ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

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Docket No. 030-03732
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Ms. Vivian Campbell, Chief
Nuclear Materials Safety Branch-A
U.S. Nuclear Regulatory Commission
Region IV
612 E. Lamar Boulevard, Suite 400
Arlington, TX 76011

SUBJECT: COMMENTS ON THE "FINAL STATUS SURVEY REPORT FOR NIST BOULDER CAMPUS, BUILDING 1 AFFECTED ROOMS", CS-HP-PN-009 NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, BOULDER, COLORADO (DOCKET NO. 030-03732; RFTA NO. 09-008) DCN 1788-TR-01-0

Dear Ms. Campbell:

The Oak Ridge Institute for Science and Education (ORISE) has reviewed the Final Status Survey Report (FSSR) for the affected rooms within Building 1 at the National Institute of Standards and Technology (NIST) in Boulder, Colorado. This FSSR was prepared by NIST contractor, Energy*Solutions*, LLC (ESL). Enclosed is the comment letter that summarizes ORISE's review of the FSSR which was requested and approved by the U.S. Nuclear Regulatory Commission (NRC).

If you have any questions, please direct them to me at 865.576.0065 or Tim Vitkus at 865.576.5073.

Sincerely,

Wade C. Adams
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Independent Environmental Assessment and Verification

WCA:km

Enclosure

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COMMENTS ON THE
"FINAL STATUS SURVEY REPORT FOR NIST BOULDER CAMPUS, BUILDING 1
AFFECTED ROOMS", CS-HP-PN-009
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY,
BOULDER, COLORADO

GENERAL COMMENTS

The final status survey report (FSSR) follows the guidance in the *Multi-Agency Radiation Survey and Site Investigation Manual* (MARSSIM), the determination of derived concentration guidelines levels (DCGLs) is appropriately addressed, and the final status survey (FSS) results are adequately presented (ESL 2009a and NRC 2000). Overall, the FSSR, as prepared by Energy*Solutions*, LLC (ESL) is well written and easy to follow.

There were several issues that should be addressed in the final FSSR that would provide clarification and closure to the report. These issues are addressed in the Specific Comments below.

SPECIFIC COMMENTS

1. **Signature Page:** The box that is checked is for a "New Plan"; should this be changed to "New Report"?

2. **Page 3, Table 1:** Clarification for the term "fixed equivalent" for alpha smears should be provided. Is this from the assumption that a smear only collects 10% of the actual removable fraction? Was the fixed alpha activity measurement taken before or after the smear was collected? If the smear was collected after the direct measurement for alpha activity was performed, how would this have affected the total alpha activity results? In several of the data sheets, the Alpha Smear (fixed equivalent) is a higher value than the Alpha Fixed activity measurement. Was this the result of the additional alpha activity that resulted from radon deposition? Please provide clarification for this.

3. **Page 18, Section 4.3, DQO 7:** The specific statistical test that was used to determine the number of samples is not provided in the FSSR. Based on the previous review of the Final Status Survey Plan (FSSP), it appears that ESL used the COMPASS (MARSSIM Implementation Software) Sign Test application for determining the number of samples (ESL 2009b). The FSSR should include a summary of this information. Also refer to Specific Comment 7.

4. **Page 21, Table 4-3, Survey Instrumentation:** Please provide clarification regarding the use of Tc-99 as a calibration source for the Ludlum Model 2350/43-68 gas-flow proportional detector since it was used to measure alpha activity only. Also, justification should be provided for using Cs-137 as a calibration source for the NaI detector when Am-241 is used as a surrogate for the contaminants-of-concern (COC). ORISE recommends that ESL account for the significant difference in response in the soil scan MDC.

5. **Page 24, Equation 4-3**: Please provide justification for not using the alpha scan MDC approach as recommended in MARSSIM, Section 6.7.2.2.

6. **Page 25, Section 4.10:** Please provide clarification as to the classification of the soil excavations. This section states that the soil excavations are Class 2; however, in the FSSP, Attachment 9.7, the COMPASS report indicates that the sample size was determined for a Class 1 area. If this area is Class 1, the explanation that the trench was simply divided into two survey units and 30 samples were collected (which was twice the normal sample density for a Class 2 area), may not be adequate. Also, if the soil was originally a Class 1 survey unit, please provide justification for a downgrading of the soil excavation to Class 2. If the pre-FSS classification for the soil area was Class 1, the FSSR should provide a comparison of the actual to required scan MDC for the NaI to demonstrate that the FSS sample spacing was adequate to detect hot spots at level less than the respective $DCGL_{EMC}$.

7. **Page 31, Section 5.2:** ORISE recommends that ESL include a statement that the performance of the Sign Test was not required for any of the individual survey units as all individual results were less than the $DCGL_w$.

8. **Page 36, Table 5.5:** The alpha limit (DCGL) is listed as 693 dpm/100 cm^2. Should this be revised to indicate that the gross activity $DCGL_w$, as approved by the NRC, is 696 dpm/100 cm^2? This is also the case for each of the Survey Unit Data Sheets.

9. **Page 51, Table 5-13:** Two different gas proportional detectors were used for alpha activity measurements. In previous Survey Unit Data Sheet tables, the instrument used to perform the measurement was indicated with a different font color. This table is in black and white. Several other data sheets may also need to be revised.

10. **Page 151, Section 5.3.16:** Several data table and figures are incorrectly labeled as other Survey Units. Please revise.

REFERENCES

Energy*Solutions*, LLC (ESL). *Final Status Survey Report for NIST Boulder Campus Building 1 Affected Rooms.* Report No. CS-HP-PN-009; Revision 0. New Milford, CT; June 2009a.

Energy*Solutions*, LLC. *Final Status Survey Plan for NIST Boulder Campus Building 1 Affected Rooms.* CS-HP-PN-008, Revision 1. Oak Ridge, TN, March 26, 2009b.

U.S. Nuclear Regulatory Commission (NRC). *Multi-Agency Radiation Survey and Site Investigation Manual* (MARSSIM), NUREG-1575; Revision 1. Washington, DC; August 2000