



**Westinghouse**

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Your ref:  
Our ref: LTR-RAC-17-63

December 12, 2017

SUBJECT: WESTINGHOUSE RESPONSES TO REQUEST FOR ADDITIONAL INFORMATION  
(Cost Activity Codes: L33317 and L00926)

Westinghouse Electric Company LLC (Westinghouse) is pleased to provide the enclosed responses to your Request for Additional Information dated December 7, 2017 regarding our License renewal application.

If you have any questions, please contact me at (803) 647-3338.

*Nancy Blair Parr*

Nancy Blair Parr, Manager  
Licensing  
Westinghouse Columbia Fuel Fabrication Facility  
Docket 70-1151 License SNM-1107

Enclosure 1: Westinghouse RAI Responses – 8 pages

cc:  
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## ENCLOSURE 1

**Westinghouse Columbia Fuel Fabrication Facility (CFFF) November RAI Responses**

REQUEST FOR ADDITIONAL INFORMATION	REG BASIS	WESTINGHOUSE RESPONSE
<b>A. ORGANIZATION</b>		
<p><b>RAI 1.</b> In the October 9, 2017 submittal of revised Chapter 10 of the License Renewal Application, Westinghouse stated that an action plan will be developed for wells exceeding an annual average of 300 pCi/L uranium (ML17282A012). Clarify the expected information that will be included in the action plan and whether it will be documented in Westinghouse's Corrective Action Plan.</p>	<p>10CFR 70.22(a)(8)</p>	<p>If there were an exceedance event, then it would be entered into the Westinghouse Corrective Action Program (CAP). Typically, the action taken would include additional sampling and subsequent analysis of the well exceeding the action level. Adjacent wells might also see increased sampling in order to help ascertain the source of uranium and full impact of the increased contaminant. Based on the results of this investigation, appropriate action would be taken. The license renewal application Chapter 10.0, Table 10.1 has been revised to clearly specify that the CAP is used in these situations (see table footnotes 1 and 2).</p>
<p><b>RAI 2.</b> In response to RAI 72 of the June 23, 2016 RAIs, Westinghouse stated, "There are no estimates of releases, as there are no additional identified point sources other than the wastewater treatment lagoons, which have been previously identified and mitigated by the installation of new lagoon liners." (ADAMS Accession No. ML16246A300). Additionally, the Environmental Report on page 2-16 states that "All process waste storage lagoons are lined with 36-mil Hypalon liners." The ER also states that only four lagoons have been relined (North, South, West-I and West-II). The 2013 AECOM Remedial Investigation report (ADAMS Accession No. ML16166A141), on page 1-9, states that the new liners consist of 80-mil HDPE at the four lagoons.</p> <p>a. Clarify the lining material for all five process</p>	<p>10CFR 70.22(a)(7)</p>	<p>Westinghouse provides the following information to clarify its December 17, 2014 Environmental Report and the August 21, 2016 RAI response.</p> <p>a. The material of construction for the North, South, West-I and West-II wastewater treatment lagoon liners is 80-mil High Density Polyethylene (HDPE). These lagoons are for settling solids from treated process wastewater prior to discharge to the Congaree River. These lagoons were relined in 2012 in response to groundwater monitoring data. The East lagoon provides extra capacity for overflow from other lagoons or for containment in the event of a spill or emergency. The East lagoon liner is constructed of 36-mil Hypalon.</p> <p>b. The liquid effluent streams from Special Nuclear Material (SNM) operations are treated to remove radiological impurities using quarantine tanks and diversion tanks inside of the chemical controlled area of the plant. A final uranium removal process is then completed at the advanced wastewater treatment facility, commonly referred to as the Waterglass Process. From the Waterglass Process, the effluent stream is discharged to</p>

<p>lagoons, including the East lagoon.</p> <p>b. Explain why the liner in the East lagoon has not been relined and how Westinghouse is assured that the East lagoon is not a continued source of gross alpha contamination, or potentially other contaminants.</p>	<p>the chemical wastewater treatment facility for chemical removal. From there, treated process wastewater (i.e., after removal of uranium and chemical contaminants) is discharged into the West-I or West-II lagoons for settling of non-hazardous solids. The liquid is then decanted from the top of the West lagoons on a batch basis to the North or South lagoons. Water is then pumped from the North or South lagoons to a lift station, aeration basin and de-chlorination chamber before being discharged to the Congaree River in accordance with CFFF's South Carolina Department of Health and Environmental Control (SCDHEC) National Pollutant Discharge Elimination System (NPDES) permit. The East lagoon was designed as an alternate or back-up for the other lagoons. It could be used if there were an overflow condition from one of the other lagoons or for containment in an emergency event such as a large spill. No such conditions requiring use of the East lagoon in this capacity have occurred since the 2007 license renewal. There are non-SNM liquid inputs into the East lagoon, such as effluent from our Deionized Water Building and rainwater from containment areas such as the chemical tank farm.</p> <p>Multiple factors show that the East lagoon is not a source of contaminants. First, the East lagoon is not used for process liquid effluents from SNM operations as described above. Also, the material of construction for the East lagoon liner is Hypalon, which has excellent durability against UV and Ozone exposure and is resistant to a wide variety of chemicals. This liner material also retains flexibility in freeze/thaw conditions. As per manufacturer recommendations, the liner is periodically inspected for tears, punctures or other damage. In addition, there are controls on the lagoon inputs and sampling. The East lagoon is monitored for pH and liquid level and is sampled for fluoride, ammonia and Total Suspended Solids (TSS). Once full, the East lagoon is pumped to either the North or South lagoon. Before the North or South lagoon is discharged, a four corner sample is taken and analyzed for pH, TSS, ammonia, fluoride and activity. If the East lagoon were a source of contamination, it would be evident in this process sampling data. Lastly, groundwater well W-22, located at the southwest corner of the East lagoon, will continue to be monitored for gross alpha and gross beta. Based on groundwater sampling data from 2004 through July 2017, well W-22 has not exceeded an annual average of 300 pCi/L uranium, the proposed</p>
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		action level for developing an investigative plan.
<p><b>RAI 3.</b> On June 23, 2016, NRC previously asked in an RAI for Westinghouse to “Provide an estimate of the amount of gross alpha contamination that has been released to the environment. ...” (ADAMS Accession No. ML 16141A738). Westinghouse’s response (ADAMS Accession No. ML16246A300) stated, “There are no estimates of releases, as there are no additional identified point sources other than the wastewater treatment lagoons, which have been previously identified and mitigated by the installation of new lagoon liners.” However, the 2015 Decommissioning Funding Plan (DFP), stated WEC discovered a leak in a buried piping system under the Uranium Recycling and Recovery Services (URRS) area. A pipe breach was also discovered after further investigation. Westinghouse performed core borings in four locations and collected soil, sludge, and water samples. The samples showed elevated levels of uranium (U)-234, U-235, and U-238.</p> <p>Provide the following information regarding this incident in the URRS area and for any other leaks/spills identified since 2008:</p> <ol style="list-style-type: none"> <li>1) Amount of gross alpha and uranium contamination released to the environment as a result of the pipe leaks within the URRS area.</li> <li>2) Information on the migration of the released material through the environment and potential pathways for exposure to a worker or member of public.</li> </ol>	<p>10CFR 51.45(b)</p>	<p>Westinghouse provides the following information to supplement its December 17, 2014 Environmental Report and the August 21, 2016 RAI response.</p> <ol style="list-style-type: none"> <li>1) Similar to the response provided for the wastewater treatment lagoons in RAI #72, there is no estimate of a release from the leaking underground pipe that was identified in 2011. If this leak were a source of groundwater contamination, it would be evident from the groundwater wells W-37, W-38 and W-29 sampling data, as they are the closest monitoring wells downgradient from where the leak occurred. These wells are monitored for gross alpha and gross beta. Based on groundwater sampling data from 2004 through July 2017, wells W-37, W-38, and W-29 have not exceeded the action level of 15pCi/L for additional isotopic uranium analysis.</li> <li>2) There is no evidence to indicate that a worker or member of the public could be exposed to this material. The pipe was underground and any soil contamination underneath the building will remain there until decommissioning. Any groundwater contamination would be detected through the existing well network, which has not identified this area as a point source for contamination based on data analyzed from 2004 through July 2017.</li> <li>3) Gross alpha concentrations for the soil and sludge in the vicinity of the leaking pipe were less than 400 pCi/g uranium. A water sample was also collected at one boring location. The accumulated water was suspected to originate from the contents of the damaged contaminated wastewater pipe. There is no estimate of the total volume of material released to the environment. In the Decommissioning Funding Plan, the estimated volume of contaminated soil accounts not only for the area of this leak, but also for the possibility of removal of soil underneath the entire SOLX processing area. It is estimated that eighty one thousand six hundred ten (81,610) cubic feet of soil will be removed, packaged and shipped offsite for disposal. As stated previously, if this leak were a source of groundwater contamination, it would be evident from the groundwater well sampling data for W-37, W-38, and W-29. These wells are monitored for gross alpha and gross beta, and</li> </ol>

<p>3) Chemical form, concentration, isotopic content, and volume of the uranium released.</p> <p>4) The DFP stated the appropriate long term action was to install a new above-ground piping system. The DFP also stated the soil will be removed. Explain the corrective actions taken in response to the identified leak. Provide the status of those efforts.</p> <p>5) Explain how Westinghouse is preventing or mitigating future leaks from the new above ground piping system.</p> <p>6) Explain to what extent this incident was communicated to SCDHEC and what was SCDHEC's response.</p> <p>7) Explain the expected migration pathway for the uranium, both vertically and horizontally, in the soil and ground water. Provide a figure showing the exact location of the pipe leak and breach with respect to the building. The figure should also include the groundwater table and topographical contours. Subsurface storm flow in the vadose zone or ground water may spread the uranium away from the building in different directions, depending on the proximity of the leak/breach to an exterior wall and subsurface flow direction.</p> <p>8) Explain if there is a uranium plume in the water-table aquifer. If so, how is it being monitored?</p> <p>9) Explain how his spill was considered in the 2013 Remedial Investigation or the 2014 Baseline Risk Assessment prepared by AECOM. If it was not considered, provide a justification.</p>	<p>based on existing groundwater sampling data from 2004 through July 2017, these wells have not exceeded the action level of 15pCi/L for additional isotopic uranium analysis.</p> <p>4) The location of the leak was determined by ground penetrating radar and push cameras used to trace the underground line. Next, influent sources to the contaminated wastewater pipe were identified. Based on the location of the leak (below structural concrete in SOLX area), the decision was made to abandon the pipe in place and replace it with above-ground piping. The piping was relocated above-ground and is constructed of 304 stainless steel. In addition, other underground ductile iron pipes, that had the potential for leaks resulting in contamination, were inspected, and no additional integrity issues were identified.</p> <p>The old pipe was abandoned in place, as it is below structural concrete for the solvent extraction area. The old pipe, like the contaminated soil underneath the building, has not been removed at this time but will be removed at the time of CFFF decommissioning. Again, through groundwater monitoring data, there is no indication of migration of this material in the groundwater.</p> <p>5) Leak prevention is achieved by the installation of new 304 stainless steel piping, designed and installed in accordance with facility standards and by periodic inspections of piping integrity. Inspections are commonly used by operations personnel to identify process leaks in this and other above-ground systems.</p> <p>6) Per CFFF procedures, there was no specific requirement to notify SCDHEC regarding this event. Groundwater monitoring data is provided to SCDHEC in an annual groundwater monitoring report. Per this license renewal, Westinghouse committed to sending this report to NRC as well.</p> <p>7) Two figures on pages 7 and 8 of this response illustrate the pipe leak. The aerial image also includes the location of the leak in relation to the existing site groundwater wells used to monitor for and detect contamination. A map with topographical contours can be found in the ER previously submitted to</p>
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<p>10) Explain how this leak of uranium in the soil factored into the plume analysis Westinghouse conducted. If it was not considered, justify why the plume analysis would not change if the pipe leak is factored in.</p> <p>11) If available, provide the natural background for uranium in the area prior to the release.</p>		<p>the NRC. The groundwater monitoring program for this event is the same as previously discussed with NRC.</p> <p>8) SNM-1107 requires that Westinghouse sample for gross alpha and gross beta constituents. Gross alpha includes uranium and all other naturally occurring radioisotopes. If the action level of 15 pCi/L is reached for gross alpha, then Westinghouse will further speciate to determine if the gross alpha is uranium originating from the CFFF. Since 2004, CFFF has had no sample results in groundwater monitoring wells W-37, W-38, and W-29 where the action level of 15 pCi/L was exceeded. Based on groundwater monitoring data, there is no indication of a uranium plume.</p> <p>9) AECOM was not tasked with performing the soil borings that were performed in the CFFF investigation of this event. This leak, like any other event at CFFF was captured in groundwater data analysis, including data from 2004 to 2017. This analysis provided visual depictions of location, movement, and concentration of any groundwater contamination, with no bias for where an event may have occurred. Review of the comprehensive groundwater monitoring well data both before and after the event does not indicate that a point source discharge of gross alpha or gross beta occurred at the side of the building where the SOLX process is located.</p> <p>10) Westinghouse contracted external consultants to analyze groundwater monitoring data from 2004 to 2017 across the site. The result of this extensive data-based analysis includes any event at the CFFF up to 2017. Any groundwater impact from previous leaks at the site would have been factored into the analysis.</p> <p>11) The natural background for uranium is discussed in the 1985 Environmental Assessment. Typical concentrations of uranium in surrounding vegetation and soil are less than 1 pCi/g.</p>
<p><b>RAI 4.</b> Westinghouse has signed a Voluntary Cleanup Contract (VCC) with the South Carolina Department of Health and Environmental Control (SCDHEC). Provide a status of efforts undertaken as part of the VCC.</p>	<p>10CFR 51.45(d)</p>	<p>For the VCC, Westinghouse has committed to complete additional groundwater screening and soil borings to better delineate a Volatile Organic Compound (VOC) plume. A Membrane Interface Probe (MIP) has been used to log the relative concentration of VOCs with depth in soil. The results of the most recent MIP borings are pending. CFFF has agreed in the new</p>

<p>Westinghouse has also applied to SCDHEC to renew its National Pollutant Discharge Elimination System (NPDES) permit. Provide a status of the NPDES renewal and explain any differences in the new permit.</p>		<p>proposed license to submit at least annually a report of the updates and progress regarding the VCC until closing of the contract.</p> <p>Independent of the VCC, Westinghouse has recently completed a groundwater sufficiency analysis as part of an effort to improve detection and monitoring of groundwater contaminants including gross alpha, gross beta, fluorides, nitrates, and ammonia.</p> <p>The NPDES renewal application was submitted to SCDHEC for review on September 29, 2017. In this renewal application, Westinghouse requested changes based on the well sufficiency analysis. In addition, Westinghouse requested changes to storage of certified wastewater treatment operator training records, the requirement for CFFF to sample for fission and activation products and tritium (i.e., CFFF is a fuel fabrication facility that manufactures nuclear fuel from un-irradiated uranium which does not contain fission and activation products or tritium), and to discharge process water currently being sent offsite in tanker trucks to its on-site treatment facility.</p>
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# Contaminated Waste Water Drain

