 303 supplied with the samples. The sample identification numbers are presented in Table 1 and the gamma spectroscopy results for the requested radionuclides are provided in Table 2. Six random samples were selected for gross alpha as directed by the NRC Form 303. The gross alpha results, along with gross beta results, for the six samples are presented in Table 3. The requested detection limit of 0.1 pCi/g for thorium-232 (Th-232) was not met for a majority of the samples. The average detection limit for the samples was 0.15 pCi/g. The Th-232 concentration was statistically positive above the requested detection limit for the samples, but it was determined that longer sample count times to further reduce the detection limit were not necessary. The formulas used to calculate total uranium are shown as a footnote in Table 2. The pertinent procedure references are included with the data tables.

ORISE's Quality Control (QC) requirements were met for these analyses. The QC files are available for your review upon request.

My contact information is listed below. You may also contact Dale Condra at 865.241.3242 with any questions or comments.

Sincerely,

Wade P. Ivey
Wade Ivey, Manager

Laboratory

WPI:RDC:bj

Enclosures

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TABLE 1
SAMPLE IDENTIFICATIONS
AND COLLECTION INFORMATION
ABB, INC.
WINDSOR, CONNECTICUT

ORISE Sample ID	NRC Region I Sample ID	Collection Date	Collection Time
2016S0314	ABB-11-30-1	12-01-11	10:35
2016S0315	ABB-11-30-2	12-01-11	10:55
2016S0316	ABB-11-30-3	12-01-11	11:05
2016S0317	ABB-11-31-1	12-09-11	10:40
2016S0318	ABB-11-31-2	12-09-11	10:50
2016S0319	ABB-11-31-3	12-09-11	11:15
2016S0320	ABB-11-31-4	12-09-11	11:35
2016S0321	ABB-11-31-5	12-09-11	11:45
2016S0322	ABB-11-31-6	12-09-11	11:55
2016S0323	ABB-11-31-7	12-09-11	12:00
2016S0324	ABB-11-31-8	12-09-11	12:25
2016S0325	ABB-11-32-1	12-14-11	14:05
2016S0326	ABB-11-32-2	12-14-11	14:15
2016S0327	ABB-11-32-3	12-14-11	14:30
2016S0328	ABB-11-32-4	12-14-11	14:40

TABLE 2
CONCENTRATIONS OF SELECTED GAMMA EMITTERS
IN SOIL SAMPLES
BY GAMMA SPECTROSCOPY CP1, REVISION 17
ABB, INC.
WINDSOR, CONNECTICUT

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations, TPU ^a , and MDCs ^b (pCi/g)					
		Th-232 by Ac-228	Ra-226 by Pb-214	Co-60	U-238 by Th-234	U-235	Total U ^c
2016S0314	ABB-11-30-1	0.82 ± 0.19 , 0.23	0.57 ± 0.09 , 0.13	0.03 ± 0.07 , 0.14	1.18 ± 0.61 , 1.40	0.10 ± 0.20 , 0.40	2.5 ± 1.2
2016S0315	ABB-11-30-2	0.76 ± 0.13 , 0.13	0.54 ± 0.06 , 0.07	0.03 ± 0.05 , 0.09	0.86 ± 0.34 , 0.74	0.20 ± 0.08 , 0.18	5.4 ± 1.8
2016S0316	ABB-11-30-3	0.48 ± 0.11 , 0.15	0.35 ± 0.05 , 0.06	0.00 ^d ± 0.04 , 0.07	0.30 ± 0.33 , 0.76	0.09 ± 0.11 , 0.22	2.3 ± 2.4
2016S0317	ABB-11-31-1	0.69 ± 0.13 , 0.16	0.48 ± 0.06 , 0.07	-0.02 ± 0.06 , 0.09	0.57 ± 0.43 , 0.98	0.04 ± 0.14 , 0.28	1.18 ± 0.87
2016S0318	ABB-11-31-2	0.90 ± 0.14 , 0.15	0.62 ± 0.06 , 0.06	-0.01 ± 0.05 , 0.08	0.90 ± 0.33 , 0.70	0.06 ± 0.08 , 0.19	1.86 ± 0.66
2016S0319	ABB-11-31-3	0.59 ± 0.12 , 0.16	0.46 ± 0.06 , 0.07	-0.02 ± 0.04 , 0.08	0.44 ± 0.32 , 0.74	0.07 ± 0.07 , 0.17	2.0 ± 1.6
2016S0320	ABB-11-31-4	0.12 ± 0.08 , 0.14	0.01 ± 0.04 , 0.11	0.00 ± 0.04 , 0.07	0.27 ± 0.31 , 0.73	0.02 ± 0.13 , 0.26	0.56 ± 0.63
2016S0321	ABB-11-31-5	0.09 ± 0.08 , 0.17	0.04 ± 0.05 , 0.10	-0.03 ± 0.04 , 0.07	0.70 ± 0.33 , 0.70	-0.07 ± 0.18 , 0.30	1.33 ± 0.68
2016S0322	ABB-11-31-6	0.98 ± 0.15 , 0.19	0.73 ± 0.07 , 0.07	0.01 ± 0.04 , 0.08	0.70 ± 0.39 , 0.89	0.00 ± 0.13 , 0.25	1.40 ± 0.79
2016S0323	ABB-11-31-7	0.25 ± 0.11 , 0.16	0.13 ± 0.05 , 0.09	0.04 ± 0.02 , 0.03	0.27 ± 0.43 , 1.00	0.07 ± 0.10 , 0.23	1.9 ± 2.2
2016S0324	ABB-11-31-8	0.63 ± 0.10 , 0.10	0.48 ± 0.05 , 0.04	0.00 ± 0.04 , 0.06	0.62 ± 0.23 , 0.52	0.06 ± 0.06 , 0.14	1.30 ± 0.46
2016S0325	ABB-11-32-1	0.97 ± 0.14 , 0.12	0.71 ± 0.07 , 0.07	-0.02 ± 0.04 , 0.07	0.90 ± 0.40 , 0.90	0.09 ± 0.07 , 0.17	1.89 ± 0.80
2016S0326	ABB-11-32-2	0.87 ± 0.14 , 0.13	0.62 ± 0.06 , 0.07	0.02 ± 0.05 , 0.08	0.89 ± 0.41 , 0.92	0.09 ± 0.13 , 0.26	1.87 ± 0.83
2016S0327	ABB-11-32-3	0.87 ± 0.12 , 0.11	0.56 ± 0.05 , 0.06	0.01 ± 0.04 , 0.07	0.79 ± 0.29 , 0.64	0.09 ± 0.15 , 0.26	1.67 ± 0.60
2016S0328	ABB-11-32-4	0.76 ± 0.13 , 0.15	0.61 ± 0.06 , 0.05	-0.01 ± 0.04 , 0.06	0.23 ± 0.35 , 0.84	0.07 ± 0.12 , 0.23	1.8 ± 2.6

^aUncertainties represent the 95% confidence level, based on total propagated uncertainties

^bMDCs are after the commas.

^cTotal uranium is calculated using either U-238*2 + U-235 for natural uranium or U-238 + U-235 + U-235*(21.7) for enriched uranium

^dZero values are due to rounding or sample and background having equal counts.

TABLE 3
CONCENTRATIONS OF GROSS ALPHA AND GROSS BETA
IN SOIL SAMPLES
BY GAS FLOW PROPORTIONAL COUNTING
AP1, REVISION 17; CP3, REVISION 3
ABB, INC.
WINDSOR, CONNECTICUT

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations, TPU ^a , and MDCs ^b (pCi/g)	
		Gross Alpha	Gross Beta
2016S0314	ABB-11-30-1	14.4 ± 3.4 , 2.9	23.2 ± 3.1 , 3.8
2016S0317	ABB-11-31-1	6.7 ± 2.6 , 3.0	21.0 ± 2.9 , 3.7
2016S0320	ABB-11-31-4	1.7 ± 1.4 , 2.1	4.8 ± 2.3 , 3.6
2016S0323	ABB-11-31-7	4.5 ± 1.9 , 2.3	8.5 ± 2.5 , 3.7
2016S0326	ABB-11-32-2	9.4 ± 3.0 , 3.0	25.5 ± 3.1 , 3.7
2016S0328	ABB-11-32-4	7.7 ± 2.8 , 3.1	21.1 ± 3.0 , 3.8

^aUncertainties represent the 95% confidence level, based on total propagated uncertainties.

^bThe MDCs are after the comma.