Westinghouse Electric Company LLC
Hematite Decommissioning Project
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USA

ATTN: Document Control Desk
Director, Office of Federal and State Materials and Environmental Management Programs
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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E-mail: hackmaek@westinghouse.com
Our ref: HEM-11-91
Date: June 21, 2011

Subject: Draft Supplemental Response to NRC Request for Additional Information on the Hematite Decommissioning Plan Excluding Chapter 11 (License No. SNM-00033, Docket No. 070-00036)

Reference:

1) Westinghouse (E. K. Hackmann) letter to NRC (Document Control Desk), HEM-10-126, dated December 10, 2010, "Partial Responses to Requests for Additional Information on Decommissioning Plan Chapters 1, 4, 6 and 7"
2) Westinghouse (E. K. Hackmann) letter to Document Control Desk (NRC), HEM-10-132, dated December 21, 2010, “Remaining Responses to Requests for Additional Information on Decommissioning Plan Chapters 1, 4, 6 and 7”
3) Westinghouse (E. K. Hackmann) letter to Document Control Desk (NRC), HEM-11-25, dated March 10, 2011, “Response to Request for Additional Information on Decommissioning Plan Chapter 3, Site Description”
4) Westinghouse (E. K. Hackmann) letter to Document Control Desk (NRC), HEM-10-85, dated August 11, 2010, “Response to Request for Additional Information Concerning Hematite Decommissioning Plan: Chapter 5, Dose Modeling”
5) Westinghouse (E. K. Hackmann) letter to Document Control Desk (NRC), HEM-10-89, dated September 15, 2010, “Additional Responses to Questions on Decommissioning Plan Chapter 5, Dose Modeling”
6) Westinghouse (E. K. Hackmann) letter to Document Control Desk (NRC), HEM-10-105, dated October 7, 2010, “Remaining Responses to Request for Additional Information Concerning Hematite Decommissioning Plan: Chapter 5, Dose Modeling”
7) Westinghouse (E. K. Hackmann) letter to Document Control Desk (NRC), HEM-10-137, dated January 24, 2011, “Responses to Requests for Additional Information on Decommissioning Plan Chapters 8 and 9”
8) Westinghouse (E. K. Hackmann) letter to Document Control Desk (NRC), HEM-11-37, dated March 21, 2011, “Response to Remaining NRC Request for Additional Information on the Hematite Decommissioning Plan Chapter 9”

9) Westinghouse (E. K. Hackmann) letter to Document Control Desk (NRC), HEM-10-138, dated January 28, 2011, "Responses to Requests for Additional Information on Decommissioning Plan Chapters 10 and 12"

10) Westinghouse (E. K. Hackmann) letter to Document Control Desk (NRC), HEM-11-2, dated January 19, 2011, "Response to Request for Additional Information on Decommissioning Plan Chapter 13"

11) Westinghouse (E. K. Hackmann) letter to Document Control Desk (NRC), HEM-10-80, dated July 30, 2010, "Response to Request for Additional Information Concerning Hematite Decommissioning Plan: Chapter 14, Characterization Report and Surrogates Report"

12) NRC (J. J. Hayes) Memorandum to NRC (P. Michalak), dated June 13, 2011, "Westinghouse Hematite Request for Additional Information Resolution" (ML111640173)

References 1 to 11 provided Westinghouse responses to NRC's Requests for Additional Information (RAIs) concerning the Hematite Decommissioning Plan (DP). This letter provides draft supplemental responses to those RAIs where NRC required clarification. These draft supplemental responses are provided in support of the scheduled June 24 and 27 conference calls identified in Reference 12.

Please contact Kevin Davis at 314-810-3348 should you have questions or need any additional information.

Sincerely,

Kevin Harris for E. Kurt Hackmann

E. Kurt Hackmann
Director, Hematite Decommissioning Project

Attachments:

1) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 1
2) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 3
3) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 4
4) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 5
5) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 8
6) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 9

7) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 10
8) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 12
9) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 13
10) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 14
11) Draft Supplemental Response to NRC Requests for Additional Information on Historical Radiological Characterization Report
12) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Information Relating to Summary Paper "Evaluation of Tc-99 Under the Process Buildings"
13) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Reference to Effluent and Environmental Monitoring Plan
14) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Reference to Water Management Plan
15) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Reference to Waste Management and Transportation Plan
16) Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Reference to Nuclear Criticality Safety Items in the License Application Request

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

ATTACHMENT 1

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 1

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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Chapter 1 – Executive Summary – Follow-up Comments to RAI Responses

RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
1-1a	Ok as noted under the Path Forward	NRC agrees that the Hematite site is not a Group 5 site but it is also not a Group 4 site. The manner of addressing the issues associated with the resolution of Chapters 3 and 5 RAIs. (Refer to RAI Chapter 5- RAI No. 11 as one example.) Based on the definition of aquifer given in Appendix A, 10 CFR 40, the Sand/Gravel and Jefferson City-Cotter constitute the upper most aquifer regardless if Sand/gravel itself could provide sufficient yield, as they are interconnected hydraulically and behave as a single aquifer (No confining layer is present between the two formations). Trace amounts of Tc-99 have been detected in the Sand/Gravel aquifer. The Sand/Gravel and Jefferson City-Cotter aquifers need to be protected. However, the NRC has issues associated with the approach to remediation proposed by Westinghouse. Issues identified below will need to be addressed in either additional RAIs or the staff's discussion with Westinghouse on their response to the RAIs.	Westinghouse agrees that the Jefferson City-Cotter Hydrostratigraphic Unit (HSU), and by interconnection, the Sand/Gravel HSU represent the protected groundwater zone. As such, Westinghouse has committed to monitoring the Sand/Gravel HSU throughout and after remediation. The discussion of these HSUs is outlined within HDP-TBD-EHS-001 Subsurface Water Overview, which was provided to NRC via Westinghouse letter HEM-11-11, dated January 21, 2011.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
1-1b	Ok as noted under the Path Forward	Basis for a 6.7 m excavation when there is contamination below the 6.7 m. The groundwater samples suggest that soil is contaminated with Tc-99 is located in the 24'-34' levels below the surface under Bldg 253. However, WEC is only committed to excavating to 20' (6.7 m). Upper level soils may meet DCGLs providing false confidence that the soil below is clean. Westinghouse has not committed to excavate below 6.7 m to identify the level of contamination.	Data, evaluation and a proposed resolution for Tc-99 in soil under the former Process Buildings at depths greater than 6.7m are provided in the document, "Evaluation of Technetium-99 Under the Process Buildings." This evaluation clarifies that excavation will be considered complete with the removal of soil that exceeds either the RGs or DCGLs, buried debris, and/or spent limestone. If the chemical RGs are not met and the excavation reaches the sand/gravel layer, then excavation will cease; however, excavation would continue if the DCGLs are not met. The completed excavation will undergo final status survey as discussed in DP Chapter 14. In addition, the evaluation specifies subsurface soil sampling (down to the depth of the well) near wells with water that exceed a defined concentration threshold for investigation.	Westinghouse letter HEM-11-56 dated 5/5/11 forwarded an "Evaluation of Technetium-99 Under the Process Buildings." This evaluation includes changes to the Decommissioning Plan that address this comment. Resolution on this evaluation will address this comment. This comment does not require its own resolution.
1-1c	Ok as noted under the Path Forward	Westinghouse may not have adequately characterized Tc-99 levels under Bldg 253. Measurements in 1988-1989 were only alpha and not beta thus Tc-99 would not have been identified.		
1-1d	Ok as noted under the Path Forward	Westinghouse has committed to remove contaminated clay/soil. When Westinghouse excavates, they need to obtain soil samples which meet the DCGLs, and collect and treat the groundwater in the excavation. Westinghouse needs to justify how their proposed action to excavate until the DCGLs are met on the surface is adequate to ensure that unacceptable levels of radionuclides will not be transported to the sand/gravel and Jefferson City-Cotter aquifers during the compliance period. Westinghouse proposed to collect soils samples around the hybrid wells (through soil borings) based on the assumption that there is NO deeper soil contamination beyond the 6.7 m and that the Tc-99 contamination observed in the water was caused by the contaminated soils at shallow depth. However, if contamination soil/spent limestone is detected above the DCGL below the 6.7 m depth, Westinghouse has to further define the extent of contaminated soil/spent limestone for excavation.	Since the original RAI addressed subsurface water, the response to this comment on soil is believed to be based on soil near wells with elevated water sample results. As discussed in the response above, the document "Evaluation of Technetium-99 Under the Process Buildings" specifies subsurface soil sampling down to the well bottom near wells with water that exceed a defined concentration threshold for investigation. This sampling will determine whether there is soil below the excavation surface that exceeds the DCGLs and requires excavation. In addition, the response to the follow-up comment on RAI HDP-8-Q6 addresses the collection and handling of water in an excavation and ensuring unacceptable levels of radionuclides will not be transported to the Sand/Gravel and Jefferson City-Cotter HSUs. In summary, the dose modeling presented in DP Chapter 5 demonstrates that the residual radioactivity concentration in pore space water in soil that is less than DCGL is acceptable and by definition, if the soil meets the DCGL, there will not be groundwater activity concentrations in the future that will cause the 25 mrem/yr to be exceeded. Also, see the process described in the Tc-99 paper for starting with investigating at depth close to the wells and then if results greater than DCGL expanding out to track the contamination for remediation back to the source.	Westinghouse letter HEM-11-56 dated 5/5/11 forwarded an "Evaluation of Technetium-99 Under the Process Buildings." This evaluation and RAI No. 6 for DP Chapter 8 address this comment. Resolution of those items will resolve this comment. This comment does not require its own resolution.

ATTACHMENT 2

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 3

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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<table>
<tr><th>RAI No.</th><th>Issues</th><th>Path Forward</th><th>Discussion Points</th><th>Proposed Resolution</th></tr>
<tr><td>3-4</td><td>Schedule for installation of 14 new monitoring wells and length or duration of post-remedial groundwater monitoring.</td><td>1. Provide a time table for the completion of these new monitoring wells;
2. Provide criterion for the termination of post-remedial groundwater monitoring.
Westinghouse should clarify if they are checking that the annual dose is less than 25 mrem, or if they are assuming that the all pathways dose will be less than 25 mrem based on the drinking water dose being less than 4 mrem.</td><td>1. Since the specific date when remediation of a particular area (e.g., Burial Pit Area, Tc-99 Area) will be completed is not known, a specific time table that includes dates cannot be forecasted for well installation. However on an area-by-area basis, post-remediation monitoring wells will be installed and developed during the first quarter following remediation and will be sampled for laboratory analysis during the second quarter following remediation. For example, assuming the Burial Pit remediation is completed during the fourth quarter of 2011, the post remediation monitoring wells for that area will be installed and developed in order to obtain a sample for laboratory analysis during the first quarter of 2012, even if remediation work is on-going elsewhere on-site. The following time table is based on DP Figure 1-1, "Proposed Schedule for Hematite Decommissioning:"
<table>
<tr><th>Well No.</th><th>Related Site Area</th><th>End of Area Remediation</th><th>Well Installation</th></tr>
<tr><td>GW-CC</td><td>Evaporation Ponds</td><td>DP Approval + 20 Months</td><td>DP Approval + 23 Months</td></tr>
<tr><td>GW-DD</td><td>Process Buildings, Soil Area</td><td>DP Approval + 21 Months</td><td>DP Approval + 24 Months</td></tr>
<tr><td>GW-EE</td><td>Burial Pits</td><td>DP Approval + 23 Months</td><td>DP Approval + 26 Months</td></tr>
<tr><td>GW-FF</td><td>Burial Pits</td><td>DP Approval + 23 Months</td><td>DP Approval + 26 Months</td></tr>
<tr><td>GW-GG</td><td>Burial Pits</td><td>DP Approval + 23 Months</td><td>DP Approval + 26 Months</td></tr>
<tr><td>GW-HH</td><td>Burial Pits</td><td>DP Approval + 23 Months</td><td>DP Approval + 26 Months</td></tr>
<tr><td>GW-II</td><td>Burial Pits</td><td>DP Approval + 23 Months</td><td>DP Approval + 26 Months</td></tr>
<tr><td>BR-13-JC</td><td>Process Buildings, Soil Area</td><td>DP Approval + 21 Months</td><td>DP Approval + 24 Months</td></tr>
<tr><td>BR-14-JC</td><td>Burial Pits</td><td>DP Approval + 23 Months</td><td>DP Approval + 26 Months</td></tr>
<tr><td>BR-15-JC</td><td>Burial Pits</td><td>DP Approval + 23 Months</td><td>DP Approval + 26 Months</td></tr>
<tr><td>BR-16-JC</td><td>Process Buildings</td><td>DP Approval + 21 Months</td><td>DP Approval + 24 Months</td></tr>
<tr><td>BR-17-JC</td><td>Process Buildings</td><td>DP Approval + 21 Months</td><td>DP Approval + 24 Months</td></tr>
<tr><td>BR-18-JC</td><td>Process Buildings</td><td>DP Approval + 21 Months</td><td>DP Approval + 24 Months</td></tr>
<tr><td>BR-19-JC</td><td>Evaporation Ponds</td><td>DP Approval + 20 Months</td><td>DP Approval + 23 Months</td></tr>
</table>
2. Specified monitoring wells will be sampled at a quarterly frequency following installation until license termination. The comparators for determining suitability for unrestricted use and license termination are the results of sequential quarterly sampling that show that the contribution to dose from the sum of all licensed radionuclides do not exceed the EPA Maximum Contaminant Level (MCL) of 4 millirem per year, and also that the sum of the contributions to dose from residual concentrations in groundwater and residual concentrations in soil do not result in an annual dose that exceeds 25 millirem/year.</td><td>The following paragraph will be added at the end of DP Section 14.5.1:
Post-remediation monitoring wells will be sampled quarterly after the completion of remediation until license termination. The data collected will be used to confirm that the sum of the annual dose from groundwater for all the radionuclides does not exceed the EPA Maximum Contaminant Level (MCL) of 4 millirem/year. Separately, the sum of the dose from all residual sources remaining after remediation, including soil and groundwater pathways, will be confirmed to result in an annual dose that does not exceed 25 millirem/year.</td></tr>
<tr><td>3-5</td><td>Hydrogeological connectivity between the Hematite source areas in the silt clay overburden and the Roubidoux aquifer.</td><td>Provide the basis for the conclusion that there is very limited hydrogeological connectivity between the Hematite source areas in the silt clay overburden and the Roubidoux aquifer when the migration of VOCs from the Hematite site, presumably in the overburden to the private Roubidoux wells illustrates the hydraulic connection between the overburden</td><td>The migration pathway of VOC contamination to the Roubidoux HSU is attributable to the open borehole construction of private wells providing a pathway from the Jefferson City-Cotter HSU and the Roubidoux HSU. Figure 1 (attached) shows the wells screened in the Roubidoux HSU that have VOC contamination.
• The observed VOC contamination at Well PW-03RB northeast of the facility is anomalous since VOC concentrations detected in Well PW-03JC appear insufficient as a source for the level of contamination (roughly a factor of 10 less at Well PW-03JC than Well PW-03RB). Also, VOC contamination is not observed in the nearby overburden Wells NB-46 and NB-71 or in the nearby Jefferson City-Cotter or Roubidoux bedrock Wells BR-04-JC, BR-05JC, BR-09-JC, BR-11-JC, BR-02-JC, BR-04RB, BR-05RB, and BR-02-RB.
• The observed VOC contamination at Well PW-19RB is not observed in Wells BR-08-RB or BR-10-RB, which are between the Site and Well PW-19RB. The lack of VOC contamination in the Roubidoux HSU at wells closer to the site is not indicative of VOCs vertically migrating from Site source areas to the Roubidoux HSU (via the Sand/Gravel</td><td>Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.</td></tr>
</table>

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
		at the site and the Roubidoux aquifer or modify the DP text to correct the claim.. With respect to Fig. 3 of "Radionuclide activity in bedrock groundwater at Westinghouse Hematite facility, Hematite, Missouri", explain the water level "mount" just south of the Joachim Creek in the Roubidoux aquifer. With respect to Table 4 of "Radionuclide activity in bedrock groundwater at Westinghouse Hematite facility, Hematite, Missouri" by SAIC, July 2009, explain how the "minimum" and "maximum" vertical hydraulic gradient calculated.	and Jefferson City-Cotter HSUs). Instead, the data indicates VOCs migrated vertically from Site sources areas to the Jefferson City-Cotter HSU and then laterally in the Jefferson City-Cotter HSU until it reached the open borehole Well PW-19RB. This and other nearby private wells have been reconstructed to isolate the Roubidoux HSU from the Jefferson City-Cotter HSU, precluding further migration of contamination to the Roubidoux HSU. Continuing observation of VOC contamination at Well PW-19RB after well reconstruction reflects remaining residual contamination at that location, although the relative concentrations have declined. • The hydraulic stress induced on the Roubidoux HSU by the Festus production wells and by the private wells south of Joachim Creek accentuated the movement of VOC contamination through the open boreholes until the summer of 2003. The Festus municipal wells were put on standby in the summer of 2003 when a "collector" well located in the floodplain of the Mississippi River was brought online. The Festus production wells are now used intermittently to supplement the "collector" well, and the limited pumping from the Roubidoux HSU has allowed recovery of the Roubidoux HSU from the hydraulic stresses. Public water was supplied to the residences south of Joachim Creek in late 2003 and early 2004 and the use of the private wells was discontinued. Evidence of limited connectivity via the contact zone between the Jefferson City-Cotter HSU and the Roubidoux HSU: • Testing was conducted in December 2004 in wells PW-06-JC/RB, PW-16-JC/RB, and PW-19-JC/RB to verify the integrity of the grout seals in the nested wells. The results of the testing inferred a lack of hydraulic communication between the Jefferson City-Cotter and Roubidoux HSUs based on the observed response of the shallow wells to pumping in the deeper wells in the nest. (Source: "Radionuclide Activity in Bedrock Groundwater at Westinghouse Hematite Facility, Hematite, Missouri," which was provided to NRC via Westinghouse letter HEM-09-133, dated 11/10/2009.) • Vertical hydraulic gradient analysis suggests some degree of communication between the upper and lower aquifers with the rate of groundwater movement controlled by the hydraulic conductivity of the bedrock formations and the availability of secondary porosity (fractures, joints, dissolution features). Vertical hydraulic gradients were calculated between the Jefferson City-Cotter HSU and the Roubidoux HSU for five well pairs with unambiguous screen interval locations. The vertical gradients at these locations were predominantly upward directed in each of the well pairs over the period from 2004 to 2009. Periods of downward directed gradients were observed in well pairs BR-02-JC/RB (December 2004 to September 2007), BR-04-JC/RB (September 2007), and PW-06-JC/RB (June 2007 to December 2007). The steepest downward vertical gradients (0.1837 to 0.4 feet/foot) were observed from pre-remedial investigation (2002) water level measurements in Roubidoux HSU wells that were influenced by the Festus production wells. Vertical gradients between the Jefferson City and Roubidoux HSUs have been upward-directed approximately since the end of 2007. Well BR-03-RB exhibited flowing artesian conditions between September 2008 and March 2009. The significance of maintaining an upward directed hydraulic gradient from the Roubidoux HSU is to impede downward vertical migration. (Source: "Radionuclide Activity in Bedrock Groundwater at Westinghouse Hematite Facility, Hematite, Missouri;" provided to NRC via Westinghouse letter HEM-09-133, dated 11/10/2009.) • Hydrographs for the wells screened in the Jefferson City-Cotter and Roubidoux HSUs indicated that the units responded differently to stresses induced by the Festus production wells and private wells south of Joachim Creek. Hydrographs from wells at Hematite that are screened in the Roubidoux HSU showed significant water level recovery following August 2003 after the Festus production wells being put on standby. (Source: 2007 Remedial Investigation Report) • The groundwater elevation data from the wells screened in the Jefferson City-Cotter HSU from the period between 2002 and 2004 is limited. However, the available measurements (graphed in the attached Figure 2) for well BR-04-JC do not show drawdown that is seen in the Roubidoux wells, drawdown that is attributable to the Festus production wells and private wells south of Joachim Creek. (Source: 2007 Remedial Investigation Report) • The observed absence of hydraulic interconnection between the Jefferson City-Cotter and Roubidoux HSUs was supported by borehole injection tests that showed intervals of high transmissivity separated by a zone of lower	

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
			transmissivity. Integration of hydraulic conductivity test results with geologic cross-sections indicated that the low transmissivity zone roughly corresponded to the contact zone between the Jefferson City-Cotter and Roubidoux HSUs. (Source: 2007 Remedial Investigation Report) • Because open-hole construction was used in the domestic wells, the head difference between the Jefferson City-Cotter HSU and the Roubidoux HSU under the influence of the pumping center at Festus may have been sufficient to induce inter-aquifer flow with the open boreholes acting as conduits. The hypothesis was evaluated by groundwater modeling using an extraction rate of 2000 feet/day (10.4 gpm) applied to 13 wells in the vicinity of PW-19 to simulate vertical flow along an unsealed well casing. A significant impact on the potentiometric surface was observed, including flow paths from the facility area toward locations PW-03, BR-08 and BR-09, beneath Joachim Creek, and into the area of PW-19 and PW-16. (Source: 2007 Remedial Investigation Report, Appendix A) The water level "mount" just south of the Joachim Creek in the Roubidoux aquifer is most likely an artifact of this well being a converted private borehole well. The vertical hydraulic gradients in Table 4 of "Radionuclide activity in bedrock groundwater at Westinghouse Hematite facility, Hematite, Missouri" by SAIC, July 2009, were calculated by: The actual water level data was used to calculated the gradient at a specific well for each monitoring period; from among those calculated results, the maximum and minimum results were reported in the Table.	
3-7	(c) "…The increasing height of the bedrock to the north and northwest would preclude general flow direction of north or northwest".	Need to discuss the basis for this conclusion. The hydraulic heads measured from monitoring wells appear to indicate a possibility that groundwater in the Jefferson-Cotter HSU may locally flow towards north/northwest direction at the NW site boundary area of site buildings. The Discussion Points provided address the flow in general terms. Are there site or local specific conditions that show otherwise?	The Jefferson City-Cotter HSU is a component of the Ozark aquifer on the Salem Plateau. Imes and Emmett (1994) and Miller and Vandike (1997) indicate that groundwater within the Ozark aquifer [which contains the Cotter, Jefferson City and Roubidoux Formations] occurs under unconfined conditions with groundwater flow occurring from upland areas toward valleys where it discharges as stream base flow. In the vicinity of the Hematite Site, groundwater within the Jefferson City – Cotter HSU appears to be unconfined. However, the results of a variety of hydraulic testing and potentiometric measurements for the Roubidoux HSU suggest that the deeper aquifer is confined. (Source: "Radionuclide Activity in Bedrock Groundwater at Westinghouse Hematite Facility, Hematite, Missouri," which was provided to NRC via Westinghouse letter HEM-09-133, dated 11/10/2009.) The Hematite facility is located in the Joachim Creek valley with groundwater flow occurring from bedrock formations comprising the valley sides and moving toward Joachim Creek. The facility and Joachim Creek are shown in yellow in the attached Figure 3. This figure is intended to show the relative steepness of the valley within which the facility is located. The local site specific conditions of hills to the northwest of the site and the gaining Joachim Creek to the southeast of the site suggest that the upper bedrock layer (Jefferson City-Cotter) slopes towards the southeast, with groundwater flowing in that direction. As seen in the groundwater flow maps provided in the response to RAI 4-13, the water level data at PZ-04 only intermittently appears to "mound," and create an appearance of flow to the northwest. This "mounding" is considered an anomaly, attributed to local natural geologic and hydrogeologic conditions possibly resulting from a combination of locally confined conditions, a local lack of secondary porosity features such as fractures or joints, and massive, fine-grained bedrock lithology in the screened interval in each well. Imes, J.L. and Emmett, L.F. 1994. *Geohydrology of the Ozarks Plateau Aquifer System in Parts of Missouri, Arkansas, Oklahoma, and Kansas*, U.S. Geological Survey Professional Paper 1414-D, Regional Aquifer System Analysis- Central Midwest. pp 43-51. Miller, D.E. and Vandike, J.E. 1997. *Groundwater Resources of Missouri*, Missouri State Water Plan Series Volume II, Missouri Water Resources Report No 46, Missouri Department of Natural Resources, Rolla, Missouri. pg 64.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
3-9	Characterization for Tc-99 in contaminated soil/spent limestone at a depth greater than the proposed depth of excavation and below the lower activity Tc-99.	Issue related to other RAIs in Chapters 4, 5, & 14.	Data, evaluation and a proposed resolution for Tc-99 in soil under the former Process Buildings at depths greater than 6.7m will be addressed in the summary document, "Evaluation of Technetium-99 Under the Process Buildings." This summary document will clarify that excavation will be only be considered complete (regardless of depth) after the removal of soil that exceeds either of the RGs or DCGLs, the removal of buried debris, and the removal of spent limestone. Samples of the completed excavation will be analyzed by gamma spectroscopy for U-235, U-238, Th-232, and Ra-226 progeny, and analyzed for Tc-99 and VOCs. In addition, the summary document will establish subsurface soil sampling down to the well bottom near wells with water that exceeds a defined concentration threshold for investigation.	Resolution of NRC comments via the summary document "Evaluation of Technetium-99 Under the Process Buildings," submitted via Westinghouse letter HEM-11-56, dated 5/5/11, will also resolve this comment. This comment does not require its own resolution.

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Figure 1. TCE in Roubidoux HSU - 2009

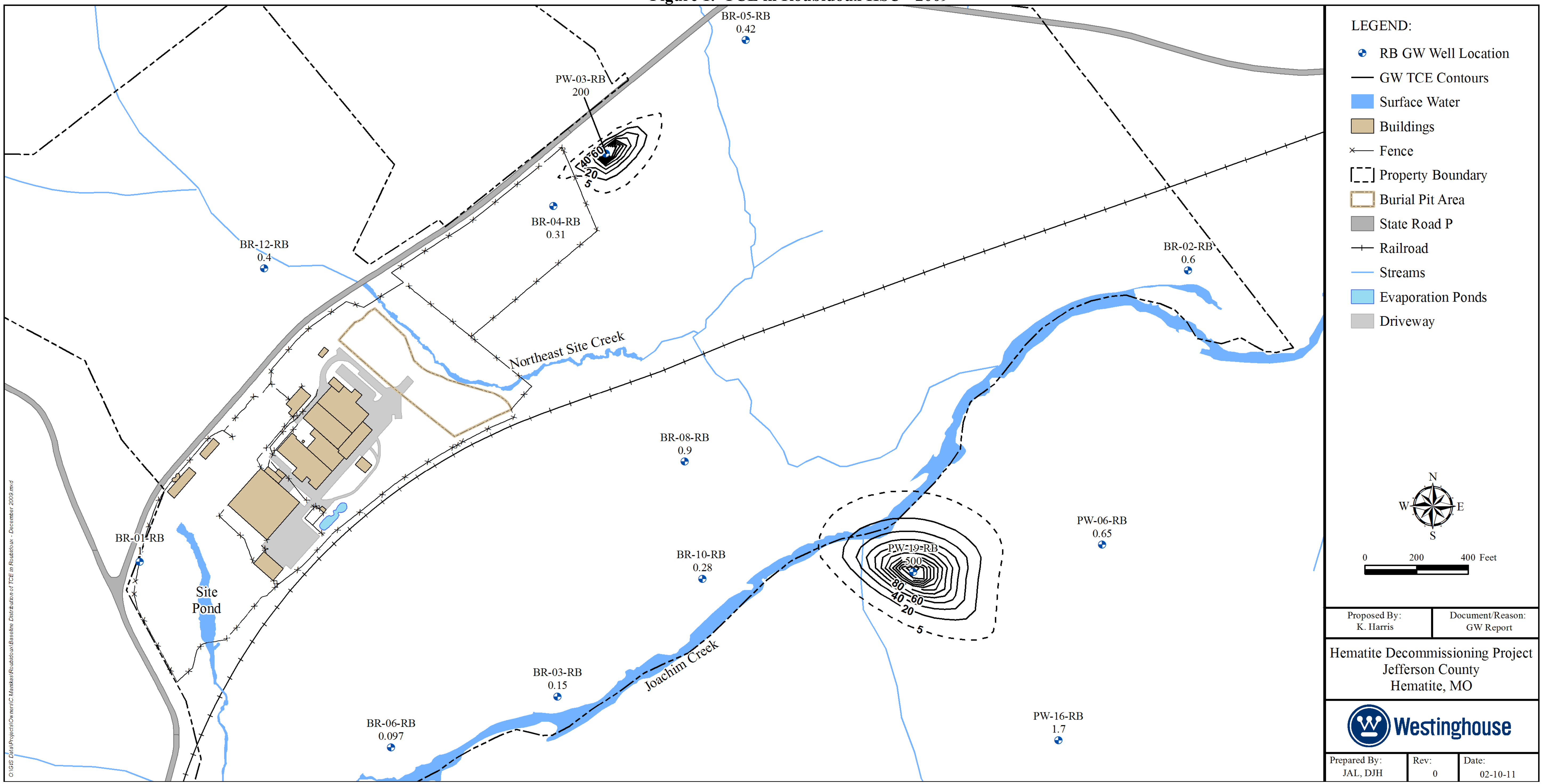

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Figure 2. Water Level in Jefferson City-Cotter Well Versus Roubidoux Wells

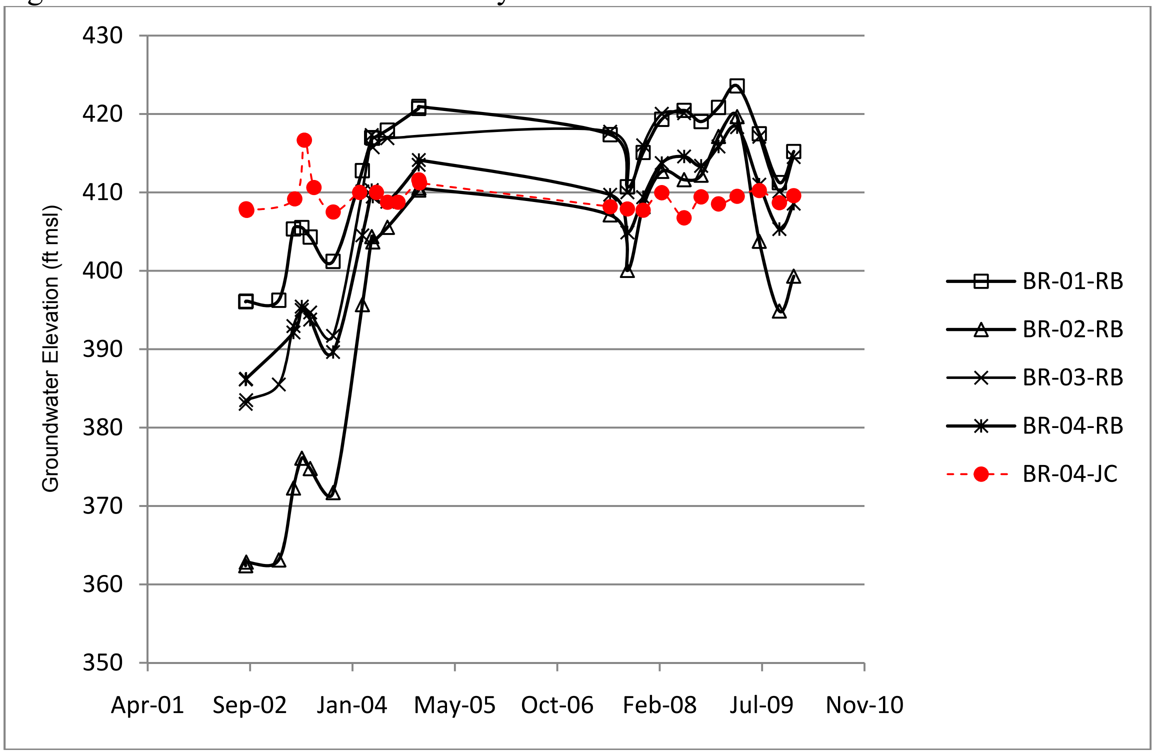
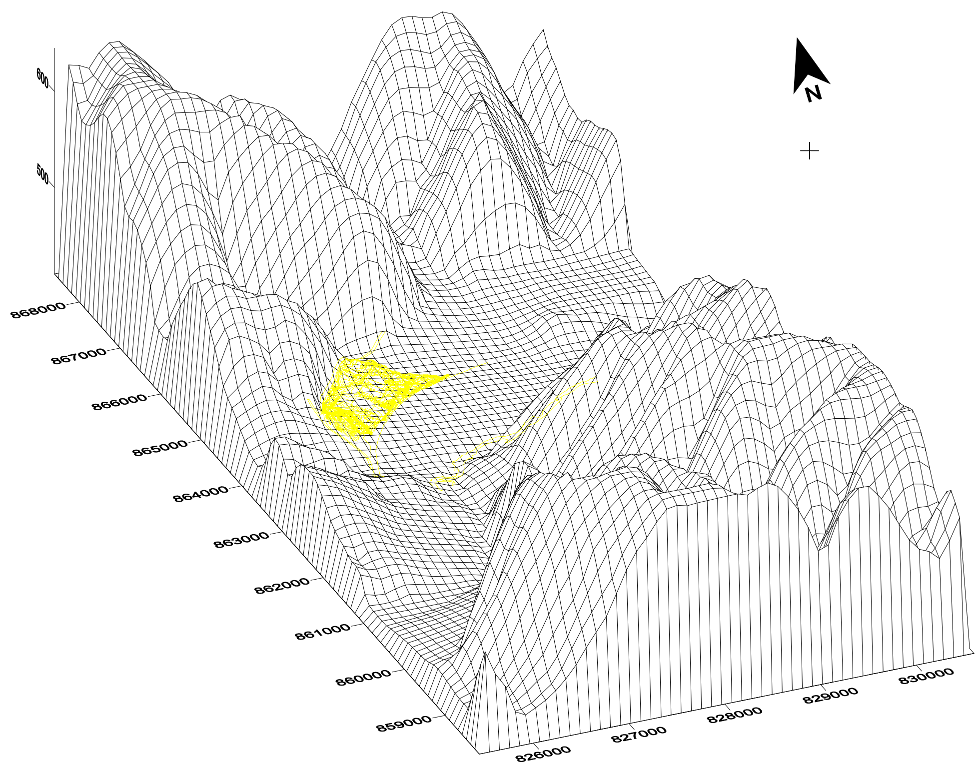


Figure 3. Bedrock Topography in the Vicinity of the Hematite Site
(z-axis is ft above mean sea level, x-axis and y-axis are standard easting and northing grids)



ATTACHMENT 3

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 4

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
4-6a	2010 concrete core data samples	(1) Clarify if the concrete core samples taken by WEC in 2010 from the buildings were analyzed for contamination and (2) How the results will be included in the DP. (3) Clarify if these samples taken for the concrete and soil were biased towards cracks and crevices. Clarification on whether the NRC received the results of these samples. Staff questions Westinghouse's position that the data is not necessarily applicable to the DP. While the material that was characterized is likely going to be sent off site, it would seem that this data is still relative for the DP because it provides information on the relative ratios of radionuclides in the buildings. The ratios observed in the concrete cores are mostly consistent with the ratios assumed in the DP for the buildings that will remain after decommissioning. The exception to this is that some of the samples from stations 2, 3, 20, and 21 have high Tc results. What was the source of this Tc? Is it known from process history that the cause of the Tc contamination in the demolished buildings is also the cause in the buildings that will remain? In other words, how does Westinghouse know that they do not have any similar areas of Tc contamination in the buildings that are going to remain.	(1) The concrete core samples taken in 2010 from the floor of the former Process Buildings were analyzed by an off-site laboratory. The samples from each sample location was analyzed by gamma spectroscopy for K-40, Bi-212, Pb-212, Bi-214, Pb-214, Ac-228, Pa-231, Th-232, Pa-234, Th-234, U-235 and isotopic uranium. Additionally, all samples were analyzed for Tc-99 by liquid scintillation. A minimum MDC of 1 pCi/g was targeted for this analysis. The sample results represented the top-most ¼ inch, the subsequent ¼ - ¾ inch in depth, the balance of the concrete core, and the underlying soil-like material. (2) The data was collected for waste characterization purposes, and was not intended to be included in the DP. However, the data will be included in a request for disposal under the provisions of 10 CFR 20.2002 that will be submitted to the NRC within the next few months. (3) These locations for concrete and soil sampling were biased towards cracks and crevices. (4) The core sampling data are provided in a separate spreadsheet following this matrix. In 2010, Characterization of Former Process Buildings Slabs involved coring of the concrete floors was performed to more extensively characterizes the depth of penetration and radionuclide contamination in concrete. Core samples were biased toward locations with high surface activity (as determined by NaI measurements) and where cracks were evident within the floor surface. After removing the concrete cores, Westinghouse obtained samples of the immediately underlying soil/gravel fill. These sampling locations are shown on Figure 1 of the paper "Evaluation of Technetium-99 Under the Process Buildings" with identification numbers from 1 to 21. (5) Sample stations 2, 3, 20 and 21 were located in the concrete floor of the Process Buildings. These sample stations, which have elevated Tc-99, were located where wet processes associated with fuel fabrication were used. The wet processes provided the mechanism for Tc-99 contamination of the concrete. Wet processes were not used in the buildings that are going to remain.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
4-6b	Depth of soil samples beneath the process buildings.	Include soil depths for the data presented in Table 1.	The soils samples referenced in Table 1-Process Building Underlying Soil Sampling Data-2010 that was presented in the Westinghouse Response to RAI HDP-4-Q6 were collected from the fill material located from the first six inches of material beneath the concrete slab surfaces.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
4-8a	Cross Sections should be designated as Figure 27 not Figure 2	Westinghouse to correct	Westinghouse agrees that that the response to RAI HDP-4-Q8 that was transmitted in Attachment 1 to HEM-10-132 should have read as follows: "Cross-sections illustrating the geological characteristics associated with the new wells and paired hybrid and leachate wells are provided herein on Figure 27 in the response to RAI HDP-4-Q12."	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
4-8b	Tc-99 in GW-X/PL-06	Provide the basis for Westinghouse's claim that the Tc-99 in GW-X/PL-06 is due to the thickness of the sand at this location and that seasonal variation can cause the sand to be unsaturated and allow water containing Tc-99 in the overlaying clay to drain into the sand/gravel zone. Justify the basis when similar concentrations of Tc-99 found in both sand/gravel and hybrid wells seem	Summary: These wells are located in an area with unique subsurface sand characteristics. Sand was observed extending about 10 feet above the sand/gravel layer into a sandy clay layer. This sandy clay layer is suspected to provide lateral transport not seen in the regular silty clay soil identified at the rest of the Site. The screens for both wells GW-X/PL-06 extend into the sandy clay layer. A former leach field and the sewage treatment line (if it leaks) are potential sources of contamination in the area; these areas are planned for remediation. The soil around these wells will be sampled in the same manner as the wells under the former Process Buildings, as specified in Westinghouse letter HEM-11-56, dated May 5, 2011. Also, as specified in that letter, soil sample results exceeding the DCGL require further investigation as to the extent of contamination, remediation, and final status	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.

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<tr><th>RAI No.</th><th>Issues</th><th>Path Forward</th><th>Discussion Points</th><th>Proposed Resolution</th></tr>
<tr><td></td><td></td><td>to indicate that the contamination in the sand/gravel aquifer may not be resulted from the transport of “leachate” through a hybrid well. Provide the basis for the claim when it appears that there is no known contaminated soil in the immediate vicinity of this well couple.

The Tc-99 detected in the sand/gravel at GW-X may not result from the installation of hybrid well PL-6. As GW-X is approximately 10 ft upgradient of PL-6, an overlapping of wells screens in both wells should not cause Tc-99 contamination in the sand/gravel by transporting contaminated “leachate” in the overburden clay/sandy clay above. Potential sources cited include former leach field, leak from a sewage treatment line, and also potentially preferential flow path along the gas line passing through the evaporation ponds. Why is there a significant concentration of Tc-99 at this well?</td><td>surveys for compliance.

Discussion: The well pair GW-X/PL-06 is located along the southern perimeter of the facility, immediately south of Building 231. Groundwater monitoring in hybrid Well PL-06 between 2004 and 2011 indicates that the sand thickness encountered at the bottom of the well is routinely saturated as shown in the table below. However, unlike other site monitoring wells, there is also a sandy clay layer that is unsaturated and would provide greater lateral migration than silty clay. Since the screen for Well PL-06 extends into the sandy clay layer, the water in the sandy clay layer may move laterally to ‘drain’ from the sandy clay layer into the sandy gravel layer.
<table>
<tr><th>Well</th><th>Date</th><th>Water Level Elevation (ft)</th><th>Sand Elevation (ft)</th><th>Difference in Water & Sand Elevation (ft)</th><th>Sandy Clay Elevation (ft)</th></tr>
<tr><td>PL-06</td><td>4Q04</td><td>415.53</td><td>405</td><td>10.53</td><td>416</td></tr>
<tr><td>PL-06</td><td>2Q07</td><td>409.90</td><td>405</td><td>4.9</td><td>416</td></tr>
<tr><td>PL-06</td><td>3Q07</td><td>409.50</td><td>405</td><td>4.5</td><td>416</td></tr>
<tr><td>PL-06</td><td>4Q07</td><td>409.40</td><td>405</td><td>4.4</td><td>416</td></tr>
<tr><td>PL-06</td><td>1Q08</td><td>411.45</td><td>405</td><td>6.45</td><td>416</td></tr>
<tr><td>PL-06</td><td>2Q08</td><td>412.30</td><td>405</td><td>7.3</td><td>416</td></tr>
<tr><td>PL-06</td><td>3Q08</td><td>411.58</td><td>405</td><td>6.58</td><td>416</td></tr>
<tr><td>PL-06</td><td>4Q08</td><td>409.72</td><td>405</td><td>4.72</td><td>416</td></tr>
<tr><td>PL-06</td><td>1Q09</td><td>411.25</td><td>405</td><td>6.25</td><td>416</td></tr>
<tr><td>PL-06</td><td>2Q09</td><td>412.64</td><td>405</td><td>7.64</td><td>416</td></tr>
<tr><td>PL-06</td><td>3Q09</td><td>410.20</td><td>405</td><td>5.2</td><td>416</td></tr>
<tr><td>PL-06</td><td>4Q09</td><td>411.63</td><td>405</td><td>6.63</td><td>416</td></tr>
<tr><td>PL-06</td><td>1Q10</td><td>411.51</td><td>405</td><td>6.51</td><td>416</td></tr>
<tr><td>PL-06</td><td>2Q10</td><td>410.62</td><td>405</td><td>5.62</td><td>416</td></tr>
<tr><td>PL-06</td><td>3Q10</td><td>411.03</td><td>405</td><td>6.03</td><td>416</td></tr>
<tr><td>PL-06</td><td>4Q10</td><td>410.42</td><td>405</td><td>5.42</td><td>416</td></tr>
<tr><td>PL-06</td><td>1Q11</td><td>410.86</td><td>405</td><td>5.86</td><td>416</td></tr>
</table>
These monitoring wells are located 10 feet apart with Well GW-X located north of Well PL-06 nearer to Building 231. The monitored interval (including the sand pack material) in Well PL-06 (401 to 413 feet msl) and Well GW-X (400.2 to 408.2 feet msl) overlap including the lower sand unit. The wells have detected virtually identical ranges of Tc-99 concentrations at 96 to 157 pCi/L (GW-X) and 92.3 to 170 pCi/L (PL-06). Well GW-X is better constructed to inhibit migration along the well bore while well PL-06 is an older hybrid well screened across the aquitard and the sand aquifer. The wells have detected virtually identical ranges of Tc-99 concentrations at 96 to 157 pCi/L (GW-X) and 92.3 to 170 pCi/L (PL-06). The presence of Tc-99 in groundwater at this well pair indicates a potential local Tc-99 source. However, Tc-99 was not detected in soil samples taken at 7, 13, 17, 29 and 33 feet bgs for location PL-06 and 14 and 28 feet bgs for location GW-X; the samples were taken during construction of these wells in 2004 and 2009, respectively.

Sources of the contamination in this area of the Hematite facility may consist of leakage associated with an underground sewage treatment line to Outfall 001 or the soils in the former leach field area. The former leach field, sewage treatment line and associated soil will be removed to the DCGL and RGs during the decommissioning. In addition, the water in these wells meets the criteria for the nearby soil to be evaluated as discussed in the summary paper for Tc-99 under the process buildings.</td><td></td></tr>
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<tr><th>RAI No.</th><th>Issues</th><th>Path Forward</th><th>Discussion Points</th><th>Proposed Resolution</th></tr>
<tr><td>4-8c</td><td>Radioactivity in leachate in GW-V/NB-31.</td><td>1. Provide an explanation for the radioactivity found in the leachate in GW-V/NB-31 when there is no known Tc-99 source. Provide an explanation of how the Tc-99 could be in the groundwater if the Tc-99 did not transfer via the soil?

2. Provide an explanation considering that boring logs provide no information and Westinghouse claims that there is no contamination in the soil above the screened area.

3. Provide water level data to show the occurrence of unsaturated conditions in the sand/gravel, and further explain how the unsaturated conditions would increase the transport of leachate to the sand/gravel.</td><td>1. Westinghouse recognizes the confounding data between soil (lower results) and leachate (higher results) for Tc-99. A useful report establishing that this condition exists at the Hematite Site is the September 1996 report Gateway Environmental Associates, Inc., “Investigation to Determine the Source of Technetium-99 in Groundwater Monitoring Wells 17 and 17B, Combustion Engineering Hematite Facility,” ABB Combustion Engineering.

This report concluded that the source of the Tc-99 in water samples from Well 17B appeared to be the former ring storage area based on the leachate sample results, even though the gross beta radioactivity results for soil samples in that area were consistent with background. Well WS-17B is twenty feet deep and monitors the leachate in the Silty Clay Aquitard HSU. The NRC response letter dated September 29, 1997 (ML052550295), stated that NRC “agrees that the source of the Tc-99 appears to be the former ring storage area." The former ring storage area is planned for excavation, which removes this likely source area for Tc-99 in the leachate.

The former ring storage area is located northwest (upgradient) of well pair GW-V/NB-31, and Well WS-17B is located between the former ring storage area and the GW-V/NB-31 well pair. Subsequent to the 1996 data, samples from Well WS-17B continue to contain elevated concentrations of Tc-99, although somewhat lower than in 1996. The 1996 report inferred that a “discrete Hydrostratigraphic unit of higher relative permeability, perhaps a silt or sand lens” in the silty-clay overburden was the transport mechanism for leached Tc-99 to migrate from the former ring storage area to Well WS-17B. This may also be the relevant pathway to Well NB-31.

2. Soils were visually inspected during boring to determining the soil classification and to evaluate the presence of higher permeability layers such as sand. Samples were collected from NB-31 during the installation of the monitoring well in June 2004. The soil samples were collected from 5, 15, 27, and 32 feet below ground surface. The screened interval for Monitoring Wells NB-31 is from 22 to 32 feet below ground surface (BGS). The Tc-99 results for these samples were less than the MDC (MDC ranged from 0.78 to 0.83 pCi/g). Also, during the installation of monitoring well GW-V in September 2009, soil samples were collected from the borehole at 26 and 32 feet below ground surface. The screened interval for Monitoring Well GW-V is from 30.9 to 33.9 feet bgs. The Tc-99 result for the sample collected at 26 feet below ground surface was 1.09 pCi/g (MDC of 0.52 pCi/g). The Tc-99 result for the sample collected from 32 feet below ground surface was less than the MDC (MDC = 0.51 pCi/g). The table below contains the results of soil sampling for Tc-99 at these two borings.

These soil sample results do not indicate a source of Tc-99 contamination in soil south of the rail line. The origin of the Tc-99 in this area is presumed to be the former ring storage area. This former ring storage area is included in the remediation area referred to as the Tc-99 area and will be remediated to DCGL during the decommissioning activities. In addition, the water in these wells meets the criteria for the nearby soil to be evaluated as discussed in the summary paper for Tc-99 under the process buildings.

<table><tr><th>Soil Sample Location</th><th>Sample Depth</th><th>Date</th><th>Analyte</th><th>Result (pCi/g)</th><th>MDC (pCi/g)</th></tr><tr><td>NB-31</td><td>5</td><td>03-Jun-04</td><td>Technetium-99</td><td>-0.0307</td><td>0.826</td></tr><tr><td>NB-31</td><td>15</td><td>03-Jun-04</td><td>Technetium-99</td><td>0.726</td><td>0.778</td></tr><tr><td>NB-31</td><td>27</td><td>03-Jun-04</td><td>Technetium-99</td><td>-0.134</td><td>0.81</td></tr><tr><td>NB-31</td><td>32</td><td>03-Jun-04</td><td>Technetium-99</td><td>-0.139</td><td>0.799</td></tr><tr><td>GW-V</td><td>26</td><td>11-Sep-09</td><td>Technetium-99</td><td>1.09</td><td>0.52</td></tr><tr><td>GW-V</td><td>32</td><td>11-Sep-09</td><td>Technetium-99</td><td>-0.04</td><td>0.51</td></tr></table>
3. The Westinghouse response to RAI HDP-4-Q8 mentioned unsaturated conditions only with respect to Wells PL-06/GW-X. The above row 8b addresses Wells PL-06/GW-X. For Wells NB-31/GW-V, water level data from the well sampling events is consistently higher than the elevation of the sand, indicating that the sand layer is saturated at this location and is not unsaturated during seasonal fluxuations. The groundwater elevations are shown in the table below:</td><td>Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.</td></tr>
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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
			(see tables below)	

Well	Date	GW Elevation	Sand Elevation	Difference
NB-31	2Q07	411.82	403	8.82
NB-31	3Q07	410.13	403	7.13
NB-31	4Q07	409.48	403	6.48
NB-31	1Q08	412.89	403	9.89
NB-31	2Q08	413.82	403	10.82
NB-31	3Q08	412.38	403	9.38
NB-31	4Q08	411.00	403	8.00
NB-31	1Q09	413.17	403	10.17
NB-31	2Q09	414.22	403	11.22
NB-31	3Q09	412.22	403	9.22
NB-31	4Q09	413.84	403	10.84
NB-31	1Q10	413.87	403	10.87
NB-31	2Q10	412.39	403	9.39
NB-31	3Q10	413.83	403	10.83
NB-31	4Q10	412.48	403	9.48
NB-31	1Q11	410.17	403	7.17

Well	Date	GW Elevation	Sand Elevation	Difference
GW-V	3Q09	411.09	403.45	7.64
GW-V	4Q09	412.78	403.45	9.33
GW-V	1Q10	412.92	403.45	9.47
GW-V	2Q10	411.63	403.45	8.18
GW-V	3Q10	412.11	403.45	8.66
GW-V	4Q10	411.37	403.45	7.92
GW-V	1Q11	412.01	403.45	8.56

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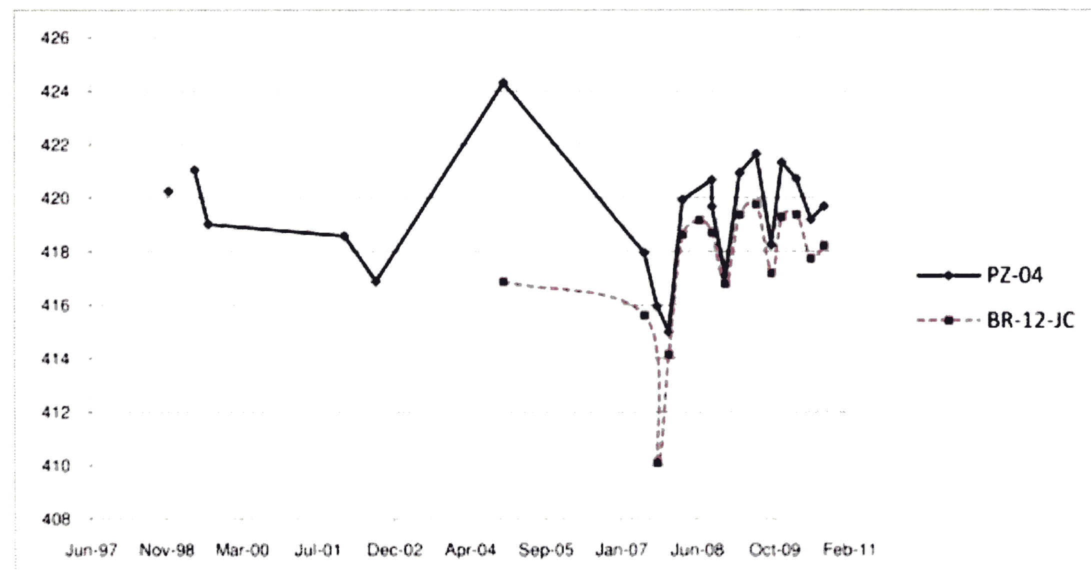
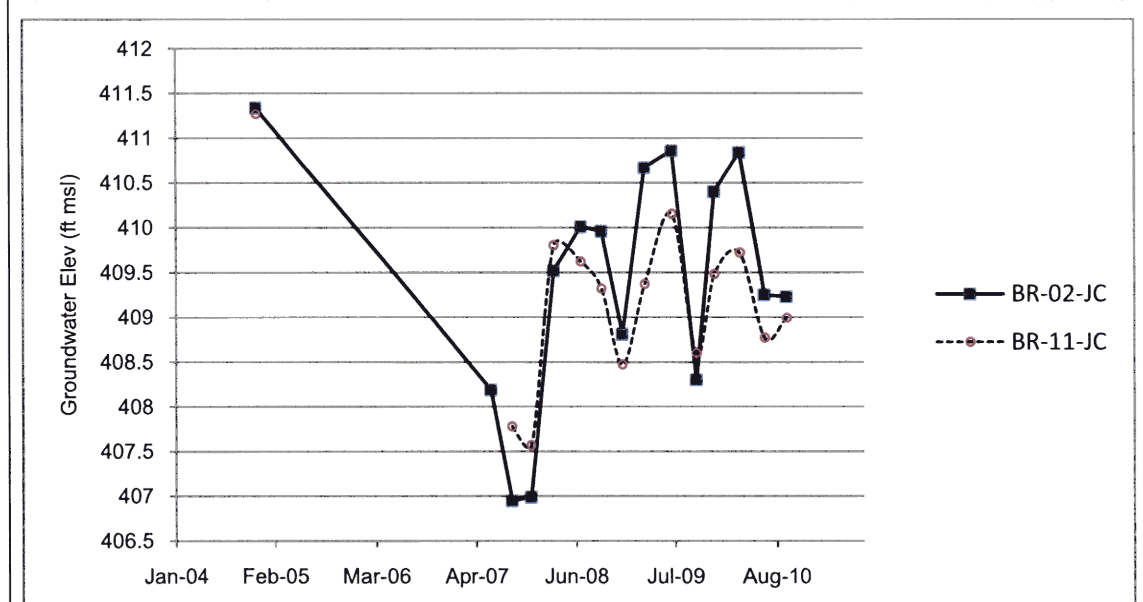
RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
4-13	Implications of localized recharge at locations such as PZ-04, BR-02-JC and BR-02-JC in Fig. 30-38.	Provide an explanation for the constructed groundwater level contour maps for the Jefferson City aquifer in Fig. 30-38 appearing to show relatively high water level elevations around, PZ-04, BR-02-JC and BR-02-JC and whether this implies some kind of localized recharge at these locations, or is it an artifact resulting from the use of the contour program.	Computer contouring has correctly reflected the water level data from Wells PZ-04 and BR-02-JC. These wells are at locations of locally elevated (typically 2 ft) groundwater levels in the Jefferson City-Cotter HSU when compared to surrounding wells in the Hematite monitoring network. Well PZ-04 is located on the northeastern corner of the Central Tract. Water levels in Well PZ-04 precisely follow the seasonal fluctuations in Well BR-12-JC for the period between 2004 and 2010, indicating that both wells are responding similarly to natural recharge. Well BR-12-JC is located off of the Central Tract approximately 370 feet northwest of well PZ-04. Similarly, groundwater levels in well BR-02-JC follow the seasonal fluctuations in well BR-11-JC, which is located approximately 880 feet west of BR-02-JC. Well BR-02-JC is located east of the Hematite facility near the site property boundary. There are no artificial sources of groundwater recharge, such as underground piping, in proximity to these well locations. The source of the slightly elevated hydraulic heads in Wells PZ-04 and BR-02-JC is attributed to natural geologic and hydrogeologic conditions at these locations, possibly resulting from a combination of locally confined conditions, a local lack of secondary porosity features such as fractures or joints, and massive, fine-grained bedrock lithology in the screened interval in each well.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.





Station ID	Sample ID	Description	Am-241 (pCi/g)			Np-237 (pCi/g)			Pu-239/240 (pCi/g)			Ra-226 (pCi/g)			Tc-99 (pCi/g)			Th-232 (pCi/g)			U-234 (pCi/g)			U-235 (pCi/g)			U-238 (pCi/g)			Total U	Perc. Enrich.
			Conc.	±2σ	C	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	(pCi/g)	(U-235)
1	991-MS-100413-13-1	Concrete sample from Station # 1 - top 1/4 "	**0.023**	0.075	0.18	0.077	0.054	0.026	0.11	0.079	0.10	0.76	0.29	0.068	**0.58**	0.88	2.1	**0.19**	0.16	0.20	178	26	0.23	5.1	1.2	0.13	9.8	1.9	0.23	193	7.4
1	991-MS-100413-13-2	Concrete sample from Station # 1 - middle 1/2 "	-	-	-	-	-	-	-	-	-				**-0.13**	0.83	1.8	-	-	-	176	28	0.28	6.1	1.4	0.21	8.4	1.7	0.28	190	10
1	991-MS-100413-13-3	Concrete sample from Station # 1 - remainder of core	**-0.20**	0.97	0.36	-	-	-	-	-	-	0.64	0.11	0.026	**0.068**	0.84	1.9	0.46	0.12	0.060	-	-	-	3.7	0.55	0.16	8.8	3.2	0.83	78	6.1
1	991-SS-100413-13-4	Underlying soil/gravel from station # 1	**0**	0.54	0.32	-	-	-	-	-	-	0.71	0.13	0.039	**-0.40**	0.87	2.4	0.59	0.15	0.094	-	-	-	1.5	0.41	0.15	2.8	3.4	1.8	32	7.8
2	992-MS-100413-13-1	Concrete sample from Station # 2 - top 1/4 "	**0.045**	0.078	0.15	**0.099**	0.12	0.18	**0.067**	0.063	0.088	**0.95**	2.0	1.2	42738	2950	3.7	**0.068**	0.095	0.092	34384	4986	95	1255	280	61	5051	834	26	40690	3.7
2	992-MS-100413-13-2	Concrete sample from Station # 2 - middle 1/2 "	-	-	-	-	-	-	-	-	-				4.5	1.1	2.8	-	-	-	15	2.7	0.097	0.29	0.20	0.097	2.5	0.70	0.19	18	1.8
2	992-MS-100413-13-3a	Concrete sample from Station # 2 - remainder of core A	**0.0070**	0.033	0.052	-	-	-	-	-	-	0.23	0.054	0.067	**0.72**	0.91	2.8	**0.14**	0.11	0.20	-	-	-	0.41	0.050	0.16	11	7.0	4.3	21	0.56
2	992-MS-100413-13-5	1/4 inch Subfloor wafer	**-0.022**	0.0080	0.15	**0.010**	0.044	0.093	**-0.040**	0.056	0.14	0.42	0.26	0.11	**-0.13**	0.88	2.3	0.51	0.27	0.21	123	18	0.29	3.3	0.92	0.13	2.0	0.67	0.13	128	21
2	992-MS-100413-13-6	1/2 inch Subfloor wafer	-	-	-	-	-	-	-	-	-				**-0.17**	0.88	1.9	-	-	-	1.4	0.51	0.26	**0.063**	0.11	0.19	0.95	0.40	0.19	**2.4**	1.0
2	992-MS-100413-13-3b	Concrete sample from Station # 2 - remainder of core B	0.27	0.41	0.23	-	-	-	-	-	-	0.73	0.13	0.030	**0.46**	0.86	2.1	0.57	0.13	0.051	-	-	-	0.25	0.24	0.15	**0.27**	3.0	1.8	**5.2**	13
2	992-SS-100413-13-4	Underlying soil/gravel from station # 2	**-0.11**	0.88	0.23	-	-	-	-	-	-	0.48	0.086	0.020	**-0.13**	0.83	1.7	0.10	0.063	0.066	2.6	0.72	0.22	**0.049**	0.081	0.094	0.56	0.30	0.25	**3.2**	1.4
3	993-MS-100413-13-1	Concrete sample from Station # 3 - top 1/4 "	**-0.025**	0.0080	0.16	**0.000**	0.11	0.32	**0.010**	0.077	0.15	0.45	0.65	0.36	22646	547	2.6	**0.12**	0.14	0.23	15232	4884	5.6	544	181	3.1	2364	764	6.7	18140	3.5
3	993-MS-100413-13-2	Concrete sample from Station # 3 - middle 1/2 "	-	-	-	-	-	-	-	-	-				122	14	2.3	-	-	-	6109	2122	2.7	206	74	1.4	904	316	2.7	7219	3.4
3	993-MS-100413-13-3a	Concrete sample from Station # 3 - remainder of core A	**-0.0040**	0.27	0.34	-	-	-	-	-	-	0.23	0.097	0.13	101	13	1.9	**0.055**	0.15	0.26	-	-	-	65	2.8	0.77	265	43	9.1	1513	3.7
3	993-MS-100413-13-5	1/4 inch Subfloor wafer	**-0.023**	0.037	0.18	**0.027**	0.040	0.066	**-0.018**	0.058	0.13	0.78	0.30	0.090	19	2.9	2.0	**0.20**	0.17	0.22	107	16	0.27	3.8	0.98	0.23	21	3.6	0.23	132	2.8

Station ID	Sample ID	Description	Am-241 (pCi/g)			Np-237 (pCi/g)			Pu-239/240 (pCi/g)			Ra-226 (pCi/g)			Tc-99 (pCi/g)			Th-232 (pCi/g)			U-234 (pCi/g)			U-235 (pCi/g)			U-238 (pCi/g)			Total U	Perc. Enrich.
			Conc.	±2σ	C	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	(pCi/g)	(U-235)
3	993-MS-100413-13-6	1/2 inch Subfloor wafer	-	-	-	-	-	-	-	-	-				2.5	1.1	1.9	-	-	-	*4.2*	*0.97*	*0.20*	*0.13*	*0.13*	*0.086*	*1.3*	*0.45*	*0.086*	5.6	1.5
3	993-MS-100413-13-3b	Concrete sample from Station # 3 - remainder of core B	**-0.080**	1.7	0.25	-	-	-	-	-	-	0.59	0.094	0.031	2.8	1.1	2.2	0.38	0.11	0.10	-	-	-	0.23	0.21	0.13	3.8	3.4	1.7	8.7	0.91
3	993-SS-100413-13-4	Underlying soil/gravel from station # 3	**-3.7**	3.0	1.7	-	-	-	-	-	-	0.97	0.20	0.057	12	2.1	1.9	0.85	0.22	0.12	-	-	-	100	11	0.82	685	73	2.8	2627	2.2
4	997-MS-100414-13-1	Concrete sample from Station # 4 - top 1/4 "	***0.000***	*0.048*	*0.16*	***0.071***	*0.11*	*0.19*	***0.010***	*0.045*	*0.095*	0.69	0.30	0.12	18	2.6	2.2	*0.39*	*0.23*	*0.088*	*1439*	*262*	*1.3*	*56*	*12*	*0.57*	*311*	*58*	*1.1*	1806	2.7
4	997-MS-100414-13-2	Concrete sample from Station # 4 - middle 1/2 "	-	-	-	-	-	-	-	-	-				5.7	0.88	0.85	-	-	-	*4661*	*980*	*1.9*	*179*	*40*	*1.9*	*1011*	*215*	*1.9*	5851	2.7
4	997-MS-100414-13-3	Concrete sample from Station # 4 - remainder of core	**-0.19**	0.93	0.54	-	-	-	-	-	-	0.53	0.15	0.049	2.6	0.51	1.0	0.51	0.13	0.065	-	-	-	151	21	0.57	1071	144	2.9	4009	2.1
4	997-SS-100414-13-4	Underlying soil/gravel from station # 4	**0.14**	1.5	0.89	-	-	-	-	-	-	0.81	0.14	0.040	**-0.18**	0.83	1.9	1.0	0.19	0.059	-	-	-	23	2.6	0.37	178	22	1.7	628	2.0
5	998-MS-100414-13-1	Concrete sample from Station # 5 - top 1/4 "	***0.024***	*0.059*	*0.14*	***0.085***	*0.10*	*0.16*	***0.010***	*0.093*	*0.18*	1.5	0.64	0.64	24	1.8	1.4	*0.50*	*0.25*	*0.16*	*37544*	*6057*	*145*	*1805*	*471*	*101*	*11035*	*1947*	*56*	50384	2.5
5	998-MS-100414-13-2	Concrete sample from Station # 5 - middle 1/2 "	-	-	-	-	-	-	-	-	-				**2.1**	0.99	2.5	-	-	-	*50*	*8.3*	*0.24*	*3.0*	*0.81*	*0.20*	*21*	*3.7*	*0.20*	74	2.2
5	998-MS-100414-13-3	Concrete sample from Station # 5 - remainder of core	**0.10**	0.61	0.35	-	-	-	-	-	-	0.73	0.12	0.034	**0.45**	0.85	1.9	0.75	0.14	0.067	-	-	-	0.63	0.29	0.18	4.5	4.0	2.1	17	2.1
5	998-SS-100414-13-4	Underlying soil/gravel from station # 5	**0.081**	1.6	0.91	-	-	-	-	-	-	0.75	0.14	0.038	**1.3**	0.90	2.1	0.48	0.15	0.081	-	-	-	27	2.9	0.43	173	22	1.8	690	2.3
6	1008-MS-100415-13-1	Concrete sample from Station # 6 - top 1/4 "	***0.062***	*0.11*	*0.23*	***0.041***	*0.14*	*0.34*	***-0.040***	*0.072*	*0.16*	**0.87**	1.1	1.3	16	1.3	1.5	*1.1*	*0.41*	*0.24*	*20166*	*3281*	*104*	*1101*	*312*	*79*	*5896*	*1086*	*79*	27163	2.8
6	1008-MS-100415-13-2	Concrete sample from Station # 6 - middle 1/2 "	-	-	-	-	-	-	-	-	-				2.9	1.0	2.1	-	-	-	*1.4*	*0.46*	*0.20*	*0.095*	*0.11*	*0.086*	*0.64*	*0.30*	*0.17*	2.1	2.3
6	1008-MS-100415-13-3	Concrete sample from Station # 6 - remainder of core	**0.080**	0.18	0.100	-	-	-	-	-	-	0.72	0.13	0.024	**1.9**	0.91	2.1	0.60	0.12	0.049	-	-	-	0.12	0.19	0.11	**0.93**	2.9	1.6	**3.3**	1.9
6	1008-SS-100415-13-4	Underlying soil/gravel from station # 6	**-0.25**	1.1	0.40	-	-	-	-	-	-	1.0	0.16	0.041	**0.71**	0.86	2.1	0.81	0.17	0.12	-	-	-	0.31	0.29	0.20	**0.23**	4.1	2.4	**6.6**	17

Station ID	Sample ID	Description	Am-241 (pCi/g)			Np-237 (pCi/g)			Pu-239/240 (pCi/g)			Ra-226 (pCi/g)			Tc-99 (pCi/g)			Th-232 (pCi/g)			U-234 (pCi/g)			U-235 (pCi/g)			U-238 (pCi/g)			Total U	Perc. Enrich.
			Conc.	±2σ	C	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	(pCi/g)	(U-235)
7	1000-MS-100415-13-1	Concrete sample from Station # 7 - top 1/4 "	**-0.023**	0.038	0.18	0.29	0.21	0.28	**-0.045**	0.069	0.16	1.0	0.65	0.23	1.5	0.46	0.78	0.87	0.38	0.24	3304	868	5.6	145	43	1.9	1074	286	3.6	4523	2.1
7	1000-MS-100415-13-2	Concrete sample from Station # 7 - middle 1/2 "	-	-	-	-	-	-	-	-	-				**0.64**	0.85	2.2	-	-	-	2.7	0.68	0.21	0.12	0.12	0.079	1.4	0.44	0.15	4.1	1.3
7	1000-MS-100415-13-3	Concrete sample from Station # 7 - remainder of core	**-0.22**	0.77	0.27	-	-	-	-	-	-	0.68	0.12	0.031	**0.041**	0.79	2.1	0.56	0.11	0.048	-	-	-	0.26	0.14	0.13	**0.89**	2.8	1.6	**5.8**	4.3
7	1000-SS-100415-13-4	Underlying soil/gravel from station # 7	**0.045**	0.14	0.078	-	-	-	-	-	-	0.23	0.073	0.021	**0.27**	0.83	1.7	0.068	0.054	0.060	-	-	-	**0.059**	0.13	0.073	0.31	0.33	0.18	**1.5**	2.8
8	999-MS-100414-13-1	Concrete sample from Station #8 - top 1/4 "	**-0.031**	0.093	0.26	**-0.030**	0.057	0.25	**0**	0.059	0.13	0.35	0.21	0.27	163	4.1	4.1	**0.0090**	0.070	0.21	2599	463	1.7	89	18	1.1	370	68	1.1	3058	3.6
8	999-MS-100414-13-2	Concrete sample from Station # 8- middle 1/2 "	-	-	-	-	-	-	-	-	-				34	1.5	8.2	-	-	-	0.73	0.31	0.19	**0.029**	0.058	0.080	0.29	0.19	0.15	**1.1**	1.5
8	999-MS-100414-13-3	Concrete sample from Station # 8 - remainder of core	**0.088**	0.39	0.23	-	-	-	-	-	-	0.41	0.093	0.028	**1.8**	0.93	2.2	0.16	0.10	0.089	-	-	-	0.31	0.21	0.12	**-0.40**	9.6	2.1	**9.9**	HEU
8	999-SS-100414-13-4	Underlying soil/gravel from station # 8	**-0.033**	2.6	0.34	-	-	-	-	-	-	1.2	0.18	0.028	112	17	1.5	**0.076**	0.13	0.086	-	-	-	0.84	0.32	0.13	6.6	3.7	1.2	23	1.9
9	1009-MS-100415-13-1	Concrete sample from Station # 9 - top 1/4 "	**0.00**	0.092	0.24	**0.037**	0.13	0.31	0.032	0.036	0.029	0.71	0.87	0.48	**0.54**	0.39	0.81	0.18	0.15	0.082	11874	2919	4.8	403	103	1.6	1574	391	1.6	13851	3.8
9	1009-MS-100415-13-2	Concrete sample from Station # 9 middle 1/2 "	-	-	-	-	-	-	-	-	-				**0.77**	0.88	2.0	-	-	-	0.70	0.33	0.25	**0.069**	0.11	0.22	0.38	0.25	0.25	**1.1**	2.7
9	1009-MS-100415-13-3	Concrete sample from Station # 9 - remainder of core	**-0.0020**	0.23	0.13	-	-	-	-	-	-	0.28	0.077	0.023	**0.57**	0.79	2.1	0.093	0.065	0.070	-	-	-	0.12	0.11	0.057	1.4	2.5	1.3	3.9	1.4
9	1009-SS-100415-13-4	Underlying soil/gravel from station # 9	**0.099**	0.35	0.20	-	-	-	-	-	-	0.16	0.074	0.027	**0.12**	0.81	2.1	**-0.052**	0.97	0.073	-	-	-	0.49	0.21	0.083	**1.1**	3.3	1.9	**10**	6.5
10	1010-MS-100415-13-1	Concrete sample from Station # 10- top 1/4 "	**0.011**	0.086	0.21	**0.000**	0.040	0.16	**0.049**	0.064	0.11	1.6	0.95	0.39	0.97	0.41	0.88	**0.19**	0.18	0.24	36426	5775	82	1267	346	82	5657	1056	46	43350	3.4
10	1010-MS-100415-13-2	Concrete sample from Station # 10- middle 1/2 "	-	-	-	-	-	-	-	-	-				**1.0**	0.82	1.8	-	-	-	1.6	0.53	0.28	**0.033**	0.066	0.091	0.33	0.21	0.091	**2.0**	1.5

Station ID	Sample ID	Description	Am-241 (pCi/g)			Np-237 (pCi/g)			Pu-239/240 (pCi/g)			Ra-226 (pCi/g)			Tc-99 (pCi/g)			Th-232 (pCi/g)			U-234 (pCi/g)			U-235 (pCi/g)			U-238 (pCi/g)			Total U	Perc. Enrich.
			Conc.	±2σ	C	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	(pCi/g)	(U-235)
10	1010-MS-100415-13-3	Concrete sample from Station # 10 - remainder of core	0.042	0.20	0.11	-	-	-	-	-	-	0.38	0.096	0.025	0.073	0.83	1.9	0.11	0.065	0.073	-	-	-	1.6	0.37	0.11	13	4.0	0.63	44	1.8
11	1011-MS-100415-13-1	Concrete sample from Station # 11 - top 1/4 "	0.011	0.10	0.25	0.067	0.11	0.22	0.0090	0.038	0.081	0.33	0.29	0.16	-0.12	0.35	1.2	0.24	0.21	0.28	1523	257	1.1	50	9.9	0.39	205	36	0.61	1778	3.7
11	1011-MS-100415-13-2	Concrete sample from Station # 11 - middle 1/2 "	-	-	-	-	-	-	-	-	-				0.80	0.87	2.0	-	-	-	8.6	1.6	0.28	0.34	0.20	0.15	1.5	0.46	0.20	10	3.5
11	1011-MS-100415-13-3	Concrete sample from Station # 11 - remainder of core	0.0037	0.45	0.26	-	-	-	-	-	-	0.33	0.077	0.021	-0.40	0.78	2.0	0.32	0.098	0.052	-	-	-	2.1	0.41	0.15	14	4.1	0.87	55	2.4
11	1011-SS-100415-13-4	Underlying soil/gravel from station # 11	-0.0020	0.12	0.068	-	-	-	-	-	-	0.16	0.057	0.019	0.85	0.86	1.8	0.042	0.036	0.053	-	-	-	0.038	0.11	0.061	0.75	2.2	1.2	1.6	0.79
12	1017-MS-100416-13-1	Concrete sample from Station # 12 - top 1/4 "	0.021	0.066	0.16	0.098	0.30	0.74	-0.029	0.056	0.14	0.20	0.25	0.68	-0.11	0.34	1.3	1.4	0.50	0.10	4481	949	2.2	165	38	1.0	650	141	2.2	5296	3.8
12	1017-MS-100416-13-2	Concrete sample from Station # 12 middle 1/2 "	-	-	-	-	-	-	-	-	-				1.1	0.84	1.7	-	-	-	0.60	0.29	0.17	0.032	0.062	0.086	0.19	0.16	0.20	0.82	2.6
12	1017-MS-100416-13-3	Concrete sample from Station # 12 - remainder of core	-0.076	2.3	0.10	-	-	-	-	-	-	0.35	0.083	0.025	0.31	0.33	1.2	0.18	0.096	0.073	-	-	-	0.028	0.14	0.077	0.32	2.7	1.6	0.88	1.3
12	1017-SS-100416-13-4	Underlying soil/gravel from station # 12	0.021	0.33	0.19	-	-	-	-	-	-	0.23	0.078	0.024	0.00	0.32	0.81	0.10	0.068	0.064	-	-	-	0.16	0.17	0.094	1.6	2.9	1.6	4.7	1.5
13	1018-MS-100416-13-1	Concrete sample from Station # 13- top 1/4 "	0.053	0.11	0.23	0.070	0.098	0.095	-0.020	0.062	0.14	0.31	0.39	0.26	3.8	0.59	0.92	0.34	0.24	0.28	2154	378	1.1	74	15	0.48	259	47	0.89	2487	4.3
13	1018-MS-100416-13-2	Concrete sample from Station # 13- middle 1/2 "	-	-	-	-	-	-	-	-	-				0.37	0.34	0.90	-	-	-	585	92	0.30	15	2.7	0.096	2.8	0.76	0.19	602	45
13	1018-MS-100416-13-3	Concrete sample from Station # 13 - remainder of core	-0.018	85	0.21	-	-	-	-	-	-	0.47	0.10	0.025	0.78	0.36	0.82	0.15	0.078	0.068	-	-	-	8.7	1.3	0.19	28	6.1	0.70	195	4.6
13	1018-SS-100416-13-4	Underlying soil/gravel from station # 13	0.0058	1.1	0.61	-	-	-	-	-	-	0.46	0.11	0.030	0.97	0.36	0.67	0.14	0.079	0.074	-	-	-	18	2.0	0.34	72	11	1.1	411	3.7
14	1019-MS-100416-13-1	Concrete sample from Station # 14 - top 1/4 "	-0.019	0.042	0.16	0.000	0.069	0.22	0.021	0.041	0.078	0.026	0.34	0.20	5.0	0.48	1.9	0.011	0.086	0.26	534	79	0.38	16	3.1	0.16	46	7.5	0.29	596	5.2

Station ID	Sample ID	Description	Am-241 (pCi/g)			Np-237 (pCi/g)			Pu-239/240 (pCi/g)			Ra-226 (pCi/g)			Tc-99 (pCi/g)			Th-232 (pCi/g)			U-234 (pCi/g)			U-235 (pCi/g)			U-238 (pCi/g)			Total U	Perc. Enrich.
			Conc.	±2σ	C	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	(pCi/g)	(U-235)
14	1019-MS-100416-13-2	Concrete sample from Station # 14 - middle 1/2 "	-	-	-	-	-	-	-	-	-				1.2	0.41	0.74	-	-	-	*407*	*65*	*0.33*	*13*	*2.4*	*0.22*	*40*	*6.7*	*0.22*	*459*	4.8
14	1019-MS-100416-13-3	Concrete sample from Station # 14 - remainder of core	**-0.10**	4.7	0.23	-	-	-	-	-	-	0.52	0.11	0.023	**0.29**	0.34	0.72	0.16	0.11	0.073	-	-	-	13	1.8	0.23	4.5	3.4	1.6	287	30
14	1019-SS-100416-13-4	Underlying soil/gravel from station # 14	**0.11**	1.3	0.75	-	-	-	-	-	-	1.1	0.18	0.035	**0.54**	0.35	0.72	1.2	0.22	0.075	-	-	-	20	2.3	0.39	11	6.5	2.0	439	22
15	1025-MS-100419-13-1	Concrete sample from Station # 15 - top 1/4 "	***0.00***	*0.064*	*0.18*	***0.015***	*0.055*	*0.11*	***-0.0070***	*0.030*	*0.076*	1.1	0.31	0.14	2.8	0.55	0.74	***0.22***	*0.18*	*0.23*	*495*	*76*	*0.50*	*18*	*3.6*	*0.45*	*85*	*14*	*0.50*	598	3.3
15	1025-MS-100419-13-2	Concrete sample from Station # 15 middle 1/2 "	-	-	-	-	-	-	-	-	-				1.2	0.41	0.75	-	-	-	*0.78*	*0.31*	*0.22*	***0.049***	*0.068*	*0.066*	*0.39*	*0.20*	*0.066*	**1.2**	1.9
15	1025-MS-100419-13-3	Concrete sample from Station # 15 - remainder of core	**-0.15**	0.87	0.14	-	-	-	-	-	-	0.61	0.12	0.025	1.6	0.39	1.2	0.14	0.076	0.072	-	-	-	0.84	0.24	0.11	2.9	3.0	1.5	19	4.3
15	1025-SS-100419-13-4	Underlying soil/gravel from station # 15	**-0.42**	0.80	0.46	-	-	-	-	-	-	0.76	0.15	0.035	2.1	0.46	0.84	0.54	0.14	0.070	-	-	-	4.3	0.66	0.19	30	7.6	1.6	115	2.2
16	1026-MS-100419-13-1	Concrete sample from Station # 16- top 1/4 "	***0.078***	*0.12*	*0.22*	***-0.028***	*0.038*	*0.21*	***-0.029***	*0.060*	*0.14*	0.82	0.51	0.24	125	6.3	2.1	*1.2*	*0.47*	*0.27*	*10714*	*3817*	*8.5*	*415*	*155*	*6.8*	*2572*	*922*	*9.0*	13701	2.4
16	1026-MS-100419-13-2	Concrete sample from Station # 16- middle 1/2 "	-	-	-	-	-	-	-	-	-				2.4	0.49	0.87	-	-	-	*1.2*	*0.40*	*0.20*	*0.18*	*0.14*	*0.071*	*0.47*	*0.23*	*0.12*	1.9	5.7
16	1026-MS-100419-13-3	Concrete sample from Station # 16 - remainder of core	0.16	0.26	0.14	-	-	-	-	-	-	0.62	0.13	0.026	6.7	0.91	0.86	**0.077**	0.040	0.090	-	-	-	0.23	0.16	0.078	5.8	2.9	0.77	11	0.61
16	1026-SS-100419-13-4	Underlying soil/gravel from station # 16	**-0.88**	1.0	0.57	-	-	-	-	-	-	1.2	0.19	0.041	2.3	0.50	0.77	1.3	0.23	0.12	-	-	-	5.5	0.87	0.31	55	10	1.4	164	1.5
17	1027-MS-100419-13-1	Concrete sample from Station # 17 - top 1/4 "	***-0.096***	*0.064*	*0.27*	*0.13*	*0.095*	*0.12*	***0.072***	*0.062*	*0.076*	0.80	0.33	0.093	5.8	0.71	1.2	***0.13***	*0.15*	*0.24*	*1125*	*199*	*1.2*	*39*	*8.6*	*0.47*	*297*	*54*	*1.4*	1461	2.0
17	1027-MS-100419-13-2	Concrete sample from Station # 17 - middle 1/2 "	-	-	-	-	-	-	-	-	-				2.4	0.54	0.85	-	-	-	*4494*	*982*	*4.5*	*172*	*43*	*1.9*	*841*	*189*	*1.9*	5507	3.1
17	1027-MS-100419-13-3	Concrete sample from Station # 17 - remainder of core	**-0.15**	1.3	0.18	-	-	-	-	-	-	0.67	0.13	0.036	**0.53**	0.36	0.72	0.17	0.078	0.074	-	-	-	1.9	0.41	0.14	21	5.5	1.1	60	1.4
17	1027-SS-100419-13-4	Underlying soil/gravel from station # 17	**-0.14**	0.31	0.17	-	-	-	-	-	-	0.56	0.11	0.023	**0.23**	0.33	0.75	0.085	0.064	0.074	-	-	-	0.18	0.20	0.11	2.3	1.1	0.38	6.0	1.2

Station ID	Sample ID	Description	Am-241 (pCi/g)			Np-237 (pCi/g)			Pu-239/240 (pCi/g)			Ra-226 (pCi/g)			Tc-99 (pCi/g)			Th-232 (pCi/g)			U-234 (pCi/g)			U-235 (pCi/g)			U-238 (pCi/g)			Total U	Perc. Enrich.
			Conc.	±2σ	C	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	(pCi/g)	(U-235)
18	1028-MS-100419-13-1	Concrete sample from Station # 18 - top 1/4 "	***0.046***	*0.087*	*0.18*	***0.076***	*0.13*	*0.25*	***0.0090***	*0.054*	*0.11*	0.51	0.26	0.25	1.8	0.41	1.1	*0.51*	*0.27*	*0.092*	*629*	*108*	*1.2*	*23*	*5.4*	*0.42*	*222*	*39*	*0.42*	874	1.6
18	1028-MS-100419-13-2	Concrete sample from Station # 18 - middle 1/2 "	-	-	-	-	-	-	-	-	-				**0.60**	0.39	0.77	-	-	-	*793*	*189*	*1.2*	*41*	*11*	*0.52*	*327*	*79*	*1.2*	1161	1.9
18	1028-MS-100419-13-3	Concrete sample from Station # 18 - remainder of core	**-1.0**	0.85	0.34	-	-	-	-	-	-	0.55	0.13	0.034	**0.094**	0.35	0.84	0.21	0.090	0.077	-	-	-	11	1.6	0.25	129	20	1.4	343	1.3
18	1028-SS-100419-13-4	Underlying soil/gravel from station # 18	**-0.048**	0.75	0.43	-	-	-	-	-	-	0.68	0.12	0.030	**0.31**	0.36	0.93	0.25	0.098	0.085	-	-	-	4.1	0.63	0.19	46	9.5	1.9	128	1.4
19	1031-MS-100420-13-1	Concrete sample from Station # 19- top 1/4 "	***-0.023***	*0.084*	*0.25*	***0.067***	*0.10*	*0.19*	***0.019***	*0.054*	*0.10*	0.85	0.42	0.15	7.1	0.73	1.4	*0.30*	*0.24*	*0.27*	*3925*	*857*	*3.8*	*142*	*34*	*2.1*	*797*	*177*	*2.8*	4864	2.7
19	1031-MS-100420-13-2	Concrete sample from Station # 19- middle 1/2 "	-	-	-	-	-	-	-	-	-				7.5	1.3	0.70	-	-	-	*2409*	*742*	*2.4*	*98*	*32*	*1.9*	*618*	*192*	*2.6*	3125	2.4
19	1031-MS-100420-13-3	Concrete sample from Station # 19 - remainder of core	**-0.15**	0.95	0.13	-	-	-	-	-	-	0.59	0.13	0.030	**0.32**	0.36	0.90	0.17	0.077	0.077	-	-	-	0.47	0.24	0.099	4.8	3.9	1.8	14	1.5
19	1031-SS-100420-13-4	Underlying soil/gravel from station # 19	**0.0027**	0.47	0.27	-	-	-	-	-	-	0.45	0.10	0.031	10	1.4	0.85	0.23	0.090	0.082	-	-	-	1.4	0.36	0.12	13	4.6	1.2	41	1.7
20	1032-MS-100420-13-1	Concrete sample from Station # 20 - top 1/4 "	***0.11***	*0.13*	*0.24*	***0.033***	*0.065*	*0.090*	***0.040***	*0.051*	*0.083*	0.91	1.0	0.58	643	32	2.1	***0.093***	*0.14*	*0.24*	*1929*	*560*	*0.88*	*73*	*22*	*0.48*	*322*	*95*	*0.48*	2324	3.4
20	1032-MS-100420-13-2	Concrete sample from Station # 20 - middle 1/2 "	-	-	-	-	-	-	-	-	-				52	6.1	0.87	-	-	-	*3.6*	*0.96*	*0.32*	*0.14*	*0.15*	*0.12*	*1.4*	*0.53*	*0.24*	5.0	1.5
20	1032-MS-100420-13-3	Concrete sample from Station # 20 - remainder of core	**-0.041**	0.42	0.093	-	-	-	-	-	-	0.53	0.11	0.024	16	1.9	0.88	0.10	0.078	0.069	-	-	-	**0.083**	0.15	0.083	3.0	3.0	1.5	**5.1**	0.42
20	1032-SS-100420-13-4	Underlying soil/gravel from station # 20	**-0.37**	1.3	0.74	-	-	-	-	-	-	1.1	0.18	0.035	5.2	0.85	0.81	0.88	0.20	0.11	-	-	-	13	1.5	0.30	74	12	2.8	323	2.7
21	1033-MS-100420-13-1	Concrete sample from Station # 21 - top 1/4 "	***0.056***	*0.11*	*0.23*	***0.032***	*0.064*	*0.088*	*0.14*	*0.082*	*0.098*	3.1	0.96	1.1	750	37	2.1	*0.64*	*0.33*	*0.11*	*170561*	*26694*	*389*	*5692*	*1488*	*328*	*24175*	*4433*	*181*	200428	3.5
21	1033-MS-100420-13-2	Concrete sample from Station # 21 - middle 1/2 "	-	-	-	-	-	-	-	-	-				2086	35	6.0	-	-	-	*64*	*10*	*0.29*	*2.4*	*0.72*	*0.11*	*12*	*2.3*	*0.34*	78	3.0

Station ID	Sample ID	Description	Am-241 (pCi/g)			Np-237 (pCi/g)			Pu-239/240 (pCi/g)			Ra-226 (pCi/g)			Tc-99 (pCi/g)			Th-232 (pCi/g)			U-234 (pCi/g)			U-235 (pCi/g)			U-238 (pCi/g)			Total U	Perc. Enrich.
			Conc.	±2σ	C	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	(pCi/g)	(U-235)
21	1033-MS-100420-13-3	Concrete sample from Station # 21 - remainder of core	**-1.1**	1.1	0.49	-	-	-	-	-	-	0.53	0.13	0.034	22	1.9	1.3	0.30	0.11	0.057	-	-	-	43	6.0	0.39	209	31	2.3	1025	3.1
21	1033-SS-100420-13-4	Underlying soil/gravel from station # 21	**-0.058**	0.89	0.52	-	-	-	-	-	-	0.95	0.15	0.031	11	1.4	0.88	0.92	0.18	0.080	-	-	-	4.7	0.68	0.23	28	8.2	2.0	118	2.5

Bold values are less than the MDC
Italicized values were analyzed by alpha spectroscopy

June 21, 2011

Process Bldgs Slab Core Sample Data.xlsx

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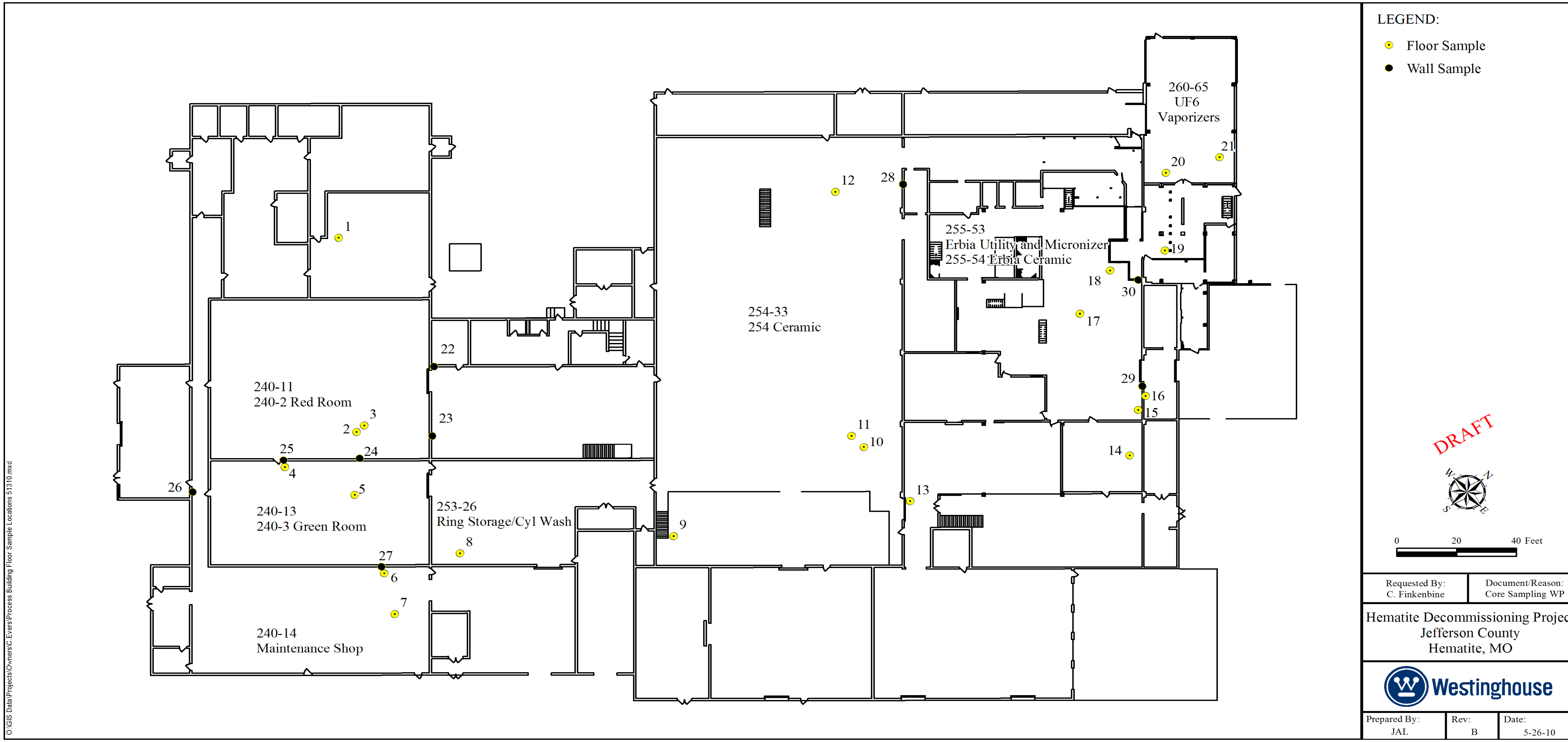
Sample Locations (map)



ATTACHMENT 4

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 5

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
5-1	1. Utilization of site characterization data for Ra and Th as a basis for measurement of Ra & Th during the FSS may not be appropriate. This specifically relates to using threshold values determined during characterization as decision points for FSS results. 2. There is inconsistency between the statements: “Th-232 and Ra-226 will be included in the analysis of FSS samples site wide” and “Th-232 will only be included for demonstrating compliance in areas distinguishable from background or when an individual result exceeds the BTV.”	1. Measure and use results in compliance demonstration for Ra and Th throughout site in FSS. OR Use the Scenario B approach and take more samples to determine which areas should be measured for demonstrating compliance for the FSS. OR Determine and justify impacted and non-impacted areas on an area-by-area basis and measure for Ra and Th in *areas* that are impacted by Ra and Th as opposed to a point by point comparison. 2. Clarify statements on analysis of Th-232 and use for compliance purposes. Use of different analyses methods for different radionuclides to determine *Th-232, U and Ra-226* impacted areas. This also relates to WEC’s treatment of background, and the subsequent determination of background threshold values (i.e., Pro UCL for Th and 99th percentile for U & Ra). [See Additional Resolution A] In the uranium calculation, why were Quantile test results for uranium excluded when it would have otherwise identified impacted areas? Were enough samples taken? [See Additional Resolution B] Th-232 determinations did not appear to have utilized individual elevated results to identify impacted ***areas***. [See Resolution 2] Retraction of commitment to perform Ra & Th analyses at non-impacted areas. [See Resolution 2] Requested all uranium data in non-impacted area and figure showing locations. Requested revised figure Attachment 2 to address all Th-232 impacted sample points within a Th-impacted area or Survey Unit. [See Resolution 2] NRC evaluate HDP’s concern that since the BTV is set up so 5% of background samples will exceed it, requiring a survey unit to be Th-232 impacted on only 1 sample in a Survey Unit exceeding the Th-232 BTV would result in cleanup of background Th-232. The update to DP Section 4.3.5.2 (quoted below) indicates that the area south of the natural gas pipeline is non-impacted.	1. Gamma spectroscopy will be performed on all samples and Ac-228 and Pb-214/Bi-214 will be used to quantify Th-232 and Ra-226 activity, respectively. 2. HDP will include in the compliance calculations (e.g., SOF) the analytical results for Th-232 and Ra-226.	1. As committed in the response to RAI HDP C5-Q1, HDP will include Th-232 and Ra-226 in the evaluation of FSS samples site wide. Gamma spectroscopy will be performed on all samples and Ac-228 and Pb-214/Bi-214 will be used to quantify Th-232 and Ra-226 activity, respectively. 2. SOF calculations • The concept of individual radionuclide impacted areas (i.e., Th-232, Ra-226, etc.) will no longer be used by Westinghouse. Areas will be specified as impacted or non-impacted prior to remediation, and for compliance purposes, dose contributions from all radionuclides of concern will be considered in the sum-of-fractions calculations for all impacted areas. • Westinghouse will update the DP to indicate that gross FSS results, not the net, will be used for either the Sign or WRS test for compliance purposes. The Sign test, as described in the DP is in error. DP and Hematite procedures will be corrected to address the errors. Section 14.4.2.5 needs to be updated and maybe others. • Westinghouse will also confirm if the calculation of dose for compliance purposes is sufficiently described in the DP. If not, they will update the document. Westinghouse has identified the changes necessary to implement the above resolutions to #1 and #2, and has provided them in Appendix A to this matrix. **Additional Resolutions** A. With the new HRCR Appendix B, (Appendix B to this response), the treatment of background and background threshold values (BTVs) for Th-232 and Ra-226 are consistent (both use ProUCL 95th normal Upper Tolerance Level (UTL)). The remaining inconsistency for the treatment of background and BTV for U is technically insignificant. The U BTV serves no other purpose than determining the MARSSIM class designation in the DP. A revised calculation of the U BTV would change its value only by decimal places while the U DCGLs are in the hundreds so the initial class designations would not change. Since U background is not subtracted in the final status survey process, a BTV revision has no impact. Revising its method of calculation and populating the result in the DP and supporting documents would be an administrative effort with no material impact on remediation and final status surveys. Appendix M contains pages from a spreadsheet of all uranium data in the non-impacted area. Also pages from spreadsheets containing the data used in ProUCL tests for U, Th-232, and R-226. B. HDP reviewed the non-impacted area uranium data (RE: HDPC 14 Q-4) and has determined that the Quantile test could provide meaningful results. The review determined that two of the locations that were used in the statistical analysis (NB-95-4.5-SL and NB-95-4.5-SL) are actually located within the impacted area. When these results are removed from the non-impacted area

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
		Is this consistent with the recent changes to impacted areas (removal of Ra-226 and Th-232 specific areas) and the discussion of adding a Class 3 buffer area south of the railroad? "Outside of the elevated Ra-226 area within the burial pits, two samples (both 1.7 pCi/g) in the impacted area beneath the process buildings and two samples (1.7 and 2.6 pCi/g) in the natural gas pipeline area exceeded the Ra-226 threshold value of 1.6 pCi/g. All of the results described above are considered to be statistical outliers and defining the area south of the natural gas pipeline area as non-impacted is valid."		population, there is sufficient data and it passes both the Quantile and Mann Whitney tests. The results of these tests along with the data sets used are provided in Appendix C. A figure showing the location of the impacted area boundary and the sample locations is provided in Appendix D.
5-3	Westinghouse showed a sensitivity analysis for the Deep DCGLs but did not discuss how the Uniform DCGLs might be impacted by a similar sensitivity analysis.	1. Perform a sensitivity analysis showing how the *Uniform* Tc-99 DGCLs change with variation in the contaminated zone thickness. 2. Send an updated Figure 5-5.	1. Westinghouse has performed a sensitivity analysis showing how the Uniform Tc-99 DGCL is affected with variation in the contaminated zone thickness. The sensitivity analysis varied the depth of the contaminated zone varied from 6.7 meters to 9.1 meters, while adjusting the size of the unsaturated zone so that the sum of the two remained equal to 9.1 meters. The analysis shows that the DCGL is insensitive to the thickness of the contaminated zone. 2. DP Figure 5-5, "Depth of Soil Contamination" has been revised.	1. Appendix E shows the sensitivity chart resulting from the analysis. 2. Appendix F provides revised DP Figure 5-5, "Depth of Soil Contamination".
5-5	Plant transfer factors for Pa-231 and milk transfer factor for Ra need to be revised.	Provide RESRAD files with revised DCGL values after correcting for transfer factors.	In letter HEM-10-85, dated 8/11/201, Westinghouse stated the revised plant transfer factor for Pa-231 and a revised milk transfer factor for Ra-226. The revised factors are based on the median values for these factors from NUREG/CR-6697.	Appendices G and H provide the revised plant transfer and milk transfer factors in DP Table 5-6. Appendix I provides draft revised DCGL tables; these DCGLs reflect changes resulting from the DP RAI responses submitted by Westinghouse to date, and this follow-up response. The associated RESRAD summary files (DP Chapter 5 Appendices) will be submitted with the revision to the DP. The RESRAD summary files are in Appendix N.
5-6	Conservatism of assumed ratios of radionuclide concentrations in sensitivity analysis is not adequately justified. Some areas of the site have a higher ratio of Tc, than assumed in the sensitivity analyses (i.e., 20%) and the behavior of this radionuclide can be significantly different than other radionuclides.	Perform a sensitivity analysis assuming 100% Tc-99 to see what parameters are sensitive. If additional parameters are found to be sensitive when there is only Tc-99 present, treat these as sensitive parameters in all CSMs.	Westinghouse performed additional sensitivity analyses to provide adequate justification as follows: 1st Step: Assumed 100% of the activity was attributed to Tc-99 to determine sensitive parameters. The analysis showed that in addition to the parameters noted as sensitive in DP Table 5-5, the Milk Transfer Factor was a sensitive parameter for the Uniform CSM. The effect on the DCGL (when recalculated using the 75th percentile of the distribution from NUREG-6697) was relatively minor, and resulted in a maximum reduction of approximately 2%. Appendix J provides the results of this 1st Step, a comparison of Tc-99 DCGLs between the DP Tables and the potential change from the milk transfer factor, and a similar comparison among theTc-99 excavation scenario concentrations resulting in 25 mrem/yr.	In consideration that the sensitivity for milk transfer factor had only minor impact for the 100% Tc-99 case, and was not identified as a sensitive parameter in the second assessment that was based on actual site conditions, Westinghouse will continue to treat this factor as an insensitive parameter (consistent with the sensitivity analysis presented in the DP).

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<table>
<tr><th>RAI No.</th><th>Issues</th><th>Path Forward</th><th>Discussion Points</th><th>Proposed Resolution</th></tr>
<tr><td></td><td></td><td></td><td>2nd Step: As a refinement to the 1st Step, a sensitivity analysis for the Uniform CSM was performed using a distribution representative of actual site conditions for Tc-99 concentration values and the average concentration values for all other radionuclides. This analysis determined that the Milk Transfer Factor was not a sensitive parameter. Appendix K provides the radionuclides used in the second step.</td><td></td></tr>
<tr><td>5-8</td><td>The higher value assumed by Westinghouse for root depth is less conservative for the Surface, Root, and Excavation CSMs.</td><td>Provide a basis for why the site-specific value of 0.6 m was averaged with non-site specific data from NUREG-6697 of 1.1 m or use the site specific value for root depth in the dose assessment.</td><td>The following sentence from the RAI response to HDP-C5Q8 from HEM-10-85 was incorrectly stated: “As noted in the DP section and the NRC’s RAI, choosing a larger value for the root depth is conservative for the Surface and Root models.” As stated later in the response and in DP Section 5.3.4.4.5, Westinghouse recognizes that the root depth parameter is negatively correlated with dose for the Surface and Root models.

Westinghouse does not consider the value of 0.6 m root depth value to be site-specific. The 0.6 m value was based on only 3 crops (corn, soybeans, and wheat) listed for Jefferson County in the 2007 Agricultural Census. Westinghouse considers the 0.6 m value to a lower bound of a representative root depth value.

An upper bound for the representative root depth value of 1.225 m was determined based on the 25th percentile of the root depth PDF from NUREG/CR-6697 Table 6.1-2.

Another upper bound for the representative root depth value of 1.1 m was determined by a weighted average of the root depths provided in NUREG/CR-6697, Attachment C, Table 6.1-1 and Table 6.1-2. The weighting was based the consumption rate of, 112 kg/yr for fruits, vegetables, and grains (FVG) and 21 kg/yr, for leafy vegetables (Leafy).

As a confirmation of 0.9 m as a representative root depth value, Westinghouse considered all 4 of the top crops in Jefferson County MO based on the 2007 Agricultural Census.
<table>
<tr><th>Crop</th><th>Acres</th><th>Mean Root Value* (m)</th></tr>
<tr><td>grass</td><td>18,477</td><td>1.05</td></tr>
<tr><td>soybean</td><td>6,241</td><td>0.45</td></tr>
<tr><td>corn</td><td>4,231</td><td>0.9</td></tr>
<tr><td>wheat</td><td>895</td><td>0.22</td></tr>
</table>
*NUREG/CR-6697, Att. C, Table 6.1-1 and Table 6.1-2

The weight root depth value considering these top 4 crops is 0.88 m. This confirms that the 0.9 value is representative.</td><td>Based on the discussion points, Westinghouse believes the 0.9 m parameter is appropriate. No further action required.</td></tr>
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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
5-9	It is unclear as to which Np-237 DCGL will be used for contamination below 1.5 m.	Clarify that the Uniform or Deep DCGL for Np-237 (0.3 pCi/g) will be used for contamination that exists below 1.5 m, while the Excavation DCGL will be used for all other radionuclides. No comments on the Proposed Resolution. Comment on the 2 numbered constraints in this RAI response: Request RESRAD summary files for area factor. Request revised DP Table 5-13. Request explanation of how used the 2 constraints discussed in the RAI response. NRC does not agree with the statement that the Deep DCGLs are technically justified for evaluating unexcavated soil below 3 m. While the intruder construction scenario may not apply for depths below 3m, the intruder well scenario would still apply. Absent an analysis of the intruder well scenario, NRC does not agree with this statement.	The following DCGLs will be used for contamination that exists below 1.5 m: • For Np-237, the Uniform or Deep DCGL (both are 0.3 pCi/g). • For all other radionuclides, the Excavation DCGL. In addition, the DCGL values have been adjusted to account for the contribution of Np-237 as one of the insignificant radionuclides. The 2 constraints were used to develop the most limiting area factors. Analysis used each of the constraints separately ensure the post-excavate soil is properly modeled for contiguous soil placement and for distributed soil placement of the hot spot. The lowest result obtained by either placement scenario is contained in Table 5-13c (which is for field use).	DP Section 5.3.6, last paragraph, will be revised as follows: *While the Deep DCGLs provided in Table 5-9 are technically viable for evaluating unexcavated soil below 3 m, additional effort to justify them will not be pursued since the smaller Excavation DCGLs provide an ALARA measure, with the exception of Np-237. Rather than apply separate DCGLs at depths below 3 m, the following DCGLs will be used for evaluating unexcavated soil at any depth below 1.5 m:* • *For Np-237, the Uniform or Deep DCGL (both are 0.3 pCi/g).* • *For all other radionuclides, the Excavation DCGL.* In response NRC's observation during a conference call that the Np-237 DCGL for the Deep CSM is inconsistent with RAI response HDPC-14-1, Westinghouse has modified the methodology to evaluate the contribution from insignificant radionuclides. Appendix L contains a revised response to NRC RAI HDPC-14-Q1 that describes the revised approach.
5-10	It is unclear as to which DCGL will be used to determine the area factor for Np-237 for depths greater than 1.5 m.	1. Ensure Area Factor for Np-237 for depths greater than 1.5 m is based on the Uniform or Deep DCGL for Np-237. 2. Provide RESRAD Summary Reports for development of Area Factors.	1. As discussed in Section 14.1.3.1 of the Hematite Decommissioning Plan (DP), Np-237, along with Pu-239/240 and Am-241, are considered insignificant radionuclides. As discussed in Section 3.3 of NUREG-1575, Vol. 2, by adjusting the remaining DCGLs, the dose from insignificant radionuclides is now accounted for in demonstrating compliance and the insignificant radionuclides are eliminated from further consideration during final status survey. Therefore, no Np-237 area factors are required during final status surveys. 2. Westinghouse will provide the RESRAD Summary Reports for development of Area Factors as an Appendix to Chapter 5 in the revision to the DP. If requested, the files can be emailed to NRC prior to submittal of the revised DP.	1. Westinghouse has determined that Np-237 is an insignificant radionuclide. Therefore, instead of using Np-237 area factors, Np-237 is accounted for as part of the insignificant radionuclide adjustment to all of the soil DCGLs 2. Westinghouse will provide the RESRAD Summary Reports for development of Area Factors with the revision to the DP as an Appendix to Chapter 5. The RESRAD summary files are in Appendix N.
5-11	Westinghouse does not provide sufficient evidence to demonstrate that the groundwater concentrations would decline over time from their current values after release of the facility.	Clarify how the leachate source term will be removed during the remediation of the contaminated soil in the burial pits and under the process buildings. Clarify if there will be dewatering of the pore space at the depths where the measurements of the leachate in Table 4-28 were taken. If these measurements were taken below the CZ, clarify how the complete source term will be removed. 1. Lack of soil characterization data under Bldgs 240 & 253. 2. Explanation of Tc-99 2007 & 2008 data from wells BD-02 & BD-04 with respect to high concentrations and the movement from BD-02 towards BD-04 and decrease in concentrations by two orders of	The following is the summary to the response to RAI HDP-3-Q9 in letter HEM-11-25 dated 3/10/11: Summary: Westinghouse considers there to be an inconsistency between Westinghouse's intent concerning its statement in RAI HDP-C5-Q11 regarding "leachate removal" and the NRC's reading of this statement, as expressed in this RAI's 'comment' and 'path forward.' is addressed in the 'Discussion' below. Westinghouse was not intending to imply creation of a distinct leachate removal program with its own criteria. The criteria used for assessing remediation of the overburden are based on the soil since that is the source of radioactivity in the leachate. For soil, the estimate of areal and vertical	Westinghouse will perform sampling as appropriate of unexcavated soil associated with monitoring wells to verify DCGLs are met. The details for this sampling associated with wells were provided with the response to RAI for DP Chapter 3, HDP-3-Q9. For Items 1-4 in the Path Forward, Westinghouse provided via letter HEM-11-56, dated 5/5/11, a summary paper regarding the nature and extent of Tc-99 under the former process buildings 240, 253, 254, 255, 256, and 260.

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
		magnitude for BD-02 & the increase in BD-04 by an order of magnitude as a function of time. What is the source of the activity spikes? 3. No characterization by Westinghouse of the soil under the buildings, 1.5 m and below. (RAI 4Q6) 4. Clarification from Westinghouse of which layer they are referring to when discussing the contamination zone (CZ). 5. Westinghouse's protocol for identifying what the "appropriate" trigger is as referred to Westinghouse's commitment to perform "sampling as appropriate of unexcavated soil below the CZ associated with monitoring wells to verify DCGLs are met." (RAI 5Q11) [The details for this sampling associated with wells were provided with the response to RAI for DP Chapter 3, HDP-3-Q9.]	extent impacted overburden soil is provided in the HRCR, and summarized in DP Chapter 4; DP Chapter 5 provides the basis for the release criteria for soil removal; and DP Chapter 14 describes the process for evaluating the adequacy of remediation, including a comparison to the release criteria defined in DP Chapter 5. The inputs to this evaluation include data obtained through radiological surveys and laboratory analysis of soil samples. Coincident with soil excavation, the portion of the leachate entrained in soil that exceeds the DCGL will be removed. Similarly, a portion of the leachate will be entrained in the soil samples analyzed by the laboratory, thereby accounting for that contribution to residual radioactivity. The RESRAD modeling described in DP Chapter 5 accounts for the residual radioactivity (i.e., whether in soil or leachate), so meeting the DCGLs is protective of the ground water. DP Chapter 7 addresses the ALARA aspects of DCGLs.	
5-14	Source lifetime parameter assumed in RESRAD is non-conservative.	The source lifetime parameter used in RESRAD BUILD should reflect the most likely value. The DCGL calculations should be updated to include this.	Westinghouse recognizes that the 25th percentile value of 17,918 days is not the most conservative option when compared to the 10,000 day value mentioned in NUREG/CR-6697 Section 8.8; however, use of the 25th percentile value is consistent with current regulatory guidance and is consistent with what has been used at other decommissioning sites. The 10,000 day value in NUREG/CR-6697 Section 8.8 is the peak of the triangular distribution frequency distribution presented in NUREG/CR 6697, and is not necessarily the most appropriate value as applied to a specific application. The applicability of the 10,000 day value in NUREG/CR-6697 Section 8.8 is described as: "Another suggestion by the ANS is an air release rate of 4 × 10-6/h for solid powders that are covered with a substantial layer of debris or are constrained by indoor static conditions (ANS, 1998). This rate is equivalent to a lifetime of approximately 10,000 days (27.4 yr). The loose contaminants on a contaminated surface can be considered as being restricted by some weak physical binding force and would, therefore, behave like the constrained solid powders. The lifetime of the constrained solid powders can be used as the most likely value for the loose contaminants." This description is not representative of the conditions that exist for HDP buildings to remain. Westinghouse selected the 25th percentile value based on the conditions of the buildings to remain and believes it to be more appropriate than the 10,000 day value that the commenter has suggested.	Westinghouse considers the source lifetime parameter of 17,918 d to be consistent with regulatory guidance and representative of site conditions. No action required.

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
5-17	WEC did not address second half of path forward: "If volumetrically contaminated building material will remain on site, provide volumetric DCGL values for the buildings."	Provide volumetric DCGL values as requested, or explain to what criteria survey results will be compared.	The buildings with historical use and survey data indicating the potential for volumetric contamination (e.g., the process buildings) will be disposed of as radioactive material (they will not be evaluated for release from radiological controls). Based on historical use and survey data, volumetric contamination does not exist within the buildings expected to remain at the time of license termination (e.g., Buildings 110, 230, 231). In the event that volumetric contamination is identified in buildings that will remain after License Termination, the volumetrically contaminated materials will be removed and disposed prior to final status survey or appropriate DCGLs will be developed at that time and submitted to NRC for approval.	Rather than develop volumetric DCGLs or criteria that are unlikely to be used, a new last paragraph will be added to DP Section 5.4.4 as follows: "Volumetric DCGLs have not been developed for buildings that are expected to remain at the time of license termination based on no evidence of volumetric contamination from process knowledge and analysis to date. Volumetrically contaminated material will be removed and shipped for disposal prior to final status survey. However, if the material will remain, appropriate DCGLs will be developed and submitted to NRC for approval."

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Appendix A			
DP Section	**Section Title**	**Text in DP Revision 0**	**Proposed Text for DP Revision 1**
TABLE OF CONTENTS	PLAN LIST OF TABLES	4-9 Statistical Results of Burial Pits Ra-226 Impacted Area Soils	4.9 Statistical Results of Elevated Ra-226 Area within the Burial Pits
TABLE OF CONTENTS	PLAN LIST OF FIGURES	5-3 Ra-226 Impacted Area	5.3 Elevated Ra-226 Area within the Burial Pits
Ch 4 TABLE OF CONTENTS	PLAN LIST OF TABLES	4-9 Statistical Results of Burial Pits Ra-226 Impacted Area Soils	4.9 Statistical Results of Elevated Ra-226 Area within the Burial Pits
4.0	RADIOLOGICAL STATUS OF FACILITY	Thorium-232 is present naturally in background soil, and has been identified as a ROC at a limited number of locations within the area of the buried waste. An analysis of the characterization data obtained from the non-impacted and the impacted areas of the site was performed and documented in Appendix A of the HRCR to determine which areas contain Th-232 at concentrations that are distinguishable from background. Radium-226 was also identified as a ROC in one area containing two Burial Pits. Results for soil sample IDs SO-BP6C-12 and SS-BP-028-DV-EL-9 showed concentrations of 414 and 183 picoCuries per gram (pCi/g), respectively (sample locations are provided on Figure 4-7 of the HRCR). The elevated Ra-226 was likely introduced into the Burial Pits with waste as a result of the installation of contaminated equipment into the process operations as described in Section 4.7.1.5 of the HRCR.	Thorium-232 is present naturally in background soil, and has been identified at a limited number of locations within the area of the buried waste. Radium-226 was also identified as a ROC in one area containing two Burial Pits. Results for soil sample IDs SO-BP6C-12 and SS-BP-028-DV-EL-9 showed concentrations of 414 and 183 picoCuries per gram (pCi/g), respectively (sample locations are provided on Figure 4-7 of the HRCR). The elevated Ra-226 was likely introduced into the Burial Pits with waste as a result of the installation of contaminated equipment into the process operations as described in Section 4.7.1.5 of the HRCR. Although only low concentrations of Th-232 and Ra-226 have been identified at locations outside of the Burial Pit Area, these radionuclides will be considered ROCs site-wide.
4.3.3	Characterization Summary	• Statistical Results of Burial Pits Ra-226 Impacted Area Soils (Table 4-9 and Section 4.7 of the HRCR);	• Statistical results of elevated Ra-226 area within the Burial Pits (Table 4-9 and Section 4.7 of the HRCR);
4.3.5.1	Surface Soil	No surface soil samples from non-impacted areas exceeded the threshold values discussed in Section 4.3.4 for total Uranium, Tc-99 and Th-232. Outside of the Ra-226 Impacted Area, one sample (2.0 pCi/g) in the area south of the railroad exceeded the Ra-226 threshold value of 1.6 pCi/g. This result is considered to be a statistical outlier and defining the sampled area as non-impacted (with respect to Ra-226) is valid.	No surface soil samples from non-impacted areas exceeded the threshold values discussed in Section 4.3.4 for total Uranium, Tc-99 and Th-232. Outside the elevated Ra-226 area within the burial pits, one sample (NB-04-00-SL at 2.0 pCi/g) in the area south of the railroad and near the eastern property line exceeded the Ra-226 threshold value of 1.6 pCi/g. This result is considered to be a statistical outlier, and is consistent with the identified presence of the naturally occurring volcanic rock rhyolite (naturally higher concentrations of radium). Defining the sampled area as non-impacted (with respect to Ra-226) is valid.
4.3.5.2	Sub-surface Soil	Burial Pits Soil – Total Uranium, Tc-99 and Ra-226 (isolated to the Ra-226 Impacted Area);	Burial Pits Soil – Total Uranium, Tc-99 and Ra-226 (isolated to the elevated Ra-226 area) ;
4.3.5.2	Sub-surface Soil	Outside of the Ra-226 Impacted Area, two samples (both 1.7 pCi/g) in the impacted area beneath the process buildings and two samples (1.7 and 2.6 pCi/g) in the natural gas pipeline area exceeded the Ra-226 threshold value of 1.6 pCi/g. All of the results described above are considered to be statistical outliers and defining the sampled areas as non-impacted is valid.	Outside of the elevated Ra-226 area within the burial pits, four samples (BD-33-4.5-SL, BD-27-13-SL, BD-32-13-SL, and BD-37-5-SL at 1.7 pCi/g) in the area beneath the process buildings, two samples (NB-134-4.5-SL at 1.7 pCi/g and NB-134-9-SL at 2.6 pCi/g) in the natural gas pipeline area, and one sample (NB-101-4.5- SL at 1.7 pCi/g) adjacent to the east side of Building 260 exceeded the Ra-226 threshold value of 1.6 pCi/g. While the results described above are considered to be statistical outliers, they are within the impacted area.
Table 4-9	Statistical Results of Burial Pits Ra-226 Impacted Area Soils	Statistical Results of Burial Pits Ra-226 Impacted Area Soils	Statistical Results of the Elevated Ra-226 Area within the Burial Pits
Figure 4-1	Groundwater Sample Locations	“RA-226 Impacted Area” (in legend)	Rename as “Elevated Ra-226 Area” (in legend).

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Appendix A			
DP Section	**Section Title**	**Text in DP Revision 0**	**Proposed Text for DP Revision 1**
Figure 4-12	Impacted Area – Sub-Surface Soil Contamination – Ra-226	"RA-226 Impacted Area" (in legend)	Rename as "Elevated Ra-226 Area" (in legend).
Figure 4-14	Groundwater monitoring Wells	"RA-226 Impacted Area" (in legend)	Rename as "Elevated Ra-226 Area" (in legend).
Ch 5 LIST OF FIGURES	N/A	5-3 Ra-226 Impacted Area	5.3 Elevated Ra-226 area within the Burial Pits
5.2	RADIONUCLIDES OF CONCERN	Thorium-232 is present in natural background and has been identified as a ROC at a limited number of locations within the area of the buried waste. Radium-226 was identified as a ROC at two locations in the buried waste (see Chapter 4 for characterization details). The elevated Ra-226 was likely introduced into the Burial Pits with waste as a result of installing contaminated equipment into the process operations.	Thorium-232 is present naturally in background soil, and has been identified at concentration greater than the Background Threshold Value for Th-232 at a limited number of locations within the area of the buried waste. Radium-226 was also identified as a ROC in one area containing two burial pits. The elevated Ra-226 was likely introduced into the burial pits with waste as a result of the installation of contaminated equipment into the process operations Although only low concentrations of Th-232 and Ra-226 have been identified at locations outside of the Burial Pit Area, these radionuclides will be considered ROCs site-wide.
5.3.3.1	Contaminated Zone	The characterization also identified two locations within the north end of the buried waste that contain Ra-226 contamination (Ra-226 Impacted Area). The size of the Ra-226 Impacted Area is approximately 0.3 acres (1,292 m^2) (see Figure 5-3). The elevated Ra-226 was likely introduced into the Burial Pits with waste as a result of installing contaminated equipment into the process operations (see Chapter 4). A separate CSM was developed for Ra-226 which assumes a 1292 m^2 Contaminated Zone area in order to be more representative of site conditions.	The characterization also identified two locations within the north end of the buried waste that contain Ra-226 contamination. The aerial extent of the Ra-226 contamination is approximately 0.3 acres (1,292 m^2) (see Figure 5-3). The elevated Ra-226 was likely introduced into the Burial Pits with waste as a result of installing contaminated equipment into the process operations (see Chapter 4).
5.3.4.3	Resrad Parameter Sensitivity Analysis	The detailed RESRAD output reports including the Regression and Correlation Output are provided in Reference 5-8. The numerical results for the PRCC (as well as PCC, SRC and SRRC) for all of the parameters evaluated and all four CSMs are provided in Appendix B.	The detailed RESRAD output reports including the Regression and Correlation Output are provided in Reference 5-15. The numerical results for the PRCC (as well as PCC, SRC and SRRC) for all of the parameters evaluated and all four CSMs are provided in Appendix A. [Note: This specific change assumes that an addendum to the sensitivity analysis report will be created and listed as a new reference (Reference 15 is next citation). RESRAD output is assumed to be in Appendix A of this new addendum.]
Table 5-5	Summary Of RESRAD Parameter Sensitivity Analyses	(Table currently shows two columns for each CSM, one for the site and one titled RIA. In the legend, RIA is defined as "Radium Impacted Area (1,292 m^2)")	[Note: Specific change not yet available. The Table will be updated to reflect the results of the revised sensitivity analysis (which includes Ra-226 in the site wide model). Also, the definition of RIA needs to be deleted from the table legend.]
Table 5-6 (pg 5 of 21)	RESRAD Input Parameters	1,292 m^2 The estimated size of the Ra-226 impacted area for Burial Pits 1A and 6A.	[Note: Delete]
Table 5-6 (pg 6 of 21)	RESRAD Input Parameters	41 m^2 The length parallel to the aquifer for the radium affected area was estimated as the diameter of the 1,292 m^2 contaminated area which is 41 m.	[Note: Delete]
Table 5-7	Soil DSRs And DCGLs - Surface	Ra-226+C 4.16E+00 0 6.0	([Note: Specific change not yet available. Revise Ra-226 DSR and DCGL for Surface Soil.]
Table 5-8	Soil DSRs And DCGLs - Root	Ra-226+C 1.153E+01 248.2 2.2	[Note: Specific change not yet available. Revise Ra-226 DSR and DCGL for Root Soil.]
Table 5-9	Soil DSRs And DCGLs - Deep	Ra-226+C 2.078E-03 1000 12,030	[Note: Specific change not yet available. Revise Ra-226 DSR and DCGL for Deep Soil.]
Table 5-10	Soil DSRs And DCGLs - Uniform	Ra-226+C 1.282E+01 0 2.0	[Note: Specific change not yet available. Revise Ra-226 DSR and DCGL for Uniform Soil.]

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Appendix A			
DP Section	**Section Title**	**Text in DP Revision 0**	**Proposed Text for DP Revision 1**
Table 5-11	Alternate Excavation Scenario Concentration Corresponding To 25 mrem/yr Compared To Deep DCGLs	Ra-226+C 9.69E+00 2.6 6015	[Note: Specific change not yet available. Revise Ra-226 DSR and DCGL for Excavated Deep Soil.]
Table 5-12	Alternate Excavation Scenario DCGL	Ra-226+C 5.2	[Note: Specific change not yet available. Revise Ra-226 DCGL for Alternate Excavation Scenario.]
Table 5-13	Area Factors for Soil	(Table currently shows "N/A" in place of area factors for Ra-226 in Elevated Measurement Areas for 153,375 m^2, 10,000 m^2 and 3000 m^2 in each of the three CSMs.)	[Note: Specific change not yet available. For each CSM, calculate area factors for Ra-226 in the same manner as the other radionuclides.]
Figure 5-3	Ra-226 Impacted Area	Ra-226 Impacted Area	Elevated Ra-226 Area within the Burial Pits
10.5	EXTERNAL EXPOSURE DETERMINATION	Based upon the HSA and other investigations, the primary HDP radionuclides of concern are Uranium (U-234, U-235, U-236 and U-238), Thorium (Th-232), Technetium-99 (Tc-99), Americium-241 (Am-241), Plutonium-239/240 (Pu-239/240) and Neptunium-237 (Np-237). Radium-226 (Ra-226) is also considered to be a radionuclide of concern in an isolated area (Ra-226 impacted area) within the Burial Pit area.	Based upon the HSA and other investigations, the primary HDP radionuclides of concern are Uranium (U-234, U-235, U-236 and U-238), Thorium (Th-232), Technetium-99 (Tc-99), Americium-241 (Am-241), Plutonium-239/240 (Pu-239/240) and Neptunium-237 (Np-237). Radium-226 (Ra-226) is also considered to be a radionuclide of concern and is found primarily within the elevated Ra-226 area identified in the burial pits.
14.1.1	RADIONUCLIDES OF CONCERN	Thorium-232 (Th-232 + C) is present in natural background and has been identified as a ROC at a limited number of locations within the Burial Pit Area. Radium-226 (Ra-226 + C) was identified as a ROC at two locations in the Burial Pit Area. The elevated Ra-226 was likely introduced into the burial pits with waste as a result of installing contaminated equipment into the process operations.	Thorium-232 is present naturally in background soil, and has been identified at concentration greater than the Background Threshold Value for Th-232 at a limited number of locations within the area of the buried waste. Radium-226 (Ra-226 + C) was identified as a ROC and has been identified primarily at two locations in the Burial Pit Area. Radium-226 was also identified as a ROC in one area containing two burial pits. The elevated Ra-226 was likely introduced into the burial pits with waste as a result of the installation of contaminated equipment into the process operations. Although only low concentrations of Th-232 and Ra-226 have been identified at locations outside of the Burial Pit Area, these radionuclides will be considered ROCs site-wide.
14.1.5.1	Sum-Of-Fractions And Weighted Sigma Calculations	When using the Wilcoxon Rank Sum (WRS) test, for each contaminant present in background, and when a background value is used (e.g., Ra-226 and Th-232), the greater of the survey unit and reference area sigma is used in the calculation.	When using the Wilcoxon Rank Sum (WRS) test, for each contaminant present in background, the greater of the survey unit and reference area sigma is used in the calculation.

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Appendix A

DP Section	Section Title	Text in DP Revision 0	Proposed Text for DP Revision 1
14.1.5.1.1	Scan Or *In Situ*	For scan or *in-situ* surveys, the SOF will be calculated based on the ratio of the radioactivity concentrations (in pCi/g) of total Uranium plus Th-232 and Ra-226 (when present above the background concentration), and their respective soil $DCGL_w$. The total Uranium concentration may be a calculated or measured value depending on instrumentation and software capabilities. The SOF will be calculated using the following equation, based on Equation 4-3 of MARSSIM. The values used in Equation 14-9 will be net results after correcting for the contribution of Ra-226 and Th-232 in open land areas where those radionuclides exist. **(14-9)** $$SOF = \frac{Conc_{Total\ U}}{DCGL_{w,Total\ U}} + \frac{Conc_{Th-232}}{DCGL_{w,Th-232}} + \frac{Conc_{Ra-226}}{DCGL_{w,Ra-226}}$$ The weighted sigma value is calculated using the following equation, based on Equation I-17 of MARSSIM. **(14-10)** $$\sigma_{SOF} = \sqrt{\left(\frac{\sigma_{Total\ U}}{DCGL_{w,Total\ U}}\right)^2 + \left(\frac{\sigma_{Th-232}}{DCGL_{w,Th-232}}\right)^2 + \left(\frac{\sigma_{Ra-226}}{DCGL_{w,Ra-226}}\right)^2}$$	[Note: Delete]
14.1.5.1.2	Sample – Measure Tc-99	When measuring Tc-99, the SOF will be calculated based on the ratio of the radioactivity concentrations (in pCi/g) of U-234, U-235, U-238, Tc-99, Ra-226 and Th-232 (when present above the background concentration), and their respective soil DCGLw values using the following equation, based on Equation 4-3 of MARSSIM.	When measuring Tc-99, the SOF will be calculated based on the ratio of the radioactivity concentrations (in pCi/g) of U-234, U-235, U-238, Tc-99, Ra-226 and Th-232 (Ra-226 and Th-232 will be corrected for background when calculating dose), and their respective soil $DCGL_w$ values using the following equation, based on Equation 4-3 of MARSSIM.

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Appendix A			
DP Section	**Section Title**	**Text in DP Revision 0**	**Proposed Text for DP Revision 1**
14.1.5.1.3	Sample – Infer Tc-99	When inferring Tc-99, the SOF will be calculated based on the ratio of the radioactivity concentrations (in pCi/g) of U-234, U-235, U-238, Ra-226 and Th-232 (when present above the background concentration), and their respective soil $DCGL_w$ values. In this case, the measurement of U-235 accounts for the dose contribution of Tc-99 and the $DCGL_w$ for U-235 is appropriately modified as provided in Table 14-10. The SOF will be calculated using the following equation, based on Equation 4-3 of MARSSIM. **(14-13)** $SOF = \frac{Conc_{U\text{-}234}}{DCGL_{w,U\text{-}234}} + \frac{Conc_{U\text{-}235}}{DCGL_{w,U\text{-}235}} + \frac{Conc_{U\text{-}238}}{DCGL_{w,U\text{-}238}} + \frac{Conc_{Th-232}}{DCGL_{w,Th-232}} + \frac{Conc_{Ra-226}}{DCGL_{w,Ra-226}}$ The weighted sigma value is calculated using the following equation, based on Equation I-17 of MARSSIM. **(14-14)** $\sigma_{SOF} = \sqrt{\left(\frac{\sigma_{U\text{-}234}}{DCGL_{w,U\text{-}234}}\right)^2 + \left(\frac{\sigma_{U\text{-}235}}{DCGL_{w,U\text{-}235}}\right)^2 + \left(\frac{\sigma_{U\text{-}238}}{DCGL_{w,U\text{-}238}}\right)^2 + \left(\frac{\sigma_{Th-232}}{DCGL_{w,Th-232}}\right)^2 + \left(\frac{\sigma_{Ra-226}}{DCGL_{w,Ra-226}}\right)^2}$	[Note: Delete.]
14.1.5.1.4	Sample – Sample Start Depth >1.5 m	For samples obtained at a depth >1.5 m, the SOF will be calculated from the radioactivity concentrations (in pCi/g) of U-234, U-235, U-238, Ra-226 and Th-232 (when present above the background concentration), and their respective soil DCGLw values using Equation 14-13. The weighted sigma value is calculated using Equation 14-14.	For samples obtained at a depth >1.5 m, the SOF will be calculated from the radioactivity concentrations (in pCi/g) of U-234, U-235, U-238, Ra-226 and Th-232 (Ra-226 and Th-232 will be corrected for background when calculating dose) and their respective soil $DCGL_W$ values using Equation 14-13. The weighted sigma value is calculated using Equation 14-14.
14.4.1	OVERVIEW	The statistical tests will include the Sign test, or the Wilcoxon Rank Sum (WRS) test for instances when the measurement results are corrected for the contribution from background radioactivity. Typically, the use of the WRS test will be limited to the evaluation of results obtained within open land surveys where Ra-226 and Th-232 are identified in soil. The balance of the measurements of soil within open land areas, and the measurements of surface contamination within buildings will be evaluated using the Sign test.	The statistical tests will include the Sign test, or the Wilcoxon Rank Sum (WRS) test for instances when the measurement results are corrected for the contribution from background radioactivity. The WRS test will used for the evaluation of results obtained within open land surveys. The measurements of surface contamination within buildings will be evaluated using the Sign test.
14.4.2.5	Background Reference Areas	Background reference area measurements are required when using statistical application of the WRS test, and when background subtraction is required to correct gross radioactivity measurements for naturally-occurring radioactivity present in soil, and in construction materials prior to applying the Sign test. Background reference areas for soil have been identified and sampled with analytical results provided in Chapter 4. However, it is anticipated that only correction for the contribution from Ra-226 and Th-232 will be applied to the gross measurement results. A discussion on this approach is provided in Chapter 5.	Background reference area measurements are required when using statistical application of the WRS test; no background correction to soil sample results when performing the WRS test on the sample results. Background reference areas for soil have been identified and sampled with analytical results and resulting background levels provided in Chapter 4. The Sign test will be used for surface contamination on building surfaces, and will be based on net FSS results; the net results will be obtained by subtracting the instrument response to ambient conditions from the gross results, but will not include a correction for the response due to naturally-occurring radioactivity in materials of construction.

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DP Section	Section Title	Text in DP Revision 0	Proposed Text for DP Revision 1
14.4.3.1.10	Excavation Depth Considerations On Sample Size Determination	First, a modification to the shift (Δ) is required (Equation 14-20). In all cases, the $DCGL_w$ will simply be equal to unity (1) due to measuring multiple ROCs. When it is desired to set the value of the LBGR to the mean concentration in the survey unit, Equation 14-22 will be used to calculate the $LBGR_{SOF}$, normalized to unity, by using the average concentration for each ROC. It is unlikely that the areas of the survey unit at Root stratum and Deep stratum conditions will be equal and therefore the average concentration level in each area will need to be weighted. The following equation defines this calculation.	First, a modification to the shift (Δ) is required (Equation 14-20). In all cases, the $DCGL_w$ will simply be equal to unity (1) due to measuring multiple ROCs. When it is desired to set the value of the LBGR to the mean concentration in the survey unit, Equation 14-22 will be used to calculate the $LBGR_{SOF}$, normalized to unity, by using the average concentration for each ROC. It is unlikely that the areas of the survey unit at Root stratum and Deep stratum conditions will be equal and therefore the average concentration level in each area will need to be weighted. If actual Tc-99 concentrations are not included in the data set that will be used to determine sample size, then the modified U-235 soil $DCGL_w$ values accounting for the presence of Tc-99 (Table 14-9) will be used. The following equation defines this calculation:
14.4.5.3	Wilcoxon Rank Sum Test	For the site, if the WRS Test is used, the test will be applied to the soil surveys using the guidance in Section 8.4 of MARSSIM. The WRS Test will be conducted as described below.	For the site, the WRS Test will be applied to the soil surveys using the guidance in Section 8.4 of MARSSIM. The WRS Test will be conducted as described below.
14.4.5.4	Sign Test	For the site, the Sign Test will be applied to the building and structural surface surveys, and open land areas not containing Ra-226 or Th-232, using the guidance in Section 8.3 of MARSSIM.	For the site, the Sign Test will be applied to the building and structural surface surveys using the guidance in Section 8.3 of MARSSIM.
14.4.5.5	Excavation Depth Considerations On Data Assessment	When the DQO process is modified as described in Section 14.4.3, a minor modification to the data assessment is also required. When the SOF is calculated for each sample location, using Equation 14-9, the DCGLw used depends on the elevation that the sample was collected, i.e., Root stratum vs. Deep stratum. The calculated SOF value is then used in the WRS or Sign tests as described in Section 14.4.5.	When the DQO process is modified as described in Section 14.4.3, a minor modification to the data assessment is also required. When the SOF is calculated for each sample location, using Equation 14-9, the $DCGL_W$ used depends on the elevation that the sample was collected, i.e., Root stratum vs. Deep stratum. The calculated SOF value is then used in the WRS test as described in Section 14.4.5.
Table 14-2	Site-Specific Soil DCGLs	Ra-226+C 6.0 2.2 12,030 2.0 5.2 [d] This DCGL only applies to those areas of the site identified as a Ra-226 impacted area.	[Note: Specific change not yet available. Revise Ra-226 DCGL for each CSM] [Note: Delete footnote.]
Table 14-4	Adjusted Site-Specific Soil DCGLs	Ra-226+C 5.9 2.2 11,910 2.0 5.1	[Note: Specific change not yet available. Revise Ra-226 DCGL for each CSM]
Table 14-10	Adjusted And Modified Soil DCGLw Values For Demonstrating Compliance	Plant Soil SEA Ra-226+C N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A Tc-99 SEA Ra-226+C N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A Burial Pit SEA Ra-226+C 5.9 5.9 2.2 2.2 11,910 11,910 2.0 2.0 5.1 5.1	[Note: Specific change not yet available. Revise Ra-226 adjusted and modified DCGL for each CSM]
Table 5-13	Area Factors for Soil	(Table currently shows "blank space" in place of area factors for Ra-226 in Elevated Measurement Areas for 92,539 m^2, 10,000 m^2 and 3000 m^2 in each of the three CSMs.)	[Note: Specific change not yet available. For each CSM, calculate area factors for Ra-226 in Elevated Measurement Areas consistent with the other radionuclides.]

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Appendix B. Radium Non-Impacted Area Analysis

(Appendix B to HRCR)

Appendix B

Ra-226 Soil Concentration Comparison with Background Ra-226 Soil Concentration

List of Tables

Radium-226 (Ra-226) is present naturally in soil. The Hematite Site derived concentration guideline levels (DCGLs) equivalent to the 25 mrem per year dose criterion are only slightly higher than typical background soil concentrations. A statistical evaluation of the data was performed to determine if the Ra-226 concentration in site areas are different from the Ra-226 concentration in background samples. The site areas include the Radium Impacted Area (RIA) and the remaining impacted areas of the site noted as non-impacted (NI) for Ra-226 (henceforth referred to as non-impacted areas in this Appendix). The Quantile and Mann-Whitney U (Rank Sum) tests were performed to compare the two populations (background and NI), and determine if they have the same distribution.

Radium-226 gamma spectroscopy data were input into ProUCL V4.0. A data set for background and a data set for the NI samples were used and hypothesis testing was done to determine if the Ra-226 from NI samples was distinguishable from background Ra-226 concentrations. The two-sample hypothesis testing was performed using the Quantile test and Mann-Whitney U (referred to as the Wilcoxon Mann Whitney (WMW) test in ProUCL technical guidance) in parallel on each data set as recommended in the guidance documents (Reference B-1). As described in Reference B-1, the "*WMW test does not place enough weight on the larger site and background measurements. This means, a WMW may lead to the conclusion that two populations are comparable even when the observations in the right tail of one distribution (e.g., site) are significantly larger than the right tail observations of other populations (e.g., background). The Quantile test is used to compare upper tails of the two distributions.*" The QQ (Quantile-Quantile) plot is provided in addition to the WMW and Quantile tests as recommended by Reference B-1; the QQ plot visual display of the data sets is useful in identifying outliers.

The null hypothesis for both the Wilcoxon Mann Whitney test and the Quantile test were:

Null Hypothesis, H0: Site or area mean/median is less than or equal to the background mean/median.

When the null hypothesis was not rejected, then the Ra-226 was considered indistinguishable from background. The conclusion for these areas is that the Ra-226 concentration is consistent

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with background and there is no reason to believe that there is residual licensed Ra-226 in the soils.

For the purpose of comparing soil concentrations to background, the data sets were broken up into unknown and known in-growth (of Ra-226 progeny beyond the radon portion of the decay chain) analyses. Mean values for Ra-226 in background soil for unknown and known in-growth are provided below, with the known in-growth mean predictably higher.

- Background unknown in-growth (N=32): 0.9 picoCuries per gram (pCi/g)
- Background known in-growth (N=32): 1.5 pCi/g

Background threshold values (BTVs) were calculated using the unknown and known in-growth background data sets. The BTVs were calculated to be 1.2 pCi/g for unknown in-growth and 1.9 pCi/g for known in-growth using the 95% normal Upper Tolerance Level (UTL) for the background distribution. It is noted that one of the background values in each case exceeded the respective BTV; however, since there were 32 background observations, one value exceeding the 95% UPL is expected. As discussed in the subsections of DP Section 14.1.5, this BTV will be used in the determination of whether sampling results necessitate a Survey Unit to be designated as impacted by Ra-226.

ProUCL results for the WMW and Quantile tests and QQ plot of the sample and background using the known in-growth data sets are provided at the back of this Appendix. ProUCL output calculations for the BTV values are also provided for the unknown and known in-growth data sets.

REFERENCES

B-1 U.S. Environmental Protection Agency, "ProUCL Version 4.0 Technical Guide," April 2007.

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Appendix C

Table B-1

Known In-growth Ra-226 Data WMW, Quantile, and QQ Plot

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	ProUCL.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: NI Ra-226 w/Ingrowth

Background Data: BKG Ra-226 w/Ingrowth

Raw Statistics

	Site	Background
Number of Valid Observations	46	32
Number of Distinct Observations	37	27
Minimum	0.138	0.976
Maximum	3.4	1.97
Mean	1.107	1.475
Median	1.11	1.525
SD	0.523	0.223
SE of Mean	0.077	0.0395

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1319
WMW Test U-Stat	-5.064
WMW Critical Value (0.050)	1.645
P-Value	1

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

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Table B-1 (continued)

Known In-growth Ra-226 Data WMW, Quantile, and QQ Plot

Non-parametric Quantile Hypothesis Test for Full Dataset (No NDs)

User Selected Options

From File	ProUCL.wst
Full Precision	OFF
Confidence Coefficient	95%
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: NI Ra-226 w/Ingrowth

Background Data: BKG Ra-226 w/Ingrowth

Raw Statistics

	Site	Background
Number of Valid Observations	46	32
Number of Distinct Observations	37	27
Minimum	0.138	0.976
Maximum	3.4	1.97
Mean	1.107	1.475
Median	1.11	1.525
SD	0.523	0.223
SE of Mean	0.077	0.0395

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.04)	6
Approximate K Value (0.04)	6
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0.0365

Conclusion with Alpha = 0.04

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney Ranked Sum Test

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Table B-1 (continued)
Known In-growth Ra-226 Data WMW, Quantile, and QQ Plot

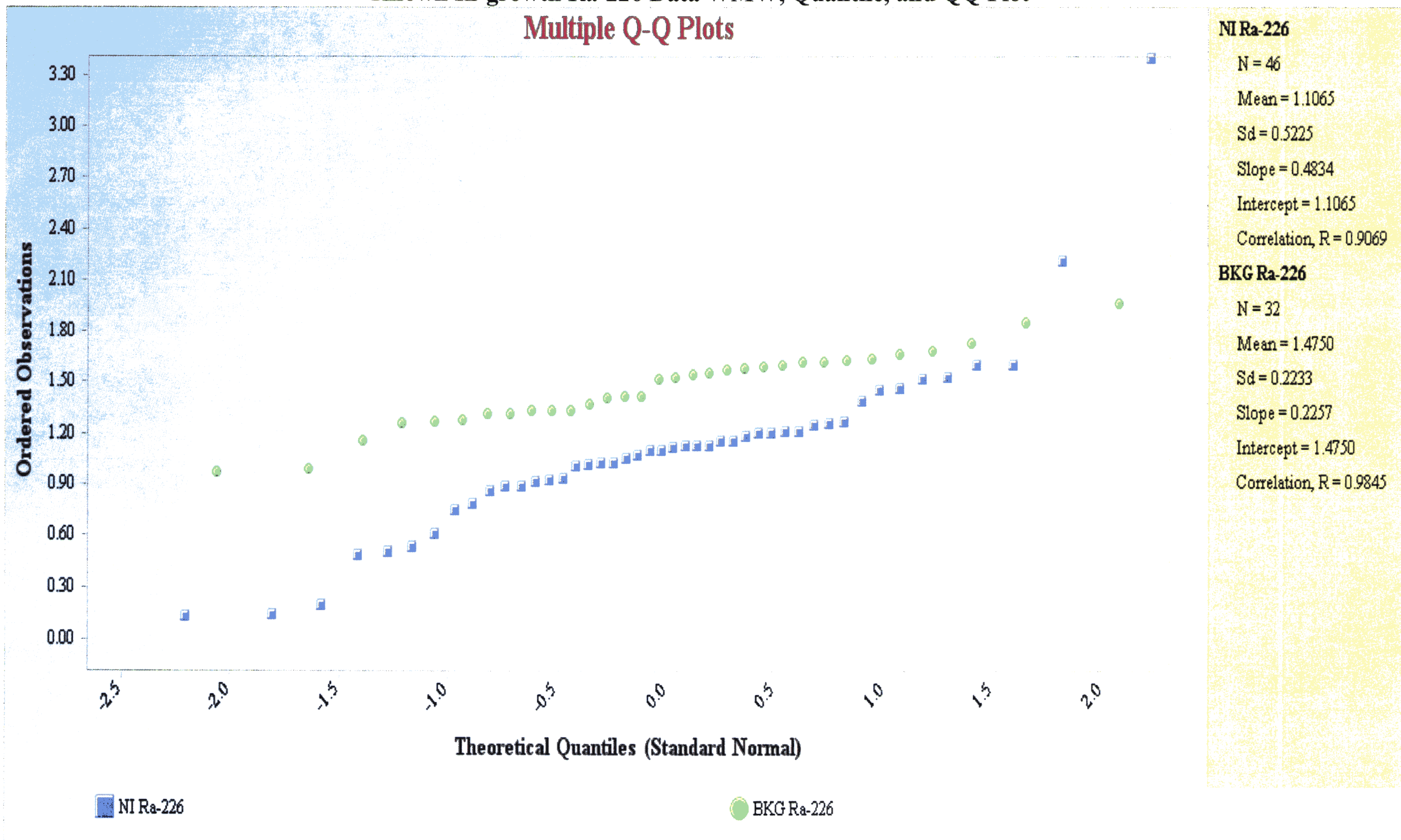

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Table B-2

Unknown In-growth BTV Determination

General Background Statistics for Full Data Sets

User Selected Options

From File	ProUCL.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
Different or Future K Values	1
Number of Bootstrap Operations	2000

BKG Ra-226 w/Unknown Ingrowth

General Statistics

Total Number of Observations	32	Number of Distinct Observations	29

Raw Statistics		Log-Transformed Statistics	
Minimum	0.661	Minimum	-0.414
Maximum	1.21	Maximum	0.191
Second Largest	1.15	Second Largest	0.14
First Quartile	0.87	First Quartile	-0.14
Median	0.943	Median	-0.0587
Third Quartile	1.09	Third Quartile	0.0862
Mean	0.947	Mean	-0.0668
SD	0.145	SD	0.159
Coefficient of Variation	0.154		
Skewness	-0.208		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.963	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	1.201	95% UTL with 90% Coverage	1.236
95% UPL (t)	1.197	95% UPL (t)	1.231
90% Percentile (z)	1.133	90% Percentile (z)	1.147
95% Percentile (z)	1.186	95% Percentile (z)	1.216
99% Percentile (z)	1.285	99% Percentile (z)	1.355

Gamma Distribution Test		Data Distribution Test	
k star	38.02	Data appear Normal at 5% Significance Level	
Theta Star	0.0249		
MLE of Mean	0.947		
MLE of Standard Deviation	0.154		
nu star	2433		

		Nonparametric Statistics	
A-D Test Statistic	0.421		
5% A-D Critical Value	0.745	90% Percentile	1.12
K-S Test Statistic	0.119	95% Percentile	1.139
5% K-S Critical Value	0.155	99% Percentile	1.191

Data appear Gamma Distributed at 5% Significance Level

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Table B-2

Unknown In-growth BTV Determination

Assuming Gamma Distribution		95% UTL with 90% Coverage	1.15
90% Percentile	1.148	95% Percentile Bootstrap UTL with 90% Coverage	1.148
95% Percentile	1.213	95% BCA Bootstrap UTL with 90% Coverage	1.147
99% Percentile	1.34	95% UPL	1.171
		95% Chebyshev UPL	1.59
95% WH Approx. Gamma UPL	1.217	Upper Threshold Limit Based upon IQR	1.421
95% HW Approx. Gamma UPL	1.22		
95% WH Approx. Gamma UTL with 90% Coverage	1.222		
95% HW Approx. Gamma UTL with 90% Coverage	1.225		

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Table B-3

Known In-growth BTV Determination

General Background Statistics for Full Data Sets

User Selected Options

From File	ProUCL.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
Different or Future K Values	1
Number of Bootstrap Operations	2000

BKG Ra-226 w/Ingrowth

General Statistics

Total Number of Observations	32	Number of Distinct Observations	27
Raw Statistics		**Log-Transformed Statistics**	
Minimum	0.976	Minimum	-0.0243
Maximum	1.97	Maximum	0.678
Second Largest	1.86	Second Largest	0.621
First Quartile	1.335	First Quartile	0.289
Median	1.525	Median	0.422
Third Quartile	1.62	Third Quartile	0.482
Mean	1.475	Mean	0.377
SD	0.223	SD	0.159
Coefficient of Variation	0.151		
Skewness	-0.222		

Background Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.97	Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 90% Coverage	1.865	95% UTL with 90% Coverage	1.923
95% UPL (t)	1.86	95% UPL (t)	1.915
90% Percentile (z)	1.761	90% Percentile (z)	1.786
95% Percentile (z)	1.842	95% Percentile (z)	1.892
99% Percentile (z)	1.995	99% Percentile (z)	2.108
Gamma Distribution Test		**Data Distribution Test**	
k star	38.72	Data appear Normal at 5% Significance Level	
Theta Star	0.0381		
MLE of Mean	1.475		
MLE of Standard Deviation	0.237		
nu star	2478		
A-D Test Statistic	0.532	**Nonparametric Statistics**	
5% A-D Critical Value	0.745	90% Percentile	1.688
K-S Test Statistic	0.129	95% Percentile	1.794
5% K-S Critical Value	0.155	99% Percentile	1.936
Data appear Gamma Distributed at 5% Significance Level			

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Table B-3

Known In-growth BTV Determination

Assuming Gamma Distribution		95% UTL with 90% Coverage	1.86
90% Percentile	1.786	95% Percentile Bootstrap UTL with 90% Coverage	1.86
95% Percentile	1.885	95% BCA Bootstrap UTL with 90% Coverage	1.848
99% Percentile	2.082	95% UPL	1.899
		95% Chebyshev UPL	2.464
95% WH Approx. Gamma UPL	1.893	Upper Threshold Limit Based upon IQR	2.048
95% HW Approx. Gamma UPL	1.898		
95% WH Approx. Gamma UTL with 90% Coverage	1.9		
95% HW Approx. Gamma UTL with 90% Coverage	1.905		

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Uranium Non Impacted Statistical Analysis

Uranium Data – Non Impacted Area

Sample ID	Total Uranium (pCi/g)
NB-02-00-SL	1.16
NB-06-00-SL	1.80
NB-114-0.5-SL	**0.75**
NB-121-0.5-SL	**0.43**
NB-17-00-SL	1.92
NB-23-00-SL	1.96
NB-114-2.5-SL	**1.03**
NB-121-12.5-SL	1.88
NB-121-2.5-SL	2.26
NB-36-05-SL	1.63
NB-36-15-SL	1.80
NB-44-05-SL	1.00
NB-63-05-SL	1.51
NB-71-01-SL	2.60
NB-78-07-SL	1.47
NB-81-09-SL	1.51

Bold values are less than MDC

Uranium Data – Background Area

Sample ID	Total Uranium (pCi/g)
BG-01-00-SL	1.26
BG-02-00-SL	1.49
BG-03-00-SL	1.55
BG-04-00-SL	1.31
BG-05-00-SL	1.47
BG-06-00-SL	1.44
BG-07-00-SL	1.29
BG-08-00-SL	1.99
BG-09-00-SL	1.97
BG-10-00-SL	1.97
BG-11-00-SL	1.99
BG-12-00-SL	1.86
BG-13-00-SL	1.80
BG-14-00-SL	**1.78**
BG-15-00-SL	**1.15**
BG-16-00-SL	1.42
BG-01-03-SL	1.37
BG-02-03-SL	1.52
BG-03-03-SL	1.61
BG-04-03-SL	1.58
BG-05-03-SL	1.64
BG-06-03-SL	1.76
BG-07-03-SL	1.51
BG-08-03SL	1.94
BG-09-03-SL	1.89
BG-10-03-SL	1.89
BG-11-03-SL	1.79
BG-12-03-SL	1.93
BG-13-03-SL	1.87
BG-14-03-SL	1.83
BG-15-03-SL	1.75
BG-16-03-SL	1.33

Bold values are less than MDC

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Non-parametric Quantile Hypothosis Test for Full Dataset (No NDs)

User Selected Options

From File	C:\ Documents and Settings\ guidojs\ Desktop\ totalU RevNI ProUCL IN.xls.wst
Full Precision	OFF
Confidence Coefficient	95%
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: TotalURevNI

Background Data: TotalU AS BKG

Raw Statistics

	Site	Background
Number of Valid Observations	16	32
Number of Distinct Observations	16	32
Minimum	0.425	1.149
Maximum	2.596	1.993
Mean	1.543	1.655
Median	1.572	1.694
SD	0.566	0.252
SE of Mean	0.141	0.0445

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.052)	10
Approximate K Value (0.052)	6
Number of Site Observations in 'R' Largest	4
Calculated Alpha	0.0537

Conclusion with Alpha = 0.052

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney Ranked Sum Test

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Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	C:\ Documents and Settings\ guidojs\ Desktop\ totalU RevNI ProUCL IN.xls.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/ Median Less Than or Equal to Background Mean/ Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/ Median Greater Than Background Mean/ Median

Area of Concern Data: TotalURevNI

Background Data: TotalU AS BKG

Raw Statistics

	Site	Background
Number of Valid Observations	16	32
Number of Distinct Observations	16	32
Minimum	0.425	1.149
Maximum	2.596	1.993
Mean	1.543	1.655
Median	1.572	1.694
SD	0.566	0.252
SE of Mean	0.141	0.0445

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/ Median of Site or AOC <= Mean/ Median of Background

Site Rank Sum W-Stat	362
WMW Test U-Stat	-0.667
WMW Critical Value (0.050)	1.645
P-Value	0.748

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

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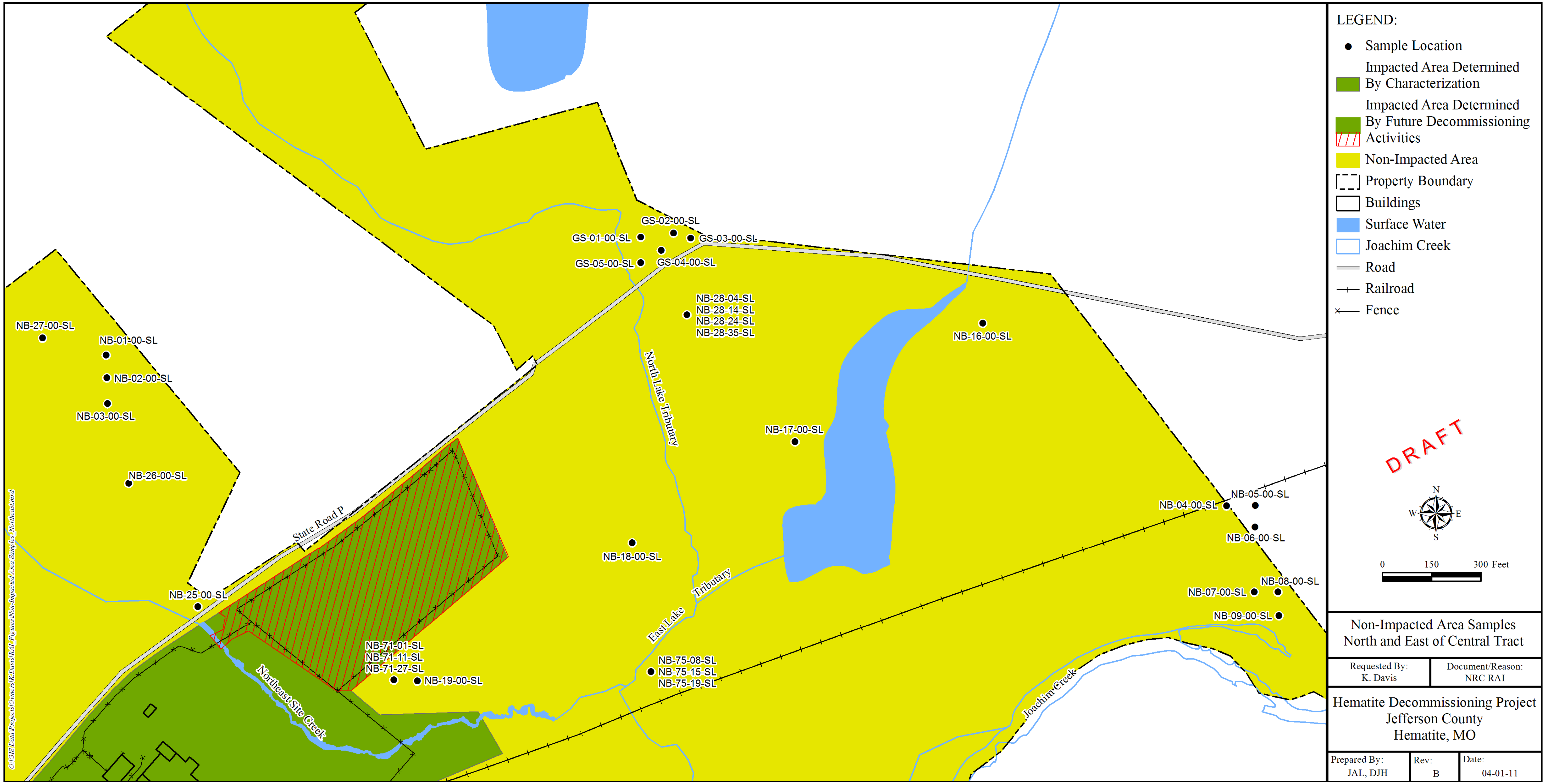
Appendix D. Uranium Non Impacted Area Samples



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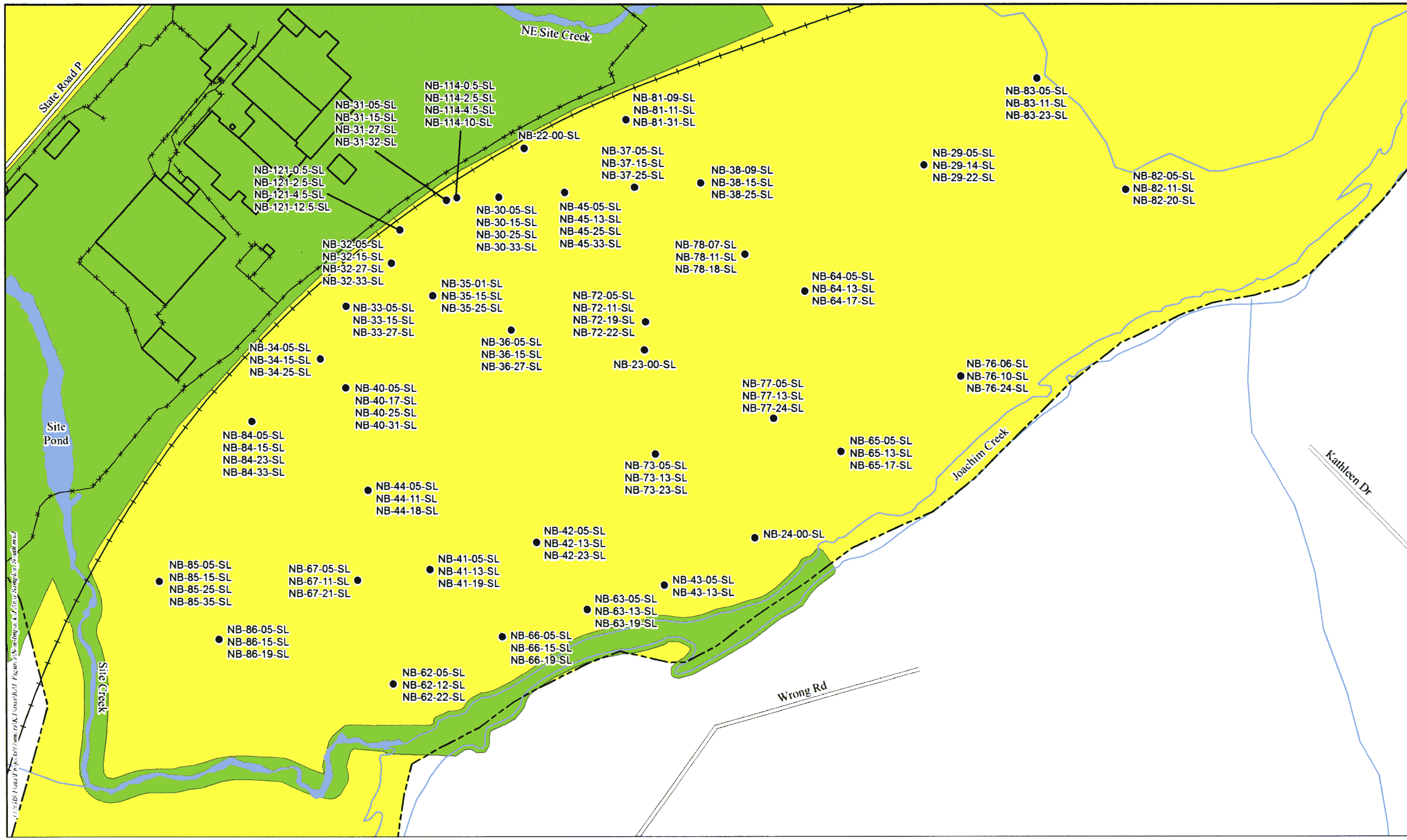
Uranium Non Impacted Area Samples



Non-Impacted Area Samples South of Central Tract	
Requested By: K. Davis	Document/Reason: NRC RAI
Hematite Decommissioning Project Jefferson County Hematite, MO	

Prepared By:	Rev:	Date:
JAL, DJH	A	03-25-11

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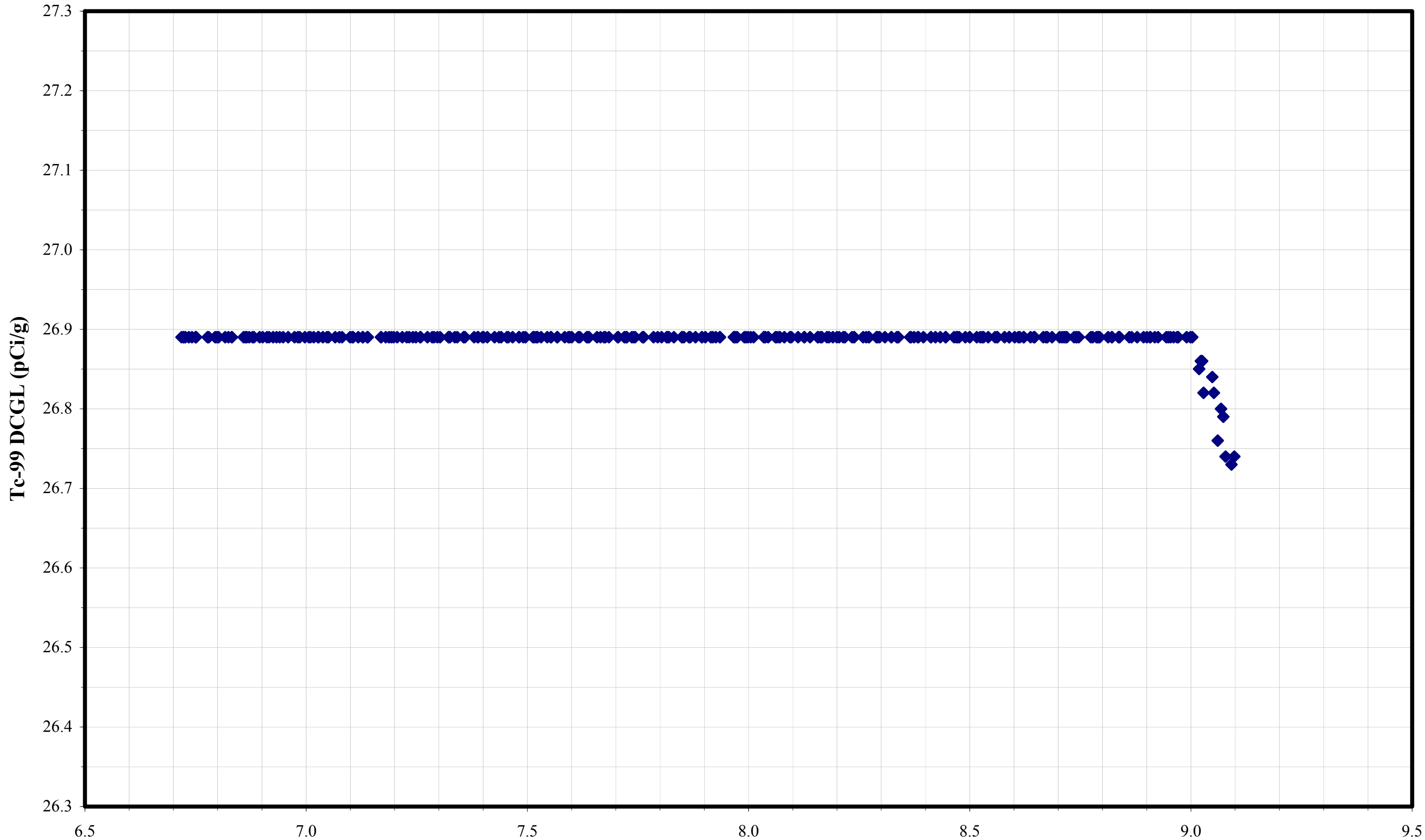
Appendix E

Sensitivity Chart of Uniform CSM DCGL vs. Increasing CZ Thickness



CZ Thickness (m)
[UZ Thickness = 9.1 m - CZ Thickness]

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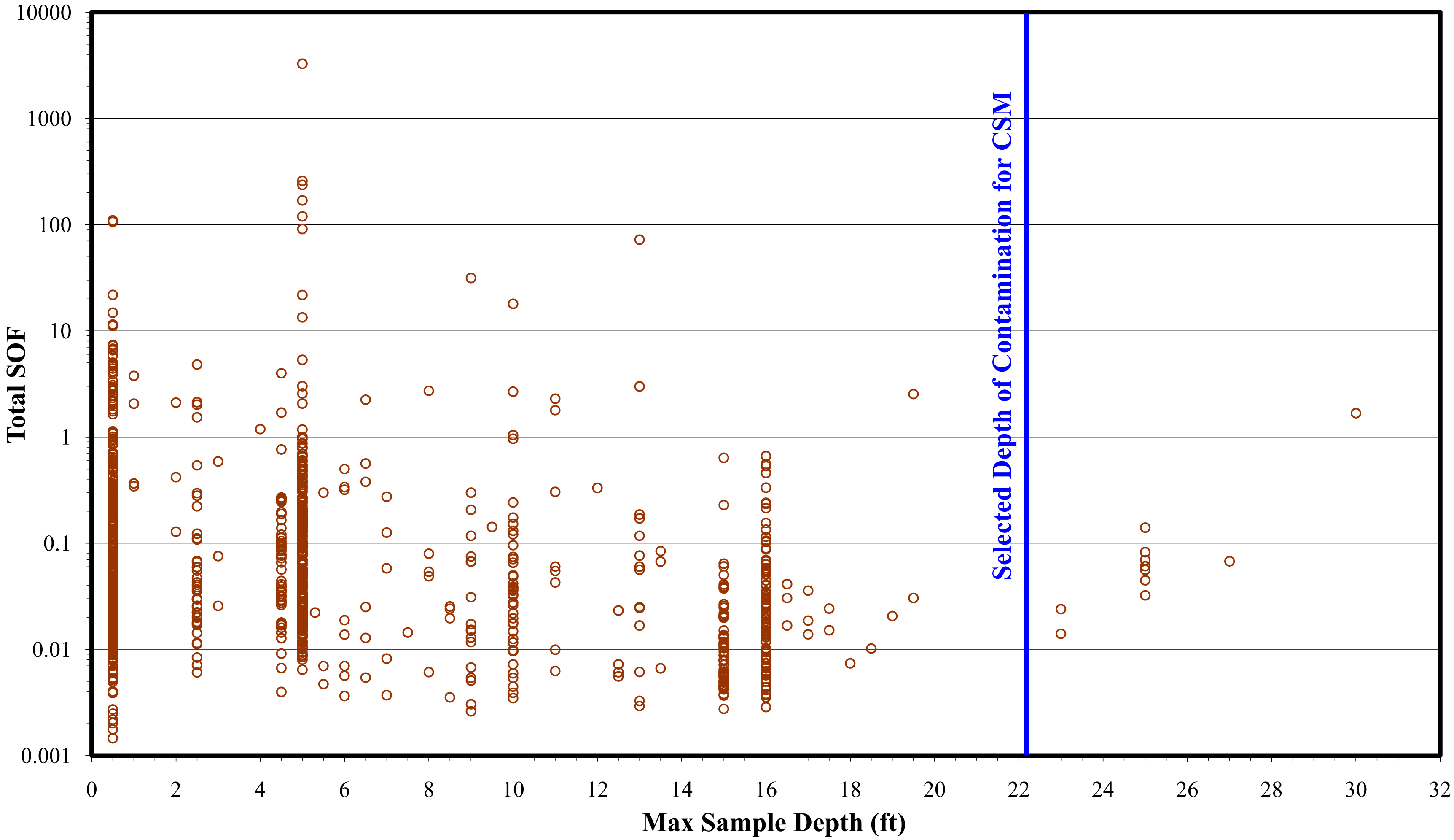
Appendix F. DP Figure 5-5 "Depth of Soil Contamination"



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Appendix G. Revised Plant Transfer Factor Table (excerpt from DP Table 5-6)

RESRAD			INPUT PARAMETER			
Parameter	**Code**	**Default**	**Value**	**Units**	**Justification**	**Reference**
HEMATITE CUSTOM DOSE FACTOR LIBRARY						
Plant Transfer Factors						
Uranium	BRTF(92,1)	2.50 E-03	3.70 E-03	unitless	P1 Physical Parameter. The 75th quantile of NUREG/CR-6697 PDF used.	Reference 5-4
Plutonium	BRTF(94,1)	1.00 E-03	1.00 E-03	unitless	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Technetium	BRTF(43,1)	5.00 E+00	9.27 E+00	unitless	The 75th quantile of NUREG/CR-6697 PDF used.	Reference 5-4
Thorium	BRTF(90,1)	1.00 E-03	9.93 E-04	unitless	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Neptunium	BRTF(93,1)	2.00 E-02	2.00 E-02	unitless	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Americium	BRTF(95,1)	1.00 E-03	1.00 E-03	unitless	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Actinium	BRTF(89,1)	2.50 E-03	1.00 E-03	unitless	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Protactinium	BRTF(91,1)	1.00 E-02	1.00 E-02	unitless	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Lead	BRTF(82,1)	1.00 E-02	4.00 E-03	unitless	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Radium	BRTF(88,1)	4.00 E-02	7.40 E-02	unitless	The 75th quantile of NUREG/CR-6697 PDF used.	Reference 5-4

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Appendix H. Revised Milk Transfer Factor Table (excerpt from DP Table 5-6)

RESRAD			INPUT PARAMETER			
Parameter	**Code**	**Default**	**Value**	**Units**	**Justification**	**Reference**
Milk Transfer Factors						
Uranium	BRTF(92,3)	6.00 E-04	6.00 E-04	(pCi/L) / (pCi/d)	P2 Physical Parameter. The 75th quantile of NUREG/CR-6697 PDF used.	Reference 5-4
Plutonium	BRTF(94,3)	1.00 E-06	9.90 E-07	(pCi/L) / (pCi/d)	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Technetium	BRTF(43,3)	1.00 E-03	1.00 E-03	(pCi/L) / (pCi/d)	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Thorium	BRTF(90,3)	5.00 E-06	4.90 E-06	(pCi/L) / (pCi/d)	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Neptunium	BRTF(93,3)	5.00 E-06	1.00 E-05	(pCi/L) / (pCi/d)	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Americium	BRTF(95,3)	2.00 E-06	2.00 E-06	(pCi/L) / (pCi/d)	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Actinium	BRTF(89,3)	2.00 E-05	2.00 E-06	(pCi/L) / (pCi/d)	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Protactinium	BRTF(91,3)	5.00 E-06	4.90 E-06	(pCi/L) / (pCi/d)	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Lead	BRTF(82,3)	3.00 E-04	3.00 E-04	(pCi/L) / (pCi/d)	The median of NUREG/CR-6697 PDF used.	Reference 5-4
Radium	BRTF(88,3)	1.00 E-03	1.00 E-03	(pCi/L) / (pCi/d)	The median of NUREG/CR-6697 PDF used.	Reference 5-4

Table 5-7 **Page 1 of 1**

Soil DSRs And DCGLs - Surface

Radionuclide	DSR (mrem/yr per pCi/g)	Year of Maximum Dose	DCGL [a] (pCi/g)
U-234	4.584E-02	0	545.4
U-235 + D	2.278E-01	0	109.7
U-238 + D	7.831E-02	0	319.2
Tc-99	1.543E-01	0	162.0
Th-232 + C	5.031E+00	0	5.0
Ra-226 + C	4.602E+00	0	5.4
Np-237 + D	1.441E+00	0	17.4
Pu-239/240	1.044E-01	0	239.6
Am-241	1.133E-01	0	220.7

[a] The reported soil limits, $DCGL_{WS}$ are the activities for the parent radionuclide as specified.

Table 5-8 **Page 1 of 1**

Soil DSRs And DCGLs – Root

Radionuclide	DSR (mrem/yr per pCi/g)	Year of Maximum Dose	DCGL [a] (pCi/g)
U-234	9.892E-02	249.8	252.7
U-235 + D	3.640E-01	1,000	68.7
U-238 + D	1.272E-01	249.9	196.6
Tc-99	7.750E-01	44.94	32.3
Th-232 + C	1.195E+01	250.3	2.1
Ra-226 + C	1.099E+01	250.0	2.3
Np-237 + D	4.991E+00	0	5.0
Pu-239/240	2.938E-01	249.9	85.1
Am-241	2.109E-01	249.7	118.5

[a] The reported soil limits, $DCGL_{WS}$ are the activities for the parent radionuclide as specified.

Table 5-9 **Page 1 of 1**

Soil DSRs And DCGLs – Deep

Radionuclide	DSR (mrem/yr per pCi/g)	Year of Maximum Dose	DCGL [a] (pCi/g)
U-234	8.066E-03	1,000	3,099
U-235 + D	7.684E-03	1,000	3,254
U-238 + D	7.700E-03	1,000	3,247
Tc-99	2.363E-04	1,000	105,800
Th-232 + C	2.512E-03	1,000	9,952
Ra-226 + C	1.789E-03	1,000	13,974
Np-237 + D	8.436E+01	595	0.3
Pu-239/240	7.047E-05	1,000	354,700
Am-241	8.379E-03	1,000	2,984

[a] The reported soil limits, $DCGL_{WS}$ are the activities for the parent radionuclide as specified.

Table 5-10 **Page 1 of 1**

Soil DSRs And DCGLs – Uniform

Radionuclide	DSR (mrem/yr per pCi/g)	Year of Maximum Dose	DCGL [a] (pCi/g)
U-234	1.193E-01	1,000	209.6
U-235 + D	4.520E-01	1,000	55.3
U-238 + D	1.381E-01	0	181.0
Tc-99	9.296E-01	0	26.9
Th-232 + C	1.195E+01	0.2543	2.1
Ra-226 + C	1.225E+01	0	2.0
Np-237 + D	8.971E+01	595	0.3
Pu-239/240	3.010E-01	0	83.1
Am-241	3.151E-01	0	79.3

[a] The reported soil limits, $DCGL_{WS}$ are the activities for the parent radionuclide as specified.

Table 5-11 **Page 1 of 1**

Alternate Excavation Scenario Concentration Corresponding To 25 mrem/yr Compared To Deep DCGLs

Radionuclide	DSR (mrem/yr per pCi/g)	Excavation Scenario Concentrations Corresponding to 25 mrem/yr (pCi/g)	Deep Scenario Concentrations Corresponding to 25 mrem/yr (pCi/g)
U-234	5.344E-02	467.8	3,099
U-235 + D	2.241E-01	111.6	3,254
U-238 + D	8.460E-02	295.5	3,247
Tc-99	6.306E-01	39.7	105,800
Th-232 + C	8.839E+00	2.8	9,952
Ra-226 + C	8.542E+00	2.9	13,974
Np-237 + D	4.428E+00	5.6	0.3
Pu-239/240	2.028E-01	123.3	354,700
Am-241	2.181E-01	114.6	2,984

Table 5-12 **Page 1 of 1**

Alternate Excavation Scenario DCGLs

Radionuclide	DCGL[a, b] (pCi/g)
U-234	935.6
U-235 + D	223.2
U-238 + D	591
Tc-99	79.4
Th-232 + C	5.6
Ra-226 + C	5.8
Np-237 + D	11.2
Pu-239/ Pu-240	246.6
Am-241	229.2

[a] The reported DCGLs are the activities for the parent radionuclide as specified.
[b] The Excavation Scenario DCGLs were derived by multiplying the "Excavation Scenario Concentrations Corresponding to 25 mrem/year" in Table 5-11 by a factor of two to account for the mixing with the assumed 1.5 m clean cover soil during excavation.
[c] The Deep DCGL of 0.3 pCi/g for Np-237 will be used in lieu of the derived Excavation Scenario DCGL of 11.2 pCi/g when located in the deep strata as it is more limiting.

Table 5-13a **Page 1 of 2**

Area Factors For Soil

Radionuclide	Elevated Measurement Area (m^2)									
	153,375	**10,000**	**3,000**	**1,000**	**300**	**100**	**30**	**10**	**3**	**1**
Surface Soil										
U-234	1.0	1.5	2.2	2.6	7.8	19.3	41.7	67.3	96.0	119.5
U-235 + D	1.0	1.1	1.2	1.2	1.3	1.5	1.8	2.6	5.4	12.1
U-238 + D	1.0	1.2	1.5	1.6	2.2	2.6	3.4	4.9	10.2	22.3
Tc-99	1.0	1.0	1.0	1.0	3.4	10.3	34.2	102.2	338.5	1,009
Th-232 + C	1.0	1.0	1.1	1.1	1.4	1.7	2.3	3.5	7.3	16.9
Ra-226 + C	1.0	1.1	1.2	1.2	1.8	2.2	3.0	4.5	9.6	22.4
Np-237 + D	1.0	1.1	1.1	1.1	2.6	4.5	7.1	11.0	23.4	52.4
Pu-239/240	1.0	1.1	1.1	1.1	3.6	9.5	23.5	43.0	65.5	83.4
Am-241	1.0	1.0	1.1	1.1	2.9	5.6	9.4	13.9	25.4	42.4
Root Soil										
U-234	1.0	1.2	1.3	1.4	4.1	9.4	19.2	33.0	67.9	130.4
U-235 + D	1.0	1.0	1.1	1.1	1.9	2.3	2.9	4.1	8.3	17.9
U-238 + D	1.0	1.1	1.3	1.3	2.5	3.6	5.0	7.2	14.8	31.5
Tc-99	1.0	1.0	1.0	1.0	3.4	10.3	34.3	103.0	343.3	1,029
Th-232 + C	1.0	1.0	1.0	1.0	2.1	3.0	4.2	6.0	12.8	28.4
Ra-226 + C	1.0	1.0	1.1	1.1	2.4	3.9	5.8	8.7	18.5	41.6
Np-237 + D	1.0	1.0	1.0	1.0	3.4	9.9	30.7	57.2	132.0	298.4
Pu-239/240	1.0	1.0	1.0	1.0	3.4	9.8	29.1	68.4	137.7	207.4
Am-241	1.0	1.0	1.0	1.0	3.1	7.8	17.4	31.0	62.2	109.8

Table 5-13a (continued) **Page 2 of 2**

Area Factors For Soil

Radionuclide	Elevated Measurement Area (m^2)									
	153,375	**10,000**	**3,000**	**1,000**	**300**	**100**	**30**	**10**	**3**	**1**
Uniform Soil										
U-234	1.0	1.2	1.3	1.3	4.0	9.3	19.6	34.3	70.5	132.8
U-235 + D	1.0	1.1	1.1	1.1	1.9	2.5	3.3	4.7	9.6	20.5
U-238 + D	1.0	1.1	1.3	1.3	2.5	3.6	5.0	7.2	14.9	31.6
Tc-99	1.0	1.0	1.0	1.0	3.4	10.3	34.3	102.9	342.7	1,027
Th-232 + C	1.0	1.0	1.0	1.0	2.1	3.0	4.2	6.1	12.9	28.9
Ra-226 + C	1.0	1.1	1.1	1.1	2.5	4.1	6.1	9.1	19.3	43.4
Np-237 + D	1.0	1.7	4.7	9.7	31.0	84.0	221.3	425.7	981.7	2,218
Pu-239/240	1.0	1.0	1.0	1.0	3.4	9.8	29.1	68.4	137.7	207.3
Am-241	1.0	1.0	1.0	1.0	3.1	7.8	17.4	31.0	62.1	109.7

Table 5-13b
Calculated Area Factors Based On Excavation Scenario Constraints 1 And 2

Radionuclide	Area Factor Based on Contiguous Elevated Area after Excavation (size of elevated area shown in m^2)*					
	148	**100**	**30**	**10**	**3.0**	**1.0**
U-234	1.0	4.0	12	19	35	65
U-235 + D	1.0	1.3	2	2	4	7
U-238 + D	1.0	1.9	3	4	7	13
Tc-99	1.0	4.2	14	42	140	410
Th-232 + C	1.0	1.9	3	4	7	14
Ra-226 + C	1.0	2.3	4	5	10	20
Np-237 + D	1.0	3.6	9	17	37	79
Pu-239/240	1.0	4.1	13	32	71	117
Am-241	1.0	3.6	9	17	32	58
	Area Factor Based on Elevated Area being Uniformly Mixed after Excavation					
Any	1.0	2.0	6.7	20	67	200

*Note - An adjustment factor of 1.5/0.9 was applied during modeling for geometrical transformation between the excavation (200 m2 x 3 m) and modeled (700 m2 x 0.9 m) geometry.

Table 5-13c
Effective Area Factor For Use With Excavation DCGLs

Radionuclide	Size of elevated area shown in m^2					
	148	**100**	**30**	**10**	**3**	**1**
U-234	1.0	2.0	6.7	19	35	65
U-235 + D	1.0	1.3	2	2	4	7
U-238 + D	1.0	1.9	3	4	7	13
Tc-99	1.0	2.0	6.7	20	67	200
Th-232 + C	1.0	1.9	3	4	7	14
Ra-226 + C	1.0	2.0	4	5	10	20
Np-237 + D	1.0	2.0	6.7	17	37	79
Pu-239/240	1.0	2.0	6.7	20	67	117
Am-241	1.0	2.0	6.7	17	32	58

Underlined values were constrained based on uniform mixing after excavation (200/area)

Table 14-2 **Page 1 of 1**

Site-Specific Soil DCGLs

Radionuclide	$DCGL_w$ (pCi/g) [a] By Conceptual Site Model				
	Surface Stratum	Root Stratum	Deep Stratum	Uniform Stratum	Excavation Scenario
U-234	545.4	252.7	3,099	209.6	935.6
U-235 + D [b]	109.7	68.7	3,254	55.3	223.2
U-238 + D [b]	319.2	196.6	3,247	181	591
Tc-99	162	32.3	105,800	26.9	79.4
Th-232 + C [c]	5	2.1	9,952	2.1	5.6
Ra-226 + C [c]	5.4	2.3	13,974	2	5.8

[a] The reported soil limits are the activities for the parent radionuclide as specified.
[b] "+ D" = plus short-lived decay products.
[c] "+ C" = plus the entire decay chain (progeny) in secular equilibrium.

Table 14-4 **Page 1 of 1**

Adjusted Site-Specific Soil DCGLs

Radionuclide	$DCGL_w$ (pCi/g) [a] By Conceptual Site Model				
	Shallow Stratum	Root Stratum	Deep Stratum	Uniform Stratum	Excavation Scenario
U-234	**508.5**	**235.6**	**2890**	**195.4**	**872.4**
U-235 + D [b]	**102.3**	**64.1**	**3034**	**51.6**	**208.1**
U-238 + D [b]	**297.6**	**183.3**	**3028**	**168.8**	**551.1**
Tc-99	**151.0**	**30.1**	**98649**	**25.1**	**74.0**
Th-232 + C [c]	**4.7**	**2.0**	**9279**	**2.0**	**5.2**
Ra-226 + C [c]	**5.0**	**2.1**	**13029**	**1.9**	**5.4**

[a] The reported soil limits are the activities for the parent radionuclide as specified and were calculated using Equation 14-1 to account for the dose contribution from insignificant radionuclides (see Section 14.1.3.2).
[b] "+ D" = plus short-lived decay products.
[c] "+ C" = plus the entire decay chain (progeny) in secular equilibrium.

Table 14-9 **Page 1 of 1**

Modified U-235 Soil $DCGL_w$ Values Accounting For Tc-99

Site Area	Modified U-235 $DCGL_w$ [a] (pCi/g) By Conceptual Site Model				
	Shallow Stratum	Root Stratum	Deep Stratum	Uniform Stratum	Excavation Scenario
Plant Soil SEA	14.1	3.0	2565	2.5	11.8
Tc-99 SEA	3.2	1.4	1815	1.2	3.3
Burial Pit SEA	20.4	7.0	2647	5.8	14.5

[a] Calculated using Equation 4-1 of MARSSIM

Table 14-10 **Page 1 of 3**

Adjusted And Modified Soil $DCGL_w$ Values For Demonstrating Compliance

Radionuclide	$DCGL_w$ (pCi/g) By Conceptual Site Model									
	Surface Soil		Root Stratum		Deep Volumetric [a]		Uniform [b]		Excavation [a]	
	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99
Plant Soil SEA										
Total Uranium [c]	394.3	191.7	202.4	52.8	2917	2895	170.2	44.1	706.3	202.8
U-234	508.5	508.5	235.6	235.6	2890	2890	195.4	195.4	872.4	872.4
U-235	102.3	14.1	64.1	3.0	3034	2565	51.6	2.5	208.1	11.8
U-238	297.6	297.6	183.3	183.3	3028	3028	168.8	168.8	551.1	551.1
Tc-99	151.0	N/A	30.1	N/A	98649	N/A	25.1	N/A	74.0	N/A
Th-232 + C	4.7	4.7	2.0	2.0	9279	9279	2.0	2.0	5.2	5.2
Ra-226 + C	5.0	5.0	2.1	2.1	13029	13029	1.9	1.9	5.4	5.4

a The distribution ratio for Deep Stratum soil was used to calculate the $DCGL_w$ for Total Uranium and U-235 when inferring Tc-99

b The distribution ratio for Root Stratum soil was used to calculate the $DCGL_w$ for Total Uranium and U-235 when inferring Tc-99

c Total Uranium $DCGL_w$ values were calculated using Equation 4-4 of MARSSIM, adjusted $DCGL_w$ values from Table 14-4, modified U-235 $DCGL_w$ values from Table 14-9, and radioactivity fractions provided in Table 14-5 corresponding to an average Uranium enrichment of 4% in soil.

Table 14-10 (continued) **Page 2 of 3**

Adjusted And Modified Soil $DCGL_w$ Values For Demonstrating Compliance

Radionuclide	$DCGL_w$ (pCi/g) By Conceptual Site Model									
	Surface Soil		Root Stratum		Deep Volumetric [a]		Uniform [b]		Excavation [a]	
	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99
Tc-99 SEA										
Total Uranium [c]	394.3	62.9	202.4	28.8	2917	2837	170.2	24.0	706.3	69.7
U-234	508.5	508.5	235.6	235.6	2890	2890	195.4	195.4	872.4	872.4
U-235	102.3	3.2	64.1	1.4	3034	1815	51.6	1.2	208.1	3.3
U-238	297.6	297.6	183.3	183.3	3028	3028	168.8	168.8	551.1	551.1
Tc-99	151.0	N/A	30.1	N/A	98649	N/A	25.1	N/A	74.0	N/A
Th-232 + C	4.7	4.7	2.0	2.0	9279	9279	2.0	2.0	5.2	5.2
Ra-226 + C	5.0	5.0	2.1	2.1	13029	13029	1.9	1.9	5.4	5.4

a The distribution ratio for Deep Stratum soil was used to calculate the $DCGL_w$ for Total Uranium and U-235 when inferring Tc-99

b The distribution ratio for Root Stratum soil was used to calculate the $DCGL_w$ for Total Uranium and U-235 when inferring Tc-99

c Total Uranium $DCGL_w$ values were calculated using Equation 4-4 of MARSSIM, adjusted $DCGL_w$ values from Table 14-4, modified U-235 $DCGL_w$ values from Table 14-9, and radioactivity fractions provided in Table 14-5 corresponding to an average Uranium enrichment of 4%.

Table 14-10 (continued) **Page 3 of 3**

Adjusted And Modified Soil $DCGL_w$ Values For Demonstrating Compliance

Radionuclide	$DCGL_w$ (pCi/g) By Conceptual Site Model									
	Surface Soil		Root Stratum		Deep Volumetric [a]		Uniform [b]		Excavation [a]	
	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99	Measure Tc-99	Infer Tc-99
Burial Pit SEA										
Total Uranium [c]	394.3	235.3	202.4	95.1	2917	2899	170.2	79.6	706.3	236.3
U-234	508.5	508.5	235.6	235.6	2890	2890	195.4	195.4	872.4	872.4
U-235	102.3	20.4	64.1	7.0	3034	2647	51.6	5.8	208.1	14.5
U-238	297.6	297.6	183.3	183.3	3028	3028	168.8	168.8	551.1	551.1
Tc-99	151.0	N/A	30.1	N/A	98649	N/A	25.1	N/A	74.0	N/A
Th-232 + C	4.7	4.7	2.0	2.0	9279	9279	2.0	2.0	5.2	5.2
Ra-226 + C	5.0	5.0	2.1	2.1	13029	13029	1.9	1.9	5.4	5.4

a The distribution ratio for Deep Stratum soil was used to calculate the $DCGL_w$ for Total Uranium and U-235 when inferring Tc-99

b The distribution ratio for Root Stratum soil was used to calculate the $DCGL_w$ for Total Uranium and U-235 when inferring Tc-99

c Total Uranium $DCGL_w$ values were calculated using Equation 4-4 of MARSSIM, adjusted $DCGL_w$ values from Table 14-4, modified U-235 $DCGL_w$ values from Table 14-9, and radioactivity fractions provided in Table 14-5 corresponding to an average Uranium enrichment of 4%.

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APPENDIX J. SUMMARY OF 100% TC-99 SENSITIVITY ANALYSIS

Sensitivity Results for Hematite Uniform Conceptual Site Model

Description of Probabilistic Variable	Coefficients for Peak of Mean Dose by Repetition						
	PRCC						
	1		2		3		Avg. Coeff
	Sig	Coeff	Sig	Coeff	Sig	Coeff	
Kd of Tc-99 in Saturated Zone	11	-0.04	5	-0.08	5	-0.13	-0.08
Plant transfer factor for Tc-99 (identified in DP Table 5-5)	1	1.00	1	1.00	1	1.00	1.00
Meat transfer factor for Tc-99	4	-0.12	4	0.09	12	-0.03	-0.02
Milk transfer factor for Tc-99	**2**	**0.58**	**2**	**0.51**	**2**	**0.56**	**0.55**
Fish transfer factor for Tc-99	13	-0.01	6	0.08	8	-0.08	0.00
Well pumping rate	9	-0.05	8	0.07	13	0.00	0.01
Mass loading for inhalation	6	0.07	13	0.01	11	0.03	0.04
Indoor dust filtration factor	8	0.07	9	-0.06	4	-0.18	-0.06
Depth of soil mixing layer	12	-0.03	7	-0.08	10	0.04	-0.02
Depth of roots	10	-0.05	11	0.03	3	-0.21	-0.08
Wet weight crop yield of fruit, grain and non-leafy vegetables	5	-0.09	12	0.02	9	-0.05	-0.04
Weathering removal constant of all vegetation	7	0.07	3	-0.13	6	0.11	0.02
Wet foliar interception fraction of leafy vegetables	3	0.16	10	-0.05	7	-0.11	0.00

Tc-99 DCGL Comparison between DP Tables and Potential Change from Milk Transfer Factor

CSM	HDP DCGL from Tables 5-7 – 5-10 (pCi/g)	DCGL (pCi/g) Using 75th Percentile of Tc-99 Milk Transfer Factor	Percent Change
Surface	162.0	159.0	-1.9%
Root	32.3	31.7	-1.9%
Deep	105,800	104,200	-1.5%
Uniform	26.9	26.4	-1.9%

Tc-99 Excavation Scenario Concentration Resulting in 25 mrem/yr Comparison between DP Tables and Potential Change from Milk Transfer Factor

HDP Table 5-11 Result (pCi/g)	Concentration (pCi/g) Using 75th Percentile of Tc Milk Transfer Factor	Percent Change
39.7	39.6	-0.3%

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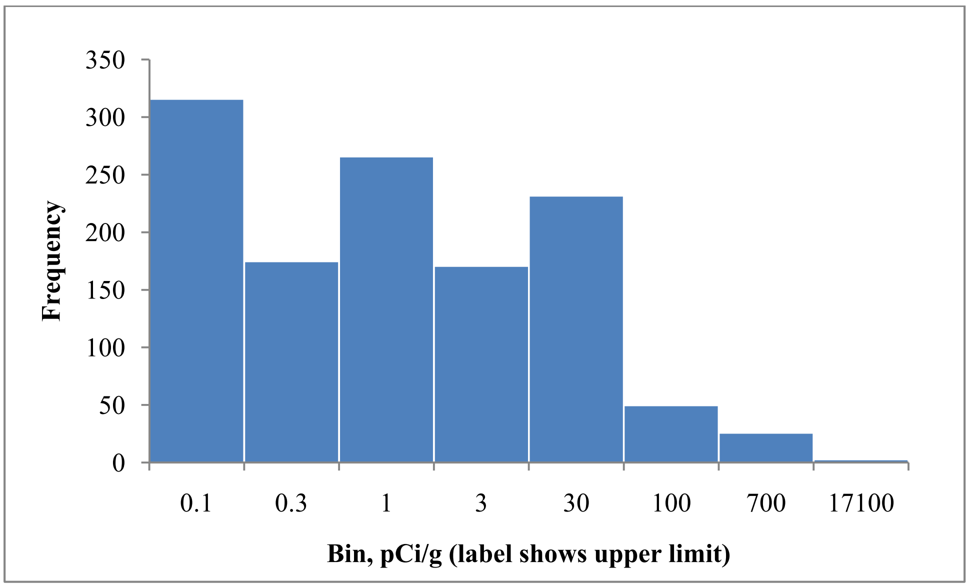
Appendix K

Radionuclide Concentrations Used in Actual Site Conditions Sensitivity Analysis

Radionuclide	Concentration
Am-241	7.13E-03
Np-237	2.03E-02
Pu-239/240	1.63E-03
U-234	4.19E+02
U-235	5.75E+00
U-238	1.41E+01
Tc-99	See figure, below

Uniform CSM Tc-99 Concentration Profile



Appendix L.
Proposed Re-Write of DP-14 Question 1 RAI Response

1. (HDPC-14-Q1) Comment: Section 14.1.3.1 of the Hematite Decommissioning Plan (HDP) and Section 2.2 of the "Derivation of Surrogates and Scaling Factors for Hard-To-Detect Radionuclides" indicate that Np-237, Pu-239/240, and Am-241 are considered to be insignificant radionuclides of concern. This conclusion was based on the aggregate dose of these radionuclides being less than 10% of the Total Effective Dose Equivalent (TEDE) for each Conceptual Site Model. Population activity concentration results are given for these radionuclides in the Surrogate Report (DO-08-008), but it is not clear how the average concentration and associated statistics were determined.

   Basis: Per guidance in NUREG-1757, Vol. 2, Rev. 1, Section 3.3, "It is important that the licensee documents the radionuclides and pathways that have been considered insignificant and eliminated from further consideration and that the licensee justifies the decision to consider them insignificant."

   Path Forward: Provide details on how the average concentration, variance, and range of the results were determined for insignificant radionuclides of concern.

   Westinghouse Response:

   Please note that there is an error in the column heading in Table 2-2 of DO-08-008. A value is reported for each of the three CSMs in units of “Dose (mrem per year)”. The values actually represent the fractional contribution to the DCGL (average SOF) for each of the three CSMs.

   The details for identifying radionuclides that may be insignificant contributors to dose is contained in *Derivation of Surrogates and Scaling Factors for Hard-to-Detect Radionuclides*, Revision 0, July 2009, and are summarized below.

   > *Existing radiological characterization data were compiled and segregated into sample populations consistent with the conceptual site models (CSMs) that were used to derive the DCGLs. The CSMs were defined by the depth of the soil below ground surface (bgs) and include: Surface Stratum: 0 meters to 0.15 meters bgs; Root Stratum: > 0.15 meters to 1.5 meter bgs; and, Deep Stratum: > 1.5 meters to depth. In each of the soil sample populations, the average activity concentration for Am-214, Np-237 and Pu-239/240 was divided by the proposed DCGLs that were developed from dose-modeling performed in support of DP development to obtain the dose contribution. The proposed DCGLs are presented in Table 2-1, and the dose contributions from Am-214, Np-237 and Pu-239/240 are provided in Table 2-2.*

Since the time this document was submitted to NRC, Westinghouse has re-considered the method that was selected for this determination, and considers that the dose contribution from insignificant radionuclides be defined based on site-wide average concentrations as opposed to average values within each individual CSM. Westinghouse believes this is appropriate because the CSM boundaries are constructs used for modeling purposes and do not necessarily represent the radionuclide concentration profile.

In addition, Westinghouse recommends that the dose contribution from insignificant radionuclides be calculated using the Uniform CSM rather than the CSM appropriate to each sample's depth. Because a sample was not collected at each depth consistent with the Surface, Root, and Deep CSMs, the previous method of dividing the sample's result by the applicable DCGL by depth may not have accounted for the total dose in the vertical soil column at the sample location. Rather, as discussed in the paragraph above, the site-wide average concentration will be determined for each radionuclide, and then divided by the Uniform DCGL applicable to the radionuclide to determine the dose contribution from that radionuclide.

The recommended method includes first calculating the average concentration for each radionuclide (across all samples), then calculating the SOF for each radionuclide by dividing each by the applicable Uniform CSM DCGL., and then comparing the sum of these three SOF values to 0.10 of the DCGL. (2.5 mrem/year)

Section 2.2, paragraphs 1 – 3 of DO-08-008, "*Derivation of Surrogates and Scaling Factors for Hard-To-Detect Radionuclides" will be revised to state the following:*

> *Characterization data for all the impacted site areas were reviewed to determine if any of the radionuclides of concern listed in Section 2.1 were considered insignificant dose contributors using methods consistent with the guidance provided in NUREG-1757 (Reference 6-3). In summary, the aggregate dose contribution from insignificant radionuclides must not exceed 10 percent of the TEDE criterion, or 2.5 mrem per year. Additionally, the aggregate dose from insignificant radionuclides must be included with the total dose from all radionuclides when demonstrating compliance with the TEDE criterion.*
>
> *Radiological characterization data for Am-241, Pu-239, and Np-237 were compiled. For each radionuclide, the average concentration across all sample locations was calculated. The SOF values from Am-241, Np-237 and Pu-239/240 were determined by dividing each average radionuclide sample activity by the corresponding Uniform CSM DCGL. The aggregate dose from each all three insignificant radionuclides*

(Am-241, Pu-239, and Np-237) was determined by summing the individual radionuclide SOF contributions and multiplying by 25 mrem.

The aggregate dose contribution from Am-214, Np-237 and Pu-239/240 was determined to be 1.7 mrem, which is less than 10 percent of the TEDE; and thus, these radionuclides are considered to be insignificant radionuclides of concern. The characterization sample data and SOF calculations are provided in Appendix A. The proposed DCGLs used in this calculation are presented in Table 2-1, and the contribution of Am-241, Np-237 and Pu-239/240 are provided in Table 2-2.

Tables 2-1, 2-2, and A-1 will be revised as follows:

Table 2-1, Proposed Site-Specific Uniform CSM Soil DCGLs (pCi/g)[a,b]

Radionuclide	DCGL
U-234	209.6
U-235 + D [c]	55.3
U-238 + D [c]	181.0
Tc-99	26.9
Th-232 + C [c]	2.1
Ra-226 + C [d,e]	2.2
Np-237 + D [c]	0.3
Pu-239/240	83.1
Am-241	79.3

[a] The reported soil limits are the activities for the parent radionuclide as specified.
[b] DCGL values shown have been updated to include changes to RESRAD input factors in accordance with applicable RAI responses.
[c] "+ D" = plus short-lived decay products.
[d] "+ C" = plus the entire decay chain (progeny) in secular equilibrium.
[e] This DCGL only applies to those areas of the site identified as a Ra-226 impacted area.
[f] Np-237 DCGL in the Deep CSM is based on the alternate excavation scenario

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Table 2-2, Dose Contribution from Insignificant Radionuclides

Insignificant Radionuclide	Average Concentration (pCi/g)	DCGL	Average SOF	Dose Contribution (mrem/yr)
Am-241	5.1E-03	7.9E+01	6.4E-05	1.6E-03
Np-237 + D	2.0E-02	3.0E-01	6.8E-02	1.7E+00
Pu-239/240	1.6E-03	8.3E+01	2.0E-05	4.9E-04
Total			6.8E-02	1.7E+00

Table A-1, Summary of Statistics - Am-241, Np-237 and Pu-239/240

Number of Samples			
Insignificant Radionuclide	Conceptual Site Model (CSM)		
	Surface	Root	Deep
Am-241	390	434	456
Np-237	74	57	19
Pu-239/240	74	57	19

Insignificant Radionuclide	Average Concentration (pCi/g)
Am-241	5.1E-03
Np-237	2.0E-02
Pu-239/240	1.6E-03

Additionally, the last two sentences in Section 14.1.3.1 of the Hematite Decommissioning Plan (HDP) will be revised as follows:

> *The contribution of insignificant radionuclides was calculated to be 1.7 mrem per year (or 6.8 percent of the TEDE criterion) for Np-237, Pu-239/240, and Am-241 for all soil depths. Details of the calculations are taken from Section 2.2 of Reference 14-4.*

Sample ID	Am-241 (pCi/g)			Np-237 (pCi/g)			Pu-239/240 (pCi/g)			Ra-226 (pCi/g)			Ra-226 w/Ingrowth (pCi/g)			Tc-99 (pCi/g)			Th-232 (pCi/g)			U-234 (pCi/g)			U-235 (pCi/g)			U-238 (pCi/g)			Total Uranium (pCi/g)	Perc. Enrich. (U-235)
	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC		
GS-01-00-SL	-0.01	0.23	0.4	–	–	–	–	–	–	0.65	0.36	0.55	–	–	–	0.43	0.63	1	0.74	0.39	0.75	–	–	–	0.1	0.45	0.76	0.31	1.2	2	2.3	<MDC
GS-02-00-SL	-0.08	0.16	0.3	–	–	–	–	–	–	1.1	0.27	0.34	–	–	–	-0.11	0.56	0.97	0.96	0.37	0.63	–	–	–	-0.07	0.42	0.77	0.79	0.67	1.3	1.6	<MDC
GS-03-00-SL	0.01	0.12	0.22	–	–	–	–	–	–	0.46	0.19	0.29	–	–	–	-0.08	0.54	0.94	0.23	0.4	0.68	–	–	–	-0.18	0.32	0.62	-0.48	0.79	1.5	0	<MDC
GS-04-00-SL	0.11	0.14	0.23	–	–	–	–	–	–	1.2	0.26	0.27	–	–	–	0.02	0.67	1.2	0.99	0.39	0.48	–	–	–	-0.04	0.36	0.65	1.6	0.97	1.7	3.2	<MDC
GS-05-00-SL	-0.1	0.14	0.26	–	–	–	–	–	–	0.91	0.32	0.36	–	–	–	0.33	0.6	0.99	0.73	0.42	0.52	–	–	–	-0.12	0.37	0.68	1.1	0.8	1.7	2.3	<MDC
NB-01-00-SL	0.54	0.43	0.66	–	–	–	–	–	–	0.8	0.22	0.28	–	–	–	0.81	0.69	1.1	0.74	0.32	0.47	–	–	–	-0.03	0.36	0.66	-0.45	1.3	2.4	0	<MDC
NB-02-00-SL	0.09	0.12	0.19	–	–	–	–	–	–	0.53	0.24	0.29	–	–	–	0.16	0.51	0.87	0.28	0.08	0.03	0.76	0.15	0.03	0.03	0.02	0.02	0.37	0.09	0.02	1.2	1.10%
NB-03-00-SL	0	0.14	0.24	0	0.01	0.02	0.03	0.02	0.01	0.57	0.19	0.24	–	–	–	0.89	0.65	1	0.38	0.4	0.63	–	–	–	0.68	0.4	0.56	0.57	1.2	2	14.5	<MDC
NB-04-00-SL	0	0.16	0.29	–	–	–	–	–	–	2	0.37	0.38	–	–	–	0.95	1.5	2.4	1.5	0.45	0.61	–	–	–	-0.03	0.4	0.71	1.5	1.4	2.3	3	<MDC
NB-05-00-SL	-0.09	0.28	0.49	–	–	–	–	–	–	1	0.3	0.47	–	–	–	0.15	0.76	1.3	0.82	0.47	0.94	–	–	–	-0.24	0.47	0.84	1.7	1.4	2.2	3.4	<MDC
NB-06-00-SL	0.05	0.17	0.29	0.01	0.01	0.03	0.02	0.01	0.01	1.3	0.27	0.24	–	–	–	-0.09	0.51	0.89	0.84	0.2	0.04	0.89	0.17	0.02	0.06	0.03	0.03	0.85	0.17	0.03	1.8	1.00%
NB-07-00-SL	0.13	0.19	0.31	–	–	–	–	–	–	1.1	0.28	0.34	–	–	–	0.38	0.52	0.86	1.1	0.47	0.64	–	–	–	0.43	0.49	0.79	1.8	1.2	2.3	9.9	<MDC
NB-08-00-SL	-0.3	0.43	0.84	–	–	–	–	–	–	1.3	0.36	0.34	–	–	–	-0.29	0.47	0.84	0.78	0.38	0.73	–	–	–	0.16	0.4	0.69	3.2	1.7	2.5	6.7	<MDC
NB-09-00-SL	-0.03	0.46	0.84	–	–	–	–	–	–	1.3	0.29	0.36	–	–	–	0.45	0.57	0.93	1.4	0.48	0.81	–	–	–	0.23	0.41	0.7	0.72	1.5	2.5	5.1	<MDC
NB-114-0.5-SL	0	0.07	0.12	-0.01	0.03	0.07	-0.01	0.03	0.06	0.22	0.08	0.13	0.21	0.08	0.06	-0.08	0.33	0.56	0.05	0.15	0.28	0.39	0.15	0.07	0.06	0.06	0.06	0.3	0.13	0.06	0.75	<MDC
NB-114-10-SL	-0.03	0.1	0.18	–	–	–	–	–	–	1.1	0.17	0.16	1.1	0.23	0.17	–	–	–	0.89	0.24	0.31	–	–	–	0.02	0.25	0.43	0.75	0.51	1.4	1.2	<MDC
NB-114-2.5-SL	0.04	0.1	0.17	–	–	–	–	–	–	0.34	0.1	0.12	0.54	0.16	0.12	-0.01	0.32	0.47	0.14	0.16	0.27	0.48	0.16	0.05	0.06	0.06	0.06	0.49	0.16	0.05	1	<MDC
NB-114-4.5-SL	-0.02	0.18	0.32	–	–	–	–	–	–	1.1	0.24	0.17	1.5	0.26	0.14	0.09	61	0.5	0.96	0.29	0.39	–	–	–	0.23	0.38	0.64	2.2	1	2.2	6.8	<MDC
NB-121-0.5-SL	-0.01	0.06	0.11	0	0	0.03	0.01	0.02	0.05	–	–	–	–	–	–	-0.08	0.39	0.67	0.05	0.14	0.24	0.25	0.12	0.08	0	0.03	0.07	0.18	0.1	0.05	0.43	<MDC
SL	-0.05	0.17	0.29	-0.01	0.03	0.06	0	0	0.03	1.1	0.24	0.21	1.6	0.32	0.18	–	–	–	0.95	0.27	0.4	0.8	0.21	0.06	0.05	0.06	0.04	1	0.25	0.05	1.9	0.80%
NB-121-2.5-SL	0.03	0.09	0.17	–	–	–	–	–	–	0.61	0.21	0.19	0.61	0.2	0.18	0.17	0.28	0.46	0.08	0.23	0.42	1.5	0.31	0.04	0.05	0.06	0.04	0.76	0.2	0.03	2.3	1.00%
NB-121-4.5-SL	0.04	0.15	0.25	–	–	–	–	–	–	1.3	0.22	0.08	1.6	0.29	0.12	0.35	0.25	0.39	0.69	0.23	0.52	–	–	–	0.11	0.28	0.47	2	0.81	1.7	4.4	<MDC
NB-16-00-SL	0.07	0.39	0.68	–	–	–	–	–	–	1	0.23	0.26	–	–	–	-0.14	0.51	0.89	0.96	0.42	0.7	–	–	–	-0.29	0.34	0.66	1.6	1.6	2.5	3.2	<MDC
NB-17-00-SL	-0.04	0.41	0.75	–	–	–	–	–	–	1.2	0.28	0.32	–	–	–	-0.17	0.48	0.84	1.5	0.46	0.62	1.1	0.2	0.03	0.03	0.02	0.03	0.8	0.16	0.02	1.9	0.60%
NB-18-00-SL	0	0.15	0.27	–	–	–	–	–	–	1.2	0.27	0.3	–	–	–	0.4	0.51	0.83	1.1	0.39	0.45	–	–	–	0.02	0.37	0.66	1.9	1.1	1.5	2.6	<MDC
NB-19-00-SL	-0.02	0.14	0.24	–	–	–	–	–	–	0.99	0.22	0.23	–	–	–	0.77	0.55	0.85	1.2	0.36	0.48	–	–	–	0.32	0.34	0.55	1.5	1	1.6	7.7	<MDC
NB-22-00-SL	-0.05	0.16	0.3	–	–	–	–	–	–	1.1	0.37	0.41	–	–	–	2.3	1.6	2.5	0.92	0.42	0.66	–	–	–	-0.02	0.49	0.88	2.3	1.2	2.2	4.6	<MDC
NB-23-00-SL	-0.13	0.15	0.28	0	0.01	0.02	0.01	0.01	0.01	1.1	0.26	0.3	–	–	–	0.29	0.55	0.92	1	0.37	0.63	1.1	0.2	0.02	0.06	0.03	0.02	0.8	0.16	0.02	2	1.20%
NB-24-00-SL	0.05	0.38	0.67	–	–	–	–	–	–	1.2	0.25	0.26	–	–	–	0.4	0.56	0.92	0.79	0.34	0.51	–	–	–	0.17	0.34	0.57	0.71	1.2	2	3.9	<MDC
NB-25-00-SL	-0.07	0.13	0.24	–	–	–	–	–	–	0.71	0.21	0.26	–	–	–	0.82	0.59	0.92	0.63	0.44	0.62	–	–	–	0.22	0.34	0.57	1.2	1.2	1.9	5.4	<MDC
NB-26-00-SL	-0.11	0.29	0.56	–	–	–	–	–	–	0.49	0.2	0.24	–	–	–	0.51	0.54	0.88	0.13	0.25	0.43	–	–	–	0.16	0.26	0.43	0.16	0.78	1.4	3.3	<MDC
NB-27-00-SL	0.38	0.48	0.78	–	–	–	–	–	–	0.58	0.22	0.34	–	–	–	-0.15	0.68	1.2	0.58	0.36	0.69	–	–	–	0.07	0.5	0.86	0.76	1.3	2.1	2.1	<MDC
NB-28-04-SL	0.2	0.48	0.83	–	–	–	–	–	–	1.1	0.3	0.38	–	–	–	0.44	0.51	0.84	1.5	0.79	1	–	–	–	0.13	0.43	0.75	0.37	1.6	2.8	2.8	<MDC
NB-28-14-SL	-0.08	0.14	0.27	–	–	–	–	–	–	0.76	0.26	0.38	–	–	–	0.36	0.49	0.8	1	0.53	0.87	–	–	–	0.06	0.49	0.88	0.61	1.1	1.8	1.8	<MDC
NB-28-24-SL	0.03	0.22	0.38	–	–	–	–	–	–	0.53	0.21	0.35	–	–	–	0.06	0.48	0.82	0.68	0.43	0.79	–	–	–	-0.07	0.39	0.69	0.65	1.2	2	1.3	<MDC
NB-28-35-SL	-0.09	0.2	0.36	–	–	–	–	–	–	0.4	0.19	0.33	–	–	–	0.24	0.47	0.79	0.35	0.54	0.89	–	–	–	0.16	0.37	0.62	0.45	1.1	1.8	3.5	<MDC
NB-29-05-SL	-0.14	0.15	0.3	–	–	–	–	–	–	0.87	0.29	0.37	–	–	–	0.25	0.49	0.82	1.1	0.56	0.84	–	–	–	0	0.48	0.88	0.49	1.3	2.1	0.97	<MDC
NB-29-14-SL	0.07	0.18	0.3	–	–	–	–	–	–	0.2	0.17	0.32	–	–	–	0.11	0.47	0.8	0.12	0.41	0.71	–	–	–	0.12	0.33	0.57	-0.59	0.74	1.4	3.9	<MDC
NB-29-22-SL	-0.12	0.27	0.54	–	–	–	–	–	–	0.47	0.23	0.29	–	–	–	0.32	0.49	0.81	0.33	0.43	0.7	–	–	–	0.02	0.26	0.49	0.71	0.8	1.3	1.2	<MDC
NB-30-05-SL	-0.03	0.61	1.1	–	–	–	–	–	–	1	0.4	0.46	–	–	–	0.08	0.47	0.8	1.2	0.24	0.01	0.92	0.18	0.04	0.12	0.55	0.97	0.88	0.17	0.03	1.9	<MDC
NB-30-15-SL	-0.13	0.67	1.2	–	–	–	–	–	–	1.1	0.46	0.58	–	–	–	0.14	0.48	0.82	0.88	0.47	0.94	–	–	–	0.24	0.52	0.89	2.7	2.2	3.5	7.5	<MDC
NB-30-25-SL	0.12	0.16	0.27	–	–	–	–	–	–	1	0.46	0.56	–	–	–	0.14	0.48	0.81	1.1	0.54	0.87	–	–	–	0.41	0.48	0.78	0.64	1.2	2.1	8.7	<MDC
NB-30-33-SL	-0.36	0.5	0.97	–	–	–	–	–	–	0.53	0.23	0.33	–	–	–	0.03	0.46	0.79	0.32	0.45	0.74	–	–	–	0.45	0.44	0.69	0.5	1.4	2.5	9.5	<MDC
NB-31-05-SL	-0.02	0.16	0.29	–	–	–	–	–	–	0.89	0.39	0.43	–	–	–	-0.03	0.48	0.83	0.85	0.64	1.4	–	–	–	0.1	0.53	0.93	0.81	0.99	2	2.8	<MDC
NB-31-15-SL	-0.09	0.66	1.2	–	–	–	–	–	–	1.1	0.39	0.45	–	–	–	0.73	0.5	0.78	0.69	0.56	0.82	0.92	0.18	0.02	0.24	0.42	0.72	0.85	0.17	0.02	2	<MDC
NB-31-27-SL	-0.06	0.61	1.1	–	–	–	–	–	–	1.1	0.3	0.4	–	–	–	-0.13	0.46	0.81	0.74	0.41	0.74	–	–	–	-0.2	0.49	0.92	1.1	1.5	2.5	2.1	<MDC
NB-31-32-SL	-0.15	0.14	0.27	–	–	–	–	–	–	0.9	0.29	0.37	–	–	–	-0.14	0.46	0.8	0.77	0.68	1	–	–	–	-0.12	0.46	0.86	1.5	1.1	1.8	3.1	<MDC
NB-32-05-SL	0.07	0.15	0.26	–	–	–	–	–	–	0.98	0.44	0.53	–	–	–	0.4	0.51	0.83	1	0.73	1	–	–	–	-0.06	0.52	0.95	-1.1	1.2	2.2	0	<MDC
NB-32-15-SL	0.16	0.15	0.24	–	–	–	–	–	–	1.1	0.32	0.41	–	–	–	0.79	0.54	0.83	0.95	0.56	0.91	–	–	–	0.24	0.5	0.86	1.1	0.83	1.6	5.7	<MDC
NB-32-27-SL	0.13	0.41	0.73	–	–	–	–	–	–	1	0.37	0.42	–	–	–	1.7	0.65	0.87	1.1	0.51	0.94	–	–	–	0.03	0.39	0.71	0.88	1.5	2.5	1.5	<MDC

	Am-241 (pCi/g)			Np-237 (pCi/g)			Pu-239/240 (pCi/g)			Ra-226 (pCi/g)			Ra-226 w/Ingrowth (pCi/g)			Tc-99 (pCi/g)			Th-232 (pCi/g)			U-234 (pCi/g)			U-235 (pCi/g)			U-238 (pCi/g)			Total Uranium	Perc. Enrich.
Sample ID	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	(pCi/g)	(U-235)
NB-32-33-SL	0.17	0.14	0.22	–	–	–	–	–	–	0.56	0.36	0.51	–	–	–	0.32	0.5	0.82	0.82	0.55	0.65	–	–	–	0.17	0.39	0.68	0	0.94	1.7	5.5	<MDC
NB-33-05-SL	-0.09	0.37	0.71	–	–	–	–	–	–	0.97	0.27	0.36	–	–	–	0.55	0.52	0.83	0.99	0.52	0.96	–	–	–	0.17	0.46	0.8	-0.75	1.4	2.6	5.7	<MDC
NB-33-15-SL	-0.05	0.15	0.28	–	–	–	–	–	–	1	0.34	0.41	–	–	–	0.1	0.51	0.87	1.2	0.88	1.3	–	–	–	0.18	0.55	0.95	0.81	0.92	2	4.3	<MDC
NB-33-27-SL	-0.09	0.36	0.68	–	–	–	–	–	–	0.68	0.29	0.36	–	–	–	0.59	0.51	0.81	0.4	0.55	0.91	–	–	–	0.31	0.31	0.49	-0.14	1.2	2.2	10.4	<MDC
NB-34-05-SL	-0.11	0.15	0.29	–	–	–	–	–	–	1.2	0.35	0.54	–	–	–	0	0.5	0.86	1.1	0.57	1	–	–	–	0.19	0.55	0.95	1.3	0.98	1.9	4.9	<MDC
NB-34-15-SL	0.24	0.4	0.68	–	–	–	–	–	–	1.1	0.29	0.4	–	–	–	0.26	0.53	0.88	0.33	0.55	1	–	–	–	-0.04	0.43	0.79	2	1.7	2.7	3.9	<MDC
NB-34-25-SL	0.01	0.11	0.2	–	–	–	–	–	–	0.51	0.22	0.39	–	–	–	0.33	0.51	0.84	0.55	0.57	0.89	–	–	–	0.23	0.35	0.59	0.29	0.93	1.6	4.7	<MDC
NB-35-01-SL	0.11	0.15	0.25	–	–	–	–	–	–	0.97	0.49	0.65	–	–	–	0.33	0.51	0.85	0.91	0.7	1	–	–	–	-0.12	0.52	0.97	1.2	1.5	2.4	2.3	<MDC
NB-35-15-SL	-0.03	0.15	0.27	–	–	–	–	–	–	1.1	0.29	0.29	–	–	–	0.1	0.47	0.81	0.77	0.55	1.2	–	–	–	0.06	0.53	0.93	0.68	0.77	1.6	1.9	<MDC
NB-35-25-SL	-0.08	0.54	1	–	–	–	–	–	–	1	0.37	0.39	–	–	–	0.19	0.5	0.84	0.99	0.48	0.79	–	–	–	0.13	0.44	0.77	0.25	1.8	3.1	2.7	<MDC
NB-36-05-SL	-0.04	0.55	1	–	–	–	–	–	–	0.89	0.27	0.38	–	–	–	0.15	0.49	0.83	0.8	0.17	0.02	0.75	0.15	0.02	0.05	0.03	0.01	0.83	0.16	0.02	1.6	1.00%
NB-36-15-SL	0.15	0.16	0.26	–	–	–	–	–	–	1.5	0.51	0.54	–	–	–	0.24	0.49	0.82	1.2	0.62	1.2	0.98	0.19	0.03	0.03	0.02	0.02	0.79	0.16	0.02	1.8	0.50%
NB-36-27-SL	0.04	0.14	0.25	–	–	–	–	–	–	0.97	0.3	0.38	–	–	–	0	0.52	0.89	1.3	0.58	0.86	–	–	–	-0.48	0.46	0.92	1.1	1.1	1.8	2.1	<MDC
NB-37-05-SL	-0.1	0.59	1.1	–	–	–	–	–	–	0.96	0.3	0.42	–	–	–	0.28	0.51	0.85	1.2	0.72	0.98	–	–	–	-0.08	0.48	0.87	1.3	1.5	2.4	2.5	<MDC
NB-37-15-SL	0.05	0.14	0.24	–	–	–	–	–	–	1.3	0.34	0.46	–	–	–	0.53	0.51	0.82	0.63	0.71	1.1	–	–	–	-0.35	0.48	0.93	1.3	1.5	2.4	2.7	<MDC
NB-37-25-SL	-0.44	0.58	1.1	–	–	–	–	–	–	0.93	0.29	0.42	–	–	–	0.05	0.48	0.82	1.4	0.71	0.91	–	–	–	0.24	0.4	0.67	0.06	1.3	2.3	5.6	<MDC
NB-38-09-SL	-0.21	0.22	0.4	–	–	–	–	–	–	0.84	0.23	0.34	–	–	–	0.46	0.51	0.83	0.86	0.5	0.99	–	–	–	-0.01	0.39	0.68	1.6	1.2	1.9	3.2	<MDC
NB-38-15-SL	-0.18	0.22	0.4	–	–	–	–	–	–	0.76	0.22	0.36	–	–	–	0.15	0.48	0.81	0.72	0.44	0.89	–	–	–	-0.36	0.38	0.7	0.37	1.1	1.9	0.75	<MDC
NB-38-25-SL	-0.05	0.22	0.38	–	–	–	–	–	–	0.82	0.24	0.38	–	–	–	0.27	0.49	0.82	0.68	0.37	0.69	–	–	–	-0.08	0.4	0.71	1.8	1.3	2.1	3.5	<MDC
NB-40-05-SL	0.08	0.14	0.24	–	–	–	–	–	–	0.81	0.44	0.62	–	–	–	0.09	0.5	0.84	0.85	0.58	1.1	–	–	–	-0.03	0.45	0.83	1.2	0.97	2	2.5	<MDC
NB-40-17-SL	-0.09	0.65	1.2	–	–	–	–	–	–	0.96	0.29	0.37	–	–	–	0.49	0.5	0.8	1.1	0.51	0.8	–	–	–	-0.08	0.48	0.87	1.6	2.2	3.7	3.3	<MDC
NB-40-25-SL	0.05	0.11	0.18	–	–	–	–	–	–	0.55	0.24	0.27	–	–	–	0.83	0.51	0.78	0.81	0.44	0.74	–	–	–	0.13	0.37	0.65	0.17	0.78	1.4	2.7	<MDC
NB-40-31-SL	-0.29	0.18	0.33	–	–	–	–	–	–	0.21	0.19	0.31	–	–	–	0.22	0.49	0.83	0.58	0.44	0.68	–	–	–	0.25	0.33	0.54	-0.25	0.84	1.5	8.4	<MDC
NB-41-05-SL	0.09	0.56	0.98	–	–	–	–	–	–	0.68	0.35	0.48	–	–	–	0.17	0.5	0.84	0.88	0.43	0.7	–	–	–	-0.2	0.47	0.87	0.45	1.5	2.5	0.9	<MDC
NB-41-13-SL	-0.01	0.09	0.17	–	–	–	–	–	–	0.46	0.32	0.47	–	–	–	0.25	0.49	0.81	0.43	0.45	0.7	–	–	–	0.2	0.35	0.59	1.2	0.83	1.3	5.1	<MDC
NB-41-19-SL	-0.05	0.2	0.35	–	–	–	–	–	–	0.58	0.25	0.36	–	–	–	0.27	0.47	0.78	0.25	0.49	0.83	–	–	–	0.32	0.39	0.63	0.26	0.96	1.6	6.9	<MDC
NB-42-05-SL	-0.15	0.6	1.1	–	–	–	–	–	–	0.72	0.25	0.35	–	–	–	0.54	0.53	0.85	0.53	0.51	0.79	–	–	–	0.13	0.38	0.67	1.3	1.5	2.5	3.9	<MDC
NB-42-13-SL	0.05	0.11	0.18	–	–	–	–	–	–	0.51	0.26	0.34	–	–	–	0.4	0.47	0.77	0.36	0.47	0.77	–	–	–	0.07	0.38	0.67	0.59	0.88	1.5	2	<MDC
NB-42-23-SL	0.05	0.17	0.28	–	–	–	–	–	–	0.3	0.17	0.31	–	–	–	0.19	0.49	0.82	0.21	0.45	0.76	–	–	–	0.21	0.3	0.49	0.07	0.83	1.4	4.8	<MDC
NB-43-05-SL	0.4	0.52	0.86	–	–	–	–	–	–	0.8	0.25	0.37	–	–	–	0.39	0.48	0.78	0.64	0.5	0.73	–	–	–	0.1	0.36	0.64	2.4	1.7	2.5	4.6	<MDC
NB-43-13-SL	0.38	0.45	0.72	–	–	–	–	–	–	0.39	0.24	0.34	–	–	–	0.34	0.49	0.81	0.12	0.41	0.75	–	–	–	-0.04	0.34	0.62	0.67	1.4	2.3	1.3	<MDC
NB-44-05-SL	0.01	0.1	0.19	–	–	–	–	–	–	0.44	0.27	0.38	–	–	–	0.36	0.48	0.79	0.36	0.34	0.7	0.49	0.11	0.02	0.03	0.02	0.02	0.47	0.1	0.01	1	1.10%
NB-44-11-SL	-0.18	0.33	0.69	–	–	–	–	–	–	0.38	0.16	0.25	–	–	–	0.5	0.5	0.81	0.31	0.33	0.5	–	–	–	0.13	0.26	0.44	0.73	0.96	1.6	3.3	<MDC
NB-44-18-SL	0.13	0.4	0.7	–	–	–	–	–	–	0.4	0.19	0.29	–	–	–	0.51	0.49	0.78	0.54	0.44	0.63	–	–	–	0.16	0.31	0.54	0.7	1.2	2	3.8	<MDC
NB-45-05-SL	0.01	0.15	0.27	–	–	–	–	–	–	0.81	0.32	0.51	–	–	–	0.13	0.48	0.81	1.3	0.93	1.4	–	–	–	0.56	0.55	0.86	1.3	1.3	2	11.9	<MDC
NB-45-13-SL	0.04	0.14	0.24	–	–	–	–	–	–	1	0.42	0.49	–	–	–	0.29	0.48	0.79	1	0.56	0.93	–	–	–	-0.16	0.47	0.89	1.3	1.1	2.2	2.5	<MDC
NB-45-25-SL	0.06	0.15	0.25	–	–	–	–	–	–	0.86	0.3	0.35	–	–	–	0.51	0.51	0.82	1.2	0.71	0.86	–	–	–	-0.07	0.53	0.98	0.38	1.3	2.2	0.76	<MDC
NB-45-33-SL	-0.03	0.2	0.35	–	–	–	–	–	–	0.5	0.19	0.31	–	–	–	0.73	0.5	0.77	0.38	0.33	0.69	–	–	–	0.11	0.33	0.56	0.2	1	1.7	2.4	<MDC
NB-62-05-SL	-0.12	0.14	0.27	–	–	–	–	–	–	0.69	0.38	0.51	–	–	–	0.54	0.9	1.5	0.86	0.71	1	–	–	–	0.36	0.47	0.77	1.4	1.1	1.7	8.3	<MDC
NB-62-12-SL	-0.01	0.29	0.55	–	–	–	–	–	–	0.38	0.27	0.41	–	–	–	-0.05	0.81	1.4	0.1	0.4	0.74	–	–	–	-0.13	0.3	0.59	1.3	1.1	1.7	2.7	<MDC
NB-62-22-SL	-0.02	0.11	0.21	–	–	–	–	–	–	0.32	0.2	0.35	–	–	–	0.27	0.81	1.4	-0.05	0.54	1.1	–	–	–	0.51	0.37	0.54	0.04	0.75	1.4	14.5	<MDC
NB-63-05-SL	-0.12	0.14	0.27	–	–	–	–	–	–	0.83	0.3	0.41	–	–	–	0.22	0.84	1.5	0.99	0.52	0.91	0.74	0.15	0.02	0.04	0.02	0.01	0.74	0.15	0.02	1.5	0.70%
NB-63-13-SL	0.28	0.48	0.81	–	–	–	–	–	–	0.66	0.34	0.45	–	–	–	-0.04	0.79	1.4	0.6	0.55	0.83	–	–	–	-0.03	0.38	0.7	-0.57	1.4	2.5	0	<MDC
NB-63-19-SL	-0.1	0.34	0.65	–	–	–	–	–	–	0.38	0.22	0.3	–	–	–	0.15	0.86	1.5	0.26	0.38	0.64	–	–	–	0.07	0.29	0.52	0.52	1.2	2	1.9	<MDC
NB-64-05-SL	0.09	0.44	0.78	–	–	–	–	–	–	0.71	0.3	0.37	–	–	–	-0.08	0.78	1.4	0.85	0.52	0.61	–	–	–	0.33	0.45	0.75	0.43	1.5	2.6	6.9	<MDC
NB-64-13-SL	0.04	0.12	0.2	–	–	–	–	–	–	0.27	0.25	0.38	–	–	–	0.13	0.87	1.5	0.34	0.55	0.93	–	–	–	0.03	0.38	0.7	0.11	0.82	1.5	0.68	<MDC
NB-64-17-SL	0.24	0.32	0.53	–	–	–	–	–	–	0.42	0.35	0.55	–	–	–	-0.17	0.77	1.4	0.26	0.46	0.79	–	–	–	0.23	0.28	0.46	0.08	1	1.9	5.4	<MDC
NB-65-05-SL	-0.34	0.39	0.8	–	–	–	–	–	–	0.91	0.26	0.31	–	–	–	0.12	0.85	1.5	0.69	0.58	0.85	–	–	–	0.18	0.38	0.65	0.89	1.4	2.4	4.3	<MDC
NB-65-13-SL	0.07	0.37	0.68	–	–	–	–	–	–	0.89	0.26	0.35	–	–	–	-0.1	0.85	1.5	0.66	0.57	0.85	–	–	–	-0.15	0.37	0.72	0.28	1.4	2.5	0.55	<MDC
NB-65-17-SL	0.04	0.11	0.2	–	–	–	–	–	–	0.36	0.24	0.32	–	–	–	-0.03	0.84	1.5	0.54	0.47	0.64	–	–	–	0.15	0.41	0.71	0.58	1.2	2	3.5	<MDC

Sample ID	Am-241 (pCi/g)			Np-237 (pCi/g)			Pu-239/240 (pCi/g)			Ra-226 (pCi/g)			Ra-226 w/Ingrowth (pCi/g)			Tc-99 (pCi/g)			Th-232 (pCi/g)			U-234 (pCi/g)			U-235 (pCi/g)			U-238 (pCi/g)			Total Uranium (pCi/g)	Perc. Enrich. (U-235)
	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC		
NB-66-05-SL	**-0.09**	0.13	0.26	–	–	–	–	–	–	0.46	0.33	0.46	–	–	–	**0.85**	0.88	1.4	**0.02**	0.71	1.4	–	–	–	**-0.21**	0.49	0.94	**0.4**	1	1.8	**0.79**	**<MDC**
NB-66-15-SL	**-0.36**	0.56	1.1	–	–	–	–	–	–	0.52	0.35	0.51	–	–	–	**0.53**	0.86	1.4	1.4	0.67	0.72	–	–	–	**0.06**	0.45	0.8	**1.1**	1.6	2.7	**2.3**	**<MDC**
NB-66-19-SL	**-0.09**	0.31	0.61	–	–	–	–	–	–	**0.33**	0.24	0.35	–	–	–	**-0.13**	0.77	1.4	**0.38**	0.45	0.72	–	–	–	**0.01**	0.33	0.6	**1**	1.2	1.9	**1.4**	**<MDC**
NB-67-05-SL	**-0.02**	0.14	0.26	–	–	–	–	–	–	0.7	0.43	0.6	–	–	–	**-0.05**	0.8	1.4	**0.87**	0.79	1.2	–	–	–	**0.23**	0.49	0.85	**1.3**	0.9	1.8	**5.7**	**<MDC**
NB-67-11-SL	**-0.11**	0.19	0.34	–	–	–	–	–	–	**0.32**	0.18	0.33	–	–	–	**0.34**	0.83	1.4	**0.4**	0.43	0.7	–	–	–	**-0.29**	0.34	0.63	**0.23**	0.94	1.6	**0.45**	**<MDC**
NB-67-21-SL	**-0.1**	0.41	0.77	–	–	–	–	–	–	0.44	0.25	0.35	–	–	–	**0.19**	0.8	1.4	**0.4**	0.39	0.58	–	–	–	**-0.18**	0.34	0.66	**0.88**	1.2	1.9	**1.8**	**<MDC**
NB-71-01-SL	**0.27**	0.63	1.1	–	–	–	–	–	–	0.98	0.28	0.39	–	–	–	**0.67**	0.93	1.5	*1.1*	*0.24*	*0.03*	*1.7*	*0.3*	*0.04*	*0.06*	*0.03*	*0.02*	*0.84*	*0.16*	*0.03*	2.6	1.10%
NB-71-11-SL	**0.03**	0.14	0.25	–	–	–	–	–	–	0.99	0.31	0.43	–	–	–	**-0.03**	0.85	1.5	1.5	0.66	1.1	–	–	–	**0.12**	0.49	0.86	**0.76**	0.82	1.8	**3**	**<MDC**
NB-71-27-SL	**0.09**	0.49	0.9	–	–	–	–	–	–	0.61	0.31	0.41	–	–	–	**-0.1**	0.8	1.4	**0.57**	0.54	0.83	–	–	–	**-0.01**	0.38	0.69	**0.41**	1.1	2	**0.81**	**<MDC**
NB-72-05-SL	**-0.16**	0.54	1	–	–	–	–	–	–	**0.44**	0.32	0.47	–	–	–	**-0.44**	0.81	1.5	**0.65**	0.55	0.8	–	–	–	**0.19**	0.42	0.72	**0.52**	1.5	2.6	**4.2**	**<MDC**
NB-72-11-SL	**-0.12**	0.14	0.28	–	–	–	–	–	–	**0.56**	0.42	0.61	–	–	–	**0.43**	0.89	1.5	**0.26**	0.71	1.3	–	–	–	**-0.04**	0.43	0.82	**0.62**	1.2	2.1	**1.2**	**<MDC**
NB-72-19-SL	**0.02**	0.2	0.34	–	–	–	–	–	–	0.5	0.22	0.32	–	–	–	**0.14**	0.86	1.5	**0.34**	0.45	0.73	–	–	–	**-0.39**	0.33	0.62	**0.35**	1	1.7	**0.69**	**<MDC**
NB-72-22-SL	**0.03**	0.1	0.18	–	–	–	–	–	–	0.48	0.27	0.38	–	–	–	**0.35**	0.87	1.5	**0.35**	0.46	0.75	–	–	–	**0**	0.38	0.69	**0.44**	0.71	1.2	**0.89**	**<MDC**
NB-73-05-SL	**-0.02**	0.12	0.22	–	–	–	–	–	–	**0.26**	0.31	0.5	–	–	–	**0.77**	0.92	1.5	**0.3**	0.58	1	–	–	–	**0.43**	0.47	0.75	**0.56**	0.89	1.5	**9**	**<MDC**
NB-73-13-SL	**0.1**	0.12	0.19	–	–	–	–	–	–	0.38	0.25	0.36	–	–	–	**1**	0.91	1.4	**0.02**	0.54	1.1	–	–	–	**0.36**	0.36	0.55	**0.55**	0.96	1.6	**7.7**	**<MDC**
NB-73-23-SL	**0.02**	0.11	0.2	–	–	–	–	–	–	**0.41**	0.31	0.46	–	–	–	**0.21**	0.9	1.6	**0.02**	0.49	0.95	–	–	–	**0.11**	0.39	0.68	**0.52**	0.99	1.7	**2.6**	**<MDC**
NB-75-08-SL	**-0.35**	0.61	1.2	–	–	–	–	–	–	0.85	0.35	0.42	–	–	–	**0.35**	0.88	1.5	**0.85**	0.64	0.94	–	–	–	**-0.23**	0.36	0.72	**1.3**	1.7	2.7	**2.6**	**<MDC**
NB-75-15-SL	**0**	0.59	1.1	–	–	–	–	–	–	0.8	0.26	0.35	–	–	–	**-0.12**	0.84	1.5	**0.65**	0.65	1	–	–	–	**-0.34**	0.42	0.82	**0.69**	1.5	2.5	**1.4**	**<MDC**
NB-75-19-SL	**0.25**	0.29	0.47	–	–	–	–	–	–	0.29	0.17	0.24	–	–	–	**0.58**	0.91	1.5	**0.22**	0.45	0.78	–	–	–	**0.07**	0.3	0.54	**0.75**	1.1	1.8	**2.2**	**<MDC**
NB-76-06-SL	**-0.5**	0.54	1.1	–	–	–	–	–	–	**0.18**	0.25	0.41	–	–	–	**1**	0.96	1.5	**-0.08**	0.45	0.91	–	–	–	**-0.13**	0.4	0.76	**-0.55**	1.3	2.3	**0**	**<MDC**
NB-76-10-SL	**-0.09**	0.29	0.57	–	–	–	–	–	–	**0.25**	0.18	0.25	–	–	–	**0.13**	0.84	1.5	**-0.03**	0.37	0.73	–	–	–	**0.13**	0.28	0.49	**-0.28**	0.92	1.7	**4.2**	**<MDC**
NB-76-24-SL	**0.02**	0.09	0.17	–	–	–	–	–	–	0.38	0.24	0.34	–	–	–	**0.99**	1	1.6	**0.22**	0.49	0.86	–	–	–	**0.13**	0.39	0.68	**-0.13**	0.61	1.4	**4.3**	**<MDC**
NB-77-05-SL	**0.06**	0.19	0.32	–	–	–	–	–	–	**0.31**	0.18	0.33	–	–	–	**0.4**	0.88	1.5	**0.38**	0.39	0.63	–	–	–	**0.04**	0.36	0.62	**0.02**	0.87	1.5	**0.8**	**<MDC**
NB-77-13-SL	**0.12**	0.5	0.88	–	–	–	–	–	–	**0.22**	0.2	0.32	–	–	–	**0.66**	0.92	1.5	**0.21**	0.41	0.72	–	–	–	**-0.06**	0.36	0.68	**0.52**	1.2	2.1	**1**	**<MDC**
NB-77-24-SL	**0**	0.33	0.6	–	–	–	–	–	–	0.74	0.21	0.22	–	–	–	**0.02**	0.86	1.5	**0.14**	0.46	0.82	–	–	–	**0.02**	0.28	0.52	**0.43**	1.1	1.9	**0.82**	**<MDC**
NB-78-07-SL	**0.06**	0.15	0.26	–	–	–	–	–	–	1.1	0.54	0.72	–	–	–	**0.55**	0.93	1.6	*0.85*	*0.18*	*0.03*	*0.74*	*0.15*	*0.04*	*0.04*	*0.03*	*0.02*	*0.69*	*0.14*	*0.03*	1.5	1.00%
NB-78-11-SL	**-0.11**	0.2	0.36	–	–	–	–	–	–	0.43	0.2	0.38	–	–	–	**-0.21**	0.82	1.5	**0.53**	0.41	0.87	–	–	–	**0.09**	0.36	0.62	**-0.07**	0.91	1.6	**2.9**	**<MDC**
NB-78-18-SL	**0.02**	0.56	1	–	–	–	–	–	–	0.87	0.36	0.43	–	–	–	**0.14**	0.86	1.5	**0.74**	0.41	0.81	–	–	–	**0.23**	0.38	0.64	**1.6**	1.5	2.4	**6**	**<MDC**
NB-81-09-SL	**-0.24**	0.57	1.1	–	–	–	–	–	–	0.95	0.28	0.35	–	–	–	**0.08**	0.87	1.5	0.83	0.44	0.72	*0.71*	*0.14*	*0.02*	*0.02*	*0.02*	*0.01*	*0.77*	*0.15*	*0.02*	1.5	0.50%
NB-81-11-SL	**0.02**	0.42	0.77	–	–	–	–	–	–	0.98	0.37	0.42	–	–	–	**0.25**	0.89	1.5	1	0.64	0.85	–	–	–	**0.13**	0.4	0.71	**-1.1**	1.4	2.7	**4.2**	**<MDC**
NB-81-31-SL	**-0.05**	0.19	0.34	–	–	–	–	–	–	0.48	0.19	0.33	–	–	–	**0.09**	0.89	1.6	**0.37**	0.44	0.71	–	–	–	**0.01**	0.36	0.62	**0.27**	0.95	1.6	**0.49**	**<MDC**
NB-82-05-SL	**0.19**	0.69	1.2	–	–	–	–	–	–	1.2	0.43	0.48	–	–	–	**1**	1.5	2.5	0.87	0.47	0.73	–	–	–	**-0.11**	0.53	0.97	**1.4**	1.8	3	**2.8**	**<MDC**
NB-82-11-SL	**-0.17**	0.17	0.32	–	–	–	–	–	–	**0.24**	0.2	0.32	–	–	–	**-0.18**	0.83	1.5	**0.11**	0.45	0.78	–	–	–	**-0.45**	0.34	0.63	**0.34**	0.83	1.4	**0.68**	**<MDC**
NB-82-20-SL	**0.11**	0.33	0.58	–	–	–	–	–	–	0.39	0.21	0.37	–	–	–	**0.42**	0.86	1.5	**0.08**	0.38	0.71	–	–	–	**0.12**	0.33	0.58	**-0.24**	0.99	1.9	**3.9**	**<MDC**
NB-83-05-SL	**0.01**	0.16	0.3	–	–	–	–	–	–	0.87	0.34	0.48	–	–	–	**0.14**	0.88	1.5	**1.4**	1.1	1.5	–	–	–	**0.15**	0.54	0.95	**1.3**	1.5	2.4	**4.2**	**<MDC**
NB-83-11-SL	**0.08**	0.2	0.33	–	–	–	–	–	–	0.39	0.19	0.34	–	–	–	**0.24**	0.96	1.7	**0.19**	0.32	0.55	–	–	–	**-0.29**	0.35	0.64	**-0.09**	1.3	2.2	**0**	**<MDC**
NB-83-23-SL	**0.05**	0.28	0.51	–	–	–	–	–	–	0.44	0.25	0.33	–	–	–	**-0.02**	0.8	1.4	**-0.07**	0.46	0.9	–	–	–	**0.11**	0.29	0.51	**0.83**	1.2	2	**2.9**	**<MDC**
NB-84-05-SL	**0.16**	0.17	0.28	–	–	–	–	–	–	1.1	0.53	0.7	–	–	–	**0.75**	0.89	1.4	**0.05**	0.85	1.6	–	–	–	**0.29**	0.57	0.97	**1.7**	1.3	2.6	**7.2**	**<MDC**
NB-84-15-SL	**0.01**	0.22	0.37	–	–	–	–	–	–	0.65	0.21	0.37	–	–	–	**0.01**	0.83	1.5	**0.57**	0.6	0.97	–	–	–	**-0.47**	0.41	0.75	**-0.4**	0.95	1.7	**0**	**<MDC**
NB-84-23-SL	**-0.36**	0.45	0.96	–	–	–	–	–	–	**0.25**	0.26	0.4	–	–	–	**-0.11**	0.86	1.5	**0.3**	0.42	0.69	–	–	–	**-0.23**	0.33	0.67	**-0.06**	1.2	2.2	**0**	**<MDC**
NB-84-33-SL	**-0.23**	0.5	0.93	–	–	–	–	–	–	0.53	0.24	0.29	–	–	–	**0.4**	0.91	1.5	**0.43**	0.46	0.71	–	–	–	**-0.05**	0.31	0.59	**0.64**	1.1	1.9	**1.3**	**<MDC**
NB-85-05-SL	**-0.18**	0.68	1.3	–	–	–	–	–	–	0.99	0.29	0.43	–	–	–	**0.45**	0.84	1.4	**0.61**	0.67	1.1	–	–	–	**0.34**	0.53	0.88	**0.55**	1.7	3	**7.2**	**<MDC**
NB-85-15-SL	**0.16**	0.63	1.1	–	–	–	–	–	–	1	0.31	0.41	–	–	–	**0.3**	0.79	1.4	1.1	0.44	0.62	–	–	–	**0.34**	0.45	0.75	**1.8**	1.7	2.6	**8.4**	**<MDC**
NB-85-25-SL	**0.15**	0.73	1.3	–	–	–	–	–	–	0.92	0.31	0.46	–	–	–	**0.22**	0.82	1.4	1.3	0.6	1.1	–	–	–	**-0.04**	0.45	0.83	**1.1**	1.7	2.9	**2.1**	**<MDC**
NB-85-35-SL	**0.12**	0.25	0.43	–	–	–	–	–	–	**0.25**	0.15	0.29	–	–	–	**0.33**	0.83	1.4	**-0.09**	0.27	0.59	–	–	–	**0.18**	0.28	0.47	**-0.38**	0.95	1.8	**6.2**	**<MDC**
NB-86-05-SL	**-0.01**	0.17	0.31	–	–	–	–	–	–	0.84	0.33	0.45	–	–	–	**0.29**	0.8	1.4	**0.44**	0.83	1.4	–	–	–	**0.67**	0.57	0.86	**1.2**	1.2	2.6	**14.3**	**<MDC**
NB-86-15-SL	**-0.57**	0.51	1.1	–	–	–	–	–	–	0.96	0.29	0.41	–	–	–	**0.33**	0.82	1.4	1.4	0.65	0.74	–	–	–	**-0.01**	0.46	0.84	**0.68**	1.6	2.7	**1.4**	**<MDC**
NB-86-19-SL	**0.21**	0.33	0.56	–	–	–	–	–	–	0.55	0.31	0.44	–	–	–	**-0.34**	0.77	1.4	**0.43**	0.54	0.88	–	–	–	**0.07**	0.35	0.62	**1.2**	1.5	2.5	**2.7**	**<MDC**

NOTE 1 – Bolded values indicate analytical result is less than the MDC value, italicized values indicate an alpha spectroscopy versus gamma spectroscopy result, and cells with "–" indicate that no analysis was performed.
NOTE 2 – For data reported as "Ra-226," the decay chain was not known to be in secular equilibrium.

Sample ID	Am-241 (pCi/g)			Np-237 (pCi/g)			Pu-239/240 (pCi/g)			Ra-226 (pCi/g)			Ra-226 w/Ingrowth (pCi/g)			Tc-99 (pCi/g)			Th-232 (pCi/g)			U-234 (pCi/g)			U-235 (pCi/g)			U-238 (pCi/g)			Total Uranium	Perc. Enrich.
	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	Conc.	±2σ	MDC	(pCi/g)	(U-235)

NOTE 3 – For data reported as “Ra-226 w/Ingrowth,” the sample was sealed and the decay chain was allowed to achieve secular equilibrium prior to measurement of progeny by gamma spectroscopy.

NOTE 4 – The total Uranium calculation uses actual analytical data for U-235 and U-238; however, when U-234 was not reported, it was calculated as discussed in Section 4.0.
Using the individual analytical values reported in the table above, which are rounded, may yield a slightly different value for total Uranium.

NOTE 5 – The reported total Uranium value was bolded when any of the Uranium isotope analytical results were less than MDC.

NOTE 6 – A value was not calculated for U-235 percent enrichment (by weight) if the total Uranium value was less than MDC.

Background U-234, U-235, U-238 and Total U via Alpha Spectroscopy

Sample ID	Sample_Date	Units	U_234_Alpha_Spec	U_235_Alpha_Spec	U_238_Alpha_Spec	Total_Uranium	PercentEnrichment_U_235
BG-01-00-SL	1/6/2005	pCi/g	*0.684*	*0.0256*	*0.554*	1.2636	0.7%
BG-02-00-SL	1/6/2005	pCi/g	*0.7*	*0.021*	*0.766*	1.487	0.4%
BG-03-00-SL	1/6/2005	pCi/g	*0.644*	*0.0297*	*0.878*	1.5517	0.5%
BG-04-00-SL	1/6/2005	pCi/g	*0.672*	*0.0391*	*0.602*	1.3131	1.0%
BG-05-00-SL	1/6/2005	pCi/g	*0.712*	*0.0168*	*0.745*	1.4738	0.3%
BG-06-00-SL	1/6/2005	pCi/g	*0.695*	*0.0695*	*0.673*	1.4375	1.6%
BG-07-00-SL	1/6/2005	pCi/g	*0.633*	*0.022*	*0.634*	1.289	0.5%
BG-08-00-SL	1/6/2005	pCi/g	*0.942*	*0.066*	*0.985*	1.993	1.0%
BG-09-00-SL	1/6/2005	pCi/g	*0.922*	*0.0692*	*0.98*	1.9712	1.1%
BG-10-00-SL	1/6/2005	pCi/g	*0.906*	*0.066*	*0.996*	1.968	1.0%
BG-11-00-SL	1/6/2005	pCi/g	*0.968*	*0.0628*	*0.96*	1.9908	1.0%
BG-12-00-SL	1/6/2005	pCi/g	*0.943*	*0.0583*	*0.859*	1.8603	1.0%
BG-13-00-SL	1/6/2005	pCi/g	*0.906*	*0.0426*	*0.855*	1.8036	0.8%
BG-14-00-SL	1/6/2005	pCi/g	*0.839*	***0.0174***	*0.921*	**1.7774**	<MDC
BG-15-00-SL	1/6/2005	pCi/g	*0.533*	***0.0258***	*0.59*	**1.1488**	<MDC
BG-16-00-SL	1/6/2005	pCi/g	*0.648*	*0.0512*	*0.718*	1.4172	1.1%
BG-01-03-SL	1/6/2005	pCi/g	*0.656*	*0.0629*	*0.649*	1.3679	1.5%
BG-02-03-SL	1/6/2005	pCi/g	*0.751*	*0.033*	*0.736*	1.52	0.7%
BG-03-03-SL	1/6/2005	pCi/g	*0.742*	*0.0532*	*0.811*	1.6062	1.0%
BG-04-03-SL	1/6/2005	pCi/g	*0.743*	*0.0802*	*0.758*	1.5812	1.6%
BG-05-03-SL	1/6/2005	pCi/g	*0.784*	*0.0514*	*0.801*	1.6364	1.0%
BG-06-03-SL	1/6/2005	pCi/g	*0.87*	*0.0672*	*0.821*	1.7582	1.3%
BG-07-03-SL	1/6/2005	pCi/g	*0.719*	*0.0471*	*0.744*	1.5101	1.0%
BG-08-03SL	1/6/2005	pCi/g	*0.922*	*0.0617*	*0.957*	1.9407	1.0%
BG-09-03-SL	1/6/2005	pCi/g	*0.889*	*0.0399*	*0.963*	1.8919	0.6%
BG-10-03-SL	1/6/2005	pCi/g	*0.895*	*0.0494*	*0.942*	1.8864	0.8%
BG-11-03-SL	1/6/2005	pCi/g	*0.838*	*0.0814*	*0.871*	1.7904	1.4%
BG-12-03-SL	1/6/2005	pCi/g	*0.924*	*0.0287*	*0.98*	1.9327	0.5%
BG-13-03-SL	1/6/2005	pCi/g	*0.821*	*0.0614*	*0.99*	1.8724	1.0%
BG-14-03-SL	1/6/2005	pCi/g	*0.842*	*0.0325*	*0.96*	1.8345	0.5%
BG-15-03-SL	1/6/2005	pCi/g	*0.898*	*0.0589*	*0.795*	1.7519	1.1%
BG-16-03-SL	1/6/2005	pCi/g	*0.672*	*0.025*	*0.629*	1.326	0.6%

Non-Impacted U-234, U-235, U-238 and Total U via Alpha Spectroscopy

Sample ID	Sample_Date	Units	U_234_Alpha_Spec	U_235_Alpha_Spec	U_238_Alpha_Spec	Total_Uranium	PercentEnrichment_U_235
NB-02-00-SL	4/29/2004	pCi/g	*0.759*	*0.026*	*0.373*	1.158	1.1%
NB-06-00-SL	4/30/2004	pCi/g	*0.888*	*0.0565*	*0.851*	1.7955	1.0%
NB-114-0.5-SL	11/16/2007	pCi/g	*0.39*	***0.056***	*0.3*	**0.746**	<MDC
NB-114-2.5-SL	11/16/2007	pCi/g	*0.48*	***0.055***	*0.49*	**1.025**	<MDC
NB-121-0.5-SL	11/16/2007	pCi/g	*0.25*	***-0.003***	*0.175*	**0.425**	<MDC
NB-121-12.5-SL	11/16/2007	pCi/g	*0.8*	*0.052*	*1.03*	1.882	0.8%
NB-121-2.5-SL	11/16/2007	pCi/g	*1.45*	*0.051*	*0.76*	2.261	1.0%
NB-17-00-SL	4/30/2004	pCi/g	*1.09*	*0.0328*	*0.801*	1.9238	0.6%
NB-23-00-SL	5/3/2004	pCi/g	*1.1*	*0.0606*	*0.803*	1.9636	1.2%
NB-30-05-SL	6/3/2004	pCi/g	*0.917*				
NB-31-15-SL	6/3/2003	pCi/g	*0.923*				
NB-36-05-SL	6/7/2004	pCi/g	*0.753*	*0.0518*	*0.83*	1.6348	1.0%
NB-36-15-SL	6/7/2004	pCi/g	*0.976*	*0.0268*	*0.794*	1.7968	0.5%
NB-44-05-SL	6/11/2004	pCi/g	*0.494*	*0.0344*	*0.474*	1.0024	1.1%
NB-63-05-SL	7/13/2004	pCi/g	*0.738*	*0.035*	*0.736*	1.509	0.7%
NB-71-01-SL	7/15/2004	pCi/g	*1.7*	*0.058*	*0.838*	2.596	1.1%
NB-78-07-SL	7/21/2004	pCi/g	*0.736*	*0.0446*	*0.689*	1.4696	1.0%
NB-81-09-SL	7/26/2004	pCi/g	*0.713*	*0.0228*	*0.771*	1.5068	0.5%

TotalU AS BKG	TotalU AS NI
1.1488	1.16
1.2636	1.8
1.289	**0.75**
1.3131	**0.43**
1.326	1.92
1.3679	1.96
1.4172	**1.03**
1.4375	1.88
1.4738	2.26
1.487	1.63
1.5101	1.8
1.52	1
1.5517	1.51
1.5812	2.6
1.6062	1.47
1.6364	1.51
1.7519	
1.7582	
1.7774	
1.7904	
1.8036	
1.8345	
1.8603	
1.8724	
1.8864	
1.8919	
1.9327	
1.9407	
1.968	
1.9712	
1.9908	
1.993	

Unknown Ingrowth Background Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth
BG-01-00-SL	1/6/2005	pCi/g	0.874
BG-01-03-SL	1/6/2005	pCi/g	0.759
BG-02-00-SL	1/6/2005	pCi/g	0.937
BG-02-03-SL	1/6/2005	pCi/g	0.991
BG-03-00-SL	1/6/2005	pCi/g	0.833
BG-03-03-SL	1/6/2005	pCi/g	0.838
BG-04-00-SL	1/6/2005	pCi/g	0.873
BG-04-03-SL	1/6/2005	pCi/g	0.949
BG-05-00-SL	1/6/2005	pCi/g	0.88
BG-05-03-SL	1/6/2005	pCi/g	1
BG-06-00-SL	1/6/2005	pCi/g	0.689
BG-06-03-SL	1/6/2005	pCi/g	1.02
BG-07-00-SL	1/6/2005	pCi/g	0.661
BG-07-03-SL	1/6/2005	pCi/g	1.12
BG-08-00-SL	1/6/2005	pCi/g	0.777
BG-08-03SL	1/6/2005	pCi/g	1.04
BG-09-00-SL	1/6/2005	pCi/g	1.09
BG-09-03-SL	1/6/2005	pCi/g	1.01
BG-10-00-SL	1/6/2005	pCi/g	0.885
BG-10-03-SL	1/6/2005	pCi/g	1.15
BG-11-00-SL	1/6/2005	pCi/g	1.13
BG-11-03-SL	1/6/2005	pCi/g	1.12
BG-12-00-SL	1/6/2005	pCi/g	0.877
BG-12-03-SL	1/6/2005	pCi/g	1.09
BG-13-00-SL	1/6/2005	pCi/g	1.1
BG-13-03-SL	1/6/2005	pCi/g	1.09
BG-14-00-SL	1/6/2005	pCi/g	0.859
BG-14-03-SL	1/6/2005	pCi/g	1.21
BG-15-00-SL	1/6/2005	pCi/g	0.681
BG-15-03-SL	1/6/2005	pCi/g	0.951
BG-16-00-SL	1/6/2005	pCi/g	0.901
BG-16-03-SL	1/6/2005	pCi/g	0.909

Known Ingrowth Background Ra-226 via Gamma Spectroscopy

sampleid	analyte	result	qualifier	units	mdl	error
BG-01-00-SL	Radium 226	1.34		pci/g	0.367	0.282
BG-01-03-SL	Radium 226	0.976	LT	pci/g	0.453	0.271
BG-02-00-SL	Radium 226	1.32	G	pci/g	0.533	0.316
BG-02-03-SL	Radium 226	1.53	G	pci/g	0.564	0.349
BG-03-00-SL	Radium 226	1.28	G	pci/g	0.407	0.301
BG-03-03-SL	Radium 226	1.27	G	pci/g	0.613	0.343
BG-04-00-SL	Radium 226	1.42	G	pci/g	0.571	0.347
BG-04-03-SL	Radium 226	1.42	G	pci/g	0.346	0.299
BG-05-00-SL	Radium 226	1.52	G	pci/g	0.42	0.324
BG-05-03-SL	Radium 226	1.59	G	pci/g	0.532	0.361
BG-06-00-SL	Radium 226	1.34	G	pci/g	0.505	0.336
BG-06-03-SL	Radium 226	1.64	G	pci/g	0.501	0.351
BG-07-00-SL	Radium 226	1.16	G	pci/g	0.39	0.284
BG-07-03-SL	Radium 226	1.41	G	pci/g	0.417	0.273
BG-08-00-SL	Radium 226	1.62	G	pci/g	0.589	0.369
BG-08-03-SL	Radium 226	1.61		pci/g		
BG-09-00-SL	Radium 226	1.63		pci/g	0.35	0.275
BG-09-03-SL	Radium 226	1.97	G	pci/g	0.518	0.38
BG-10-00-SL	Radium 226	1.74	G	pci/g	0.572	0.397
BG-10-03-SL	Radium 226	1.6	G	pci/g	0.565	0.327
BG-11-00-SL	Radium 226	1.67	G	pci/g	0.564	0.385
BG-11-03-SL	Radium 226	1.58	G	pci/g	0.501	0.386
BG-12-00-SL	Radium 226	1.62	G	pci/g	0.47	0.312
BG-12-03-SL	Radium 226	1.69	G	pci/g	0.514	0.388
BG-13-00-SL	Radium 226	1.55	G	pci/g	0.534	0.357
BG-13-03-SL	Radium 226	1.86	G	pci/g	0.528	0.395
BG-14-00-SL	Radium 226	1.34	G	pci/g	0.553	0.347
BG-14-03-SL	Radium 226	1.56	G	pci/g	0.566	0.376
BG-15-00-SL	Radium 226	0.995	LT,G	pci/g	0.529	0.303
BG-15-03-SL	Radium 226	1.37	G	pci/g	0.59	0.338
BG-16-00-SL	Radium 226	1.26	G	pci/g	0.419	0.302
BG-16-03-SL	Radium 226	1.32	G	pci/g	0.462	0.305

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
BD-09-00-SL	5/5/2004	pCi/g	**0.342**	0.75
BD-10-00-SL	5/6/2004	pCi/g	0.69	
BD-11-00-SL	5/6/2004	pCi/g	1.13	
BD-12-00-SL	5/5/2004	pCi/g	0.628	
BD-13-09-SL	7/6/2004	pCi/g	0.606	
BD-13-15-SL	7/6/2004	pCi/g	1.01	
BD-13-23-SL	7/6/2004	pCi/g	0.843	
BD-13-30-SL	7/6/2004	pCi/g	0.6	
BD-14-05-SL	7/8/2004	pCi/g	0.966	
BD-14-13-SL	7/8/2004	pCi/g	0.66	
BD-14-25-SL	7/8/2004	pCi/g	0.893	
BD-14-31-SL	7/8/2004	pCi/g	0.404	
BD-15-05-SL	7/8/2004	pCi/g	0.871	
BD-15-17-SL	7/8/2004	pCi/g	0.932	
BD-15-25-SL	7/8/2004	pCi/g	0.673	
BD-15-31-SL	7/8/2004	pCi/g	0.946	
BD-16-05-SL	7/6/2004	pCi/g	0.878	
BD-16-15-SL	7/6/2004	pCi/g	1.18	
BD-16-19-SL	7/6/2004	pCi/g	0.886	
BD-16-25-SL	7/6/2004	pCi/g	1.09	
BD-16-34-SL	7/6/2004	pCi/g	1.12	
BD-17-2.5-SL	11/26/2007	pCi/g	1.15	1.1
BD-17-4.5-SL	11/26/2007	pCi/g	1.14	
BD-17-8.5-SL	11/26/2007	pCi/g	1.24	
BD-18-2.5-SL	11/26/2007	pCi/g	0.97	
BD-18-4.5-SL	11/26/2007	pCi/g	1.43	
BD-18-8.5-SL	11/26/2007	pCi/g	1.09	
BD-19-0.5-SL	11/19/2007	pCi/g	0.26	
BD-19-10.5-SL	11/19/2007	pCi/g	1.5	
BD-19-4.5-SL	11/19/2007	pCi/g	1.07	
BD-20-16.5-SL	11/26/2007	pCi/g	1.53	
BD-20-2.5-SL	11/26/2007	pCi/g	1.02	
BD-20-4.5-SL	11/26/2007	pCi/g	1.45	
BD-21-2.5-SL	11/26/2007	pCi/g	0.84	
BD-21-4.5-SL	11/26/2007	pCi/g	1.11	
BD-21-9-SL	11/26/2007	pCi/g	1.1	
BD-22-12.5-SL	11/26/2007	pCi/g	1.56	
BD-22-2.5-SL	11/26/2007	pCi/g	0.111	
BD-22-4.5-SL	11/26/2007	pCi/g	1.03	
BD-23-2.5-SL	11/26/2007	pCi/g	1.17	0.89
BD-23-4.5-SL	11/26/2007	pCi/g	1.1	
BD-23-5-SL	11/26/2007	pCi/g	1.05	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
BD-24-0.5-SL	11/20/2007	pCi/g	1.26	1.39
BD-24-13-SL	11/20/2007	pCi/g	0.94	
BD-24-2.5-SL	11/20/2007	pCi/g	0.34	
BD-24-4.5-SL	11/20/2007	pCi/g	0.88	
BD-25-16.5-SL	11/26/2007	pCi/g	1.28	
BD-25-2.5-SL	11/26/2007	pCi/g	0.55	
BD-25-4.5-SL	11/26/2007	pCi/g	1.06	
BD-26-2.5-SL	11/21/2007	pCi/g	0.92	
BD-26-4.5-SL	11/21/2007	pCi/g	1.47	
BD-26-7.5-SL	11/21/2007	pCi/g	1.46	
BD-27-13-SL	11/26/2007	pCi/g	1.7	
BD-27-2.5-SL	11/26/2007	pCi/g	0.166	
BD-27-4.5-SL	11/26/2007	pCi/g	0.87	
BD-28-0.5-SL	11/17/2007	pCi/g	0.63	0.94
BD-28-12.5-SL	11/17/2007	pCi/g	1.44	
BD-28-2.5-SL	11/17/2007	pCi/g	0.64	
BD-28-4.5-SL	11/17/2007	pCi/g	1.37	
BD-29-2.5-SL	11/26/2007	pCi/g	1.1	
BD-29-4.5-SL	11/26/2007	pCi/g	1.46	
BD-29-8.5-SL	11/26/2007	pCi/g	1.41	
BD-30-2.5-SL	11/21/2007	pCi/g	1.11	1.08
BD-30-4.5-SL	11/21/2007	pCi/g	0.37	
BD-30-9-SL	11/21/2007	pCi/g	1.1	
BD-31-2.5-SL	11/26/2007	pCi/g	0.39	
BD-31-4.5-SL	11/26/2007	pCi/g	1.18	
BD-31-8.5-SL	11/26/2007	pCi/g	1.21	
BD-32-13-SL	11/26/2007	pCi/g	1.65	
BD-32-2.5-SL	11/26/2007	pCi/g	1.01	
BD-32-4.5-SL	11/26/2007	pCi/g	1.16	
BD-33-12.5-SL	11/21/2007	pCi/g	1.58	
BD-33-2.5-SL	11/21/2007	pCi/g	1.36	
BD-33-4.5-SL	11/21/2007	pCi/g	1.66	1.27
BD-34-13-SL	11/19/2007	pCi/g	1.18	
BD-34-2.5-SL	11/19/2007	pCi/g	0.75	
BD-34-4.5-SL	11/19/2007	pCi/g	1.06	
BD-35-2.5-SL	11/16/2007	pCi/g	0.42	
BD-35-4.5-SL	11/16/2007	pCi/g	1.18	
BD-35-6.5-SL	11/16/2007	pCi/g	1.55	
BD-36-12.5-SL	11/26/2007	pCi/g	1.2	
BD-36-4.5-SL	11/26/2007	pCi/g	1.35	
BD-37-2.5-SL	11/26/2007	pCi/g	0.86	
BD-37-4.5-SL	11/26/2007	pCi/g	1.46	

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT Non-Impacted

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
BD-37-5-SL	11/26/2007	pCi/g	1.65	
BD-38-2.5-SL	11/20/2007	pCi/g	0.5	
BD-38-4.5-SL	11/20/2007	pCi/g	1.26	
BD-38-5-SL	11/20/2007	pCi/g	1.27	
BD-39-2.5-SL	11/26/2007	pCi/g	1.04	1.03
BD-39-4.5-SL	11/26/2007	pCi/g	1.05	
BD-39-8.5-SL	11/26/2007	pCi/g	1.56	
BD-40-18-SL	11/15/2007	pCi/g	1.36	
BD-40-2.5-SL	11/15/2007	pCi/g	0.34	
BD-40-4.5-SL	11/15/2007	pCi/g	1.25	
BD-41-2.5-SL	11/9/2007	pCi/g	0.35	
BD-41-4.5-SL	11/9/2007	pCi/g	0.63	
BD-41-6-SL	11/9/2007	pCi/g	1.36	
BD-42-2.5-SL	11/20/2007	pCi/g	0.172	
BD-42-4.5-SL	11/20/2007	pCi/g	0.5	
BD-42-9-SL	11/20/2007	pCi/g	1.05	
BD-43-2.5-SL	11/20/2007	pCi/g	1.07	
BD-43-4.5-SL	11/20/2007	pCi/g	1.4	
BD-43-5-SL	11/20/2007	pCi/g	1.62	
BD-44-2.5-SL	11/19/2007	pCi/g	0.68	
BD-44-4.5-SL	11/19/2007	pCi/g	0.67	
BD-44-8.5-SL	11/19/2007	pCi/g	1.49	
BD-45-13-SL	11/8/2007	pCi/g	1.23	
BD-45-2.5-SL	11/8/2007	pCi/g	0.76	
BD-45-4.5-SL	11/8/2007	pCi/g	1.53	
BD-46-2.5-SL	11/20/2007	pCi/g	0.65	
BD-46-4.5-SL	11/20/2007	pCi/g	1.47	
BD-46-5-SL	11/20/2007	pCi/g	0.94	
BD-47-2.5-SL	11/19/2007	pCi/g	1.03	
BD-47-4.5-SL	11/19/2007	pCi/g		
BD-47-6.5-SL	11/19/2007	pCi/g	1.2	
BD-48-2.5-SL	11/19/2007	pCi/g	1.09	
BD-48-4.5-SL	11/19/2007	pCi/g	1.38	
BD-48-5.5-SL	11/19/2007	pCi/g	1.39	
BLD240-01-01	11/25/2003	pCi/g	0.99	
BLD240-01-09	11/25/2003	pCi/g	1.03	
BLD240-01-09FD	11/25/2003	pCi/g	0.85	
BLD240-01-Fill	11/25/2003	pCi/g	**0.16**	
BLD240-03-04	11/25/2003	pCi/g	1.29	
BLD240-03-04FD	11/25/2003	pCi/g	0.92	
BLD240-03-19	11/25/2003	pCi/g	1	
BLD240-03-Fill	11/25/2003	pCi/g	**0.45**	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
BLD240-04-02	11/24/2003	pCi/g	0.63	
BLD240-04-04	11/24/2003	pCi/g	0.73	
BLD240-04-Fill	11/24/2003	pCi/g	0.38	
BLD240-05-01	11/21/2003	pCi/g	0.89	
BLD240-05-02	11/21/2003	pCi/g	1.07	
BLD253-02-01	11/24/2003	pCi/g	0.95	
BLD253-02-04	11/24/2003	pCi/g	1	
BLD253-02-Fill	11/24/2003	pCi/g	**0.17**	
BLD253-02-FillFD	11/24/2003	pCi/g	**0.23**	
BLD255-05-Fill	11/21/2003	pCi/g	0.41	
BLD255-07-02	11/24/2003	pCi/g	0.92	
BLD255-07-15	11/24/2003	pCi/g	0.91	
BLD255-08-01	11/19/2003	pCi/g	0.81	
BLD255-08-08	11/19/2003	pCi/g	1.12	
BLD260-06-01	11/20/2003	pCi/g	1.04	
BLD260-06-03	11/20/2003	pCi/g	1.26	
BLD260-06-Fill	11/20/2003	pCi/g	0.72	
BP-01-00-SL	4/28/2004	pCi/g	0.792	
BP-02-00-SL	5/3/2004	pCi/g	0.927	
BP-03-00-SL	5/3/2004	pCi/g	1.02	
BP-04-00-SL	5/3/2004	pCi/g	0.797	
BP-05-00-SL	5/3/2004	pCi/g	1.26	
BP-06-00-SL	4/28/2004	pCi/g	1.08	
BP-07-00-SL	4/29/2004	pCi/g	0.992	
BP-08-00-SL	4/28/2004	pCi/g	1.59	
BP-09-00-SL	4/28/2004	pCi/g	1.18	
BP-10-00-SL	4/29/2004	pCi/g	1.43	
BP-11-00-SL	4/29/2004	pCi/g	1.31	
BP-12-00-SL	4/29/2004	pCi/g	1.44	1.03
BP-13-05-SL	6/15/2004	pCi/g	1.01	1.26
BP-13-11-SL	6/15/2004	pCi/g	0.998	
BP-13-15-SL	6/15/2004	pCi/g	0.69	
BP-13-25-SL	6/15/2004	pCi/g	0.946	
BP-13-35-SL	6/15/2004	pCi/g	0.773	
BP-17-05-SL	6/30/2004	pCi/g	0.641	
BP-17-15-SL	6/30/2004	pCi/g	0.894	
BP-17-23-SL	6/30/2004	pCi/g	0.891	
BP-17-31-SL	6/30/2004	pCi/g	0.947	
BP-18-05-SL	6/30/2004	pCi/g	0.768	1.16
BP-18-15-SL	6/30/2004	pCi/g	1.12	
BP-18-25-SL	6/30/2004	pCi/g	0.995	
BP-18-31-SL	6/30/2004	pCi/g	0.474	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
BP-19-05-SL	6/30/2004	pCi/g	0.865	
BP-19-13-SL	6/30/2004	pCi/g	1.02	
BP-19-25-SL	6/30/2004	pCi/g	1	
BP-19-29-SL	6/30/2004	pCi/g	0.828	
BP-20-03-SL	6/29/2004	pCi/g	1.03	
BP-20-19-SL	6/29/2004	pCi/g	0.738	
BP-20-27-SL	6/29/2004	pCi/g	0.548	
BP-21-07-SL	6/28/2004	pCi/g	0.848	
BP-21-07-SL-FD	6/28/2004	pCi/g	1.04	
BP-21-13-SL	6/28/2004	pCi/g	0.961	
BP-21-24-SL	6/28/2004	pCi/g	1.01	
BP-21-34-SL	6/28/2004	pCi/g	0.571	
BP-22-05-SL	6/29/2004	pCi/g	0.949	
BP-22-13-SL	6/29/2004	pCi/g	0.728	
BP-22-23-SL	6/29/2004	pCi/g	0.843	
BP-22-33-SL	6/29/2004	pCi/g	0.398	
CB-01-00-SL	4/27/2004	pCi/g	0.789	
CB-01-00-SL-FD	4/27/2004	pCi/g	0.998	
CB-02-05-SL	6/2/2004	pCi/g	0.901	
CB-02-05-SL-FD	6/2/2004	pCi/g	1.02	
CB-02-15-SL	6/2/2004	pCi/g	0.886	
CB-02-25-SL	6/2/2004	pCi/g	0.748	
DM-02-05-SL	7/1/2003	pCi/g	0.777	
DM-02-17-SL	7/1/2004	pCi/g	1.07	
DM-02-22-SL	7/1/2005	pCi/g	0.743	
DM-02-33-SL	7/1/2006	pCi/g	0.732	
DM-03-05-SL	7/2/2004	pCi/g	0.716	
DM-03-05-SL-FD	7/2/2004	pCi/g	1.51	
DM-03-13-SL	7/2/2004	pCi/g	1.17	
DM-03-25-SL	7/2/2004	pCi/g	1.1	
DM-03-34-SL	7/2/2004	pCi/g	0.842	
EP-01-00-SL	5/6/2004	pCi/g	1.45	
EP-02-00-SL	5/7/2004	pCi/g	1.21	
EP-03-00-SL	5/8/2004	pCi/g	1.19	
EP-04-00-SL	5/6/2004	pCi/g	**0.654**	
EP-04-00-SL-FD	5/6/2004	pCi/g	0.959	
EP-05-00-SL	5/6/2004	pCi/g	1.07	
EP-06-00-SL	5/5/2004	pCi/g	**0.476**	
EP-07-00-SL	5/5/2004	pCi/g	0.812	
EP-08-00-SL	5/5/2004	pCi/g	1.02	
EP-09-00-SL	5/5/2004	pCi/g	1.39	
EP-10-00-SL	5/5/2004	pCi/g	0.799	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
EP-11-00-SL	5/5/2004	pCi/g	0.979	
EP-12-00-SL	5/5/2004	pCi/g	0.873	
EP-13-03-SL	7/7/2004	pCi/g	1.36	
EP-13-13-SL	7/7/2004	pCi/g	1.18	
EP-13-25-SL	7/7/2004	pCi/g	0.945	
EP-13-30-SL	7/7/2004	pCi/g	0.714	
EP-14-05-SL	7/7/2004	pCi/g	0.885	1.1
EP-14-13-SL	7/7/2004	pCi/g	0.98	
EP-14-25-SL	7/7/2004	pCi/g	0.961	
EP-14-31-SL	7/7/2004	pCi/g	0.772	
EP-15-05-SL	6/10/2004	pCi/g	1.09	
EP-15-13-SL	6/10/2004	pCi/g	0.992	
EP-15-25-SL	6/10/2004	pCi/g	0.58	
EP-15-29-SL	6/10/2004	pCi/g	1.03	
EP-16-05-SL	6/9/2004	pCi/g	1.26	
EP-16-15-SL	6/9/2004	pCi/g	1.03	
EP-16-27-SL	6/9/2004	pCi/g	0.322	
EP-17-05-SL	6/10/2004	pCi/g	1.15	
EP-17-15-SL	6/10/2004	pCi/g	1.2	
EP-17-25-SL	6/10/2004	pCi/g	0.983	
EP-17-30-SL	6/10/2004	pCi/g	0.438	
EP-18-09-SL	7/7/2004	pCi/g	1.06	
EP-18-09-SL-FD	7/7/2004	pCi/g	0.921	
EP-18-15-SL	7/7/2004	pCi/g	1.02	
EP-18-29-SL	7/7/2004	pCi/g	1.29	
EP-19-05-SL	7/7/2004	pCi/g	0.729	
EP-19-13-SL	7/7/2004	pCi/g	0.912	
EP-19-25-SL	7/7/2004	pCi/g	0.937	
EP-19-31-SL	7/7/2004	pCi/g	0.748	
EP-20-05-SL	6/8/2004	pCi/g	0.937	
EP-20-15-SL	6/8/2004	pCi/g	1.09	
EP-20-25-SL	6/8/2004	pCi/g	0.97	
FS-19-1-BIA-1-SO-1	7/1/2008	pCi/g	1.01	
FS-19-1-BIA-1-SO-2	7/1/2008	pCi/g	1.09	
FS-19-1-BIA-1-SO-3	7/1/2008	pCi/g	1.1	
FS-19-1-BIA-1-SO-3-QC	7/1/2008	pCi/g	1.16	
FS-19-1-BIA-2-SO-1	7/1/2008	pCi/g	1.04	
FS-19-1-BIA-2-SO-2	7/1/2008	pCi/g	0.992	
FS-19-1-BIA-2-SO-3	7/1/2008	pCi/g	1.08	
FS-19-1-BIA-3-SO-1	7/1/2008	pCi/g	0.61	
FS-19-1-BIA-3-SO-2	7/1/2008	pCi/g	1.02	
FS-19-1-BIA-3-SO-3	7/1/2008	pCi/g	1.19	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
FS-19-1-BIA-3-SO-3-QA	7/1/2008	pCi/g	1.09	
FS-19-1-BIA-4-SO-1	7/1/2008	pCi/g	0.658	
FS-19-1-BIA-4-SO-2	7/1/2008	pCi/g	1.06	
FS-19-1-BIA-4-SO-3	7/1/2008	pCi/g	1.18	
FS-19-1-BIA-5-SO-1	7/1/2008	pCi/g	0.78	
FS-19-1-BIA-5-SO-2	7/1/2008	pCi/g	1.08	
FS-19-1-BIA-5-SO-3	7/1/2008	pCi/g	1.09	
FS-19-1-QA-10-SO-3	6/25/2008	pCi/g	1.14	
FS-19-1-QA-1-SO-3	6/24/2008	pCi/g	1.11	
FS-19-1-QA-21-SO-3	6/26/2008	pCi/g	0.823	
FS-19-1-QA-9-SO-3	6/23/2008	pCi/g	1.23	
FS-19-1-SYS-10-SO-1	6/25/2008	pCi/g	1.07	
FS-19-1-SYS-10-SO-2	6/25/2008	pCi/g	1.31	
FS-19-1-SYS-10-SO-3	6/25/2008	pCi/g	1.17	
FS-19-1-SYS-11-SO-1	6/24/2008	pCi/g	0.844	
FS-19-1-SYS-11-SO-2	6/24/2008	pCi/g	1.12	
FS-19-1-SYS-11-SO-3	6/24/2008	pCi/g	1.11	
FS-19-1-SYS-12-SO-1	6/25/2008	pCi/g	1.01	
FS-19-1-SYS-12-SO-2	6/25/2008	pCi/g	1.16	
FS-19-1-SYS-12-SO-3	6/25/2008	pCi/g	1.17	
FS-19-1-SYS-13-SO-1	6/25/2008	pCi/g	0.92	
FS-19-1-SYS-13-SO-2	6/25/2008	pCi/g	1.13	
FS-19-1-SYS-13-SO-3	6/25/2008	pCi/g	1.13	
FS-19-1-SYS-14-SO-1	6/25/2008	pCi/g	0.893	
FS-19-1-SYS-14-SO-2	6/25/2008	pCi/g	1.26	
FS-19-1-SYS-14-SO-3	6/25/2008	pCi/g	1.2	
FS-19-1-SYS-15-SO-1	6/24/2008	pCi/g	0.726	
FS-19-1-SYS-15-SO-2	6/24/2008	pCi/g	0.849	
FS-19-1-SYS-15-SO-3	6/24/2008	pCi/g	1.18	
FS-19-1-SYS-16-SO-1	6/25/2008	pCi/g	0.989	
FS-19-1-SYS-16-SO-2	6/25/2008	pCi/g	1.06	
FS-19-1-SYS-16-SO-3	6/25/2008	pCi/g	1.19	
FS-19-1-SYS-17-SO-1	6/26/2008	pCi/g	0.674	
FS-19-1-SYS-17-SO-2	6/26/2008	pCi/g	0.934	
FS-19-1-SYS-17-SO-3	6/26/2008	pCi/g	1.07	
FS-19-1-SYS-18-SO-1	6/26/2008	pCi/g	0.93	
FS-19-1-SYS-18-SO-2	6/26/2008	pCi/g	0.931	
FS-19-1-SYS-18-SO-3	6/26/2008	pCi/g	1.19	
FS-19-1-SYS-19-SO-1	6/26/2008	pCi/g	0.401	
FS-19-1-SYS-19-SO-2	6/26/2008	pCi/g	0.918	
FS-19-1-SYS-19-SO-3	6/26/2008	pCi/g	1	
FS-19-1-SYS-1-SO-1	6/24/2008	pCi/g	0.777	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
FS-19-1-SYS-1-SO-2	6/24/2008	pCi/g	0.972	
FS-19-1-SYS-1-SO-3	6/24/2008	pCi/g	1.15	
FS-19-1-SYS-20-SO-1	6/26/2008	pCi/g	0.723	
FS-19-1-SYS-20-SO-2	6/26/2008	pCi/g	0.96	
FS-19-1-SYS-20-SO-3	6/26/2008	pCi/g	1.35	
FS-19-1-SYS-21-SO-1	6/26/2008	pCi/g	0.708	
FS-19-1-SYS-21-SO-2	6/26/2008	pCi/g	0.91	
FS-19-1-SYS-21-SO-3	6/26/2008	pCi/g	0.855	
FS-19-1-SYS-22-SO-1	6/26/2008	pCi/g	0.729	
FS-19-1-SYS-22-SO-2	6/26/2008	pCi/g	0.85	
FS-19-1-SYS-22-SO-3	6/26/2008	pCi/g	0.9	
FS-19-1-SYS-2-SO-1	6/24/2008	pCi/g	0.795	
FS-19-1-SYS-2-SO-2	6/24/2008	pCi/g	1.23	
FS-19-1-SYS-2-SO-3	6/24/2008	pCi/g	1.04	
FS-19-1-SYS-3-SO-1	6/24/2008	pCi/g	0.926	
FS-19-1-SYS-3-SO-2	6/24/2008	pCi/g	1.18	
FS-19-1-SYS-3-SO-3	6/24/2008	pCi/g	1.16	
FS-19-1-SYS-4-SO-1	6/23/2008	pCi/g	1.06	
FS-19-1-SYS-4-SO-2	6/23/2008	pCi/g	1.22	
FS-19-1-SYS-4-SO-3	6/23/2008	pCi/g	1.26	
FS-19-1-SYS-5-SO-1	6/24/2008	pCi/g	0.531	
FS-19-1-SYS-5-SO-2	6/24/2008	pCi/g	1.22	
FS-19-1-SYS-5-SO-3	6/24/2008	pCi/g	1.12	
FS-19-1-SYS-6-SO-1	6/23/2008	pCi/g	1.16	
FS-19-1-SYS-6-SO-2	6/23/2008	pCi/g	1.14	
FS-19-1-SYS-6-SO-3	6/23/2008	pCi/g	1.23	
FS-19-1-SYS-7-SO-1	6/23/2008	pCi/g	0.636	
FS-19-1-SYS-7-SO-2	6/23/2008	pCi/g	1.29	
FS-19-1-SYS-7-SO-3	6/23/2008	pCi/g	1.24	
FS-19-1-SYS-8-SO-1	6/23/2008	pCi/g	0.783	
FS-19-1-SYS-8-SO-2	6/23/2008	pCi/g	1.07	
FS-19-1-SYS-8-SO-3	6/23/2008	pCi/g	1.21	
FS-19-1-SYS-9-SO-1	6/23/2008	pCi/g	0.831	
FS-19-1-SYS-9-SO-2	6/23/2008	pCi/g	1.02	
FS-19-1-SYS-9-SO-3	6/23/2008	pCi/g	1.15	
FS-19-2-QA-06-SO-3	6/28/2008	pCi/g	1.12	
FS-19-2-QA-17-SO-3	6/27/2008	pCi/g	0.973	
FS-19-2-QA-8-SO-3	6/30/2008	pCi/g	1.1	
FS-19-2-QC-04-SO-3	6/28/2008	pCi/g	0.95	
FS-19-2-SYS-01-SO-1	6/28/2008	pCi/g	1.11	
FS-19-2-SYS-01-SO-2	6/28/2008	pCi/g	1.07	
FS-19-2-SYS-01-SO-3	6/28/2008	pCi/g	0.99	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
FS-19-2-SYS-02-SO-1	6/30/2008	pCi/g	1.03	
FS-19-2-SYS-02-SO-2	6/30/2008	pCi/g	1.17	
FS-19-2-SYS-02-SO-3	6/30/2008	pCi/g	0.958	
FS-19-2-SYS-03-SO-1	6/28/2008	pCi/g	0.988	
FS-19-2-SYS-03-SO-2	6/28/2008	pCi/g	1.28	
FS-19-2-SYS-03-SO-3	6/28/2008	pCi/g	0.916	
FS-19-2-SYS-04-SO-1	6/28/2008	pCi/g	1.2	
FS-19-2-SYS-04-SO-2	6/28/2008	pCi/g	1.13	
FS-19-2-SYS-04-SO-3	6/28/2008	pCi/g	1.03	
FS-19-2-SYS-05-SO-1	6/30/2008	pCi/g	0.99	
FS-19-2-SYS-05-SO-2	6/30/2008	pCi/g	1.17	
FS-19-2-SYS-05-SO-3	6/30/2008	pCi/g	1.15	
FS-19-2-SYS-06-SO-1	6/28/2008	pCi/g	1	
FS-19-2-SYS-06-SO-2	6/28/2008	pCi/g	1.02	
FS-19-2-SYS-06-SO-3	6/28/2008	pCi/g	1.07	
FS-19-2-SYS-09-SO-1	6/28/2008	pCi/g	0.712	
FS-19-2-SYS-09-SO-2	6/28/2008	pCi/g	0.961	
FS-19-2-SYS-09-SO-3	6/28/2008	pCi/g	1.06	
FS-19-2-SYS-10-SO-1	6/30/2008	pCi/g	1.02	
FS-19-2-SYS-10-SO-2	6/30/2008	pCi/g	1.27	
FS-19-2-SYS-10-SO-3	6/30/2008	pCi/g	1.17	
FS-19-2-SYS-11-SO-1	6/30/2008	pCi/g	1.13	
FS-19-2-SYS-11-SO-2	6/30/2008	pCi/g	1.06	
FS-19-2-SYS-11-SO-3	6/30/2008	pCi/g	1.02	
FS-19-2-SYS-12-SO-1	6/28/2008	pCi/g	0.803	
FS-19-2-SYS-12-SO-2	6/28/2008	pCi/g	1.03	
FS-19-2-SYS-12-SO-3	6/28/2008	pCi/g	1.06	
FS-19-2-SYS-13-SO-1	6/30/2008	pCi/g	1.14	
FS-19-2-SYS-13-SO-2	6/30/2008	pCi/g	0.98	
FS-19-2-SYS-13-SO-3	6/30/2008	pCi/g	1.06	
FS-19-2-SYS-14-SO-1	6/30/2008	pCi/g	0.909	
FS-19-2-SYS-14-SO-2	6/30/2008	pCi/g	1.05	
FS-19-2-SYS-14-SO-3	6/30/2008	pCi/g	1.1	
FS-19-2-SYS-15-SO-1	6/28/2008	pCi/g	0.584	
FS-19-2-SYS-15-SO-2	6/28/2008	pCi/g	0.99	
FS-19-2-SYS-15-SO-3	6/28/2008	pCi/g	1.04	
FS-19-2-SYS-16-SO-1	6/27/2008	pCi/g	0.467	
FS-19-2-SYS-16-SO-2	6/27/2008	pCi/g	0.839	
FS-19-2-SYS-16-SO-3	6/27/2008	pCi/g	0.945	
FS-19-2-SYS-17-SO-1	6/27/2008	pCi/g	0.601	
FS-19-2-SYS-17-SO-2	6/27/2008	pCi/g	0.822	
FS-19-2-SYS-17-SO-3	6/27/2008	pCi/g	0.97	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
FS-19-2-SYS-18-SO-1	6/28/2008	pCi/g	0.784	
FS-19-2-SYS-18-SO-2	6/28/2008	pCi/g	0.915	
FS-19-2-SYS-18-SO-3	6/28/2008	pCi/g	0.94	
FS-19-2-SYS-19-SO-1	6/27/2008	pCi/g	0.882	
FS-19-2-SYS-19-SO-2	6/27/2008	pCi/g	0.898	
FS-19-2-SYS-19-SO-3	6/27/2008	pCi/g	1.05	
FS-19-2-SYS-20-SO-1	6/27/2008	pCi/g	0.663	
FS-19-2-SYS-20-SO-2	6/27/2008	pCi/g	0.943	
FS-19-2-SYS-20-SO-3	6/27/2008	pCi/g	0.864	
FS-19-2-SYS-21-SO-1	6/27/2008	pCi/g	0.655	
FS-19-2-SYS-21-SO-2	6/27/2008	pCi/g	0.967	
FS-19-2-SYS-21-SO-3	6/27/2008	pCi/g	1.35	
FS-19-2-SYS-22-SO-1	6/27/2008	pCi/g	0.83	
FS-19-2-SYS-22-SO-2	6/27/2008	pCi/g	0.978	
FS-19-2-SYS-22-SO-3	6/27/2008	pCi/g	0.729	
FS-19-2-SYS-7-SO-1	6/30/2008	pCi/g	1.08	
FS-19-2-SYS-7-SO-2	6/30/2008	pCi/g	0.968	
FS-19-2-SYS-7-SO-3	6/30/2008	pCi/g	1.08	
FS-19-2-SYS-8-SO-1	6/30/2008	pCi/g	0.967	
FS-19-2-SYS-8-SO-2	6/30/2008	pCi/g	1.04	
FS-19-2-SYS-8-SO-3	6/30/2008	pCi/g	1.06	
GS-01-00-SL	4/30/2004	pCi/g	0.652	
GS-01-00-SL-FD	4/30/2004	pCi/g	0.807	
GS-02-00-SL	5/3/2004	pCi/g	1.08	
GS-03-00-SL	4/30/2004	pCi/g	0.455	
GS-04-00-SL	5/3/2004	pCi/g	1.16	
GS-05-00-SL	5/3/2004	pCi/g	0.909	
LB01R	10/10/2005	pCi/g		
LB02R	10/10/2005	pCi/g		
LB03R	10/10/2005	pCi/g		
LB04R	10/10/2005	pCi/g		
LB05R	10/10/2005	pCi/g		
LB06R	10/10/2005	pCi/g		
LB0708C1	10/10/2005	pCi/g		
LB07R	10/10/2005	pCi/g		
LB08R	10/10/2005	pCi/g		
LB09R	10/10/2005	pCi/g		
LB10R	10/10/2005	pCi/g		
LB11R	10/11/2005	pCi/g		
LB12R	10/11/2005	pCi/g		
LB13R	10/11/2005	pCi/g		
LB14R	10/11/2005	pCi/g		

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
LB15R	10/11/2005	pCi/g		
LB15RD	10/11/2005	pCi/g		
LB1617C2	10/11/2005	pCi/g		
LB16R	10/11/2005	pCi/g		
LB17R	10/11/2005	pCi/g		
LB18R	10/11/2005	pCi/g		
LB19R	10/11/2005	pCi/g		
LB20R	10/11/2005	pCi/g		
LB21R	10/11/2005	pCi/g		
LB22R	10/11/2005	pCi/g		
LB23R	10/11/2005	pCi/g		
LB2425C3	10/11/2005	pCi/g		
LB24R	10/11/2005	pCi/g		
LB25R	10/11/2005	pCi/g		
LB26R	10/11/2005	pCi/g		
LB27R	10/11/2005	pCi/g		
LB28R	10/11/2005	pCi/g		
LB29R	10/11/2005	pCi/g		
LB30R	10/11/2005	pCi/g		
LB31R	10/11/2005	pCi/g		
LB3233C4	10/12/2005	pCi/g		
LB32R	10/11/2005	pCi/g		
LB33R	10/12/2005	pCi/g		
LB34R	10/12/2005	pCi/g		
LB35R	10/12/2005	pCi/g		
LB3637RC5	10/12/2005	pCi/g		
LB36R	10/12/2005	pCi/g		
LB36RD	10/12/2005	pCi/g		
LB37R	10/12/2005	pCi/g		
LB38R	10/12/2005	pCi/g		
LB39R	10/12/2005	pCi/g		
LF-01-00-SL	5/5/2004	pCi/g	0.695	
LF-02-00-SL	5/5/2004	pCi/g	**0.333**	
LF-03-00-SL	5/5/2004	pCi/g	0.794	
LF-04-00-SL	5/5/2004	pCi/g	0.907	
LF-05-00-SL	5/5/2004	pCi/g	0.635	
LF-06-05-SL	7/19/2004	pCi/g	0.828	0.79
LF-06-13-SL	7/19/2004	pCi/g	0.818	
LF-06-27-SL	7/19/2004	pCi/g	0.798	
LF-06-32-SL	7/19/2004	pCi/g	**0.287**	
LF-07-09-SL	7/16/2004	pCi/g	1.06	
LF-07-15-SL	7/16/2004	pCi/g	1	

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT Non-Impacted

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
LF-07-25-SL	7/16/2004	pCi/g	1.05	
LF-07-34-SL	7/16/2004	pCi/g	0.577	
LF-08-05-SL	7/16/2004	pCi/g	1.16	
LF-08-05-SL-FD	7/16/2004	pCi/g	0.758	
LF-08-15-SL	7/16/2004	pCi/g	1.16	
LF-08-21-SL	7/16/2004	pCi/g	0.947	
LF-08-37-SL	7/16/2004	pCi/g	0.709	
LF-09-03-SL	7/16/2004	pCi/g	0.818	
LF-09-17-SL	7/16/2004	pCi/g	1.04	
LF-09-25-SL	7/16/2004	pCi/g	1.12	
LF-09-31-SL	7/16/2004	pCi/g	0.604	
LS-01-00-SL	5/6/2004	pCi/g	0.757	
LS-02-00-SL	5/6/2004	pCi/g	0.501	
LS-03-00-SL	5/6/2004	pCi/g	0.859	
NB-01-00-SL	4/29/2004	pCi/g	0.798	
NB-02-00-SL	4/29/2004	pCi/g	0.532	
NB-03-00-SL	4/29/2004	pCi/g	0.569	
NB-04-00-SL	4/30/2004	pCi/g	1.97	
NB-05-00-SL	4/30/2004	pCi/g	1.01	
NB-06-00-SL	4/30/2004	pCi/g	1.25	
NB-07-00-SL	4/30/2004	pCi/g	1.13	
NB-07-00-SL-FD	4/30/2004	pCi/g	1.39	
NB-08-00-SL	4/30/2004	pCi/g	1.32	
NB-09-00-SL	4/30/2004	pCi/g	1.29	
NB-10-00-SL	5/3/2004	pCi/g	1.24	
NB-100-4.5-SL	11/9/2007	pCi/g	1.29	
NB-100-7-SL	11/9/2007	pCi/g	1.63	
NB-101-2.5-SL	11/17/2007	pCi/g	0.38	
NB-101-4.5-SL	11/17/2007	pCi/g	1.71	
NB-101-7-SL	11/17/2007	pCi/g	0.179	
NB-102-0.5-SL	11/17/2007	pCi/g	0.56	
NB-102-4.5-SL	11/17/2007	pCi/g	0.59	
NB-102-5-SL	11/17/2007	pCi/g	0.69	
NB-103-13.5-SL	11/17/2007	pCi/g	1.17	
NB-103-2.5-SL	11/17/2007	pCi/g	0.41	
NB-103-4.5-SL	11/17/2007	pCi/g	0.55	
NB-104-0.5-SL	11/19/2007	pCi/g	0.98	
NB-104-12.5-SL	11/19/2007	pCi/g	1.07	
NB-104-4.5-SL	11/19/2007	pCi/g	1.07	
NB-105-15.5-SL	11/15/2007	pCi/g	0.72	
NB-105-4.5-SL	11/15/2007	pCi/g	0.8	
NB-106-2.5-SL	11/19/2007	pCi/g	0.195	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
NB-106-4.5-SL	11/19/2007	pCi/g	1.2	
NB-106-7.5-SL	11/19/2007	pCi/g	0.8	
NB-107-0.5-SL	11/19/2007	pCi/g	0.84	
NB-107-17-SL	11/19/2007	pCi/g	1.19	
NB-107-4.5-SL	11/19/2007	pCi/g	1.16	
NB-108-0.5-SL	11/19/2007	pCi/g	1.23	
NB-108-4.5-SL	11/19/2007	pCi/g	0.95	
NB-108-9-SL	11/19/2007	pCi/g	1.01	
NB-109-0.5-SL	11/15/2007	pCi/g	1.32	
NB-109-4.5-SL	11/15/2007	pCi/g	0.85	
NB-109-5-SL	11/15/2007	pCi/g	0.95	
NB-110-0.5-SL	11/15/2007	pCi/g	0.95	
NB-11-00-SL	5/3/2004	pCi/g	1.12	
NB-110-4.5-SL	11/15/2007	pCi/g	1.11	
NB-110-5-SL	11/15/2007	pCi/g	1.42	
NB-111-0.5-SL	11/15/2007	pCi/g	1.14	
NB-111-4.5-SL	11/15/2007	pCi/g	0.76	
NB-111-8.5-SL	11/15/2007	pCi/g	1.55	
NB-112-4.5-SL	11/15/2007	pCi/g	0.92	
NB-112-8.5-SL	11/15/2007	pCi/g	0.82	
NB-113-19.5-SL	11/20/2007	pCi/g	1.49	
NB-113-2.5-SL	11/17/2007	pCi/g	0.304	
NB-113-4.5-SL	11/17/2007	pCi/g	0.91	
NB-114-0.5-SL	11/16/2007	pCi/g	0.223	0.206
NB-114-10-SL	11/16/2007	pCi/g	1.06	1.06
NB-114-2.5-SL	11/16/2007	pCi/g	0.337	0.54
NB-114-4.5-SL	11/16/2007	pCi/g	1.07	1.53
NB-115-12.5-SL	11/17/2007	pCi/g	1.39	
NB-115-2.5-SL	11/17/2007	pCi/g	0.38	
NB-115-4.5-SL	11/17/2007	pCi/g	1.38	
NB-116-0.5-SL	11/14/2007	pCi/g	1.21	
NB-116-12.5-SL	11/14/2007	pCi/g	1.32	
NB-116-4.5-SL	11/14/2007	pCi/g	1.39	
NB-117-13.5-SL	11/15/2007	pCi/g	1.09	
NB-117-4.5-SL	11/15/2007	pCi/g	1.21	
NB-118-0.5-SL	11/15/2007	pCi/g	0.31	
NB-118-10.5-SL	11/15/2007	pCi/g	1.49	
NB-118-4.5-SL	11/15/2007	pCi/g	0.48	
NB-119-0.5-SL	11/15/2007	pCi/g	0.9	
NB-119-13.5-SL	11/15/2007	pCi/g	1.11	
NB-119-2.5-SL	11/15/2007	pCi/g	0.76	
NB-119-4.5-SL	11/15/2007	pCi/g	1.13	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
NB-120-0.5-SL	11/16/2007	pCi/g	0.6	
NB-12-00-SL	5/3/2004	pCi/g	1.2	
NB-120-16.5-SL	11/16/2007	pCi/g	1.25	
NB-120-2.5-SL	11/16/2007	pCi/g	0.94	
NB-120-4.5-SL	11/16/2007	pCi/g	1.16	
NB-121-0.5-SL	11/16/2007	pCi/g		
NB-121-12.5-SL	11/16/2007	pCi/g	1.12	1.61
NB-121-2.5-SL	11/16/2007	pCi/g	0.61	0.61
NB-121-4.5-SL	11/16/2007	pCi/g	1.34	1.61
NB-122-0.5-SL	11/15/2007	pCi/g		
NB-122-14.5-SL	11/15/2007	pCi/g	1.19	
NB-122-4.5-SL	11/15/2007	pCi/g	0.85	1.12
NB-123-0.5-SL	11/16/2007	pCi/g	0.55	
NB-123-2.5-SL	11/16/2007	pCi/g	1.27	
NB-123-4.5-SL	11/16/2007	pCi/g	1.59	
NB-123-8.5-SL	11/16/2007	pCi/g	0.96	
NB-124-0.5-SL	11/14/2007	pCi/g	1	
NB-124-4.5-SL	11/14/2007	pCi/g	0.87	
NB-124-8.5-SL	11/14/2007	pCi/g	0.91	
NB-125-0.5-SL	11/14/2007	pCi/g	1.09	
NB-125-4.5-SL	11/14/2007	pCi/g	1.05	
NB-125-7-SL	11/14/2007	pCi/g	1.16	
NB-126-0.5-SL	11/14/2007	pCi/g	0.78	
NB-126-12.5-SL	11/14/2007	pCi/g	0.76	
NB-126-4.5-SL	11/14/2007	pCi/g	1.2	
NB-127-4.5-SL	11/15/2007	pCi/g	0.73	
NB-127-5-SL	11/15/2007	pCi/g	1.04	
NB-128-0.5-SL	11/16/2007	pCi/g	0.92	
NB-128-18.5-SL	11/16/2007	pCi/g	1.1	
NB-128-2.5-SL	11/16/2007	pCi/g	1.02	
NB-128-4.5-SL	11/16/2007	pCi/g	1.07	
NB-129-0.5-SL	11/16/2007	pCi/g	1.02	
NB-129-19-SL	11/16/2007	pCi/g	1.29	
NB-129-2.5-SL	11/16/2007	pCi/g	0.85	
NB-129-4.5-SL	11/16/2007	pCi/g	0.94	
NB-130-0.5-SL	11/14/2007	pCi/g	1.36	1.25
NB-13-00-SL	5/3/2004	pCi/g	1.24	
NB-130-11-SL	11/14/2007	pCi/g	0.9	
NB-130-4.5-SL	11/14/2007	pCi/g	0.9	
NB-131-0.5-SL	11/15/2007	pCi/g	0.28	
NB-131-4.5-SL	11/15/2007	pCi/g	0.352	
NB-131-6.5-SL	11/15/2007	pCi/g	0.92	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
NB-132-13-SL	11/15/2007	pCi/g	1.19	
NB-132-4.5-SL	11/15/2007	pCi/g	0.81	
NB-133-2.5-SL	11/15/2007	pCi/g	0.47	1.02
NB-133-4.5-SL	11/15/2007	pCi/g	1.11	
NB-133-5.5-SL	11/15/2007	pCi/g	0.86	
NB-134-0.5-SL	11/16/2007	pCi/g	0.78	
NB-134-2.5-SL	11/16/2007	pCi/g	0.74	
NB-134-4.5-SL	11/16/2007	pCi/g	1.72	
NB-134-9-SL	11/16/2007	pCi/g	2.6	
NB-135-0.5-SL	11/14/2007	pCi/g	1.51	
NB-135-15-SL	11/14/2007	pCi/g	1.09	
NB-135-4.5-SL	11/14/2007	pCi/g	1.26	
NB-136-0.5-SL	11/14/2007	pCi/g	1.4	
NB-136-17.5-SL	11/14/2007	pCi/g	1.25	
NB-136-4.5-SL	11/14/2007	pCi/g	1.55	1.13
NB-137-0.5-SL	11/13/2007	pCi/g	1.14	
NB-137-13.5-SL	11/13/2007	pCi/g	1.49	
NB-137-4.5-SL	11/13/2007	pCi/g	1.48	
NB-138-0.5-SL	11/15/2007	pCi/g		
NB-138-14.5-SL	11/15/2007	pCi/g	1.33	
NB-138-4.5-SL	11/15/2007	pCi/g	0.99	
NB-139-0.5-SL	11/15/2007	pCi/g	1.4	
NB-139-15-SL	11/15/2007	pCi/g	1.41	
NB-139-4.5-SL	11/19/2007	pCi/g	1.25	
NB-140-0.5-SL	11/15/2007	pCi/g	0.99	1.46
NB-14-00-SL	5/3/2004	pCi/g	1.05	
NB-140-12.5-SL	11/15/2007	pCi/g	1.5	
NB-140-4.5-SL	11/15/2007	pCi/g	1.18	
NB-141-0.5-SL	11/13/2007	pCi/g	1.28	
NB-141-17.5-SL	11/13/2007	pCi/g	1.04	
NB-141-4.5-SL	11/13/2007	pCi/g	1.6	1.47
NB-142-0.5-SL	11/15/2007	pCi/g	0.88	
NB-142-4.5-SL	11/15/2007	pCi/g	0.93	
NB-142-9-SL	11/15/2007	pCi/g	1.34	
NB-143-0.5-SL	11/13/2007	pCi/g	0.42	
NB-143-4.5-SL	11/13/2007	pCi/g	0.83	
NB-143-6.5-SL	11/13/2007	pCi/g	1.09	
NB-144-0.5-SL	11/14/2007	pCi/g	0.3	
NB-144-4.5-SL	11/14/2007	pCi/g	0.73	
NB-144-7-SL	11/14/2007	pCi/g	1.22	
NB-15-00-SL	5/3/2004	pCi/g	1.38	
NB-16-00-SL	4/30/2004	pCi/g	1.02	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
NB-17-00-SL	4/30/2004	pCi/g	1.23	
NB-18-00-SL	4/30/2004	pCi/g	1.16	
NB-19-00-SL	5/3/2004	pCi/g	0.99	
NB-20-00-SL	4/28/2004	pCi/g	1.15	
NB-21-00-SL	5/3/2004	pCi/g	0.944	
NB-22-00-SL	5/3/2004	pCi/g	1.08	
NB-23-00-SL	5/3/2004	pCi/g	1.12	
NB-24-00-SL	5/3/2004	pCi/g	1.18	
NB-25-00-SL	5/3/2004	pCi/g	0.712	
NB-26-00-SL	4/29/2004	pCi/g	0.492	
NB-27-00-SL	4/29/2004	pCi/g	0.58	
NB-27-00-SL-FD	4/29/2004	pCi/g	1.03	
NB-28-04-SL	5/25/2004	pCi/g	1.07	
NB-28-14-SL	5/25/2004	pCi/g	0.756	
NB-28-24-SL	5/25/2004	pCi/g	0.525	
NB-28-35-SL	5/27/2004	pCi/g	0.395	
NB-29-05-SL	5/25/2004	pCi/g	0.867	
NB-29-14-SL	5/25/2004	pCi/g	**0.198**	
NB-29-22-SL	5/27/2004	pCi/g	0.465	
NB-30-05-SL	6/3/2004	pCi/g	1	
NB-30-15-SL	6/3/2004	pCi/g	1.08	
NB-30-25-SL	6/3/2004	pCi/g	1.03	
NB-30-33-SL	6/3/2005	pCi/g	0.532	
NB-31-05-SL	6/3/2002	pCi/g	0.888	
NB-31-15-SL	6/3/2003	pCi/g	1.06	
NB-31-27-SL	6/3/2004	pCi/g	1.09	
NB-31-32-SL	6/3/2004	pCi/g	0.903	
NB-32-05-SL	6/4/2004	pCi/g	0.981	
NB-32-15-SL	6/4/2004	pCi/g	1.07	
NB-32-27-SL	6/4/2004	pCi/g	1.02	
NB-32-33-SL	6/4/2004	pCi/g	0.56	
NB-33-05-SL	6/4/2004	pCi/g	0.967	
NB-33-15-SL	6/4/2004	pCi/g	1.02	
NB-33-27-SL	6/4/2004	pCi/g	0.676	
NB-34-05-SL	6/4/2004	pCi/g	1.16	
NB-34-15-SL	6/4/2004	pCi/g	1.06	
NB-34-25-SL	6/4/2004	pCi/g	0.514	
NB-35-01-SL	6/7/2004	pCi/g	0.97	
NB-35-15-SL	6/7/2004	pCi/g	1.07	
NB-35-25-SL	6/7/2004	pCi/g	1.04	
NB-36-05-SL	6/7/2004	pCi/g	0.892	
NB-36-15-SL	6/7/2004	pCi/g	1.53	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
NB-36-27-SL	6/7/2004	pCi/g	0.971	
NB-37-05-SL	6/8/2004	pCi/g	0.962	
NB-37-15-SL	6/8/2004	pCi/g	1.31	
NB-37-25-SL	6/8/2004	pCi/g	0.927	
NB-38-09-SL	6/8/2004	pCi/g	0.842	
NB-38-15-SL	6/8/2004	pCi/g	0.756	
NB-38-25-SL	6/8/2004	pCi/g	0.818	
NB-39-05-SL	6/9/2004	pCi/g	1.01	
NB-39-15-SL	6/9/2004	pCi/g	1.05	
NB-39-25-SL	6/9/2004	pCi/g	0.758	
NB-39-30-SL	6/9/2004	pCi/g	0.657	
NB-40-05-SL	6/10/2004	pCi/g	0.814	
NB-40-05-SL-FD	6/10/2004	pCi/g	0.652	
NB-40-17-SL	6/10/2004	pCi/g	0.959	
NB-40-25-SL	6/10/2004	pCi/g	0.548	
NB-40-31-SL	6/10/2004	pCi/g	**0.21**	
NB-41-05-SL	6/11/2004	pCi/g	0.675	
NB-41-13-SL	6/11/2004	pCi/g	**0.459**	
NB-41-19-SL	6/11/2004	pCi/g	0.584	
NB-42-05-SL	6/11/2004	pCi/g	0.717	
NB-42-13-SL	6/11/2004	pCi/g	0.507	
NB-42-23-SL	6/11/2004	pCi/g	**0.304**	
NB-43-05-SL	6/11/2004	pCi/g	0.799	
NB-43-13-SL	6/11/2004	pCi/g	0.388	
NB-44-05-SL	6/11/2004	pCi/g	0.443	
NB-44-05-SL-FD	6/11/2004	pCi/g	**0.327**	
NB-44-11-SL	6/11/2004	pCi/g	0.382	
NB-44-18-SL	6/11/2004	pCi/g	0.404	
NB-45-05-SL	6/16/2004	pCi/g	0.808	
NB-45-05-SL-FD	6/16/2004	pCi/g	1.08	
NB-45-13-SL	6/16/2004	pCi/g	1.01	
NB-45-25-SL	6/16/2004	pCi/g	0.863	
NB-45-33-SL	6/16/2004	pCi/g	0.504	
NB-46-09-SL	6/15/2004	pCi/g	0.774	
NB-46-17-SL	6/15/2004	pCi/g	0.654	
NB-46-25-SL	6/15/2004	pCi/g	0.813	
NB-46-29-SL	6/15/2004	pCi/g	0.862	
NB-47-05-SL	6/21/2004	pCi/g	0.96	
NB-47-15-SL	6/21/2004	pCi/g	1.12	
NB-47-25-SL	6/21/2004	pCi/g	1.27	
NB-47-31-SL	6/21/2004	pCi/g	0.747	
NB-48-05-SL	6/21/2004	pCi/g	1.16	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
NB-48-11-SL	6/21/2004	pCi/g	1.09	
NB-48-15-SL	6/21/2004	pCi/g	1.29	
NB-48-25-SL	6/21/2004	pCi/g	1.12	
NB-48-35-SL	6/21/2004	pCi/g	0.794	
NB-49-05-SL	6/22/2004	pCi/g	1.04	
NB-49-05-SL-FD	6/22/2004	pCi/g	0.866	
NB-49-15-SL	6/22/2004	pCi/g	1.15	
NB-49-25-SL	6/22/2004	pCi/g	0.977	
NB-49-37-SL	6/22/2004	pCi/g	0.478	
NB-50-05-SL	6/22/2004	pCi/g	0.917	
NB-50-15-SL	6/22/2004	pCi/g	1.17	
NB-50-25-SL	6/22/2004	pCi/g	0.931	
NB-50-37-SL	6/22/2004	pCi/g	0.479	
NB-51-05-SL	6/22/2004	pCi/g	0.706	
NB-51-13-SL	6/22/2004	pCi/g	0.815	
NB-51-25-SL	6/22/2004	pCi/g	1.06	
NB-51-37-SL	6/22/2004	pCi/g	1.01	
NB-52-05-SL	6/23/2004	pCi/g	0.872	
NB-52-13-SL	6/23/2004	pCi/g	0.832	
NB-52-25-SL	6/23/2004	pCi/g	0.989	
NB-52-35-SL	6/23/2004	pCi/g	0.753	
NB-53-05-SL	6/23/2004	pCi/g	0.82	
NB-53-13-SL	6/23/2004	pCi/g	0.887	
NB-53-23-SL	6/23/2004	pCi/g	0.909	
NB-53-33-SL	6/23/2004	pCi/g	0.802	
NB-54-05-SL	6/24/2004	pCi/g	0.837	
NB-54-13-SL	6/24/2004	pCi/g	0.85	
NB-54-25-SL	6/24/2004	pCi/g	0.784	
NB-54-31-SL	6/24/2004	pCi/g	**0.254**	
NB-55-05-SL	6/24/2004	pCi/g	0.66	
NB-55-13-SL	6/24/2004	pCi/g	0.845	
NB-55-25-SL	6/24/2004	pCi/g	0.786	
NB-55-33-SL	6/24/2004	pCi/g	**0.262**	
NB-56-05-SL	6/24/2004	pCi/g	0.839	
NB-56-13-SL	6/24/2004	pCi/g	1.28	
NB-56-25-SL	6/24/2004	pCi/g	0.841	
NB-56-33-SL	6/24/2004	pCi/g	0.476	
NB-57-05-SL	6/25/2004	pCi/g	0.867	
NB-57-05-SL-FD	6/25/2004	pCi/g	0.747	
NB-57-15-SL	6/25/2004	pCi/g	0.945	
NB-57-29-SL	6/25/2004	pCi/g	0.956	
NB-57-34-SL	6/25/2004	pCi/g	0.766	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
NB-58-05-SL	6/25/2004	pCi/g	0.983	
NB-58-15-SL	6/25/2004	pCi/g	0.84	
NB-58-29-SL	6/25/2004	pCi/g	0.97	
NB-58-36-SL	6/25/2004	pCi/g	0.704	
NB-59-05-SL	6/25/2004	pCi/g	0.955	
NB-59-13-SL	6/25/2004	pCi/g	0.804	
NB-59-25-SL	6/25/2004	pCi/g	0.946	
NB-59-31-SL	6/25/2004	pCi/g	0.652	
NB-60-05-SL	7/19/2004	pCi/g	0.984	
NB-60-13-SL	7/19/2004	pCi/g	0.873	
NB-60-23-SL	7/19/2004	pCi/g	0.866	
NB-60-31-SL	7/19/2004	pCi/g	**0.491**	
NB-61-05-SL	6/28/2004	pCi/g	1.24	
NB-61-13-SL	6/28/2004	pCi/g	0.94	
NB-61-23-SL	6/28/2004	pCi/g	0.803	
NB-61-28-SL	6/28/2004	pCi/g	0.562	
NB-62-05-SL	7/2/2004	pCi/g	0.689	
NB-62-12-SL	7/2/2004	pCi/g	**0.379**	
NB-62-22-SL	7/2/2004	pCi/g	**0.322**	
NB-63-05-SL	7/13/2004	pCi/g	0.827	
NB-63-13-SL	7/13/2004	pCi/g	0.659	
NB-63-19-SL	7/13/2004	pCi/g	0.384	
NB-64-05-SL	7/12/2004	pCi/g	0.708	
NB-64-13-SL	7/12/2004	pCi/g	**0.267**	
NB-64-17-SL	7/12/2004	pCi/g	**0.415**	
NB-65-05-SL	7/12/2004	pCi/g	0.911	
NB-65-13-SL	7/12/2004	pCi/g	0.885	
NB-65-17-SL	7/12/2004	pCi/g	0.361	
NB-66-05-SL	7/13/2004	pCi/g	0.462	
NB-66-05-SL-FD	7/13/2004	pCi/g	0.527	
NB-66-15-SL	7/13/2004	pCi/g	0.524	
NB-66-19-SL	7/13/2004	pCi/g	**0.33**	
NB-67-05-SL	7/13/2004	pCi/g	0.695	
NB-67-11-SL	7/13/2004	pCi/g	**0.315**	
NB-67-21-SL	7/13/2004	pCi/g	0.439	
NB-68-05-SL	7/14/2004	pCi/g	0.827	
NB-68-13-SL	7/14/2004	pCi/g	0.968	
NB-68-17-SL	7/14/2004	pCi/g	0.759	
NB-68-25-SL	7/14/2004	pCi/g	0.955	
NB-68-33-SL	7/14/2004	pCi/g	0.398	
NB-69-05-SL	7/14/2004	pCi/g	0.972	
NB-69-15-SL	7/14/2004	pCi/g	0.51	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
NB-69-22-SL	7/14/2004	pCi/g	0.685	
NB-69-34-SL	7/14/2004	pCi/g	0.533	
NB-70-05-SL	7/14/2004	pCi/g	1.01	
NB-70-15-SL	7/14/2004	pCi/g	0.922	
NB-70-23-SL	7/14/2004	pCi/g	0.85	
NB-70-33-SL	7/14/2004	pCi/g	0.809	
NB-71-01-SL	7/15/2004	pCi/g	0.977	
NB-71-01-SL-FD	7/15/2004	pCi/g	0.93	
NB-71-11-SL	7/15/2004	pCi/g	0.994	
NB-71-27-SL	7/15/2004	pCi/g	0.611	
NB-72-05-SL	7/15/2004	pCi/g	**0.44**	
NB-72-11-SL	7/15/2004	pCi/g	**0.557**	
NB-72-19-SL	7/15/2004	pCi/g	0.501	
NB-72-22-SL	7/15/2004	pCi/g	0.48	
NB-73-05-SL	7/15/2004	pCi/g	**0.257**	
NB-73-13-SL	7/15/2004	pCi/g	0.378	
NB-73-23-SL	7/15/2004	pCi/g	**0.414**	
NB-74-05-SL	7/20/2004	pCi/g	0.969	
NB-74-17-SL	7/20/2004	pCi/g	0.976	
NB-74-25-SL	7/20/2004	pCi/g	0.983	
NB-74-33-SL	7/20/2004	pCi/g	0.534	
NB-75-08-SL	7/19/2004	pCi/g	0.85	
NB-75-15-SL	7/19/2004	pCi/g	0.802	
NB-75-19-SL	7/19/2004	pCi/g	0.288	
NB-76-06-SL	7/21/2004	pCi/g	**0.177**	
NB-76-10-SL	7/21/2004	pCi/g	**0.247**	
NB-76-24-SL	7/21/2004	pCi/g	0.381	
NB-77-05-SL	7/21/2004	pCi/g	**0.305**	
NB-77-13-SL	7/21/2004	pCi/g	**0.223**	
NB-77-24-SL	7/21/2004	pCi/g	0.743	
NB-78-07-SL	7/21/2004	pCi/g	1.09	
NB-78-11-SL	7/21/2004	pCi/g	0.431	
NB-78-18-SL	7/21/2004	pCi/g	0.871	
NB-79-05-SL	7/23/2004	pCi/g	0.801	
NB-79-05-SL-FD	7/23/2004	pCi/g	0.814	
NB-79-11-SL	7/23/2004	pCi/g	0.48	
NB-79-24-SL	7/23/2004	pCi/g	0.63	
NB-80-05-SL	7/23/2004	pCi/g	0.503	
NB-80-11-SL	7/23/2004	pCi/g	0.534	
NB-80-27-SL	7/23/2004	pCi/g	0.6	
NB-81-09-SL	7/26/2004	pCi/g	0.954	
NB-81-11-SL	7/26/2004	pCi/g	0.982	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
NB-81-31-SL	7/26/2004	pCi/g	0.478	
NB-82-05-SL	7/27/2004	pCi/g	1.19	
NB-82-11-SL	7/27/2004	pCi/g	**0.236**	
NB-82-20-SL	7/27/2004	pCi/g	0.385	
NB-83-05-SL	7/27/2004	pCi/g	0.866	
NB-83-11-SL	7/27/2004	pCi/g	0.386	
NB-83-23-SL	7/27/2004	pCi/g	0.442	
NB-84-05-SL	7/28/2004	pCi/g	1.07	
NB-84-15-SL	7/28/2004	pCi/g	0.651	
NB-84-23-SL	7/28/2004	pCi/g	**0.254**	
NB-84-33-SL	7/28/2004	pCi/g	0.533	
NB-85-05-SL	8/24/2004	pCi/g	0.987	
NB-85-15-SL	8/24/2004	pCi/g	1.02	
NB-85-25-SL	8/24/2004	pCi/g	0.918	
NB-85-35-SL	8/24/2004	pCi/g	**0.254**	
NB-86-05-SL	8/24/2004	pCi/g	0.838	
NB-86-15-SL	8/24/2004	pCi/g	0.955	
NB-86-19-SL	8/24/2004	pCi/g	0.549	
NB-87-18-SL	11/9/2007	pCi/g	1.29	
NB-87-4.5-SL	11/9/2007	pCi/g	0.69	
NB-88-0.5-SL	11/16/2007	pCi/g	1.07	
NB-88-20-SL	11/16/2007	pCi/g	0.73	
NB-88-4.5-SL	11/16/2007	pCi/g	1.21	
NB-89-0.5-SL	11/13/2007	pCi/g	0.62	
NB-89-19.5-SL	11/13/2007	pCi/g	0.58	
NB-89-4.5-SL	11/13/2007	pCi/g	0.59	
NB-90-11.5-SL	11/9/2007	pCi/g	1.39	
NB-90-4.5-SL	11/9/2007	pCi/g	1.11	
NB-91-0.5-SL	11/16/2007	pCi/g	0.62	
NB-91-4.5-SL	11/16/2007	pCi/g	0.76	
NB-91-6.5-SL	11/16/2007	pCi/g	0.54	
NB-92-11-SL	11/9/2007	pCi/g	1.36	
NB-92-4.5-SL	11/9/2007	pCi/g	1.04	
NB-93-0.5-SL	11/16/2007	pCi/g	0.59	
NB-93-15-SL	11/16/2007	pCi/g	1.13	
NB-93-4.5-SL	11/16/2007	pCi/g	1.2	
NB-94-15-SL	11/9/2007	pCi/g	1.13	
NB-94-4.5-SL	11/9/2007	pCi/g	0.87	
NB-95-16.5-SL	11/9/2007	pCi/g	1.23	
NB-95-4.5-SL	11/9/2007	pCi/g	1.09	
NB-96-0.5-SL	11/16/2007	pCi/g	0.33	
NB-96-4.5-SL	11/16/2007	pCi/g	1.03	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
NB-96-5-SL	11/16/2007	pCi/g	0.78	
NB-97-0.5-SL	11/16/2007	pCi/g	1.04	
NB-97-4.5-SL	11/16/2007	pCi/g	1.27	
NB-97-9.5-SL	11/16/2007	pCi/g	1.6	
NB-99-13-SL	11/9/2007	pCi/g	1.12	
NB-99-4.5-SL	11/9/2007	pCi/g	1.2	
OA-01-00-SL	4/27/2004	pCi/g	0.749	
OA-01-00-SL-FD	4/27/2004	pCi/g	0.618	
OA-02-00-SL	4/27/2004	pCi/g	0.817	
OA-03-00-SL	4/27/2004	pCi/g	1.08	
OA-04-00-SL	4/28/2004	pCi/g	1.18	
OA-05-00-SL	4/28/2004	pCi/g	1.22	
OA-06-00-SL	5/6/2004	pCi/g	1.11	
OA-07-00-SL	5/6/2004	pCi/g	1.12	
OA-08-00-SL	5/6/2004	pCi/g	1.06	
OA-09-00-SL	5/6/2004	pCi/g	1.14	
OA-10-00-SL	5/4/2004	pCi/g	0.834	
OA-11-00-SL	5/4/2004	pCi/g	0.842	
OA-12-00-SL	5/4/2004	pCi/g	0.983	
OA-13-00-SL	5/4/2004	pCi/g	1.09	
OA-14-00-SL	5/4/2004	pCi/g	0.997	
OA-15-00-SL	5/4/2004	pCi/g	0.7	
OA-16-00-SL	5/4/2004	pCi/g	0.782	
OA-18-03-SL	7/1/2004	pCi/g	0.938	
OA-18-17-SL	7/1/2004	pCi/g	1.08	
OA-18-25-SL	7/1/2004	pCi/g	0.857	
OA-18-33-SL	7/1/2004	pCi/g	0.745	
OA-19-05-SL	7/1/2004	pCi/g	1.01	
OA-19-15-SL	7/1/2004	pCi/g	1.21	
OA-19-25-SL	7/1/2004	pCi/g	0.947	
OA-19-33-SL	7/1/2004	pCi/g	0.638	
OA-20-00-SL	5/4/2004	pCi/g	0.955	
OA-21-00-SL	5/4/2004	pCi/g	0.951	
OA-22-00-SL	5/4/2004	pCi/g	0.895	
OA-23-00-SL	5/4/2004	pCi/g	0.441	
OA-24-00-SL	5/4/2004	pCi/g	1.1	
OA-25-00-SL	5/5/2004	pCi/g	0.438	
OA-26-00-SL	5/6/2004	pCi/g	0.796	
OA-27-00-SL	5/3/2004	pCi/g	1.04	
OA-28-00-SL	4/28/2004	pCi/g	1.07	
OA-29-00-SL	4/28/2004	pCi/g	1.16	
OA-30-00-SL	4/28/2004	pCi/g	1.02	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
OA-31-00-SL	4/28/2004	pCi/g	1.23	
OA-32-00-SL	4/28/2004	pCi/g	1.08	
OA-33-00-SL	4/28/2004	pCi/g	1.15	
OA-34-00-SL	4/29/2004	pCi/g	1.02	
OA-35-00-SL	4/29/2004	pCi/g	0.709	
OA-36-00-SL	4/29/2004	pCi/g	0.9	
OA-37-00-SL	4/29/2004	pCi/g	1.22	1.01
OA-38-00-SL	4/29/2004	pCi/g	1.06	0.86
OA-39-00-SL	4/29/2004	pCi/g	1.14	1.21
OA-40-00-SL	4/29/2004	pCi/g	0.931	
PL-01-00-SL	4/29/2004	pCi/g	1.1	
PL-02-00-SL	4/29/2004	pCi/g	1.07	
PL-03-00-SL	4/29/2004	pCi/g	1.36	
PL-04-05-SL	6/29/2004	pCi/g	1.18	
PL-04-13-SL	6/29/2004	pCi/g	0.865	
PL-04-23-SL	6/29/2004	pCi/g	0.914	
PL-04-31-SL	6/29/2004	pCi/g	0.866	
PL-05-05-SL	6/7/2004	pCi/g	0.859	
PL-05-15-SL	6/7/2004	pCi/g	0.798	
PL-05-28-SL	6/7/2004	pCi/g	0.731	
PL-06-07-SL	6/18/2004	pCi/g	0.936	
PL-06-13-SL	6/18/2004	pCi/g	0.969	
PL-06-17-SL	6/18/2004	pCi/g	1.09	
PL-06-29-SL	6/18/2004	pCi/g	0.471	
PL-06-33-SL	6/18/2004	pCi/g	0.377	
RR-01-00-SL	4/27/2004	pCi/g	**0.595**	
RR-02-00-SL	4/27/2004	pCi/g	1.12	
RR-03-00-SL	4/27/2004	pCi/g	1.29	
RR-04-07-SL	6/2/2004	pCi/g	1.18	
RR-04-15-SL	6/2/2004	pCi/g	0.939	
RR-04-25-SL	6/2/2004	pCi/g	0.886	
RR-05-05-SL	6/1/2004	pCi/g	0.971	
RR-05-05-SL-FD	6/1/2004	pCi/g	1.12	
RR-05-15-SL	6/1/2004	pCi/g	0.91	
RR-05-25-SL	6/1/2004	pCi/g	0.872	
SO-BP1D-12	11/1/2006	pCi/g	0.92	
SO-BP2B-12	11/1/2006	pCi/g	0.96	
SO-BP2C-12	11/1/2006	pCi/g	0.94	
SO-BP2D-05	11/1/2006	pCi/g	1.09	
SO-BP2D-05-D	11/1/2006	pCi/g	1.12	
SO-BP2E-07	11/1/2006	pCi/g	1.04	
SO-BP4A-04	11/1/2006	pCi/g	0.79	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SO-BP4D-08	11/1/2006	pCi/g	1.25	
SO-BP4E-09	11/1/2006	pCi/g	1.31	
SO-BP4F-08	11/1/2006	pCi/g	1.34	
SO-BP5B-10	11/1/2006	pCi/g	1.08	
SO-BP5C-08	11/1/2006	pCi/g	1.01	
SO-BP5D-08	11/1/2006	pCi/g	1.31	
SO-BP5E-10	11/1/2006	pCi/g	1.33	
SO-BP7B-08	11/1/2006	pCi/g	1.14	
SO-BP7C-12	11/1/2006	pCi/g	1.21	
SO-BP9A-16	11/1/2006	pCi/g	0.87	
SO-PB5-04	11/1/2006	pCi/g	1.01	
SO-RR6-01	11/1/2006	pCi/g	0.73	
SO-RR7-01	11/1/2006	pCi/g	0.81	
SO-RR8-05	11/1/2006	pCi/g	0.82	
SO-RR9-01	11/1/2006	pCi/g	0.74	
SS-BP-001-DV	5/21/2008	pCi/g	0.95	
SS-BP-001-SF	5/21/2008	pCi/g	0.81	
SS-BP-001-SV	5/21/2008	pCi/g	1	
SS-BP-002-DV	7/18/2008	pCi/g	0.736	
SS-BP-002-SF	7/18/2008	pCi/g	0.841	
SS-BP-002-SV	7/18/2008	pCi/g	0.957	
SS-BP-003-DV	7/17/2008	pCi/g	0.997	
SS-BP-003-DV-QC	7/17/2008	pCi/g	0.94	
SS-BP-003-SF	7/17/2008	pCi/g	0.934	1.16
SS-BP-003-SV	7/17/2008	pCi/g	0.9	
SS-BP-004-DV	5/28/2007	pCi/g	0.9	
SS-BP-004-SF	5/28/2007	pCi/g	0.97	
SS-BP-004-SV	5/28/2007	pCi/g	0.84	
SS-BP-005-DV	5/21/2008	pCi/g	0.84	
SS-BP-005-SF	5/21/2008	pCi/g	0.168	
SS-BP-005-SV	5/21/2008	pCi/g	0.83	
SS-BP-007-DV	5/28/2007	pCi/g	0.96	
SS-BP-007-EL-10	5/28/2007	pCi/g	1.32	
SS-BP-007-SF	5/28/2007	pCi/g	0.91	
SS-BP-007-SV	5/28/2007	pCi/g	0.83	
SS-BP-008-DV	5/28/2007	pCi/g	1.05	
SS-BP-008-SF	5/28/2007	pCi/g	1	
SS-BP008-SV	5/28/2007	pCi/g	0.85	
SS-BP-009-DV	5/28/2007	pCi/g	1.03	
SS-BP-009-SF	5/28/2007	pCi/g	0.82	
SS-BP-009-SV	5/28/2007	pCi/g	0.78	
SS-BP-010-DV	5/29/2008	pCi/g	0.91	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-BP-010-SF	5/29/2008	pCi/g	0.81	
SS-BP-010-SV	5/29/2008	pCi/g	0.96	
SS-BP-011-DV	5/29/2008	pCi/g	1.21	
SS-BP-011-SF	5/29/2008	pCi/g	0.76	
SS-BP-011-SV	5/29/2008	pCi/g	0.69	
SS-BP-012-DV	5/29/2008	pCi/g	0.87	
SS-BP-012-SF	5/29/2008	pCi/g	0.92	
SS-BP-012-SV	5/29/2008	pCi/g	0.61	
SS-BP-014-DV	6/19/2008	pCi/g	0.75	
SS-BP-014-DV-QC	6/19/2008	pCi/g	0.696	
SS-BP-014-SF	6/19/2008	pCi/g	0.228	
SS-BP-014-SV	6/19/2008	pCi/g	0.781	
SS-BP-017-DV	5/30/2008	pCi/g	1.02	
SS-BP-017-DV-EL-11	5/30/2008	pCi/g	1.02	
SS-BP-017-SF	5/30/2008	pCi/g	0.79	
SS-BP-017-SV	5/30/2008	pCi/g	0.81	
SS-BP-018DV	5/30/2008	pCi/g	1.09	
SS-BP-018-SF	5/30/2008	pCi/g	0.77	
SS-BP-018-SV	5/30/2008	pCi/g	0.83	
SS-BP-021-DV	5/30/2008	pCi/g	0.93	
SS-BP-021-SF	5/30/2008	pCi/g	1	
SS-BP-021-SV	5/30/2008	pCi/g	1.02	
SS-BP-024-DV	5/29/2008	pCi/g	0.88	
SS-BP-024-SF	5/29/2008	pCi/g	0.44	
SS-BP-024-SV	5/29/2008	pCi/g	1.08	
SS-BP-025-DV	6/19/2008	pCi/g	0.892	
SS-BP-025-DV-QC	6/19/2008	pCi/g	0.86	
SS-BP-025-SF	6/19/2008	pCi/g	0.685	
SS-BP-025-SV	6/19/2008	pCi/g	0.794	
SS-BP-026-DV	6/18/2008	pCi/g	0.94	
SS-BP-026-DV-QC	6/18/2008	pCi/g	1.03	
SS-BP-026-SF	6/18/2008	pCi/g	1.38	
SS-BP-026-SV	6/18/2008	pCi/g	0.397	
SS-BP-027-DV	5/29/2008	pCi/g	0.94	
SS-BP-027-SF	5/29/2008	pCi/g	0.435	
SS-BP-027-SV	5/29/2008	pCi/g	0.74	
SS-BP-031-DV	6/3/2008	pCi/g	0.91	
SS-BP-031-SF	6/3/2008	pCi/g	0.86	
SS-BP-031-SV	6/3/2008	pCi/g	0.97	
SS-BP-032-DV	6/18/2008	pCi/g	0.993	
SS-BP-032-SF	6/18/2008	pCi/g	0.292	
SS-BP-032-SV	6/18/2008	pCi/g	0.708	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-BP-033-DV	6/4/2008	pCi/g	1.11	
SS-BP-033-SF	6/4/2008	pCi/g	0.81	
SS-BP-033-SV	6/4/2008	pCi/g	0.88	
SS-BP-037-DV	6/3/2008	pCi/g	0.78	
SS-BP-037-SF	6/3/2008	pCi/g	0.82	
SS-BP-037-SV	6/3/2008	pCi/g	0.83	
SS-BP-038-DV	6/5/2008	pCi/g	1.11	
SS-BP-038-SF	6/5/2008	pCi/g	0.87	0.92
SS-BP-038-SV	6/5/2008	pCi/g	0.97	
SS-BP-039-DV	6/5/2008	pCi/g	0.95	
SS-BP-039-SF	6/5/2008	pCi/g	0.76	1.13
SS-BP-039-SV	6/5/2008	pCi/g	0.94	
SS-BP-039-SV-QC	6/5/2008	pCi/g	0.9	
SS-BP-040-DV	5/23/2008	pCi/g	1.13	
SS-BP-040-SF	5/23/2008	pCi/g	0.82	
SS-BP-040-SV	5/23/2008	pCi/g	0.93	
SS-BP-041-DV	6/5/2008	pCi/g	0.94	
SS-BP-041-SF	6/5/2008	pCi/g	0.99	
SS-BP-041-SV	6/5/2008	pCi/g	0.94	
SS-BP-042-DV	6/5/2008	pCi/g	1.09	
SS-BP-042-SF	6/5/2008	pCi/g	1.07	
SS-BP-042-SV	6/5/2008	pCi/g	0.83	
SS-BP-043-DV	6/5/2008	pCi/g	0.97	
SS-BP-043-SV	6/5/2008	pCi/g	0.79	
SS-BP-044-DV	6/5/2008	pCi/g	1	
SS-BP-044-SF	6/5/2008	pCi/g	0.78	
SS-BP-044-SV	6/5/2008	pCi/g	0.98	
SS-BP-045-DV	6/18/2008	pCi/g	1.24	
SS-BP-045-DV-QC	6/17/2008	pCi/g	1.04	
SS-BP-045-SF	6/18/2008	pCi/g	1.07	
SS-BP-045-SV	6/18/2008	pCi/g	1.09	
SS-BP-046-DV	6/14/2008	pCi/g	0.981	
SS-BP-046-SF	6/14/2008	pCi/g	1.06	
SS-BP-046-SV	6/14/2008	pCi/g	0.997	
SS-BP-047-DV	6/7/2008	pCi/g	1.22	
SS-BP-047-SF	6/7/2008	pCi/g	1.04	
SS-BP-047-SV	6/7/2008	pCi/g	0.93	
SS-BP-048-DV	6/7/2008	pCi/g	1.27	
SS-BP-048-SF	6/7/2008	pCi/g	1.02	
SS-BP-048-SV	6/7/2008	pCi/g	0.84	
SS-BP-049-DV	6/6/2008	pCi/g	1.12	
SS-BP-049-SF	6/6/2008	pCi/g	1.21	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-BP-049-SV	6/6/2008	pCi/g	0.68	
SS-BP-049-SV-QC	6/6/2008	pCi/g	1.08	
SS-BP-051-DV	6/6/2008	pCi/g	1.24	
SS-BP-051-SF	6/6/2008	pCi/g	0.99	
SS-BP-051-SV	6/6/2008	pCi/g	1.13	
SS-BP-052-DV	6/11/2008	pCi/g	1.41	
SS-BP-052-EL-6	6/11/2008	pCi/g	1.14	
SS-BP-052-SF	6/11/2008	pCi/g	1.04	
SS-BP-052-SV	6/11/2008	pCi/g	1.14	
SS-BP-053-DV	6/12/2008	pCi/g	1.16	
SS-BP-053-SF	6/12/2008	pCi/g	1.09	
SS-BP-053-SV	6/12/2008	pCi/g	1.09	
SS-BP-054-DV	6/12/2008	pCi/g	1.12	
SS-BP-054-SF	6/12/2008	pCi/g	1.08	
SS-BP-054-SV	6/12/2008	pCi/g	1.18	
SS-BP-055-DV	5/27/2008	pCi/g	0.97	
SS-BP-055-SF	5/27/2008	pCi/g	1.2	
SS-BP-055-SV	5/27/2008	pCi/g	1.01	
SS-BP-056-DV	6/12/2008	pCi/g	1.09	
SS-BP-056-SF	6/12/2008	pCi/g	1.09	
SS-BP-056-SV	6/12/2008	pCi/g	1.12	
SS-BP-057-DV	6/6/2008	pCi/g	0.98	
SS-BP-057-SF	6/6/2008	pCi/g	0.75	
SS-BP-057-SV	6/6/2008	pCi/g	0.97	
SS-BP-058-DV	6/6/2008	pCi/g	0.89	
SS-BP-058-SF	6/6/2008	pCi/g	0.92	
SS-BP-058-SV	6/6/2008	pCi/g	0.96	
SS-BP-060-DV	6/7/2008	pCi/g	1.32	
SS-BP-060-SF	6/7/2008	pCi/g	0.92	
SS-BP-060-SV	6/7/2008	pCi/g	0.91	
SS-BP-061-DV	6/17/2008	pCi/g	1.05	
SS-BP-061-SF	6/17/2008	pCi/g	1.13	
SS-BP-061-SV	6/17/2008	pCi/g	1.04	
SS-BP-062-DV	6/18/2008	pCi/g	1.21	
SS-BP-062-DV-EL-10	6/18/2008	pCi/g	1.14	
SS-BP-062-SF	6/18/2008	pCi/g	1.09	
SS-BP-062-SV	6/18/2008	pCi/g	1.11	
SS-BP-063-DV	6/18/2008	pCi/g	1.08	
SS-BP-063-DV-QC	6/18/2008	pCi/g	1.16	
SS-BP-063-SF	6/18/2008	pCi/g	1.12	
SS-BP-063-SV	6/18/2008	pCi/g	1.13	
SS-BP-064-DV	6/17/2008	pCi/g	1	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-BP-064-DV-QC	6/17/2008	pCi/g	0.995	
SS-BP-064-SF	6/17/2008	pCi/g	1.01	
SS-BP-064-SV	6/17/2008	pCi/g	1.02	
SS-BP-065-DV	6/17/2008	pCi/g	1	
SS-BP-065-DV-EL-5	6/17/2008	pCi/g	0.98	
SS-BP-065-SF	6/17/2008	pCi/g	1.01	
SS-BP-065-SV	6/17/2008	pCi/g	1.02	
SS-BP-066-CUT-EL	6/17/2008	pCi/g	0.85	
SS-BP-066-DV	6/17/2008	pCi/g	1.04	
SS-BP-066-SF	6/17/2008	pCi/g	1.02	
SS-BP-066-SV	6/17/2008	pCi/g	1.02	
SS-BP-067-DV	6/14/2008	pCi/g	1.14	
SS-BP-067-SF	6/14/2008	pCi/g	1.08	
SS-BP-067-SV	6/14/2008	pCi/g	1.2	
SS-BP-068-DV	6/14/2008	pCi/g	1.11	
SS-BP-068-SF	6/14/2008	pCi/g	1.07	
SS-BP-068-SV	6/14/2008	pCi/g	1.1	
SS-BP-069-DV	6/17/2008	pCi/g	1	
SS-BP-069-SF	6/17/2008	pCi/g	0.99	
SS-BP-069-SV	6/17/2008	pCi/g	1.43	
SS-BP-070-DV	6/13/2008	pCi/g	0.964	
SS-BP-070-DV-QC	6/13/2008	pCi/g	0.95	
SS-BP-070-SF	6/13/2008	pCi/g	0.99	1.22
SS-BP-070-SV	6/13/2008	pCi/g	1.02	
SS-BP-071-DV	6/13/2008	pCi/g	1.03	
SS-BP-071-SF	6/13/2008	pCi/g	1.1	1.21
SS-BP-071-SV	6/13/2008	pCi/g	1.01	
SS-BP-072-DV	6/13/2008	pCi/g	1.07	
SS-BP-072-SF	6/13/2008	pCi/g	1.07	
SS-BP-072-SV	6/13/2008	pCi/g	1.14	
SS-BP-073-DV	6/14/2008	pCi/g	1.08	
SS-BP-073-SF	6/14/2008	pCi/g	1.05	
SS-BP-073-SV	6/14/2008	pCi/g	1.15	
SS-BP-074-DV	6/14/2008	pCi/g	1.1	
SS-BP-074-DV-QC	6/14/2008	pCi/g	1.09	
SS-BP-074-SF	6/14/2008	pCi/g	1.09	
SS-BP-074-SV	6/14/2008	pCi/g	1.13	
SS-BP-075-DV	6/14/2008	pCi/g	1.08	
SS-BP-075-DV-EL-7	6/14/2008	pCi/g	0.9	
SS-BP-075-SF	6/14/2008	pCi/g	1.12	
SS-BP-075-SV	6/14/2008	pCi/g	1.08	
SS-BP-076-DV	6/17/2008	pCi/g	1.11	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-BP-076-DV-QC	6/16/2008	pCi/g	1.12	
SS-BP-076-SF	6/17/2008	pCi/g	1.05	
SS-BP-076-SV	6/17/2008	pCi/g	1.02	
SS-BP-077-DV	6/12/2008	pCi/g	1.19	
SS-BP-077-SF	6/12/2008	pCi/g	0.952	
SS-BP-077-SV	6/12/2008	pCi/g	1.19	
SS-BP-078-DV	6/7/2008	pCi/g	1.13	
SS-BP-078-SF	6/7/2008	pCi/g	0.95	
SS-BP-078-SV	6/7/2008	pCi/g	0.93	
SS-BP-079-DV	6/12/2008	pCi/g	1.14	
SS-BP-079-SF	6/12/2008	pCi/g	1.34	
SS-BP-079-SV	6/12/2008	pCi/g	1.1	
SS-BP-080-DV	6/12/2008	pCi/g	1.08	
SS-BP-080-SF	6/12/2008	pCi/g	1	
SS-BP-080-SV	6/12/2008	pCi/g	1.2	
SS-BP-106-DV	6/17/2008	pCi/g	1	
SS-BP-106-SF	6/17/2008	pCi/g	1.06	
SS-BP-106-SV	6/17/2008	pCi/g	1.02	
SS-BP-107-DV	6/4/2008	pCi/g	0.71	
SS-BP-107-SF	6/4/2008	pCi/g	0.97	
SS-BP-107-SV	6/4/2008	pCi/g	0.84	
SS-BP-108B-DV	6/4/2008	pCi/g	1.31	
SS-BP-108B-DV-EL-6	6/4/2008	pCi/g	0.73	
SS-BP-108B-SF	6/4/2008	pCi/g	0.8	
SS-BP-108B-SV	6/4/2008	pCi/g	0.89	
SS-BP-108-SF	6/4/2008	pCi/g	0.68	
SS-BP-108-SV	6/4/2008	pCi/g	0.86	
SS-BP-110-DV	6/4/2008	pCi/g	0.9	
SS-BP-110-SF	6/4/2008	pCi/g	0.91	
SS-BP-110-SV	6/4/2008	pCi/g	0.98	
SS-BP-111-DV	6/5/2008	pCi/g	1.16	
SS-BP-111-SF	6/5/2008	pCi/g	1.08	
SS-BP-111-SV	6/5/2008	pCi/g	0.89	
SS-E.EVAP-001-SF	7/21/2008	pCi/g	0.99	
SS-E.EVAP-001-SV	7/21/2008	pCi/g	1.21	
SS-GA-001-DV	7/10/2008	pCi/g	1.02	
SS-GA-001-SF	7/10/2008	pCi/g	0.729	
SS-GA-001-SV	7/10/2008	pCi/g	0.863	
SS-GA-002-DV	7/9/2008	pCi/g	0.86	
SS-GA-002-SF	7/9/2008	pCi/g	0.942	
SS-GA-002-SV	7/9/2008	pCi/g	1.03	
SS-GA-003-DV	6/17/2008	pCi/g	0.854	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-GA-003-SV	6/17/2008	pCi/g	1.08	
SS-GA-004-DV	6/21/2008	pCi/g	1.21	
SS-GA-004-DV-QC	6/21/2008	pCi/g	1.15	
SS-GA-004-SF	6/21/2008	pCi/g	0.538	
SS-GA-004-SV	6/21/2008	pCi/g	0.766	
SS-GA-005-DV	6/21/2008	pCi/g	1.12	
SS-GA-005-SF	6/21/2008	pCi/g	0.7	
SS-GA-005-SV	6/21/2008	pCi/g	1.22	
SS-GB-002-DV	7/15/2008	pCi/g	0.91	
SS-GB-002-SF	7/15/2008	pCi/g	0.93	
SS-GB-002-SV	7/15/2008	pCi/g	1.1	
SS-GB-003-SF	7/9/2008	pCi/g	1.06	
SS-GB-003-SV	7/9/2008	pCi/g	1.16	
SS-GB-004-DV	7/14/2008	pCi/g	1.13	
SS-GB-004-SF	7/14/2008	pCi/g	0.845	
SS-GB-004-SV	7/14/2008	pCi/g	0.99	
SS-GB-006-DV	6/21/2008	pCi/g	1.26	
SS-GB-006-SF	6/21/2008	pCi/g	0.91	
SS-GB-006-SV	6/21/2008	pCi/g	1.3	
SS-GB-007-DV	6/21/2008	pCi/g	1.4	
SS-GB-007-SF	6/21/2008	pCi/g	1.2	
SS-GB-007-SV	6/21/2008	pCi/g	1.2	
SS-GB-009-DV	6/21/2008	pCi/g	1.2	
SS-GB-009-SF	6/21/2008	pCi/g	1.03	
SS-GB-009-SV	6/21/2008	pCi/g	0.93	
SS-GB-010-DV	6/21/2008	pCi/g	1.08	
SS-GB-010-DV-QC	6/21/2008	pCi/g	1.05	
SS-GB-010-SF	6/21/2008	pCi/g	0.926	
SS-GB-010-SV	6/21/2008	pCi/g	0.987	
SS-GB-012-DV	6/20/2008	pCi/g	1.26	
SS-GB-012-DV-QC	6/20/2008	pCi/g	1.11	
SS-GB-012-SF	6/20/2008	pCi/g	0.917	
SS-GB-012-SV	6/20/2008	pCi/g	1.16	
SS-GB-013-DV	6/20/2008	pCi/g	0.932	
SS-GB-013-SF	6/20/2008	pCi/g	0.945	
SS-GB-013-SV	6/20/2008	pCi/g	1.24	
SS-GB-015-DV	6/20/2008	pCi/g	1.03	
SS-GB-015-SF	6/20/2008	pCi/g	0.624	
SS-GB-015-SV	6/20/2008	pCi/g	1.06	
SS-GB-016-DV	6/20/2008	pCi/g	1.15	
SS-GB-016-DV-QC	6/20/2008	pCi/g	1.15	
SS-GB-016-SF	6/20/2008	pCi/g	0.872	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-GB-016-SV	6/20/2008	pCi/g	1.08	
SS-GB-018-DV	6/20/2008	pCi/g	1.16	
SS-GB-018-SF	6/20/2008	pCi/g	0.562	
SS-GB-018-SV	6/20/2008	pCi/g	1.06	
SS-GB-019-DV	6/20/2008	pCi/g	1.14	
SS-GB-019-SF	6/20/2008	pCi/g	0.89	
SS-GB-019-SV	6/20/2008	pCi/g	0.96	
SS-GB-020-DV	6/20/2008	pCi/g	1	
SS-GB-020-SF	6/20/2008	pCi/g	1.03	
SS-GB-020-SV	6/20/2008	pCi/g	0.99	
SS-GB-020-SV-QC	6/20/2008	pCi/g	1.04	
SS-GB-021-DV	6/20/2008	pCi/g	0.99	
SS-GB-021-SF	6/20/2008	pCi/g	0.89	
SS-GB-021-SF-QC	6/20/2008	pCi/g	0.82	
SS-GB-021-SV	6/20/2008	pCi/g	0.946	
SS-GB-022-SF	7/8/2008	pCi/g	0.945	
SS-GB-022-SV	7/8/2008	pCi/g	1.01	
SS-GB-023-SF	7/8/2008	pCi/g	1.04	
SS-GB-023-SV	7/8/2008	pCi/g	0.99	
SS-GC-001-DV	6/20/2008	pCi/g	0.875	
SS-GC-001-SF	6/20/2008	pCi/g	0.656	
SS-GC-001-SV	6/20/2008	pCi/g	0.97	
SS-GC-002-DV	6/20/2008	pCi/g	0.952	
SS-GC-002-SF	6/20/2008	pCi/g	0.88	
SS-GC-002-SV	6/20/2008	pCi/g	0.902	
SS-GC-004-DV	6/19/2008	pCi/g	1.15	
SS-GC-004-DV-QC	6/19/2008	pCi/g	1.18	
SS-GC-004-SF	6/19/2008	pCi/g	0.967	
SS-GC-004-SV	6/19/2008	pCi/g	1.18	
SS-GC-005-DV	6/19/2008	pCi/g	1.17	
SS-GC-005-SF	6/19/2008	pCi/g	1.13	
SS-GC-005-SV	6/19/2008	pCi/g	1.1	
SS-GC-007-DV	7/8/2008	pCi/g	0.91	
SS-GC-007-SF	7/8/2008	pCi/g	0.889	
SS-GC-007-SF-QC	7/8/2008	pCi/g	0.96	
SS-GC-007-SV	7/8/2008	pCi/g	1.01	
SS-GC-008-DV	6/19/2008	pCi/g	1.31	
SS-GC-008-SF	6/19/2008	pCi/g	1.05	
SS-GC-008-SV	6/19/2008	pCi/g	1.23	
SS-GC-010-DV	7/7/2008	pCi/g	0.951	
SS-GC-010-SF	7/7/2008	pCi/g	0.949	
SS-GC-010-SV	7/7/2008	pCi/g	0.89	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-GC-011-DV	6/18/2008	pCi/g	1.13	
SS-GC-011-SF	6/18/2008	pCi/g	1.13	
SS-GC-011-SV	6/18/2008	pCi/g	1.16	
SS-GL-001-SF	6/10/2008	pCi/g	0.148	0.138
SS-GL-001-SV	6/10/2008	pCi/g	1.04	
SS-GL-002-SF	6/10/2008	pCi/g	0.899	
SS-GL-002-SV	6/10/2008	pCi/g	0.931	
SS-GL-003-SF	6/10/2008	pCi/g	0.824	
SS-GL-003-SV	6/10/2008	pCi/g	0.961	
SS-GL-004-SF	6/10/2008	pCi/g	0.118	0.144
SS-GL-004-SV	6/10/2008	pCi/g	0.946	
SS-GL-005-SF	6/10/2008	pCi/g	0.774	
SS-GL-005-SV	6/10/2008	pCi/g	0.773	
SS-GL-006-SF	6/10/2008	pCi/g	0.163	
SS-GL-006-SV	6/10/2008	pCi/g	0.709	
SS-GL-007-SF	6/10/2008	pCi/g	0.545	
SS-GL-007-SV	6/10/2008	pCi/g	1.06	
SS-GL-008-DV	6/10/2008	pCi/g	1.16	
SS-GL-008-SF	6/10/2008	pCi/g	0.44	
SS-GL-008-SV	6/10/2008	pCi/g	1.07	
SS-GL-009-DV	6/11/2008	pCi/g	1.2	
SS-GL-009-SF	6/11/2008	pCi/g	0.525	0.509
SS-GL-009-SV	6/11/2008	pCi/g	1.05	
SS-GL-009-SV-QC	6/11/2008	pCi/g	0.94	
SS-GL-010-DV	6/11/2008	pCi/g	1.19	
SS-GL-010-SF	6/11/2008	pCi/g	1.04	
SS-GL-010-SV	6/11/2008	pCi/g	1.14	
SS-GL-011-SF	6/12/2008	pCi/g	0.818	
SS-GL-011-SV	6/12/2008	pCi/g	1.11	
SS-GL-012-SF	6/12/2008	pCi/g	0.8	
SS-GL-012-SV	6/12/2008	pCi/g	1.11	
SS-GL-013-SF	6/12/2008	pCi/g	0.96	
SS-GL-013-SV	6/11/2008	pCi/g	1.11	
SS-GL-014-SF	6/11/2008	pCi/g	0.637	
SS-GL-014-SV	6/11/2008	pCi/g	1.14	
SS-GL-015-SF	6/13/2008	pCi/g	1.07	
SSGL-015-SV	6/13/2008	pCi/g	0.99	
SS-GL-016-SF	6/13/2008	pCi/g	0.884	
SS-GL-016-SV	6/13/2008	pCi/g	1	
SS-GL-017-SF	6/13/2008	pCi/g	1	
SS-GL-017-SV	6/13/2008	pCi/g	1.11	
SS-GL-018-SF	6/13/2008	pCi/g	0.11	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-GL-018-SV	6/13/2008	pCi/g	1.03	
SS-GL-019-SF	6/13/2008	pCi/g	0.166	
SS-GL-019-SV	6/13/2008	pCi/g	0.92	
SS-GL-020-SF	6/13/2008	pCi/g	0.225	
SS-GL-020-SV	6/13/2008	pCi/g	0.914	
SS-GL-021-SF	6/16/2008	pCi/g	0.272	
SS-GL-021-SV	6/16/2008	pCi/g	1.18	
SS-GL-022-SF	6/16/2008	pCi/g	0.479	0.494
SS-GL-022-SV	6/16/2008	pCi/g	0.899	
SS-GL-022-SV-QC	6/16/2008	pCi/g	1.1	
SS-GL-023-SF	6/16/2008	pCi/g	0.355	
SS-GL-023-SV	6/16/2008	pCi/g	0.587	
SS-GL-024-SF	6/16/2008	pCi/g	0.348	
SS-GL-024-SV	6/16/2008	pCi/g	0.508	
SS-GL-025-SF	6/16/2008	pCi/g	1.02	
SS-GL-025-SV	6/16/2008	pCi/g	1.07	
SS-GL-026-SF	6/16/2008	pCi/g	1	
SS-GL-026-SV	6/16/2008	pCi/g	1.12	
SS-GL-027-SF	6/16/2008	pCi/g	1.03	
SS-GL-027-SV	6/16/2008	pCi/g	1.04	
SS-GL-028-SF	6/16/2008	pCi/g	1.03	
SS-GL-028-SV	6/16/2008	pCi/g	1.07	
SS-GL-029-SF	6/16/2008	pCi/g	0.966	
SS-GL-029-SV	6/16/2008	pCi/g	1.14	
SS-GL-030-SF	6/17/2008	pCi/g	1.06	
SS-GL-030-SV	6/17/2008	pCi/g	1.15	
SS-GL-031-SF	6/17/2008	pCi/g	1.11	
SS-GL-031-SV	6/17/2008	pCi/g	1.11	
SS-GL-031-SV-QC	6/17/2008	pCi/g	1.1	
SS-GL-032-SF	6/17/2008	pCi/g	1.18	
SS-GL-032-SV	6/17/2008	pCi/g	1.13	
SS-GL-033-SF	6/17/2008	pCi/g	1.05	
SS-GL-033-SV	6/17/2008	pCi/g	1.21	
SS-GL-034-SF	6/17/2008	pCi/g	1.17	
SS-GL-034-SV	6/17/2008	pCi/g	1.25	
SS-GL-035-SF	6/17/2008	pCi/g	1.1	
SS-GL-035-SV	6/17/2008	pCi/g	1.08	
SS-HS-001-SF	7/15/2008	pCi/g	0.881	
SS-HS-001-SV	7/15/2008	pCi/g	0.862	
SS-HS-001-SV-A	7/16/2008	pCi/g	0.876	
SS-HS-002-EL-0.5	7/16/2008	pCi/g	1.97	1.52
SS-HS-002-SF	7/16/2008	pCi/g	0.873	

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT Non-Impacted

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-HS-002-SV	7/16/2008	pCi/g	0.876	
SS-HS-003-SF	7/16/2008	pCi/g	0.86	
SS-HS-003-SV	7/16/2008	pCi/g	0.892	
SS-HS-004-EL-1.0	7/16/2008	pCi/g	1.14	
SS-HS-004-SF	7/16/2008	pCi/g	0.926	
SS-HS-004-SV	7/16/2008	pCi/g	0.96	
SS-HS-005-DV	7/21/2008	pCi/g	1.3	
SS-HS-005EL-0.75-1.0	7/21/2008	pCi/g	4.3	**3.4**
SS-HS-005-EL-1.0-1.5	7/21/2008	pCi/g	2.29	
SS-HS-005-EL-4.5-5.0	7/21/2008	pCi/g	2.1	
SS-HS-005-SF	7/21/2008	pCi/g	1.18	
SS-HS-005-SV	7/21/2008	pCi/g	2.55	2.21
SS-HS-006-EL-0.5-1.0	7/21/2008	pCi/g	1.35	
SS-HS-006-SF	7/21/2008	pCi/g	1.09	
SS-LA-006-DV	5/31/2008	pCi/g	0.87	
SS-LA-006-SF	5/31/2008	pCi/g	0.82	
SS-LA-006-SV	5/31/2008	pCi/g	0.86	
SS-LA-019-DV	6/2/2008	pCi/g	0.93	
SS-LA-019-SF	6/2/2008	pCi/g	0.38	
SS-LA-019-SV	6/2/2008	pCi/g	1.22	
SS-LA-020-DV	5/31/2008	pCi/g	0.98	
SS-LA-020-SF	5/31/2008	pCi/g	0.42	
SS-LA-020-SV	5/31/2008	pCi/g	0.85	
SS-LA-029-DV	6/2/2008	pCi/g	1.02	
SS-LA-029-SF	6/2/2008	pCi/g	0.66	
SS-LA-029-SV	6/2/2008	pCi/g	0.87	
SS-LA-035-DV	6/9/2008	pCi/g	1.09	
SS-LA-035-SF	6/9/2008	pCi/g	1.03	
SS-LA-035-SV	6/9/2008	pCi/g	1.09	
SS-LA-036-DV	6/10/2008	pCi/g	1.25	
SS-LA-036-SF	6/10/2008	pCi/g	0.989	
SS-LA-036-SV	6/10/2008	pCi/g	1.06	
SS-LA-050-DV	6/6/2008	pCi/g	0.8	
SS-LA-050-SF	6/6/2008	pCi/g	0.85	
SS-LA-050-SV	6/6/2008	pCi/g	0.73	
SS-LA-050-SV-QC	6/6/2008	pCi/g	0.78	
SS-LA-059-DV	6/7/2008	pCi/g	1.04	
SS-LA-059-SF	6/7/2008	pCi/g	0.68	
SS-LA-059-SV	6/7/2008	pCi/g	0.73	
SS-LA-081-DV	5/31/2008	pCi/g	1.08	
SS-LA-081-SF	5/31/2008	pCi/g	0.84	
SS-LA-081-SV	5/31/2008	pCi/g	1.12	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-LA-082-DV	5/31/2008	pCi/g	1.04	
SS-LA-082-SF	5/31/2008	pCi/g	**0.06**	
SS-LA-082-SV	5/31/2008	pCi/g	0.75	
SS-LA-083-DV	5/31/2008	pCi/g	0.97	
SS-LA-083-SF	5/31/2008	pCi/g	0.59	
SS-LA-083-SV	5/31/2008	pCi/g	0.95	
SS-LA-084-DV	6/2/2008	pCi/g	1.01	
SS-LA-084-SF	6/2/2008	pCi/g	**0.064**	
SS-LA-084-SV	6/2/2008	pCi/g	1.15	
SS-LA-085-DV	6/2/2008	pCi/g	0.94	
SS-LA-085-DV-EL-6	6/2/2008	pCi/g	1.18	
SS-LA-085-SF	6/2/2008	pCi/g	0.44	
SS-LA-085-SV	6/2/2008	pCi/g	1.41	
SS-LA-086-DV	6/2/2008	pCi/g	1	
SS-LA-086-SF	6/2/2008	pCi/g	0.61	
SS-LA-086-SV	6/2/2008	pCi/g	0.99	
SS-LA-086-SV-QC	6/2/2008	pCi/g	1.27	
SS-LA-087-DV	6/2/2008	pCi/g	0.95	
SS-LA-087-SF	6/2/2008	pCi/g	0.97	
SS-LA-087-SV	6/2/2008	pCi/g	1.15	
SS-LA-088-DV	6/9/2008	pCi/g	1.07	
SS-LA-088-SV	6/9/2008	pCi/g	0.81	
SS-LA-089-DV	6/7/2008	pCi/g	0.87	
SS-LA-089-SF	6/7/2008	pCi/g	0.84	1.19
SS-LA-089-SV	6/7/2008	pCi/g	0.9	
SS-LA-089-SV-QC	6/7/2008	pCi/g	0.92	
SS-LA-090-DV	6/9/2008	pCi/g	0.97	
SS-LA-090-SF	6/9/2008	pCi/g	0.81	
SS-LA-090-SV	6/9/2008	pCi/g	0.97	
SS-LA-091-DV	6/9/2008	pCi/g	0.93	
SS-LA-091-SF	6/9/2008	pCi/g	0.72	0.89
SS-LA-091-SV	6/9/2008	pCi/g	1.01	
SS-LA-092-DV	6/9/2008	pCi/g	1.05	
SS-LA-092-DV-QC	6/9/2008	pCi/g	1.28	
SS-LA-092-SF	6/9/2008	pCi/g	0.96	
SS-LA-092-SV	6/9/2008	pCi/g	1.06	
SS-LA-093-DV	6/9/2008	pCi/g	1.14	
SS-LA-093-SF	6/9/2008	pCi/g	0.89	
SS-LA-093-SV	6/9/2008	pCi/g	0.95	
SS-LA-094-DV	6/9/2008	pCi/g	1.06	
SS-LA-094-SF	6/9/2008	pCi/g	0.87	
SS-LA-094-SV	6/9/2008	pCi/g	1.19	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SS-LA-095-DV	6/10/2008	pCi/g	1.23	
SS-LA-095-SF	6/10/2008	pCi/g	0.883	0.93
SS-LA-095-SV	6/10/2008	pCi/g	0.95	
SS-LA-096-DV	6/10/2008	pCi/g	1.12	
SS-LA-096-DV-QC	6/10/2008	pCi/g	1.08	
SS-LA-096-SF	6/10/2008	pCi/g	0.952	
SS-LA-096-SV	6/10/2008	pCi/g	1.06	
SS-LA-097-DV	6/10/2008	pCi/g	1.09	
SS-LA-097-SF	6/10/2008	pCi/g	0.503	
SS-LA-098-DV	6/10/2008	pCi/g	1.17	
SS-LA-098-SF	6/10/2008	pCi/g	0.892	
SS-LA-098-SV	6/10/2008	pCi/g	1.33	
SS-LA-099-DV	6/9/2008	pCi/g	1.2	
SS-LA-099-DV-QC	6/9/2008	pCi/g	1.19	
SS-LA-099-SF	6/9/2008	pCi/g	0.94	1.22
SS-LA-099-SV	6/9/2008	pCi/g	0.99	
SS-LA-100-DV	6/10/2008	pCi/g	1.14	
SS-LA-100-SF	6/10/2008	pCi/g	0.826	
SS-LA-100-SV	6/10/2008	pCi/g	1.16	
SS-LF-101-DV	6/11/2008	pCi/g	0.934	
SS-LF-101-DV-QC	6/11/2008	pCi/g	1.12	
SS-LF-101-SF	6/11/2008	pCi/g	0.755	
SS-LF-101-SV	6/11/2008	pCi/g	0.791	
SS-LF-102-DV	6/11/2008	pCi/g	1.05	
SS-LF-102-SF	6/11/2008	pCi/g	0.91	
SS-LF-102-SV	6/11/2008	pCi/g	0.847	
SS-LF-103-DV	6/11/2008	pCi/g	1	
SS-LF-103-SF	6/11/2008	pCi/g	0.85	
SS-LF-103-SV	6/11/2008	pCi/g	0.99	
SS-LF-104-DV	6/11/2008	pCi/g	1.06	
SS-LF-104-SF	6/11/2008	pCi/g	0.683	
SS-LF-104-SV	6/11/2008	pCi/g	0.89	
SS-LF-105-DV	6/11/2008	pCi/g	1.05	
SS-LF-105-SF	6/11/2008	pCi/g	0.928	
SS-LF-105-SV	6/11/2008	pCi/g	0.885	
SS-W.EVAP-001-SF	7/22/2008	pCi/g	1.04	
SS-W.EVAP-001-SV	7/22/2008	pCi/g	1.24	
SW-01-00-SL	4/27/2004	pCi/g	1.14	
SW-01-SS	4/28/2004	pCi/g	1.37	
SW-02-00-SL	4/27/2004	pCi/g	1.32	
SW-02-01-SL	6/14/2004	pCi/g	0.932	
SW-02-09-SL	6/14/2004	pCi/g	0.798	

Unknown and Known Ingrowth Non-Impacted Ra-226 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Ra_226_Unknown_Ingrowth	Ra_226_with_Ingrowth
SW-02-15-SL	6/14/2004	pCi/g	1.02	
SW-02-23-SL	6/14/2004	pCi/g	0.938	
SW-02-SS	4/27/2004	pCi/g	0.572	
SW-03-00-SL	4/27/2004	pCi/g	0.924	
SW-03-SS	4/27/2004	pCi/g	0.83	
SW-04-00-SL	4/27/2004	pCi/g	1.26	
SW-04-SS	4/27/2004	pCi/g	0.991	
SW-05-08-SL	5/25/2004	pCi/g	1.24	
SW-05-12-SL	5/25/2004	pCi/g	0.914	
SW-05-SS	4/27/2004	pCi/g	1.22	
SW-06-05-SL	5/27/2004	pCi/g	0.786	
SW-06-05-SL-FD	5/27/2004	pCi/g	1.01	
SW-06-13-SL	5/27/2004	pCi/g	0.913	
SW-06-23-SL	5/27/2004	pCi/g	0.891	
SW-06-SS	4/27/2004	pCi/g	1.13	
SW-07-05-SL	5/27/2004	pCi/g	1.14	1.13
SW-07-15-SL	5/27/2004	pCi/g	0.929	
SW-07-23-SL	5/27/2004	pCi/g	0.762	
SW-07-SS	4/28/2004	pCi/g	1.51	
SW-08-03-SL	6/1/2004	pCi/g	0.999	
SW-08-05-SL	6/1/2004	pCi/g	0.961	
SW-08-15-SL	6/1/2004	pCi/g	1.08	
SW-08-25-SL	6/1/2004	pCi/g	**0.304**	
SW-08-SS	4/28/2004	pCi/g	0.309	
SW-08-SS-FD	4/28/2004	pCi/g	0.426	
SW-10-SS	4/30/2004	pCi/g	0.746	
SW-11-SS	4/30/2004	pCi/g	0.68	
SW-12-SS	4/30/2004	pCi/g	0.491	
SW-13-SS	4/30/2004	pCi/g	1	
SW-14-SS	4/29/2004	pCi/g	0.308	
SW-15-SS	4/29/2004	pCi/g	0.955	
SW-16-SS	4/29/2004	pCi/g	0.3	
WS-BP2A-11	11/1/2006	pCi/g	0.92	
WS-BP5A-07	11/1/2006	pCi/g	0.97	
WS-BP7A-08	11/1/2006	pCi/g	1.45	
WS-BP8A-10	11/1/2006	pCi/g	1.06	

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
0.661	0.06	0.976	0.138
0.681	0.064	0.995	0.144
0.689	0.11	1.16	0.206
0.759	0.111	1.26	0.494
0.777	0.118	1.27	0.509
0.833	0.148	1.28	0.54
0.838	0.16	1.32	0.61
0.859	0.163	1.32	0.75
0.873	0.166	1.34	0.79
0.874	0.166	1.34	0.86
0.877	0.168	1.34	0.89
0.88	0.17	1.37	0.89
0.885	0.172	1.41	0.92
0.901	0.177	1.42	0.93
0.909	0.179	1.42	0.94
0.937	0.195	1.52	1.01
0.949	0.198	1.53	1.02
0.951	0.21	1.55	1.03
0.991	0.223	1.56	1.03
1	0.223	1.58	1.06
1.01	0.225	1.59	1.08
1.02	0.228	1.6	1.1
1.04	0.23	1.61	1.1
1.09	0.236	1.62	1.12
1.09	0.247	1.62	1.13
1.09	0.254	1.63	1.13
1.1	0.254	1.64	1.13
1.12	0.254	1.67	1.16
1.12	0.257	1.69	1.16
1.13	0.26	1.74	1.19
1.15	0.262	1.86	1.21
1.21	0.267	1.97	1.21
	0.272		1.22
	0.28		1.22
	0.287		1.25
	0.288		1.26
	0.292		1.27
	0.3		1.39
	0.3		1.46
	0.304		1.47
	0.304		1.52
	0.304		1.53
	0.305		1.61
	0.308		1.61
	0.309		2.21
	0.31		3.4
	0.315		
	0.322		
	0.322		
	0.327		
	0.33		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.33		
	0.333		
	0.337		
	0.34		
	0.34		
	0.342		
	0.348		
	0.35		
	0.352		
	0.355		
	0.361		
	0.37		
	0.377		
	0.378		
	0.379		
	0.38		
	0.38		
	0.38		
	0.38		
	0.381		
	0.382		
	0.384		
	0.385		
	0.386		
	0.388		
	0.39		
	0.395		
	0.397		
	0.398		
	0.398		
	0.401		
	0.404		
	0.404		
	0.41		
	0.41		
	0.414		
	0.415		
	0.42		
	0.42		
	0.42		
	0.426		
	0.431		
	0.435		
	0.438		
	0.438		
	0.439		
	0.44		
	0.44		
	0.44		
	0.44		
	0.441		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.442		
	0.443		
	0.45		
	0.455		
	0.459		
	0.462		
	0.465		
	0.467		
	0.47		
	0.471		
	0.474		
	0.476		
	0.476		
	0.478		
	0.478		
	0.479		
	0.479		
	0.48		
	0.48		
	0.48		
	0.491		
	0.491		
	0.492		
	0.5		
	0.5		
	0.501		
	0.501		
	0.503		
	0.503		
	0.504		
	0.507		
	0.508		
	0.51		
	0.514		
	0.524		
	0.525		
	0.525		
	0.527		
	0.531		
	0.532		
	0.532		
	0.533		
	0.533		
	0.534		
	0.534		
	0.538		
	0.54		
	0.545		
	0.548		
	0.548		
	0.549		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.55		
	0.55		
	0.55		
	0.557		
	0.56		
	0.56		
	0.562		
	0.562		
	0.569		
	0.571		
	0.572		
	0.577		
	0.58		
	0.58		
	0.58		
	0.584		
	0.584		
	0.587		
	0.59		
	0.59		
	0.59		
	0.59		
	0.595		
	0.6		
	0.6		
	0.6		
	0.601		
	0.604		
	0.606		
	0.61		
	0.61		
	0.61		
	0.61		
	0.611		
	0.618		
	0.62		
	0.62		
	0.624		
	0.628		
	0.63		
	0.63		
	0.63		
	0.63		
	0.635		
	0.636		
	0.637		
	0.638		
	0.64		
	0.641		
	0.65		
	0.651		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.652		
	0.652		
	0.652		
	0.654		
	0.654		
	0.655		
	0.656		
	0.657		
	0.658		
	0.659		
	0.66		
	0.66		
	0.66		
	0.663		
	0.67		
	0.673		
	0.674		
	0.675		
	0.676		
	0.68		
	0.68		
	0.68		
	0.68		
	0.68		
	0.683		
	0.685		
	0.685		
	0.689		
	0.69		
	0.69		
	0.69		
	0.69		
	0.69		
	0.695		
	0.695		
	0.696		
	0.7		
	0.7		
	0.704		
	0.706		
	0.708		
	0.708		
	0.708		
	0.709		
	0.709		
	0.709		
	0.71		
	0.712		
	0.712		
	0.714		
	0.716		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.717		
	0.72		
	0.72		
	0.72		
	0.723		
	0.726		
	0.728		
	0.729		
	0.729		
	0.729		
	0.729		
	0.73		
	0.73		
	0.73		
	0.73		
	0.73		
	0.73		
	0.73		
	0.73		
	0.731		
	0.732		
	0.736		
	0.738		
	0.74		
	0.74		
	0.74		
	0.743		
	0.743		
	0.745		
	0.746		
	0.747		
	0.747		
	0.748		
	0.748		
	0.749		
	0.75		
	0.75		
	0.75		
	0.75		
	0.753		
	0.755		
	0.756		
	0.756		
	0.757		
	0.758		
	0.758		
	0.759		
	0.76		
	0.76		
	0.76		
	0.76		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.76		
	0.76		
	0.76		
	0.762		
	0.766		
	0.766		
	0.768		
	0.77		
	0.772		
	0.773		
	0.773		
	0.774		
	0.774		
	0.777		
	0.777		
	0.78		
	0.78		
	0.78		
	0.78		
	0.78		
	0.78		
	0.78		
	0.78		
	0.781		
	0.782		
	0.783		
	0.784		
	0.784		
	0.786		
	0.786		
	0.789		
	0.79		
	0.79		
	0.79		
	0.791		
	0.792		
	0.794		
	0.794		
	0.794		
	0.795		
	0.796		
	0.797		
	0.798		
	0.798		
	0.798		
	0.798		
	0.799		
	0.799		
	0.8		
	0.8		
	0.8		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.8		
	0.8		
	0.801		
	0.802		
	0.802		
	0.803		
	0.803		
	0.804		
	0.807		
	0.808		
	0.809		
	0.81		
	0.81		
	0.81		
	0.81		
	0.81		
	0.81		
	0.81		
	0.81		
	0.81		
	0.812		
	0.813		
	0.814		
	0.814		
	0.815		
	0.817		
	0.818		
	0.818		
	0.818		
	0.818		
	0.82		
	0.82		
	0.82		
	0.82		
	0.82		
	0.82		
	0.82		
	0.82		
	0.822		
	0.823		
	0.824		
	0.826		
	0.827		
	0.827		
	0.828		
	0.828		
	0.83		
	0.83		
	0.83		
	0.83		
	0.83		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.83		
	0.83		
	0.83		
	0.831		
	0.832		
	0.834		
	0.837		
	0.838		
	0.839		
	0.839		
	0.84		
	0.84		
	0.84		
	0.84		
	0.84		
	0.84		
	0.84		
	0.84		
	0.84		
	0.841		
	0.841		
	0.842		
	0.842		
	0.842		
	0.843		
	0.843		
	0.844		
	0.845		
	0.845		
	0.847		
	0.848		
	0.849		
	0.85		
	0.85		
	0.85		
	0.85		
	0.85		
	0.85		
	0.85		
	0.85		
	0.85		
	0.85		
	0.85		
	0.85		
	0.85		
	0.854		
	0.855		
	0.857		
	0.859		
	0.859		
	0.86		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.86		
	0.86		
	0.86		
	0.86		
	0.86		
	0.86		
	0.86		
	0.862		
	0.862		
	0.863		
	0.863		
	0.864		
	0.865		
	0.865		
	0.866		
	0.866		
	0.866		
	0.866		
	0.867		
	0.867		
	0.87		
	0.87		
	0.87		
	0.87		
	0.87		
	0.87		
	0.87		
	0.87		
	0.87		
	0.87		
	0.871		
	0.871		
	0.872		
	0.872		
	0.872		
	0.873		
	0.873		
	0.873		
	0.875		
	0.876		
	0.876		
	0.878		
	0.88		
	0.88		
	0.88		
	0.88		
	0.88		
	0.881		
	0.882		
	0.883		
	0.884		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT

ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.885		
	0.885		
	0.885		
	0.886		
	0.886		
	0.886		
	0.887		
	0.888		
	0.889		
	0.89		
	0.89		
	0.89		
	0.89		
	0.89		
	0.89		
	0.89		
	0.89		
	0.89		
	0.891		
	0.891		
	0.892		
	0.892		
	0.892		
	0.892		
	0.893		
	0.893		
	0.894		
	0.895		
	0.898		
	0.899		
	0.899		
	0.9		
	0.9		
	0.9		
	0.9		
	0.9		
	0.9		
	0.9		
	0.9		
	0.9		
	0.9		
	0.9		
	0.901		
	0.902		
	0.903		
	0.907		
	0.909		
	0.909		
	0.909		
	0.91		
	0.91		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.91		
	0.91		
	0.91		
	0.91		
	0.91		
	0.91		
	0.91		
	0.91		
	0.91		
	0.91		
	0.91		
	0.91		
	0.911		
	0.912		
	0.913		
	0.914		
	0.914		
	0.914		
	0.915		
	0.916		
	0.917		
	0.917		
	0.918		
	0.918		
	0.92		
	0.92		
	0.92		
	0.92		
	0.92		
	0.92		
	0.92		
	0.92		
	0.92		
	0.92		
	0.92		
	0.92		
	0.92		
	0.92		
	0.921		
	0.922		
	0.924		
	0.926		
	0.926		
	0.926		
	0.927		
	0.927		
	0.928		
	0.929		
	0.93		
	0.93		
	0.93		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.93		
	0.93		
	0.93		
	0.93		
	0.93		
	0.93		
	0.93		
	0.93		
	0.931		
	0.931		
	0.931		
	0.931		
	0.932		
	0.932		
	0.932		
	0.934		
	0.934		
	0.934		
	0.936		
	0.937		
	0.937		
	0.938		
	0.938		
	0.939		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.94		
	0.942		
	0.943		
	0.944		
	0.945		
	0.945		
	0.945		
	0.945		
	0.945		
	0.946		
	0.946		
	0.946		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.946		
	0.946		
	0.947		
	0.947		
	0.947		
	0.949		
	0.949		
	0.95		
	0.95		
	0.95		
	0.95		
	0.95		
	0.95		
	0.95		
	0.95		
	0.95		
	0.95		
	0.95		
	0.95		
	0.95		
	0.951		
	0.951		
	0.952		
	0.952		
	0.952		
	0.954		
	0.955		
	0.955		
	0.955		
	0.955		
	0.955		
	0.956		
	0.957		
	0.958		
	0.959		
	0.959		
	0.96		
	0.96		
	0.96		
	0.96		
	0.96		
	0.96		
	0.96		
	0.96		
	0.96		
	0.96		
	0.96		
	0.96		
	0.961		
	0.961		
	0.961		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.961		
	0.961		
	0.962		
	0.964		
	0.966		
	0.966		
	0.967		
	0.967		
	0.967		
	0.967		
	0.968		
	0.968		
	0.969		
	0.969		
	0.97		
	0.97		
	0.97		
	0.97		
	0.97		
	0.97		
	0.97		
	0.97		
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	0.97		
	0.97		
	0.97		
	0.971		
	0.971		
	0.972		
	0.972		
	0.973		
	0.976		
	0.977		
	0.977		
	0.978		
	0.979		
	0.98		
	0.98		
	0.98		
	0.98		
	0.98		
	0.98		
	0.98		
	0.98		
	0.981		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT

ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	0.981		
	0.982		
	0.983		
	0.983		
	0.983		
	0.983		
	0.984		
	0.987		
	0.987		
	0.988		
	0.989		
	0.989		
	0.989		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.99		
	0.991		
	0.992		
	0.992		
	0.992		
	0.993		
	0.994		
	0.995		
	0.995		
	0.997		
	0.997		
	0.997		
	0.998		
	0.998		
	0.999		
	1		
	1		
	1		
	1		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1		
	1		
	1		
	1		
	1		
	1		
	1		
	1		
	1		
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	1.01		
	1.01		
	1.02		
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	1.02		
	1.02		
	1.02		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.02		
	1.02		
	1.02		
	1.02		
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	1.03		
	1.03		
	1.04		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.04		
	1.04		
	1.04		
	1.04		
	1.04		
	1.04		
	1.04		
	1.04		
	1.04		
	1.04		
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	1.05		
	1.05		
	1.06		
	1.06		
	1.06		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.06		
	1.06		
	1.06		
	1.06		
	1.06		
	1.06		
	1.06		
	1.06		
	1.06		
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Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.07		
	1.07		
	1.07		
	1.07		
	1.07		
	1.07		
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	1.07		
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Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.09		
	1.09		
	1.09		
	1.09		
	1.09		
	1.09		
	1.09		
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	1.11		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.11		
	1.11		
	1.11		
	1.11		
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Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.13		
	1.13		
	1.13		
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	1.15		
	1.16		
	1.16		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.16		
	1.16		
	1.16		
	1.16		
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Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.18		
	1.18		
	1.18		
	1.18		
	1.19		
	1.19		
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	1.21		
	1.22		
	1.22		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.22		
	1.22		
	1.22		
	1.22		
	1.22		
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	1.27		
	1.27		
	1.27		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.27		
	1.27		
	1.28		
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	1.29		
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	1.29		
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	1.36		
	1.37		
	1.37		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.38		
	1.38		
	1.38		
	1.38		
	1.39		
	1.39		
	1.39		
	1.39		
	1.39		
	1.39		
	1.4		
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	1.41		
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	1.55		
	1.55		
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	1.56		
	1.56		
	1.58		

Ra-226 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

BKG Ra-226 w/Unknown Ingrowth	NI Ra-226 w/Unknown Ingrowth	BKG Ra-226 w/Ingrowth	NI Ra-226 w/Ingrowth
	1.59		
	1.59		
	1.6		
	1.6		
	1.62		
	1.63		
	1.65		
	1.65		
	1.66		
	1.7		
	1.71		
	1.72		
	1.97		
	1.97		
	2.1		
	2.29		
	2.55		
	2.6		
	4.3		

Background Th-232 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Th_232_Gamma_Spec
BG-01-00-SL	1/6/2005	pCi/g	1
BG-02-00-SL	1/6/2005	pCi/g	1.01
BG-03-00-SL	1/6/2005	pCi/g	**0.53**
BG-04-00-SL	1/6/2005	pCi/g	**0.532**
BG-05-00-SL	1/6/2005	pCi/g	0.814
BG-06-00-SL	1/6/2005	pCi/g	**0.82**
BG-07-00-SL	1/6/2005	pCi/g	0.767
BG-08-00-SL	1/6/2005	pCi/g	1.38
BG-09-00-SL	1/6/2005	pCi/g	1.43
BG-10-00-SL	1/6/2005	pCi/g	1.14
BG-11-00-SL	1/6/2005	pCi/g	1.43
BG-12-00-SL	1/6/2005	pCi/g	1.38
BG-13-00-SL	1/6/2005	pCi/g	1.17
BG-14-00-SL	1/6/2005	pCi/g	0.997
BG-15-00-SL	1/6/2005	pCi/g	0.802
BG-16-00-SL	1/6/2005	pCi/g	**1.04**
BG-01-03-SL	1/6/2005	pCi/g	**0.774**
BG-02-03-SL	1/6/2005	pCi/g	0.68
BG-03-03-SL	1/6/2005	pCi/g	**0.877**
BG-04-03-SL	1/6/2005	pCi/g	**0.834**
BG-05-03-SL	1/6/2005	pCi/g	**0.978**
BG-06-03-SL	1/6/2005	pCi/g	0.806
BG-07-03-SL	1/6/2005	pCi/g	**0.931**
BG-08-03SL	1/6/2005	pCi/g	1.83
BG-09-03-SL	1/6/2005	pCi/g	1.19
BG-10-03-SL	1/6/2005	pCi/g	1.17
BG-11-03-SL	1/6/2005	pCi/g	1.17
BG-12-03-SL	1/6/2005	pCi/g	1.49
BG-13-03-SL	1/6/2005	pCi/g	1.18
BG-14-03-SL	1/6/2005	pCi/g	1.55
BG-15-03-SL	1/6/2005	pCi/g	1.46
BG-16-03-SL	1/6/2005	pCi/g	0.758

Non-Impacted Th-232 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Th_232_Gamma_Spec
GS-01-00-SL	4/30/2004	pCi/g	**0.735**
GS-01-00-SL-FD	4/30/2004	pCi/g	1
GS-02-00-SL	5/3/2004	pCi/g	0.962
GS-03-00-SL	4/30/2004	pCi/g	**0.226**
GS-04-00-SL	5/3/2004	pCi/g	0.993
GS-05-00-SL	5/3/2004	pCi/g	0.726
NB-01-00-SL	4/29/2004	pCi/g	0.743
NB-02-00-SL	4/29/2004	pCi/g	**0.121**
NB-03-00-SL	4/29/2004	pCi/g	**0.384**
NB-04-00-SL	4/30/2004	pCi/g	1.5
NB-05-00-SL	4/30/2004	pCi/g	**0.82**
NB-06-00-SL	4/30/2004	pCi/g	1.33
NB-07-00-SL	4/30/2004	pCi/g	1.12
NB-07-00-SL-FD	4/30/2004	pCi/g	0.919
NB-08-00-SL	4/30/2004	pCi/g	0.784
NB-09-00-SL	4/30/2004	pCi/g	1.37
NB-114-0.5-SL	11/16/2007	pCi/g	**0.05**
NB-121-0.5-SL	11/16/2007	pCi/g	**0.05**
NB-16-00-SL	4/30/2004	pCi/g	0.959
NB-17-00-SL	4/30/2004	pCi/g	1.46
NB-18-00-SL	4/30/2004	pCi/g	1.09
NB-19-00-SL	5/3/2004	pCi/g	1.21
NB-22-00-SL	5/3/2004	pCi/g	0.915
NB-23-00-SL	5/3/2004	pCi/g	1
NB-24-00-SL	5/3/2004	pCi/g	0.791
NB-25-00-SL	5/3/2004	pCi/g	0.632
NB-26-00-SL	4/29/2004	pCi/g	**0.134**
NB-27-00-SL	4/29/2004	pCi/g	**0.584**
NB-27-00-SL-FD	4/29/2004	pCi/g	**0.509**
NB-100-4.5-SL	11/9/2007	pCi/g	0.42
NB-100-7-SL	11/9/2007	pCi/g	0.99
NB-114-10-SL	11/16/2007	pCi/g	0.89
NB-114-2.5-SL	11/16/2007	pCi/g	**0.14**
NB-114-4.5-SL	11/16/2007	pCi/g	0.96
NB-121-12.5-SL	11/16/2007	pCi/g	0.95
NB-121-2.5-SL	11/16/2007	pCi/g	**0.08**
NB-121-4.5-SL	11/16/2007	pCi/g	0.69
NB-28-04-SL	5/25/2004	pCi/g	1.49
NB-28-14-SL	5/25/2004	pCi/g	0.996
NB-28-24-SL	5/25/2004	pCi/g	**0.682**

Non-Impacted Th-232 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Th_232_Gamma_Spec
NB-28-35-SL	5/27/2004	pCi/g	**0.345**
NB-29-05-SL	5/25/2004	pCi/g	1.12
NB-29-14-SL	5/25/2004	pCi/g	**0.12**
NB-29-22-SL	5/27/2004	pCi/g	**0.327**
NB-30-05-SL	6/3/2004	pCi/g	1.41
NB-30-15-SL	6/3/2004	pCi/g	**0.875**
NB-30-25-SL	6/3/2004	pCi/g	1.07
NB-30-33-SL	6/3/2005	pCi/g	**0.32**
NB-31-05-SL	6/3/2002	pCi/g	**0.854**
NB-31-15-SL	6/3/2003	pCi/g	**0.694**
NB-31-27-SL	6/3/2004	pCi/g	0.742
NB-31-32-SL	6/3/2004	pCi/g	**0.771**
NB-32-05-SL	6/4/2004	pCi/g	1.02
NB-32-15-SL	6/4/2004	pCi/g	0.951
NB-32-27-SL	6/4/2004	pCi/g	1.06
NB-32-33-SL	6/4/2004	pCi/g	0.818
NB-33-05-SL	6/4/2004	pCi/g	0.99
NB-33-15-SL	6/4/2004	pCi/g	**1.2**
NB-33-27-SL	6/4/2004	pCi/g	**0.401**
NB-34-05-SL	6/4/2004	pCi/g	1.07
NB-34-15-SL	6/4/2004	pCi/g	**0.331**
NB-34-25-SL	6/4/2004	pCi/g	**0.546**
NB-35-01-SL	6/7/2004	pCi/g	**0.906**
NB-35-15-SL	6/7/2004	pCi/g	**0.774**
NB-35-25-SL	6/7/2004	pCi/g	0.987
NB-36-05-SL	6/7/2004	pCi/g	0.711
NB-36-15-SL	6/7/2004	pCi/g	**1.17**
NB-36-27-SL	6/7/2004	pCi/g	1.33
NB-37-05-SL	6/8/2004	pCi/g	1.16
NB-37-15-SL	6/8/2004	pCi/g	**0.632**
NB-37-25-SL	6/8/2004	pCi/g	1.37
NB-38-09-SL	6/8/2004	pCi/g	**0.862**
NB-38-15-SL	6/8/2004	pCi/g	**0.719**
NB-38-25-SL	6/8/2004	pCi/g	**0.682**
NB-40-05-SL	6/10/2004	pCi/g	**0.846**
NB-40-05-SL-FD	6/10/2004	pCi/g	**0.478**
NB-40-17-SL	6/10/2004	pCi/g	1.07
NB-40-25-SL	6/10/2004	pCi/g	0.807
NB-40-31-SL	6/10/2004	pCi/g	**0.579**
NB-41-05-SL	6/11/2004	pCi/g	0.878

Non-Impacted Th-232 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Th_232_Gamma_Spec
NB-41-13-SL	6/11/2004	pCi/g	**0.425**
NB-41-19-SL	6/11/2004	pCi/g	**0.253**
NB-42-05-SL	6/11/2004	pCi/g	**0.526**
NB-42-13-SL	6/11/2004	pCi/g	**0.358**
NB-42-23-SL	6/11/2004	pCi/g	**0.208**
NB-43-05-SL	6/11/2004	pCi/g	**0.638**
NB-43-13-SL	6/11/2004	pCi/g	**0.117**
NB-44-05-SL	6/11/2004	pCi/g	**0.363**
NB-44-05-SL-FD	6/11/2004	pCi/g	**-0.00504**
NB-44-11-SL	6/11/2004	pCi/g	**0.308**
NB-44-18-SL	6/11/2004	pCi/g	**0.537**
NB-45-05-SL	6/16/2004	pCi/g	**1.3**
NB-45-05-SL-FD	6/16/2004	pCi/g	1.34
NB-45-13-SL	6/16/2004	pCi/g	1.01
NB-45-25-SL	6/16/2004	pCi/g	1.18
NB-45-33-SL	6/16/2004	pCi/g	**0.377**
NB-46-09-SL	6/15/2004	pCi/g	1.07
NB-46-17-SL	6/15/2004	pCi/g	**0.824**
NB-46-25-SL	6/15/2004	pCi/g	**0.816**
NB-46-29-SL	6/15/2004	pCi/g	0.913
NB-62-05-SL	7/2/2004	pCi/g	**0.859**
NB-62-12-SL	7/2/2004	pCi/g	**0.103**
NB-62-22-SL	7/2/2004	pCi/g	**-0.0536**
NB-63-05-SL	7/13/2004	pCi/g	0.992
NB-63-13-SL	7/13/2004	pCi/g	**0.595**
NB-63-19-SL	7/13/2004	pCi/g	**0.258**
NB-64-05-SL	7/12/2004	pCi/g	0.854
NB-64-13-SL	7/12/2004	pCi/g	**0.343**
NB-64-17-SL	7/12/2004	pCi/g	**0.257**
NB-65-05-SL	7/12/2004	pCi/g	**0.692**
NB-65-13-SL	7/12/2004	pCi/g	**0.66**
NB-65-17-SL	7/12/2004	pCi/g	**0.54**
NB-66-05-SL	7/13/2004	pCi/g	**0.024**
NB-66-05-SL-FD	7/13/2004	pCi/g	1.45
NB-66-15-SL	7/13/2004	pCi/g	1.42
NB-66-19-SL	7/13/2004	pCi/g	**0.377**
NB-67-05-SL	7/13/2004	pCi/g	**0.865**
NB-67-11-SL	7/13/2004	pCi/g	**0.399**
NB-67-21-SL	7/13/2004	pCi/g	**0.404**
NB-68-05-SL	7/14/2004	pCi/g	1.23

Non-Impacted Th-232 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Th_232_Gamma_Spec
NB-68-13-SL	7/14/2004	pCi/g	1.23
NB-68-17-SL	7/14/2004	pCi/g	1.06
NB-68-25-SL	7/14/2004	pCi/g	1.62
NB-68-33-SL	7/14/2004	pCi/g	**0.142**
NB-69-05-SL	7/14/2004	pCi/g	0.708
NB-69-15-SL	7/14/2004	pCi/g	**0.651**
NB-69-22-SL	7/14/2004	pCi/g	1.04
NB-69-34-SL	7/14/2004	pCi/g	**0.627**
NB-70-05-SL	7/14/2004	pCi/g	1.28
NB-70-15-SL	7/14/2004	pCi/g	1.3
NB-70-23-SL	7/14/2004	pCi/g	0.883
NB-70-33-SL	7/14/2004	pCi/g	**0.793**
NB-71-01-SL	7/15/2004	pCi/g	**0.846**
NB-71-01-SL-FD	7/15/2004	pCi/g	**0.974**
NB-71-11-SL	7/15/2004	pCi/g	1.47
NB-71-27-SL	7/15/2004	pCi/g	**0.574**
NB-72-05-SL	7/15/2004	pCi/g	**0.65**
NB-72-11-SL	7/15/2004	pCi/g	**0.261**
NB-72-19-SL	7/15/2004	pCi/g	**0.342**
NB-72-22-SL	7/15/2004	pCi/g	**0.35**
NB-73-05-SL	7/15/2004	pCi/g	**0.304**
NB-73-13-SL	7/15/2004	pCi/g	**0.0204**
NB-73-23-SL	7/15/2004	pCi/g	**0.0184**
NB-75-08-SL	7/19/2004	pCi/g	**0.852**
NB-75-15-SL	7/19/2004	pCi/g	**0.647**
NB-75-19-SL	7/19/2004	pCi/g	**0.216**
NB-76-06-SL	7/21/2004	pCi/g	**-0.0767**
NB-76-10-SL	7/21/2004	pCi/g	**-0.0347**
NB-76-24-SL	7/21/2004	pCi/g	**0.218**
NB-77-05-SL	7/21/2004	pCi/g	**0.376**
NB-77-13-SL	7/21/2004	pCi/g	**0.205**
NB-77-24-SL	7/21/2004	pCi/g	**0.14**
NB-78-07-SL	7/21/2004	pCi/g	**0.94**
NB-78-11-SL	7/21/2004	pCi/g	**0.533**
NB-78-18-SL	7/21/2004	pCi/g	**0.74**
NB-81-09-SL	7/26/2004	pCi/g	0.828
NB-81-11-SL	7/26/2004	pCi/g	1.03
NB-81-31-SL	7/26/2004	pCi/g	**0.374**
NB-82-05-SL	7/27/2004	pCi/g	0.865
NB-82-11-SL	7/27/2004	pCi/g	**0.109**

Non-Impacted Th-232 via Gamma Spectroscopy

Sample ID	Sample_Date	Units	Th_232_Gamma_Spec
NB-82-20-SL	7/27/2004	pCi/g	**0.0776**
NB-83-05-SL	7/27/2004	pCi/g	**1.4**
NB-83-11-SL	7/27/2004	pCi/g	**0.185**
NB-83-23-SL	7/27/2004	pCi/g	**-0.0743**
NB-84-05-SL	7/28/2004	pCi/g	**0.0546**
NB-84-15-SL	7/28/2004	pCi/g	**0.573**
NB-84-23-SL	7/28/2004	pCi/g	**0.304**
NB-84-33-SL	7/28/2004	pCi/g	**0.432**
NB-85-05-SL	8/24/2004	pCi/g	**0.607**
NB-85-15-SL	8/24/2004	pCi/g	1.1
NB-85-25-SL	8/24/2004	pCi/g	1.33
NB-85-35-SL	8/24/2004	pCi/g	**-0.0859**
NB-86-05-SL	8/24/2004	pCi/g	**0.443**
NB-86-15-SL	8/24/2004	pCi/g	1.35
NB-86-19-SL	8/24/2004	pCi/g	**0.425**
NB-87-18-SL	11/9/2007	pCi/g	0.83
NB-87-4.5-SL	11/9/2007	pCi/g	0.6
NB-90-11.5-SL	11/9/2007	pCi/g	0.97
NB-90-4.5-SL	11/9/2007	pCi/g	0.75
NB-92-11-SL	11/9/2007	pCi/g	1.28
NB-92-4.5-SL	11/9/2007	pCi/g	0.58
NB-94-15-SL	11/9/2007	pCi/g	0.86
NB-94-4.5-SL	11/9/2007	pCi/g	0.64
NB-95-16.5-SL	11/9/2007	pCi/g	1.16
NB-95-4.5-SL	11/9/2007	pCi/g	0.91
NB-99-13-SL	11/9/2007	pCi/g	1.13
NB-99-4.5-SL	11/9/2007	pCi/g	0.48

Th-232 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

Th-232 GS BKG	Th-232 GS NI
0.53	-0.0859
0.532	-0.0767
0.68	-0.0743
0.758	-0.0536
0.767	-0.0347
0.774	-0.00504
0.802	0.0184
0.806	0.0204
0.814	0.024
0.82	0.05
0.834	0.05
0.877	0.0546
0.931	0.0776
0.978	0.08
0.997	0.103
1	0.109
1.01	0.117
1.04	0.12
1.14	0.121
1.17	0.134
1.17	0.14
1.17	0.14
1.18	0.142
1.19	0.185
1.38	0.205
1.38	0.208
1.43	0.216
1.43	0.218
1.46	0.226
1.49	0.253
1.55	0.257
1.83	0.258
	0.261
	0.304
	0.304
	0.308
	0.32
	0.327
	0.331
	0.342
	0.343
	0.345

Th-232 GS BKG	Th-232 GS NI
	0.35
	0.358
	0.363
	0.374
	0.376
	0.377
	0.377
	0.384
	0.399
	0.401
	0.404
	0.42
	0.425
	0.425
	0.432
	0.443
	0.478
	0.48
	0.509
	0.526
	0.533
	0.537
	0.54
	0.546
	0.573
	0.574
	0.579
	0.58
	0.584
	0.595
	0.6
	0.607
	0.627
	0.632
	0.632
	0.638
	0.64
	0.647
	0.65
	0.651
	0.66
	0.682

Th-232 Bkgrd & non-impacted Data for ProUCL.xls DRAFT ProUCL Input

Th-232 GS BKG	Th-232 GS NI
	0.682
	0.69
	0.692
	0.694
	0.708
	0.711
	0.719
	0.726
	0.735
	0.74
	0.742
	0.743
	0.75
	0.771
	0.774
	0.784
	0.791
	0.793
	0.807
	0.816
	0.818
	0.82
	0.824
	0.828
	0.83
	0.846
	0.846
	0.852
	0.854
	0.854
	0.859
	0.86
	0.862
	0.865
	0.865
	0.875
	0.878
	0.883
	0.89
	0.906
	0.91
	0.913

Th-232 GS BKG	Th-232 GS NI
	0.915
	0.919
	0.94
	0.95
	0.951
	0.959
	0.96
	0.962
	0.97
	0.974
	0.987
	0.99
	0.99
	0.992
	0.993
	0.996
	1
	1
	1.01
	1.02
	1.03
	1.04
	1.06
	1.06
	1.07
	1.07
	1.07
	1.07
	1.09
	1.1
	1.12
	1.12
	1.13
	1.16
	1.16
	1.17
	1.18
	1.2
	1.21
	1.23
	1.23
	1.28

Th-232 GS BKG	Th-232 GS NI
	1.28
	1.3
	1.3
	1.33
	1.33
	1.33
	1.34
	1.35
	1.37
	1.37
	1.4
	1.41
	1.42
	1.45
	1.46
	1.47
	1.49
	1.5
	1.62

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Appendix N. RESRAD Print-outs

Since there are nearly 3000 pages of RESRAD print-outs, they have not been placed directly into this file. The file with these RESRAD printouts will be submitted to NRC via Electronic Information Exchange as a multi-part bundle set of file documents with letter HEM-11-91.

ATTACHMENT 5

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 8

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
8-2a	Disposal of resin	Clarify how the resin will be disposed of and the amount expected to be disposed. If NCS is a potential concern, then it would seem appropriate to be monitoring the resin content prior to the time of transport of the resin. Periodic sampling and analysis of the resin would seem appropriate. Also, it does not seem appropriate to develop a disposition plan after it is determined that NCS controls are required. Rather such a plan should be in place prior to the system operating.	During Water Treatment System (WTS) operation a weekly survey and/or sampling is performed of the ion exchange beds to determine the amount of U-235 loading. Surveys and/or sampling are also performed prior to clean out of ion exchange beds. The sample or survey results are used to determine whether NCS controls are required or not, and to determine the actions that are required to prepare the resin for disposal Site requirements for NCS during handling are in place for either situation. For example, resin that does not require NCS controls will be transferred to the material loading pad for disposition. Resin requiring NCS controls will be recovered into a collared drum, transferred to the Waste Evaluation Area and/or Material Assay Area for radiological assay. Based on assay data, the requirements to ensure NCS will be prepared for disposal under a pre-existing disposition plan. The system as designed has two ion columns, both containing ~2000 lbs (or ~45 ft3) of Type 1 Resin. It is expected that the resin installed in these columns will not become depleted by HDP activities and should last the lifetime of the project (nominally 2+ years). Subsequently, Westinghouse anticipates that ~4,000 lbs of radiologically contaminated resin from this system will be disposed of as Class A radioactive waste.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
8-2b	Expected Decontamination Factors for Uranium and Technetium.	Provide the range of removal efficiencies possible. Provide information on how the HDP process is comparable to the experimental conditions cited. Provide information on the initiating parameter or condition which will result in the replacement of the resin. Since only a removal efficiency of up to 99% can be claimed for Tc-99 then similarly, only a DF of up to 100 can be claimed. Why is there a discussion about continuous discharge? Previous discussions had indicated that such discharges would only occur during the 25 year rainfall event. Is there now a plan for continuous releases from the WTS? It is stated under Resin Replacement that the removal efficiency of the WTS will be monitored in accordance with the EEMP. Where in the EEMP is this commitment? Also under Resin Replacement, it would also seem appropriate for HDP management to monitor the resin for NCS concerns based upon the response to 2a. Was the previous statement under Resin Replacement that "the removal efficiency of the WTS will be monitored in accordance with the EEMP" erroneous?	Removal Efficiencies. HDP reviewed available documentation that considered historical efficiencies of comparable systems in similar environments to determine the removal efficiencies for Waste Water Treatment System (WTS). From this documentation, the removal efficiencies for U-235 and U-238 range from 99.27% to 99.94%, with an average of 99.8%. For Tc-99 this documentation states "demonstrated effectiveness at Tc-99 removal (up to 99%)" without a range. These removal efficiencies would produce expected decontamination factors of approximately 500 for U-235 and U-238, and 99 for Tc-99. Once operational, actual decontamination factors based upon laboratory analytical data will be determined for this system. (Note: There was a misunderstanding on sampling of WTS discharges. Westinghouse's plan has always been to sample batches prior to batch discharge or to continuously sample, via composite sampler, continuous discharges. There was not an intention to limit continuous discharges to the 25 year rainfall event.) Design Conditions. The capacity of the WTS (including the holding tanks) should accommodate a hypothetical condition involving 5.5 inches of rain within a 24-hr period, assuming collection of 75% of the water over a 2-acre excavation. This design is based on the 25 year rain event, which is a common design practice for short duration projects (less than 5 years). The 2 acre assumption is based on a conservative estimate of the largest open excavation that may be present in the burial pit area at any given time. This capacity does not include the volume of water that could be temporarily retained in the excavation until such time that treatment can be accomplished. Resin Replacement. Once the WTS system is operating, the removal efficiency of the system will be monitored so the system meets the effluent release requirements of DP Chapter 11. It is expected that the resin installed in these columns will not become depleted by HDP activities and should last the lifetime of the project (nominally 2+ years). HDP management will monitor the decontamination factor for the system to determine when resin replacement is necessary to satisfy the project commitment to maintain effluent concentrations ALARA. In addition, survey and/or sample results of the resin beds will be used to determine the amount of U-235 loading, and to	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
			determine whether NCS controls are required or not during media change out. The previous statement "the removal efficiency of the WTS will be monitored in accordance with the EEMP" required revision since the EEMP did not specifically address how to monitor the removal efficiency.	
8-2c	Batch sampling versus composite sampling	Modify the DP and the response to the RAI to indicate that prior to a batch release, a batch sample will be taken and analyzed prior to the release of the batch tank contents. Also, modify both the RAI and the DP to indicate that a continuous composite sample will be obtained from continuous releases and the effluent line. Is the Westinghouse commitment to Revision 2 of RG 4.16? There is no Reference 11-7 in the DP. WEC's proposal to have continuous releases following a period of operational experience with only a grab sample of the release and laboratory analysis of the sample occurring later has questionable merit. Such an approach is for situations where the process is well defined and effluents show consistency in quantities and types of radionuclides. The WTS is handling liquids extracted from the burial pits. It is very uncertain that each of the pits will have the homogenous nature that WEC is suggesting. There is no March 1987 version of RG 4.16. Rev 2 is December 2010 and Rev 1 is December 1985. RG 4.16 was developed for operating facilities with processes which have some consistency in effluents. The decommissioning effort at Hematite involves the remediation of burial pit material which may have varying liquid and gaseous constituents. Therefore, some of the guidance in RG 4.16 may not apply since the streams may not have the homogeneity that is assumed by the RG. Therefore, reductions in sampling and analysis of effluents are only appropriate when it is demonstrated a consistent makeup of the material being processed and discharged. The utilization of the results of batch sampling and analysis as a basis for justifying operation of the waste treatment system in a continuous release mode is curious. The results of the batch sample and analysis only demonstrate whether, for the previous operation, sufficient treatment has occurred to permit the release of the material. It is not a demonstration of the waste	Regulatory Guide 4.16, Revision 1, December 1985, was in effect during the development and submittal of the DP. Accordingly, it is continued to be used and referenced as the applicable guidance for sampling of effluent. By using this Regulatory Guide to obtain representative samples of WTS effluent, Westinghouse and NRC are assured of having the data to determine whether effluent limits and ALARA considerations are followed. This Regulatory Guide states the following: Representative samples should be collected at each liquid release point for the subsequent determination of the quantities and average concentrations of radionuclides discharged in any liquid effluents that could reach an unrestricted area, including discharges to a sanitary sewerage system. For continuous releases, representative samples should be continually collected at each release point. For batch releases, a representative sample of each batch should be collected. For some liquid effluents, the licensee may establish, by periodic sampling or by other means, that radioactivity in the effluent is insignificant. In such cases, the effluents should be sampled at least quarterly. The licensee should show, as supplemental information, that these samples are representative of actual releases. For the purposes of this guide, a liquid effluent release is significant if the concentration averaged over a calendar quarter is equal to 10% or more of the appropriate concentration listed in Table II of Appendix B to 10 CFR Part 20. The sampling program should be sufficient to permit a determination of the quantities of radionuclides and the average concentration of radio nuclides being discharged from the plant. The sampling rate at each release point should be such that a representative sample of the effluent is collected. The volumes of liquid effluents should be reported so the NRC staff can calculate the quantities of radionuclides discharged. Westinghouse considers that the timing of sample results with respect to the timing of the releases, as discussed in the proposed resolution, is not inconsistent with Regulatory Guide 4.16 since the guidance does not indicate that the data obtained from laboratory analysis must in all cases be evaluated prior to discharge. This preceding statement is not intended to discount Westinghouse's obligations for meeting the release limits and following ALARA. Rather, that statement is meant to recognize the flexibility available the guidance, regulations, limits, and ALARA for Westinghouse to best manage its systems based on conditions encountered. Regulatory Guide 4.16 also discusses more frequent sample analysis where consistency of radionuclide composition may not be predictable, as follows: Radionuclide analyses should be made more often (1) at the beginning of the monitoring program until a predictable radio nuclide composition of effluents is established, (2) whenever there is a significant unexplained increase in gross radioactivity, or (3) whenever a process change or other circumstance might cause a significant variation in the radionuclide	DP Section 11.4 will be revised to add: "11-6 U.S. Nuclear Regulatory Commission Regulatory Guide 4.16, "Monitoring and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Gaseous Effluents from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants," Revision 1, December 1985. Westinghouse will revise the last paragraph in Section 11.2.3.4.of DP Chapter 11, which also revises the second to the last paragraph of the response to the RAI HDP-8-Q2 in Westinghouse letter HEM-10-137, to read as follows: To accurately measure and report the concentration in effluent releases, Westinghouse will collect representative samples of the WTS effluent to determine the quantities and average concentrations of radionuclides discharged using methods based on Regulatory Guide 4.16, Revision 1, December 1985. (Reference 11-7). Specifically, representative samples will be collected of the liquid release from the WTS for the subsequent determination of the quantities and average concentrations of radionuclides discharged in any liquid effluents that could reach an unrestricted area. For continuous releases from the WTS, representative samples will be continually collected from the release. For batch releases from the WTS, a representative sample of each batch will be collected. • Batch sampling: Prior to discharge of the liquid effluent a sample is obtained from the WTS tank. The sample, or portion of it, is analyzed on-site and/or sent for laboratory analysis. • Continuous sampling: During continuous discharge of the liquid effluent a composite sampler is used to obtain a sample that is

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		treatment system's capability while operating in a continuous mode of operation. There are a number of reasons why this is so. For one, resin removal capability will become exhausted (reduced) with time as material is treated. Another is that resin regeneration may not be equally effective due to the chemical and physical qualities and attributes of the material which has been treated. Third, the effectiveness of the treatment system may be a function of the physical and chemical characteristics of the material being treated. No discussion has been provided which describes actions taken to ensure that these characteristics are consistent.	composition. As an additional confirmation on the predictability of the WTS effluent given the nature of remediation work, a daily grab sample will be taken during WTS continuous discharge and analyzed for gross alpha and gross beta radioactivity to ensure there is not an elevated result requiring attention prior to the more detailed results of the weekly composite sample. Resin will be replaced, not regenerated.	representative of the effluent and proportional to the volume of the discharge over time. During WTS operations involving continuous releases, this sample will be submitted for laboratory analysis on a weekly frequency. In addition, a daily grab sample will be taken during WTS continuous discharges and analyzed for gross alpha and gross beta radioactivity to ensure the WTS is operating as expected. Batch sampling will be the primary sampling method during the initial operational phase of the WTS while its performance characteristics (e.g., decontamination factors) are being established. This will allow the retention of effluent until sample results are obtained for comparison against release limits and ALARA goals. Continuous sampling will be the primary sampling method once batch sampling has demonstrated that the WTS system performs in a consistent manner and produces liquid effluent of known quality even when challenged by a range of concentrations. This is a reasonable approach for potentially variable influent concentrations based on a large decontamination factor that will be validated during initial system operation.
8-3a	Reapplication of fixatives to slabs to ensure sufficient protective layer.	Provide the criteria for applying additional fixative as the demolition process proceeds and surfaces are no longer subject to disturbance.	Westinghouse believes that the fourth bullet in the response to RAI HDP-8-Q3 (HEM-10-137) contained the requested criteria, as follows: "Post-demolition, if routine surveys determine that removable activity is greater than 200 dpm/100 cm2 for either alpha or beta contamination, decontamination activities and application of additional fixative will occur to maintain removable contamination below acceptable levels." During the demolition process, the area will be posted as a contaminated area and a combination of professional judgment using visual observations and radiological survey results (increasing levels of loose surface contamination) will be used to determine if the application of additional fixative is necessary during demolition.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
8-3b	Collection of surface run-off & run-on & its treatment.	Describe the manner for the collection & treatment of run-off & run-on so as to prevent the spread of contamination and how the water will be handled, sampled, and analyses performed on it. RAI response addressed the containment, monitoring,	The perimeter of contaminated areas will be sloped inward or curbed to contain and direct potentially contaminated surface water to sumps or other low-lying areas that will be used as collection points within the contaminated area. All impacted water encountered during the remedial actions will be sampled and discharged providing effluent release criteria are met with due consideration of maintaining release concentrations ALARA, or will be collected and processed	The following text will be added to the end of DP Section 8.6: The perimeter of contaminated areas will be sloped inward or curbed to contain and direct potentially contaminated surface water to sumps or other low-

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
		and controlling of contamination associated with soil remediation activities from surface water run-off, and surface water run-on using berms, temporary drainage ditches and silt fences. The discussion points address surface water run-off when building slabs and foundations are undergoing demolition. What about during soil remediation activities? Also, what is meant by "to the extent practicable"? The additional information in the discussion points should be put in the DP. What is the risk of a 10-year rainfall occurring during remediation? Westinghouse has based their drain design on an average reoccurrence event of once in 10 years. This frequency of occurrence and the amount of rainfall associated with the event is based upon the area which was utilized to determine the 10 year value. If the value was not based upon data from the Hematite site itself, the amount of rainfall and the frequency may not be indicative of the Hematite site. Considering the frequency of thunderstorms in the Hematite area, the potential for the decommissioning process to extend for longer than two years, and other site specific factors, it would seem appropriate for Westinghouse to commit to re-assessing the adequacy of the drain design as circumstances require. Presently, no such commitment exists.	through the Water Treatment System, as appropriate. To reduce the amount of surface water run-on into contaminated areas (which would create additional water requiring collection and processing), diversion features (e.g., curbs) will be constructed at up gradient locations to direct precipitation around contaminated areas. Berms, either soil or other impermeable material, will be installed along the eastern side of the waste handling area to control suspended solids associated with sheet flow in this direction. The berm will be used to direct surface water flow to the french drain associated with the loading pad. Storm sewer inlets in the areas of active remediation will be protected with a combination of straw bales and/or silt fencing. Storm sewer inlets may also be blocked with impermeable material (e.g., neoprene/EDPM and ballast material). Water collected will be pumped to the WTS, or discharged through a permitted outfall depending on the results of sample analysis. Batch sampling or composite sampling of the effluent will be performed. The loading pad drain was designed for a 10-year rainfall for Jefferson County, MO, which is 5 inches in 24 hours per the U.S. Department of Agriculture's "Urban Hydrology for Small Watersheds," TR-55, June 1986. The probability (p_N) of a 10-year rainfall occurring during the remediation phase is 19%. The applicable equation is $p_N = 1 - (1 - p)^N$ where N=2 (number of years for remediation from DP Figure 1-1) and p=1/10 (inverse of 10 year period of return). This risk is addressed in the proposed resolution.	lying areas that will be used as collection points within the contaminated area. All impacted water encountered during the remedial actions will be sampled and discharged providing effluent release criteria are met with due consideration of maintaining release concentrations ALARA, or will be collected and processed through the Water Treatment System, as appropriate. To reduce the amount of surface water run-on into contaminated areas (which would create additional water requiring collection and processing), diversion features (e.g., curbs) will be constructed at up gradient locations to direct precipitation around contaminated areas. Specifically, berms, either soil or other impermeable material, will be installed along the eastern side of the waste handling area to control suspended solids associated with sheet flow in this direction. The berm will be used to direct surface water flow to the subsurface drain at the loading pad. The subsurface drain discharges to the former evaporation pond, which has been lined with impermeable material and now serves as a collection sump. The subsurface drain was designed to handle a nominal 10 year rainfall event. If a larger rainfall event occurs during the remediation of the site, the area surrounding the subsurface drain would have minor ponding, but be limited to the impacted area of the site. This area is planned to be excavated near the end of the remediation work so remediated areas are not re-impacted by potentially contaminated surface water. In addition, the drain design will be re-evaluated if precipitation overwhelms the drain capacity three times during remediation work. Storm sewer inlets in the areas of active remediation will be protected with a combination of straw bales and/or silt fencing. Storm sewer inlets may also be blocked with impermeable material (e.g., neoprene/EDPM and ballast material). Water collected will be pumped to the WTS, or discharged through a permitted outfall depending on the results of sample analysis. Batch sampling or composite sampling of the effluent will be performed.

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
8-5a	Change in approach with respect to area factors.	Provide NRC with additional details on the revised approach for area factors. This is an open item for associated with RAI No. 9 of Chapter 5.	The discussion regarding area factors in response to DP Chapter 5, RAI HDP-5-Q9, pertains to those derived using the DCGLs defined by the Excavation Conceptual Site Model (CSM) for soils greater than 1.5 meters below grade. Westinghouse is not proposing an alternate approach on the application of area factors. Area factors will be applied in accordance with DP Chapter 14, Section 14.4.5.6 which is based on Section 8.5.1 of NUREG-1575. Subsequently, if the Final Status Survey of the soils surrounding the natural gas line pipeline indicates the presence of residual radioactive material in excess of the Elevated Measurement Comparison using the approved area factors, then all necessary steps will be taken to remediate the elevated concentrations so that the survey unit complies with the unrestricted release criteria.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
8-5b	Remediation/ excavation sampling near pipeline.	Provide additional information on how sampling will be done in the vicinity of the pipeline.	The methods that will be used for soil sampling in the vicinity of the natural gas pipeline will use the same techniques as the balance of the site. (e.g., trowel, hand-auger, geo-probe,). Westinghouse has already used air-knife equipment to unearth and positively identify the precise location and depth of the natural gas pipeline based on visual identification at intervals of approximately 40 feet. The civil survey coordinates and the depth of the natural gas pipeline at each interval have been documented for future reference during excavation. Missouri Natural Gas will be contacted in advance of excavation and/or sampling with within five feet of the natural gas pipeline, and will prescribe any necessary precautions or controls.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
8-6	Basis for no remediation of ground or surface water.	Will be reviewed as part of resolution associated with Chapters 1, 3 & 4. The point in the first paragraph that if the soil meets the DCGL, then the groundwater will meet the 25 mrem limit is not entirely accurate. The water in the vicinity of soil that meets the DCGL will meet 25 mrem, but it is possible for there to be a plume that is deeper than the remediated soil that has a higher concentration It is still unclear as to whether Westinghouse has a mechanism for verifying that the above noted situation isn't present. It appears that Westinghouse does not intend to remediate the soil in the vicinity of the hybrid wells. This is surprising because it was the staff's observation that the source of the contamination in the hybrid well was the soil in the vicinity of it. With respect to the elevated activity observed in wells screened in the aquitard overburden that are located in impacted soil areas and that are not scheduled for remediation, if elevated activity in unremediated wells did increase rather than decrease, the dose impact represented by the residual activity represented by these wells may not be minimal as stated by Westinghouse. Agree that the "Evaluation of Tc-99 under the Process	The dose modeling presented in DP Chapter 5 demonstrates that the residual radioactivity concentration in pore space water in soil that is less than DCGL is acceptable and by definition, if the soil meets the DCGL, there will not be groundwater activity concentrations in the future that will cause the 25 mrem/yr to be exceeded. Any standing liquid from within the excavation (e.g., either draining from the contaminated soil during excavation, or from infiltration into the excavation) will be pumped from the excavation and treated and/or sampled prior to its release in accordance with NRC and MDNR effluent discharge requirements. Once remediated, the remaining soils will be surveyed to demonstrate compliance with the dose-based release criteria represented by the soils DCGLs. In addition to surface soils samples taken at grade and from the surface of the soils exposed by excavation, sub surface soil sampling will also be performed in open excavations and soil associated with hybrid wells that are not fully excavated in accordance with DP Chapter 14, Sections 14.4.4.1.6.2 and 14.4.3.5 (as revised by Westinghouse letter HEM-11-25). Westinghouse also understands that any elevated activity observed in wells screened in the aquitard overburden that are located in impacted soil areas that are not scheduled for remediation is due to the lateral transport of contaminated leachate through the overburden from the radioactive contaminated soil source. It is postulated that once the source of leachate contamination has been removed, the elevated activity observed in these wells will diminish. However, in the unlikely event that elevated activity in unremediated wells did not decrease, the dose impact represented by the residual activity represented by these wells is minimal as discussed below. As an illustration, Wells GW-NB31 and GW-PL06 represent wells screened in the aquitard overburden that are located in impacted soil areas. These wells are hybrid wells that monitor both the Silty Clay Aquitard HSU and the Sand/Gravel HSU. These wells are scheduled to be abandoned, but the surrounding soil is not scheduled for remediation. Replacement wells have been installed in the sand gravel adjacent to these well locations and will	Westinghouse has provided the requested clarifying information in the Discussion Points and the "Evaluation of Tc-99 under the Process Buildings" submitted by Westinghouse letter Hem-11-56. No further action required.

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
		Buildings" addresses the 5/13 discussion above.	continue to be monitored. Wells GW-NB31 and GW-PL06 have consistently presented sample results showing elevated activity. The average and maximum radionuclide activity observed in these wells over the last eight calendar quarters is presented in the following table: (tables follow)	

GW-NB31

	Average Quarterly Concentration	Maximum Quarterly Concentration	Dose to Source Ratio	Dose Based on Average Quarterly Concentration	Dose Based on Maximum Quarterly Concentration
	pCi/L	pCi/L	mrem/yr per pCi/L	mrem/yr	mrem/yr
U-234	0.151	0.220	0.153	0.023	0.034
U-235	0.012	0.044	0.145	0.002	0.006
U-238	0.091	0.160	0.146	0.013	0.023
Tc-99	126.725	231.0	9.374E-04	0.119	0.217
Total Dose				0.157	0.280

GW-PL06

	Average Quarterly Concentration	Maximum Quarterly Concentration	Dose to Source Ratio	Dose Based on Average Quarterly Concentration	Dose Based on Maximum Quarterly Concentration
	pCi/L	pCi/L	mrem/yr per pCi/L	mrem/yr	mrem/yr
U-234	0.293	1.630	0.153	0.045	0.250
U-235	0.016	0.090	0.145	0.002	0.013
U-238	0.221	1.220	0.146	0.031	0.178
Tc-99	141.063	170.0	9.374E-04	0.132	0.159
Total Dose				0.210	0.600

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
			To demonstrate the minimal impact on dose, a nominal dose check calculation was performed as if the overburden water could be ingested, which it cannot since water in the aquitard overburden (clay overburden and hybrid well screen) is considered leachate from precipitation and recharge interaction with the contaminated soil and buried waste materials, as explained in detail in DP Chapter 4, Section 4.5.3 and DP Chapter 5, Section 5.3.3.2. This example calculation applies the dose-to-source ratios for groundwater presented in DP Table 5-14 to the average leachate concentrations for each radionuclide of concern as if the leachate were groundwater. The calculation for water from these two monitoring wells results in a dose of 0.157 mrem/yr and 0.210 mrem/yr using the average radionuclide concentration and a dose of 0.280 mrem/yr and 0.600 mrem/yr using the maximum observed radionuclide concentrations. The theoretical dose impact from the elevated leachate is minimal and less than the current EPA radionuclide standards for drinking water.	
8-10a	Control of contamination on loading pad.	Provide a description of the manner to be utilized to prevent the spread of contamination from wind and precipitation. Doesn't the area in the vicinity of the loading pad have some contamination? Therefore, isn't essential that the run-off and surface water are directed to the drain for collection? Even if there is not contamination in the vicinity of the loading pad, , shouldn't berms be in place at the beginning of the operations to direct run-off and surface water from the loading pad to the drain? Does the drain have adequate capability to handle a 5 yr, 10yr or 25 yr rainfall? As noted above, it would seem appropriate that such diversions be in place prior to decommissioning starting.	With respect to wind. The primary method that will be employed to prevent the spread of contamination during material handling will be the use of water mist. After application of water mist, temporary stockpiles (e.g., those that remain until the next workday) may also be tamped using the flat side of the excavator bucket or similar piece of heavy equipment to consolidate the surface of the material thus reducing the potential for erosion. Additives may also be added with the water mist that form a thin crust-like layer, (e.g., a dilute non-hazardous adhesive), or those that posses hygroscopic properties to sustain the effectiveness of water application. (e.g., calcium chloride). To gauge the effectiveness of contamination control measures, the results of general area and breathing zone air samplers will be evaluated to identify outliers or trends in concentration that suggest appropriate actions be taken to mitigate airborne radioactivity. With respect to precipitation: A subsurface drain has been installed to collect surface water and runoff from the loading pad. The subsurface drain was designed to handle a nominal 10 year rainfall event. If a larger rainfall event occurs during the remediation of the site, the area surrounding the subsurface drain would have minor ponding, but be limited to the impacted area of the site. This area is planned to be excavated near the end of the remediation work so remediated areas are not re-impacted by potentially contaminated surface water. During the contractor mobilization and prior to remediation activities commencing, best management practices (BMPs), including additional berms, will be implemented to improve the direction of flow into this drain. The subsurface drain discharges to the former evaporation pond, which has been lined with impermeable material and now serves as a collection sump. Water collected here will be sampled and discharged providing effluent release criteria are met with due consideration of maintaining release concentrations ALARA, or will be collected and processed through the Water Treatment System as necessary.	The following new fourth paragraph of DP Section 8.4.3 will be added: With respect to preventing the spread of contamination by the wind, the primary method that will be employed to prevent the spread of contamination during material handling will be the use of water mist. After application of water mist, temporary stockpiles (e.g., those that remain until the next workday) may also be tamped using the flat side of the excavator bucket or similar piece of heavy equipment to consolidate the surface of the material thus reducing the potential for erosion. Additives may also be added with the water mist that form a thin crust-like layer, (e.g., a dilute non-hazardous adhesive), or those that posses hygroscopic properties to sustain the effectiveness of water application. (e.g., calcium chloride). To gauge the effectiveness of contamination control measures, the results of general area and breathing zone air samplers will be evaluated to identify outliers or trends in concentration that suggest appropriate actions be taken to mitigate airborne radioactivity. With respect preventing the spread of contamination by precipitation, see Section 8.6.
8-10b	Surface water barriers	Provide a description of the surface water barriers to be provided for the waste consolidation area and the waste holding area as the laydown area incorporates such barriers. As noted above, it would seem appropriate that the run-off and surface water are directed to the drain. Otherwise, contamination could be spread. It would	Erosion controls will be used in the laydown and waste staging areas. In the laydown area, a combination of berms, silt fence, straw bales and/or waddles will be used along the drainage channel to control sediment in stormwater runoff and to minimize soil erosion. The stormwater will be direct to Outfall #006. The waste handling and staging areas are adjacent to the loading pad. The BMPs, including additional berms, to be implemented for the loading pad will also divert water from the waste	Westinghouse has provided the requested clarifying information in the Discussion Points and DP proposed resolutions in rows 3b and 10a. No further action required.

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
		seem appropriate that such diversions be in place prior to decommissioning starting. Does the drain have adequate capability to handle a 5 yr, 10yr or 25 yr rainfall?	staging area to the subsurface drain. The subsurface drain was designed to handle a nominal 10 year rainfall event. During the contractor mobilization and prior to remediation activities commencing, best management practices (BMPs), including additional berms, will be implemented to improve the direction of flow into this drain. The subsurface drain discharges to the former evaporation pond, which has been lined with impermeable material and now serves as a collection sump. Water collected here will be sampled and discharged providing effluent release criteria are met with due consideration of maintaining release concentrations ALARA, or will be collected and processed through the Water Treatment System as necessary.	
8-10c	Effluent Monitoring of the Soil Treatment Facility	Types & frequency of monitoring and the locations needs to be provided. Reference may be made to the appropriate Sections in Chapter 11 & in the Effluent & Environmental Monitoring Plan if incorporated. Agree that resolution will occur under RAI No.3 of Chapter 12.	The treatment of effluent and the types, and the frequency and location of effluent monitoring of the soil treatment facility are being addressed in response to NRC comments on DP Chapter 12, RAI No. 3. This response was provided to NRC on 4/19/11, and was discussed with NRC on 4/20/11. Since the issue is already in discussions on this other RAI, duplication here is not necessary.	Resolution of NRC comments on DP Chapter 12, RAI No. 3, will also resolve this comment. This comment does not require its own resolution.
8-14	Definition of NCS exempt	Modify DP Sections 8.5.2.1 and 10.9.2.1.1, with the definition provided in the RAI response.	Westinghouse is modifying the previously submitted definition of "NCS-Exempt", replacing the words "Nuclear Criticality Safety Assessment (NCSA)" with the words, "nuclear criticality safety evaluation" to allow more flexibility in evaluation documentation when a formal NCSA is not otherwise warranted.	Westinghouse will add the following definition to DP Sections 8.5.2.1 and 10.9.2.1.1 "Unless otherwise defined and justified within a nuclear criticality safety evaluation, NCS Exempt Material is conservatively defined as material containing ^{235}U with an average nuclide fissile concentration not exceeding 0.1 g ^{235}U/L, or material that comprises no greater than 15 g^{235}U and is enclosed within a container with a volume of at least 5 liters."

ATTACHMENT 6

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 9

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
9-1	We have an issue with Westinghouse's response dated 3/28/11 for Chapter 9, Question 1. After the qualification table, it is stated Westinghouse is going to revise the NCS specialist qualification to a BS in science or engineering, or equivalent with 1 year experience in NCS OR a BS in nuclear engineering, or equivalent.	In Westinghouse's RAI response dated 1/28/11, regarding the difference, if any between an NCS engineer and NCS specialist (RAI # 11 for chapter 10), the qualification was the same except for 3 years experience if the degree is in science or engineering (vs. a nuclear engineer). We do not agree with the March 28, 2011 revision. It is unacceptable and left unchanged will be stated so in the SER.	Westinghouse will retain the requirement for 3 years of experience for the NCS Specialist.	The changes for the NCS Specialist qualifications identified to DP Section 10.9.1.1.2 in Westinghouse letter HEM-11-37, dated March 21, 2011, will not be made in the DP revision.
9-3	Management positions meeting ANSI/ANS3.1-1993. WEC indicating that RG1.8 is NA for Hematite. WEC QA program not meeting experience requirements of ANSI/ASME NQA-1-1983	WEC needs to meet the requirements of ANSI/ANS3.1-1993 with respect to management positions, meet RG 1.8 and meet the experience requirements of ANSI/ASME NQA-1-1983,	ANSI/ANS3.1 applies specifically to nuclear power plants. It does not apply to fuel cycle facilities, and has never been applied to Hematite, even when the Site was operating as a fuel cycle facility. Application to Hematite for decommissioning operations is not warranted. NRC Regulatory Guide 1.8 does not endorse ANSI/ANS3.1 for 10 CFR Part 70 licensees, which states: "C. *Regulatory Position* *ANSI/ANS-3.1-1993, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants," provides criteria for the selection, qualification, and training of personnel for nuclear power plants. These criteria, with the following additions, exceptions, and clarifications, are acceptable to the NRC staff for complying with the qualifications and training requirements of 10 CFR Parts 50 and 55 and with the guidance regarding the shift technical advisor (STA) function provided in the Commission's "Policy Statement on Engineering Expertise on Shift*." ANSI/ANS3.1 and NRC Regulatory Guide 1.8 are not included as guidance for the NRC Standard Review Plan for operating fuel cycle facilities; NUREG 1520, Revision 1, issued May of 2010 states: " *2.4.2 Regulatory Guidance* *There are no regulatory guides specific to the organization and administration description of fuel cycle facilities*." Also neither document is included as guidance in NUREG 1757 for materials licensees in decommissioning. ANSI/ASME NQA-1 does not invoke the guidance of ANSI/ANS 3.1. Nor does it include management experience requirements.	The second bullet in the qualification portion of DP Section 9.3.5 for the Radiation Safety Officer will be revised to read, "At least three years of work experience…."

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
			With respect to RAI HDP-9-Q3, the focus was on the RSO, and the RSO qualifications are substantially unchanged from the current NRC SNM-33 license. In response to RAI HDP-9-Q1 Westinghouse provided the following: "*This section provides a description of the minimum qualifications and responsibilities of the key functional positions of Hematite Decommissioning Project Director and Radiation Safety Officer. Within 30 days after a change of any individual in one of these positions the licensee shall submit to the NRC written notification of the change. This notification shall include a summary of the new individual's experience and qualifications, and an evaluation that verifies that the individual's experience and qualifications meet the minimum requirements for the position.*" This requirement within the Decommissioning Plan provides the NRC the necessary information to determine if the RSO has met the education, experience and other qualification requirements.	
9-5	Proposed revision to Section 9.2.1 lacks clarity.	WEC to clarify process as to who is the "responsible HDP manager", the "Supervisor or Manager responsible for the work" and the "responsible HDP Manager" in the proposed revision to Section 9.1.2. Proposed revision to DP Section 9.2.1 does not seem to clarify the stop work issue which needs clarification in Section 9.1.2	Differing terms were used even though the same concept was intended to be conveyed. In addition to the cited terms, the term "functional area manager" was also used in DP Chapter 9. To improve clarity, the single term "functional area manager" will be used in DP Chapter 9. The functional area manager is responsible for the organizational group that has the primary responsibility for a particular aspect of the work. The cited section in the Issue/comment and the path forward description led us to focus on Section 9.2.1. The change to Section 9.1.2 has been added to the Proposed Resolution.	The first paragraph of Section 9.1.2 will be revised as follows: After a person declares Stop Work, personnel in the area immediately put their work in a safe condition and stop work. The individual declaring the Stop Work informs the Supervisor or Manager in the Department that has overall lead for the work (typically Operations or Project Engineering Departments). That Supervisor or Manager informs the Project Director and the Manager of the appropriate safety discipline (e.g., EH&S, NCS, radiation safety) of the Stop Work. The responsible HDP Manager shall: Section 9.2.1. will be revised as follows: "9.2.1 PROCEDURES Decommissioning activities are managed through policies and procedures which establish the constraints under which a specific program or plan (e.g., Radiation Protection Plan) will operate. Work is accomplished by procedures that implement the requirements of regulations and License SNM-33 (Reference 9-1). Functional area managers are responsible for the subject matter covered by a program or plan. The functional area manager is responsible for ensuring that other organizations impacted by the document are given the opportunity to review them, and any revisions, before issuance. Prior to issuance or revision, the following classifications of documents require the minimum functional management approvals indicated: • Radiation Protection – Radiation Protection and Project Director; • Environmental, Health and Safety – EH&S and Project Director; • Material Control and Accounting (MC&A) – Licensing and Project Director; • Criticality Control – Criticality Safety, Radiation Protection and Project Director; • Waste Management – Waste Management, Radiation Protection and Project

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
				Director; • Quality Assurance – Quality Assurance and Project Director; and • Physical Security – Security, Licensing and Project Director."
9-8a	Operations functional area manager training	Describe "Fissile Worker Training" which is noted in Section 10.9.2.1.	At the time of DP submittal "Fissile Worker Training" was required for personnel engaged in activities in which the job function required them to handle fissile material. Since the time of DP submittal, Westinghouse has enhanced training related to fissile material and developed training for three distinct levels of employees as follows: General Employee Training for all workers contains instruction on the basic concepts of criticality control measures. The Fissile Material Handler Training (FMHT) training course is for Personnel at the project whose job function requires them to handle fissile material in quantities requiring Nuclear Criticality Safety control measures. FMHT contains the following topics: • Basic fundamentals of nuclear criticality • Key factors affecting criticality • HDP Nuclear Criticality Safety Policies and Procedures • Utilization of "Double Contingency" principle for criticality control The Fissile Material Training for Supervisors and Managers (FMTSM) training course is for Supervisors and Managers of personnel assigned to plan or perform work and all persons involved in planning work associated with fissile materials in quantities requiring Nuclear Criticality Safety control measures. FMTSM contains the following topics: • Basic fundamentals of Nuclear Criticality • Terms and Definitions • Use of Criticality Safety Parameters • Criticality Safety Controls and Defense in Depth • Use of CSCs and preferred hierarchy for their application • Incorporating CSCs and DinDs into Work Planning	DP Chapter 10 section 10.9.1.2.1 NCS Training second paragraph will be revised to read as follows; "The NCS training shall be appropriate to the work conducted by the person, such as the following three levels: Basic Concepts in General Employee Training; Fissile Material Handler Training (FMHT); and Fissile Material Training for Supervisors and Managers. The Basic Concept training provided in General Employee Training would be provided to all project personnel to ensure understanding of criticality safety controls and postings. FMHT would be provided to Personnel at the project whose job function requires them to handle fissile material in quantities requiring Nuclear Criticality Safety control measures. FMTSM would be provided to Supervisors and Managers of personnel assigned to plan or perform work and all persons involved in planning work associated with fissile materials in quantities requiring Nuclear Criticality Safety control measures."
9-8b	Operations functional area manager training	Distinguish between of "Fissile Worker Training" in Section 10.9.2.1 and "Fissile Material Handler Training" in Section 9.4.	The change to DP Section 10.9.2.1 in the preceding row resolves the inconsistency.	See above.
9-9	Licensing functional area manager qualifications	Revise licensing functional area manager qualifications	Westinghouse will revise the Licensing Manager position qualifications to include years of experience.	Section 9.3.4 will be revised as follows; "Licensing responsibilities include those site activities necessary to ensure compliance

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		to include the years of experience in the field they are managing. License commitments should be objective and inspectable.	In addition, Westinghouse will revise the DP to place responsibility for the management of Nuclear Criticality Safety with the Radiation Safety Officer verses the Licensing Manager. Westinghouse considers that this change is reasonable since the skill sets necessary to effectively manage criticality safety are more prevalent with a person having a radiation safety background than a person with a licensing background.	with the License SNM-33 (Reference 9-1). Licensing activities include interacting with the NRC and other regulators as assigned, preparing license amendments, and reviewing planned work activities to ensure compliance with License SNM-33 (Reference 9-1). At a minimum, the Licensing functional area manager will meet the following qualifications: • Bachelor's degree in an appropriate discipline or an equivalent combination of education and experience; • Previous managerial experience in the environmental and safety discipline; • Two years of experience in licensing, or regulatory affairs, or equivalent; and • Strong skills in written and oral communication and organizational management." In addition, Section 9.3.6 will be revised as indicated in *Italics*: "The RSO is responsible for the establishment and guidance of radiation protection programs. As such, the RSO is responsible for ensuring that activities involving the use of radioactive material are conducted safely and in accordance with applicable regulatory requirements. The RSO also evaluates potential and/or actual radiation exposures, establishes appropriate control measures, approves written procedures, and assures compliance with pertinent procedures and regulations. Under the RSO's direction, health physics personnel collect samples, perform analyses, take measurements, maintain records, and assist in performing the technical aspects of the radiation protection program. The Project Director has also assigned the RSO responsibilities for *managing Nuclear Criticality Safety*, the radiological aspects of waste management and hazardous material transportation." Figure 9-1 will also be revised to reflect that the RSO responsibilities include Nuclear Criticality Safety. The last sentence of DP Section 10.9.1.1 will be deleted since it is redundant to Section 9.3.6. The second paragraph of DP Section 10.9.1.1.2 will be revised to state: "The functional area manager for the NCS organization has the authority and responsibility to assign and direct activities for the NCS function." The first sentence of the next paragraph will be revised to state, "NCS Specialists have the authority and responsibility to conduct activities assigned to the NCS function." The last sentence of the subsection "1. Annual Audits" in DP Section 10.9.1.2.2 will be revised to state: "The functional area manager for NCS shall assign responsibility regarding follow-up for recommendations made by the audit team." The last sentence of the first paragraph of DP Section 10.9.1.2.4 will be revised to state: "The NCS organization shall maintain the current list and control distribution of NCSS."

ATTACHMENT 7

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 10

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
10-1a	Practicality of moving and maintaining a portable air sampler within 12 inches of a worker	WEC to re- confirm their commitment. (Refer to NUREG-1400, Chapter 3 & RG 8.25)	The potential difficulty of maintaining a portable air sampler within 12 inches of a worker's head is understood by the Westinghouse staff. The use of a portable air sampler for occupational monitoring within 12 inches of a worker's head would likely only be used when in a stationary situation, or when a short duration activity would require a greater sample volume than could be obtained using a lapel pump. Westinghouse has an adequate inventory of lapel air samplers to ensure a sufficient quantity is available for occupational monitoring to ensure concentrations representative of the breathing zone are obtained.	Westinghouse confirms the commitment to performing air samples within approximately 12 inches of the worker's head when estimated or known concentrations exceed 10 percent of the occupational DAC value in the breathing zone of a worker or exceeds 2 percent of a DAC value in the breathing zone of a declared pregnant female.
10-1b	Performance of intermittent or grab samples when air concentration below 10% of DAC.	Clarify frequency and events which would trigger obtaining intermittent or grab sample. Don't agree that the two terms "intermittent" and "grab" are synonymous. In addition, intermittent is a term which denotes frequency of a sample while grab designates a type of sample.	Westinghouse will ensure that the DP exclusively use the term "grab" sample to denote a type of sample. In the RAI response, Westinghouse intended for the terms "intermittent' and 'grab' to be interchangeable for the purposes of workplace air sampling for radioactivity. Westinghouse had gotten that impression from Regulatory Guide 4.16 Section 1.3, which states "Air sampling may be continuous during work hours or intermittent (grab samples taken during part of the work)." Events that trigger a grab sample are work activities with the potential to generate between 2 and 10 percent of the DAC (derived from requirements stated in paragraph 3 of DP Section 10.2). Such events are determined by prospective estimates of air concentrations based on expected work area conditions, including expected removable contamination levels. The response to RAI HDP-10-Q1 provided an example of such a prospective estimate. If subsequent to the prospective estimate contamination surveys show removable contamination levels that invalidate the prospective estimate, then the Radiation Work Permit and the prospective estimate would be revised to ensure adequate air samples are taken and/or personnel monitoring is initiated. The frequency of grab samples during for such events is daily when the work activities occur, as stated in the response to RAI HDP-10-Q2: "operational grab or continuous air samples will be collected daily during any work activities for which the projected air concentrations are estimated to exceed 2 percent of the occupational DAC values." The grab method of sampling is the minimum to be used, but since work activities are primarily outdoors, lapel samplers may be utilized rather than grab samples when estimated air concentrations exceed 2 percent of the occupational DAC values. In addition, Westinghouse routinely performs air sampling for work activities in which the estimated DAC value is below 2 percent to provide added assurance that the conditions are as expected during planning.	Westinghouse will ensure that the DP exclusively uses the term "grab" sample to denote a type of sample.
10-2	Basis for default filter efficiency of 99% for ε_f	Filter efficiency is based upon particle size of material be captured and filter media. Considering the likely airborne material to be sampled, what it the basis for the 99%?	Air sampler characteristics, filter characteristics, and the filter efficiency are provided below. Discussions with M.D. Hoover confirmed that these filters are appropriate for the intended application. Low volume air samplers: • Nominal sample flow rate of 50 lpm.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.

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		The pore size, usually stated in micrometers (μm), of filter media is defined by the diameter of particles retained by the filter matrix. Pore size ratings, which can be either nominal or absolute, refer to the size of organisms or particles retained by the filter media. The collection or retention capability of filter media is also a function of flow rate through the media. Westinghouse has not demonstrated that the material to be collected has a particle size of 1 μm for which they claim a 99% efficiency nor has Westinghouse statements clearly articulated that the 99% efficiency applies at the flow rates given for the portable and lapel samplers.	• Filter face velocity of 78 cm/s. • 47mm diameter mixed cellulose ester membrane filter (Metricel® GN-6). Lapel air samplers: • Nominal sample flow rate of 2 lpm. • Filter face velocity of 3.1 cm/s. • 37mm diameter, mixed cellulose ester membrane filter (Metricel® GN-4). Metricel GN-6 filter: • Pore size of 0.45μm (absolute). • Greater than 99.8% – 99.99% collection efficiency. This collection efficiency is the lowest reported efficiency and is for a particle diameter range of 0.035 to 1 micron with a face velocity range of 1 to 100 cm/s. • Efficiency based on relevant sources including: Filtration in "Radioactive Air Sampling Methods" (M.L. Maiello and M.D. Hoover); and Characteristics of Air Sampling Filter Media in "Aerosols in the Mining and Industrial Work Environments" (Liu B.Y.H., D. Y. H Pui and K. L. Rubow). Note that HDP has verified with the manufacturer that the GM-6 model filter cited in this reference is equivalent to the GN-6 which is currently in use. Metricel GN-4 filter: • Pore size of 0.8μm (absolute), • Greater than 99.8% – 99.99% collection efficiency. • Efficiency based on Metricel GN-6 filter due to equivalent specifications as the GN-6, with the exception of 0.8 micron versus 0.45 micron pore size. Section 6.6.2 of ANSI-N13-1999 confirms that this difference in pore size would not cause degradation of efficiency, as follows: Filters are porous structures with controlled external dimensions such as thickness and cross sectional area normal to the flow. Filtration is the most widely used technique for collection of aerosol particles because of its low cost and simplicity. Filters capture particles by a combination of physical processes, which include direct interception, inertial deposition, Brownian diffusion, electrical attraction, and gravitational sedimentation. As shown in figure 3, filters typically have a minimum collection efficiency for particles that are approximately 0.2 - 0.5 μm diameter Above about 0.3 μm diameter, filtration efficiency increases due to inertial impaction and below this size efficiency increases due to Brownian diffusion. A common misconception is that filters act as sieves, and that there is a direct relationship between the pore size of a filter and the minimum particle size that can be collected. In reality, because collection occurs by a complex combination of	

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
			mechanisms, filters with nominal pore sizes larger than 1 µm can be very efficient collectors of sub-micrometer particles. As demonstrated by Lindeken et al. (1964), membrane filters show no serious degradation of collection efficiency until the pore diameters exceed 5 µm. In fact, filters with a 5-µm pore size are often preferred because they have lower pressure drops than smaller pore-size filters, yet retain high efficiency values.	
10-10	Definition of all constants in equations	Provide definition In the resolution table response to RAI 10-Q10, there is an updated Equation 14-29 which includes a total 4π weighted efficiency. In the original RAI response, it was indicated that this MDC was for the "Static MDC for FSS of Building and Structural Surfaces." In order to be consistent with ISO-7503-1, a 2π efficiency would be used during the FSS. In the WEC response to RA 14-Q16, it was also stated that "for the measurements to be conducted during final status survey, HDP will implement the recommendations of ISO 7503-1." Clarification should be provided on the usage of 2π vs. 4π in this equation, and if this equation is intended for use during the FSS.	Westinghouse will provide definitions for the constants in the equations as requested. The cited equation (14-29) will be used for FSS of Building and Structural Surfaces. For clarity, Equation 14-29 and the definition of ε_t were not changed from the RAI response. The variable ε_t represents the total weighted efficiency and incorporates consideration of both the instrument efficiency (ε_i) and surface efficiency (ε_s). The instrument efficiency component (ε_i) is calculated using the surface emission rate (i.e., 2π particle fluence). This methodology for calculation of the total weighted efficiency is described in DP Section 14.4.4.2.4, second paragraph, first sentence: *A weighted efficiency is calculated for each contaminant, including progeny, as the product of the instrument efficiency for detection, surface (source) efficiency, radiation yield, and radioactivity fraction.* An example calculation is provided in Table 14-19. The definition of ε_t in Equation 14-29, DP Section 14.4.4.2.4, and Table 14-19 will be revised to identify that the instrument efficiency is 2π.	DP Chapter 10, Section 10.8.4. Equation 10-1 will be revised as follows: $$\text{Air Sample MDC (uCi/ml)} = \frac{3 + 3.29\sqrt{(R_b)(T_g)\left(1+\frac{T_g}{T_b}\right)}}{(\varepsilon_i)(\varepsilon_c)(T_g)(V_s)(2.22E^9)}$$ Where; V_s = sample volume (liters) ε_i = instrument efficiency-intra- ε_c = collection efficiency (default 0.99) R_b = background count rate (cpm) T_b = background count time (minutes) T_g = gross count time (minutes) $2.22E^9$ = conversion factor (dpm to uCi and liters to ml) 3 = derived constant based on Type I and Type II errors of 0.05 (NUREG-1507, Sect 3.1) 3.29 = derived constant based on the 95 percent confidence level (NUREG-1507, Sect 3.1) DP Chapter 10, Section 10.8.4. Equation 10-2 will be revised as follows: MDC for a Portable Counter (timed count) $$\text{MDC (dpm/100cm}^2) = \frac{3 + 3.29\sqrt{(\mathrm{R_b})(\mathrm{T_g})\left(1+\frac{\mathrm{T_g}}{\mathrm{T_b}}\right)}}{\frac{\mathrm{DA}}{100}(\varepsilon_i)(\mathrm{T_g})}$$ Where; DA = detector area (cm^2) ε_i = instrument efficiency (c/d) R_b = background count rate (cpm) T_b = background count time (minutes) T_g = gross count time (minutes) 3 = derived constant based on Type I and Type II errors of 0.05 (NUREG-1507, Sect 3.1) 3.29 = derived constant based on the 95 percent confidence level (NUREG-1507, Sect 3.1) 100 = conversion factor (detector area (cm^2) to 100 cm^2)

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
				DP Chapter 10, Section 10.8.4. Equation 10-3 will be revised as follows: Bench Counter Smear MDC $$\text{Smear MDC (dpm/100cm}^2) = \frac{3 + 3.29\sqrt{(R_b)(T_g)\left(1 + \frac{T_g}{T_b}\right)}}{(\varepsilon_i)(T_g)}$$ Where; ε_i = instrument efficiency (c/d) R_b = background count rate (cpm) T_b = background count time (minutes) T_g = gross count time (minutes) 3 = derived constant based on Type I and Type II errors of 0.05 (NUREG-1507, Sect 3.1) 3.29 = derived constant based on the 95 percent confidence level (NUREG-1507, Sect 3.1) DP Chapter 14, Section 14.4.4.2.5, Equation 14-29 will be revised as follows: $$\text{MDC (dpm/100cm}^2) = \frac{3 + 3.29\sqrt{(R_b)(T_s)\left(1 + \frac{T_s}{T_b}\right)}}{\frac{A}{100\text{cm}^2}(\varepsilon_t)(T_s)}$$ Where; A = probe area (cm^2) ε_t = total weighted efficiency (c/d; 4π), is the product of the individual radionuclide weighted efficiencies. The weighted efficiency is the product of the 2π instrument efficiency (ε_i), surface (source) efficiency (ε_s), radiation yield, and radioactivity fraction. R_b = background count rate (cpm) T_b = background count time (minutes) T_s = sample or measurement count time (minutes) 3 = derived constant based on Type I and Type II errors of 0.05 (NUREG-1507, Sect 3.1) 3.29 = derived constant based on the 95 percent confidence level (NUREG-1507, Sect 3.1) 100 = conversion factor (detector area (cm^2) to 100 cm^2) DP Chapter 14, Section 14.4.4.2.6, Equation 14-31 will be revised as follows: $$\text{MDC (pCi/g)} = \frac{3 + 4.65\sqrt{B}}{(K)(W)(t)}$$ Where; B = Number of background counts during the count interval t K = Proportionality constant that relates the detector response to the radioactivity level in a sample for a given set of measurement conditions

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				W = Sample weight (dry grams) *t* = Count time (minutes) 3 = derived constant based on Type I and Type II errors of 0.05 (NUREG-1507, Sect 3.1) 4.65 = derived constant based on the 95 percent confidence level (NUREG-1507, Sect 3.1) DP Chapter 14, Section 14.4.4.2.8, Equation 14-34 will be revised as follows: $\text{Scan MDC} = \frac{MDCR}{\left(\sqrt{p}\right)\left(\varepsilon_t\right)\left(\frac{A}{100cm^2}\right)}$ Where; *MDCR* = minimum detectable count rate (cpm) ε_t = total efficiency (c/d) *p* = surveyor efficiency (unitless – typically assumed to be 0.5) *A* = detector area (cm^2) 100 = conversion factor (detector area (cm^2) to 100 cm^2) Footnote 'b' to Table 14-19 will be revised as follows: [b] Nominal 2πefficiency value for a 126 cm2 gas flow proportional detector with a 0.8 mg/cm2 window in the α + β mode. Section 14.4.4.2.4, second paragraph, first sentence will be revised as follows: A weighted efficiency is calculated for each contaminant, including progeny, as the product of the 2π instrument efficiency for detection, surface (source) efficiency, radiation yield, and radioactivity fraction.

ATTACHMENT 8

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 12

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
12-1	NCS	Provide clarification on what is meant by the statement in the RAI response that "If elevated radioactivity measurements in excess of the NCS Exempt Material Limit are encountered prior to or during excavation, the detector response will be evaluated and the appropriate excavation depth determined." Describe the relationship between the detector response, the excavation depth, and maintaining criticality safety.	In order to support the remediation activities a calibration analysis was performed on the gamma scintillation detector intended for use in conducting surveys of possibly contaminated soils prior to their exhumation. The analysis is performed for a variety of soil and waste matrix model conditions, accounting for underestimation effects due to attenuation of the photon intensity in the surrounding medium. The calibration results provide maximum observed net count rates for a given prospective depth and waste matrix density. Two independent individuals will perform an in-situ radiological survey, each with independent (i.e., physically separate) equipment. Equally important to the screening criteria discussed above is the need to limit the thickness of exhumed layers of contaminated soils and buried wastes to a value consistent with the calibration basis of the equipment. Moreover, the basis for the NCS Performance Requirement is dependent upon the observed net count rate adequately resulting in a detector response easily identified by a technician. Because the amount of attenuation provided by the soil/waste, the maximum cut depth permitted to be exhumed at any one time is conservatively restricted to 12" or less. This conservative prescribed maximum cut depth provides an ample detector response of 19,527 counts per minute corresponding to the most restrictive screening limit for a waste matrix of 1.73 g/cc. Therefore, the calibration results ensure objects/regions of soil/waste will be identified. Once these areas are identified to result in a detector response exceeding the limit corresponding to the NCS performance requirement defined above the observed net count rates will be consulted and an appropriate cut depth (e.g., 2", 4", 6", 8", 10", or 12") determined in accordance with the derived calibration analysis tables. The considerations above support the view that there is no credible NCS concern due to potential under-reading of ^{235}U content during the in-situ radiological surveys on account of the presence of ^{235}U distributions. To reflect a requirement for such an analysis to define the relationship between the detector and the Fissile Material Exemption Limit, the first bullet in Section 8.5.1 will be revised. Consistent with the response to the follow-up comment on the response to RAI HDP-8-Q14, the definition of NCS Exempt Material will be placed in Section 8.5.2.1.	As identified in the original RAI 12-Q1, the proposed resolution involves changes to DP Chapter 8. The first bullet in Section 8.5.1 will be revised as follows: "Soil will be evaluated using in-situ GWS, VOC monitoring (Photo-Ionization detector) and visual inspection of the exposed surface, repeated for each newly exposed surface. If elevated radioactivity measurements indicating amounts in excess of the NCS Exempt Material Limit are encountered prior to or during excavation, the detector response will be evaluated and the appropriate excavation depth determined. An analysis shall be performed that establishes the detector response that corresponds to the NCS Exempt Material Limit (defined in Section 8.5.2.1)." The last paragraph of DP Section 8.5.2.1 will be revised as follows: "Unless otherwise defined and justified within a nuclear criticality safety evaluation, NCS Exempt Material is conservatively defined as material containing ^{235}U with an average nuclide fissile concentration not exceeding 0.1 g^{235}U/L, or material that comprises no greater than 15 g^{235}U and is enclosed within a container with a volume of at least 5 liters. Refer to Chapter 10 for further details on NCS and handling of fissile material."
12-3	Treatment of exhaust air from soil vapor extraction (SVE) system	Provide a description of the exhaust air treatment methods associated with the SVE system. Is the HEPA filter after the activated carbon? If it is, what is the basis for having it after rather than before? The 1999 Revision to ANSI N13.1 states in Section 6.3.1 of the standard that "the ANSI N13.1-1969 recommendation for isokinetic sampling is no longer required," and that "studies have shown that isokinetic operation is not a prerequisite for obtaining representative samples (McFarland and Rodgers 1993)." The standard goes on to discuss	The exhaust air from the soil vapor extraction system (SVES) will be treated using the following equipment. The equipment is listed in sequence with the exhaust airflow. A description of the SVES and its parameters are included in Appendix A. • Condensate trap • Heat exchanger • Condensate filter separator • HEPA filter • Vapor phase activated carbon filter <u>Sampling for Radioactive Emissions</u>. During SVE operations, a representative sample will be collected using a continuous sampler and a method consistent with on	The second paragraph of DP Section 12.4.3.4, as revised in the Westinghouse response to RAI HDP-12-Q3, will be replaced with the following paragraphs: VOC treatment will be conducted in treatment tanks by *ex-situ* soil vapor extraction (SVE). SVE uses a mechanical blower to induce a vacuum, which causes the VOCs to be stripped and volatilized into the air stream. The exhaust air is then treated to remove particulates and VOCs before it is emitted to the atmosphere. The exhaust air treatment consists of

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
		sampling nozzle design and some of the considerations for designing a representative sampling point. The resolution table response from WEC indicates that isokinetic sampling will be used and that methodology will be in accordance with ANSI N13.1-1999. It may be a bit arbitrary to state that isokinetic sampling will always be used, as N13.1-1999 has differing guidance than the 1969 revision. It is suggested that WEC reword this to indicate that representative sampling will be performed in accordance with ANSI N13.1-1999 (which means they will have to determine the appropriate air velocity, which might not arbitrarily be isokinetic). Why wouldn't the weekly sample be analyzed for Tc-99 and isotopes of uranium? There is no discussion of composite samples as discussed in Item 2 below. Proposed revision to DP Section 12.4.3.4 still does not meet recommendations from 4/20/11. The discussion points indicate that "methodology will follow ANSI N13.1-1069, 'Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities'." Based upon the stated title, this document is presumably referring to ANSI N13.1 (1999), and the "1069" designation appears to be a misprint. There are two versions of N13.1 (1969 and 1999), and clarification should be provided on whether the 1969 or 1999 version of N13.1 is actually being used. The selection of this document should also be described in the DP. Since this is a newly constructed process, it would seem that the 1999 revision is appropriate. Usage of an older standard (1969) would necessitate some discussion on why that version was deemed acceptable instead of the revised (1999) version. 1. There needs to be a particulate removal device prior to the charcoal. Otherwise, the charcoal will be plugged by the particulates. 2. A composite sample needs to be pulled off and passed through a HEPA filter and a charcoal adsorber and both need to be analyzed to release from the exhaust. It is not clear to me that performance of a gross beta will result in a determination of the amount of Tc-99. Not sure about the gross α being able to determine uranium either. 3. The composite sample collected on the HEPA filter and charcoal adsorber should be determine the amount of radioactivity analyzed weekly for Tc-99 and uranium and the other ROCs. 4. What good is sampling the effluent after the gross α and the gross β have indicated the effluent exceeded the 10% of annual effluent limit. The proverbial horse is already out of the barn. 5. The proposed revision to DP Section 12.3.4 is insufficient. The revision should include the additional details provided under discussion points, should address the items noted above.	ANSI N13.1-1999. The inlet to the sampler will be located after air treatment is complete. A portion of the soil requiring SVE treatment will require heating the soil. To confirm that that heating does not volatilize radionuclides, the sampling will include a charcoal adsorber sampler to account for gaseous radioactivity until sufficient data is gathered to confirm no gaseous radiological releases. This charcoal absorber sample will be in addition to the particulate sample. The frequency of changing the sample media is weekly when the SVES is in operation to allow for actions to be taken as necessary to ensure the annual limit and annual ALARA constraint per 10 CFR 20.1101(d) are met. The following analysis of air samples is consistent with Regulatory Guide 4.16 and SNM-33. The air samples will be analyzed for gross alpha and beta radioactivity for operations without added heat and isotopic analysis for operation with added heat. If a gross alpha or beta radioactivity result exceeds an Investigation Level, then the same sample will also be sent for laboratory analysis for isotopic analysis. The effluent release limits in DP Chapter 11 are based on Column 1 of Table 2 of Appendix B of 10 CFR 20, using Th-234 for beta radioactivity and uranium for alpha radioactivity; Th-234 is conservative for Tc-99 and accounts for uranium daughters. Results of sampling will be used to demonstrate compliance with the effluent limits of Chapter 11 of the Decommissioning Plan. See the additional information for RAI 11 in the matrix for DP Chapter 11 on how Pb-210 is addressed by the air effluent limit established in DP Chapter 11. Sampling for VOC Emissions. At air sampling ports located upstream and downstream of the activated carbon will be used to collect air samples on a daily basis for analysis during operation of the SVE System. The samples will be analyzed by a photo-ionization detector (PID) for volatile organics (perchloroethylene, trichloroethylene and vinyl chloride). If the PID indicates the sample from the post-activated carbon sample port has concentrations of VOCs at 50 percent or more of the effluent release limits, then additional analysis for volatile organics will be performed according to, EPA Method TO-1 Method for the Determination of VOC in Ambient Air Using TENAX Adsorption and Gas Chromotography/Mass Spectrometry (GC/MS).	condensate trap, heat exchanger, condensate filter separator (condensate set to water treatment system), HEPA filter, and vapor phase activated carbon filter. Sampling for Radioactive Emissions. • During SVE operations, a representative sample will be collected using a continuous sampler and a method consistent with ANSI N13.1-1999. • The sampling media will include a charcoal adsorber in addition to the particulate filter to account for any radioactivity not collected on the particulate filter. The charcoal medium will be used until sufficient data are compiled to conclude that airborne radioactivity is not in a form requiring collection on a charcoal filter. • The sample media will be analyzed weekly. Analysis for gross alpha and beta radioactivity will be used during for operations without added heat and isotopic analysis will be used for operation with added heat. If a gross alpha or beta radioactivity result exceeds an Investigation Level, then the same sample will also be submitted for isotopic analysis. Sampling for VOC Emissions. • Daily grab samples at ports upstream and downstream of the activated carbon filter during operation of the SVE System. • Analyzed by a photo-ionization detector (PID) for volatile organics (perchloroethylene, trichloroethylene and vinyl chloride). If the PID indicates the sample from the post-activated carbon sample port has concentrations of VOCs at 50 percent or more of the effluent release limits, then additional analysis for volatile organics will be performed according to, EPA Method TO-1 Method for the Determination of VOC in Ambient Air Using TENAX Adsorption and Gas Chromatography/Mass Spectrometry (GC/MS).

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Appendix A

The construction and design of the Soil Vapor Extraction System (SVES) is intended to meet the requirements of accumulation units. The accumulation units are specifically designed to meet the regulatory definition of a tank as a condition of the exemptions under 40 CFR 266.230 for LLMW and under 40 CFR 262.34 for hazardous waste. The soil accumulation/treatment units will be designed, constructed, and operated to meet the applicable requirements for tanks and tank systems under 40 CFR 265.

Soil treatment will be conducted in specially constructed cells that meet the regulatory definition of a tank, with existing concrete or asphalt pavement serving as the base (and secondary liner) and concrete barriers serving as the structural sidewalls. The tanks will be lined and covered with flexible membrane liner material and outfitted for collection of liquids. A soil pile will be constructed in the tank using a series of three soil lifts that will be between 2-3 feet in thickness. Air distribution piping will be placed between the lifts as the soil pile is created.

Soil for treatment will be identified and segregated during excavation activities. Identification of VOC impacted soil will be through the use of photoionization detectors (PIDs) or flame ionization detectors (FIDs). The VOC impacted areas will be demarcated with flagging or other visual markers. The soil will then be excavated and accumulated separately from the non-VOC impacted soils. This soil will then be transported to the SVES where the soil pile will be constructed.

Treatment of soil for VOCs is by air and negative pressure that draws off the VOCs. VOC-impacted soils that are determined to be hazardous or Low Level Mixed Waste, the SVES will be operated by blowing ambient air through the pile, while pulling a sufficient volume of air to maintain a vacuum on the system. The purpose of this treatment is to achieve waste acceptance criteria for the disposal of materials offsite. VOC-impacted soils that meet the reuse DCGL and are determined not to be RCRA hazardous, heated air may be used to remove the VOCs. The purpose of this treatment is to reduce the levels of VOC impacts to below the Remediation Goals (RGs) so the soil can be reused as backfill material.

To operate the system using heat, treatment air is injected into the soil pile at a temperature ranging from ambient to 750 degrees Fahrenheit (ºF). Depending on the soil conditions, the soil temperature will vary, with a range of 150ºF and 450ºF. The soil is treated at these conditions until the levels of volatile contaminates are reduced to the RGs. It is anticipated that the RGs will be accomplished in 4 to 7 days during typical spring through fall temperatures. If treatment is done during winter months the time may increase to 14 days. The system is operated 24 hours a day until treatment is complete.

Treatment air exiting the soil pile will be moist, contain VOCs, and have a maximum of ~250 ºF. A high performance centrifugal blower is used to draw the treatment air through its process pathway. This centrifugal blower has a manually-adjusted inlet damper that varies the air flow from 1000 to 3500 cfm, as needed.

The initial stage of processing the treatment air is a Condensate Separator. This Condensate Separator consists of two 10" corrosion-resistant hose and galvanized pipe runs to result in VOC bearing condensate from the treatment air, and initial cooling to ~150 ºF of the treatment air. The VOC bearing condensate is drained to a collection tote or drum.

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The next stage of processing the treatment air is the Air-to-Air Heat Exchanger. The treatment air is cooled to ~100 ºF and the additional VOC bearing condensate is drained to a collection tote or drum. The secondary side of the Air-to-Air Heat Exchanger is cooled by an ambient air blown through it. The secondary side air has no direct contact with the treatment air. The secondary side air is discharged to atmosphere.

The next stage of processing the treatment air is a condensate filter separator. This condensate filter separator is partially filled with packing material, such as glass spheres, to provide significantly increased surface area that further improves the removal of the VOC contaminants. The VOC bearing condensate is drained to a collection tote or drum. All collected condensate will be processed through the Water Treatment System prior to discharge.

The next stage of processing the treatment air is filtered by HEPA Filters. The HEPA filters are 24"x30" in size with efficiency of 99.97 percent for 0.3 micron particles. One filter is used for air flows up to 1750 cfm and two are used in parallel for flows 1750-3000 cfm. Pressure gauges either side of the HEPA Filters provide indication of the need for replacement due to loading.

The final stage of processing the treatment air is through the vapor phase activated carbon. The activated carbon is the final polishing of the effluent and will remove remaining VOC is the exhaust air.

ATTACHMENT 9

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 13

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
13-1a	Flow of Hematite QA/QC Requirements into Vendor Laboratory QA Requirements	Provide explanation of how WEC requirements flow through to the vendor laboratory.	Through the Purchase Order to vendor laboratories, Westinghouse imposes flow through requirements on the vendor laboratory to assure analysis of sampled material results in acceptable quality data packages.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
13-1b	WEC determination of the acceptability of the vendor laboratory data packages	Provide explanation of how WEC determines the acceptability of the vendor laboratory's data packages.	The contract laboratory performs data review, verification, and reporting in accordance with approved standard operating procedures (SOPs). In accordance with these SOPs, analytical data is reviewed by the analyst performing the task, followed by a secondary review by a department supervisor/lead analyst or their designee, and then review by the associated project manager. The vendor QA department performs an independent random review as oversight of the process. This review is documented on a data review checklist specific to each analytical method. Following receipt of laboratory data, HDP staff perform a data review to assess the validity of the data for use in the final status survey. This review includes an evaluation of the data to ensure that that all of the data quality objectives (DQOs) have been met.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.

ATTACHMENT 10

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Chapter 14

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

DRAFT

RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
14-1a	Exclusion of Np-237 as a significant radionuclide and utilization of the Excavation DCGL as opposed to the Deep or Uniform in determining the contribution for Np-237.	Addressed by Chapter 5, RAI No. 9. "Westinghouse will provide formal transmittal of the Attachment 14 revision to RAI HDPC-14-1."	Addressed by the Westinghouse response to Chapter 5, RAI No. 9. "Westinghouse will provide formal transmittal of the Attachment 14 revision to RAI HDPC-14-1."	Resolution of NRC comments on DP Chapter 5, RAI No. 9, will also resolve this comment. This comment does not require its own resolution.
14-1b	Utilization of negative values in determining the average value for Np-237.	Provide additional details on the calculation of the mean values presented in the Table of the RAI response. Explain whether the mean values were determined from results greater than MDC only or did they include all samples analyzed. If the latter, discuss what values were used for measurements below MDC. Confirm if negative values were used in determining the average. Justify the use of negative values in determining the average by clarifying the guidance that was followed to incorporate the negative values.	Westinghouse will provide a copy of the spread sheet used to develop the mean values. This spreadsheet was recently revised in response to the initial set of RAIs. Westinghouse used all reported analytical values in this calculation (including negative and < MDC values). Since the concentration of Np-237 is near zero, values reported as negative are not unexpected. Inclusion of these values provides an accurate measure of the central tendency of the Np-237 distribution. It should be noted that when calculating the necessary adjustment to account for the dose of this insignificant radionuclide, the difference between including and excluding the negative values is 0.93 versus 0.92. Guidance which addresses the inclusion of negative values are as follows: Section 2.3.5 of MARSSIM addresses the use of < MDC and negative data and indicates that such data can be used in statistical tests. *Even negative results and results with large uncertainties can be used in the statistical tests to demonstrate compliance.* Section 18.6.5 of MARLAP also addresses the reporting of negative results. In this section it is stated: *Many factors influence the evaluation of negative results. The simplest case occurs when the background measurement is unbiased and both the gross counts and background counts are high enough that the distribution of the net count rate is approximately normal. In this case, normal statistics can be used to determine whether a negative result indicates a problem. For example, if a sample contains zero activity, there is a very small probability of obtaining a net count rate more than two-and-a-half or three standard deviations below zero (i.e., negative value). Since the combined standard uncertainty is an estimate of the standard deviation, a result that is less than zero by more than three times its combined standard uncertainty should be investigated. In fact, if a blank sample is analyzed using an unbiased measurement process, negative results can be expected about 50 percent of the time. As long as the magnitudes of negative values are comparable to the estimated measurement uncertainties and there is no discernible negative bias in a set of measurements, negative results should be accepted as legitimate data and their uncertainty should be assessed. On the other hand, if a sample activity value is far*	In conjunction with this matrix table, Westinghouse provides a copy of the spreadsheet used to develop mean values used to determine insignificant radionuclide contribution.

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
			below zero, there may be a reason to investigate the result. A large percentage of negative results may also indicate a problem, even if all of the results are near zero. When instrument backgrounds are extremely low, statistics based on a normal distribution may not be appropriate (Chapter 19). Section 3.2.2.2 of EPA G-9 (Data Quality Assessment, Statistical Methods for Practitioners), also provides guidance on the use of negative data: *If possible, results should be recorded with sufficient accuracy so that a large number of tied values do not occur. Estimated concentrations should be reported for data below the detection limit, even if these estimates are negative, as their relative magnitude to the rest of the data is of importance. If this is not possible, substitute the value DL/2 for each value below the detection limit providing all the data have the same detection limit.* Section 6.2 (footnote 2) of NUREG 1505 (A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys) provides the following guidance on the use of negative values: *All actual measurement results (with an associated uncertainty) should be reported, even if they are negative, so that unbiased estimates of averages can be calculated.*	
14-2	Lack of concrete core samples from the buildings which will remain.	Westinghouse has committed to develop volumetric DCGLs if the need arises in response to Chapter 5 RAI No. 17 Resolution Table.	This issue is addressed in the Westinghouse response to Chapter 5 RAI additional question No. 17.	Resolution of NRC comments on DP Chapter 5, RAI No. 179, has also resolved this comment. This comment does not require its own resolution.
14-3a	Use of U-235 as a surrogate for Tc-99. (Same issue as burial pit 20.2002)	Revise response with a commitment to sample for Tc-99.	Westinghouse has addressed this issue in correspondence HEM-10-80, "Response to Request for Additional Information Concerning Hematite Decommissioning Plan: Characterization Report and Surrogate Report", submitted to the NRC on July 30, 2010. Westinghouse states the following in the last sentence of the response to RAI Question No. 3: *"To confirm that the amount of Tc-99 as residual radioactivity is accurately quantified, HDP intends to analyze for Tc-99 in all samples taken for demonstrating compliance with the dose-based unrestricted release criteria during FSS."* Westinghouse will revise the DP to clarify that the U-235 adjusted DCGLs are prohibited from use during final status survey to demonstrate compliance with the dose criteria.	Westinghouse will add the following to the end of DP Section 14.1.4.3.1: *Surrogate relationships have been developed for Tc-99 and U-234 and are presented in Sections 14.1.4.3.2 and 14.1.4.3.3, respectively. However, the Tc-99 surrogate relationship is prohibited from use in the evaluation of analytical results to determine compliance with the final status survey dose criteria Instead of a surrogate relationship, laboratory analysis for Tc-99 will be performed for all FSS samples.* Westinghouse will add the following to the beginning of DP Section 14.1.4.3.5: *The application of the modified U-235 values (and associated total uranium values) from Table 4-19 is restricted to survey design (evaluation of scan sensitivity) and excavation control (remedial action support surveys). Laboratory analysis for Tc-99 will be performed on all final status survey samples and as such, the adjusted U-235 DCGL values shown in Tables14-4, 14-9, and 14-10 are prohibited from use to demonstrate compliance with the final status survey dose criteria.* Westinghouse will delete DP Section 14.1.5.1.3. Westinghouse will revised the third paragraph of Section 14.4.3.1.10 as follows:

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<table>
<tr><th>RAI No.</th><th>Issues</th><th>Path Forward</th><th>Discussion Points</th><th>Proposed Resolution</th></tr>
<tr><td></td><td></td><td></td><td></td><td>First, a modification to the shift (Δ) is required (Equation 14-20). In all cases, the $DCGL_W$ will simply be equal to unity (1) due to measuring multiple ROCs. When it is desired to set the value of the LBGR to the mean concentration in the survey unit, Equation 14-22 will be used to calculate the $LBGR_{SOF}$, normalized to unity, by using the average concentration for each ROC. It is unlikely that the areas of the survey unit at Root stratum and Deep stratum conditions will be equal and therefore the average concentration level in each area will need to be weighted. Also, if actual Tc-99 concentrations are not included in the data set that will be used to determine sample size, then the modified U-235 soil $DCGL_W$ values (Table 14-9), which account for the presence of Tc-99, will be used. The following equation defines this calculation of $LBGR_{SOF}$.

Westinghouse will add to footnote ‘b’ of Table 14-4 and to footnote ‘a’ of Table 14-9 the following: “Values of U-235 DCGLs adjusted for Tc-99 are prohibited from use to demonstrate compliance with the final status survey dose criteria.”

Westinghouse will revise the title of DP Table 14-10 to read, “…for Survey Design and Remedial Action Support.”</td></tr>
<tr><td>14-3b</td><td>Sampling for Tc-99.</td><td>Provide a flow chart depicting when & where sampling for Tc-99 will occur and describe if or how Westinghouse will be performing scans to identify the presence of Tc-99.</td><td>With respect to sampling for Tc-99, Westinghouse provides the following table in lieu of a flowchart since the information being requested is better suited to a table format.

<table>
<tr><th colspan="3">Minimum Laboratory Analysis Methods for Tc-99</th></tr>
<tr><th>Work Activity</th><th>Sample Purpose</th><th>Analysis Method</th></tr>
<tr><td rowspan="5">Remediation Phase</td><td>NCS Samples</td><td>Gamma Spec</td></tr>
<tr><td>Remedial Action Support Survey</td><td>Gamma Spec</td></tr>
<tr><td>Reuse Material Sample</td><td>Gamma Spec and Tc-99</td></tr>
<tr><td>USEI Waste Sample</td><td>Gamma Spec and Tc-99</td></tr>
<tr><td>Waste Sample (other disposal facility)</td><td>Gamma Spec</td></tr>
<tr><td>Supplemental Characterization (as needed)</td><td>Characterization Sample</td><td>Gamma Spec
Or
Gamma Spec and Tc-99</td></tr>
<tr><td>Final Status Survey Phase</td><td>FSS Sample</td><td>Gamma Spec and Tc-99</td></tr>
</table>

With respect to scans to identify the presence of Tc-99, Westinghouse will use the approach outlined in Westinghouse letter HEM-10-80, dated July 30, 2010. The surrogate relationship between U-235 and Tc-99 allows conventional radiological instrumentation to perform scan surveys during Final Status Survey. These scans will rely on the use of a conservative U-235: Tc-99 ratio from DO-08-008 to adjust the U-235 $DCGL_{EMC}$ to account for Tc-99. Where the scan sensitivity based on the ratio is insufficient (e.g., the TSA SEA), adjustments to the sample size will be made in accordance with</td><td>Westinghouse has provided clarifying information in the Discussion Points. No further action required.</td></tr>
</table>

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
			MARSSIM protocol (as described in Section 14.4.3.1.11).	
14-4a	ProUCL tests used to classify areas as non-impacted for certain nuclides and measurements of nuclides for compliance purposes.	Resolution of Chapter 5, RAI No. 1 should address this issue.	This issue is being addressed in the Westinghouse response to Chapter 5 RAI additional question No. 1.	Resolution of NRC comments on DP Chapter 5, RAI No. 1, will also resolve this comment. This comment does not require its own resolution.
14-4b	Failure to categorize areas downstream of Joachim Creek with activities > background as impacted area subject to Class 3 considerations, as a minimum and the failure to extend the impacted area of the creek to the site boundary.	Include downstream areas of Joachim Creek as impacted, Class 3 areas or provide justification for not including them as impacted.	Westinghouse re-evaluated the data in Table 4-12 of the Hematite Radiological Characterization Report (HRCR), HRCR Figure 4-6, and Figure 14-11 from the Decommissioning Plan (DP) and. For convenience, the attached Figure1 superimposes these two figures together. The review of Joachim Creek for potential impacts starts where the Site Creek enters Joachim Creek. This is because of Site discharges into the Site Pond and the Site Creek. There are no mechanisms for Site impacts to Joachim Creek upstream of where the Site Creek enters Joachim Creek. In reviewing the sample data in HRCR Table 4-12, Westinghouse identified that two sediment/soil samples from Joachim Creek are upstream of where the Site Creek enters Joachim Creek. These two sediment/soil samples are US-05-SS and SW-15-SS. The data for Sample SW-15-SS should be moved to the "Surface – Background Stream Sediment" part of HRCR Table 4-12. Based on these two upstream background values, the downstream sediment/soil sample results do not indicate the presence of residual contamination in the downstream areas of Joachim Creek. Westinghouse understands the potential effect of the Site Creek and Site Pond on Joachim Creek downstream of where the Site Creek enters Joachim Creek. It is for that reason in the HSA Westinghouse provided the following in section 6.2.1.7: "*Joachim Creek would be classified as non-impacted based on historical and characterization data; however, as described in the Hematite Radiological Characterization Report (Reference 4-4), an impacted (Class 3) buffer zone will be conservatively established along a short distance of the Joachim Creek up to the first radiological characterization sample location east of the confluence of the Site Creek.*" It is also why DP Figure 14-12 shows the impacted area of the site extending from the Site Pond, along the Site Creek, and continuing downstream along Joachim Creek for a short distance.	The data for Sample SW-15-SS will be moved to the "Surface – Background Stream Sediment" part of HRCR Table 4-12.
14-4c	Dismissing Quantile test results for uranium when assessing for impacted areas.	Provide detailed data used in the uranium comparison of non-impacted area to background.	This issue is being addressed in the Westinghouse response to Chapter 5 RAI additional question No. 1. Westinghouse has provided the requested data via an email (Davis to Hayes) dated 04/6/11.	Resolution of NRC comments on DP Chapter 5, RAI No. 1, and 4d below will also resolve this comment. This comment does not require its own resolution.
14-4d	Dissimilar characteristics for	Perform appropriate additional characterization to	Westinghouse has reviewed the analytical data from the surface and subsurface background	Westinghouse has provided clarifying information in the Discussion Points. No further

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<table>
<tr><th>RAI No.</th><th>Issues</th><th>Path Forward</th><th>Discussion Points</th><th>Proposed Resolution</th></tr>
<tr>
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<td>background and non-impacted areas (surface and subsurface inconsistent).

Utilization of a limited number of samples to evaluate a large non-impacted area.</td>
<td>provide smaller geographic-sized areas and to allow comparison of surface results to surface background and subsurface results to subsurface background.

There are numerous gamma spec samples showing activities above the proposed 2.4 pCi/g uranium threshold value. The MDC values are, in many cases, above this value as well. How are these gamma spec data useful in a comparison to the threshold value and in ultimately defining non-impacted areas? It is not clear that, as stated, “gamma spectroscopy data supports the same conclusion as that reached by the statistical evaluation performed on the alpha spectroscopy dataset.”</td>
<td>studies and has concluded that there is no significant difference between the two populations. A summary of the two data sets is provided below. Based on this conclusion, Westinghouse believes that the current characterization data is sufficient and additional characterization is not necessary.

<table>
<tr><th colspan="6">Comparison of Surface and Subsurface Background Data</th></tr>
<tr><th>Variable</th><th>Mean pCi/g</th><th>StDev pCi/g</th><th>Minimum pCi/g</th><th>Median pCi/g</th><th>Maximum pCi/g</th></tr>
<tr><td>U-234 surface</td><td>0.77</td><td>0.14</td><td>0.53</td><td>0.71</td><td>0.97</td></tr>
<tr><td>U-234 subsurface</td><td>0.81</td><td>0.088</td><td>0.66</td><td>0.83</td><td>0.92</td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>U-235 surface</td><td>0.043</td><td>0.020</td><td>0.017</td><td>0.041</td><td>0.070</td></tr>
<tr><td>U-235 subsurface</td><td>0.052</td><td>0.017</td><td>0.025</td><td>0.052</td><td>0.081</td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>U-238 surface</td><td>0.79</td><td>0.15</td><td>0.55</td><td>0.81</td><td>1.00</td></tr>
<tr><td>U-238 subsurface</td><td>0.84</td><td>0.12</td><td>0.63</td><td>0.82</td><td>0.99</td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>U_{tot} surface</td><td>1.6</td><td>0.30</td><td>1.1</td><td>1.5</td><td>2.0</td></tr>
<tr><td>U_{tot} subsurface</td><td>1.7</td><td>0.20</td><td>1.3</td><td>1.8</td><td>1.9</td></tr>
</table>
This dataset used both alpha spectroscopy results and gamma spectroscopy results for determining the statistical parameters for the populations. The alpha spectroscopy results were a relatively small subset of the much larger gamma spectroscopy dataset. For the non impacted area, there were 148 sample locations. Gamma spectroscopy data (U-235 and U-238) is available for all 148 locations, while alpha spectroscopy data is available for only 16 of these locations. Westinghouse has provided both alpha spectroscopy results and gamma spectroscopy results via an email (Davis to Hayes) dated 04/6/11.

The nature of the gamma spectroscopy data prevents a quantitative determination of the total uranium concentration (due to uncertainty in the predicted U-234 concentration associated with each individual sample) and as such, this data cannot be used in a statistical evaluation of the total uranium concentration as compared to the background area. However, the gamma spectroscopy data supports the same conclusion as that reached by the statistical evaluation performed on the alpha spectroscopy dataset

5/19/2011 Discussion

See additional information in item 4e, below.</td>
<td>action required.</td>
</tr>
<tr>
<td>14-4e</td>
<td>Westinghouse’s premise that the source of uranium in soil is due to airborne deposition and excludes the possibility</td>
<td>Provide the basis for excluding the potential burial of uranium materials.

It appears that all gamma spec data were excluded from the non-impacted area</td>
<td>The source of this comment is the second to the last paragraph in the response to RAI HDPC-14-Q5 in Westinghouse letter HEM-10-80, dated July 30, 2010. That paragraph contained a confusing analysis of data that resulted in an unintended implication about subsurface contamination.

That paragraph was to be part of DP Section 14.2.6, and states: “Lastly, the highest four total Uranium activity concentrations from the non-impacted area are from sub-surface</td>
<td>Westinghouse will replace the paragraph of DP Section 14.2.6 quoted in Discussions Points with the following:

Lastly, analysis of the uranium data from the non-impacted area where uranium was detected outside the error band of the MDC shows that only one sample, NB-71-01-SL, exceeded the background threshold value (BTV) of 2.4 pCi/g established in DP Section 4.3.5. Sample NB-71-01-SL had a result</td>
</tr>
</table>

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<table>
<tr><th>RAI No.</th><th>Issues</th><th>Path Forward</th><th>Discussion Points</th><th>Proposed Resolution</th></tr>
<tr>
<td></td>
<td>of uranium materials being buried</td>
<td>evaluation based upon the statement that “for any sample with at least one of the uranium isotopes greater than MDC+2σ, the total uranium result was compared to the background threshold value (BTV) of 2.4 pCi/g established in DP Section 4.3.5.” This point should be considered along with the previous 4a issue that gamma spec MDCs were above the proposed threshold.</td>
<td>samples at depths ranging from 4.5 to 9 feet. Based on the information provided in the HSA (e.g., historical use and aerial photographs), the most likely mode of contaminant transport would be air deposition on surface soil rather than placement below the ground surface. Therefore it is doubtful that the Uranium activity observed in these samples can be attributed to licensed activities.”

To provide a clearer analysis of data, the spreadsheet file “Uranium Non-impacted Data” (in Attachment 4 to this letter) was reviewed in preparing these discussion points. This spreadsheet data reflected responses to other NRC comments since the preparation of Westinghouse letter HEM-10-80 in July 30, 2010. To evaluate this data, each sample result for U-234, U-235 and U-238 was compared against that sample’s minimum detectable concentration plus its error (MDC+2σ). For any sample with at least one of the uranium isotopes greater than MDC+2σ, the total uranium result was compared to the background threshold value (BTV) of 2.4 pCi/g established in DP Section 4.3.5. Only one sample, NB-71-01-SL, exceeded the BTV. Sample NB-71-01-SL had a result of 2.6 pCi/g and was taken within the top 1 foot of soil. Thus, there is no data that implies the potential for burial of uranium materials. This single data point at the surface that exceeds the BTV is reasonable considering that the BTV is selected such that some non-impacted total uranium results would exceed it.

From the 5/19/11 conference call, it was understood that the underlying concern for RAI 14-4 is related to the amount and type of uranium data within a portion of the area designated as non-impacted, To resolve this concern, HDP will expand the size of the impacted area.

The boundary of the existing survey unit LSA-11-01 will be modified as illustrated in Attachment 2, and the size increased from 14,885 m^2 to 24,715 m^2. This will include fully encompass the area of characterization sample NB-71-01 which was noted in the NRC path forward, as well as the land area further to the northeast.

Additionally, a new Class 3 survey unit (LSA-11-02) will be defined along the southern edge of the active rail line as illustrated in Attachment 2. The included surface area of this survey unit will be 5,394 square meters.

While the boundary of LSA-11-02 will encompass the active rail line, the active rail line will not be surveyed or sampled as justified below; surveys and sampling will be limited to the 20 foot section of ground between the southern edge of the active rail line and the southern boundary of this survey unit. The random sampling locations that fall on the active rail line during survey design will be relocated to the southern edge of the railroad bed.

This approach for survey and sampling in this newly-defined survey unit is reasonable given the history, nature, and safety considerations of the active rail line. First, the rail has been in existence prior to the initial construction of the facility, thus the potential for subsurface contamination is very small. Second, the use of the rail line over time has served to fracture and compact the rail bed, resulting in a relatively impermeable surface. This compaction results in drainage of any precipitation (and radioactivity that may have been deposited by air deposition) to the edges of the rail bed. This is the area where the relocated samples will be collected, and thus these samples should actually be biased to the location of the greatest</td>
<td>of 2.6 pCi/g and was taken within the top 1 foot of soil. This single data point at the surface that exceeds the BTV is reasonable considering that the BTV is selected such that some non-impacted total uranium results would exceed it.

DP Figure 14-14 will be revised as attached. Other related DP figures showing impacted areas will be revised to be consistent with the attached figure.

In DP Table 14-16, the row for LSA-11 will be replaced with the following 2 rows for LSA-11.

<table>
<tr><th rowspan="2">Survey Area Code</th><th rowspan="2">Survey Area Description</th><th rowspan="2">Survey Unit Code</th><th rowspan="2">Survey Unit Description</th><th rowspan="2">Initial MARSSIM Class</th><th colspan="2">Area (m^2)</th><th rowspan="2">Figure No.</th></tr>
<tr><th>Floor Area</th><th>Total Area</th></tr>
<tr><td>LSA-11</td><td>East/Southeast Open Land Area</td><td>01</td><td>Section 1</td><td>3</td><td>N/A</td><td>24,715</td><td>14-14</td></tr>
<tr><td></td><td></td><td>02</td><td>Section 2</td><td>3</td><td>N/A</td><td>5,394</td><td>14-14</td></tr>
</table>

DP Section 14.2.5 will be revised as follows:

Activities with special nuclear materials (SNM) were conducted within an approximately 10-acre Central Tract area of the site. The Central Tract area is bounded by State Road P to the north, the land adjacent to east bank of the Northeast Site Creek, the Union-Pacific Railroad to the south and the Site Pond to the west. Approximately 3.8 acres along the Site Creek downstream to Joachim creek and along Joachim Creek to the location of sample SW-14-SS are considered potentially impacted based on site characterization data; and 7.1 acres to be used as a soil staging area near the Northeast Site Creek are expected to become impacted as result of the decommissioning activities. Additionally, a 20 foot wide area immediately south of the railroad in the central tract, an area west of the Site Pond, and an area between the Northeast site creek and the soil staging area are also considered as impacted (total of about 10.1 acres). The remaining portions of the 228-acre Hematite Site are considered to be non-impacted as illustrated on Figure 14-11.

A new DP Section 14.4.4.1.6.6 will be added as follows:

14.4.4.1.6.6 Active Rail Line

While the boundary of conceptual survey unit LSA-11-02 (Figure 14-14) will encompass the active rail line, the active rail line will not be surveyed or sampled as justified below; surveys and sampling will be limited to the 20 foot section of ground between the southern edge of the active rail line and the southern boundary of this survey unit. The random sampling locations that fall on the active rail line</td>
</tr>
</table>

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
			potential for contamination.	during survey design will be relocated to the southern edge of the railroad bed. This approach for survey and sampling in this newly-defined survey unit is reasonable given the history, nature, and safety considerations of the active rail line. First, the rail has been in existence prior to the initial construction of the facility, thus the potential for subsurface contamination is very small. Second, the use of the rail line over time has served to fracture and compact the rail bed, resulting in a relatively impermeable surface. This compaction results in drainage of any precipitation (and radioactivity that may have been deposited by air deposition) to the edges of the rail bed. This is the area where the relocated samples will be collected, and thus these samples should actually be biased to the location of the greatest potential for contamination.
14-6	Incomplete information on Westinghouse's buried piping calculation, and their intentions to perform further characterization during decommissioning	Provide details on the methods and technologies to be used for characterizing buried pipes during the decommissioning process and prior to the Final Status Survey. This question was meant as a follow up to the original RAI commitment that "HDP will provide buried piping survey methodology and technical support documentation for buried piping that is consistent with MARSSIM and NUREG-1757 guidance for NRC review and approval prior to Final Status Survey of buried piping." Please confirm when delivery of this documentation is expected.	Sanitary/Gray Water/Storm Drain Systems: Characterization surveys and sampling were performed in early 2010 (subsequent to DP submittal) via 14 manholes that are a part of the sanitary/gray water and storm drain lines, and also via a drain located in the southwest corner within Building 230 that ties into the storm drain system located south of Building 230. Removable contamination surveys and gamma radiation surveys were performed using a calibrated NaI 2 x 2 gamma detector or a calibrated Ludlum Model 19 micro-R meter. In 2 manholes, alpha/beta scintillation detectors were also used to obtain measurements of total contamination in pipes within the manholes. Sediment samples were collected in 6 of the 14 the manholes where sufficient sediment was present for sample collection. These samples were analyzed by gamma spectroscopy. Process Building Underground Piping: In late 2010, the Process Building underground piping was characterized by survey and sampling to support a determination of the appropriate nuclear criticality safety controls for removal or in-situ remediation, and to be used in developing safety requirements for the associated work plans. The investigation of the piping included the use of robotic crawlers, video scopes and push cameras to provide video of the piping internals, and provide a delivery mechanism for a gamma radiation detector for radiological surveys. The radiological surveys were performed using a calibrated DCA-3096-3 with an external probe option connected by 300 feet of cable. The DCA-3096-3 measures radiation field intensities of X-ray and gamma radiation and was used to determine if any sections of piping showed elevated gamma radiation levels. The results of these surveys were used to estimate the amount of U-235 and will serve as the basis for NCS control measures. The characterization of the piping also included collection of removable activity and/or sediments from the piping for analysis. The surveys and sampling were also performed in large sections of gray water; sanitary sewer lines and storm drain piping that are designated in DP Table 5-21 as pipes that may remain at license termination. Approximately 2,000 feet of piping was visually inspected and surveyed. Approximately 30 samples were sent to a laboratory and were analyzed for Tc-99 and for U-234, U-235 and U-238 using ICP Mass Spectroscopy. These characterization efforts provide sufficient information to plan the work activities for removal or remediation of the contaminated piping in a safe manner ensuring the protection of the work force and the environment. From a Final Status Survey planning perspective, no further characterization is needed to determine classification as any remaining piping will be	Westinghouse has provided the requested clarifying information in the Discussion Points. The remaining Westinghouse action is to submit for NRC review and approval of the method for final status surveys of piping as a prerequisite to implementation of final surveys of piping. To reflect this commitment, the following new sentence will be added to the end of Section 14.4: "The method for final status surveys of piping will be submitted for NRC review and approval, with approval received prior to implementation of final surveys of piping."

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
			designated as Class 1, with the exception of Public and Raw Water systems that have a negligible potential for contamination and have been designated as Class 3 for Final Status Survey.	
14-7	Westinghouse's basis for not reclassifying areas consistent with MARSSIM when survey data shows elevated concentrations.	Revise the RAI response and Chapter 14 of the DP to indicate that when a survey unit is misclassified in Class 2 or Class 3 areas, the area would be reclassified and a sufficient number of additional surveys will be completed in order to comply with the appropriate survey classification. If either a re-classification of the survey unit or the affected area of the unit occurs, then the release record should indicate such changes.	Westinghouse will revise DP Sections 14.4.1, 14.4.3.1.11, 14.4.3.6, and 14.6.1 to use words from MARSSIM. These text changes supersede the changes identified in the response to RAI HDPC-14-Q7 in Westinghouse letter HEM-10-80, dated 6/30/10.	The 12th full paragraph (i.e., not counting bullets) in DP Section 14.4.1 will be replaced with: *As a survey progresses, reevaluation of a survey unit classification may be necessary based on newly acquired survey data. For example, if contamination is identified in a Class 3 area, an investigation and reevaluation of that area should be performed to determine if the Class 3 area classification is appropriate. Typically, the investigation will result in part or all of the area being reclassified as Class 1 or Class 2. If survey results identify residual contamination in a Class 2 area exceeding the $DCGL_W$ or suggest that there may be a reasonable potential that contamination is present in excess of the $DCGL_W$, then an investigation should be initiated to determine if all or part of the area should be reclassified to Class 1 (see DP Section 14.4.3.6 for details).* The last sentence of the first paragraph in DP Section 14.4.3.1.11 will be replaced with: "*Instances where a measurement obtained in a Class 2 survey unit exceeds the $DCGL_W$ or a measurement obtained in a Class 3 survey unit exceeds 50 percent of the $DCGL_W$ will be evaluated for reclassification per DP Section 14.4.3.6.*" The second paragraph of DP Section 14.4.3.6 will be replaced with: *As a survey progresses, reevaluation of a survey unit classification may be necessary based on newly acquired survey data. An investigation should be initiated to determine if all or part of the area should be reclassified when:* • *Survey results identify residual contamination in a Class 2 area exceeding the $DCGL_W$ or suggest that there may be a reasonable potential that contamination is present in excess of the $DCGL_W$.* • *Survey results identify residual contamination in a Class 3 area exceeding 50 percent of the $DCGL_W$.* *Typically, the investigation will involve additional scan surveys and/or sampling and result in part or all of the area being reclassified as Class 1 or Class 2. If the investigation verifies a result exceeds the $DCGL_W$ in a Class 2 or Class 3, then the survey unit will require reclassification of all or part of the survey unit to Class 1. If the investigation verifies a result to be less than the $DCGL_W$ but greater than 50 percent of the $DCGL_W$ in a Class 3 survey unit, then the survey unit will require reclassification of all or part of the survey unit to Class 2. If the investigation fails to verify a result and the variability in population of the individual and average measurement results*

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
				with respect to the DCGL do not suggest the initial classification was inappropriate, then the survey unit will not be reclassified. *The investigation and the evaluation of the additional information will be thoroughly documented in the release record. If all or part of a survey unit is reclassified, then the reasons for the initial misclassification will be documented in the release record.* Westinghouse will replace the tenth bullet in DP Section 14.6.1 with: *"Changes from the FSS survey design including, but not limited to field changes, and reasons for survey unit reclassification (and the reasons for the initial misclassification)."*
14-9a	Apparent utilization of the indistinguishable from background tests as the primary, if not only, criterion for determining that certain areas are non-impacted (utilization for compliance purposes) when the utilization of the MARSSIM guidance in some areas would have resulted in these areas as being classified as "impacted".	If the results from the indistinguishable from background tests are actually used for compliance purposes, they are effectively being used for FSS purposes. NRC does allow the usage of characterization data for FSS purposes, but they must satisfy the quality objectives of the FSS. NUREG-1757, Vol. 2, Section 2.3 and Appendix O.2. To be addressed in the Resolution Table DP Chapter 5, RAI No. 1 to indicate that "the presence of both Ra-226 and Th-232 would be accounted for in all impacted areas during final status survey to demonstrate compliance with the dose criteria."	Westinghouse believes that this issue was addressed by Westinghouse's commitment to considering Ra-226 and Th-232 as radionuclides of concern in the identified impacted area at HDP (DP Figure 14-11). Westinghouse will revise the DP to clarify that the presence of both Ra-226 and Th-232 would be accounted for in all impacted areas during final status survey to demonstrate compliance with the dose criteria.	Resolution of NRC comments on DP Chapter 5, RAI No. 1, will also resolve this comment. This comment does not require its own resolution.
14-9b	Westinghouse's apparent utilization of Scenario B via the use of the "indistinguishable from background" methodology.	Westinghouse needs to re-evaluate their approach and possibly take more background samples to be consistent with Scenario B. If Scenario B is not going to be used, then sufficient justification must be in place to call areas non-impacted.	Westinghouse believes that this issue was addressed by Westinghouse's commitment to considering Ra-226 and Th-232 as radionuclides of concern in the identified impacted area at HDP (DP Figure 14-11). Westinghouse will revise the DP to clarify that the presence of both Ra-226 and Th-232 would be accounted for in all impacted areas during final status survey to demonstrate compliance with the dose criteria.	Resolution of NRC comments on DP Chapter 5, RAI No. 1, will also resolve this comment. This comment does not require its own resolution.

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
14-9c	Consideration of impacted areas on an area by area basis versus a point to point basis.	Westinghouse should clarify their intentions as there are statements in the response to RAI 5-Q1 stating that "Thorium-232 will only be included for demonstrating compliance in areas distinguishable from background or when an individual result exceeds the BTV." Once areas impacted by Th-232 are identified, Th-232 should be analyzed for compliance purposes in all samples from that area.	Westinghouse believes that this issue was addressed by Westinghouse's commitment to considering Ra-226 and Th-232 as radionuclides of concern in the identified impacted area at HDP (DP Figure 14-11). Westinghouse will revise the DP to clarify that the presence of both Ra-226 and Th-232 would be accounted for in all impacted areas during final status survey to demonstrate compliance with the dose criteria.	Resolution of NRC comments on DP Chapter 5, RAI No. 1, will also resolve this comment. This comment does not require its own resolution.

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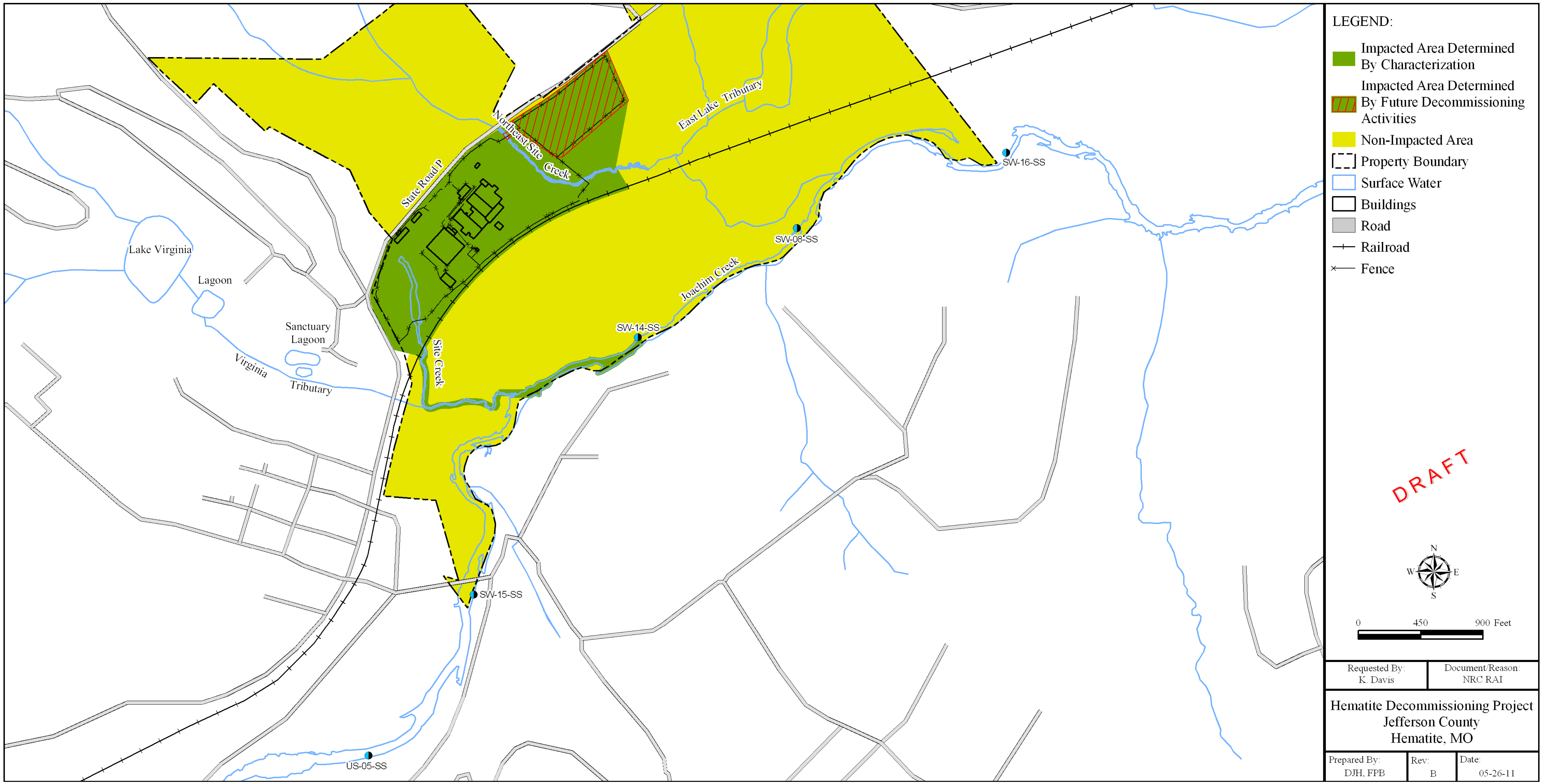
Figure 1. Sample Locations along Joachim Creek and Impacted Area



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DP Figure 14-14. Conceptual Open Land Survey Units

Insignificant Radionuclide	Average Concentration (pCi/g)	DCGL	Average SOF	Dose Contribution (mrem)
Am-241	5.1E-03	7.9E+01	6.4E-05	1.6E-03
Np-237 + D	2.0E-02	3.0E-01	6.8E-02	1.7E+00
Pu-239/240	1.6E-03	8.3E+01	2.0E-05	4.9E-04
		Total	6.8E-02	1.7E+00

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Insignificant Radionuclide	Average Concentration
Am-241	5.1E-03
Np-237	2.0E-02
Pu-239/240	1.6E-03

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
BD-09-00-SL	Surface	3.17E-02[a]	1.0E-02	2.1E-03	**3.17E-02**	**1.02E-02**	**2.11E-03**
BD-10-00-SL	Surface	3.8E+00	—[b]	—	**3.80E+00**	—[b]	—
BD-11-00-SL	Surface	1.7E+00	—	—	**1.66E+00**	—	—
BD-12-00-SL	Surface	1.9E+00	5.7E-02	7.9E-03	**1.94E+00**	5.66E-02	7.94E-03
BD-19-0.5-SL	Surface	1.0E-03	-6.7E-03	-1.8E-02	**1.00E-03**	**-6.70E-03**	**-1.80E-02**
BD-24-0.5-SL	Surface	5.0E-02	-6.0E-03	-3.0E-03	**5.00E-02**	**-6.00E-03**	**-3.00E-03**
BD-28-0.5-SL	Surface	-5.0E-03	1.7E-02	-8.0E-02	**-5.00E-03**	**1.70E-02**	**-8.00E-02**
BLD240-01-Fill	Surface	1.6E-01	—	—	**1.60E-01**	—	—
BLD240-03-Fill	Surface	7.0E-01	—	—	**7.00E-01**	—	—
BLD240-04-Fill	Surface	-1.0E-03	—	—	**-1.00E-03**	—	—
BLD253-02-Fill	Surface	6.0E-02	—	—	**6.00E-02**	—	—
BLD255-05-Fill	Surface	5.0E-01	—	—	**5.00E-01**	—	—
BLD260-06-Fill	Surface	0.0E+00	—	—	**0.00E+00**	—	—
BP-01-00-SL	Surface	4.5E-02	—	—	**4.49E-02**	—	—
BP-02-00-SL	Surface	-7.7E-02	—	—	**-7.68E-02**	—	—
BP-03-00-SL	Surface	2.6E-01	4.2E-02	7.1E-03	**2.60E-01**	4.21E-02	7.06E-03
BP-04-00-SL	Surface	1.0E-02	-8.8E-04	2.1E-03	**1.04E-02**	**-8.83E-04**	**2.07E-03**
BP-05-00-SL	Surface	-4.2E-02	—	—	**-4.18E-02**	—	—
BP-06-00-SL	Surface	7.8E-02	—	—	**7.81E-02**	—	—
BP-07-00-SL	Surface	5.7E-01	6.6E-02	6.8E-03	**5.66E-01**	6.60E-02	**6.76E-03**
BP-08-00-SL	Surface	-8.9E-02	—	—	**-8.90E-02**	—	—
BP-09-00-SL	Surface	1.4E-01	—	—	**1.36E-01**	—	—
BP-10-00-SL	Surface	1.7E-01	—	—	**1.68E-01**	—	—
BP-11-00-SL	Surface	-1.9E-01	—	—	**-1.88E-01**	—	—
BP-12-00-SL	Surface	-1.4E-01	—	—	**-1.43E-01**	—	—
CB-01-00-SL	Surface	-1.4E-01	1.2E-02	1.6E-03	**-1.42E-01**	**1.21E-02**	**1.63E-03**
DM-02-00-SL	Surface	2.9E+00	—	—	2.94E+00	—	—
DM-02-05-SL	Surface	1.3E-01	2.2E-02	-2.1E-03	**1.26E-01**	**2.15E-02**	**-2.08E-03**
DM-02-17-SL	Surface	-6.8E-01	—	—	**-6.77E-01**	—	—
DM-02-22-SL	Surface	1.0E-01	—	—	**1.01E-01**	—	—
DM-02-33-SL	Surface	5.3E-01	5.9E-03	-2.3E-03	**5.26E-01**	**5.90E-03**	**-2.26E-03**
DM-03-05-SL	Surface	1.6E-01	—	—	**1.58E-01**	—	—
DM-03-13-SL	Surface	4.0E-03	—	—	**4.03E-03**	—	—
DM-03-25-SL	Surface	-1.9E-02	—	—	**-1.85E-02**	—	—
DM-03-34-SL	Surface	2.3E-01	—	—	**2.29E-01**	—	—
EP-01-00-SL	Surface	8.6E-01	—	—	**8.59E-01**	—	—
EP-02-00-SL	Surface	9.1E-01	5.8E-01	3.0E-02	**9.10E-01**	5.84E-01	2.97E-02
EP-03-00-SL	Surface	2.3E-01	4.0E-02	4.0E-05	**2.26E-01**	4.03E-02	**4.00E-05**
EP-04-00-SL	Surface	3.1E+00	—	—	3.12E+00	—	—
EP-05-00-SL	Surface	5.7E-02	—	—	**5.73E-02**	—	—
EP-06-00-SL	Surface	1.0E+00	—	—	1.04E+00	—	—
EP-07-00-SL	Surface	9.2E-02	—	—	**9.15E-02**	—	—
EP-08-00-SL	Surface	1.2E-01	—	—	**1.19E-01**	—	—
EP-09-00-SL	Surface	3.0E-02	-6.2E-03	8.0E-03	**3.01E-02**	**-6.18E-03**	**7.98E-03**
EP-10-00-SL	Surface	1.8E+00	1.0E-01	4.5E-03	**1.80E+00**	1.03E-01	**4.50E-03**
EP-11-00-SL	Surface	-6.2E-02	5.3E-03	1.1E-02	**-6.15E-02**	**5.28E-03**	**1.05E-02**
EP-12-00-SL	Surface	3.9E-01	1.1E-02	4.5E-03	**3.89E-01**	**1.13E-02**	**4.53E-03**

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
FS-19-1-BIA-1-SO-1	Surface	4.0E-04	—	—	**4.00E-04**	—	—
FS-19-1-BIA-2-SO-1	Surface	4.9E-02	—	—	**4.90E-02**	—	—
FS-19-1-BIA-3-SO-1	Surface	-7.0E-02	—	—	**-7.00E-02**	—	—
FS-19-1-BIA-4-SO-1	Surface	-1.5E-02	—	—	**-1.50E-02**	—	—
FS-19-1-BIA-5-SO-1	Surface	-1.3E-01	—	—	**-1.30E-01**	—	—
FS-19-1-SYS-10-SO-1	Surface	-6.0E-03	—	—	**-6.00E-03**	—	—
FS-19-1-SYS-11-SO-1	Surface	4.0E-03	—	—	**4.00E-03**	—	—
FS-19-1-SYS-12-SO-1	Surface	3.2E-02	—	—	**3.20E-02**	—	—
FS-19-1-SYS-13-SO-1	Surface	8.0E-04	—	—	**8.00E-04**	—	—
FS-19-1-SYS-14-SO-1	Surface	-1.4E-02	—	—	**-1.40E-02**	—	—
FS-19-1-SYS-15-SO-1	Surface	9.0E-03	—	—	**9.00E-03**	—	—
FS-19-1-SYS-16-SO-1	Surface	-5.4E-02	—	—	**-5.40E-02**	—	—
FS-19-1-SYS-17-SO-1	Surface	1.2E-02	—	—	**1.20E-02**	—	—
FS-19-1-SYS-18-SO-1	Surface	3.6E-02	—	—	**3.60E-02**	—	—
FS-19-1-SYS-19-SO-1	Surface	-4.0E-03	—	—	**-4.00E-03**	—	—
FS-19-1-SYS-1-SO-1	Surface	1.1E-02	—	—	**1.10E-02**	—	—
FS-19-1-SYS-20-SO-1	Surface	4.0E-03	—	—	**4.00E-03**	—	—
FS-19-1-SYS-21-SO-1	Surface	-1.3E-02	—	—	**-1.30E-02**	—	—
FS-19-1-SYS-22-SO-1	Surface	6.0E-03	—	—	**6.00E-03**	—	—
FS-19-1-SYS-2-SO-1	Surface	1.4E-02	—	—	**1.40E-02**	—	—
FS-19-1-SYS-3-SO-1	Surface	1.5E-02	—	—	**1.50E-02**	—	—
FS-19-1-SYS-4-SO-1	Surface	1.6E-02	—	—	**1.60E-02**	—	—
FS-19-1-SYS-5-SO-1	Surface	-5.0E-03	—	—	**-5.00E-03**	—	—
FS-19-1-SYS-6-SO-1	Surface	1.2E-02	—	—	**1.20E-02**	—	—
FS-19-1-SYS-7-SO-1	Surface	-5.0E-05	—	—	**-5.00E-05**	—	—
FS-19-1-SYS-8-SO-1	Surface	-4.9E-02	—	—	**-4.90E-02**	—	—
FS-19-1-SYS-9-SO-1	Surface	3.5E-02	—	—	**3.50E-02**	—	—
FS-19-2-SYS-01-SO-1	Surface	-4.0E-02	—	—	**-4.00E-02**	—	—
FS-19-2-SYS-02-SO-1	Surface	3.0E-04	—	—	**3.00E-04**	—	—
FS-19-2-SYS-03-SO-1	Surface	8.0E-03	—	—	**8.00E-03**	—	—
FS-19-2-SYS-04-SO-1	Surface	2.5E-02	—	—	**2.50E-02**	—	—
FS-19-2-SYS-05-SO-1	Surface	1.6E-02	—	—	**1.60E-02**	—	—
FS-19-2-SYS-06-SO-1	Surface	-1.2E-02	—	—	**-1.20E-02**	—	—
FS-19-2-SYS-09-SO-1	Surface	9.0E-03	—	—	**9.00E-03**	—	—
FS-19-2-SYS-10-SO-1	Surface	6.0E-04	—	—	**6.00E-04**	—	—
FS-19-2-SYS-11-SO-1	Surface	9.0E-03	—	—	**9.00E-03**	—	—
FS-19-2-SYS-12-SO-1	Surface	8.0E-03	—	—	**8.00E-03**	—	—
FS-19-2-SYS-13-SO-1	Surface	3.8E-02	—	—	**3.80E-02**	—	—
FS-19-2-SYS-14-SO-1	Surface	3.0E-03	—	—	**3.00E-03**	—	—
FS-19-2-SYS-15-SO-1	Surface	9.0E-03	—	—	**9.00E-03**	—	—
FS-19-2-SYS-16-SO-1	Surface	-1.4E-02	—	—	**-1.40E-02**	—	—
FS-19-2-SYS-17-SO-1	Surface	-1.4E-02	—	—	**-1.40E-02**	—	—
FS-19-2-SYS-18-SO-1	Surface	2.5E-02	—	—	**2.50E-02**	—	—
FS-19-2-SYS-19-SO-1	Surface	-1.8E-02	—	—	**-1.80E-02**	—	—
FS-19-2-SYS-20-SO-1	Surface	-1.5E-02	—	—	**-1.50E-02**	—	—
FS-19-2-SYS-21-SO-1	Surface	1.1E-02	—	—	**1.10E-02**	—	—
FS-19-2-SYS-22-SO-1	Surface	1.5E-02	—	—	**1.50E-02**	—	—
FS-19-2-SYS-7-SO-1	Surface	-1.4E-02	—	—	**-1.40E-02**	—	—
FS-19-2-SYS-8-SO-1	Surface	-4.0E-03	—	—	**-4.00E-03**	—	—
LF-01-00-SL	Surface	-1.1E-01	—	—	**-1.10E-01**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
LF-02-00-SL	Surface	1.4E-02	—	—	**1.43E-02**	—	—
LF-03-00-SL	Surface	4.0E-02	—	—	**4.03E-02**	—	—
LF-04-00-SL	Surface	3.0E-01	—	—	**2.99E-01**	—	—
LF-05-00-SL	Surface	2.6E-02	—	—	**2.59E-02**	—	—
NB-10-00-SL	Surface	-9.8E-02	—	—	**-9.80E-02**	—	—
NB-102-0.5-SL	Surface	-1.5E-02	3.5E-02	-5.8E-03	**-1.50E-02**	3.50E-02	**-5.80E-03**
NB-104-0.5-SL	Surface	1.5E-01	2.4E-02	3.4E-02	**1.50E-01**	**2.40E-02**	**3.40E-02**
NB-107-0.5-SL	Surface	-6.0E-02	7.0E-04	-2.4E-02	**-6.00E-02**	**7.00E-04**	**-2.40E-02**
NB-108-0.5-SL	Surface	5.0E-02	6.0E-03	1.1E-02	**5.00E-02**	**6.00E-03**	**1.10E-02**
NB-109-0.5-SL	Surface	7.0E-02	3.9E-02	6.0E-04	**7.00E-02**	**3.90E-02**	**6.00E-04**
NB-110-0.5-SL	Surface	7.0E-02	-1.4E-02	3.0E-03	**7.00E-02**	**-1.40E-02**	**3.00E-03**
NB-11-00-SL	Surface	6.4E-02	2.6E-03	1.2E-02	**6.38E-02**	**2.56E-03**	**1.20E-02**
NB-111-0.5-SL	Surface	1.0E-02	-1.0E-02	-9.0E-03	**1.00E-02**	**-1.00E-02**	**-9.00E-03**
NB-116-0.5-SL	Surface	9.0E-02	-1.1E-02	-2.0E-03	**9.00E-02**	**-1.10E-02**	**-2.00E-03**
NB-118-0.5-SL	Surface	3.0E-02	-6.0E-03	5.0E-03	**3.00E-02**	**-6.00E-03**	**5.00E-03**
NB-119-0.5-SL	Surface	3.0E-02	1.5E-02	-9.0E-03	**3.00E-02**	**1.50E-02**	**-9.00E-03**
NB-120-0.5-SL	Surface	-2.0E-02	0.0E+00	4.4E-02	**-2.00E-02**	**0.00E+00**	**4.40E-02**
NB-12-00-SL	Surface	1.3E-02	-2.9E-03	7.1E-03	**1.33E-02**	**-2.92E-03**	**7.12E-03**
NB-122-0.5-SL	Surface	1.1E-02	7.0E-03	-1.2E-02	**1.10E-02**	**7.00E-03**	**-1.20E-02**
NB-123-0.5-SL	Surface	1.0E-01	7.0E-03	-4.0E-03	**1.00E-01**	**7.00E-03**	**-4.00E-03**
NB-124-0.5-SL	Surface	-1.0E-02	1.0E-03	2.1E-02	**-1.00E-02**	**1.00E-03**	**2.10E-02**
NB-125-0.5-SL	Surface	5.0E-02	1.0E-02	-4.0E-03	**5.00E-02**	**1.00E-02**	**-4.00E-03**
NB-126-0.5-SL	Surface	-6.0E-02	8.0E-03	-1.5E-02	**-6.00E-02**	**8.00E-03**	**-1.50E-02**
NB-128-0.5-SL	Surface	1.6E-02	1.0E-02	1.7E-02	**1.63E-02**	**1.00E-02**	**1.70E-02**
NB-129-0.5-SL	Surface	-2.0E-02	2.7E-02	-1.0E-02	**-2.00E-02**	**2.70E-02**	**-1.00E-02**
NB-130-0.5-SL	Surface	-4.0E-02	-1.0E-02	0.0E+00	**-4.00E-02**	**-1.00E-02**	**0.00E+00**
NB-13-00-SL	Surface	6.9E-02	—	—	**6.86E-02**	—	—
NB-131-0.5-SL	Surface	1.8E-02	1.1E-02	-2.0E-03	**1.80E-02**	**1.10E-02**	**-2.00E-03**
NB-134-0.5-SL	Surface	1.0E-02	1.1E-02	2.8E-02	**1.00E-02**	**1.10E-02**	**2.80E-02**
NB-135-0.5-SL	Surface	-3.0E-02	6.0E-04	1.8E-02	**-3.00E-02**	**6.00E-04**	**1.80E-02**
NB-136-0.5-SL	Surface	2.0E-02	-3.6E-03	1.1E-02	**2.00E-02**	**-3.60E-03**	**1.10E-02**
NB-137-0.5-SL	Surface	1.0E-02	5.0E-03	-1.3E-02	**1.00E-02**	**5.00E-03**	**-1.30E-02**
NB-138-0.5-SL	Surface	-1.2E-02	-5.0E-03	-5.0E-03	**-1.20E-02**	**-5.00E-03**	**-5.00E-03**
NB-139-0.5-SL	Surface	1.0E-01	5.0E-03	-3.0E-03	**1.00E-01**	**5.00E-03**	**-3.00E-03**
NB-140-0.5-SL	Surface	3.0E-02	6.0E-04	1.5E-02	**3.00E-02**	**6.00E-04**	**1.50E-02**
NB-14-00-SL	Surface	-6.3E-01	1.6E-03	-1.7E-03	**-6.27E-01**	**1.56E-03**	**-1.73E-03**
NB-141-0.5-SL	Surface	8.0E-03	-9.6E-03	-7.2E-03	**8.00E-03**	**-9.60E-03**	**-7.20E-03**
NB-142-0.5-SL	Surface	5.0E-02	-8.8E-03	2.0E-02	**5.00E-02**	**-8.80E-03**	**2.00E-02**
NB-143-0.5-SL	Surface	8.0E-02	1.3E-02	1.3E-02	**8.00E-02**	**1.30E-02**	**1.30E-02**
NB-144-0.5-SL	Surface	-8.0E-03	6.8E-02	-2.6E-02	**-8.00E-03**	**6.80E-02**	**-2.60E-02**
NB-15-00-SL	Surface	3.7E-01	—	—	**3.68E-01**	—	—
NB-20-00-SL	Surface	1.2E-02	—	—	**1.18E-02**	—	—
NB-21-00-SL	Surface	9.3E-02	—	—	**9.26E-02**	—	—
NB-88-0.5-SL	Surface	-4.0E-03	9.0E-04	1.1E-02	**-4.00E-03**	**9.00E-04**	**1.10E-02**
NB-89-0.5-SL	Surface	6.9E-02	3.6E-02	6.0E-03	**6.90E-02**	**3.60E-02**	**6.00E-03**
NB-91-0.5-SL	Surface	-4.0E-03	2.1E-02	-3.7E-03	**-4.00E-03**	**2.10E-02**	**-3.70E-03**
NB-93-0.5-SL	Surface	3.5E-02	5.0E-03	6.0E-04	**3.50E-02**	**5.00E-03**	**6.00E-04**
NB-96-0.5-SL	Surface	3.0E-03	-5.0E-03	6.0E-04	**3.00E-03**	**-5.00E-03**	**6.00E-04**
NB-97-0.5-SL	Surface	-9.0E-02	-7.5E-03	9.0E-03	**-9.00E-02**	**-7.50E-03**	**9.00E-03**

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
NB-98-0.5-SL	Surface	-6.0E-02	-7.5E-03	2.9E-02	**-6.00E-02**	**-7.50E-03**	**2.90E-02**
OA-01-00-SL	Surface	-2.5E-02	1.6E-02	1.4E-02	**-2.46E-02**	**1.60E-02**	1.44E-02
OA-02-00-SL	Surface	1.4E-01	1.0E-02	5.0E-03	**1.35E-01**	**1.01E-02**	**5.03E-03**
OA-03-00-SL	Surface	-2.9E-01	—	—	**-2.92E-01**	—	—
OA-04-00-SL	Surface	-1.8E+00	—	—	**-1.77E+00**	—	—
OA-05-00-SL	Surface	6.2E-02	—	—	**6.24E-02**	—	—
OA-06-00-SL	Surface	-1.8E-02	—	—	**-1.76E-02**	—	—
OA-07-00-SL	Surface	1.0E-01	3.3E-03	1.1E-03	**1.03E-01**	**3.31E-03**	**1.13E-03**
OA-08-00-SL	Surface	9.8E-01	1.8E-02	6.3E-03	**9.80E-01**	1.84E-02	**6.29E-03**
OA-09-00-SL	Surface	-2.4E-01	—	—	**-2.35E-01**	—	—
OA-10-00-SL	Surface	-4.2E-01	—	—	**-4.17E-01**	—	—
OA-11-00-SL	Surface	-1.0E-01	6.9E-03	8.4E-03	**-1.01E-01**	**6.94E-03**	**8.44E-03**
OA-12-00-SL	Surface	-5.5E-01	—	—	**-5.52E-01**	—	—
OA-13-00-SL	Surface	8.1E-02	—	—	**8.06E-02**	—	—
OA-14-00-SL	Surface	3.7E-01	—	—	**3.67E-01**	—	—
OA-15-00-SL	Surface	-2.4E-01	—	—	**-2.36E-01**	—	—
OA-16-00-SL	Surface	-1.9E-01	6.1E-03	2.0E-03	**-1.86E-01**	**6.14E-03**	**2.03E-03**
OA-20-00-SL	Surface	2.8E-01	—	—	**2.79E-01**	—	—
OA-21-00-SL	Surface	3.3E-01	—	—	**3.34E-01**	—	—
OA-22-00-SL	Surface	8.3E-02	2.7E-03	3.2E-03	**8.27E-02**	**2.72E-03**	**3.22E-03**
OA-23-00-SL	Surface	-5.1E-02	—	—	**-5.07E-02**	—	—
OA-24-00-SL	Surface	-4.6E-01	—	—	**-4.62E-01**	—	—
OA-25-00-SL	Surface	-1.3E-01	—	—	**-1.29E-01**	—	—
OA-26-00-SL	Surface	-1.1E-01	1.2E-01	3.4E-03	**-1.12E-01**	1.19E-01	**3.38E-03**
OA-27-00-SL	Surface	1.4E-01	—	—	**1.39E-01**	—	—
OA-28-00-SL	Surface	2.9E-02	—	—	**2.92E-02**	—	—
OA-29-00-SL	Surface	-1.4E-01	—	—	**-1.39E-01**	—	—
OA-30-00-SL	Surface	-7.4E-02	—	—	**-7.44E-02**	—	—
OA-31-00-SL	Surface	1.0E-01	—	—	**1.01E-01**	—	—
OA-32-00-SL	Surface	-3.6E-02	—	—	**-3.58E-02**	—	—
OA-33-00-SL	Surface	4.7E-02	—	—	**4.67E-02**	—	—
OA-34-00-SL	Surface	-2.6E-01	—	—	**-2.64E-01**	—	—
OA-35-00-SL	Surface	-4.3E-01	—	—	**-4.32E-01**	—	—
OA-36-00-SL	Surface	-5.7E-02	—	—	**-5.73E-02**	—	—
OA-37-00-SL	Surface	-7.0E-02	0.0E+00	8.7E-03	**-6.97E-02**	**0.00E+00**	8.72E-03
OA-38-00-SL	Surface	3.4E-03	—	—	**3.41E-03**	—	—
OA-39-00-SL	Surface	7.7E-03	—	—	**7.69E-03**	—	—
OA-40-00-SL	Surface	2.8E-02	—	—	**2.81E-02**	—	—
PL-01-00-SL	Surface	7.1E-02	1.0E-03	8.3E-03	**7.09E-02**	**1.01E-03**	**8.26E-03**
PL-02-00-SL	Surface	-8.2E-02	—	—	**-8.18E-02**	—	—
PL-03-00-SL	Surface	6.0E-02	—	—	**6.02E-02**	—	—
RR-01-00-SL	Surface	8.6E-01	1.1E-01	8.0E-05	**8.62E-01**	1.08E-01	**8.00E-05**
RR-02-00-SL	Surface	2.5E-01	—	—	**2.49E-01**	—	—
RR-03-00-SL	Surface	1.8E-01	—	—	**1.82E-01**	—	—
SS-BP-001-SF	Surface	3.0E-03	—	—	**3.00E-03**	—	—
SS-BP-002-SF	Surface	2.0E-03	—	—	**2.00E-03**	—	—
SS-BP-003-SF	Surface	3.0E-03	—	—	**3.00E-03**	—	—
SS-BP-004-SF	Surface	9.0E-02	—	—	**9.00E-02**	—	—
SS-BP-005-SF	Surface	2.1E-02	—	—	**2.10E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
SS-BP-007-SF	Surface	1.8E-01	—	—	**1.80E-01**	—	—
SS-BP-008-SF	Surface	5.0E-02	—	—	**5.00E-02**	—	—
SS-BP-009-SF	Surface	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-BP-010-SF	Surface	4.6E-02	—	—	**4.60E-02**	—	—
SS-BP-011-SF	Surface	4.0E-02	—	—	**4.00E-02**	—	—
SS-BP-012-SF	Surface	4.0E-02	—	—	**4.00E-02**	—	—
SS-BP-014-SF	Surface	9.0E-04	—	—	**9.00E-04**	—	—
SS-BP-015-SF	Surface	2.0E-02	—	—	**2.00E-02**	—	—
SS-BP-016-SF	Surface	-1.6E-02	—	—	**-1.60E-02**	—	—
SS-BP-017-SF	Surface	1.1E-01	—	—	**1.10E-01**	—	—
SS-BP-018-SF	Surface	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-BP-021-SF	Surface	5.0E-02	—	—	**5.00E-02**	—	—
SS-BP-022-SF	Surface	6.0E-02	—	—	**6.00E-02**	—	—
SS-BP-023-SF	Surface	6.0E-02	—	—	**6.00E-02**	—	—
SS-BP-024-SF	Surface	4.0E-03	—	—	**4.00E-03**	—	—
SS-BP-025-SF	Surface	1.2E-02	—	—	**1.20E-02**	—	—
SS-BP-026-SF	Surface	2.0E-02	—	—	**2.00E-02**	—	—
SS-BP-027-SF	Surface	9.2E-02	—	—	**9.20E-02**	—	—
SS-BP-028A-SF	Surface	1.3E-02	—	—	**1.30E-02**	—	—
SS-BP-028B-SF	Surface	-7.0E-03	—	—	**-7.00E-03**	—	—
SS-BP-028C-SF	Surface	1.0E-04	—	—	**1.00E-04**	—	—
SS-BP-028-SF	Surface	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-BP-030-SF	Surface	4.0E-02	—	—	**4.00E-02**	—	—
SS-BP-031-SF	Surface	-4.0E-02	—	—	**-4.00E-02**	—	—
SS-BP-032-SF	Surface	4.0E-03	—	—	**4.00E-03**	—	—
SS-BP-033-SF	Surface	-3.0E-02	—	—	**-3.00E-02**	—	—
SS-BP-034-SF	Surface	-4.0E-02	—	—	**-4.00E-02**	—	—
SS-BP-037-SF	Surface	-2.0E-03	—	—	**-2.00E-03**	—	—
SS-BP-038-SF	Surface	0.0E+00	—	—	**0.00E+00**	—	—
SS-BP-039-SF	Surface	0.0E+00	—	—	**0.00E+00**	—	—
SS-BP-040-SF	Surface	6.0E-02	—	—	**6.00E-02**	—	—
SS-BP-041-SF	Surface	-7.0E-03	—	—	**-7.00E-03**	—	—
SS-BP-042-SF	Surface	9.0E-02	—	—	**9.00E-02**	—	—
SS-BP-044-SF	Surface	6.0E-02	—	—	**6.00E-02**	—	—
SS-BP-045-SF	Surface	1.5E-02	—	—	**1.50E-02**	—	—
SS-BP-046-SF	Surface	1.5E-02	—	—	**1.50E-02**	—	—
SS-BP-047-SF	Surface	0.0E+00	—	—	**0.00E+00**	—	—
SS-BP-048-SF	Surface	-7.0E-02	—	—	**-7.00E-02**	—	—
SS-BP-049-SF	Surface	1.3E-01	—	—	**1.30E-01**	—	—
SS-BP-051-SF	Surface	0.0E+00	—	—	**0.00E+00**	—	—
SS-BP-052-SF	Surface	1.1E-02	—	—	**1.10E-02**	—	—
SS-BP-053-SF	Surface	-2.4E-02	—	—	**-2.40E-02**	—	—
SS-BP-054-SF	Surface	1.0E-03	—	—	**1.00E-03**	—	—
SS-BP-055-SF	Surface	8.0E-02	—	—	**8.00E-02**	—	—
SS-BP-056-SF	Surface	-9.0E-03	—	—	**-9.00E-03**	—	—
SS-BP-057-SF	Surface	2.7E-01	—	—	**2.70E-01**	—	—
SS-BP-058-SF	Surface	-3.0E-02	—	—	**-3.00E-02**	—	—
SS-BP-060-SF	Surface	2.0E-02	—	—	**2.00E-02**	—	—
SS-BP-061-SF	Surface	2.2E-02	—	—	**2.20E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
SS-BP-062-SF	Surface	1.0E-03	—	—	**1.00E-03**	—	—
SS-BP-063-SF	Surface	-1.8E-02	—	—	**-1.80E-02**	—	—
SS-BP-064-SF	Surface	5.0E-03	—	—	**5.00E-03**	—	—
SS-BP-065-SF	Surface	6.0E-03	—	—	**6.00E-03**	—	—
SS-BP-066-SF	Surface	-1.5E-02	—	—	**-1.50E-02**	—	—
SS-BP-067-SF	Surface	-9.0E-03	—	—	**-9.00E-03**	—	—
SS-BP-068-SF	Surface	-1.6E-02	—	—	**-1.60E-02**	—	—
SS-BP-069-SF	Surface	-4.0E-03	—	—	**-4.00E-03**	—	—
SS-BP-070-SF	Surface	2.2E-02	—	—	**2.20E-02**	—	—
SS-BP-071-SF	Surface	-2.8E-02	—	—	**-2.80E-02**	—	—
SS-BP-072-SF	Surface	1.1E-02	—	—	**1.10E-02**	—	—
SS-BP-073-SF	Surface	-2.3E-02	—	—	**-2.30E-02**	—	—
SS-BP-074-SF	Surface	5.0E-04	—	—	**5.00E-04**	—	—
SS-BP-075-SF	Surface	4.0E-03	—	—	**4.00E-03**	—	—
SS-BP-076-SF	Surface	5.3E-02	—	—	**5.30E-02**	—	—
SS-BP-077-SF	Surface	2.9E-02	—	—	**2.90E-02**	—	—
SS-BP-078-SF	Surface	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-BP-079-SF	Surface	4.3E-02	—	—	**4.30E-02**	—	—
SS-BP-080-SF	Surface	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-BP-106-SF	Surface	2.2E-02	—	—	**2.20E-02**	—	—
SS-BP-107-SF	Surface	1.1E-01	—	—	**1.10E-01**	—	—
SS-BP-108B-SF	Surface	0.0E+00	—	—	**0.00E+00**	—	—
SS-BP-108-SF	Surface	-3.0E-02	—	—	**-3.00E-02**	—	—
SS-BP-109-SF	Surface	2.0E-02	—	—	**2.00E-02**	—	—
SS-BP-110-SF	Surface	7.0E-02	—	—	**7.00E-02**	—	—
SS-BP-111-SF	Surface	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-E.EVAP-001-SF	Surface	-6.0E-02	—	—	**-6.00E-02**	—	—
SS-GA-001-SF	Surface	4.0E-03	—	—	**4.00E-03**	—	—
SS-GA-002-SF	Surface	5.0E-02	—	—	**5.00E-02**	—	—
SS-GA-004-SF	Surface	2.2E-02	—	—	**2.20E-02**	—	—
SS-GA-005-SF	Surface	-2.5E-02	—	—	**-2.50E-02**	—	—
SS-GB-002-SF	Surface	-4.0E-03	—	—	**-4.00E-03**	—	—
SS-GB-003-SF	Surface	1.4E-02	—	—	**1.40E-02**	—	—
SS-GB-004-SF	Surface	-3.7E-02	—	—	**-3.70E-02**	—	—
SS-GB-006-SF	Surface	-5.0E-03	—	—	**-5.00E-03**	—	—
SS-GB-007-SF	Surface	6.0E-03	—	—	**6.00E-03**	—	—
SS-GB-009-SF	Surface	-8.0E-03	—	—	**-8.00E-03**	—	—
SS-GB-010-SF	Surface	8.0E-03	—	—	**8.00E-03**	—	—
SS-GB-012-SF	Surface	2.9E-02	—	—	**2.90E-02**	—	—
SS-GB-013-SF	Surface	3.0E-03	—	—	**3.00E-03**	—	—
SS-GB-015-SF	Surface	7.0E-04	—	—	**7.00E-04**	—	—
SS-GB-016-SF	Surface	-1.4E-02	—	—	**-1.40E-02**	—	—
SS-GB-018-SF	Surface	-9.0E-03	—	—	**-9.00E-03**	—	—
SS-GB-019-SF	Surface	-1.4E-02	—	—	**-1.40E-02**	—	—
SS-GB-020-SF	Surface	2.6E-02	—	—	**2.60E-02**	—	—
SS-GB-021-SF	Surface	5.1E-02	—	—	**5.10E-02**	—	—
SS-GB-022-SF	Surface	-9.0E-04	—	—	**-9.00E-04**	—	—
SS-GB-023-SF	Surface	4.0E-03	—	—	**4.00E-03**	—	—
SS-GC-001-SF	Surface	-5.0E-03	—	—	**-5.00E-03**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
SS-GC-002-SF	Surface	-7.0E-03	—	—	**-7.00E-03**	—	—
SS-GC-004-SF	Surface	-6.0E-03	—	—	**-6.00E-03**	—	—
SS-GC-005-SF	Surface	5.0E-05	—	—	**5.00E-05**	—	—
SS-GC-007-SF	Surface	-9.0E-03	—	—	**-9.00E-03**	—	—
SS-GC-008-SF	Surface	7.0E-03	—	—	**7.00E-03**	—	—
SS-GC-010-SF	Surface	4.0E-03	—	—	**4.00E-03**	—	—
SS-GC-011-SF	Surface	8.0E-03	—	—	**8.00E-03**	—	—
SS-GL-001-SF	Surface	2.0E-03	—	—	**2.00E-03**	—	—
SS-GL-002-SF	Surface	-2.0E-03	—	—	**-2.00E-03**	—	—
SS-GL-003-SF	Surface	-5.0E-03	—	—	**-5.00E-03**	—	—
SS-GL-004-SF	Surface	-9.0E-04	—	—	**-9.00E-04**	—	—
SS-GL-005-SF	Surface	-6.0E-03	—	—	**-6.00E-03**	—	—
SS-GL-006-SF	Surface	-3.0E-04	—	—	**-3.00E-04**	—	—
SS-GL-007-SF	Surface	1.9E-02	—	—	**1.90E-02**	—	—
SS-GL-008-SF	Surface	-1.1E-02	—	—	**-1.10E-02**	—	—
SS-GL-009-SF	Surface	8.0E-03	—	—	**8.00E-03**	—	—
SS-GL-010-SF	Surface	-1.5E-02	—	—	**-1.50E-02**	—	—
SS-GL-011-SF	Surface	-4.0E-02	—	—	**-4.00E-02**	—	—
SS-GL-012-SF	Surface	-2.1E-02	—	—	**-2.10E-02**	—	—
SS-GL-013-SF	Surface	-4.0E-03	—	—	**-4.00E-03**	—	—
SS-GL-014-SF	Surface	5.0E-03	—	—	**5.00E-03**	—	—
SS-GL-015-SF	Surface	-1.5E-02	—	—	**-1.50E-02**	—	—
SS-GL-016-SF	Surface	-3.2E-02	—	—	**-3.20E-02**	—	—
SS-GL-017-SF	Surface	7.0E-03	—	—	**7.00E-03**	—	—
SS-GL-018-SF	Surface	2.0E-04	—	—	**2.00E-04**	—	—
SS-GL-019-SF	Surface	4.0E-03	—	—	**4.00E-03**	—	—
SS-GL-020-SF	Surface	-4.0E-03	—	—	**-4.00E-03**	—	—
SS-GL-021-SF	Surface	2.0E-03	—	—	**2.00E-03**	—	—
SS-GL-022-SF	Surface	3.0E-04	—	—	**3.00E-04**	—	—
SS-GL-023-SF	Surface	-7.0E-03	—	—	**-7.00E-03**	—	—
SS-GL-024-SF	Surface	1.1E-02	—	—	**1.10E-02**	—	—
SS-GL-025-SF	Surface	-1.8E-02	—	—	**-1.80E-02**	—	—
SS-GL-026-SF	Surface	3.0E-03	—	—	**3.00E-03**	—	—
SS-GL-027-SF	Surface	-3.0E-02	—	—	**-3.00E-02**	—	—
SS-GL-028-SF	Surface	-1.2E-02	—	—	**-1.20E-02**	—	—
SS-GL-029-SF	Surface	-1.5E-02	—	—	**-1.50E-02**	—	—
SS-GL-030-SF	Surface	-1.0E-03	—	—	**-1.00E-03**	—	—
SS-GL-031-SF	Surface	-2.0E-03	—	—	**-2.00E-03**	—	—
SS-GL-032-SF	Surface	-5.0E-03	—	—	**-5.00E-03**	—	—
SS-GL-033-SF	Surface	-3.3E-02	—	—	**-3.30E-02**	—	—
SS-GL-034-SF	Surface	2.0E-03	—	—	**2.00E-03**	—	—
SS-GL-035-SF	Surface	3.9E-02	—	—	**3.90E-02**	—	—
SS-HS-001-SF	Surface	8.0E-03	—	—	**8.00E-03**	—	—
SS-HS-002-EL-0.5	Surface	8.0E-01	—	—	**8.00E-01**	—	—
SS-HS-002-SF	Surface	-1.5E-01	—	—	**-1.50E-01**	—	—
SS-HS-003-SF	Surface	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-HS-004-SF	Surface	-2.8E-02	—	—	**-2.80E-02**	—	—
SS-HS-005-SF	Surface	-2.0E-03	—	—	**-2.00E-03**	—	—
SS-HS-006-SF	Surface	8.0E-02	—	—	**8.00E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
SS-LA-006-SF	Surface	4.0E-02	—	—	**4.00E-02**	—	—
SS-LA-019-SF	Surface	1.5E-02	—	—	**1.50E-02**	—	—
SS-LA-020-SF	Surface	-7.0E-02	—	—	**-7.00E-02**	—	—
SS-LA-029-SF	Surface	2.0E-02	—	—	**2.00E-02**	—	—
SS-LA-035-SF	Surface	-3.0E-02	—	—	**-3.00E-02**	—	—
SS-LA-036-SF	Surface	3.5E-02	—	—	**3.50E-02**	—	—
SS-LA-050-SF	Surface	9.0E-02	—	—	**9.00E-02**	—	—
SS-LA-059-SF	Surface	1.0E-01	—	—	**1.00E-01**	—	—
SS-LA-081-SF	Surface	7.0E-02	—	—	**7.00E-02**	—	—
SS-LA-082-SF	Surface	2.7E-02	—	—	**2.70E-02**	—	—
SS-LA-083-SF	Surface	8.0E-02	—	—	**8.00E-02**	—	—
SS-LA-084-SF	Surface	-1.1E-02	—	—	**-1.10E-02**	—	—
SS-LA-085-SF	Surface	2.0E-02	—	—	**2.00E-02**	—	—
SS-LA-086-SF	Surface	3.8E-02	—	—	**3.80E-02**	—	—
SS-LA-087-SF	Surface	-1.0E-01	—	—	**-1.00E-01**	—	—
SS-LA-089-SF	Surface	-9.0E-02	—	—	**-9.00E-02**	—	—
SS-LA-090-SF	Surface	6.0E-04	—	—	**6.00E-04**	—	—
SS-LA-091-SF	Surface	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-LA-092-SF	Surface	8.0E-02	—	—	**8.00E-02**	—	—
SS-LA-093-SF	Surface	2.0E-02	—	—	**2.00E-02**	—	—
SS-LA-094-SF	Surface	1.2E-01	—	—	**1.20E-01**	—	—
SS-LA-095-SF	Surface	1.4E-02	—	—	**1.40E-02**	—	—
SS-LA-096-SF	Surface	3.2E-02	—	—	**3.20E-02**	—	—
SS-LA-097-SF	Surface	8.0E-03	—	—	**8.00E-03**	—	—
SS-LA-098-SF	Surface	-7.0E-03	—	—	**-7.00E-03**	—	—
SS-LA-099-SF	Surface	-6.0E-02	—	—	**-6.00E-02**	—	—
SS-LA-100-SF	Surface	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-LF-101-SF	Surface	5.0E-03	—	—	**5.00E-03**	—	—
SS-LF-102-SF	Surface	2.0E-04	—	—	**2.00E-04**	—	—
SS-LF-103-SF	Surface	-2.0E-03	—	—	**-2.00E-03**	—	—
SS-LF-104-SF	Surface	-6.0E-04	—	—	**-6.00E-04**	—	—
SS-LF-105-SF	Surface	4.7E-02	—	—	**4.70E-02**	—	—
SS-W.EVAP-001-SF	Surface	-4.0E-03	—	—	**-4.00E-03**	—	—
SW-01-00-SL	Surface	-2.8E-01	2.1E-02	9.2E-03	**-2.81E-01**	**2.11E-02**	**9.16E-03**
SW-01-SS	Surface	1.3E-01	3.3E-02	6.3E-03	**1.28E-01**	3.31E-02	**6.25E-03**
SW-02-00-SL	Surface	1.4E-02	—	—	**1.38E-02**	—	—
SW-02-SS	Surface	-1.2E-01	0.0E+00	1.8E-03	**-1.24E-01**	**0.00E+00**	**1.81E-03**
SW-03-00-SL	Surface	-2.9E-01	—	—	**-2.85E-01**	—	—
SW-03-SS	Surface	-2.0E-02	—	—	**-2.02E-02**	—	—
SW-04-00-SL	Surface	-6.7E-02	—	—	**-6.65E-02**	—	—
SW-04-SS	Surface	-1.1E-01	—	—	**-1.07E-01**	—	—
SW-05-SS	Surface	-4.9E-01	—	—	**-4.91E-01**	—	—
SW-06-SS	Surface	2.2E-01	—	—	**2.23E-01**	—	—
SW-07-SS	Surface	-1.8E-01	2.6E-02	3.0E-05	**-1.81E-01**	2.63E-02	**3.00E-05**
SW-11-SS	Surface	2.6E-02	—	—	**2.56E-02**	—	—
SW-12-SS	Surface	-9.4E-02	—	—	**-9.43E-02**	—	—
SW-13-SS	Surface	1.4E-01	-8.6E-04	6.1E-03	**1.42E-01**	**-8.64E-04**	**6.10E-03**
SW-14-SS	Surface	-3.5E-03	—	—	**-3.53E-03**	—	—
BD-14-05-SL	Root	4.8E-02	—	—	**4.79E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
BD-15-05-SL	Root	-1.8E-01	—	—	**-1.77E-01**	—	—
BD-16-05-SL	Root	2.2E-02	1.1E-02	2.8E-03	**2.15E-02**	**1.13E-02**	**2.78E-03**
BD-17-2.5-SL	Root	-6.0E-02	1.5E-02	-1.0E-02	**-6.00E-02**	**1.50E-02**	**-1.00E-02**
BD-17-4.5-SL	Root	-6.0E-02	3.4E-02	3.0E-03	**-6.00E-02**	**3.40E-02**	**3.00E-03**
BD-18-2.5-SL	Root	7.0E-02	-7.0E-03	1.5E-02	**7.00E-02**	**-7.00E-03**	**1.50E-02**
BD-18-4.5-SL	Root	3.0E-02	—	—	**3.00E-02**	—	—
BD-19-4.5-SL	Root	4.0E-03	—	—	**4.00E-03**	—	—
BD-20-2.5-SL	Root	5.0E-02	-1.1E-02	9.0E-03	**5.00E-02**	**-1.10E-02**	**9.00E-03**
BD-20-4.5-SL	Root	5.0E-02	—	—	**5.00E-02**	—	—
BD-21-2.5-SL	Root	3.1E-02	—	—	**3.14E-02**	—	—
BD-21-4.5-SL	Root	5.0E-02	-1.0E-03	-3.0E-03	**5.00E-02**	**-1.00E-03**	**-3.00E-03**
BD-22-2.5-SL	Root	-1.3E-02	3.0E-03	1.7E-02	**-1.30E-02**	**3.00E-03**	**1.70E-02**
BD-22-4.5-SL	Root	6.0E-02	—	—	**6.00E-02**	—	—
BD-23-2.5-SL	Root	6.0E-02	1.4E-02	9.0E-03	**6.00E-02**	**1.40E-02**	**9.00E-03**
BD-23-4.5-SL	Root	2.0E-02	—	—	**2.00E-02**	—	—
BD-23-5-SL	Root	9.0E-02	—	—	**9.00E-02**	—	—
BD-24-2.5-SL	Root	-1.0E-02	—	—	**-1.00E-02**	—	—
BD-24-4.5-SL	Root	6.0E-02	—	—	**6.00E-02**	—	—
BD-25-2.5-SL	Root	4.0E-03	1.3E-02	-3.9E-03	**4.00E-03**	**1.30E-02**	**-3.90E-03**
BD-25-4.5-SL	Root	1.0E-02	—	—	**1.00E-02**	—	—
BD-26-2.5-SL	Root	-6.0E-02	-1.7E-02	-3.8E-03	**-6.00E-02**	**-1.70E-02**	**-3.80E-03**
BD-26-4.5-SL	Root	8.0E-02	2.9E-02	-1.1E-02	**8.00E-02**	**2.90E-02**	**-1.13E-02**
BD-27-2.5-SL	Root	-1.7E-02	-1.1E-02	-5.4E-03	**-1.70E-02**	**-1.10E-02**	**-5.40E-03**
BD-27-4.5-SL	Root	2.0E-02	—	—	**2.00E-02**	—	—
BD-28-2.5-SL	Root	-7.0E-02	—	—	**-7.00E-02**	—	—
BD-28-4.5-SL	Root	6.0E-02	—	—	**6.00E-02**	—	—
BD-29-2.5-SL	Root	-6.0E-02	-1.2E-02	-3.9E-03	**-6.00E-02**	**-1.19E-02**	**-3.90E-03**
BD-29-4.5-SL	Root	2.0E-02	—	—	**2.00E-02**	—	—
BD-30-2.5-SL	Root	4.0E-02	—	—	**4.00E-02**	—	—
BD-30-4.5-SL	Root	3.8E-02	-6.0E-03	-1.0E-02	**3.80E-02**	**-6.00E-03**	**-1.02E-02**
BD-31-2.5-SL	Root	2.4E-02	-1.1E-02	-5.0E-03	**2.40E-02**	**-1.07E-02**	**-5.00E-03**
BD-31-4.5-SL	Root	5.0E-02	—	—	**5.00E-02**	—	—
BD-32-2.5-SL	Root	4.0E-02	-1.1E-02	-1.8E-03	**4.00E-02**	**-1.07E-02**	**-1.80E-03**
BD-32-4.5-SL	Root	7.0E-02	—	—	**7.00E-02**	—	—
BD-33-2.5-SL	Root	1.0E-02	-9.5E-03	6.0E-03	**1.00E-02**	**-9.50E-03**	**6.00E-03**
BD-33-4.5-SL	Root	9.0E-02	—	—	**9.00E-02**	—	—
BD-34-2.5-SL	Root	2.0E-02	4.2E-01	2.7E-02	**2.00E-02**	4.20E-01	**2.70E-02**
BD-34-4.5-SL	Root	2.0E-02	—	—	**2.00E-02**	—	—
BD-35-2.5-SL	Root	2.8E-02	6.0E-03	6.0E-03	**2.80E-02**	**6.00E-03**	**6.00E-03**
BD-35-4.5-SL	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
BD-36-4.5-SL	Root	-6.0E-02	1.2E-02	5.0E-03	**-6.00E-02**	**1.20E-02**	**5.00E-03**
BD-37-2.5-SL	Root	-3.0E-02	5.0E-03	8.0E-03	**-3.00E-02**	**5.00E-03**	**8.00E-03**
BD-37-4.5-SL	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
BD-37-5-SL	Root	-8.0E-02	—	—	**-8.00E-02**	—	—
BD-38-2.5-SL	Root	6.2E-02	-5.4E-03	-3.9E-03	**6.20E-02**	**-5.40E-03**	**-3.90E-03**
BD-38-4.5-SL	Root	3.0E-04	—	—	**3.00E-04**	—	—
BD-38-5-SL	Root	-3.0E-02	-5.0E-03	-3.8E-03	**-3.00E-02**	**-5.00E-03**	**-3.80E-03**
BD-39-2.5-SL	Root	-5.0E-03	5.0E-03	-1.6E-02	**-5.00E-03**	**5.00E-03**	**-1.60E-02**
BD-39-4.5-SL	Root	5.0E-02	—	—	**5.00E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
BD-40-2.5-SL	Root	4.2E-02	6.0E-03	2.9E-02	**4.20E-02**	**6.00E-03**	**2.90E-02**
BD-40-4.5-SL	Root	3.0E-02	-1.1E-02	-3.8E-02	**3.00E-02**	**-1.10E-02**	**-3.80E-02**
BD-41-2.5-SL	Root	1.7E-02	8.0E-04	-8.0E-03	**1.70E-02**	**8.00E-04**	**-8.00E-03**
BD-41-4.5-SL	Root	2.0E-02	—	—	**2.00E-02**	—	—
BD-42-2.5-SL	Root	1.6E-02	—	—	**1.60E-02**	—	—
BD-42-4.5-SL	Root	1.9E-02	-5.0E-03	4.0E-03	**1.90E-02**	**-5.00E-03**	**4.00E-03**
BD-43-2.5-SL	Root	3.0E-02	-1.1E-02	-1.4E-02	**3.00E-02**	**-1.08E-02**	**-1.40E-02**
BD-43-4.5-SL	Root	1.0E-02	—	—	**1.00E-02**	—	—
BD-43-5-SL	Root	-4.0E-02	—	—	**-4.00E-02**	—	—
BD-44-2.5-SL	Root	3.0E-02	7.0E-04	-5.6E-03	**3.00E-02**	**7.00E-04**	**-5.60E-03**
BD-44-4.5-SL	Root	4.0E-03	—	—	**4.00E-03**	—	—
BD-45-2.5-SL	Root	4.0E-03	3.0E-03	-7.0E-03	**4.00E-03**	**3.00E-03**	**-7.00E-03**
BD-45-4.5-SL	Root	-7.0E-02	—	—	**-7.00E-02**	—	—
BD-46-2.5-SL	Root	2.0E-02	3.0E-03	-5.0E-03	**2.00E-02**	**3.00E-03**	**-5.00E-03**
BD-46-4.5-SL	Root	-1.1E-01	—	—	**-1.10E-01**	—	—
BD-46-5-SL	Root	9.0E-03	—	—	**9.00E-03**	—	—
BD-47-2.5-SL	Root	3.0E-02	-6.0E-03	6.0E-04	**3.00E-02**	**-6.00E-03**	**6.00E-04**
BD-47-4.5-SL	Root	0.0E+00	—	—	**0.00E+00**	—	—
BD-48-2.5-SL	Root	3.0E-04	0.0E+00	8.0E-03	**3.00E-04**	**0.00E+00**	**8.00E-03**
BD-48-4.5-SL	Root	5.0E-02	—	—	**5.00E-02**	—	—
BLD240-01-01	Root	6.9E-03	2.2E-03	2.9E-03	6.92E-03	**2.19E-03**	**2.92E-03**
BLD240-03-04	Root	2.1E-03	5.1E-03	-1.1E-03	**2.05E-03**	5.07E-03	**-1.09E-03**
BLD240-04-02	Root	9.1E-03	1.4E-03	1.0E-03	9.12E-03	**1.38E-03**	**1.03E-03**
BLD240-04-04	Root	-2.9E-01	—	—	**-2.90E-01**	—	—
BLD240-05-01	Root	-8.0E-02	—	—	**-8.00E-02**	—	—
BLD240-05-02	Root	0.0E+00	—	—	**0.00E+00**	—	—
BLD253-02-01	Root	-6.0E-02	—	—	**-6.00E-02**	—	—
BLD253-02-04	Root	3.2E-03	7.7E-03	9.6E-04	3.23E-03	7.72E-03	**9.60E-04**
BLD255-07-02	Root	4.1E-03	1.8E-03	3.8E-03	**4.08E-03**	**1.76E-03**	**3.80E-03**
BLD255-08-01	Root	4.1E-03	1.9E-02	5.1E-03	4.14E-03	1.92E-02	**5.14E-03**
BLD260-06-01	Root	3.0E-03	2.0E-03	2.8E-03	2.95E-03	**1.97E-03**	2.77E-03
BLD260-06-03	Root	1.0E-02	—	—	**1.00E-02**	—	—
BP-13-05-SL	Root	1.0E-02	—	—	**1.01E-02**	—	—
BP-17-05-SL	Root	-3.3E-02	—	—	**-3.25E-02**	—	—
BP-18-05-SL	Root	-3.0E-01	—	—	**-3.01E-01**	—	—
BP-19-05-SL	Root	-3.6E-01	—	—	**-3.60E-01**	—	—
BP-20-03-SL	Root	-1.0E-01	—	—	**-9.97E-02**	—	—
BP-22-05-SL	Root	2.4E-01	—	—	**2.44E-01**	—	—
CB-02-05-SL	Root	1.7E-01	—	—	**1.72E-01**	—	—
EP-13-03-SL	Root	7.5E-01	—	—	**7.47E-01**	—	—
EP-14-05-SL	Root	6.3E-02	—	—	**6.34E-02**	—	—
EP-15-05-SL	Root	4.6E-01	—	—	**4.63E-01**	—	—
EP-16-05-SL	Root	-2.0E-02	—	—	**-2.03E-02**	—	—
EP-17-05-SL	Root	-1.5E-03	1.2E-02	4.8E-03	**-1.46E-03**	**1.22E-02**	4.79E-03
EP-19-05-SL	Root	-1.4E-01	—	—	**-1.44E-01**	—	—
EP-20-05-SL	Root	2.2E-02	—	—	**2.16E-02**	—	—
FS-19-1-BIA-1-SO-2	Root	1.7E-02	—	—	**1.70E-02**	—	—
FS-19-1-BIA-2-SO-2	Root	-5.0E-03	—	—	**-5.00E-03**	—	—
FS-19-1-BIA-3-SO-2	Root	-2.3E-02	—	—	**-2.30E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
FS-19-1-BIA-4-SO-2	Root	-1.5E-02	—	—	**-1.50E-02**	—	—
FS-19-1-BIA-5-SO-2	Root	9.0E-03	—	—	**9.00E-03**	—	—
FS-19-1-SYS-10-SO-2	Root	-3.5E-02	—	—	**-3.50E-02**	—	—
FS-19-1-SYS-11-SO-2	Root	-3.0E-03	—	—	**-3.00E-03**	—	—
FS-19-1-SYS-12-SO-2	Root	1.2E-02	—	—	**1.20E-02**	—	—
FS-19-1-SYS-13-SO-2	Root	9.0E-03	—	—	**9.00E-03**	—	—
FS-19-1-SYS-14-SO-2	Root	-8.0E-03	—	—	**-8.00E-03**	—	—
FS-19-1-SYS-15-SO-2	Root	1.8E-02	—	—	**1.80E-02**	—	—
FS-19-1-SYS-16-SO-2	Root	1.5E-02	—	—	**1.50E-02**	—	—
FS-19-1-SYS-17-SO-2	Root	1.4E-02	—	—	**1.40E-02**	—	—
FS-19-1-SYS-18-SO-2	Root	2.2E-02	—	—	**2.20E-02**	—	—
FS-19-1-SYS-19-SO-2	Root	6.0E-03	—	—	**6.00E-03**	—	—
FS-19-1-SYS-1-SO-2	Root	-1.0E-03	—	—	**-1.00E-03**	—	—
FS-19-1-SYS-20-SO-2	Root	-1.7E-02	—	—	**-1.70E-02**	—	—
FS-19-1-SYS-21-SO-2	Root	-2.0E-03	—	—	**-2.00E-03**	—	—
FS-19-1-SYS-22-SO-2	Root	9.0E-03	—	—	**9.00E-03**	—	—
FS-19-1-SYS-2-SO-2	Root	8.0E-03	—	—	**8.00E-03**	—	—
FS-19-1-SYS-3-SO-2	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
FS-19-1-SYS-4-SO-2	Root	5.0E-03	—	—	**5.00E-03**	—	—
FS-19-1-SYS-5-SO-2	Root	-1.0E-02	—	—	**-1.00E-02**	—	—
FS-19-1-SYS-6-SO-2	Root	-1.0E-02	—	—	**-1.00E-02**	—	—
FS-19-1-SYS-7-SO-2	Root	-1.0E-02	—	—	**-1.00E-02**	—	—
FS-19-1-SYS-8-SO-2	Root	-2.0E-04	—	—	**-2.00E-04**	—	—
FS-19-1-SYS-9-SO-2	Root	6.0E-03	—	—	**6.00E-03**	—	—
FS-19-2-SYS-01-SO-2	Root	2.0E-02	—	—	**2.00E-02**	—	—
FS-19-2-SYS-02-SO-2	Root	-5.0E-03	—	—	**-5.00E-03**	—	—
FS-19-2-SYS-03-SO-2	Root	4.0E-03	—	—	**4.00E-03**	—	—
FS-19-2-SYS-04-SO-2	Root	2.1E-02	—	—	**2.10E-02**	—	—
FS-19-2-SYS-05-SO-2	Root	-6.0E-04	—	—	**-6.00E-04**	—	—
FS-19-2-SYS-06-SO-2	Root	1.8E-02	—	—	**1.80E-02**	—	—
FS-19-2-SYS-09-SO-2	Root	-1.1E-02	—	—	**-1.10E-02**	—	—
FS-19-2-SYS-10-SO-2	Root	1.1E-02	—	—	**1.10E-02**	—	—
FS-19-2-SYS-11-SO-2	Root	-3.2E-02	—	—	**-3.20E-02**	—	—
FS-19-2-SYS-12-SO-2	Root	2.0E-03	—	—	**2.00E-03**	—	—
FS-19-2-SYS-13-SO-2	Root	1.3E-02	—	—	**1.30E-02**	—	—
FS-19-2-SYS-14-SO-2	Root	6.0E-03	—	—	**6.00E-03**	—	—
FS-19-2-SYS-15-SO-2	Root	2.0E-03	—	—	**2.00E-03**	—	—
FS-19-2-SYS-16-SO-2	Root	1.3E-02	—	—	**1.30E-02**	—	—
FS-19-2-SYS-17-SO-2	Root	-2.2E-02	—	—	**-2.20E-02**	—	—
FS-19-2-SYS-18-SO-2	Root	3.0E-03	—	—	**3.00E-03**	—	—
FS-19-2-SYS-19-SO-2	Root	-6.0E-03	—	—	**-6.00E-03**	—	—
FS-19-2-SYS-20-SO-2	Root	1.3E-02	—	—	**1.30E-02**	—	—
FS-19-2-SYS-21-SO-2	Root	-1.0E-02	—	—	**-1.00E-02**	—	—
FS-19-2-SYS-22-SO-2	Root	-2.4E-02	—	—	**-2.40E-02**	—	—
FS-19-2-SYS-7-SO-2	Root	1.0E-03	—	—	**1.00E-03**	—	—
FS-19-2-SYS-8-SO-2	Root	5.0E-03	—	—	**5.00E-03**	—	—
LF-06-05-SL	Root	-8.6E-02	4.1E-03	4.0E-03	**-8.55E-02**	**4.12E-03**	**3.98E-03**
LF-08-05-SL	Root	-9.0E-02	—	—	**-9.02E-02**	—	—
LF-09-03-SL	Root	-7.1E-01	—	—	**-7.05E-01**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
NB-101-2.5-SL	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
NB-101-4.5-SL	Root	-1.1E-01	—	—	**-1.10E-01**	—	—
NB-102-4.5-SL	Root	2.0E-02	—	—	**2.00E-02**	—	—
NB-102-5-SL	Root	4.1E-02	—	—	**4.10E-02**	—	—
NB-103-2.5-SL	Root	8.0E-05	—	—	**8.00E-05**	—	—
NB-103-4.5-SL	Root	1.0E-02	3.0E-03	-2.0E-03	**1.00E-02**	**3.00E-03**	**-2.00E-03**
NB-104-4.5-SL	Root	2.0E-03	—	—	**2.00E-03**	—	—
NB-105-4.5-SL	Root	8.0E-02	—	—	**8.00E-02**	—	—
NB-106-2.5-SL	Root	-1.4E-02	—	—	**-1.40E-02**	—	—
NB-106-4.5-SL	Root	7.0E-02	2.0E-02	-2.0E-02	**7.00E-02**	**2.00E-02**	**-2.00E-02**
NB-107-4.5-SL	Root	2.6E-02	—	—	**2.60E-02**	—	—
NB-108-4.5-SL	Root	1.9E-01	—	—	**1.90E-01**	—	—
NB-109-4.5-SL	Root	3.0E-04	—	—	**3.00E-04**	—	—
NB-109-5-SL	Root	3.0E-03	—	—	**3.00E-03**	—	—
NB-110-4.5-SL	Root	-3.0E-02	—	—	**-3.00E-02**	—	—
NB-110-5-SL	Root	-6.0E-02	—	—	**-6.00E-02**	—	—
NB-111-4.5-SL	Root	4.0E-02	—	—	**4.00E-02**	—	—
NB-112-4.5-SL	Root	2.0E-02	—	—	**2.00E-02**	—	—
NB-113-2.5-SL	Root	-2.0E-03	-1.1E-02	-6.0E-03	**-2.00E-03**	**-1.10E-02**	**-6.00E-03**
NB-113-4.5-SL	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
NB-115-2.5-SL	Root	2.2E-02	-8.0E-03	-4.0E-03	**2.20E-02**	**-8.00E-03**	**-4.00E-03**
NB-115-4.5-SL	Root	7.0E-02	—	—	**7.00E-02**	—	—
NB-116-4.5-SL	Root	5.0E-02	—	—	**5.00E-02**	—	—
NB-117-4.5-SL	Root	9.0E-02	2.8E-02	1.4E-02	**9.00E-02**	**2.80E-02**	**1.40E-02**
NB-118-4.5-SL	Root	5.7E-02	—	—	**5.70E-02**	—	—
NB-119-2.5-SL	Root	5.0E-02	—	—	**5.00E-02**	—	—
NB-119-4.5-SL	Root	-5.0E-02	—	—	**-5.00E-02**	—	—
NB-120-2.5-SL	Root	-3.0E-02	—	—	**-3.00E-02**	—	—
NB-120-4.5-SL	Root	-3.0E-02	1.3E-02	1.0E-02	**-3.00E-02**	**1.30E-02**	**1.00E-02**
NB-122-4.5-SL	Root	7.0E-03	—	—	**7.00E-03**	—	—
NB-123-2.5-SL	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
NB-123-4.5-SL	Root	-2.0E-03	—	—	**-2.00E-03**	—	—
NB-124-4.5-SL	Root	2.0E-02	—	—	**2.00E-02**	—	—
NB-125-4.5-SL	Root	1.3E-01	—	—	**1.30E-01**	—	—
NB-126-4.5-SL	Root	-3.0E-03	—	—	**-3.00E-03**	—	—
NB-127-4.5-SL	Root	1.0E-02	-1.1E-02	4.0E-03	**1.00E-02**	**-1.10E-02**	**4.00E-03**
NB-127-5-SL	Root	2.7E-02	—	—	**2.70E-02**	—	—
NB-128-2.5-SL	Root	3.0E-02	—	—	**3.00E-02**	—	—
NB-128-4.5-SL	Root	6.0E-02	5.0E-03	-4.0E-03	**6.00E-02**	**5.00E-03**	**-4.00E-03**
NB-129-2.5-SL	Root	3.0E-02	—	—	**3.00E-02**	—	—
NB-129-4.5-SL	Root	-5.0E-03	—	—	**-5.00E-03**	—	—
NB-130-4.5-SL	Root	-3.0E-02	—	—	**-3.00E-02**	—	—
NB-131-4.5-SL	Root	8.0E-03	—	—	**8.00E-03**	—	—
NB-132-4.5-SL	Root	-6.0E-03	—	—	**-6.00E-03**	—	—
NB-133-2.5-SL	Root	-1.0E-02	-6.0E-03	-5.0E-03	**-1.00E-02**	**-6.00E-03**	**-5.00E-03**
NB-133-4.5-SL	Root	5.0E-02	—	—	**5.00E-02**	—	—
NB-134-2.5-SL	Root	6.0E-02	—	—	**6.00E-02**	—	—
NB-134-4.5-SL	Root	-1.2E-01	—	—	**-1.20E-01**	—	—
NB-135-4.5-SL	Root	1.1E-01	—	—	**1.10E-01**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
NB-136-4.5-SL	Root	9.0E-02	—	—	**9.00E-02**	—	—
NB-137-4.5-SL	Root	2.0E-02	-1.2E-02	4.0E-03	**2.00E-02**	**-1.18E-02**	**4.00E-03**
NB-138-4.5-SL	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
NB-139-4.5-SL	Root	0.0E+00	—	—	**0.00E+00**	—	—
NB-140-4.5-SL	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
NB-141-4.5-SL	Root	1.0E-02	—	—	**1.00E-02**	—	—
NB-142-4.5-SL	Root	-4.0E-02	—	—	**-4.00E-02**	—	—
NB-143-4.5-SL	Root	1.0E-02	—	—	**1.00E-02**	—	—
NB-144-4.5-SL	Root	-3.0E-02	-9.1E-03	-3.0E-03	**-3.00E-02**	**-9.10E-03**	**-3.00E-03**
NB-39-05-SL	Root	3.6E-01	—	—	**3.64E-01**	—	—
NB-47-05-SL	Root	-8.2E-02	—	—	**-8.15E-02**	—	—
NB-48-05-SL	Root	6.6E-01	—	—	**6.55E-01**	—	—
NB-49-05-SL	Root	0.0E+00	—	—	**0.00E+00**	—	—
NB-50-05-SL	Root	-2.2E-01	—	—	**-2.21E-01**	—	—
NB-51-05-SL	Root	-2.6E-01	—	—	**-2.63E-01**	—	—
NB-52-05-SL	Root	-2.9E-02	—	—	**-2.93E-02**	—	—
NB-53-05-SL	Root	-1.0E-01	—	—	**-1.02E-01**	—	—
NB-54-05-SL	Root	1.6E-01	—	—	**1.55E-01**	—	—
NB-55-05-SL	Root	-8.3E-03	—	—	**-8.28E-03**	—	—
NB-56-05-SL	Root	-1.4E-01	—	—	**-1.42E-01**	—	—
NB-57-05-SL	Root	-5.1E-01	—	—	**-5.12E-01**	—	—
NB-58-05-SL	Root	-5.0E-01	—	—	**-5.03E-01**	—	—
NB-59-05-SL	Root	1.2E-01	—	—	**1.20E-01**	—	—
NB-60-05-SL	Root	-1.0E-01	—	—	**-1.02E-01**	—	—
NB-61-05-SL	Root	-4.3E-01	—	—	**-4.33E-01**	—	—
NB-74-05-SL	Root	-1.7E-01	—	—	**-1.66E-01**	—	—
NB-79-05-SL	Root	1.2E-02	—	—	**1.23E-02**	—	—
NB-80-05-SL	Root	1.2E-02	—	—	**1.19E-02**	—	—
NB-88-4.5-SL	Root	4.0E-02	—	—	**4.00E-02**	—	—
NB-89-4.5-SL	Root	-4.0E-02	—	—	**-4.00E-02**	—	—
NB-91-4.5-SL	Root	4.0E-02	—	—	**4.00E-02**	—	—
NB-93-4.5-SL	Root	4.0E-02	—	—	**4.00E-02**	—	—
NB-96-4.5-SL	Root	-6.0E-02	—	—	**-6.00E-02**	—	—
NB-96-5-SL	Root	-5.0E-02	—	—	**-5.00E-02**	—	—
NB-97-4.5-SL	Root	1.3E-01	—	—	**1.30E-01**	—	—
NB-98-4.5-SL	Root	8.0E-02	—	—	**8.00E-02**	—	—
OA-18-03-SL	Root	-6.7E-02	—	—	**-6.70E-02**	—	—
OA-19-05-SL	Root	1.2E-01	—	—	**1.18E-01**	—	—
PL-04-05-SL	Root	-3.6E-01	5.1E-03	-3.4E-04	**-3.62E-01**	**5.06E-03**	**-3.40E-04**
PL-05-05-SL	Root	3.3E-01	—	—	**3.34E-01**	—	—
RR-05-05-SL	Root	5.2E-01	—	—	**5.18E-01**	—	—
SO-BP4A-04	Root	—	—	—	—	—	—
SO-PB5-04	Root	1.0E-03	8.1E-02	1.0E-02	**1.00E-03**	8.10E-02	**1.00E-02**
SO-RR6-01	Root	—	—	—	—	—	—
SO-RR7-01	Root	—	—	—	—	—	—
SO-RR8-05	Root	—	—	—	—	—	—
SO-RR9-01	Root	—	—	—	—	—	—
SS-BP-001-SV	Root	1.0E-01	—	—	**1.00E-01**	—	—
SS-BP-002-SV	Root	1.9E-02	—	—	**1.90E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
SS-BP-003-SV	Root	1.3E-02	—	—	**1.30E-02**	—	—
SS-BP-004-SV	Root	-8.0E-02	—	—	**-8.00E-02**	—	—
SS-BP-005-SV	Root	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-BP-007-SV	Root	-1.1E-01	—	—	**-1.10E-01**	—	—
SS-BP008-SV	Root	-1.0E-03	—	—	**-1.00E-03**	—	—
SS-BP-009-SV	Root	9.0E-02	—	—	**9.00E-02**	—	—
SS-BP-010-SV	Root	-6.0E-03	—	—	**-6.00E-03**	—	—
SS-BP-011-SV	Root	-6.0E-04	—	—	**-6.00E-04**	—	—
SS-BP-012-SV	Root	0.0E+00	—	—	**0.00E+00**	—	—
SS-BP-014-SV	Root	2.3E-02	—	—	**2.30E-02**	—	—
SS-BP-015-SV	Root	6.0E-02	—	—	**6.00E-02**	—	—
SS-BP-016-SV	Root	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-BP-017-SV	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-BP-018-SV	Root	-1.0E-01	—	—	**-1.00E-01**	—	—
SS-BP-021-SV	Root	6.0E-03	—	—	**6.00E-03**	—	—
SS-BP-022-SV	Root	8.0E-02	—	—	**8.00E-02**	—	—
SS-BP-023-SV	Root	-6.0E-02	—	—	**-6.00E-02**	—	—
SS-BP-024-SV	Root	2.0E-02	—	—	**2.00E-02**	—	—
SS-BP-025-SV	Root	2.0E-03	—	—	**2.00E-03**	—	—
SS-BP-026-SV	Root	4.0E-03	—	—	**4.00E-03**	—	—
SS-BP-027-SV	Root	2.0E-03	—	—	**2.00E-03**	—	—
SS-BP-028A-SV	Root	1.2E-02	—	—	**1.20E-02**	—	—
SS-BP-028B-SV	Root	-5.0E-04	—	—	**-5.00E-04**	—	—
SS-BP-028C-SV	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-BP-028-SV	Root	3.0E-02	—	—	**3.00E-02**	—	—
SS-BP-030-SV	Root	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-BP-031-SV	Root	6.0E-03	—	—	**6.00E-03**	—	—
SS-BP-032-SV	Root	-9.0E-03	—	—	**-9.00E-03**	—	—
SS-BP-033-SV	Root	-4.0E-03	—	—	**-4.00E-03**	—	—
SS-BP-034-SV	Root	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-BP-037-SV	Root	0.0E+00	—	—	**0.00E+00**	—	—
SS-BP-038-SV	Root	-4.0E-02	—	—	**-4.00E-02**	—	—
SS-BP-039-SV	Root	3.0E-03	—	—	**3.00E-03**	—	—
SS-BP-040-SV	Root	4.0E-02	—	—	**4.00E-02**	—	—
SS-BP-041-SV	Root	3.0E-02	—	—	**3.00E-02**	—	—
SS-BP-042-SV	Root	6.0E-03	—	—	**6.00E-03**	—	—
SS-BP-043-SV	Root	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-BP-044-SV	Root	-6.0E-02	—	—	**-6.00E-02**	—	—
SS-BP-045-SV	Root	7.0E-03	—	—	**7.00E-03**	—	—
SS-BP-046-SV	Root	1.7E-02	—	—	**1.70E-02**	—	—
SS-BP-047-SV	Root	7.0E-02	—	—	**7.00E-02**	—	—
SS-BP-048-SV	Root	4.0E-02	—	—	**4.00E-02**	—	—
SS-BP-049-SV	Root	2.4E-01	—	—	**2.40E-01**	—	—
SS-BP-051-SV	Root	-2.0E-03	—	—	**-2.00E-03**	—	—
SS-BP-052-SV	Root	0.0E+00	—	—	**0.00E+00**	—	—
SS-BP-053-SV	Root	7.0E-04	—	—	**7.00E-04**	—	—
SS-BP-054-SV	Root	2.0E-04	—	—	**2.00E-04**	—	—
SS-BP-055-SV	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-BP-056-SV	Root	1.1E-02	—	—	**1.10E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
SS-BP-057-SV	Root	8.0E-03	—	—	**8.00E-03**	—	—
SS-BP-058-SV	Root	-7.0E-02	—	—	**-7.00E-02**	—	—
SS-BP-060-SV	Root	-3.0E-02	—	—	**-3.00E-02**	—	—
SS-BP-061-SV	Root	7.0E-03	—	—	**7.00E-03**	—	—
SS-BP-062-SV	Root	-6.0E-03	—	—	**-6.00E-03**	—	—
SS-BP-063-SV	Root	5.0E-03	—	—	**5.00E-03**	—	—
SS-BP-064-SV	Root	1.2E-02	—	—	**1.20E-02**	—	—
SS-BP-065-SV	Root	9.0E-03	—	—	**9.00E-03**	—	—
SS-BP-066-SV	Root	1.5E-02	—	—	**1.50E-02**	—	—
SS-BP-067-SV	Root	3.8E-02	—	—	**3.80E-02**	—	—
SS-BP-068-SV	Root	2.5E-02	—	—	**2.50E-02**	—	—
SS-BP-069-SV	Root	6.0E-02	—	—	**6.00E-02**	—	—
SS-BP-070-SV	Root	2.4E-02	—	—	**2.40E-02**	—	—
SS-BP-071-SV	Root	2.9E-02	—	—	**2.90E-02**	—	—
SS-BP-072-SV	Root	2.0E-03	—	—	**2.00E-03**	—	—
SS-BP-073-SV	Root	-1.0E-03	—	—	**-1.00E-03**	—	—
SS-BP-074-SV	Root	5.3E-02	—	—	**5.30E-02**	—	—
SS-BP-075-SV	Root	1.5E-02	—	—	**1.50E-02**	—	—
SS-BP-076-SV	Root	-5.4E-02	—	—	**-5.40E-02**	—	—
SS-BP-077-SV	Root	3.1E-02	—	—	**3.10E-02**	—	—
SS-BP-078-SV	Root	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-BP-079-SV	Root	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-BP-080-SV	Root	1.7E-02	—	—	**1.70E-02**	—	—
SS-BP-106-SV	Root	-2.0E-03	—	—	**-2.00E-03**	—	—
SS-BP-107-SV	Root	-8.0E-02	—	—	**-8.00E-02**	—	—
SS-BP-108B-SV	Root	4.0E-02	—	—	**4.00E-02**	—	—
SS-BP-108-SV	Root	4.0E-02	—	—	**4.00E-02**	—	—
SS-BP-109-SV	Root	5.0E-03	—	—	**5.00E-03**	—	—
SS-BP-110-SV	Root	-4.0E-02	—	—	**-4.00E-02**	—	—
SS-BP-111-SV	Root	2.0E-02	—	—	**2.00E-02**	—	—
SS-E.EVAP-001-SV	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-GA-001-SV	Root	1.8E-02	—	—	**1.80E-02**	—	—
SS-GA-002-SV	Root	-2.0E-03	—	—	**-2.00E-03**	—	—
SS-GA-003-SV	Root	-1.6E-02	—	—	**-1.60E-02**	—	—
SS-GA-004-SV	Root	-1.7E-02	—	—	**-1.70E-02**	—	—
SS-GA-005-SV	Root	3.0E-03	—	—	**3.00E-03**	—	—
SS-GB-002-SV	Root	1.5E-01	—	—	**1.50E-01**	—	—
SS-GB-003-SV	Root	7.0E-03	—	—	**7.00E-03**	—	—
SS-GB-004-SV	Root	-9.0E-03	—	—	**-9.00E-03**	—	—
SS-GB-006-SV	Root	2.0E-03	—	—	**2.00E-03**	—	—
SS-GB-007-SV	Root	5.0E-03	—	—	**5.00E-03**	—	—
SS-GB-009-SV	Root	-8.0E-04	—	—	**-8.00E-04**	—	—
SS-GB-010-SV	Root	3.6E-02	—	—	**3.60E-02**	—	—
SS-GB-012-SV	Root	7.0E-03	—	—	**7.00E-03**	—	—
SS-GB-013-SV	Root	1.8E-02	—	—	**1.80E-02**	—	—
SS-GB-015-SV	Root	-1.9E-02	—	—	**-1.90E-02**	—	—
SS-GB-016-SV	Root	-6.0E-03	—	—	**-6.00E-03**	—	—
SS-GB-018-SV	Root	-1.0E-04	—	—	**-1.00E-04**	—	—
SS-GB-019-SV	Root	-3.0E-03	—	—	**-3.00E-03**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
SS-GB-020-SV	Root	6.0E-02	—	—	**6.00E-02**	—	—
SS-GB-021-SV	Root	-1.5E-02	—	—	**-1.50E-02**	—	—
SS-GB-022-SV	Root	-7.0E-03	—	—	**-7.00E-03**	—	—
SS-GB-023-SV	Root	2.6E-02	—	—	**2.60E-02**	—	—
SS-GC-001-SV	Root	1.1E-02	—	—	**1.10E-02**	—	—
SS-GC-002-SV	Root	-2.2E-02	—	—	**-2.20E-02**	—	—
SS-GC-004-SV	Root	2.1E-02	—	—	**2.10E-02**	—	—
SS-GC-005-SV	Root	1.3E-02	—	—	**1.30E-02**	—	—
SS-GC-007-SV	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-GC-008-SV	Root	5.0E-03	—	—	**5.00E-03**	—	—
SS-GC-010-SV	Root	1.0E-02	—	—	**1.00E-02**	—	—
SS-GC-011-SV	Root	1.5E-02	—	—	**1.50E-02**	—	—
SS-GL-001-SV	Root	-2.0E-04	—	—	**-2.00E-04**	—	—
SS-GL-002-SV	Root	2.7E-02	—	—	**2.70E-02**	—	—
SS-GL-003-SV	Root	1.3E-02	—	—	**1.30E-02**	—	—
SS-GL-004-SV	Root	-3.0E-03	—	—	**-3.00E-03**	—	—
SS-GL-005-SV	Root	1.4E-02	—	—	**1.40E-02**	—	—
SS-GL-006-SV	Root	2.0E-03	—	—	**2.00E-03**	—	—
SS-GL-007-SV	Root	-2.4E-02	—	—	**-2.40E-02**	—	—
SS-GL-008-SV	Root	2.6E-02	—	—	**2.60E-02**	—	—
SS-GL-009-SV	Root	-6.0E-04	—	—	**-6.00E-04**	—	—
SS-GL-010-SV	Root	4.0E-03	—	—	**4.00E-03**	—	—
SS-GL-011-SV	Root	-3.0E-03	—	—	**-3.00E-03**	—	—
SS-GL-012-SV	Root	-1.4E-02	—	—	**-1.40E-02**	—	—
SS-GL-013-SV	Root	-2.0E-04	—	—	**-2.00E-04**	—	—
SS-GL-014-SV	Root	-4.0E-03	—	—	**-4.00E-03**	—	—
SSGL-015-SV	Root	2.0E-02	—	—	**2.00E-02**	—	—
SS-GL-016-SV	Root	7.0E-03	—	—	**7.00E-03**	—	—
SS-GL-017-SV	Root	-2.4E-02	—	—	**-2.40E-02**	—	—
SS-GL-018-SV	Root	2.8E-02	—	—	**2.80E-02**	—	—
SS-GL-019-SV	Root	7.0E-03	—	—	**7.00E-03**	—	—
SS-GL-020-SV	Root	-9.0E-03	—	—	**-9.00E-03**	—	—
SS-GL-021-SV	Root	6.0E-03	—	—	**6.00E-03**	—	—
SS-GL-022-SV	Root	-5.0E-04	—	—	**-5.00E-04**	—	—
SS-GL-023-SV	Root	9.0E-04	—	—	**9.00E-04**	—	—
SS-GL-024-SV	Root	1.6E-02	—	—	**1.60E-02**	—	—
SS-GL-025-SV	Root	-1.7E-02	—	—	**-1.70E-02**	—	—
SS-GL-026-SV	Root	-2.4E-02	—	—	**-2.40E-02**	—	—
SS-GL-027-SV	Root	-2.3E-02	—	—	**-2.30E-02**	—	—
SS-GL-028-SV	Root	-5.0E-03	—	—	**-5.00E-03**	—	—
SS-GL-029-SV	Root	-1.1E-02	—	—	**-1.10E-02**	—	—
SS-GL-030-SV	Root	6.0E-03	—	—	**6.00E-03**	—	—
SS-GL-031-SV	Root	5.0E-03	—	—	**5.00E-03**	—	—
SS-GL-032-SV	Root	4.0E-03	—	—	**4.00E-03**	—	—
SS-GL-033-SV	Root	1.1E-02	—	—	**1.10E-02**	—	—
SS-GL-034-SV	Root	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-GL-035-SV	Root	0.0E+00	—	—	**0.00E+00**	—	—
SS-HS-001-SV	Root	-1.5E-01	—	—	**-1.50E-01**	—	—
SS-HS-002-SV	Root	6.0E-02	—	—	**6.00E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
SS-HS-003-SV	Root	-3.0E-02	—	—	**-3.00E-02**	—	—
SS-HS-004-EL-1.0	Root	-1.3E+00	—	—	**-1.30E+00**	—	—
SS-HS-004-SV	Root	1.2E-01	—	—	**1.20E-01**	—	—
SS-HS-005EL-0.75-1.0	Root	-2.5E+00	—	—	**-2.50E+00**	—	—
SS-HS-005-EL-1.0-1.5	Root	-1.4E+00	—	—	**-1.40E+00**	—	—
SS-HS-005-EL-4.5-5.0	Root	-1.2E-01	—	—	**-1.20E-01**	—	—
SS-HS-005-SV	Root	-1.7E-01	—	—	**-1.70E-01**	—	—
SS-HS-006-EL-0.5-1.0	Root	-1.2E+01	—	—	**-1.15E+01**	—	—
SS-LA-006-SV	Root	2.0E-03	—	—	**2.00E-03**	—	—
SS-LA-019-SV	Root	1.9E-01	—	—	**1.90E-01**	—	—
SS-LA-020-SV	Root	-3.0E-02	—	—	**-3.00E-02**	—	—
SS-LA-029-SV	Root	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-LA-035-SV	Root	1.0E-02	—	—	**1.00E-02**	—	—
SS-LA-036-SV	Root	-6.0E-04	—	—	**-6.00E-04**	—	—
SS-LA-050-SV	Root	6.0E-02	—	—	**6.00E-02**	—	—
SS-LA-059-SV	Root	1.0E-01	—	—	**1.00E-01**	—	—
SS-LA-081-SV	Root	-7.0E-02	—	—	**-7.00E-02**	—	—
SS-LA-082-SV	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-LA-083-SV	Root	5.0E-02	—	—	**5.00E-02**	—	—
SS-LA-084-SV	Root	8.0E-02	—	—	**8.00E-02**	—	—
SS-LA-085-SV	Root	2.0E-02	—	—	**2.00E-02**	—	—
SS-LA-086-SV	Root	1.2E-01	—	—	**1.20E-01**	—	—
SS-LA-087-SV	Root	3.0E-02	—	—	**3.00E-02**	—	—
SS-LA-088-SV	Root	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-LA-089-SV	Root	-5.0E-03	—	—	**-5.00E-03**	—	—
SS-LA-090-SV	Root	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-LA-091-SV	Root	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-LA-092-SV	Root	2.0E-02	—	—	**2.00E-02**	—	—
SS-LA-093-SV	Root	-6.0E-02	—	—	**-6.00E-02**	—	—
SS-LA-094-SV	Root	3.0E-02	—	—	**3.00E-02**	—	—
SS-LA-095-SV	Root	-5.0E-03	—	—	**-5.00E-03**	—	—
SS-LA-096-SV	Root	-3.0E-03	—	—	**-3.00E-03**	—	—
SS-LA-098-SV	Root	-1.5E-02	—	—	**-1.50E-02**	—	—
SS-LA-099-SV	Root	-4.0E-02	—	—	**-4.00E-02**	—	—
SS-LA-100-SV	Root	-1.4E-02	—	—	**-1.40E-02**	—	—
SS-LF-101-SV	Root	3.0E-03	—	—	**3.00E-03**	—	—
SS-LF-102-SV	Root	-3.1E-02	—	—	**-3.10E-02**	—	—
SS-LF-103-SV	Root	2.2E-02	—	—	**2.20E-02**	—	—
SS-LF-104-SV	Root	2.3E-02	—	—	**2.30E-02**	—	—
SS-LF-105-SV	Root	1.1E-02	—	—	**1.10E-02**	—	—
SS-W.EVAP-001-SV	Root	2.0E-02	—	—	**2.00E-02**	—	—
SW-02-01-SL	Root	3.1E-01	1.5E-01	7.5E-03	**3.06E-01**	1.54E-01	**7.53E-03**
SW-06-05-SL	Root	2.4E-01	—	—	**2.35E-01**	—	—
SW-07-05-SL	Root	-4.7E-01	—	—	**-4.70E-01**	—	—
SW-08-03-SL	Root	-5.9E-02	—	—	**-5.87E-02**	—	—
SW-08-05-SL	Root	9.4E-02	—	—	**9.42E-02**	—	—
BD-13-09-SL	Deep	-1.7E-01	—	—	**-1.74E-01**	—	—
BD-13-15-SL	Deep	-1.4E-01	—	—	**-1.41E-01**	—	—
BD-13-23-SL	Deep	1.9E-01	—	—	**1.89E-01**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
BD-13-30-SL	Deep	1.5E-02	—	—	**1.51E-02**	—	—
BD-14-13-SL	Deep	2.2E-01	—	—	**2.23E-01**	—	—
BD-14-25-SL	Deep	-7.9E-02	—	—	**-7.87E-02**	—	—
BD-14-31-SL	Deep	-6.5E-03	—	—	**-6.52E-03**	—	—
BD-15-17-SL	Deep	2.7E-01	—	—	2.65E-01	—	—
BD-15-25-SL	Deep	-2.9E-02	—	—	**-2.94E-02**	—	—
BD-15-31-SL	Deep	-3.3E-02	—	—	**-3.28E-02**	—	—
BD-16-15-SL	Deep	-1.5E-01	—	—	**-1.46E-01**	—	—
BD-16-19-SL	Deep	-1.2E-01	—	—	**-1.22E-01**	—	—
BD-16-25-SL	Deep	8.9E-02	—	—	**8.90E-02**	—	—
BD-16-34-SL	Deep	-3.7E-02	—	—	**-3.68E-02**	—	—
BD-17-8.5-SL	Deep	-4.0E-03	—	—	**-4.00E-03**	—	—
BD-18-8.5-SL	Deep	4.0E-02	1.6E-02	-5.0E-03	**4.00E-02**	**1.60E-02**	**-5.00E-03**
BD-19-10.5-SL	Deep	1.0E-02	—	—	**1.00E-02**	—	—
BD-20-16.5-SL	Deep	-9.0E-02	—	—	**-9.00E-02**	—	—
BD-21-9-SL	Deep	3.0E-02	—	—	**3.00E-02**	—	—
BD-22-12.5-SL	Deep	3.0E-02	2.5E-02	-5.6E-03	**3.00E-02**	**2.50E-02**	**-5.60E-03**
BD-24-13-SL	Deep	1.0E-01	—	—	**1.00E-01**	—	—
BD-25-16.5-SL	Deep	5.0E-02	-1.1E-02	-9.9E-03	**5.00E-02**	**-1.07E-02**	**-9.90E-03**
BD-26-7.5-SL	Deep	-5.0E-02	—	—	**-5.00E-02**	—	—
BD-27-13-SL	Deep	-3.0E-02	1.7E-02	-6.8E-03	**-3.00E-02**	**1.70E-02**	**-6.80E-03**
BD-28-12.5-SL	Deep	1.2E-01	—	—	**1.20E-01**	—	—
BD-29-8.5-SL	Deep	-1.0E-03	-1.7E-02	7.0E-04	**-1.00E-03**	**-1.70E-02**	**7.00E-04**
BD-30-9-SL	Deep	7.8E-03	—	—	**7.80E-03**	—	—
BD-31-8.5-SL	Deep	-3.0E-02	—	—	**-3.00E-02**	—	—
BD-32-13-SL	Deep	-7.0E-03	—	—	**-7.00E-03**	—	—
BD-33-12.5-SL	Deep	1.0E-02	—	—	**1.00E-02**	—	—
BD-34-13-SL	Deep	-5.0E-02	—	—	**-5.00E-02**	—	—
BD-35-6.5-SL	Deep	-2.0E-03	—	—	**-2.00E-03**	—	—
BD-36-12.5-SL	Deep	9.0E-02	—	—	**9.00E-02**	—	—
BD-39-8.5-SL	Deep	4.0E-02	9.0E-03	-1.0E-02	**4.00E-02**	**9.00E-03**	**-1.00E-02**
BD-40-18-SL	Deep	-5.0E-02	—	—	**-5.00E-02**	—	—
BD-41-6-SL	Deep	2.0E-02	—	—	**2.00E-02**	—	—
BD-42-9-SL	Deep	5.0E-02	—	—	**5.00E-02**	—	—
BD-44-8.5-SL	Deep	0.0E+00	—	—	**0.00E+00**	—	—
BD-45-13-SL	Deep	4.0E-02	—	—	**4.00E-02**	—	—
BD-47-6.5-SL	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
BD-48-5.5-SL	Deep	-4.0E-02	-1.0E-03	4.0E-03	**-4.00E-02**	**-1.00E-03**	**4.00E-03**
BLD240-01-09	Deep	-2.3E-01	—	—	**-2.30E-01**	—	—
BLD240-03-19	Deep	-8.0E-02	—	—	**-8.00E-02**	—	—
BLD255-07-15	Deep	-4.0E-02	—	—	**-4.00E-02**	—	—
BLD255-08-08	Deep	8.3E-03	3.6E-03	7.8E-03	8.27E-03	**3.57E-03**	7.83E-03
BP-13-11-SL	Deep	0.0E+00	—	—	**0.00E+00**	—	—
BP-13-15-SL	Deep	5.0E-02	—	—	**5.03E-02**	—	—
BP-13-25-SL	Deep	-4.1E-01	—	—	**-4.05E-01**	—	—
BP-13-35-SL	Deep	1.4E-01	—	—	**1.35E-01**	—	—
BP-17-15-SL	Deep	-2.0E-01	—	—	**-2.00E-01**	—	—
BP-17-23-SL	Deep	-3.5E-01	—	—	**-3.48E-01**	—	—
BP-17-31-SL	Deep	-4.8E-02	—	—	**-4.77E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
BP-18-15-SL	Deep	3.0E-03	—	—	**3.01E-03**	—	—
BP-18-25-SL	Deep	4.5E-01	—	—	**4.52E-01**	—	—
BP-18-31-SL	Deep	-1.7E-01	—	—	**-1.73E-01**	—	—
BP-19-13-SL	Deep	5.8E-01	—	—	**5.77E-01**	—	—
BP-19-25-SL	Deep	-1.2E-01	—	—	**-1.23E-01**	—	—
BP-19-29-SL	Deep	-4.7E-02	—	—	**-4.67E-02**	—	—
BP-20-19-SL	Deep	-1.9E-01	—	—	**-1.88E-01**	—	—
BP-20-27-SL	Deep	-9.5E-02	—	—	**-9.50E-02**	—	—
BP-21-07-SL	Deep	-9.2E-02	—	—	**-9.20E-02**	—	—
BP-21-13-SL	Deep	6.7E-02	—	—	**6.73E-02**	—	—
BP-21-24-SL	Deep	5.6E-02	—	—	**5.59E-02**	—	—
BP-21-34-SL	Deep	1.1E-01	—	—	**1.12E-01**	—	—
BP-22-13-SL	Deep	-4.1E-01	—	—	**-4.14E-01**	—	—
BP-22-23-SL	Deep	-3.7E-01	—	—	**-3.68E-01**	—	—
BP-22-33-SL	Deep	1.0E-02	—	—	**1.01E-02**	—	—
CB-02-15-SL	Deep	-1.6E-01	—	—	**-1.55E-01**	—	—
CB-02-25-SL	Deep	-9.7E-02	—	—	**-9.67E-02**	—	—
EP-13-13-SL	Deep	-5.1E-02	—	—	**-5.06E-02**	—	—
EP-13-25-SL	Deep	-9.4E-02	—	—	**-9.35E-02**	—	—
EP-13-30-SL	Deep	4.6E-02	—	—	**4.63E-02**	—	—
EP-14-13-SL	Deep	-4.2E-01	—	—	**-4.18E-01**	—	—
EP-14-25-SL	Deep	-2.4E-01	—	—	**-2.38E-01**	—	—
EP-14-31-SL	Deep	0.0E+00	—	—	**0.00E+00**	—	—
EP-15-13-SL	Deep	3.2E-02	—	—	**3.23E-02**	—	—
EP-15-25-SL	Deep	-1.7E-02	—	—	**-1.74E-02**	—	—
EP-15-29-SL	Deep	-8.8E-02	—	—	**-8.84E-02**	—	—
EP-16-15-SL	Deep	5.9E-01	—	—	**5.94E-01**	—	—
EP-16-27-SL	Deep	3.5E-01	—	—	**3.45E-01**	—	—
EP-17-15-SL	Deep	5.1E-01	—	—	**5.06E-01**	—	—
EP-17-25-SL	Deep	-4.5E-02	—	—	**-4.51E-02**	—	—
EP-17-30-SL	Deep	-1.1E-01	—	—	**-1.12E-01**	—	—
EP-18-09-SL	Deep	-2.3E-02	-2.8E-03	7.2E-03	**-2.32E-02**	**-2.84E-03**	7.15E-03
EP-18-15-SL	Deep	-4.5E-01	—	—	**-4.46E-01**	—	—
EP-18-29-SL	Deep	6.1E-02	—	—	**6.07E-02**	—	—
EP-19-13-SL	Deep	1.7E-01	1.4E-03	-1.2E-03	**1.72E-01**	**1.40E-03**	**-1.16E-03**
EP-19-25-SL	Deep	2.4E-01	—	—	**2.38E-01**	—	—
EP-19-31-SL	Deep	-1.6E-01	—	—	**-1.59E-01**	—	—
EP-20-15-SL	Deep	0.0E+00	—	—	**0.00E+00**	—	—
EP-20-25-SL	Deep	-2.1E-02	—	—	**-2.10E-02**	—	—
FS-19-1-BIA-1-SO-3	Deep	2.1E-02	—	—	**2.10E-02**	—	—
FS-19-1-BIA-2-SO-3	Deep	-6.0E-03	—	—	**-6.00E-03**	—	—
FS-19-1-BIA-3-SO-3	Deep	-2.0E-03	—	—	**-2.00E-03**	—	—
FS-19-1-BIA-4-SO-3	Deep	3.9E-02	—	—	**3.90E-02**	—	—
FS-19-1-BIA-5-SO-3	Deep	-8.0E-03	—	—	**-8.00E-03**	—	—
FS-19-1-QA-10-SO-3	Deep	3.2E-02	—	—	**3.20E-02**	—	—
FS-19-1-QA-1-SO-3	Deep	6.0E-03	—	—	**6.00E-03**	—	—
FS-19-1-QA-21-SO-3	Deep	-4.0E-03	—	—	**-4.00E-03**	—	—
FS-19-1-QA-9-SO-3	Deep	-4.0E-03	—	—	**-4.00E-03**	—	—
FS-19-1-SYS-10-SO-3	Deep	1.2E-02	—	—	**1.20E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
FS-19-1-SYS-11-SO-3	Deep	5.9E-02	—	—	**5.90E-02**	—	—
FS-19-1-SYS-12-SO-3	Deep	0.0E+00	—	—	**0.00E+00**	—	—
FS-19-1-SYS-13-SO-3	Deep	-1.0E-03	—	—	**-1.00E-03**	—	—
FS-19-1-SYS-14-SO-3	Deep	8.0E-03	—	—	**8.00E-03**	—	—
FS-19-1-SYS-15-SO-3	Deep	-5.0E-03	—	—	**-5.00E-03**	—	—
FS-19-1-SYS-16-SO-3	Deep	2.0E-03	—	—	**2.00E-03**	—	—
FS-19-1-SYS-17-SO-3	Deep	-1.0E-03	—	—	**-1.00E-03**	—	—
FS-19-1-SYS-18-SO-3	Deep	-2.0E-03	—	—	**-2.00E-03**	—	—
FS-19-1-SYS-19-SO-3	Deep	-1.7E-02	—	—	**-1.70E-02**	—	—
FS-19-1-SYS-1-SO-3	Deep	1.2E-02	—	—	**1.20E-02**	—	—
FS-19-1-SYS-20-SO-3	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
FS-19-1-SYS-21-SO-3	Deep	3.0E-04	—	—	**3.00E-04**	—	—
FS-19-1-SYS-22-SO-3	Deep	1.0E-03	—	—	**1.00E-03**	—	—
FS-19-1-SYS-2-SO-3	Deep	-3.1E-02	—	—	**-3.10E-02**	—	—
FS-19-1-SYS-3-SO-3	Deep	-1.1E-02	—	—	**-1.10E-02**	—	—
FS-19-1-SYS-4-SO-3	Deep	1.2E-02	—	—	**1.17E-02**	—	—
FS-19-1-SYS-5-SO-3	Deep	1.6E-02	—	—	**1.60E-02**	—	—
FS-19-1-SYS-6-SO-3	Deep	1.4E-02	—	—	**1.40E-02**	—	—
FS-19-1-SYS-7-SO-3	Deep	-3.0E-02	—	—	**-3.00E-02**	—	—
FS-19-1-SYS-8-SO-3	Deep	-2.1E-02	—	—	**-2.10E-02**	—	—
FS-19-1-SYS-9-SO-3	Deep	-2.0E-03	—	—	**-2.00E-03**	—	—
FS-19-2-QA-06-SO-3	Deep	5.0E-05	—	—	**5.00E-05**	—	—
FS-19-2-QA-17-SO-3	Deep	6.0E-03	—	—	**6.00E-03**	—	—
FS-19-2-QA-8-SO-3	Deep	-4.0E-04	—	—	**-4.00E-04**	—	—
FS-19-2-QC-04-SO-3	Deep	9.0E-04	—	—	**9.00E-04**	—	—
FS-19-2-SYS-01-SO-3	Deep	1.0E-03	—	—	**1.00E-03**	—	—
FS-19-2-SYS-02-SO-3	Deep	1.7E-02	—	—	**1.70E-02**	—	—
FS-19-2-SYS-03-SO-3	Deep	2.5E-02	—	—	**2.50E-02**	—	—
FS-19-2-SYS-04-SO-3	Deep	-7.0E-04	—	—	**-7.00E-04**	—	—
FS-19-2-SYS-05-SO-3	Deep	2.0E-02	—	—	**2.00E-02**	—	—
FS-19-2-SYS-06-SO-3	Deep	2.4E-02	—	—	**2.40E-02**	—	—
FS-19-2-SYS-09-SO-3	Deep	1.9E-02	—	—	**1.90E-02**	—	—
FS-19-2-SYS-10-SO-3	Deep	3.5E-02	—	—	**3.50E-02**	—	—
FS-19-2-SYS-11-SO-3	Deep	-1.2E-02	—	—	**-1.20E-02**	—	—
FS-19-2-SYS-12-SO-3	Deep	-1.1E-02	—	—	**-1.10E-02**	—	—
FS-19-2-SYS-13-SO-3	Deep	1.0E-03	—	—	**1.00E-03**	—	—
FS-19-2-SYS-14-SO-3	Deep	-1.8E-02	—	—	**-1.80E-02**	—	—
FS-19-2-SYS-15-SO-3	Deep	3.0E-03	—	—	**3.00E-03**	—	—
FS-19-2-SYS-16-SO-3	Deep	6.0E-04	—	—	**6.00E-04**	—	—
FS-19-2-SYS-17-SO-3	Deep	2.0E-03	—	—	**2.00E-03**	—	—
FS-19-2-SYS-18-SO-3	Deep	2.7E-02	—	—	**2.70E-02**	—	—
FS-19-2-SYS-19-SO-3	Deep	-2.0E-03	—	—	**-2.00E-03**	—	—
FS-19-2-SYS-20-SO-3	Deep	5.0E-03	—	—	**5.00E-03**	—	—
FS-19-2-SYS-21-SO-3	Deep	2.2E-02	—	—	**2.20E-02**	—	—
FS-19-2-SYS-22-SO-3	Deep	5.0E-04	—	—	**5.00E-04**	—	—
FS-19-2-SYS-7-SO-3	Deep	-6.0E-03	—	—	**-6.00E-03**	—	—
FS-19-2-SYS-8-SO-3	Deep	2.1E-02	—	—	**2.10E-02**	—	—
LF-06-13-SL	Deep	6.0E-02	—	—	**6.00E-02**	—	—
LF-06-27-SL	Deep	-2.1E-01	—	—	**-2.14E-01**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
LF-06-32-SL	Deep	-1.8E-01	—	—	**-1.82E-01**	—	—
LF-07-09-SL	Deep	-1.5E-01	—	—	**-1.48E-01**	—	—
LF-07-15-SL	Deep	2.3E-01	—	—	**2.27E-01**	—	—
LF-07-25-SL	Deep	-2.0E-01	—	—	**-1.97E-01**	—	—
LF-07-34-SL	Deep	-2.8E-03	—	—	**-2.82E-03**	—	—
LF-08-15-SL	Deep	1.2E-01	—	—	**1.23E-01**	—	—
LF-08-21-SL	Deep	-5.9E-01	—	—	**-5.90E-01**	—	—
LF-08-37-SL	Deep	6.1E-02	—	—	**6.09E-02**	—	—
LF-09-17-SL	Deep	-1.6E-01	—	—	**-1.62E-01**	—	—
LF-09-25-SL	Deep	-1.5E-01	—	—	**-1.49E-01**	—	—
LF-09-31-SL	Deep	3.5E-02	—	—	**3.47E-02**	—	—
NB-101-7-SL	Deep	-3.0E-03	—	—	**-3.00E-03**	—	—
NB-103-13.5-SL	Deep	5.0E-02	—	—	**5.00E-02**	—	—
NB-104-12.5-SL	Deep	7.0E-03	—	—	**7.00E-03**	—	—
NB-105-15.5-SL	Deep	8.0E-02	—	—	**8.00E-02**	—	—
NB-106-7.5-SL	Deep	1.7E-02	—	—	**1.70E-02**	—	—
NB-107-17-SL	Deep	1.2E-02	—	—	**1.20E-02**	—	—
NB-108-9-SL	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
NB-111-8.5-SL	Deep	1.0E-01	—	—	**1.00E-01**	—	—
NB-112-8.5-SL	Deep	3.0E-02	—	—	**3.00E-02**	—	—
NB-113-19.5-SL	Deep	1.0E-02	—	—	**1.00E-02**	—	—
NB-115-12.5-SL	Deep	-6.0E-02	—	—	**-6.00E-02**	—	—
NB-116-12.5-SL	Deep	9.0E-03	—	—	**9.00E-03**	—	—
NB-117-13.5-SL	Deep	2.0E-02	—	—	**2.00E-02**	—	—
NB-118-10.5-SL	Deep	2.0E-02	—	—	**2.00E-02**	—	—
NB-119-13.5-SL	Deep	5.0E-02	—	—	**5.00E-02**	—	—
NB-120-16.5-SL	Deep	-4.0E-02	—	—	**-4.00E-02**	—	—
NB-122-14.5-SL	Deep	-3.0E-02	—	—	**-3.00E-02**	—	—
NB-123-8.5-SL	Deep	1.0E-02	—	—	**1.00E-02**	—	—
NB-124-8.5-SL	Deep	3.0E-02	—	—	**3.00E-02**	—	—
NB-125-7-SL	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
NB-126-12.5-SL	Deep	7.0E-03	—	—	**7.00E-03**	—	—
NB-128-18.5-SL	Deep	1.1E-02	—	—	**1.10E-02**	—	—
NB-129-19-SL	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
NB-130-11-SL	Deep	-6.0E-04	—	—	**-6.00E-04**	—	—
NB-131-6.5-SL	Deep	2.0E-03	—	—	**2.00E-03**	—	—
NB-132-13-SL	Deep	-1.0E-02	—	—	**-1.00E-02**	—	—
NB-133-5.5-SL	Deep	2.0E-02	—	—	**2.00E-02**	—	—
NB-134-9-SL	Deep	7.0E-02	—	—	**7.00E-02**	—	—
NB-135-15-SL	Deep	-1.0E-02	—	—	**-1.00E-02**	—	—
NB-136-17.5-SL	Deep	4.0E-02	—	—	**4.00E-02**	—	—
NB-137-13.5-SL	Deep	-1.0E-02	—	—	**-1.00E-02**	—	—
NB-138-14.5-SL	Deep	1.0E-03	—	—	**1.00E-03**	—	—
NB-139-15-SL	Deep	1.0E-01	—	—	**1.00E-01**	—	—
NB-140-12.5-SL	Deep	6.0E-02	—	—	**6.00E-02**	—	—
NB-141-17.5-SL	Deep	4.0E-03	—	—	**4.00E-03**	—	—
NB-142-9-SL	Deep	8.0E-03	—	—	**8.00E-03**	—	—
NB-143-6.5-SL	Deep	7.9E-02	—	—	**7.90E-02**	—	—
NB-144-7-SL	Deep	4.5E-02	—	—	**4.50E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
NB-39-15-SL	Deep	1.3E-01	—	—	**1.28E-01**	—	—
NB-39-25-SL	Deep	-1.1E-01	—	—	**-1.12E-01**	—	—
NB-39-30-SL	Deep	2.2E-01	—	—	**2.20E-01**	—	—
NB-47-15-SL	Deep	1.6E-01	—	—	**1.57E-01**	—	—
NB-47-25-SL	Deep	5.8E-02	—	—	**5.81E-02**	—	—
NB-47-31-SL	Deep	-3.0E-01	—	—	**-2.96E-01**	—	—
NB-48-11-SL	Deep	-1.1E-01	—	—	**-1.08E-01**	—	—
NB-48-15-SL	Deep	-9.7E-02	—	—	**-9.70E-02**	—	—
NB-48-25-SL	Deep	-4.5E-01	—	—	**-4.52E-01**	—	—
NB-48-35-SL	Deep	3.0E-02	—	—	**3.00E-02**	—	—
NB-49-15-SL	Deep	-6.0E-01	—	—	**-5.96E-01**	—	—
NB-49-25-SL	Deep	-1.5E-01	—	—	**-1.49E-01**	—	—
NB-49-37-SL	Deep	1.5E-01	—	—	**1.50E-01**	—	—
NB-50-15-SL	Deep	1.2E-01	—	—	**1.17E-01**	—	—
NB-50-25-SL	Deep	-4.9E-02	—	—	**-4.91E-02**	—	—
NB-50-37-SL	Deep	2.2E-01	—	—	**2.21E-01**	—	—
NB-51-13-SL	Deep	-7.2E-01	—	—	**-7.16E-01**	—	—
NB-51-25-SL	Deep	4.7E-01	—	—	**4.73E-01**	—	—
NB-51-37-SL	Deep	-9.0E-02	—	—	**-9.03E-02**	—	—
NB-52-13-SL	Deep	1.3E-01	—	—	**1.30E-01**	—	—
NB-52-25-SL	Deep	-4.7E-02	—	—	**-4.65E-02**	—	—
NB-52-35-SL	Deep	2.3E-02	—	—	**2.25E-02**	—	—
NB-53-13-SL	Deep	-4.3E-01	—	—	**-4.26E-01**	—	—
NB-53-23-SL	Deep	1.6E-02	—	—	**1.62E-02**	—	—
NB-53-33-SL	Deep	8.9E-02	—	—	**8.91E-02**	—	—
NB-54-13-SL	Deep	6.8E-02	—	—	**6.77E-02**	—	—
NB-54-25-SL	Deep	-3.4E-02	—	—	**-3.39E-02**	—	—
NB-54-31-SL	Deep	2.3E-02	—	—	**2.34E-02**	—	—
NB-55-13-SL	Deep	-9.4E-02	—	—	**-9.36E-02**	—	—
NB-55-25-SL	Deep	1.4E-01	—	—	**1.38E-01**	—	—
NB-55-33-SL	Deep	-3.6E-01	—	—	**-3.63E-01**	—	—
NB-56-13-SL	Deep	-3.2E-02	—	—	**-3.16E-02**	—	—
NB-56-25-SL	Deep	-9.5E-02	—	—	**-9.46E-02**	—	—
NB-56-33-SL	Deep	5.4E-02	—	—	**5.35E-02**	—	—
NB-57-15-SL	Deep	-1.5E-01	—	—	**-1.54E-01**	—	—
NB-57-29-SL	Deep	8.0E-02	—	—	**8.02E-02**	—	—
NB-57-34-SL	Deep	6.0E-02	—	—	**6.04E-02**	—	—
NB-58-15-SL	Deep	7.3E-01	—	—	**7.33E-01**	—	—
NB-58-29-SL	Deep	4.7E-02	—	—	**4.71E-02**	—	—
NB-58-36-SL	Deep	-1.5E-01	—	—	**-1.48E-01**	—	—
NB-59-13-SL	Deep	-2.2E-01	—	—	**-2.19E-01**	—	—
NB-59-25-SL	Deep	7.0E-02	—	—	**7.04E-02**	—	—
NB-59-31-SL	Deep	4.7E-02	—	—	**4.68E-02**	—	—
NB-60-13-SL	Deep	1.4E-02	—	—	**1.38E-02**	—	—
NB-60-23-SL	Deep	-2.8E-02	—	—	**-2.81E-02**	—	—
NB-60-31-SL	Deep	3.5E-02	—	—	**3.50E-02**	—	—
NB-61-13-SL	Deep	-2.9E-03	—	—	**-2.88E-03**	—	—
NB-61-23-SL	Deep	6.0E-02	—	—	**5.95E-02**	—	—
NB-61-28-SL	Deep	-3.7E-02	—	—	**-3.72E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
NB-74-17-SL	Deep	5.6E-01	—	—	**5.58E-01**	—	—
NB-74-25-SL	Deep	6.8E-02	—	—	**6.76E-02**	—	—
NB-74-33-SL	Deep	-6.2E-02	—	—	**-6.22E-02**	—	—
NB-79-11-SL	Deep	9.6E-03	—	—	**9.56E-03**	—	—
NB-79-24-SL	Deep	4.1E-01	—	—	**4.14E-01**	—	—
NB-80-11-SL	Deep	-1.7E-01	—	—	**-1.73E-01**	—	—
NB-80-27-SL	Deep	3.1E-01	—	—	**3.14E-01**	—	—
NB-88-20-SL	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
NB-89-19.5-SL	Deep	-1.1E-01	—	—	**-1.10E-01**	—	—
NB-91-6.5-SL	Deep	3.0E-03	—	—	**3.00E-03**	—	—
NB-93-15-SL	Deep	8.0E-02	—	—	**8.00E-02**	—	—
NB-97-9.5-SL	Deep	-8.0E-02	—	—	**-8.00E-02**	—	—
NB-98-9-SL	Deep	-2.0E-04	—	—	**-2.00E-04**	—	—
OA-18-17-SL	Deep	-1.5E-01	—	—	**-1.54E-01**	—	—
OA-18-25-SL	Deep	5.0E-02	—	—	**4.95E-02**	—	—
OA-18-33-SL	Deep	-1.0E-01	—	—	**-1.04E-01**	—	—
OA-19-15-SL	Deep	6.7E-02	—	—	**6.71E-02**	—	—
OA-19-25-SL	Deep	3.3E-02	—	—	**3.29E-02**	—	—
OA-19-33-SL	Deep	-4.9E-02	—	—	**-4.89E-02**	—	—
PL-04-13-SL	Deep	3.9E-02	—	—	**3.92E-02**	—	—
PL-04-23-SL	Deep	2.9E-01	—	—	**2.92E-01**	—	—
PL-04-31-SL	Deep	1.0E-01	—	—	**1.03E-01**	—	—
PL-05-15-SL	Deep	1.2E-01	—	—	**1.17E-01**	—	—
PL-05-28-SL	Deep	-1.0E-01	—	—	**-1.04E-01**	—	—
PL-06-07-SL	Deep	-7.0E-02	—	—	**-6.96E-02**	—	—
PL-06-13-SL	Deep	-3.3E-01	—	—	**-3.28E-01**	—	—
PL-06-17-SL	Deep	-6.3E-01	—	—	**-6.25E-01**	—	—
PL-06-29-SL	Deep	-1.4E-01	—	—	**-1.37E-01**	—	—
PL-06-33-SL	Deep	-1.9E-01	—	—	**-1.92E-01**	—	—
RR-04-07-SL	Deep	4.5E-02	6.2E-03	-2.1E-03	**4.53E-02**	**6.21E-03**	**-2.08E-03**
RR-04-15-SL	Deep	3.3E-01	—	—	**3.31E-01**	—	—
RR-04-25-SL	Deep	-3.5E-02	—	—	**-3.53E-02**	—	—
RR-05-15-SL	Deep	5.7E-01	—	—	**5.69E-01**	—	—
RR-05-25-SL	Deep	1.0E-01	—	—	**1.03E-01**	—	—
SO-BP1A-14	Deep	—	—	—	—	—	—
SO-BP1B-09	Deep	—	—	—	—	—	—
SO-BP1C-10	Deep	—	—	—	—	—	—
SO-BP1D-12	Deep	—	—	—	—	—	—
SO-BP1E-07	Deep	—	—	—	—	—	—
SO-BP1F-06	Deep	—	—	—	—	—	—
SO-BP2B-12	Deep	—	—	—	—	—	—
SO-BP2C-12	Deep	—	—	—	—	—	—
SO-BP2D-05	Deep	—	—	—	—	—	—
SO-BP2E-07	Deep	—	—	—	—	—	—
SO-BP4B-08	Deep	—	—	—	—	—	—
SO-BP4C-10	Deep	—	—	—	—	—	—
SO-BP4D-08	Deep	—	—	—	—	—	—
SO-BP4E-09	Deep	—	—	—	—	—	—
SO-BP4F-08	Deep	—	—	—	—	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
SO-BP5B-10	Deep	—	—	—	—	—	—
SO-BP5C-08	Deep	—	—	—	—	—	—
SO-BP5D-08	Deep	—	—	—	—	—	—
SO-BP5E-10	Deep	—	—	—	—	—	—
SO-BP6A-06	Deep	-1.4E-02	5.5E-02	9.0E-03	**-1.40E-02**	**5.50E-02**	**9.00E-03**
SO-BP6B-09	Deep	—	—	—	—	—	—
SO-BP6C-12	Deep	3.3E-02	1.7E-02	-7.0E-03	**3.30E-02**	**1.70E-02**	**-7.00E-03**
SO-BP6D-12	Deep	-6.0E-03	1.7E-01	7.0E-03	**-6.00E-03**	1.65E-01	**7.00E-03**
SO-BP6E-14	Deep	2.2E-02	6.0E-03	1.7E-02	**2.20E-02**	**6.00E-03**	**1.70E-02**
SO-BP6F-09	Deep	3.2E-02	2.2E-02	-6.0E-03	**3.20E-02**	**2.20E-02**	**-6.00E-03**
SO-BP6G-10	Deep	5.1E-02	7.9E-02	-4.0E-03	**5.10E-02**	7.90E-02	**-4.00E-03**
SO-BP7B-08	Deep	—	—	—	—	—	—
SO-BP7C-12	Deep	—	—	—	—	—	—
SO-BP9A-16	Deep	-1.8E-02	8.2E-02	7.0E-03	**-1.80E-02**	8.20E-02	**7.00E-03**
SS-BP-001-DV	Deep	4.0E-02	—	—	**4.00E-02**	—	—
SS-BP-002-DV	Deep	3.8E-02	—	—	**3.80E-02**	—	—
SS-BP-003-DV	Deep	1.0E-03	—	—	**1.00E-03**	—	—
SS-BP-004-DV	Deep	-1.3E-01	—	—	**-1.30E-01**	—	—
SS-BP-005-DV	Deep	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-BP-007-DV	Deep	1.6E-01	—	—	**1.60E-01**	—	—
SS-BP-007-EL-10	Deep	1.0E+00	—	—	1.03E+00	—	—
SS-BP-008-DV	Deep	-4.0E-05	—	—	**-4.00E-05**	—	—
SS-BP-009-DV	Deep	2.0E-02	—	—	**2.00E-02**	—	—
SS-BP-010-DV	Deep	-1.5E-01	—	—	**-1.50E-01**	—	—
SS-BP-011-DV	Deep	8.0E-03	—	—	**8.00E-03**	—	—
SS-BP-012-DV	Deep	-2.0E-01	—	—	**-2.00E-01**	—	—
SS-BP-014-DV	Deep	2.2E-02	—	—	**2.20E-02**	—	—
SS-BP-015-DV	Deep	1.0E-02	—	—	**1.00E-02**	—	—
SS-BP-016-DV	Deep	5.0E-02	—	—	**5.00E-02**	—	—
SS-BP-017-DV	Deep	-8.0E-02	—	—	**-8.00E-02**	—	—
SS-BP-017-DV-EL-11	Deep	4.0E-02	—	—	**4.00E-02**	—	—
SS-BP-018DV	Deep	2.4E-01	—	—	**2.40E-01**	—	—
SS-BP-021-DV	Deep	-6.0E-02	—	—	**-6.00E-02**	—	—
SS-BP-022-DV	Deep	-2.0E-01	—	—	**-2.00E-01**	—	—
SS-BP-022-DV-EL-6	Deep	-6.0E-02	—	—	**-6.00E-02**	—	—
SS-BP-023-DV	Deep	5.0E-02	—	—	**5.00E-02**	—	—
SS-BP-024-DV	Deep	-1.0E-01	—	—	**-1.00E-01**	—	—
SS-BP-025-DV	Deep	7.0E-03	—	—	**7.00E-03**	—	—
SS-BP-026-DV	Deep	-1.1E-02	—	—	**-1.10E-02**	—	—
SS-BP-027-DV	Deep	8.0E-02	—	—	**8.00E-02**	—	—
SS-BP-028A-DV	Deep	-2.0E-03	—	—	**-2.00E-03**	—	—
SS-BP-028B-DV	Deep	-8.0E-03	—	—	**-8.00E-03**	—	—
SS-BP-028C-DV	Deep	3.5E-02	—	—	**3.50E-02**	—	—
SS-BP-028-DV	Deep	6.0E-02	—	—	**6.00E-02**	—	—
SS-BP-028-DV-EL-9	Deep	9.0E-02	—	—	**9.00E-02**	—	—
SS-BP-030-DV	Deep	1.0E-01	—	—	**1.00E-01**	—	—
SS-BP-031-DV	Deep	-6.0E-02	—	—	**-6.00E-02**	—	—
SS-BP-032-DV	Deep	-1.6E-02	—	—	**-1.60E-02**	—	—
SS-BP-033-DV	Deep	-9.0E-02	—	—	**-9.00E-02**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
SS-BP-034-DV	Deep	1.3E-01	—	—	**1.30E-01**	—	—
SS-BP-037-DV	Deep	-4.0E-02	—	—	**-4.00E-02**	—	—
SS-BP-038-DV	Deep	1.2E-01	—	—	**1.20E-01**	—	—
SS-BP-039-DV	Deep	-9.0E-02	—	—	**-9.00E-02**	—	—
SS-BP-040-DV	Deep	-3.0E-02	—	—	**-3.00E-02**	—	—
SS-BP-041-DV	Deep	2.0E-02	—	—	**2.00E-02**	—	—
SS-BP-042-DV	Deep	9.0E-02	—	—	**9.00E-02**	—	—
SS-BP-043-DV	Deep	-9.0E-03	—	—	**-9.00E-03**	—	—
SS-BP-044-DV	Deep	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-BP-045-DV	Deep	1.8E-02	—	—	**1.80E-02**	—	—
SS-BP-046-DV	Deep	-2.0E-03	—	—	**-2.00E-03**	—	—
SS-BP-047-DV	Deep	5.0E-02	—	—	**5.00E-02**	—	—
SS-BP-048-DV	Deep	6.0E-02	—	—	**6.00E-02**	—	—
SS-BP-049-DV	Deep	-4.0E-02	—	—	**-4.00E-02**	—	—
SS-BP-051-DV	Deep	2.0E-02	—	—	**2.00E-02**	—	—
SS-BP-052-DV	Deep	1.5E-02	—	—	**1.50E-02**	—	—
SS-BP-052-EL-6	Deep	-4.0E-02	—	—	**-4.00E-02**	—	—
SS-BP-053-DV	Deep	-2.0E-03	—	—	**-2.00E-03**	—	—
SS-BP-054-DV	Deep	1.0E-03	—	—	**1.00E-03**	—	—
SS-BP-055-DV	Deep	8.0E-03	—	—	**8.00E-03**	—	—
SS-BP-056-DV	Deep	7.0E-04	—	—	**7.00E-04**	—	—
SS-BP-057-DV	Deep	0.0E+00	—	—	**0.00E+00**	—	—
SS-BP-058-DV	Deep	1.4E-01	—	—	**1.40E-01**	—	—
SS-BP-060-DV	Deep	2.0E-02	—	—	**2.00E-02**	—	—
SS-BP-061-DV	Deep	2.0E-03	—	—	**2.00E-03**	—	—
SS-BP-062-DV	Deep	3.0E-03	—	—	**3.00E-03**	—	—
SS-BP-062-DV-EL-10	Deep	-1.2E-01	—	—	**-1.20E-01**	—	—
SS-BP-063-DV	Deep	2.5E-02	—	—	**2.50E-02**	—	—
SS-BP-064-DV	Deep	-4.0E-03	—	—	**-4.00E-03**	—	—
SS-BP-065-DV	Deep	-6.0E-03	—	—	**-6.00E-03**	—	—
SS-BP-065-DV-EL-5	Deep	1.1E-01	—	—	**1.09E-01**	—	—
SS-BP-066-CUT-EL	Deep	-1.7E-01	—	—	**-1.70E-01**	—	—
SS-BP-066-DV	Deep	1.4E-02	—	—	**1.40E-02**	—	—
SS-BP-067-DV	Deep	4.0E-03	—	—	**4.00E-03**	—	—
SS-BP-068-DV	Deep	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-BP-069-DV	Deep	3.6E-02	—	—	**3.60E-02**	—	—
SS-BP-070-DV	Deep	2.0E-04	—	—	**2.00E-04**	—	—
SS-BP-071-DV	Deep	1.2E-02	—	—	**1.20E-02**	—	—
SS-BP-072-DV	Deep	0.0E+00	—	—	**0.00E+00**	—	—
SS-BP-073-DV	Deep	1.1E-02	—	—	**1.10E-02**	—	—
SS-BP-074-DV	Deep	3.0E-03	—	—	**3.00E-03**	—	—
SS-BP-075-DV	Deep	6.0E-03	—	—	**6.00E-03**	—	—
SS-BP-075-DV-EL-7	Deep	5.0E-02	—	—	**5.00E-02**	—	—
SS-BP-076-DV	Deep	2.6E-02	—	—	**2.60E-02**	—	—
SS-BP-077-DV	Deep	-6.0E-03	—	—	**-6.00E-03**	—	—
SS-BP-078-DV	Deep	5.0E-02	—	—	**5.00E-02**	—	—
SS-BP-079-DV	Deep	4.0E-03	—	—	**4.00E-03**	—	—
SS-BP-080-DV	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-BP-106-DV	Deep	1.0E-03	—	—	**1.00E-03**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Sample ID	CSM	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)	Am-241 (pCi/g)	Np-237 (pCi/g)	Pu-239/240 (pCi/g)
SS-BP-107-DV	Deep	6.0E-05	—	—	**6.00E-05**	—	—
SS-BP-108B-DV	Deep	-2.7E-01	—	—	**-2.70E-01**	—	—
SS-BP-108B-DV-EL-6	Deep	5.0E-01	—	—	**5.00E-01**	—	—
SS-BP-109-DV	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-BP-110-DV	Deep	2.0E-02	—	—	**2.00E-02**	—	—
SS-BP-111-DV	Deep	4.0E-03	—	—	**4.00E-03**	—	—
SS-GA-001-DV	Deep	2.0E-03	—	—	**2.00E-03**	—	—
SS-GA-002-DV	Deep	2.4E-02	—	—	**2.40E-02**	—	—
SS-GA-003-DV	Deep	2.6E-02	—	—	**2.60E-02**	—	—
SS-GA-004-DV	Deep	1.4E-02	—	—	**1.40E-02**	—	—
SS-GA-005-DV	Deep	2.0E-04	—	—	**2.00E-04**	—	—
SS-GB-002-DV	Deep	-3.8E-02	—	—	**-3.80E-02**	—	—
SS-GB-004-DV	Deep	2.3E-02	—	—	**2.30E-02**	—	—
SS-GB-006-DV	Deep	3.0E-03	—	—	**3.00E-03**	—	—
SS-GB-007-DV	Deep	0.0E+00	—	—	**0.00E+00**	—	—
SS-GB-009-DV	Deep	1.1E-02	—	—	**1.10E-02**	—	—
SS-GB-010-DV	Deep	5.3E-02	—	—	**5.30E-02**	—	—
SS-GB-012-DV	Deep	8.0E-04	—	—	**8.00E-04**	—	—
SS-GB-013-DV	Deep	-2.2E-02	—	—	**-2.20E-02**	—	—
SS-GB-015-DV	Deep	1.7E-02	—	—	**1.70E-02**	—	—
SS-GB-016-DV	Deep	2.0E-03	—	—	**2.00E-03**	—	—
SS-GB-018-DV	Deep	-2.2E-02	—	—	**-2.20E-02**	—	—
SS-GB-019-DV	Deep	3.0E-04	—	—	**3.00E-04**	—	—
SS-GB-020-DV	Deep	-4.0E-03	—	—	**-4.00E-03**	—	—
SS-GB-021-DV	Deep	1.1E-02	—	—	**1.10E-02**	—	—
SS-GC-001-DV	Deep	1.3E-02	—	—	**1.30E-02**	—	—
SS-GC-002-DV	Deep	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-GC-004-DV	Deep	-4.0E-03	—	—	**-4.00E-03**	—	—
SS-GC-005-DV	Deep	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-GC-007-DV	Deep	-1.4E-02	—	—	**-1.40E-02**	—	—
SS-GC-008-DV	Deep	2.0E-02	—	—	**2.00E-02**	—	—
SS-GC-010-DV	Deep	1.8E-02	—	—	**1.80E-02**	—	—
SS-GC-011-DV	Deep	3.1E-02	—	—	**3.10E-02**	—	—
SS-GL-008-DV	Deep	2.4E-02	—	—	**2.40E-02**	—	—
SS-GL-009-DV	Deep	-6.0E-03	—	—	**-6.00E-03**	—	—
SS-GL-010-DV	Deep	-1.0E-03	—	—	**-1.00E-03**	—	—
SS-HS-005-DV	Deep	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-LA-006-DV	Deep	4.0E-02	—	—	**4.00E-02**	—	—
SS-LA-019-DV	Deep	9.0E-02	—	—	**9.00E-02**	—	—
SS-LA-020-DV	Deep	-4.0E-02	—	—	**-4.00E-02**	—	—
SS-LA-029-DV	Deep	-2.0E-04	—	—	**-2.00E-04**	—	—
SS-LA-035-DV	Deep	0.0E+00	—	—	**0.00E+00**	—	—
SS-LA-036-DV	Deep	-2.4E-02	—	—	**-2.40E-02**	—	—
SS-LA-050-DV	Deep	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-LA-059-DV	Deep	-3.0E-02	—	—	**-3.00E-02**	—	—
SS-LA-081-DV	Deep	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-LA-082-DV	Deep	3.0E-02	—	—	**3.00E-02**	—	—
SS-LA-083-DV	Deep	6.0E-02	—	—	**6.00E-02**	—	—
SS-LA-084-DV	Deep	1.0E-03	—	—	**1.00E-03**	—	—

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

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SS-LA-085-DV	Deep	-6.0E-03	—	—	**-6.00E-03**	—	—
SS-LA-085-DV-EL-6	Deep	5.0E-02	—	—	**5.00E-02**	—	—
SS-LA-086-DV	Deep	5.0E-02	—	—	**5.00E-02**	—	—
SS-LA-087-DV	Deep	-6.0E-02	—	—	**-6.00E-02**	—	—
SS-LA-088-DV	Deep	-5.0E-02	—	—	**-5.00E-02**	—	—
SS-LA-089-DV	Deep	8.0E-02	—	—	**8.00E-02**	—	—
SS-LA-090-DV	Deep	6.0E-02	—	—	**6.00E-02**	—	—
SS-LA-091-DV	Deep	3.0E-02	—	—	**3.00E-02**	—	—
SS-LA-092-DV	Deep	-7.0E-02	—	—	**-7.00E-02**	—	—
SS-LA-093-DV	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-LA-094-DV	Deep	5.0E-02	—	—	**5.00E-02**	—	—
SS-LA-095-DV	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-LA-096-DV	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-LA-097-DV	Deep	-3.2E-02	—	—	**-3.20E-02**	—	—
SS-LA-098-DV	Deep	-1.0E-04	—	—	**-1.00E-04**	—	—
SS-LA-099-DV	Deep	-8.0E-02	—	—	**-8.00E-02**	—	—
SS-LA-100-DV	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-LF-101-DV	Deep	3.2E-02	—	—	**3.20E-02**	—	—
SS-LF-102-DV	Deep	-1.0E-02	—	—	**-1.00E-02**	—	—
SS-LF-103-DV	Deep	-2.0E-02	—	—	**-2.00E-02**	—	—
SS-LF-104-DV	Deep	1.3E-02	—	—	**1.30E-02**	—	—
SS-LF-105-DV	Deep	-2.1E-02	—	—	**-2.10E-02**	—	—
SW-02-09-SL	Deep	-8.7E-02	—	—	**-8.74E-02**	—	—
SW-02-15-SL	Deep	-3.5E-01	—	—	**-3.47E-01**	—	—
SW-02-23-SL	Deep	1.3E-01	—	—	**1.34E-01**	—	—
SW-05-08-SL	Deep	-6.6E-02	—	—	**-6.56E-02**	—	—
SW-05-12-SL	Deep	5.1E-02	—	—	**5.11E-02**	—	—
SW-06-13-SL	Deep	4.3E-02	—	—	**4.29E-02**	—	—
SW-06-23-SL	Deep	1.5E-02	—	—	**1.53E-02**	—	—
SW-07-15-SL	Deep	-1.7E-01	—	—	**-1.65E-01**	—	—
SW-07-23-SL	Deep	-5.3E-02	—	—	**-5.33E-02**	—	—
SW-08-15-SL	Deep	7.3E-02	—	—	**7.29E-02**	—	—
SW-08-25-SL	Deep	-2.5E-01	—	—	**-2.50E-01**	—	—
WS-BP2A-11	Deep	—	—	—	—	—	—
WS-BP5A-07	Deep	—	—	—	—	—	—
WS-BP7A-08	Deep	—	—	—	—	—	—
WS-BP8A-10	Deep	2.1E-02	2.2E-01	-6.0E-04	**2.10E-02**	2.19E-01	**-6.00E-04**
Average					5.06E-03	2.03E-02	1.63E-03

Insignificant Radionulides - 20110223 R2.xlsx DRAFT Table a-2

Radionuclide	DSR (mrem/yr per pCi/g)	Year of Maximum Dose	DCGL [a] (pCi/g)
U-234	1.19E-01	1,000	209.6
U-235 + D	4.52E-01	1,000	55.3
U-238 + D	1.38E-01	0	181
Tc-99	9.30E-01	0	26.9
Th-232 + C	1.20E+01	0.2543	2.1
Ra-226 + C	1.12E+01	0	2.2
Np-237 + D	8.97E+01	595	0.3
Pu-239/240	3.01E-01	0	83.1
Am-241	3.15E-01	0	79.3

ATTACHMENT 11

Draft Supplemental Response to NRC Requests for Additional Information on Historical Radiological Characterization Report

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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RAI No.	Issues	Path Forward	Discussion Points	Proposed Resolution
RCR-1 & 2	Updated maps identifying 2003, 2007 and 2010 UBC sampling locations and revised HRCR Tables 4-24 and 4-25 and DP Table 4-13. NRC staff reviewed the 4Q6 response along with information in the "white paper" (HEM-11-56), and it appears that 2003, 2007, and 2010 sampling locations have all been provided. However, it is not clear if sampling in the Erbia Room Area was addressed. Sampling in the Erbia room.	No further comment with respect to this issue. Provide additional sampling of the Erbia room or justify why such sampling is not needed.	Westinghouse described the ERBIA area within Building 255, which was much of the building, and how this was a dry process (only incidental water, such as for mopping the floor). The locations of soil sampling under the ERBIA area within Building 255 were also explained from the Westinghouse letter HEM-11-56.	Westinghouse has provided requested confirmation. No further action required.
RCR-3	Clarify that the corrections in Attachment 8 will be added to the DP.	Clarify how the tables in DP will be corrected. (Possible solution would be to add Attachment 8 as an Appendix to Chapter).	As requested, Attachment 8 to Westinghouse letter HEM-10-80 will be added to the DP Revision 1. Future revisions of the DP and the Historical Radiological Characterization Report may readjust the location of this reported information to better fit the organizational structure of the reports.	Westinghouse will place the information in Attachment 8 and the last paragraph of the response to RAI RCR-Q3 in Attachment 1of Westinghouse letter HEM-10-80 in a new DP Table 4-30.
RCR-5	RSO approval of alternate release criteria. The "weighting the radionuclides" as an acceptable method to determine the effective criterion for a mixture of radionuclides.	Revise discussion from 10.7.1 of HDP, quoted in RAI response, to delete ability of RSO to approve alternate release criteria. Delete the discussion on "weighting the radionuclides" as an acceptable method to determine the effective criterion for a mixture. Replace with the sum of fractions method.	The wording was not intended to give the RSO the ability to approve alternate release criteria. The sum of the fractions method will be used.	The last two sentences of Section 10.7.1 will be revised to state: "For a mixture of radionuclides with differing limits, the effective contamination limit may be derived by using the most conservative radionuclide present or by the sum of the fractions reflecting the relative contributions of the radionuclides present. The RSO shall approve the sum of the fractions calculation.

ATTACHMENT 12

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Information Relating to Summary Paper "Evaluation of Tc-99 Under the Process Buildings"

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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Document supporting other RAI Responses	Issues & Path Forward	Discussion Points	Proposed Resolution
Westinghouse letter HEM-11-56, "Evaluation of Tc-99 Under the Process Buildings"	Figure 4: Why wasn't the Process Bldg Investigative Area extended to the Bldg 253 east and west walls?	The Investigation Area identified on Figure 4 should have extended to the southeastern wall of Building 253. This Investigation Area extends to the northeast wall of Building 253 and extends beyond the southwest wall of Building 253.	When placing Figure 4 in the DP as new DP Figure 14-1, revise it to extend to the southeastern wall of Building 253.
Westinghouse letter HEM-11-56, "Evaluation of Tc-99 Under the Process Buildings"	What is the investigative process for soil samples, including subsurface, that contain radiological constituents above their DCGLs?	Consistent with MARSSIM, DP Section 14.4.5.6, Elevated Measurement Comparison Evaluation, contains the investigative process for soil samples that contain radiological constituents above their DCGLs. This process would be applied to samples taken per Section 9.2 of the Evaluation of Tc-99 Under the Process Buildings.	When placing the text in Section 9.2 of the Evaluation of Tc-99 Under the Process Buildings as new DP subsection 14.4.3.4.2, add the following before the bullets: "Results from the following samples are subject to Section 14.4.5.6 for elevated measurement comparison."
Westinghouse letter HEM-11-56, "Evaluation of Tc-99 Under the Process Buildings"	Basis for not increasing subsurface sampling for radionuclides between Bldgs 240 and 255 and 256?	Subsurface sampling was increased as follows in Westinghouse letter HEM-11-56: • Appendix C to Attachment 1 of HEM-11-56 identified 26 locations where additional samples will be taken from archived soil corings. The corings are up to 20.5 ft long (representing a maximum depth of 20.5 ft bgs). Nine of the 26 locations are in the area between Buildings 240 and 255. • Historically, the area between Buildings 240 and 255 initially consisted of Buildings 250/251, and open space. In 1989, Buildings 250/251 were dismantled and Buildings 253/254 were constructed in the space between Buildings 240/255. The Investigation Area, as extended per the resolution in the first row above, encompasses all of the open area that existed between Buildings 240 and 251; some wet processes/tanks had been located in this open area. The Investigation Area has increased subsurface sampling per Section 9.2 of Attachment 1 to HEM-11-56. The remaining open area that had existing between Buildings 240 and 255 did not involve wet processes/tanks, so the Investigation Area was not extended to cover this area.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.

ATTACHMENT 13

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Reference to Effluent and Environmental Monitoring Plan

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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EEMP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
8.3.1 C1	Location of permanent air samplers	Provide details on how the location of the permanent air samplers account for releases from the work areas where remediation activities will occur and prevalent wind directions. The EEMP indicates in Section 8.3.1 (Airborne Sources) that "from on-site meteorological data, prevailing winds on-site are generally from the south-southwest or from north-northeast (essentially parallel to State Road P and the adjacent hill)." A review of EEMP Appendix A and Figure B-1 shows that 6 air monitoring locations (AS-A, AS-B, AS-C, AS-D, AS-F, and AS-G) will be in place around the decommissioning area perimeter. There appears to be an air sampling void in the south-southwest area of the site (west of the site pond), which is along the direction of the prevailing winds. This fact, coupled with statements in DP Section 11.2 and EEMP Section 8.4 that perimeter sampling of air effluents will only be performed when work activities could potentially generate at the perimeter of the work activities, airborne radioactivity concentrations in excess of 20 percent of annual limits specified in 10 CFR 20, Appendix B, raises concerns that adequate effluent air monitoring may not be performed when winds are blowing toward the south-southwest. Since the loading pad is an area which will involve significant remediation activities associated with radioactive waste, it would also seem appropriate to include air samplers around the loading pad in the downwind locations from the prevailing winds. Information contained in the discussion points needs to be incorporated either into the DP or the EEMP. If the latter, a revised docketed EEMP needs to be provided. Will the portable air samples result in the detection levels at 10% the annual average effluent limit? Acceptability of air monitoring is strongly dependent upon the utilization of mobile samplers. Westinghouse did not seem to address whether such samplers were capable of measuring 10% of the annual limit.	As stated in EEMP Section 8.3.1, from on-site meteorological data, prevailing winds on-site are generally from the south-southwest or from north-northeast (essentially parallel to State Road P and the adjacent hill). The locations of the permanent environmental samplers are based on the prevailing wind directions. Six of the eight permanent sampling locations are established downwind of both prevailing directions. Therefore, the number and arrangement of these permanent sampling locations are appropriate to determine the average annual concentration based on prevailing wind conditions. The four permanent environmental air samplers that are currently in operation at the perimeter of the site were identified in the Decommissioning Plan, Table 11-5. Subsequently, the Response to RAI, Chapter 11, Question 3 included Figure 11-1 that reflected the addition of two permanent environmental air samplers to arrive at a total of six permanent air sampling locations for decommissioning activities. One of the additional samplers will be located along the east side of the Planned Laydown Area which is intended to measure air concentrations relevant to the nearest member of the public, and the 2nd additional sampler will be located adjacent to the south side of the rail spur waste loading operations to measure air concentrations within the public railroad right-of-way. Another permanent air sampler has been added southeast of Building 231 to be closer to the loading pad. Another permanent, but mobile, air sampler has been added to the west of the Site Pond to provide additional coverage in that direction. All permanent environmental air samplers will operate 7 days per week, 24 hours per day in order to obtain an adequate sample volume to demonstrate that the individual member of the public likely to receive the highest dose would not be expected to receive a total effective dose equivalent in excess of 10 mrem per year from site air effluents. Figure 1 shows the location of the permanent air samplers. As a supplement to the arrangement of the eight permanent environmental air sampler locations that is in itself adequate to measure the annual average concentration, portable air samplers will be positioned downwind of work areas on specific work days when activities cannot be properly assessed by the locations of the permanent sampling locations. The portable sampler air filters will be analyzed after a collection period of one day to provide timely information on the effectiveness of engineering controls. Although the sample volumes obtained by these portable samplers cannot result in the low detection levels afforded by the permanent samplers, any concentration in a single daily sample that exceeds 50 percent of the annual average effluent limit could be identified by this mode of sampling. This will ensure than an adverse condition (e.g., a single	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.

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EEMP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
			daily sample indicating a concentration in excess of 50 percent of the annual effluent limit) is identified in a timely manner. This will serve as an initiator for corrective actions that may include adjustment to engineering controls or work practices to ensure the annual average concentration limit is not exceeded.	
8.3.1 C2	Location of permanent air samplers	Provide details on how does Westinghouse address the situation where the wind direction will not result in a permanent downstream sampler measuring the release? Information from the Discussion Points needs to be added to DP or docketed EEMP.	When wind direction is such that a permanent environmental air sampler will not measure the release at a specific point in time, portable air samples will be positioned downwind of the work areas when there is a potential to exceed 20 percent of the air effluent limit at the perimeter of the work area. In practice, it is Westinghouse's intent to run perimeter samplers during nearly all operations that involve movement of exposed soil, (e.g., excavation, rail car loading), thus portable downwind air samplers will be utilized for many activities that have the potential to generate concentrations that are less than 20 percent of the air effluent limit.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
8.3.4 C1	Conflicting information with respect to operation of the wastewater treatment facility under the continuous mode of operation for the 25 year storm scenario and the monitoring and effluent conditions under such a scenario.	Correct or clarify the conflicting information. Westinghouse's approach with respect to continuous releases is unacceptable. There is no basis for concluding that previous batch measurements are indicative of releases on a continuous basis. If Westinghouse wishes to operate the system on a continuous basis then it needs to monitor the effluent by taking a continuous composite sample and a continuous flow measurement. Such measurements may be made by using either (1) a continuous proportioning sampling system, with at least two sample collection tanks. The system should be designed to collect a sample at a fixed ratio established between the sample collection flow rate and the effluent stream discharge flow rate or (2) Use of a periodic automatic grab sampling system, with at least two sample collection tanks. The system should be designed to collect a sample at a fixed volume established at a rate that is proportional to the effluent stream discharge flow rate. See Staff response to DP Chapter 8 RAI No. 2c. Staff concerns carry over here too.	While EEMP Section 8.3.4 does not mention the 25 year storm scenario, review of 8.3.4 identified that the discussion of batch versus continuous sampling could be improved. Westinghouse will revise Section 8.3.4 to be consistent with the response to the matrix response on DP Chapter 8, RAI#2c. Effluent samples from the WTS pathway are obtained after treatment at the sample location denoted as SFW-A2 on Figure 1, "Existing Sampling Locations for Air, Surface Water, and Sediment."	The first paragraph of EEMP Section 8.3.4 will be revised to include the same information that is in the proposed resolution in the matrix response on DP Chapter 8, RAI #2c.
8.3.4 C2	Investigative derived waste treatment system	Clarify whether such a system will be utilized as part of the decommissioning and provide a description of the system in the DP.	The Investigative Derived Waste Treatment System (IDWTS) was a small scale water treatment system that was used to treat purge water and small volumes of impacted water from the site. This system is no longer in service and has been dismantled, but was not removed in the event it was needed before the Water Treatment System was operational. All impacted water encountered during the remedial actions will be sampled and discharged providing effluent release criteria are met with due consideration of maintaining release concentrations ALARA, or will be collected, sampled and processed through the Water Treatment System, as appropriate. References to IDWTS will be removed from future revisions of site documents.	Westinghouse will revise: (1) Section 8.3.3 of the EEMP removing the paragraph describing the IDWTS; (2) Section 10.2 of the EEMP removing the reference to the IDWTS from the table describing the outfall sample locations; (3) Section 11.0 of the EEMP removing reference to the IDWTS; (4) Table 1 of the EEMP removing reference to the IDWTS in the sample point description for liquid effluent; and (5) Appendix A removing reference to the IDWTS from the description of Outfall #001 and from the list of acronyms.

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EEMP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
8.4.1	Perimeter sampling %	Provide the basis for only performing perimeter sampling if the performance of the work activities generate activities at the perimeter of the work, concentrations greater than 20% of the annual limits specified in 10CFR20, Appendix B, Table 2, Column 1 when the ALARA goal described in DP Section 11.1.1.1 is at 20% of the Appendix B value. Discussion points need to be provided in a revised DP or in a revised docketed EEMP. Include the information in the Discussion Points in the DP.	The basis is derived from the ALARA constraint in 10 CFR 20.1101 (d) of 10 mrem/yr for public exposure from emissions of airborne radioactive material, which is equivalent to twenty percent of 10CFR20, Appendix B, Table 2, Column 1. However, the location of a perimeter air sampler is conservative relative to the location of a member of the public. A member of the public would not be at the perimeter of the work area for the duration of the work, which is where the air sampler is located. Thus, a member of the public would receive less dose than the dose estimated from perimeter air sample results. Accordingly, sampling at the perimeter of the work area at an action level equivalent to the ALARA goal for the public, and taking ALARA actions based on exceedances of the ALARA goal at the perimeter of the work area, conservatively ensure the ALARA goal is met for the public at a downwind location. In practice, it is Westinghouse's intent to run perimeter samplers during nearly all operations that involve movement of exposed soil, (e.g., excavation, rail car loading), thus portable downwind air samplers will be utilized for many activities that have the potential to generate concentrations that are less than 20 percent of the air effluent limit.	The following text will be added to the end of the first paragraph in DP Section 11.2.1: This basis is derived from the ALARA constraint in 10 CFR 20.1101 (d) of 10 mrem/yr for public exposure from emissions of airborne radioactive material, which is equivalent to twenty percent of 10CFR20, Appendix B, Table 2, Column 1. It should be noted that the location of a perimeter air sampler is conservative relative to the location of a member of the public. A member of the public would not be at the perimeter of the work area for the duration of the work, which is where the air sampler is located. Thus, a member of the public would receive less dose than the dose estimated from perimeter air sample results. Accordingly, sampling at the perimeter of the work area at an action level equivalent to the ALARA goal for the public, and taking ALARA actions based on exceedances of the ALARA goal at the perimeter of the work area, conservatively ensure the ALARA goal is met for the public at a downwind location. The following text will be inserted after the second sentence in the second paragraph of DP Section 11.2.1: "In practice, it is Westinghouse's intent to run perimeter samplers during nearly all operations that involve movement of exposed soil, (e.g., excavation, rail car loading), thus portable downwind air samplers will be utilized for many activities that have the potential to generate concentrations that are less than 20 percent of the air effluent limit."
8.4.4 C1	Discussion of air samples (1st paragraph)	WEC delete reference to air samples. Revision needs to be docketed.	Westinghouse will revise the section in question per the proposed resolution.	Westinghouse will revise Section 8.4.4 of the EEMP to read as follows: "Liquid effluent samples shall be analyzed for gross alpha radioactivity and gross beta radioactivity. The review of liquid effluent results shall include consideration of whether the isotopic mixture may differ from that previously understood, thus warranting isotopic analysis. Considerations to determine that a change in isotopic mixture may have occurred include isotopic results of soil or other media associated with the origin of the wastewater."
8.4.4 C2	Batch release based upon process knowledge and	Justify why process knowledge and retrospective confirmation is permissible for a batch release in lieu of a laboratory analysis results prior to release of the batch. See RAI No. 8.3.4 C.1 above.	Westinghouse will revise the section in question per the proposed resolution.	See the proposed resolution to 8.3.4C1 above.

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<table>
<tr><th>EEMP Section</th><th>Issues</th><th>Path Forward</th><th>Discussion Points</th><th>Proposed Resolution</th></tr>
<tr><td></td><td>retrospective confirmation in addition to laboratory analysis.</td><td></td><td></td><td></td></tr>
<tr><td>8.5</td><td>Erosion controls</td><td>Clarify whether erosion controls will be used in the laydown and waste handling staging area.

Laydown area seems to be addressed by the Northeast Creek Water Diversion System. Appears that waste staging area is addressed by Section 9.8 of the Water Management Plan. Need to confirm the latter.</td><td>Yes, erosion controls will be used in the laydown and waste staging areas. The document HDP-PO-EM-004, Water Management Plan, which was provided to NRC via the same Westinghouse letter that provided the EEMP (HEM-10-138 dated January 28, 2011) discusses erosion control measures.</td><td>DP Table 8-4 will be revised to add the following rows:
<table>
<tr><td><u>Laydown Area</u>

Storm and surface water</td><td>BMP – silt fence, straw bales, waddles, berms, or ditches to divert surface and storm water towards outfalls, i.e. Implement SWPPP controls.</td></tr>
<tr><td><u>Waste Staging Area</u>

Storm and surface water</td><td>BMP – sand bags, berms, silt fences, or ditches to divert surface and storm water towards subsurface drain for water collection, sample analysis, and treatment as necessary.</td></tr>
</table></td></tr>
<tr><td>9.3 Table 2 C1</td><td>Investigation Level Environmental Samples</td><td>Provide a description of how Westinghouse determines that an environmental sample will exceed 10% of the regulatory limits in Table 1 of the Effluent Monitoring Plan.

DP needs to be revised to include discussion points.</td><td>Permanent environmental air samples and samples of water, sediment and vegetation are analyzed for gross alpha and beta radioactivity using a target detection level of 5 percent of the annual air effluent concentration limit. Based on experience, this target is appropriate since the average detection level for the year 2010 was less than 5 percent of the annual limit.

See the additional response to the RAI on DP Chapter 11-11 in Westinghouse letter HEM-11-90 for routine isotopic analysis, which allows the individual sample threshold t be the investigation level.</td><td>Changes made to DP Chapter 11 based on HEM-11-90 will also be propagated through the EEMP.</td></tr>
<tr><td>9.3 Table 2 C2</td><td>Investigation levels limits for Table 2</td><td>Provide the investigatory limits in Table 2.

ORISE review:

OBSERVATION 1:

The application of the Mann-Kendall test as provided in Section 9.5 and Appendix D Data Quality Objectives (DQOs) is an appropriate statistical method to evaluate either a stable, upward, or downward trend of groundwater contaminant concentrations. However, the monitoring plan lacks much of the specific information relevant to how the test will be applied and other considerations. Information that has not been provided includes:

1. Per Section 9.5 and Table 2, WEC will use the Mann-Kendall test to analyze trends in soil, surface water, groundwater, and vegetation samples. Are all of these media subject to exhibiting contamination level trending and if not, is this an appropriate method for evaluating data from these sample media?

2. How will the null hypothesis (H_0) be stated? As with any hypothesis test, overwhelming evidence is required to reject the assumed base condition (H_0) and</td><td>Investigation limits are shown for the parameters listed in Table 1 since these parameters have associated regulatory limits. With the exception of the air sample medium, the sample media listed in Table 2 do not have specific regulatory limits. For surface water, groundwater, soil, vegetation, and sediment environmental sample results, two analyses of the results will be used to evaluate adverse trends within the data.

1. HDP plans to use the Mann-Kendall test to evaluate the environmental monitoring results of soil, groundwater, vegetation, and sediment samples at the locations listed in EEMP Table 2 using the following test parameters:

• The null hypothesis will be stated as no trend.

• HDP will use a one-tailed test.

• HDP plans to use the normal approximation for sample size greater than 10 and will use the methodology contained in</td><td>Westinghouse will insert the following footnote to Table 2 of the EEMP: “Note: See Section 9.5 for trending of all sample media results except for air sample results, which have investigative limits established in Table 1 of this EEMP.”

Westinghouse will revise Section 9.5 of the EEMP to state:

The quarterly environmental monitoring results for groundwater, soil, vegetation, and sediment shall be reviewed for trends and outlier results, and should include:

• A graphical analysis to identify patterns that would otherwise go unnoticed using purely statistical methods (such as identification of outliers and seasonal data patterns). The</td></tr>
</table>

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EEMP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
		accept the alternative hypothesis (H_A). That is, will H_0 be stated in such a way that there is no trend, a one-tailed upward trend, a one-tailed downward trend, or a two-tailed upward/downward trend? Most example applications state H_0 with the base condition being no trend, then the A is stated where it accounts for either a one- or two-tailed test. It is anticipated that WEC would be concerned with a one-tailed upward trend. 3. There are two specific methods for applying the test, dependent upon whether n is < or > 40. The plan does not discuss this. When $n > 40$, a normal approximation test is used. 4. The DQOs provided in Appendix D provide no specific information on the control of the α and β errors. 5. The document should provide for additional data evaluation methods. For instance, it is assumed that the Mann-Kendall will be applied for each monitoring well. The document does not discuss whether the data from multiple monitoring stations will be evaluated to draw conclusions for the site as a whole. Section 16.4.4 "Homogeneity of Stations" in Gilbert 1987 provides additional information on this assessment. The outlier discussions/evaluations in the plan lack clarity. CONCLUSION 1: The plan provides limited information for prospective review and independent evaluation of the selected statistical test, controls on errors, application of the test, anomalous result evaluation, etc. PATH FORWARD 1: It is recommended that WEC revise the plan to include more specific information that clearly defines test parameters, inputs, and data quality assessment methods. A detailed discussion of assumptions and uncertainties need to be presented, along with an explanation of why the Mann-Kendall test is appropriate for all sample media. OBSERVATION 2: The limitations of the test and how the site will account for these limitations are not discussed. These limitations are: 1. The Mann-Kendall test does not consider the magnitude of the data; rather scores are given either a +1 or -1 dependent upon the prior result for a given monitoring point. Therefore, dependent upon n, the test could conclude there is no trend when there are indeed individual results the site should evaluate. An example would be results of 10 pCi/l; 9,000 pCi/l; 8,500 pCi/l; 9,500 pCi/l; and 8,900 pCi/l. In this example, the result of the statistical test would be to fail to reject H_0 and conclude there is no trend, when obviously there is a significant and abrupt increase in concentration. Another example for the test concluding there is a decreasing trend are the results: 0.23; 5; 43; 921; 1,340; 103; 1.62; 0.23; 0.23; and 0.23. However, such a result is more indicative of a contaminant slug moving past the well. Would WEC identify similar scenarios as an adverse condition? (Also see Observation No. 3.)	EPA-QA/G9 for sample sizes smaller than or equal to 10. • HDP will use an alpha error of 0.05. There is not beta error rate associated with the Mann-Kendall test. HDP does not plan to apply a statistical evaluation to evaluate homogeneity across stations. 2. For individual sample results, HDP plans to evaluate outlier measurements through graphical evaluation and comparison with a 3 sigma confidence interval on the mean. HDP will establish a 3 sigma confidence interval on the historical mean for each sample medium (calculated under stable, pre-remediation conditions) and use this criterion to flag individual measurements for additional evaluation. Owing the limited project duration, HDP does not plan to perform a statistical evaluation to identify seasonal trends, but will consider seasonal conditions as a potential source of variability in the individual measurements. The historical data used to determine the mean and 3 sigma confidence interval spans seasonal variations.	graphical analysis will include the historical mean plus 3 sigma (calculated under stable, pre-remediation conditions). Measurements which exceed this historical mean plus 3 sigma range should be flagged for further evaluation as outliers. • The Mann-Kendall test (Reference 5.17) using a 0.05 probability level with a one-tailed confidence interval (Null Hypothesis of no trend). For a sample size of less than 10 measurements, the Mann-Kendall "S" statistic should be evaluated using EPA QA/G-9, Table A-11 ("Probabilities for the small-sample Mann-Kendall Trend Test") (Reference 5.18). For a sample size greater than 10, the normal approximation may be used (References 5.17 and 5.18). Evaluation of statistical trending methods should consider the following limitations inherent in the Mann-Kendall test: 1) insensitivity to the magnitude of successive measurements, and 2) susceptibility to false results due to changes in laboratory analytical methods. In any case, failure to reject the null hypothesis (there is no trend) is not conclusive; it simply means that there is insufficient evidence to reject the null hypothesis of no trend. The EH&S Manager and RSO shall be notified of any individual outlier measurements and of identified trends. Once an upward trend is identified, a review of the associated decommissioning activity(s) will be conducted to determine if such activities are contributing to the observed increase. The review should assess, as applicable, remedial actions, the source of contamination, the potential for contamination to become airborne or reach liquid effluents, the equipment being used, and control, treatment, and/or mitigation measures. Changes to work methods and/or engineering controls should be implemented, as appropriate, to reduce effluent concentrations to ALARA levels. New References 5.17 and 5.18 will be added to the EEMP as follows: 5.17 Gilbert, R.O., Statistical Methods for

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EEMP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
		2. The test will not account for seasonality, nor for varying sampling or analytical methods. The underlying assumptions are that these conditions are known/controlled and that any trending is the result of natural attenuation. 3. Because of how the H_0 is generally stated, a "no trend" result for this test is not conclusive. It simply means there is insufficient evidence to reject the H_0. The examples provided above in Observation 2.1 illustrate this point. CONCLUSION 2: The plan as currently written does not discuss how the limitations of selected statistical tests will be controlled. PATH FORWARD 2: It is recommended that WEC revise the plan to include more specific information regarding the test's limitations, anomaly detection, decision processes, and potential conclusion errors. OBSERVATION 3: Section 9.5, page 15 of 28 states that the Environmental Health and Safety (EH&S) Manager and Radiation Safety Officer (RSO) will be notified if an adverse trend is identified. How is an adverse trend defined? Would this be defined as one quarterly monitoring round where the conclusion is there is an upward trend? What about individual anomalous results (refer also to Observation 2.1)? The discussion provided in Section 8.2 states: "…an investigation level for individual air and liquid effluent samples has been established at 50 percent of the applicable values in 10 CFR 20, Appendix B." Is this intended to define what is meant by an "adverse trend?" CONCLUSION 3: The plan is unclear in the discussion of anomalous results. PATH FORWARD 3: It is recommended that WEC revise the plan to include more specific information that clearly discusses anomaly detection and evaluations for individual data points for all matrices.		Environmental Pollution Monitoring, 1987, John Wiley & Sons, New York. 5.18 EPA QA/G-9, Guidance for Data Quality Assessment, Practical Methods for Data Analysis, EPA/600/R-96/084, July 2000

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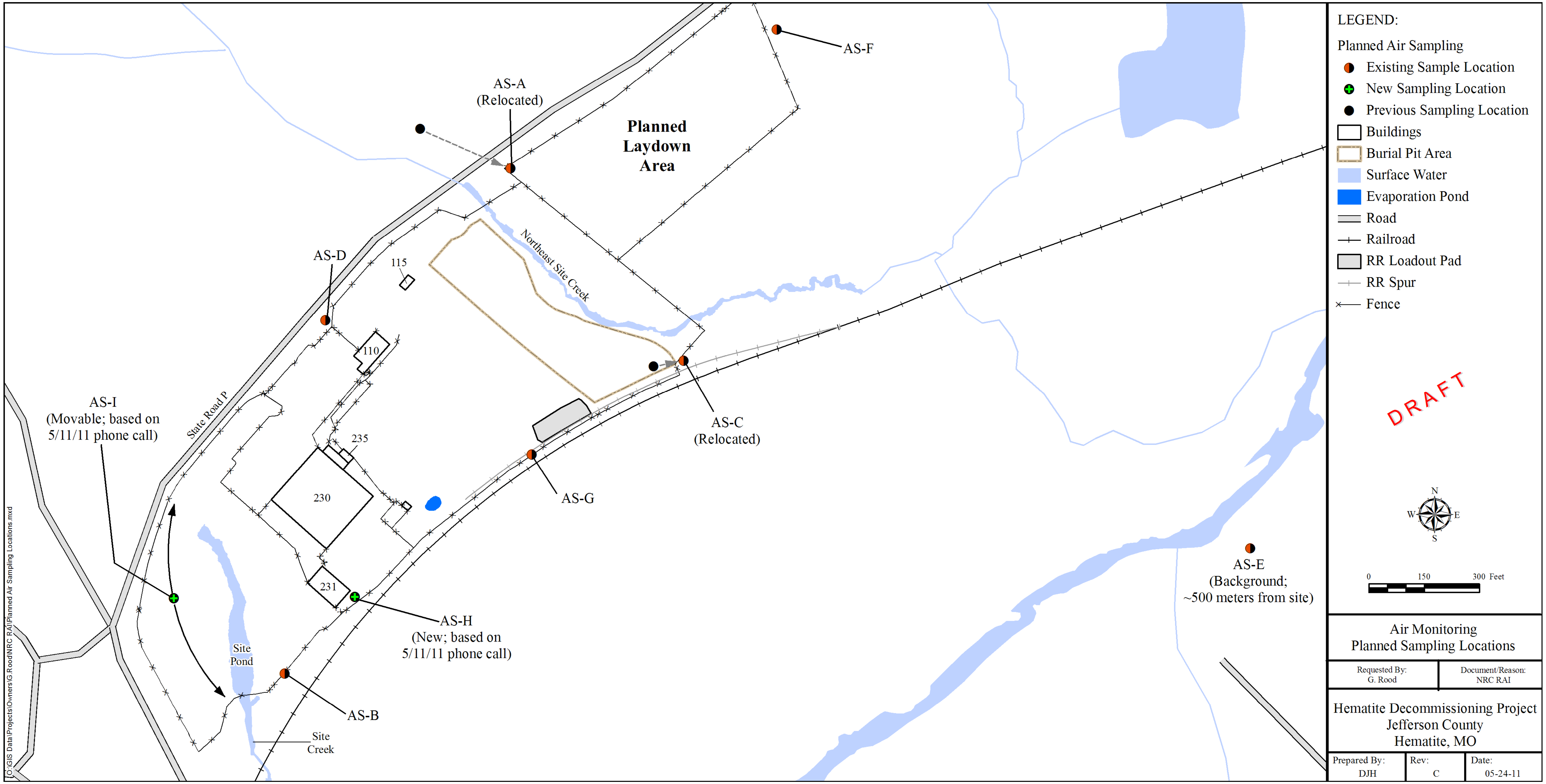
Figure 1. Figure for Permanent Air Monitoring Stations



ATTACHMENT 14

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Reference to Water Management Plan

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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WMP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
8.3a	Free-flow by gravity from effluent holding tanks.	First appearance of this release mechanism. No such description in the Chapter 8 RAI response about the WTS.	The Water Treatment System (WTS) design had not been completed at the time that the Water Management Plan (WMP) was prepared, so the WMP was written to allow for the possibility of gravity drain. However, the installed WTS requires pumps for the discharge.	The last sentence of the second paragraph of WMP Section 8.3 will be revised as follows: "Water will be pumped during effluent discharge."
8.3b	Discharge of processed water without sampling & analysis based upon operational history & fact previous releases have met effluent standards.	Approach is unacceptable as discussed in NRC response of May 6, 2011 to Westinghouse EEMP Resolution Table.	There was a misunderstanding on sampling of WTS discharges. Westinghouse's plan has always been to sample batches prior to batch discharge or to continuously sample, via composite sampler, continuous discharges.	The last paragraph of WMP Section 8.3 will be revised to state: "During the early stage of operation, or when processing water with new radiological or chemical characteristics, the processed water will be stored in a tank and tested to determine if the effluent standards have been met (sampling and batch release). After a period of operational experience that shows consistent reliability in achieving the effluent standards, processed water may be continuously sampled via a composite sampling device during periods of continuous discharge (continuous sampling of release). While in this mode of operation, a weekly composite sample will be collected for subsequent laboratory analysis."
9.2.2 & 9.6.2	0.5 inch precipitation event	Specify a time period for the 0.5 inch. Also, specify that evidence of standing water would be a basis for checking.	The intended precipitation event was 0.5 inch in a day. Standing water on ground surfaces is a reasonable visual indication of this amount of precipitation.	The last sentence of the first paragraph of WMP Section 9.2.2 will be revised as follows: "To ensure controls are operating effectively and as intended, each barrier and water management control in place will be checked whenever a half-inch of precipitation is measured during the daily check of the Site's rain gauge, or whenever standing water is observed on ground surfaces (e.g., soil or grass surfaces, but not paved or gravel surfaces)." The last sentence of WMP Section 9.6.2 will be revised as follows: "To ensure that it is functioning correctly, the method of redirecting upstream water will be inspected whenever a half-inch of precipitation is measured during the daily check of the Site's rain gauge, or whenever standing water is observed on ground surfaces (e.g., soil or grass surfaces, but not paved or gravel surfaces)."
9.6.1a second bullet	Grab Sample of drain of supernatant from site pond. Monitoring of supernatant discharge	Commit to composite sample. Clarify whether the composite sampling at WS-18 in Table 1 of the EEMP would capture this release. The discharge location will "likely" be combined with Outfall #001. Either it is or it is not. There should be no ambiguity. Wherever it goes, it should be to a composite sampler. Based upon the proposed revision to Section 9.6.1, it appears that the discharge from Outfall #001 is being moved then its new location should be reflected in the EEMP, other applicable Plans and Programs and associated Figures and Tables throughout the DP. Present Section 9.6.1 describes the draining of the site pond. With the proposed change, one might conclude that the draining being described is that associated with the diversion around the site pond and not the supernatant in the pond. The third bullet proposed in Section 9.6.1 states that the WTS discharge is to Outfall #003 while the	The supernatant from the Site Pond will be drained to a discharge with a composite sampler. The discharge location will be monitored by continuous sampler (samples analyzed weekly) following approval of the DP License Amendment. (Sample WS-18 is a grab sample currently taken at Outfall #001 per the current SNM-33 amendment).	A new WMP Section 9.6.1 will be added and the existing Sections 9.6.x will be renumbered accordingly. 9.6.1 Water Diversion (Temporary Changes) • The non-impacted spring and surface water originating from the north side of State Road P and then entering the Site Pond will be diverted around the Site Pond and the portion of the Site Creek below the dam that is to be remediated. This diversion will discharge sufficiently downstream of the remediation area within the Site Creek to avoid interference with remediation. • The current location of Outfall #001 is along the eastern bank of the Site Creek, immediately downstream of the Site Pond Dam. Outfall #001 effluent consists of waste water from the Sanitary Treatment System, and is continuously sampled via composite sampler. While the Site Creek is undergoing remediation, the discharge at Outfall #001 will be diverted sufficiently downstream of the Site Creek remediation area to avoid interference with remediation. The diverted Outfall #001 discharge will continue to be sampled by a composite sampler. • The current location of Outfall #003 is along the eastern bank of the Site Pond. Note that Outfall #3 does not discharge directly to the environment. Rather, Outfall #3 discharges to the Site Pond, and is included in the effluent measurement obtained by the composite sampler at Outfall #002 (Site Dam). Outfall #003 effluent consists of effluent from the WTS, stormwater from the parking lot, part of the footprint of the

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WMP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
		fourth bullet says it is to the culvert below the site pond. Which is correct?		former processing building, barn area, and building roof drains. While the Site Pond is undergoing remediation, discharge at Outfall #003 will be diverted either to Outfall #001 or sufficiently downstream of the Site Creek remediation area to avoid interference with remediation, depending upon the timing of Site Creek remediation. The diverted Outfall #003 discharge will be sampled by a composite sampler during the diversion. WMP Section 9.6.2 (old 9.6.1) will be replaced with a bullet as follows: 9.6.2 Draining of Site Pond Supernatant • Either a pump or a gravity drain will be used; pumping would be performed utilizing a submersible pump fitted with a screen. The third bullet (previously 2nd bullet of 9.6.1) of WMP Section 9.6.2 (old 9.6.1) will be revised as follows: "Pump/gravity drain the supernatant down to a depth of 6 inches or less. Composite sampling will be conducted during this draining."
9.6.1b second bullet & 9.7	Treatment of the supernatant by the WTS.	Commit to treating the supernatant if the sample indicates concentrations at 20% of the effluent limits. For the evaporative pond, there was no commitment to treat the bottom six inches of the supernatant. Does the discussion in Section 9.7 pertain to the lined pond or the pond after the liner has been removed? Is the water being pumped out is the water contained by the liner? If there is a commitment for the 50% and 20% levels for the evaporative pond, why wouldn't there be a comparable commitment for the site pond which is not lined ? Westinghouse has made the forgone conclusion that the material collected by the various drains and transmitted to the evaporative ponds does not warrant treatment. That seems presumptuous just because the pond is lined. Would guess that the issue would be based upon activity levels not the presence of a liner. Also, the staff thought that there was previously a commitment by Westinghouse to treat liquid in the evaporative pond using the WTS based upon activity level in the pond. See Section 8.2 as an example. Eventually, the evaporative pond will be drawn down and the supernatant will need to be addressed. As noted above, the basis would not seem to be the presence of a liner.	Westinghouse had previously committed to treating the Site Pond supernatant that is closest to the sediment, i.e., the bottom 6 inches of the supernatant. An equivalent commitment is not warranted for draining the remaining evaporation pond in operation since it is lined. After the liner is removed, the area is treated as an excavation area. In the preceding row of this matrix, Westinghouse committed to composite sampling during supernatant draining. The following sentence in Section 9.7 was inconsistent with DP Chapter 11 and will be removed: "If the sample results are 20 percent of any effluent limits or more, the supernatant will be collected and treated as described in Section 8.0." Consistent with DP Chapter 11, Westinghouse will apply an Investigation Level of 50 percent and its annual ALARA Goal of 20 percent in evaluating these sample results and considering appropriate actions, such as treating the supernatant from the Site Pond or Evaporation Pond.	The first paragraph of Section 9.7 will be revised as follows: Appendix B shows the location of the Evaporation Ponds, which is about 0.03 acre in size. The western Evaporation Pond (secondary) was emptied of water, lined, and backfilled during 2010, and currently contains soil that will be removed during remediation. At about that same time, the eastern Evaporation Pond (primary) was converted to a collection sump by removing the water, and installing an impermeable liner and temporary pump. The discharge of the pump is currently connected to the WTS. During remediation, the supernatant will be removed from the eastern Evaporation Pond prior to excavation. The supernatant will either be processed through the WTS, or if in-situ samples of the supernatatnt show an acceptable concentration, it will be directly discharged through a temporary pump and additional temporary hose/piping. After the supernatant is removed, the liner and any accumulated water-laden sediment on top of the liner will be excavated in conjunction with the underlying pond floor and sidewalls. No drying time of the sediment is planned since the pond is very small in size, allowing the limited amount of sediment to be mixed with the dryer, contaminated soil underlying the liner.

ATTACHMENT 15

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Reference to Waste Management and Transportation Plan

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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WMTP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
6 C1	Responsibility for VOC and radiologically contaminated material and just radiologically contaminated material is not identified in this section.	Identify who is responsible for VOC and radiologically contaminated material and just radiologically contaminated material.	The RSO is responsible for radiologically contaminated material, regardless of whether such material also contains non-radiological constituents. The RSO is also responsible for defining the disposal requirements for soil and waste containing radiological contaminants and for determining whether soil is suitable for re-use as backfill based on radiological characteristics. The EH&S manager is responsible for identification, safety and controls for non-radiological contaminants, such as VOCs and chemicals, and for determining whether soil is suitable for re-use as backfill based on non-radiological characteristics. Waste Management is responsible for coordinating the transportation and disposal of any radioactive, hazardous or mixed waste.	Section 6.2 will be revised to add the following: "The RSO is responsible for radiologically contaminated material, regardless of whether such material also contains non-radiological constituents. The RSO is also responsible for defining the disposal requirements for soil and waste containing radiological contaminants and for determining whether soil is suitable for re-use as backfill based on radiological characteristics." Section 6.3 will be revised to add the following: "Additionally, the EH&S manager is responsible for identification, safety and controls for non-radiological contaminants, such as VOCs and chemicals, and for determining whether soil is suitable for re-use as backfill based on non-radiological characteristics." Section 6.2 will be revised to add the following: "…WMTP, and is responsible to identify radioactive materials and radioactive waste." Section 6.4 will be revised to state: "WM is responsible for waste disposal which entails ensuring radioactive, hazardous and mixed waste are properly identified, classified, packaged, marked, labeled and offered for transport in accordance with DOT and other applicable regulations."
6 C2	Whether Waste Management is a manager, group or whatever	Indicate what Waste Management is.	The Waste Management Group reports to the RSO and is composed of one or more Waste Management Specialist(s) and health physics technicians, supported by operations personnel and quality assurance inspectors. This Group is responsible to ensure that the different types of waste generated at the HDP is compliantly identified, classified, packaged, marked, labeled and offered for transportation.	Section 6.4 will be revised to add the following: "Waste Management is a group within the RSO's organization and is composed of one or more Waste Management Specialist(s) supported by health physics technicians, operations personnel and quality assurance inspectors."
8.1	Commitment to subcontract shipment of fissile material to an NRC licensee	Clarify when and when not an NRC licensee will be utilized to handle fissile material shipments. (DOE/Lawsuit resolution).	Westinghouse will not initiate transportation of a fissile material shipment from the Hematite Site under NRC License No. SNM-33. Instead, Westinghouse will initiate transportation of 'fissile exempt' Shipments under SNM-33. To accomplish this, mechanical size reduction of material will occur as necessary so that all decommissioning shipments may be made as fissile exempt. Westinghouse contemplates two contingencies to fissile exempt shipments, as follows: 1. Westinghouse will utilize the U.S. Department of Energy (DOE) in the unlikely discovery of material that exceeds the minimum quantity of DOE Category II, as defined by DOE Manual 470.4-6. For implementation of this contingency, the DOE would take possession of the material at the Hematite Site and conduct the shipment under their authority pursuant to the Atomic Energy Act. The contingency plan for using DOE was established in the binding Judicial Settlement Agreement, Consent Decree, and Final Judgment of Westinghouse v. U.S.A. Civil Action No 4:03-CV-00861(CDP). 2. Westinghouse will consider using another NRC licensee (other than Westinghouse-Hematite) to perform a fissile	Section 8.1, third paragraph, will be revised as follows: "SNM resulting from decommissioning work is expected to be shipped as fissile exempt, using mechanical size reduction as necessary. As a contingency, the U.S. Department of Energy (DOE) or an NRC licensee (other than Westinghouse-Hematite) may be utilized in the unlikely event that a shipment of fissile material is required. For such a contingency, the DOE or NRC licensee would take possession of the material at the Hematite Site. Shipments by the U.S. Department of Energy (DOE) would be performed in accordance with DOE quality requirements. Shipment by another NRC licensee would be in accordance with that licensee's approved quality assurance program in accordance with 10 CFR 71 Subpart H – Quality Assurance (Reference 5.2)."

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WMTP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
			material shipment in the unlikely event of discovering material viable for re-introduction into the fuel manufacturing process. For implementation of this contingency, the NRC licensee would take possession of the fissile material at the Hematite Site and conduct the shipment under their license. The contingency action plan for using another NRC licensee has not been formally established at this time, but considerations would likely include the amount of fissile material relative to the fissile exempt criteria, the effort to size-reduce the material to less than the fissile exempt criteria, the ease of re-introducing the fissile material into the commercial fuel manufacturing process, and the licensee's license conditions. Since potential re-introduction of material into the fuel manufacturing process will depend on the properties of the discovered fissile material, Westinghouse would complete such contingency arrangements after the material is discovered and its properties are determined. As an example, arrangements could be made with the Westinghouse Columbia facility (NRC License No. SNM-1107) to conduct fissile material shipments when the viable fissile material is less than 5 percent enriched.	
8.6.5 C1	Use of surrogates, specifically U-235 as a surrogate for Tc-99.	Clarification that U-235 will not be used as a surrogate for Tc-99 and that laboratory analyses will be performed for Tc-99. WEC refers to the 1983 "NRC Low-Level Licensing Branch, Technical Position on Radioactive Waste Classification, Revision 0 (5/83)" as part of their justification for using scaling factors to represent Tc-99 in waste streams going to NRC licensed facilities. This document states that "the [NRC] staff considers a reasonable target for determining measured or inferred radionuclide concentrations is that the concentrations are accurate to within a factor of 10." WEC also refers to 10 CFR 61.55 which indicates that: "8) Determination of concentrations in wastes. The concentration of a radionuclide may be determined by indirect methods such as use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as nanocuries per gram."	Westinghouse will not use a surrogate for Tc-99 for waste characterization for disposal at USEI, or for demonstrating compliance with the FSS dose criterion. Instead, laboratory analytical data of samples will be used to demonstrate compliance with the commitments made to the NRC in the 10 CFR 20.2002 alternate disposal exemption request for US Ecology-Idaho, and to demonstrate compliance during FSS. However, regarding the use of scaling factors for radioactive waste characterization for disposal at facility licensed by the NRC, 10 CFR 61 provides the following; "8) *Determination of concentrations in wastes*. The concentration of a radionuclide may be determined by indirect methods such as use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as nanocuries per gram." Westinghouse will use either laboratory analytical data from samples, or scaling factors for radioactive waste shipments to licensed facilities. The technical basis for the use of scaling factors to support waste disposal at an NRC-licensed facility will be documented.	Section 8.6.5 will be revised as follows: A combination of radiological characterization data from the HRCR and additional sampling at the time of waste packaging may be used for radioactive waste manifesting purposes. However, note that differing requirements exist for different disposal or processing facilities and are summarized below: • U S Ecology-Idaho is not an Agreement State nor a NRC licensed facility. Approval for disposal is anticipated under a request for alternate disposal per 10 CFR 20.2002. Pursuant to the conditions of this approval, the radioactivity concentration within each railcar (package), will be measured using laboratory methods. • Energy Solutions-Clive Facility is an Agreement State Licensed facility and accepts radioactive and mixed waste that is compliant with the NRC Low-Level Licensing Branch, Technical Position on Radioactive Waste Classification (Reference 5.36), and the site Waste Acceptance Criteria. Consistent with NRC guidance regarding waste characterization and classification, laboratory methods have been used to define the contributors to radioactivity in the waste. It is acknowledged that the waste destined for disposal at Energy Solutions may be unique in that higher concentrations of radionuclides may be present, and these radionuclides may be present in ratios that differ from the average site-wide ratio. Because of this, composite sampling will be used to characterize each railcar at a frequency of one composite sample per railcar, or equivalent volume if railcars are not used, The composite sample will be analyzed for the primary radionuclides (i.e., Tc-99, U-234/235/238, Th-232, Ra-226), and the data used as the basis for transportation and disposal.

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WMTP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
		Based on the NRC staff's previous analysis of surrogates it cannot really be said there is reasonable assurance that the indirect methods can be correlated with actual measurements based solely on the current data. There needs to be additional verification. Accordingly, there is also some verbiage in the 1983 BTP stating that "scaling factors should be developed on a facility and waste stream specific basis, and should be initially determined and periodically confirmed through direct measurements." The staff's conclusion is that scaling factors may be acceptable in accordance with the 1983 BTP, but there also needs to be a clear commitment to initially determine and then periodically confirm the surrogates via direct measurements.		
8.6.5 C2	Utilization of surrogates	Identify the surrogates that anticipated to be used. See preceding row.	Westinghouse will use either laboratory analytical data from samples, or scaling factors for radioactive waste shipments to facilities licensed by the NRC. The radioisotopes that may be inferred include Tc-99, and U-234. The latter will be calculated based on enrichment defined by the ratio of the measured activities of U-235 and U-238. The remaining hard to detect radionuclides in the waste stream do not exist at concentrations or activities that will require manifesting per 49 CFR, the NRC Low-Level Licensing Branch Technical Position on Radioactive Waste Classification, or 10 CFR 20 Appendix G. Westinghouse will not use a surrogate for Tc-99 for waste characterization for disposal at USEI, or for demonstrating compliance with the FSS dose criterion. Instead, laboratory analytical data of samples will be used to demonstrate compliance with the commitments made to the NRC in the 10 CFR 20.2002 alternate disposal exemption request for US Ecology-Idaho, and to demonstrate compliance during FSS.	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
11.1	Quality Assurance Requirements in accordance with 10CFR71.101(f)	Clarify as DOE shipments probably may not be in accordance with 10CFR71.101(f).	Westinghouse agrees that clarification is needed since the U.S. Department of Energy is not subject to 10 CFR71.	Section 11.1, paragraph 3, last sentence will be revised to state; "As a contingency, the U.S. Department of Energy (DOE) or an NRC licensee (other than Westinghouse-Hematite) may be utilized in the unlikely event that a shipment of fissile material is required. Shipments by the U.S. Department of Energy (DOE) would be performed in accordance with DOE quality requirements. Shipment by another NRC licensee would be in accordance with that licensee's approved quality assurance program in accordance with 10 CFR 71 Subpart H – Quality Assurance (Reference 5.2)."
14.2	Shipping Manifests Form and Signoff for wastes which are	Clarify what type of form will be used and who will sign off for the shipments which are not HazMat Class 7.	If the material to be shipped is a waste, does not contain licensed material and is not a hazardous waste, then no manifest or bill of lading is required. This waste will be disposed of as Office Waste and Construction &Demolition Waste (i.e., non-	Section 14.2 will be revised to read as follows: For shipping manifests, the requirements of 49 CFR, Appendix G of 10 CFR 20 (Reference 5.1) (Uniform Low-Level Radioactive Waste Manifest

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WMTP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
	not HazMat Class 7		hazardous industrial waste). If the material to be shipped contains licensed material and is waste, then the waste will be manifested on a Uniform Low-Level Radioactive Waste Manifest (NRC 540 and 541 or equivalent form). This includes low level radioactive waste that does not meet the definition of radioactive material as identified by the DOT. If the material to be shipped does not contain licensed material, and is hazardous waste, then the waste will be manifested on a Uniform Hazardous Waste Manifest (EPA Form 8700-22). If the material to be shipped contains licensed material as waste and contains hazardous waste, then the waste will be manifested on a Uniform Low-Level Radioactive Waste Manifest (NRC 540 and 541 or equivalent form) and on a Uniform Hazardous Waste Manifest (EPA Form 8700-22). This includes low-level mixed waste that does not meet the definition of radioactive material as identified by the DOT. Personnel assigned to the position of HDP Waste Management Specialist(s) have been trained and qualified as identified in section 8.4.4 of the WMTP and 49 CFR 172 subpart H will prepare documentation and authorize shipments.	or equivalent) 40 CFR 262 (Reference 5.17) (Uniform Hazardous Waste Manifest) are applied as follows: • If the material to be shipped is: 1) a waste, 2) does not contain licensed material, and 3) is not a hazardous waste, then no manifest or bill of lading is required. This waste will be disposed of as Office Waste and Construction &Demolition Waste. • If the material to be shipped is 1) a waste, 2) contains licensed material, and 3) is not a hazardous waste, then the waste will be manifested on a Uniform Low-Level Radioactive Waste Manifest (NRC 540 and 541 or equivalent form). This includes low level radioactive waste that does not meet the definition of radioactive material as identified by the DOT. • If the material to be shipped: does not contain licensed material, and is a hazardous waste, then the waste will be manifested on a Uniform Hazardous Waste Manifest (EPA Form 8700-22). • If the material to be shipped is 1) a waste, 2) contains licensed material, and 3) is a hazardous waste, then the waste will be manifested on a Uniform Low-Level Radioactive Waste Manifest (NRC 540 and 541 or equivalent form) and on a Uniform Hazardous Waste Manifest (EPA Form 8700-22). This includes low-level mixed waste that does not meet the definition of radioactive material as identified by the DOT.
14.3.3	Licensee must notify NRC within 1 hour of discovering loss SNM of moderate strategic significance	Add commitment to notify NRC to 14.3.3	Both Sections 14.3.3 and 14.3.2 will be modified to include notifying the NRC within 1 hour of discovery of the loss of a shipment.	Sections 14.3.2 and 14.3.3 will be combined and revised as follows: For shipments of SNM, immediately initiate a trace investigation of any shipment that is determined to be lost or unaccounted for after a reasonable time beyond the estimated time of arrival. Notify the NRC Operations Center within one hour after discovery of the loss of the shipment and within one hour after recovery or accounting for such lost shipment in accordance with the provisions of 10 CFR 73.71, Reporting of Safeguards Events.
Appendix A Transportation Security Plan for Shipments of SNM of Low Strategic Significance 2.1.2	Confirmation from receiver must be received before shipment of SMN	Clarify that confirmation will be received before shipment.	Westinghouse believes that the following text is clear in requiring confirmation before the shipment departs. Paragraph 2.1 states: "HDP will take the following actions prior to the shipment leaving the facility:" The following subtier list includes Paragraph 2.1.2, which states "Receive confirmation from the receiver that the receiver will be ready to accept the shipment at the planned time and location and acknowledges the specific mode of transportation. This may be in the form of an email."	Westinghouse has provided the requested clarifying information in the Discussion Points. No further action required.
Appendix A Transportation Security Plan for Shipments of SNM of Low Strategic Significance	Licensee should commit to establishing and maintaining response procedures in accordance with	Add commitment.	Section 2.2 of Appendix A and its subsections are intended to be the response procedure as required by 10 CFR 73.67(g)(3)(i) and is maintained as part of this WMTP. The DP requirements for maintaining copies of quality records, such as the WMTP, are located in DP Section 13.6.	The heading of Appendix A, Section 2.2, will be revised to read: "3.0 In-Transit Physical Protection and Response Procedures" The following subsections to 2.2 will be renumbered. A new paragraph between Sections 3.0 and 3.1 will be added as follows: "The following subsections are the response procedures per 10 CFR 73.67(g)(3)(i) for

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WMTP Section	Issues	Path Forward	Discussion Points	Proposed Resolution
2.1.12	73.67(g)(3)(i).			dealing with threats or thefts of SNM shipped by HDP.” The newly numbered Subsection 3.4 will be revised to read: “For shipments of SNM of low strategic significance, conduct immediately a trace investigation of any shipment that is lost or unaccounted for after the estimated arrival time and notify the NRC Operations Center within one hour after discovery of the loss of the shipment and within one hour after recovery of or accounting for such lost shipment in accordance with the provisions of 10 CFR 73.71 Reporting of Safeguards Events.”

ATTACHMENT 16

Draft Supplemental Response to NRC Requests for Additional Information on Decommissioning Plan Reference to Nuclear Criticality Safety Items in the License Application Request (Westinghouse Letter HEM-11-79)

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

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<table>
<tr><th>LAR Section</th><th>Issues</th><th>Path Forward</th><th>Discussion Points</th><th>Proposed Resolution</th></tr>
<tr><td>Section 1.6.2, 3rd bullet</td><td>Westinghouse needs to define how it determines that the areas are “neutronically” separated.</td><td>Clarify how areas are determined to be “neutronically” separated.</td><td>Neutronically separated areas are effectively neutronically isolated from all other areas used to store fissile material. Each area used to store fissile materials is deemed to be neutronically isolated from all other areas used to store fissile material when either of the following conditions are satisfied:

a) A minimum edge-to-edge separation distance of 12 feet is maintained between each area used to store fissile material; or

b) The configuration of each area used to store fissile material, in conjunction with any present fixed shielding (e.g., concrete block walls) between the areas, is demonstrated by neutron transport calculations to result in effective neutron isolation between each area.

The 3rd bullet of Section 1.6.3 states:

• Materials within neutronically separate areas containing less than the following isotopic mass amount per separate area:

– 700 g ^{235}U in uranium enriched to more than 5 wt.% ^{235}U/U, and

– 1640 g ^{235}U in uranium enriched to no more than 5 wt.% ^{235}U/U;

Note: (1) Structure surfaces within the separate area that contain residual ^{235}U surface contamination below an areal density of 10 g ^{235}U/ft^2 are not included in the mass amount for the separate area.

(2) Any ^{235}U in undisturbed subsurface areas is not included in the isotopic mass amount for the separate area.</td><td>Westinghouse will revise the text in Enclosure 2 of Westinghouse letter, HEM-10-122, dated November 11, 2010, “Revision to Hematite License Application for Decommissioning and Exemption” to read as follows:

This exemption is needed based on ANSI/ANS-8.3 Section 4.1.1, which is endorsed by the NRC in Regulatory Guide 3.71. ANSI/ANS-8.3 Section 4.1.1 states that a CAAS should only be installed when it will result in a reduction in total risk. Stated conversely, a CAAS should not be installed when it will result in an increase in personnel risk. ANSI/ANS-8.3 also makes it clear that the hazards associated with false alarms are an important consideration. Given that there is no credible risk of a criticality accident associated with the amounts of SNM specified in this bullet, the hazards associated with personnel evacuating from false alarms increases personnel risk. Thus an active CAAS would be inconsistent with the guidance in this standard, and this fact supports the issuance of the requested exemption.

The supporting analysis for the mass limits in this exemption request is in Westinghouse letter dated December 4, 2009, (Westinghouse [E. K. Hackmann] letter to NRC [Document Control Desk], HEM-09-140, "Hematite Decommissioning Project Criticality Alarm Exemption Request"). These mass limits are set at or below the subcritical mass limits specified in Table 1 and Table 6 of ANSI/ANS-8.1-1998. In summary, the specified mass limits do not exceed the maximum subcritical mass limits for the corresponding ^{235}U enrichment, provided each area used to store fissile materials is deemed to be neutronically isolated from all other areas used to store fissile material.

Neutronically separated areas are to be considered effectively neutronically isolated from all other areas used to store fissile material when either of the following conditions are satisfied by:

a) A minimum edge-to-edge separation distance of 12 feet is maintained between each area used to store fissile material; or

b) The configuration of each area used to store fissile material, in conjunction with any present fixed shielding (e.g., concrete block walls) between the areas, is demonstrated by neutron transport calculations to result in effective neutron isolation between each area.

In addition, the notes are based on:

(1) The peak areal density established for the surfaces of the buildings at the Hematite site is less than 10 g^{235}U/ft^2. Due to the very large margin between this peak value and the maximum safe areal density of ^{235}U identified in Table 1 of ANSI/ANS-8.1, it is assured that any neutron interaction between building surfaces and items located within the buildings will be insignificant.

(2) The years of material being in subsurface areas empirically demonstrate that the undisturbed material is subcritical. Material located in undisturbed subsurface areas can only be quantified after it is disturbed.</td></tr>
<tr><td>Section 1.6.2, 3rd bullet</td><td>Additional details are necessary in Enclosure 2 demonstrating how the previous submittal dated 12/4/2009 bounds this situation.</td><td>Revise text in Enclosure 2 encompassing how areas are determined to be “neutronically” separated.</td><td>Westinghouse agrees that additional justification is required to connect the intrinsically safe mass limits that are established in the 12/4/2009 letter with neutronically separated areas.</td><td>(1) The proposed resolution in the preceding row incorporates additional justification.</td></tr>
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LAR Section	Issues	Path Forward	Discussion Points	Proposed Resolution
Section 1.6.2, 5th bullet	Westinghouse needs to define what is meant by "in secure storage."	Provide the criteria for secured storage areas.	An on-site secured storage area is defined as an area in which dual controlled entry is required as well as tandem operations with oversight. The secured storage area access doors are maintained in a locked position until opened via two different locking mechanisms (e.g., combination lock or key lock). Two different persons are required when accessing the area and each is required to perform tasks in tandem; in addition, oversight is required during all active operations. The 5th bullet of Section 1.6.3 states: A Contingency Hot Spot that is in secure storage, is neutronically isolated from other SNM, and is intrinsically safe due to two of its physical parameters (e.g., mass, volume, enrichment, geometry, moderation) being in a known state that is sufficient to render the item safely subcritical. The term 'Contingency Hot Spot' is defined in the *Nuclear Criticality Safety Contingency Plan for Remediating Contingency Hot Spots*.	Westinghouse will revise the text in Enclosure 2 of Westinghouse letter, HEM-10-122, dated November 11, 2010, "Revision to Hematite License Application for Decommissioning and Exemption" to read as follows: This exemption is needed based on ANSI/ANS-8.3 Section 4.1.1, which is endorsed by the NRC in Regulatory Guide 3.71. ANSI/ANS-8.3 Section 4.1.1 states that a CAAS should only be installed when it will result in a reduction in total risk. Stated conversely, a CAAS should not be installed when it will result in an increase in personnel risk. ANSI/ANS-8.3 also makes it clear that the hazards associated with false alarms are an important consideration. Given that there is no credible risk of a criticality accident associated with secure storage under the specified conditions, the hazards associated with personnel evacuating from false alarms increases personnel risk. Thus an active CAAS would be inconsistent with the guidance in this standard, and this fact supports the issuance of the requested exemption. Assuming that the unlikely event of discovering a *Contingency Hot Spot* occurs during remediation, this exemption is solely for the secure storage of a *Contingency Hot Spot*. Other operations involving the *Contingency Hot Spot* would not be exempt. The secure storage of a *Contingency Hot Spot* is only exempt where the specified conditions are met. The specified conditions apply the double contingency principle to prevent self-criticality and apply neutronic isolation to prevent interaction with other SNM. Achievement of these conditions would be subject to Westinghouse's nuclear criticality safety program, which is described in Chapter 10, Section 10.9 of the Decommissioning Plan and would be approved by the NRC by virtue of its approval of the Decommissioning Plan, as submitted by Westinghouse letter dated August 12, 2009, (Westinghouse [E. K. Hackmann] letter to NRC [Document Control Desk], HEM-09-94, "Decommissioning Plan and Revision to License Application"). This change is part of incorporating the discussions supporting the Westinghouse-U.S. Government Settlement Agreement-in-Principle The term *Contingency Hot Spot* is defined in the Nuclear Criticality Safety Contingency Plan for Remediating Contingency Hot Spots, as submitted by Westinghouse letter dated November 12, 2010, (Westinghouse [E. K. Hackmann] letter to NRC [Document Control Desk], HEM-10-116, "Nuclear Criticality Safety Contingency Plan"). • A Hot Spot is defined as a distinct, in-situ location where field instruments indicate an elevated quantity of ^{235}U (whether one object, a group of objects, or a cluster of material) when compared to the quantity of ^{235}U in the surrounding area. • A *Contingency Hot Spot* is defined as a discrete item with a 235U mass estimate exceeding 700 g235U (i.e., a distinct in-situ location where field instruments indicate the presence of more than 700 g of 235U). The term secured storage area is defined as an area in which dual controlled entry is required as well as tandem operations with oversight. Neutronically isolated (separated) areas are to be considered effectively neutronically isolated from all other areas used to store fissile material when <u>either</u> of the following conditions are satisfied by: (2) a) A minimum edge-to-edge separation distance of 12 feet is maintained between each area used to

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LAR Section	Issues	Path Forward	Discussion Points	Proposed Resolution
				store fissile material; or (3) b) The configuration of each area used to store fissile material, in conjunction with any present fixed shielding (e.g., concrete block walls) between the areas, is demonstrated by neutron transport calculations to result in effective neutron isolation between each area.
Section 1.6.2, 5th bullet	Westinghouse needs to define how it determines that the items are "neutronically isolated."	Clarify how areas are determined to be "neutronically" isolated.	Each area used to store fissile materials is deemed to be neutronically isolated from all other areas used to store fissile material when either of the following conditions are satisfied: a) A minimum edge-to-edge separation distance of 12 feet is maintained between each area used to store fissile material; or b) The configuration of each area used to store fissile material, in conjunction with any present fixed shielding (e.g., concrete block walls) between the areas, is demonstrated by neutron transport calculations to result in effective neutron isolation between each area.	The proposed resolution in a previous row incorporates this definition.