UNITED STATES
NUCLEAR REGULATORY COMMISSION
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January 16, 2018

William T. Frederick, P.G.
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1776 Niagara Street
Buffalo, N.Y. 14207

SUBJECT: THE U.S. ARMY CORPS OF ENGINEERS BUFFALO DISTRICT DESIGN - LEVEL SEDIMENT SAMPLING AND ANALYSIS PLAN - SPRINGVILLE DAM AND CATTARAUGUS CREEK SEDIMENT SAMPLING, DATED JULY 2017

Dear Mr. Frederick:

The U.S. Nuclear Regulatory Commission (NRC) received the U.S. Army Corps of Engineers' (USACE's) email (Agencywide Documents Access and Management System [ADAMS] Accession No. ML17038A318), dated December 20, 2016, requesting that the NRC review the subject document, dated December 2016 (ADAMS Accession No. ML17038A319).

The NRC understands that the Buffalo District of the USACE is authorized by the Great Lakes Fishery and Ecosystem Restoration program to develop construction plans for the Springville Dam on Cattaraugus Creek that will basically involve crest lowering and fish passage components. In the subject plan, the USACE states that the purpose of the Sampling and Analysis Plan (SAP) is to support this construction project (Springville Dam Project), as related to the "targeted excavation and re-use of approximately 20,000 cubic yards of sediment from behind the dam." The USACE also states in the SAP that, "[t]he dam is downstream of a rural watershed that also contains the U.S. Department of Energy West Valley Demonstration Project (WVDP). Consequently, sediment samples will be analyzed for chemical, radiologic, and physical constituents."

In 2016, the USACE informed the NRC of its intent to develop a sediment SAP with a contingency plan in case residual radioactivity was found upon sampling the sediment associated with the Springville Dam Project and expressed its desire for the NRC to review these plans. The NRC explained that it would become involved if offsite residual radioactivity was identified that was shown to be associated with the former West Valley reprocessing plant (NRC License CSF-1, Docket 50-201) and agreed to conduct a courtesy review of the USACE sediment SAP and contingency plan once these plans were developed.

The NRC staff completed its courtesy review of revised plan dated July 2017 (ADAMS Accession No. ML17347A152. The staff found that the U.S. Army Corps of Engineers (USACE) generally addressed the staff's comments sent to USACE on February 28, 2017 (ADAMS

Accession No. ML17039A773) on the December 2016 version of the plan; however, the staff provides below additional comments for USACE's consideration:

1. The plan is focused on determining the impacts of excavation and re-use of sediments from behind the dam for the purpose of the New York State's beneficial use determination (BUD) process through the use of composite sampling. The BUD process has not been evaluated by the NRC to demonstrate compliance with Title 10 of the Code of Federal Regulations (10 CFR) Part 20, Standards for Protection Against Radiation, requirements. As stated in the NRC's February 28, 2017, letter (ADAMS Accession No. ML17039A773) to the USACE, the NRC would become involved in the Springville Dam activities if it was determined that offsite residual radioactivity was identified that was shown to be associated with the former West Valley reprocessing plant (NRC License CSF-1, Docket 50-201). Therefore, the NRC is looking forward to reviewing the separate document to address contingency actions, as noted in the U.S. Army Corps of Engineers' (USACE's) December 20, 2016 email (Agencywide Documents Access and Management System [ADAMS] Accession No. ML17038A318).

2. With respect to the beneficial use determination (BUD) assessment, according to the subject plan, the USACE is comparing its measurements and data against the West Valley Demonstration Project (WVDP) Annual Site Environmental Report background data. Although the USACE is not measuring some of the Hard to Detect (HTD) radionuclides that are WVDP radionuclides of interest listed in the Phase 1 Decommissioning Plan (DOE, 2009)[1], the USACE did agree to add gross alpha and beta when determining worker health and safety. Furthermore, the USACE indicated that they can determine if stream sediments were impacted by West Valley operations by other WVDP signature radionuclides that they measure. These plans are reasonable for the purposes of the USACE Springville Dam project.

3. It is unclear how the scan and measurement minimum detectable concentrations (MDCs) instrument capabilities relate to background concentrations. Therefore, the staff is uncertain if the instruments will be sensitive enough for the intended purposes.

4. Primary and secondary screening ranges in the sampling plan are based on average background concentration values for sediments and soils, but it is unclear in the plan what statistical approach will be used to compare background screening ranges to results from the sampling analysis of streambed sediments (e.g., analysis of variance (or ANOVA) or straight comparison between average values).

5. Composite sediment samples are derived from 0-6, 6-12, 12-18, and 18-24 foot depths. Using Cs-137 as an example, cesium rapidly adsorbs on soils and sediments and has limited mobility in soils. Cesium concentrations typically decline exponentially with soil

[1] Phase 1 Decommissioning Plan for the West Valley Demonstration Project, Rev. 2, Prepared by Washington Safety Management Solutions, URS Washington Division, Science Applications International Corporation, December 2009.

depth. But given the dynamic nature of sediment disposition, it is likely that mixing or re-disposition of sediment may have occurred. The sampling plan also identified periodic flushing of sediments from the dam. It appears that for the BUD process homogenization is acceptable. The USACE plans to composite samples for analysis, because the reused soils would be excavated in 4-6 foot lifts and mixed during staging and packaging. Therefore, the composite samples would likely be representative of the mixed material planned for reuse (sediment spoils). USACE plans for composite sampling appear reasonable for the purpose of the BUD evaluation.

However, as described in Section 14.3 of NUREG-1505, "A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys" (ADAMS Accession No. ML061870462) and explained in more detail in the document "Technical Bases and Guidance for the Use of Composite Soil Sampling for Demonstrating Compliance with Radiological Release Criteria" (ADAMS Accession No. ML13101A090), radiological threshold criteria should be adjusted to account for the potential effects of sample dilution when composite samples are taken. The detailed guidance referenced above recommends (1) retaining samples in case further analysis is needed, (2) establishing an adjusted limit that would trigger analysis of individual subsamples, and (3) using samples of the same volume. While the guidance is related to radiological release criteria for decommissioning sites, NRC staff is concerned that elevated areas of radioactivity, which may be present in buried sediments, may be diluted with cleaner soils as a result of compositing. To ensure protection of members of the public who may be exposed to contaminated sediments, including protection of workers involved in the project during sediment excavation, or who may be exposed to excavated sediments, NRC staff recommends that USACE establish investigation levels, which would trigger protective actions to protect workers and analysis of individual subsamples. Because USACE has established background as the screening level, it would be problematic to set investigation levels at a fraction of the background screening limit. Field scanning results could be used to determine the need for protective actions to protect workers, and analysis of individual subsamples. The threshold could be based on evaluation of reasonable exposure scenarios related to sediment excavation; as well as, staging, storage or transport of excavated materials. Alternatively, USACE could provide additional details to show that the field scanning and BUD evaluation process would also be protective of members of the public, including workers, who may be exposed to contaminated sediments as a result of this project.

In accordance with Title 10 of the *Code of Federal Regulations* Part 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 NRC's ADAMS. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions, please contact Ms. Amy Snyder, Senior Project Manager of my staff. She can be reached amy.snyder@nrc.gov or 301 415-6822. Again, the NRC is looking forward to the review the separate document to address contingency actions.

Sincerely,

/RA/

Stephen Koenick, Chief
Materials Decommissioning Branch
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No. 50-0201
License No. CSF-1

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OFC	DUWP	DUWP	DUWP	DUWP	DUWP	OGC (NLO)	DUWP
NAME	A. Snyder	C. Holston	S.Koenick	C.McKenney	B.Watson	S.Clark	S.Koenick
DATE	12/8/17	12/11/17	12/15/17	12/18/17	12/15/17	1/12/18	1/16/18

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