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Our ref: HEM-10-86
Date: August 30, 2010

Subject: Information Concerning Radium in Hematite Area Residential Wells
(License No. SNM-00033, Docket No. 070-00036)

This letter is in response to NRC's request to provide additional information related to radiological analytical results of residential groundwater well sampling in the Hematite area.

The Missouri Department of Health and Senior Services (MDHSS) provides testing and laboratory analytical services for residential wells in the vicinity of the Hematite facility. The results of MDHSS's April 2010 testing identified low levels of radium in some nearby residential wells.

As requested by NRC inspectors during a recent conversation, Attachment 1 discusses the recent analytical results for radium-226, along with that of other pertinent Hematite radionuclides. Radium is often found in bedrock aquifers throughout the region surrounding Hematite; sometimes in concentrations that exceed the regulatory drinking water standard. The radium detected in the recent residential well sampling is consistent with that found in the area. Sampling performed by Westinghouse of on-site groundwater wells indicates that radium is not present as a site source for the contaminant. It is therefore concluded that the radium observed recently in nearby residential wells is consistent with the concentrations found in nature and does not appear to originate from a source at the site.

Please contact Gerald Rood, Radiation Safety Officer of my staff at 314-810-3382 should you have questions or need any additional information.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Kurt Hackmann', with a stylized flourish at the end.

E. Kurt Hackmann
Director, Hematite Decommissioning Project

HEM-10-86

Date: August 30, 2010

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Attachment: 1) Radium in Hematite Area Residential Wells

cc: E. Gilstrap, MDNR, w/ attachment
J. J. Hayes, NRC/FSME/DWMEP/DURLD, w/ attachment
J. W. Smetanka, Westinghouse, w/o attachment
J. E. Tapp, NRC Region III/DNMS/MCID, w/ attachment
W. J. Slawinski, NRC Region III/DNMS/MCID, w/ attachment

ATTACHMENT 1

Radium in Hematite Area Residential Wells

Westinghouse Electric Company LLC, Hematite Decommissioning Project

Docket No. 070-00036

The Missouri Department of Health and Senior Services (MDHSS) recently (April 2010) provided testing and laboratory analytical services for residential groundwater wells in the vicinity of the Hematite Facility. Some of the water samples collected at residences located near the Westinghouse Hematite facility showed radium at concentrations that exceeded the regulatory drinking water standard of 5 pCi/l (i.e., Maximum Concentration Level = 5 pCi/l for Ra-226 plus Ra-228).

Depending on the local geology, bedrock aquifers used for drinking water sometimes contain levels of Ra-226 and Ra-228, and in some instances at concentrations that exceed the regulatory drinking water standard. For example, the 2008 Annual Compliance Report of Missouri Public Drinking Water Systems reports that the Ra-226/228 limit was exceeded 71 times during that reporting year. One nearby system in Farmington, Missouri, reported a running annual average of 22 pCi/l (Farmington Public Notice, dated June 14, 2010, which reported data from 3rd Quarter 2009 through 2nd Quarter 2010).

During the Hematite Remedial Investigation performed by Westinghouse in 2004, groundwater samples were collected from bedrock wells at a location northeast of the site, which is up gradient with respect to groundwater flow. Ra-226 was detected in these groundwater samples at concentrations ranging from 0.73 – 1.38 pCi/l. Section 4.5.2 of the Hematite Decommission Plan describes these wells and the radiological findings as follows:

“There are no groundwater monitoring wells that were specifically constructed for the purpose of obtaining samples that are representative of the background radioactivity concentration.

However, bedrock wells BR12JC and BR12RB are located up gradient of the impacted areas of the site with respect to groundwater flow, and therefore the data obtained at these locations are considered to be representative of the background concentration. The summary statistics of the data obtained from these wells, including the results that were less than the MDC, are reported in Table 4-1 of the HRCR” (Hematite Radiological Characterization Report). “The mean and standard deviation values for gross alpha, gross beta and total uranium are listed below.

- Gross Alpha: mean – 6.9 pCi/L; standard deviation – 2.5 pCi/L
- Gross Beta: mean – 6.8 pCi/L; standard deviation – 2.2 pCi/L
- Total Uranium: mean – 4.1 pCi/L; standard deviation – 3.4 pCi/L”

Additional sampling of on-site wells within the central tract area of the facility was conducted in March 2009 as part of Westinghouse's Interim Groundwater Monitoring Program, performed in accordance with an agreement with the State of Missouri. This sampling focused on the radiological constituents including radium, technetium, and uranium. The monitoring showed that in groundwater collected from hybrid and leachate wells within the burial pit, evaporation pond and process building areas, uranium exceeded the Minimal Detection Concentration (MDC) of 1 pCi/l in 14 of the 34 samples, technetium exceeded the MDC in 19 of 34 samples,

and radium exceeded the MDC in only 3 samples. The following table contains the results of this sampling period.

Well Number	Date	Uranium (pCi/L)	Note	Technetium - 99 (pCi/L)	Note	Radium (pCi/L)	Note
GW-BD14	3/27/2009	4.59		0.49	U	0.79	J
GW-BP15	3/31/2009	1.67	B	-0.15	U	0.86	J
GW-BP22A	3/30/2009	0.73	B	0.18	U	0.63	J
GW-BP22B	3/30/2009	0.35	B	53		0.29	U
GW-BP2A	4/1/2009	1.32	B	435		0.12	U
GW-BP40	3/31/2009	13.77		55.9		0.18	U
GW-BP55	4/1/2009	5.4		0.23	U	0.25	J
GW-BP5A	4/1/2009	9.72		-0.58	U	0.45	J
GW-BP7A	3/31/2009	5.67		-0.44	U	0.45	J
GW-DM02	3/30/2009	190.89		173		0.37	J
GW-EP16	3/25/2009	0.81	B	434		0.17	U
GW-EP20	3/26/2009	0.32	B	1030		0.25	J
GW-LF09	3/26/2009	2.97		4.2		0.39	J
GW-NB54	3/26/2009	2.7	U	-0.51	U	0.34	J
GW-NB74	3/26/2009	0.68	B	4.2		0.86	J
GW-PL06	3/25/2009	0.27	B	133		0.19	J
GW-RMC9	3/30/2009	7.83		1740		0.12	U
GW-WS07	3/25/2009	0.26		524		0.13	U
GW-WS13	3/27/2009	0.78		31.6		0.27	J
GW-WS14	3/30/2009	0.35	B	155		0.1	U
GW-WS15	3/30/2009	2.48	B	28.7		0.1	U
GW-WS16	3/31/2009	0.32	B	32.3		0.14	U
GW-WS17B	3/31/2009	2.7	U	2240		0.18	J
GW-WS22	3/26/2009	2.7	U	2.83	J	0.13	U
GW-WS23	3/27/2009	2.7	U	-0.79	U	0.24	J
GW-WS24	3/30/2009	152.01		51.4		0.29	J
GW-WS25	3/30/2009	7.83		-0.44	U	1.73	
GW-WS26	3/30/2009	51.3		0.84	U	0.26	J
GW-WS27	3/30/2009	5.4		0.07	U	0.5	J
GW-WS28	3/31/2009	1.05	B	32.6		0.24	J
GW-WS29	3/31/2009	0.57	B	-0.38	U	0.49	J
GW-WS32	3/30/2009	0.43	B	12.5		1	
GW-WS33	3/25/2009	0.43	B	1.11	U	0.17	J
GW-WS34	3/25/2009	0.20	B	-0.83	U	1.03	

Notes: B: The constituent was present in the associated trip blank.

U: The analyte was not detected

J: Indicates that the analyte was positively identified and the numerical value is approximate.

This data indicates that the primary contaminants at the Hematite facility (uranium and technetium) are present in the hybrid and leachate wells within the burial pit, evaporation pond and process building areas. However, the data obtained within these areas indicate that Ra-226 is consistent with the above mentioned background concentration and is not present as a site

source for the contaminant. Also of note is that technetium-99 (Tc-99), while present in the on-site source area, was not identified in any of the off-site residential wells.

In summary, the Ra-226 concentration observed in the nearby residential wells appears to be consistent with the concentrations found in nature in the Missouri area, and the radium does not appear to originate from a source at the Hematite facility. Westinghouse continues to consult with the State of Missouri regarding groundwater monitoring. There continues to be no indication of radioactive contamination from the Hematite facility of groundwater outside the facility.