

October 8, 2015

Ms. Gay Fussell, Deputy Director
Hematite Decommissioning Project
Westinghouse Electric Company
3300 State Road P
Festus, MO 63028

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION CONCLUSIONS ASSOCIATED
WITH THE UTILIZATION OF OFF-SITE BORROW MATERIAL AT THE
WESTINGHOUSE HEMATITE SITE

Dear Ms. Fussell:

On November 19, 2014, Westinghouse Electric Company LLC (Westinghouse) sent to the U.S. Nuclear Regulatory Commission (NRC) a letter (HEM-14-89, ML14323A238). This letter provided a statistical assessment (HDP-RPT-FSS-301, Attachment 1 to HEM-14-89) to demonstrate the suitability of soil from a potential off-site borrow location for onsite backfill at the Hematite Decommissioning Project (HDP). Westinghouse indicated that the statistical analysis performed was based on *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, EPA 540-R-01-003. The analysis provided by Westinghouse had excluded outlier data points identified in both the reference area and borrow material.

In a March 12, 2015, public telephone conference call, the NRC staff stated that removing the outliers from the data set was inconsistent with NRC guidance and requested Westinghouse perform a revised analysis with the outliers included. A revised submittal was provided by WEC on March 18, 2015 (HEM-15-20, ML15077A476), in which outliers were included and not all statistical tests were passed. In a March 19, 2015, telephone conference call, the NRC staff stated that the statistical analysis performed by Westinghouse should be performed according to the guidance set forth either in NUREG-1505, *A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys*, and/or NUREG-1575 Supplement 1, *Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual (MARSAME)*.

In response to the NRC's request, Westinghouse performed a re-analysis with the outliers that had been removed in the HDP-RPT-FSS-301 assessment placed back into the data set. This re-analysis was conducted according to the guidance in NUREG-1505 and NUREG-1575 Supplement 1. The re-analysis was presented in Westinghouse's April 2, 2015, letter to the NRC (ML15092A213, HEM 15-25).

In an April 16, 2015, telephone conference call, the NRC stated that the statistical analysis should be performed with the upper bound of the gray region set as the mean of the reference area results plus three times the associated standard deviation. In an April 27, 2015, letter to the NRC (ML15117A151, HEM-15-39), Westinghouse provided the results of their re-analysis with the upper bound of the gray region set as the mean of the reference area results plus three times the associated standard deviation.

The NRC's review of Westinghouse's re-analysis identified the following:

The Scenario B WRS and Quantile tests appear to have been performed in accordance with NUREG-1505. However, the associated hypothesis statements are not appropriate for a comparison between a background reference area and an area that should be equivalent to background (borrow soil) and must be updated before approval to use the referenced off-site borrow soil as backfill.

WEC indicated in their April 2, 2015, submittal that:

WRS tests were performed for each radionuclide in accordance with Section 6.3 of NUREG-1505. Scenario B of the test was used, with a null hypothesis that the median concentration of radioactivity in the borrow material and in the reference area is less than the lower boundary of the gray region (LBGR). The value of 3ω was used for each radionuclide as the LBGR and the width of the gray region is the derived concentration guideline level (DCGL) per Section 13.4 of NUREG-1505.

Section 13.4 of NUREG-1505 states the hypotheses tested by WRS under Scenario B as follows:

H_0 : The difference in the median concentration of radioactivity in the survey unit and in the reference area is less than the LBGR

H_A : The difference in the median concentration of radioactivity in the survey unit and in the reference area is greater than the $DCGL_w$.

These hypothesis statements from NUREG-1505 are only appropriate if Scenario B is being utilized for a survey unit where a DCGL is used as the release criterion. Since the current WEC application of Scenario B is used as a comparison of survey areas to background, and not to a DCGL, it would be appropriate for WEC to adjust their hypothesis statements as follows:

H_0 : The difference in the median concentration of radioactivity in the survey unit and in the reference area is less than the LBGR

H_A : The difference in the median concentration of radioactivity in the survey unit and in the reference area is greater than the mean/median of the reference area + 3ω .

In this case, it is acceptable to set the lower bound of the gray region (LBGR) equal to 3ω and to set the upper bound of the gray region (UBGR) equal to the mean of the reference area + 3ω . Therefore, the width of the gray region is the mean of the reference area. As such, the relative shift calculation that should be utilized to determine the required number of survey unit (borrow) samples becomes:

$$\Delta/\sigma = (UBGR - LBGR) / \sigma, \text{ which simplifies to}$$

$$\Delta/\sigma = (\text{mean of the reference area} / \sigma),$$

where σ is the standard deviation of the reference area.

The NRC approves the usage of the offsite borrow soil referenced in the April 27, 2015, submittal on the condition that WEC utilize the appropriate hypothesis statements and relative shift calculations as indicated above. As such, WEC should demonstrate that their data would fail to reject the null hypothesis for the WRS test and that an appropriate number of samples were taken in the borrow survey unit based upon a relative shift calculation where the width of the gray region is represented by the mean of the reference area.

NRC staff also notes that the April 27, 2015, submittal only included retrospective power curves and did not include the WRS/Quantile test results and the associated hypothesis test results (i.e., did the test reject or fail to reject the null hypothesis). As such, it would be appropriate for WEC to finalize all conclusions in a single document.

The conclusions presented in this letter are also applicable to any other source of offsite borrow material. Westinghouse informed the NRC on September 24, 2015, that they have procured access to two other sources of offsite borrow. Westinghouse should consider the conclusions contained in this letter as they may apply to these two resources.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Please contact Mr. John Hayes if you have any questions concerning the above. He can be reached at (301) 415-5928 or via email at John.Hayes@nrc.gov.

Sincerely,

/RA/

Michael A. Norato, Ph.D., Chief
Material Decommissioning Branch
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No.: 70-36
License No.: SNM-33

cc:
Westinghouse – Hematite Service List
Joseph W. Smetanka, Westinghouse

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Sincerely,

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Docket No.: 70-36
License No.: SNM-33

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