SITE INSPECTION REPORT
HOLY TRINITY CEMETERY
5401 ROBERT AVENUE
LEWISTON, NIAGARA COUNTY, NEW YORK

EPA ID No.: NYN000206698

Prepared by:

Weston Solutions, Inc.
Edison, New Jersey

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY

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Date 6/9/2014

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SITE SUMMARY

The Holy Trinity Cemetery (HTC) site (EPA ID No. NYN000206698) consists of an area of radionuclide contamination located at a cemetery of approximately 31.5 acres in Lewiston, New York. The area of observed contamination is 2.91 acres; the property is owned by Holy Trinity Cemetery. The area of observed contamination is located in the northernmost portion of the property on a relatively flat and slightly elevated grassy field, as well as on existing roadbeds. There is one building on site, which is utilized both as a residence and cemetery maintenance facility

The HTC site is bordered: to the north and east by Interstate 190; to the south by another cemetery; and to the west by Robert Avenue and a residential area.

In a 1978 U.S. Department of Energy (U.S. DOE) aerial radiological survey, more than 15 properties throughout the region were identified as having elevated levels of radiation above background. It is believed that, in the early 1960s, slag from the local Union Carbide facility was used as fill on the properties prior to paving. The slag contained sufficient quantities of uranium and thorium to be classified as a licensable radioactive source material. Union Carbide subsequently obtained a license from the Atomic Energy Commission (now the Nuclear Regulatory Commission) and the State of New York; however, the slag had been used as fill throughout the Niagara Falls region prior to licensing. Based on the original survey and subsequent investigations, it is believed that the radioactive Union Carbide slag was deposited at the Holy Trinity Cemetery property.

In February 1980, the New York State Department of Health (NYSDOH) Bureau of Radiological Health and the Niagara County Health Department conducted a radiological survey of the Holy Trinity Cemetery site to identify areas of elevated radioactivity as a result of radioactive slag having been used on the property for fill. The survey was conducted based on information that the slag used at the cemetery was from the same source used at two other locations in nearby Niagara Falls, which had been identified by the NYSDOH as containing elevated levels of radioactivity. During the survey, cemetery personnel showed NYSDOH a slag pile located near the caretaker's garage in the western portion of the property. Cemetery personnel stated that this slag was used as fill for the cemetery roads throughout the property.

Additionally, the slag was used as fill for the base of two proposed roadbeds that extended approximately 500 to 600 feet from the caretaker's garage northwest toward Robert Avenue. At the time of the survey, the construction of these roads had been abandoned. The underlying slag base was covered with an unknown amount of soil and was left as an open field. Using an Eberline PRM 7 radiation meter, radioactivity of the slag pile was measured at 250 microroentgens per hour (μR/hr); readings along cemetery roads ranged from 5 μR/hr (i.e., background concentration) to 30 μR/hr [Ref. 3, pp. 2–3; 16, p. 1]. Readings along the abandoned roadbeds ranged from 200 μR/hr to 400 μR/hr. Samples of the slag were collected as part of the investigation; laboratory analyses of the samples indicated detectable concentrations of potassium-40, uranium-235 and -238, radium- 226, thorium-232, and one other isotope. In October 2006, the New York State Department of Environmental Conservation (NYSDEC) and the Niagara County Health Department conducted a site visit at HTC. At that time, the slag pile that previously had been observed near the caretaker's garage was no longer on site; the current caretaker had neither knowledge of the slag pile, nor what happened to it. The caretaker also indicated that children living nearby use this area for recreation. Since the 1980 NYSDOH site investigation, trees had grown through the abandoned slag roadbeds, pushing the slag to the surface. As part of the site visit, NYSDEC conducted a radioactivity survey with an Exploranium GR-135. Readings taken while walking along the roadbed indicated levels of 200–450 μR/hr at waist height and a surface contact reading of 450–570 μR/hr; a contact reading of 700 μR/hr at exposed slag near a tree was documented. NYSDEC collected four samples of the slag; the samples were analyzed for isotopic uranium and isotopic thorium, and underwent gamma-ray spectroscopy analysis. Laboratory analytical results indicated the presence of uranium-238/234 ranging from 114 to 1,664 picocuries per gram (pCi/g) and thorium-232 ranging from 114 to 898 pCi/g.

In May 2007, NYSDEC visited the site to identify contamination in an on-site debris pile using gamma-ray spectroscopy. A 5-minute static reading was taken; radium- 226 was the only nuclide identified. An additional similar analysis was conducted on one of the roadbeds, confirming the presence of thorium-232.

During a July 2013 NYSDOH reconnaissance, screening activities showed radiation levels at the HTC site along the roadway and along the back roadway leading to offsite with radiation levels up to 51 μR/hr in the roadway with the pressurized ion chamber (PIC) and up to 50,000 counts per minute (cpm) with the sodium iodide (NaI) 2x2 detector.

On December 12 and 13, 2013, Weston Solutions, Inc. (WESTON®) personnel collected a total of 14 subsurface soil samples and three slag samples from the site property. Soil samples were also collected from two locations suspected to be outside the influence of the area of observed contamination to document background conditions. At each sample location, soil samples were collected directly beneath slag material; at locations where a radioactive layer was not visually observed to be present, the soil sample was collected at the equivalent depth interval. The slag samples each consisted of one single piece of slag.

The soil samples were analyzed by TestAmerica Laboratories for Target Analyte List (TAL) metals analysis; isotopic thorium, isotopic uranium, radium-226, and radium-228 by alpha spectroscopy; and radioisotopes by gamma spectroscopy. The slag samples were analyzed for the same parameters, with the exception of TAL metals analysis. One soil sample for TAL metals analysis was designated as a matrix spike/matrix spike duplicate (MS/MSD) sample for quality assurance/quality control (QA/QC) purposes. One rinsate blank was collected to demonstrate adequate decontamination of non-dedicated sampling equipment (e.g., cutting shoe). Analytical results indicate concentrations of radionuclides found in all slag samples and seven soil samples (including the field duplicate) to be significantly higher than at background conditions.

On May 1, 2014, WESTON personnel collected radon and thoron concentration measurements from locations on and in the vicinity of the HTC site. At the selected locations in background areas, above the source material, and off the source area, radon and thoron concentration measurements in picocuries per liter (pCi/L) were collected with RAD7 radon detectors. The radon and thoron measurements were collected at heights of one meter above the ground surface. During the May 2014 air monitoring event, background radon concentrations were measured as 0.13 +/- 0.12 pCi/L (to account for maximum background concentrations, the uncertainty value is added to the background measurement for an adjusted concentration of 0.25 pCi/L) during the morning hours and 0.026 +/- 0.052 pCi/L (adjusted concentration is 0.078 pCi/L) during the midday hours. Background thoron concentrations were calculated to be 0.11 +/- 0.15 pCi/L (adjusted concentration is 0.26 pCi/L) during the morning hours and 0.16 +/- 0.18 pCi/L (adjusted concentration is 0.34 pCi/L) during the midday hours. To account for minimum possible release concentrations, the uncertainty value for each potential release measurement collected above and downwind of source areas is subtracted from the measurement to calculate the adjusted concentration. There were no radon or thoron concentrations that exceeded the site-specific background, nor were there any adjusted concentrations that equaled or exceeded a value two standard deviations above the mean site-specific background concentration for that radionuclide in that type of sample.

SCALE

1:1,647

LEGEND

RST 3 Sample Location

SAI Sample Location

Notes:
1.) All results presented in picocuries per gram (pCi/g).
2.) Depth of sample collection is presented in parenthesis next to sample number.
3.) Values highlighted red equal/exceed the EPA Site-Specific Removal Action Level (SSRAL).
4.) ND = Non-Detect

Figure 7: Soil Analytical Results Map

Holy Trinity Cemetery Site
Lewiston, New York

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REMOVAL SUPPORT TEAM 3
CONTRACT # EP-S2-14-01

Weston Solutions, Inc.

In Association With Scientific and Environmental Associates, Inc.; Environmental Compliance Consultants, Inc.; Avatar Environmental, LLC; On-Site Environmental, Inc.; and Sovereign Consulting, Inc

GIS ANALYST:	P. LISCHENKO
EPA OSC:	E. DALY
RST 3 PM:	B. WEGST
FILENAME:	150910_HT_EnVsHist.mxd
FIGURE	7
REVISION	1
DATE MODIFIED	9/16/2015

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SCALE

1:1,647

LEGEND

- RST 3 Sample Location
- SAT Sample Location
- Proposed Excavation Area

Notes:
1.) Volume estimates based on 2 foot excavation depth.
2.) sq. ft. - Square Feet.
3.) cu. yrds - Cubic Yards.

Figure 8: Site Overview and Area of Concern Map

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Lewiston, New York

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GIS ANALYST:	P. LISICHENKO
EPA OSC:	E. DALY
RST 3 SPAC:	B. NWOSU
FILENAME:	150910_HT_ExVolfin.mxd
FIGURE	18
REVISION	1
DATE MODIFIED	9/15/2015

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