



Formerly Utilized Sites Remedial Action Program (FUSRAP)
Investigation of the Lewiston-Porter Central School District Property
Field Sampling Plan
August 2010

Purpose: The purpose of the United States Army Corps of Engineers (USACE) Buffalo District investigation of the Lewiston-Porter Central School District Property is to conduct additional sampling to close out potential environmental concerns resulting from past government activity.

Background: The Formerly Utilized Sites Remedial Action Program (FUSRAP) was initiated in 1974 to address radiological contamination generated by activities of the Manhattan Engineer District and the Atomic Energy Commission (MED/AEC) during development of the atomic weapons in the 1940s and 1950s.

The Niagara Falls Storage Site (NFSS), located at 1397 Pletcher Road in the Township of Lewiston, New York, less than two miles east of the Lewiston-Porter Central School District Property, is being investigated by the USACE under FUSRAP since the site has been used to store radioactive residues that resulted from the processing of uranium ores during the development of the atomic bomb since 1944.

The NFSS is a 191-acre, federally owned portion of the former 7,500 Lake Ontario Ordnance Works (LOOW) site used by the War Department in the 1940s to manufacture trinitrotoluene (TNT) in support of World War II. Underground utility lines (UULs) were constructed in 1942 to support this process, although in July 1943 the War Department stopped production at LOOW due to an oversupply of TNT. The UULs include, but are not limited to, acid waste, sanitary sewer, storm sewer, TNT waste, chemical waste, 30-inch wastewater discharge line, water, fire suppression, and associated drains, pits, and sumps.

After the multi-phase Remedial Investigation (RI) sampling at NFSS to identify the nature and extent of radiological contamination resulting from past government activities, samples from the LOOW UULs on the NFSS property indicated radiological contamination existed within sediment and water in the sanitary sewer and acid waste UU lines.

Since the UULs on the NFSS property extend north to the former LOOW wastewater treatment plant and subsequently to the 30-inch outfall to the Niagara River, which traverses a portion of the Southwest Drainage Ditch (SWDD) on the Lewiston-Porter Central School District property, the UULs lines on the northern site boundary were grouted to avoid potential transport of radiological contamination off-site. Sampling was then initiated on portions of the UULs extending north from NFSS to determine if radiological contaminants had transported off-site.

Between August and October of 2006, USACE collected a total of 60 samples for radiological analysis for 27 locations from within or adjacent to UU lines on the former LOOW north and west of NFSS. Fifty-five (55) samples were sludge and wastewater within, and soil below, UU lines on the former LOOW, including the 30-inch outfall. In addition, one co-located surface water and sediment sample and surface soil and subsurface soil sample was collected beneath the 30-inch outfall line at a single point where it traverses the SWDD on the Lewiston-Porter Central School District property. Lastly, one sediment (SD) sample was collected within the sludge bed of the former LOOW wastewater treatment plant. All samples were analyzed for radiological constituents including, but not limited to, isotopic uranium, isotopic thorium, radium-226, radium-228, and cesium-137.

Results from the sampling of the UULs north and west of NFSS indicated that uranium was detected above background levels at three of the 27 soil sample locations and five of 18 wastewater locations. Uranium, radium, cesium, lead, and thorium were detected above background in thirteen of 15 sediment samples. A majority of the background exceedances were located in the acid waste and sanitary sewer lines extending from NFSS and samples collected within the former LOOW WWTP.



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Results from the one collocated surface water and sediment sample and surface soil and subsurface soil sample collected beneath the 30-inch outfall line at a single point where it traverses the SWDD on the Lewiston-Porter Central School District property indicate no radionuclides greater than background levels.

Regardless, to verify that there is no that there is no migration of FUSRAP compounds from NFSS past the former LOOW WWTP to outfall line which crosses the SWDD, USACE – Buffalo will collect co-located filtered and unfiltered surface water, sediment, surface soil, and subsurface soil samples at six locations along the SWDD on the Lewiston-Porter Central School District property for full suite radiological analysis.

Southwest Drainage Ditch

The purpose of the FUSRAP soil investigation is to identify any elevated radiological readings/contaminants at locations investigation along the SWDD as part of the Formerly Used Defense Sites (FUDS) program. Locations and the field investigative approach are as specified in the *Final Field Sampling Plan Addendum for Occidental Chemical Corporation Property Data Gap and Lewiston-Porter Central School District Investigations at the Former LOOW (August 2009)* and re-iterated as follows: Six biased sample locations will be selected along the portion of the SWDD that traverse the Lewiston-Porter School campus (see attached figure). Samples will be collected from the most down-gradient location (north) to the most up-gradient location (south) along the SWDD in order to minimize potential cross contamination of the collected samples. The intent it to collect the most up-gradient sample from the point at which the SWDD enters the Lewiston- Porter School campus to the south and the most down-gradient location from a point adjacent to where the SWDD exits the Lewiston-Porter School Campus to the north. The remaining four sample locations will be evenly distributed along the length of the SWDD as it traverses the Lewiston-Porter School Campus. At each of the six locations, one filtered and one unfiltered surface water sample, one sediment sample, one surface soil sample (0-6 inches below ground surface (bgs)), and one subsurface soil (6 inches – maximum depth of 4 feet bgs) sample will be collected for laboratory analysis. Additionally, water quality parameters such as temperature, pH, turbidity, Eh, ORP, etc will be measured for surface water samples. Based on the depth of the SWDD at the time of sample collection, the samples will be collected as closely to the center of the SWDD as possible, while still providing adequate safety to the field team members collecting the samples. The subsurface sample will be collected from the one foot interval exhibiting the highest radiological scanning reading.

Analytical Parameters

Sample Matrix	Number of Samples	Analytical Parameter (each sample)	Test Method	Minimum Detection Limit (pCi/g or pCi/L)
Surface Water	12 (6 filtered & 6 unfiltered)	Ra-226	EPA 903 Mod-Lucas Cell/Emanation/GFPC	1
Sediment	6	Ra-228	EPA 904 Mod-GFPC	1
		Gross Alpha	GFPC	2 (aqueous)/0.5 (solid)
Surface Soil	6	Gross Beta	GFPC	4 (aqueous)/1 (solid)
		Gamma Spectroscopy	Gamma Spectroscopy – HASL 300	0.1 (Cs-137)
Subsurface Soil	6	Strontium-90	EPA 905.0 Mod	2
		Iso-Plutonium	Alpha Spectroscopy-HASL 300	1
Subsurface Soil	6	Iso-Uranium	Alpha Spectroscopy-HASL 300	0.5
		Iso-Thorium	Alpha Spectroscopy-HASL 300	0.5

Notes:

GFPC – gas flow proportional counter



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Standard turnaround time for the laboratory analyses will be required for all soil samples unless otherwise specified. Once USACE-Buffalo receives raw data from the laboratory, the data will undergo an internal data validation to ensure the quality of the data prior to public release.

Background: In December of 2001, in support of Remedial Investigation activities at the NFSS, a gamma walkover survey was conducted on the Lewiston-Porter Central School District property to develop a background, or non-MED/AEC impacted, gamma walkover dataset to compare NFSS gamma walkover results to. The results documenting this background location can be found in the *Final Gamma Walkover Survey Report, Lewiston-Porter School Property, Youngstown, New York, U.S. Army Corps of Engineers Buffalo District, February 6, 2002.*

During the 2001 gamma walkover survey at the Lewiston-Porter Central School District property, two mounds of debris located in a wooded area east of the soccer field, identified as Anomaly D in the report, contained rocks with natural radioactivity up to 38,222 counts per minute (CPM). The Global Positioning System (GPS) coordinate for this location is x = 315145.22533m; y=357635.833361m or Latitude - 43.2194; Longitude - 79.0123.

Although the rocks with elevated natural radioactivity are likely not a result of former MED/AEC activity, USACE – Buffalo plans to collect two co-located debris and soil samples from this area for full suite radiological analysis to verify that with analytical data versus gamma walkover survey results.

Soil Mound with Previous Elevated Radiological Detections in Developed Area

USACE will perform a gamma walkover survey (GWS) to verify elevated readings encountered during the background gamma walkover survey documented in *Final Gamma Walkover Survey Report, Lewiston-Porter School Property, Youngstown, New York, U.S. Army Corps of Engineers Buffalo District, February 6, 2002.* Based on the historical GWS and the new GWS, the two locations with the highest radiological detector measurements will be selected for soil boring advancement. Refer to attached figure for surface mound location.

These two soil boring locations will be advanced using a hand auger until the boring reaches the interface of the mounded material and the native ground surface or as otherwise directed by the USACE field representative. From each soil boring, one surface soil sample (0-1 foot bgs) and one subsurface soil sample will be collected for laboratory analysis. The depth of the collected subsurface soil sample will be based on the one foot interval exhibiting the highest radiological detector reading. It is expected that these soil borings will be advanced a maximum of five feet bgs. It should be noted that bgs refers to the depth below the surface of the mound and not below the native ground surface. Additionally, upon reaching the borehole's termination depth, a downhole gamma scan will be performed with resulting measurements provided on the soil boring logs.

Soil boring logs will be generated for each these two soil borings. Soil boring logs will have a description of all material that includes ASTM classification (ASTM Method D2488-06), consistency, moisture content, and color. All soil boring logs will show depth to the water table (if encountered) and each geologic formation. Soil boring logs will include all radionuclide scan measurements for each one foot sampling interval as well as the downhole measurements. Each soil boring will be surveyed for location and elevation. The survey coordinates (data) shall be geo-referenced to appropriate New York State Plane coordinates.



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Sample Matrix	Number of Samples	Analytical Parameter (each sample)	Test Method	Minimum Detection Limit (pCi/g)
Surface Soil	2	Ra-226	EPA 903 Mod-Lucas Cell/Emanation/GFPC	1
		Ra-228	EPA 904 Mod-GFPC	1
		Gross Alpha	GFPC	0.5
		Gross Beta	GFPC	1
		Gamma Spectroscopy	Gamma Spectroscopy – HASL 300	0.1 (Cs-137)
Subsurface Soil	2	Strontium-90	EPA 905.0 Mod	2
		Iso-Plutonium	Alpha Spectroscopy-HASL 300	1
		Iso-Uranium	Alpha Spectroscopy-HASL 300	0.5
		Iso-Thorium	Alpha Spectroscopy-HASL 300	0.5

Standard turnaround time for the laboratory analyses will be required for all soil samples unless otherwise specified. Once USACE-Buffalo receives raw data from the laboratory, the data will undergo an internal data validation to ensure the quality of the data prior to public release.

