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February 28, 2017

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 DECEMBER 2016

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 (ADAMS Accession No. ML17038A319).

The NRC understands that the Buffalo District of the USACE is authorized by the Great Lakes Fishery and Ecosystem Restoration (GLFER) 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 has completed the courtesy review of USACE's sediment SAP for the Springville Dam project and provides the enclosed comments. As indicated in the USACE email dated December 20, 2016, the SAP does not include contingency actions, but the USACE intends to develop a separate document to address contingency actions and plans to provide it to the NRC for courtesy review at a later date.

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 me. I can be reached at (301) 415-6822 or Amy.Snyder@nrc.gov.

Sincerely,

/RA/

Amy Snyder, Senior Project Manager
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

cc: w/enclosure:
P. Bembia, NYSERDA
B. Bower, DOE-WV
A. Iglesias, EPA
T. Rice, NYSDEC
D. Samson, NYSDOH

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DOCUMENT DATE: February 28, 2017

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

DISTRIBUTION:
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ADAMS Accession No.: ML17039A773

OFC	DUWP	DUWP	DUWP	DUWP	OGC (NLO)	DUWP
NAME	A. Snyder	C. Holston	T.Smith	C.McKenney A. Schwartzman for	SClark	A.Snyder
DATE	2-7-17	2-8-17	2-8-17	2-13-17	2-27-17	2-28-17

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Comments and Questions

The United States Army Corps of Engineers (USACE), "Design-Level Sediment Sampling and Analysis Plan Springville Dam and Cattaraugus Creek Sediment Sampling," prepared by: USACE Buffalo District, 1776 Niagara Street, Buffalo, N.Y. 14207, dated December 2016.

1. Sampling method

   Page 9 "The sediment sampling method will include a USACE-contracted hollow-stem auger drill rig that will continuously advance a minimum diameter 2-inch split spoon sampler to collect sediment throughout the vertical profile at each targeted location (i.e., the USACE drilling contracts include options for larger diameter split spoons that would produce larger sample volumes to meet laboratory needs)."

   Page 10 "The anticipated volume of sediment required to fill all laboratory-supplied containers for each method listed in Table 2 data should not be problematic with the 2-inch diameter (or greater) split-spoon sampler and composite sampling method. Should extremely poor sediment recovery occur at any given location, a nearby alternative location will be selected by the on-site USACE technical representative to meet project goals. High-percentage core recovery is a priority for the sampling program, thus core recovery and sample number will be maximized via contingency penetrations that will be included in the drilling contract. For example, the contract will have a specific number of optional penetrations that would be actuated during the drilling period in accordance with the Triad philosophy, which is available at the following link: http://www.itrcweb.org/Guidance/GetDocument?documentID=90."

   Comment: It appears that thought was given to the sampling method to ensure that a sufficient number of samples and sufficient sample volume of material will be collected considering previous problems with SOMAT's (a contractor) use of the vibracore method for collecting samples in earlier investigations. How confident is USACE that the hollow stem auger and split spoon sampling method will be successful in obtaining representative samples for the full volume of the dredged prism? The sampling plan should also explicitly state if there is any expected bias in the collection of samples given the sampling methodology and the acceptability of such bias for the beneficial use determination (BUD) (e.g., finer grained materials that may have higher concentrations of constituents of concern).

2. Page 12, Human Health Risk

"Previous analytical data generated in 2007 and 2011 indicated surface and near-surface sediments both upstream and downstream of the Springville Dam are not impacted with chemical or radiologic elements that pose a risk to human health and the environment."

Comment: The statement in the Executive Summary and Page 10 about the low human health risk is based on the measure of risk utilized in the study. Please clarify the basis for the statement in the SAP and specifically the measure used to assess risk.

3. Page 15, Screening Approach

"Sediment obtained from the subsurface intervals will be screened with the following field instruments:

1. Photo-ionizing detector (PID) to detect chlorinated solvents or alike chemicals;

2. Geiger-Mueller meter to detect alpha, beta, and gamma radiation; and

3. Sodium-iodide (NaI) scintillation detector to optimally detect gamma radiation.

The USACE also will consider the use of an alpha-beta phosphor sandwich (or phoswich) detector to distinguish between alpha and beta signatures in total radioactivity; such instruments include Ludlum 43-89 or 43-93 series detectors.

This screening step will occur when the sediment is exposed in the split spoon device and prior to homogenizing into a clean stainless steel bowl (see Section 4.2)."

Comment: Additional detail could be provided in the sediment Sampling and Analysis Plan (SAP) on the screening approach to be used in the field for radionuclides of interest and their basis. Screening value ranges are provided in Table 3, but those screening criteria appear to be based on comparison to analytical results. The field screening methods to be used in conjunction with the Geiger-Mueller and Sodium-Iodide detectors for radiological constituents do not appear to have a specified purpose or action limit in the SAP.

4. Screening Levels

Page 16 "The initial exposure risk and radiologic background criteria to be used for screening the analytical results are summarized in Table 3. These criteria will be used to provide approval of the case-specific BUD. The radiologic results will be screened against the WVDP-specific radionuclides that are listed for sediment in the 2012 WVDP

Annual Site Environmental Report (ASER Table F-2E). The entire gamma spectroscopy library will be reported by the laboratory, but only WVDP-related radionuclides noted below Table 1 and listed on Table 3 will be assessed for the BUD."

Comment: Tables in Appendix F of the U.S. Department of Energy's (DOE's) 2012 Annual Site Environmental Report (ASER) are used as the basis for the list of radionuclides of interest for the BUD (see Table 1 below). The list is inconsistent with the radionuclides of interest cited in the West Valley Demonstration Project (WVDP) Decommissioning Plan (DP), Revision 2 (DOE, 2009), reproduced in Table 2 below. The list of 18 radionuclides of interest in the decommissioning plan are primarily based on risk significance or prevalence (e.g., high activity fractions of Sr-90 and Cs-137). USACE should provide a clear rationale for the selection of the list of radionuclides which are the focus of the BUD. Most notably, hard-to-detect radionuclides such as C-14, I-129, and Tc-99, are not listed. Pu-241 is also not listed, but this radionuclide could possibly be inferred from analytical results for other Pu isotopes. Np-237 is similarly not listed but could possibly be quantified through the gamma spectroscopy analysis that will be performed. Please note that U.S. Nuclear Regulatory Commission (NRC) recognizes that the hard to detect radionuclides would be difficult to measure, are not expected to be dominant constituents in sediments given their relatively high solubility, or may not provide useful information on the presence of WVDP contamination in the sediments. The NRC suggests inclusion of gross alpha and gross beta analyses to demonstrate that radionuclides not specifically included in the analyses are not present at unusually high levels. Nonetheless, the basis for inclusion or exclusion of certain radionuclides of interest should be clarified.

The primary screening range, provided in Table 1 is based on background soil samples near a West Valley air monitor while the secondary screening range is based on background sediment concentrations near Bigelow Bridge. The selection of background soil locations for the primary screening range is unclear. A basis should be provided, as well as an explanation of the intended use of the primary versus the secondary screening ranges. Additionally, the plan should be clear to state the statistical approach to be used to compare the sediment concentrations to the screening values (e.g., sediment averages greater than two standard deviations above the background values provided in Table 3 of the SAP will be considered potentially impacted and will be subjected to further screening). Although the screening values, listed in Table 3 of the plan, are being used as "initial" screening values, it is unclear what follow-up approaches may be used to support the BUD in the event the background screening value ranges are exceeded (e.g., use of WVDP Phase 1 DP Derived Concentration Guideline Levels (DCGLs), NRC/Environmental Protection Agency (EPA) Memorandum of Understanding values, or NRC screening values [see Table F-1A in the DOE 2012 ASER]). Although the background values may be overly restrictive, use of alternative screening values should be justified consistent with the ultimate disposition of the materials (e.g., will sediments be used for construction projects or backfill). For example, use of sediment

DCGLs cited in the WVDP DP, Rev. 2 (Table 2) may not be appropriate because certain assumptions went into the calculation of the DCGLs that may be invalid for the BUD.

Additionally, there appears to be an error in the Table 3 primary screening value for U-232. Please consult the 2012 ASER for the correct value (the value should be 0.0034+/-0.0273 pCi/g).

Table 1, Screening Levels for Beneficial Use Determination. Adapted from Table 3 in the USACE Sampling and Analysis Plan.

WVDP Rad	Symbol	Screening Range (Primary)	Units	Screening Range (Secondary)
Potassium-40	K-40	10.6±1.3	pCi/g	13.7±1.5
Cobalt-60	Co-60	0.0005±0.0261	pCi/g	0.0002±0.0162
Strontium-90	Sr-90	0.0349±0.0403	pCi/g	0.0004±0.0497
Cesium-137	Cs-137	0.350±0.058	pCi/g	0.0373±0.0227
Uranium-232	U-232	-0.0034.0273	pCi/g	0±0.0552
Uranium-233/234	U-233/234	0.80±0.120	pCi/g	0.542±0.119
Uranium-235/236	U-235/236	0.0371±0.0370	pCi/g	0.0573±0.0388
Uranium-238	U-238	1.01±0.13	pCi/g	0.53±0.114
Total Uranium	Uranium	2.26±0.14	mg/kg	1.91±0.04
Plutonium-238	Pu-238	0.00275±0.00934	pCi/g	0.0111±0.0186
Plutonium-239/240	Pu-239/240	0.0165±0.0170	pCi/g	0.0144±0.0144
Amercium-241	Am-241	0.0061±0.0106	pCi/g	0.017±0.0224

Note: Primary Screening Range is based on WVDP ASER 2012 (DOE 2013) Table F-2D, 10-year Average for Background Soil at Great Valley Air Monitor (Soil last collected in 2012 on five-year periodicity.) Secondary Screening Range is based on WVDP ASER 2012 (DOE 2013) Table F-2E, Bigelow Bridge 10-year Average for Cattaraugus Creek Background (Sediment last collected in 2012 on five-year periodicity.)

Table 2, West Valley Decommissioning Plan Radionuclides of Interest and DCGLs in pCi/g. Adapted from DOE's Phase 1 DP, Revision 2 (DOE, 2009)

Nuclide	Surface	Subsurface	Sediment
Am-241	2.90E+01	6.30E+03	1.00E+04
C-14	1.60E+01	9.90E+02	1.80E+03
Cm-243	3.50E+01	1.10E+03	3.10E+03
Cm-244	6.50E+01	2.20E+04	3.80E+04
Cs-137(2)	1.50E+01	3.00E+02	1.00E+03
I-129	3.30E-01	7.50E+00	7.90E+02
Np-237	2.60E-01	1.00E+00	3.20E+02
Pu-238	4.00E+01	1.30E+04	1.20E+04
Pu-239	2.50E+01	3.10E+03	1.20E+04
Pu-240	2.60E+01	3.40E+03	1.20E+04
Pu-241	1.20E+03	2.40E+05	3.40E+05
Sr-90(2)	4.10E+00	2.80E+02	4.70E+03
Tc-99	2.10E+01	5.90E+02	6.60E+05
U-232	1.50E+00	7.40E+01	2.20E+02
U-233	8.30E+00	1.90E+02	2.20E+04
U-234	8.40E+00	2.00E+02	2.20E+04
U-235	3.50E+00	2.10E+02	2.30E+03
U-238	9.80E+00	2.10E+02	8.20E+03

NOTES: (1) The $DCGL_W$ is the DCGL applicable to the average concentration over a survey unit. (2) DCGLs for Sr-90 and Cs-137 apply to the year 2041 and later.

5. Source of Potential Contamination

It is not possible to determine the source of residual radioactivity, if detected, based purely on localized sampling. If residual radioactivity is found, it is unclear whether the USACE will require additional sampling or take other actions to identify the source of radionuclides that are present in the samples. If residual radioactivity common to DOE operations and the former reprocessing plant are found above background, it may be difficult to identify the source or the residual radioactivity.

The USACE infers in its plan that the WVDP is the only potential source of radionuclides that might be found in the sediment due to its proximity to the Springville Dam. Also, the USACE, in its plan, references the DOE WVDP ASER; however the ASER documents DOE's environmental surveillance program, which is specific to DOE operations.

The USACE should address the possibility of any other potential sources of radioactivity such as the radioactivity due to past releases from the former West Valley reprocessing plant; any other activity due to effluent discharges in the region that may be due to New York State licensed material (other licensees and the State Licensed Disposal Facility); radioactivity due to fall-out from nuclear weapons testing; and other naturally occurring radionuclides, especially those that are also noted as WVDP radionuclides. If USACE does not plan on discussing other potential sources, then the USACE should explain why the USACE is only focused on the WVDP. As indicated in the USACE email dated December 20, 2016, the SAP does not include contingency actions, but the USACE intends to develop a separate document to address contingency actions and plans to provide it to the NRC for courtesy review at a later date. It is unclear whether there is a mechanism to link contingency planning to field implementation and sample collection, especially if radionuclides common to the WVDP and the former reprocessing plant or any other licensed facilities are present above action levels.

6.0 Editorial Comment

Page 10, “The planned intervals (totaling four at each 11 locations) are listed below and will be sampled for the chemicals and radionuclides listed in Table 1:

1. One composite sample derived from the homogenization of all sediment retrieved from the top three split-spoon samples (nominally zero to 6.0 feet deep).

2. One composite sample derived from the homogenization of all sediment retrieved from the subsequent three samples (nominally 6.0 feet to 12.0 feet deep).

3. One composite sample derived from the homogenization of all sediment retrieved from the third set of three split-spoon samples (nominally 12.0 feet to 18.0 feet deep).

4. One composite sample derived from the homogenization of all sediment retrieved from the fourth set of three split-spoon samples (nominally 18.0 feet to 24.0 feet deep).”

Comment: Please clarify that not all of the 11 sample locations will be composited for each of the depth intervals (i.e., 4 composites representative of each of the 4 depth intervals) as the text on page 10 may imply this and could be made more clear. Table 2 and text on page 9 are clear to indicate that 44 samples will be analyzed.