



November 12, 2015

Mr. Gene Bonano
U.S. Nuclear Regulatory Commission
Region III
2443 Warrenville Road
Lisle, IL 60532-4351

**SUBJECT: ORISE CONTRACT NO. DE-AC05-06OR23100
LETTER REPORT FOR ANALYTICAL RESULTS FOR THIRTY SIX SOIL
SAMPLES ASSOCIATED WITH THE WESTINGHOUSE HEMATITE
DECOMMISSIONING PROJECT IN FESTUS, MISSOURI
[TAC NO. 07000036/2015003] [DOCKET NO. 070-00036](RFTA NO. 16-001)
DCN: 5279-LR-01-0**

Dear Mr. Bonano:

Oak Ridge Associated Universities (ORAU), under the Oak Ridge Institute for Science and Education (ORISE) contract, received thirty six soil samples on October 12, 2015 from the Westinghouse Hematite Decommissioning project in Festus, Missouri. The samples were received in good condition. Per the NRC Form 303 that was sent with the samples, the samples were analyzed for uranium-235, uranium-238, radium-226, and thorium-232 by gamma spectrometry, and technetium-99 by liquid scintillation counting. The analytical data are presented in the attached reports. A case narrative is included to detail the instructions given to the laboratory and to provide information regarding the analytical data. The pertinent procedure references are included with the data tables.

ORAU'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 Forrest Smith at 865.574.9802 with any questions or comments.

Sincerely,

Wade P. Ivey
Wade Ivey, Manager

Laboratory
WPI:WFS:km

Enclosures

Electronic: T. Carter, NRC S. Roberts, ORAU T. Vitkus, ORAU File 10855

Distribution approval and concurrence:	Initials
Quality Review	YB
Technical Review	DAK



CASE NARRATIVE

5279-LR-01-0

Gamma Spectrometry:

The samples were analyzed using ORAU/REAL standard operating procedure (SOP) CP1, revision 19. The radionuclides of concern (ROC) requested and the identifying isotopes and peak energies used to quantify the ROCs are listed in the table below. Per conversation with the NRC, radium-226 (Ra-226) was quantified using the progeny without waiting for full ingrowth of the daughters.

Radionuclide of Concern	Identifying Radionuclide	Peak Energy (keV)
Ra-226	Pb-214	351.9
Th-232	Ac-228	911.2
U-235	U-235	143.8
U-238	Th-234	63.3

Uranium-234 (U-234) was a requested analyte. However, at low activity, U-234 cannot be quantified by gamma spectrometry. Per a phone conversation with the NRC inspector, alpha spectrometry was not requested for the samples. Therefore, U-234 results are not presented in the data tables.

Total uranium and percent enrichment (% U-235, by weight) were requested by the NRC inspector. For these calculations, the laboratory had to determine whether or not the samples were natural or enriched with uranium. This was performed by an in-house determination by comparison of the results versus the minimum detectable concentrations and the U-238/U-235 activity ratios. All samples were determined to be natural except one (HEM-15-2-28). The total uranium was calculated based upon the following equations:

$$\text{Natural U: Total U} = \text{U-235} + (2 * \text{U-238})$$

$$\text{Enriched U: Total U} = \text{U-235} + \text{U-238} + (21.7 * \text{U-235})$$

Two samples, HEM-15-2-35 and HEM-15-2-36, had very low concentrations of uranium, thorium, and radium. Because of these low levels (lower than typical soils), the percent enrichment of U-235 appear to be elevated. These data need to be used with caution.

Technetium-99:

The samples were analyzed using ORAU/REAL SOP AP5, revision 21. Sample HEM-15-2-28 was slightly elevated in Tc-99. There were no deviations from the SOP and all quality control samples were within acceptable limits.

Sum of Fractions:

The sum of fraction (SOF) calculation for the samples was requested by the NRC inspector via a phone conversation. The SOF data is presented in the data tables. There were no samples with a SOF greater than unity.

Gamma Spectrometry Summary Results By Analyte



Report Date: November 10, 2015

Analyte:	Ra-226 by Pb-214	SOP (Rev. #)	CP1 (19)
Project Name:	Hematite-Lab Only-Oct-2015	Energy Signature:	351.93 (KeV)
Project #:	201210855	SDG #:	201210855-1

Client Sample ID:	Lab Sample ID:	Result	TPU (2σ)	MDC	Units	Qualifier Flag	Batch #
HEM-15-2-01	10855S0001	0.808	0.086	0.091	pCi/g		GS0130
HEM-15-2-02	10855S0002	0.791	0.069	0.061	pCi/g		GS0130
HEM-15-2-03	10855S0003	0.687	0.070	0.067	pCi/g		GS0130
HEM-15-2-04	10855S0004	0.658	0.068	0.079	pCi/g		GS0130
HEM-15-2-05	10855S0005	0.569	0.061	0.061	pCi/g		GS0130
HEM-15-2-06	10855S0006	0.584	0.053	0.046	pCi/g		GS0130
HEM-15-2-07	10855S0007	0.784	0.074	0.067	pCi/g		GS0130
HEM-15-2-08	10855S0008	0.880	0.078	0.074	pCi/g		GS0130
HEM-15-2-09	10855S0009	0.848	0.099	0.110	pCi/g		GS0130
HEM-15-2-10	10855S0010	0.617	0.058	0.055	pCi/g		GS0130
HEM-15-2-11	10855S0011	0.716	0.068	0.065	pCi/g		GS0130
HEM-15-2-12	10855S0012	0.795	0.071	0.072	pCi/g		GS0130
HEM-15-2-13	10855S0013	0.875	0.085	0.079	pCi/g		GS0130
HEM-15-2-14	10855S0014	0.787	0.068	0.059	pCi/g		GS0130
HEM-15-2-15	10855S0015	0.772	0.068	0.058	pCi/g		GS0130
HEM-15-2-16	10855S0016	0.797	0.071	0.068	pCi/g		GS0130
HEM-15-2-17	10855S0017	0.802	0.080	0.079	pCi/g		GS0130
HEM-15-2-18	10855S0018	0.725	0.062	0.056	pCi/g		GS0130
HEM-15-2-19	10855S0019	0.762	0.068	0.057	pCi/g		GS0130
HEM-15-2-20	10855S0020	0.845	0.075	0.072	pCi/g		GS0130
HEM-15-2-21	10855S0021	0.849	0.083	0.076	pCi/g		GS0131
HEM-15-2-22	10855S0022	0.810	0.067	0.062	pCi/g		GS0131
HEM-15-2-23	10855S0023	0.764	0.088	0.059	pCi/g		GS0131
HEM-15-2-24	10855S0024	0.876	0.081	0.083	pCi/g		GS0131
HEM-15-2-25	10855S0025	0.894	0.083	0.072	pCi/g		GS0131
HEM-15-2-26	10855S0026	0.846	0.075	0.071	pCi/g		GS0131
HEM-15-2-27	10855S0027	0.994	0.084	0.073	pCi/g		GS0131
HEM-15-2-28	10855S0028	0.878	0.087	0.090	pCi/g		GS0131
HEM-15-2-29	10855S0029	0.900	0.074	0.066	pCi/g		GS0131
HEM-15-2-30	10855S0030	0.825	0.072	0.058	pCi/g		GS0131
HEM-15-2-31	10855S0031	0.877	0.073	0.074	pCi/g		GS0131

Qualifier Flags:

U = Analyte not detected (< MDC)

TPU = Total Propagated Uncertainty
MDC = Minimum Detectable Concentration

Gamma Spectrometry Summary Results By Analyte



Report Date: November 10, 2015

Analyte:	Ra-226 by Pb-214	SOP (Rev. #)	CP1 (19)
Project Name:	Hematite-Lab Only-Oct-2015	Energy Signature:	351.93 (KeV)
Project #:	201210855	SDG #:	201210855-1

Client Sample ID:	Lab Sample ID:	Result	TPU (2s)	MDC	Units	Qualifier Flag	Batch #
HEM-15-2-32	10855S0032	0.967	0.091	0.085	pCi/g		GS0131
HEM-15-2-33	10855S0033	0.954	0.076	0.063	pCi/g		GS0131
HEM-15-2-34	10855S0034	0.973	0.084	0.069	pCi/g		GS0131
HEM-15-2-35	10855S0035	0.145	0.028	0.045	pCi/g		GS0131
HEM-15-2-36	10855S0036	0.226	0.038	0.049	pCi/g		GS0131

Electronically Validated By:
John Cox- 10/15/2015 15:08

Electronically Approved By:

Wade R Ivey

Wade Ivey 11/10/2015 11:25

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Gamma Spectrometry Summary Results By Analyte



Report Date: November 10, 2015

Analyte:	Th-232 by Ac-228	SOP (Rev. #)	CP1 (19)
Project Name:	Hematite-Lab Only-Oct-2015	Energy Signature:	911.20 (KeV)
Project #:	201210855	SDG #:	201210855-1

Client Sample ID:	Lab Sample ID:	Result	TPU (2s)	MDC	Units	Qualifier Flag	Batch #
HEM-15-2-01	10855S0001	0.95	0.16	0.20	pCi/g		GS0130
HEM-15-2-02	10855S0002	1.07	0.14	0.13	pCi/g		GS0130
HEM-15-2-03	10855S0003	0.92	0.14	0.14	pCi/g		GS0130
HEM-15-2-04	10855S0004	0.87	0.13	0.14	pCi/g		GS0130
HEM-15-2-05	10855S0005	0.65	0.11	0.13	pCi/g		GS0130
HEM-15-2-06	10855S0006	0.87	0.11	0.11	pCi/g		GS0130
HEM-15-2-07	10855S0007	0.94	0.14	0.14	pCi/g		GS0130
HEM-15-2-08	10855S0008	1.03	0.14	0.15	pCi/g		GS0130
HEM-15-2-09	10855S0009	1.03	0.19	0.24	pCi/g		GS0130
HEM-15-2-10	10855S0010	0.87	0.12	0.12	pCi/g		GS0130
HEM-15-2-11	10855S0011	1.11	0.15	0.15	pCi/g		GS0130
HEM-15-2-12	10855S0012	1.27	0.15	0.13	pCi/g		GS0130
HEM-15-2-13	10855S0013	1.18	0.17	0.18	pCi/g		GS0130
HEM-15-2-14	10855S0014	1.27	0.15	0.14	pCi/g		GS0130
HEM-15-2-15	10855S0015	1.01	0.14	0.11	pCi/g		GS0130
HEM-15-2-16	10855S0016	1.13	0.14	0.14	pCi/g		GS0130
HEM-15-2-17	10855S0017	0.90	0.15	0.19	pCi/g		GS0130
HEM-15-2-18	10855S0018	1.02	0.13	0.13	pCi/g		GS0130
HEM-15-2-19	10855S0019	0.95	0.13	0.12	pCi/g		GS0130
HEM-15-2-20	10855S0020	1.04	0.14	0.13	pCi/g		GS0130
HEM-15-2-21	10855S0021	1.03	0.16	0.18	pCi/g		GS0131
HEM-15-2-22	10855S0022	1.19	0.14	0.13	pCi/g		GS0131
HEM-15-2-23	10855S0023	1.09	0.14	0.13	pCi/g		GS0131
HEM-15-2-24	10855S0024	1.07	0.15	0.15	pCi/g		GS0131
HEM-15-2-25	10855S0025	1.07	0.16	0.16	pCi/g		GS0131
HEM-15-2-26	10855S0026	1.15	0.15	0.13	pCi/g		GS0131
HEM-15-2-27	10855S0027	1.31	0.16	0.14	pCi/g		GS0131
HEM-15-2-28	10855S0028	1.11	0.16	0.17	pCi/g		GS0131
HEM-15-2-29	10855S0029	1.26	0.15	0.13	pCi/g		GS0131
HEM-15-2-30	10855S0030	1.12	0.15	0.12	pCi/g		GS0131
HEM-15-2-31	10855S0031	1.09	0.13	0.14	pCi/g		GS0131

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Gamma Spectrometry Summary Results By Analyte



Report Date: November 10, 2015

Analyte:	Th-232 by Ac-228	SOP (Rev. #)	CP1 (19)
Project Name:	Hematite-Lab Only-Oct-2015	Energy Signature:	911.20 (KeV)
Project # :	201210855	SDG # :	201210855-1

Client Sample ID:	Lab Sample ID:	Result	TPU (2s)	MDC	Units	Qualifier Flag	Batch #
HEM-15-2-32	10855S0032	1.23	0.17	0.18	pCi/g		GS0131
HEM-15-2-33	10855S0033	1.36	0.16	0.13	pCi/g		GS0131
HEM-15-2-34	10855S0034	1.27	0.17	0.17	pCi/g		GS0131
HEM-15-2-35	10855S0035	0.100	0.042	0.077	pCi/g		GS0131
HEM-15-2-36	10855S0036	0.262	0.068	0.077	pCi/g		GS0131

Electronically Validated By:
John Cox- 10/15/2015 15:08

Electronically Approved By:

Wade R. Ivey

Wade Ivey 11/10/2015 11:25

Qualifier Flags:

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TPU = Total Propagated Uncertainty

MDC = Minimum Detectable Concentration

Gamma Spectrometry Summary Results By Analyte



Report Date: November 10, 2015

Analyte:	U-235	SOP (Rev. #)	CP1 (19)
Project Name:	Hematite-Lab Only-Oct-2015	Energy Signature:	143.76 (KeV)
Project #:	201210855	SDG #:	201210855-1

Client Sample ID:	Lab Sample ID:	Result	TPU (2σ)	MDC	Units	Qualifier Flag	Batch #
HEM-15-2-01	10855S0001	0.100	0.079	0.180	pCi/g	U	GS0130
HEM-15-2-02	10855S0002	0.135	0.072	0.160	pCi/g	U	GS0130
HEM-15-2-03	10855S0003	0.089	0.076	0.174	pCi/g	U	GS0130
HEM-15-2-04	10855S0004	0.245	0.099	0.214	pCi/g	U	GS0130
HEM-15-2-05	10855S0005	0.106	0.071	0.160	pCi/g	U	GS0130
HEM-15-2-06	10855S0006	0.031	0.056	0.135	pCi/g	U	GS0130
HEM-15-2-07	10855S0007	0.067	0.070	0.162	pCi/g	U	GS0130
HEM-15-2-08	10855S0008	0.098	0.098	0.229	pCi/g	U	GS0130
HEM-15-2-09	10855S0009	0.22	0.14	0.31	pCi/g	U	GS0130
HEM-15-2-10	10855S0010	0.077	0.092	0.222	pCi/g	U	GS0130
HEM-15-2-11	10855S0011	0.087	0.075	0.174	pCi/g	U	GS0130
HEM-15-2-12	10855S0012	0.113	0.081	0.184	pCi/g	U	GS0130
HEM-15-2-13	10855S0013	0.147	0.082	0.183	pCi/g	U	GS0130
HEM-15-2-14	10855S0014	0.12	0.10	0.25	pCi/g	U	GS0130
HEM-15-2-15	10855S0015	-0.00	0.10	0.24	pCi/g	U	GS0130
HEM-15-2-16	10855S0016	0.115	0.067	0.237	pCi/g	U	GS0130
HEM-15-2-17	10855S0017	0.06	0.12	0.28	pCi/g	U	GS0130
HEM-15-2-18	10855S0018	0.058	0.094	0.224	pCi/g	U	GS0130
HEM-15-2-19	10855S0019	-0.03	0.11	0.25	pCi/g	U	GS0130
HEM-15-2-20	10855S0020	0.080	0.093	0.218	pCi/g	U	GS0130
HEM-15-2-21	10855S0021	0.149	0.086	0.193	pCi/g	U	GS0131
HEM-15-2-22	10855S0022	0.125	0.068	0.152	pCi/g	U	GS0131
HEM-15-2-23	10855S0023	0.087	0.074	0.171	pCi/g	U	GS0131
HEM-15-2-24	10855S0024	0.059	0.085	0.202	pCi/g	U	GS0131
HEM-15-2-25	10855S0025	0.061	0.072	0.170	pCi/g	U	GS0131
HEM-15-2-26	10855S0026	0.084	0.074	0.171	pCi/g	U	GS0131
HEM-15-2-27	10855S0027	0.22	0.10	0.23	pCi/g	U	GS0131
HEM-15-2-28	10855S0028	0.417	0.099	0.190	pCi/g	U	GS0131
HEM-15-2-29	10855S0029	0.193	0.077	0.168	pCi/g	U	GS0131
HEM-15-2-30	10855S0030	0.256	0.075	0.150	pCi/g	U	GS0131
HEM-15-2-31	10855S0031	0.01	0.13	0.31	pCi/g	U	GS0131

Qualifier Flags:

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Gamma Spectrometry Summary Results By Analyte



Report Date: November 10, 2015

Analyte:	U-235	SOP (Rev. #)	CP1 (19)
Project Name:	Hematite-Lab Only-Oct-2015	Energy Signature:	143.76 (KeV)
Project # :	201210855	SDG # :	201210855-1

Client Sample ID:	Lab Sample ID:	Result	TPU (2s)	MDC	Units	Qualifier Flag	Batch #
HEM-15-2-32	10855S0032	0.305	0.095	0.195	pCi/g		GS0131
HEM-15-2-33	10855S0033	0.03	0.11	0.26	pCi/g	U	GS0131
HEM-15-2-34	10855S0034	0.116	0.084	0.191	pCi/g	U	GS0131
HEM-15-2-35	10855S0035	0.088	0.074	0.183	pCi/g	U	GS0131
HEM-15-2-36	10855S0036	0.096	0.051	0.110	pCi/g	U	GS0131

Electronically Validated By:
John Cox- 10/15/2015 15:08

Electronically Approved By:

Wade P. Ivey

Wade Ivey 11/10/2015 11:25

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Gamma Spectrometry Summary Results By Analyte



Report Date: November 10, 2015

Analyte:	U-238 by Th-234	SOP (Rev. #)	CP1 (19)
Project Name:	Hematite-Lab Only-Oct-2015	Energy Signature:	63.29 (KeV)
Project #:	201210855	SDG #:	201210855-1

Client Sample ID:	Lab Sample ID:	Result	TPU (2s)	MDC	Units	Qualifier Flag	Batch #
HEM-15-2-01	10855S0001	1.04	0.44	0.83	pCi/g		GS0130
HEM-15-2-02	10855S0002	2.11	0.60	0.78	pCi/g		GS0130
HEM-15-2-03	10855S0003	1.33	0.44	0.69	pCi/g		GS0130
HEM-15-2-04	10855S0004	1.66	0.77	1.49	pCi/g		GS0130
HEM-15-2-05	10855S0005	0.98	0.36	0.63	pCi/g		GS0130
HEM-15-2-06	10855S0006	1.20	0.40	0.64	pCi/g		GS0130
HEM-15-2-07	10855S0007	1.38	0.45	0.71	pCi/g		GS0130
HEM-15-2-08	10855S0008	1.53	0.77	1.53	pCi/g	U	GS0130
HEM-15-2-09	10855S0009	1.82	0.62	1.00	pCi/g		GS0130
HEM-15-2-10	10855S0010	0.77	0.33	0.62	pCi/g		GS0130
HEM-15-2-11	10855S0011	1.43	0.45	0.69	pCi/g		GS0130
HEM-15-2-12	10855S0012	1.54	0.74	1.45	pCi/g		GS0130
HEM-15-2-13	10855S0013	1.85	0.57	0.84	pCi/g		GS0130
HEM-15-2-14	10855S0014	1.24	0.44	0.77	pCi/g		GS0130
HEM-15-2-15	10855S0015	1.07	0.38	0.63	pCi/g		GS0130
HEM-15-2-16	10855S0016	0.95	0.69	1.52	pCi/g	U	GS0130
HEM-15-2-17	10855S0017	1.60	0.50	0.74	pCi/g		GS0130
HEM-15-2-18	10855S0018	1.05	0.40	0.72	pCi/g		GS0130
HEM-15-2-19	10855S0019	1.19	0.41	0.67	pCi/g		GS0130
HEM-15-2-20	10855S0020	2.4	1.1	2.4	pCi/g	U	GS0130
HEM-15-2-21	10855S0021	1.49	0.53	0.91	pCi/g		GS0131
HEM-15-2-22	10855S0022	1.58	0.49	0.75	pCi/g		GS0131
HEM-15-2-23	10855S0023	1.35	0.43	0.67	pCi/g		GS0131
HEM-15-2-24	10855S0024	2.08	0.88	1.62	pCi/g		GS0131
HEM-15-2-25	10855S0025	1.90	0.59	0.89	pCi/g		GS0131
HEM-15-2-26	10855S0026	1.22	0.41	0.67	pCi/g		GS0131
HEM-15-2-27	10855S0027	1.00	0.75	1.66	pCi/g	U	GS0131
HEM-15-2-28	10855S0028	2.65	0.72	0.88	pCi/g		GS0131
HEM-15-2-29	10855S0029	1.66	0.50	0.72	pCi/g		GS0131
HEM-15-2-30	10855S0030	1.59	0.48	0.69	pCi/g		GS0131
HEM-15-2-31	10855S0031	1.16	0.58	1.19	pCi/g	U	GS0131

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Gamma Spectrometry Summary Results By Analyte



Report Date: November 10, 2015

Analyte:	U-238 by Th-234	SOP (Rev. #)	CP1 (19)
Project Name:	Hematite-Lab Only-Oct-2015	Energy Signature:	63.29 (KeV)
Project # :	201210855	SDG # :	201210855-1

Client Sample ID:	Lab Sample ID:	Result	TPU (2s)	MDC	Units	Qualifier Flag	Batch #
HEM-15-2-32	10855S0032	1.51	0.52	0.85	pCi/g		GS0131
HEM-15-2-33	10855S0033	1.58	0.52	0.83	pCi/g		GS0131
HEM-15-2-34	10855S0034	1.43	0.47	0.74	pCi/g		GS0131
HEM-15-2-35	10855S0035	0.25	0.29	0.67	pCi/g	U	GS0131
HEM-15-2-36	10855S0036	0.25	0.20	0.45	pCi/g	U	GS0131

Electronically Validated By:
John Cox- 10/15/2015 15:08

Electronically Approved By:

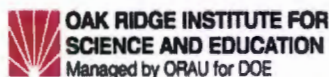
Wade R. Ivey

Wade Ivey 11/10/2015 11:25

Qualifier Flags:
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TPU = Total Propagated Uncertainty
MDC = Minimum Detectable Concentration

Summary Results by Analyte



Analyte: U-Total and % U-235 by Weight SOP (Rev. #): CP1 (19) Report Date: 11/10/2015
 Project Name: Hematite-Lab Only-Oct-2015
 Project #: 201210855 SDG #: 201210855-1

Client Sample ID	Lab Sample ID	Result*	TPU(2s)	Units	% U-235 by wt.	Batch #
HEM-15-2-01	10855S0001	2.18	0.88	pCi/g	1.47%	GS0130
HEM-15-2-02	10855S0002	4.4	1.2	pCi/g	0.98%	GS0130
HEM-15-2-03	10855S0003	2.75	0.88	pCi/g	1.03%	GS0130
HEM-15-2-04	10855S0004	3.6	1.5	pCi/g	2.24%	GS0130
HEM-15-2-05	10855S0005	2.07	0.72	pCi/g	1.65%	GS0130
HEM-15-2-06	10855S0006	2.43	0.80	pCi/g	0.40%	GS0130
HEM-15-2-07	10855S0007	2.83	0.90	pCi/g	0.75%	GS0130
HEM-15-2-08	10855S0008	3.2	1.5	pCi/g	0.99%	GS0130
HEM-15-2-09	10855S0009	3.9	1.2	pCi/g	1.84%	GS0130
HEM-15-2-10	10855S0010	1.62	0.67	pCi/g	1.53%	GS0130
HEM-15-2-11	10855S0011	2.95	0.90	pCi/g	0.94%	GS0130
HEM-15-2-12	10855S0012	3.2	1.5	pCi/g	1.13%	GS0130
HEM-15-2-13	10855S0013	3.8	1.1	pCi/g	1.22%	GS0130
HEM-15-2-14	10855S0014	2.60	0.89	pCi/g	1.48%	GS0130
HEM-15-2-15	10855S0015	2.14	0.77	pCi/g	0.01%	GS0130
HEM-15-2-16	10855S0016	2.0	1.4	pCi/g	1.85%	GS0130
HEM-15-2-17	10855S0017	3.3	1.0	pCi/g	0.58%	GS0130
HEM-15-2-18	10855S0018	2.16	0.81	pCi/g	0.85%	GS0130
HEM-15-2-19	10855S0019	2.35	0.83	pCi/g	-0.39%	GS0130
HEM-15-2-20	10855S0020	4.9	2.2	pCi/g	0.52%	GS0130
HEM-15-2-21	10855S0021	3.1	1.1	pCi/g	1.53%	GS0131
HEM-15-2-22	10855S0022	3.29	0.98	pCi/g	1.21%	GS0131
HEM-15-2-23	10855S0023	2.79	0.86	pCi/g	0.99%	GS0131
HEM-15-2-24	10855S0024	4.2	1.8	pCi/g	0.44%	GS0131
HEM-15-2-25	10855S0025	3.9	1.2	pCi/g	0.50%	GS0131
HEM-15-2-26	10855S0026	2.52	0.82	pCi/g	1.06%	GS0131
HEM-15-2-27	10855S0027	2.2	1.5	pCi/g	3.31%	GS0131
HEM-15-2-28	10855S0028	12.1**	2.3	pCi/g	2.39%	GS0131
HEM-15-2-29	10855S0029	3.5	1.0	pCi/g	1.78%	GS0131
HEM-15-2-30	10855S0030	3.44	0.96	pCi/g	2.44%	GS0131
HEM-15-2-31	10855S0031	2.3	1.2	pCi/g	0.13%	GS0131
HEM-15-2-32	10855S0032	3.3	1.0	pCi/g	3.04%	GS0131
HEM-15-2-33	10855S0033	3.2	1.0	pCi/g	0.29%	GS0131
HEM-15-2-34	10855S0034	2.98	0.94	pCi/g	1.25%	GS0131
HEM-15-2-35	10855S0035	0.59	0.58	pCi/g	5.19%	GS0131
HEM-15-2-36	10855S0036	0.60	0.40	pCi/g	5.63%	GS0131

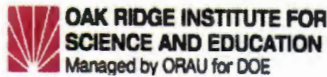
*Total U calculated by: U-total = U-235 + (2 * U-238)

**Total U calculated by: U-total = U-235 + U-238 + (21.7 * U-235)

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Wade

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 ou=Standard Accounts,
 ou=UserAccts, cn=Ivey, Wade,
 email=Wade.Ivey@orau.org
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Summary Results by Analyte



Analyte: Tc-99
Project Name: Hematite-Lab Only-Oct-2015
Project #: 201210855

SOP (Rev. #): AP5 (21) Report Date: 11/10/2015
SDG #: 201210855-1

Client Sample ID	Lab Sample ID	Result	TPU(2s)	MDC	Units	Batch #
HEM-15-2-01	10855S0001	0.28	0.19	0.31	pCi/g	Tc0138
HEM-15-2-02	10855S0002	0.26	0.19	0.32	pCi/g	Tc0138
HEM-15-2-03	10855S0003	1.27	0.24	0.32	pCi/g	Tc0138
HEM-15-2-04	10855S0004	0.32	0.19	0.31	pCi/g	Tc0138
HEM-15-2-05	10855S0005	0.43	0.20	0.31	pCi/g	Tc0138
HEM-15-2-06	10855S0006	0.24	0.18	0.30	pCi/g	Tc0138
HEM-15-2-07	10855S0007	0.05	0.18	0.32	pCi/g	Tc0138
HEM-15-2-08	10855S0008	0.26	0.19	0.31	pCi/g	Tc0138
HEM-15-2-09	10855S0009	1.05	0.23	0.30	pCi/g	Tc0138
HEM-15-2-10	10855S0010	0.05	0.18	0.32	pCi/g	Tc0138
HEM-15-2-11	10855S0011	0.10	0.18	0.31	pCi/g	Tc0138
HEM-15-2-12	10855S0012	0.13	0.18	0.31	pCi/g	Tc0138
HEM-15-2-13	10855S0013	-0.12	0.18	0.33	pCi/g	Tc0140
HEM-15-2-14	10855S0014	0.02	0.19	0.34	pCi/g	Tc0140
HEM-15-2-15	10855S0015	-0.18	0.18	0.33	pCi/g	Tc0140
HEM-15-2-16	10855S0016	-0.07	0.19	0.34	pCi/g	Tc0140
HEM-15-2-17	10855S0017	-0.03	0.19	0.33	pCi/g	Tc0140
HEM-15-2-18	10855S0018	-0.07	0.19	0.34	pCi/g	Tc0140
HEM-15-2-19	10855S0019	-0.10	0.18	0.33	pCi/g	Tc0140
HEM-15-2-20	10855S0020	-0.06	0.19	0.33	pCi/g	Tc0140
HEM-15-2-21	10855S0021	0.00	0.19	0.34	pCi/g	Tc0140
HEM-15-2-22	10855S0022	-0.10	0.19	0.34	pCi/g	Tc0140
HEM-15-2-23	10855S0023	-0.15	0.18	0.34	pCi/g	Tc0140
HEM-15-2-24	10855S0024	-0.09	0.19	0.34	pCi/g	Tc0140
HEM-15-2-25	10855S0025	0.04	0.18	0.32	pCi/g	Tc0144
HEM-15-2-26	10855S0026	-0.11	0.18	0.32	pCi/g	Tc0144
HEM-15-2-27	10855S0027	0.26	0.19	0.31	pCi/g	Tc0144
HEM-15-2-28	10855S0028	3.67	0.34	0.32	pCi/g	Tc0144
HEM-15-2-29	10855S0029	0.08	0.19	0.32	pCi/g	Tc0144
HEM-15-2-30	10855S0030	0.60	0.21	0.32	pCi/g	Tc0144
HEM-15-2-31	10855S0031	0.06	0.19	0.32	pCi/g	Tc0144
HEM-15-2-32	10855S0032	0.06	0.18	0.32	pCi/g	Tc0144
HEM-15-2-33	10855S0033	0.08	0.19	0.32	pCi/g	Tc0144
HEM-15-2-34	10855S0034	0.17	0.19	0.31	pCi/g	Tc0144
HEM-15-2-35	10855S0035	0.09	0.18	0.32	pCi/g	Tc0144
HEM-15-2-36	10855S0036	0.11	0.19	0.32	pCi/g	Tc0144

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Wade

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ou=Standard Accounts,
ou=UserAccts, cn=Ivey, Wade,
email=Wade.Ivey@orau.org
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Summary Results by Analyte



Analyte: Sum of Fractions (SOF) SOP (Rev. #): N/A Report Date: 11/10/2015
 Project Name: Hematite-Lab Only-Oct-2015
 Project #: 201210855 SDG #: 201210855-1

Client Sample ID	Lab Sample ID	Result
HEM-15-2-01	10855S0001	0.02
HEM-15-2-02	10855S0002	0.07
HEM-15-2-03	10855S0003	0.07
HEM-15-2-04	10855S0004	0.04
HEM-15-2-05	10855S0005	0.03
HEM-15-2-06	10855S0006	0.02
HEM-15-2-07	10855S0007	0.02
HEM-15-2-08	10855S0008	0.04
HEM-15-2-09	10855S0009	0.08
HEM-15-2-10	10855S0010	0.01
HEM-15-2-11	10855S0011	0.08
HEM-15-2-12	10855S0012	0.16
HEM-15-2-13	10855S0013	0.11
HEM-15-2-14	10855S0014	0.15
HEM-15-2-15	10855S0015	0.01
HEM-15-2-16	10855S0016	0.07
HEM-15-2-17	10855S0017	0.02
HEM-15-2-18	10855S0018	0.02
HEM-15-2-19	10855S0019	0.01
HEM-15-2-20	10855S0020	0.05
HEM-15-2-21	10855S0021	0.03
HEM-15-2-22	10855S0022	0.11
HEM-15-2-23	10855S0023	0.06
HEM-15-2-24	10855S0024	0.06
HEM-15-2-25	10855S0025	0.06
HEM-15-2-26	10855S0026	0.09
HEM-15-2-27	10855S0027	0.23
HEM-15-2-28	10855S0028	0.24
HEM-15-2-29	10855S0029	0.16
HEM-15-2-30	10855S0030	0.11
HEM-15-2-31	10855S0031	0.06
HEM-15-2-32	10855S0032	0.18
HEM-15-2-33	10855S0033	0.23
HEM-15-2-34	10855S0034	0.20
HEM-15-2-35	10855S0035	0.01
HEM-15-2-36	10855S0036	0.01

Ivey,
Wade

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 ou=Standard Accounts,
 ou=UserAccts, cn=Ivey, Wade,
 email=Wade.Ivey@orau.org
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