RADIOLOGICAL SURVEY & SAMPLING RESULTS

MORGAN DRIVE LOT 3 MT KISCO, NY

October 2017

Prepared By:



50 Ridge Road Buffalo, New York 14218 (716) 827-0700

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EXECUTIVE SUMMARY

This Report presents the results of the radiological walkover survey and sampling conducted by Great Lakes Environmental & Safety Consultants, Inc. ("Great Lakes"), on August 21 and 22, 2017, at Morgan Drive Lot 3, 2 Morgan Drive, Mount Kisco, New York 10549 (the "Site"). The purpose of the survey and sampling was to identify potential radioactivity hotspots associated with historical use of the site as a wastewater treatment plant ("WWTP"). The survey was completed pursuant to the approved plan and procedures outlined in the Work Plan dated June 21, 2017.

The site consists of one parcel that is approximately 5.7 acres in size. The property is generally flat and the majority of the property is an open field with brush and small trees, but a portion of the site is overgrown and densely wooded. Several structures from the former WWTP remain on the property.

The sitewide gamma walkover of accessible areas observed average activity levels not significantly greater than background levels. Significantly elevated activity levels were observed, however, in three hotspots across the site. Biased samples were taken from these three hotspots, the results of which confirmed significantly greater activity than background, specifically for the Radium-226 radionuclide.

Gamma walkovers of remaining structural components of the WWTP observed average activity levels not significantly greater than background levels. Samples were taken from the Soil Drying Bed #1, Soil Drying Bed #2, and Sprinkling Filter Bed #2, the results of which indicated some activity greater than background.

Great Lakes recommends a remedial action plan be developed that addresses the removal and disposal of soil in areas identified with elevated radioactivity. Construction and excavation activities should be monitored to ensure all spoils removed from the site are below acceptable levels.

WORK PLAN

Task 1.1 WWTP Component Walkover Surveys

Under this task, Great Lakes used field measurement instruments to conduct a gamma walkover survey to detect for the presence of gamma emitting radionuclides and their progeny at various locations on the site. Great Lakes utilized a calibrated Ludlum 2221 ratemeter equipped with Model 44-2 scintillation sodium iodide detectors under this task.

Gamma walkover surveys were performed in the following areas (area numbers correspond to Survey Work Plan, attached as **Appendix A**):

- 1. Sludge Drying Bed #1
- 5. Sludge Drying Bed #2
- 8. Sprinkling Bed

Gross gamma surveys were recorded in units of counts per minute (cpm) across the walkover areas. A two-dimensional walkover survey diagram is included in **Appendix B**, noting the average background activity at each of the locations and representative readings across the walkover area, presented as a range of cpm for each ~100 square feet (e.g., 7,000-8,000 cpm)

Background radiation levels were documented both in areas on-site and in areas that are not impacted by the site and marked on the walkover surveys accordingly. Background radiation is established in order to verify that the results are not influenced by imported materials or equipment that may contain elevated concentrations of radionuclides.

Task 1.2 Hauling Activity Area Walkover Survey

Based on its understanding of historical operations and cleanup activities, Great Lakes believes the unvegetated areas inferred to be ingress and egress for the hauling of dried sludge may potentially contain radioactive spoils left behind from operations. (Area #3 on the Survey Work Plan, attached as **Appendix A**).

The gamma survey of these areas was conducted in a similar method to that of Task 1.1 and all measurements recorded for incorporation into this Report.

Task 2 Field Sampling

Under this task, Great Lakes collected representative samples of environmental media from the site for laboratory analysis. Sampling locations were selected based on the initial visit and analysis of historical uses of each component of the WWTP. The following field samples were collected:

- Solid samples (surficial) –11 soil samples were collected from distributed locations onsite (area numbers refer to the Survey Work Plan, attached as **Appendix A**):
 - 1. Sludge Drying Bed #1 samples of filter media to be obtained at sampling frequency of one sample per 900 square foot area (4 samples)
 - 2. Pond #2 sediment samples obtained from bottom of pond via technician wading into pond (2 samples)
 - **4.** Pond #1 sediment sample to be obtained from bottom of pond via technician wading into pond (1 sample)
 - 5. Sludge Drying Bed #2 samples of filter media to be obtained at sampling frequency of one sample per 900 square foot area (4 samples)
 - **6.** Primary Tank #2 Inaccessible due to safety concerns
 - 7. Primary Tank #1 Inaccessible due to safety concerns
- Water samples 2 aqueous samples were collected from the following areas in which water has accumulated on-site:
 - 2. Pond #2 composite aqueous sample obtained via technician wading into pond (1 sample)
 - **4.** Pond #1 composite aqueous sample obtained via technician wading into pond (1 sample)
 - **6.** Primary Tank #1 & #2 Inaccessible due to safety concerns

The quantity of samples at each location was determined based on Technical Guidance for Site Investigation and Remediation recommended sampling frequency of one sample per 900 square feet of area, unless otherwise noted.

Solid samples were collected using reusable sampling tools (e.g., stainless steel trowels/augers). Dedicated sampling equipment was for this project. Sampling tools were decontaminated with Alconox prior to first use on-site, between samples, between sampling locations, and following last use on-site.

Samples were placed in labeled sample containers. All sampling information was recorded in the field logbook. A chain-of-custody was completed which includes sample identification with the date, time, type, area, and GPS location of collection. The sampler secured the cooler with a custody seal for shipment to the laboratory.

GPS coordinates of all sample locations were logged using a Trimble Geo 7 handheld GPS sensor. Locations were plotted on an existing survey to identify relative locations.

Aqueous samples were collected using plastic bailers from each water sampling location and transferred to 1-liter plastic containers. Field preservation with nitric acid was not required, as the laboratory received the samples within one business day.

The samples selected for analysis were placed into laboratory-provided containers immediately following collection and labels were promptly affixed to the sample containers. The samples were transported via delivery service under chain-of-custody control to the off-site laboratory for analysis, and were analyzed for gross alpha/beta (USEPA Method 900.0 for aqueous samples, Method 9310 for solids), Ra-226 (USEPA Method 901.1 for solids, Method 903.1 for aqueous samples), Ra-228 (USEPA Method 901.1 for solids, Method 904.0 for aqueous samples). No minimum detection limit was specified to the laboratory and results will be reported in minimum detectable concentrations. Sampling methods and quantities are summarized in the table below:

	USEPA		
Type	Method	Description	Quantity
Solid	9310	Gross Alpha & Gross Beta (GFPC)	14
Solid	901.1	Radium-226 & Radium-228 (GS)	
Water	900.0	Gross Alpha & Gross Beta GFPC)	2
Water	903.1	Radium-226 (GFPC)	
Water	904.0	Radium-228 (GFPC)	

GFPC - gas flow proportional counter

GS - gamma scan

Laboratory analysis was performed by Pace Analytical Services, LLC – Pittsburgh, PA (ELAP ID: 10888), with a turnaround time of 20 business days. Laboratory results are attached as **Appendix J**.

WWTP COMPONENT WALKOVER

On August 21, 2017, Great Lakes conducted a gamma walkover survey over each of the remaining structural components of the WWTP, including the two solid drying beds and the sprinkling filter bed.

For each of the components, Great Lakes created a grid of approximately 100 square foot areas and recorded a range of gross counts per minute (cpm) for each area (+/- 1,000 cpm).

Soil Drying Bed #1 (SD-1)

Soil Drying Bed #1 is located in the far western portion of the site. It is an approximately 36' x 80' (~2,880 square foot) rectangular structure with ~3 foot concrete walls, the floor of which is loamy soil.

The walkover survey of SD-1 (attached as **Appendix C**) observed a maximum activity of ~13,200 counts per minute and an average activity of 10,500 counts per minute across the 32 areas measured.

Soil Drying Bed #2 (SD-2)

Soil Drying Bed #1 is located in the center of the site. It is an approximately 36' x 96' (~3,500 square foot) rectangular structure with ~3 foot concrete walls, the floor of which is loamy soil.

The walkover of SD-2 (attached as **Appendix D**) observed a maximum activity of \sim 13,600 counts per minute and an average activity of \sim 10,500 counts per minute across the 32 areas measured.

Sprinkling Filter Bed

Sprinkling Filter Bed is located in the eastern portion of the site. It is an approximately 120' x 120' (~14,000 square foot) rectangular structure with ~3 foot concrete walls, the floor of which is a rocky filtering media that appears to extend several feet below the surface. A concrete wall divides the structure into two sections from southeast to northwest.

The walkover survey of SFB (attached as **Appendix E**) observed a maximum activity of ~15,700 counts per minute and an average activity of ~12,700 counts per minute across the 80 areas measured.

SITEWIDE WALKOVER

On August 21, 2017, Great Lakes personnel performed a gamma walkover in areas inferred to be ingress and egress for the hauling of dried sludge that may potentially contain radioactive spoils left behind from operations. A diagram showing the results of the survey, labeled in counts per minute (+/- 1,000) is attached as **Appendix B**.

Surface gamma radiological data was obtained using Ludlum Model 44-10 2" X 2" NaI gamma scintillation detectors. A grid was established across all accessible areas, with each grid encompassing approximately 100 square feet.

Surveyors traveled at a speed of approximately 1.6 feet per second with the detectors about 4 inches above the ground surface. Gamma count rates were recorded in real time. Static background counts were obtained on either side of the site (both ~9,000 cpm).

The average gamma count observed during the walkover was approximately 9,300 cpm.

The survey identified three locations of elevated gamma count rates that suggest possible concentrations of radioactivity that are elevated with respect to background levels ("hotspots"). These hotspots are labeled as HS-1, HS-2, and HS-3 on the walkover diagram. Biased soil samples were obtained from each of the three hotspots, from a depth of approximately six inches below the surface.

- HS-1 was taken from an area between the Primary Tank and Sprinkling Filter Bed. Average gamma activity in the area was ~9,500 cpm, and the hotspot was measured at ~137,000 cpm. A biased sample was taken at this location, the character of which was dry loamy soil.
- HS-2 was taken from an area on the northwestern edge of Pond #2. Average gamma activity in the area was ~11,500 cpm, and the hotspot was measured at ~134,000 cpm. A biased sample was taken at this location, the character of which was dry loamy soil.
- HS-3 was taken from an area along the northwestern boundary of the site between Pond #1 and Pond #2 (along suspected haul road). Average gamma activity in the area was ~8,800 cpm, and the hotspot was measured at ~180,000 cpm. A biased sample was taken at this location, the character of which was silty sediment.

Some areas were deemed inaccessible at the time of the survey (marked on the survey as inaccessible). Due to the overgrowth of vegetation across much of the site, it is recommended that a full site walkover be conducted, which may require additional equipment such as brush-clearing equipment, etc.

SAMPLE ANALYSIS

Aqueous Samples

On August 22, 2017, Great Lakes obtained composite aqueous samples of each of the two ponds on-site (Pond #1 & Pond #2) by wading into the center of the pond and using new plastic bailers. The water samples were then transferred to laboratory-approved containers.

On the sampling date, only a small amount of water remained in Pond #1 (a depth of only 2-3 inches across ~200 square feet). The samples drawn from this volume were turbid and likely had suspended solids from the sludge-like bed of the pond. Gross alpha counts from the Pond #1 sample (P1-W1) were detected at 317 pCi/L. This exceeds the threshold of 15 pCi/L established in the New York Department of Environmental Conservation's Division of Water Technical and Operational Guidance Series (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. The sample also exhibited elevated levels of the isotope Radium-226, the threshold for which is established at 3 pCi/L in the same publication.

Water levels in Pond #2 were also low, but substantially higher than Pond #1 (a depth of approximately 6-8 inches across ~1,500 square feet). The aqueous sample drawn from Pond 2 (P2-W1) did not exhibit elevated radioactivity levels.

The laboratory confirmed that they would have rejected water samples that were too turbid for analysis. Any suspended and/or dissolved solids present in the aqueous samples would have been filtered out when analyzing for Ra-226, per EPA Method 903.1:

"Note: If there is solid matter in the sample, do not filter before starting analysis. Follow procedure steps through 8.4, then filter solution into a clean centrifuge tube." (EPA Method 903.1, Section 8.1)

The analysis of aqueous samples for gross alpha and gross beta, however, may have been affected by the presence of solids, as EPA Method 900.0 does not contemplate filtering:

"Since, in this method for gross alpha and gross beta measurement, the radioactivity of the sample is not separated from the solids of the sample, the solids concentration is very much a limiting factor in the sensitivity of the method for any given water sample." (EPA Method 900.0, Section 1.4)

The water in both Pond #1 and Pond #2 is inferred to be present only from accumulation of rain water, and likely has no direct affiliation with historical use of the property and therefore not contaminated per se. Any elevated readings are likely due to the suspended solids from pond sediment.

Geolocation of all samples are attached in **Appendix F**.

Full laboratory results are attached as **Appendix G**.

Aqueous Samples

Sample	Parameter	Radioactivity (pCi/L)	Uncertainty ¹	Threshold ²	Exceed?
Pond #1	Gross Alpha ³	317	+/- 61.0	15	YES
(P1-W1)	Gross Beta ⁴	114	+/- 22.1	1000	
	Radium-226 ⁵	11.3	+/- 2.21	3	YES
	Radium-228 ⁶	0.409	+/- 0.502	5	
Pond #2	Gross Alpha	6.39	+/- 2.78	15	
(P2-W1)	Gross Beta	2.92	+/- 1.23	1000	
	Radium-226	1.16	+/- 0.556	3	
	Radium-228	0.630	+/- 0.378	5	

¹ For aqueous samples: Safe Drinking Water Act standard of 1.96 sigma count uncertainty.

² For aqueous samples: Division of Water Technical and Operational Guidance Series (1.1.1), *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*

³ EPA Method 900.0

⁴ EPA Method 900.0

⁵ EPA Method 903.1

⁶ EPA Method 904.0

Solid Samples

On August 22, 2017, Great Lakes obtained surficial soil samples according to the sampling plan outlined in the Work Plan, as well as from each of the three hotspots identified during the site walkover. A hand trowel and field shovel were used to obtain soil samples from approximately the first six inches below the surface.

The soil cleanup objectives published in 40 CFR 192 Part B establish a threshold of 5 pCi/g average residual (above background) concentration. Background Radium-226 levels estimated at ~2 pCi/g based on United States Geological Survey, therefore a threshold of 7 pCi/g is used as a reporting level in the table below.

Sediment samples were obtained from each of the ponds, one from Pond #1 (P1-S1) and two from Pond #2 (P2-S1 and P2-S2).

Soil samples were obtained from each of the soil drying beds, four from Soil Drying Bed #1 (SD1-1, SD1-2, SD1-3, and SD1-4) and four from Soil Drying Bed #2 (SD2-1, SD2-2, SD2-3, SD2-4).

Soil samples were obtained from each of the three hotspots identified during the gamma walkover (HS-1, HS-2, and HS-3).

Geolocation of all samples are attached in **Appendix F**.

Full laboratory results are attached as **Appendix G**.

Solid Samples

Sample	Parameter	Radioactivity (pCi/g)	Uncertainty ⁷	Threshold ⁸	Exceed?
P1-S1	Gross Alpha ⁹	40.9	+/- 11.7		
	Gross Beta ¹⁰	16.7	+/- 5.13		
	Radium-226 ¹¹	5.244	+/- 0.901	7	
	Radium-228 ¹²	1.124	+/- 0.837	7	
P2-S1	Gross Alpha	272	+/- 53.7		
	Gross Beta	45.6	+/- 10.7		
	Radium-226	21.046	+/- 2.971	7	YES
	Radium-228	2.109	+/- 0.707	7	
P2-S2	Gross Alpha	441	+/- 83.4		
	Gross Beta	33.7	+/- 8.99		
	Radium-226	18.709	+/- 2.585	7	YES
	Radium-228	0.297	+/- 0.407	7	
SD1-1	Gross Alpha	64.4	+/- 16.2		
	Gross Beta	12.1	+/- 5.05		
	Radium-226	7.768	+/- 1.213	7	YES
	Radium-228	0.835	+/- 0.765	7	
SD1-2	Gross Alpha	52.0	+/- 13.5		
	Gross Beta	15.1	+/- 4.50		
	Radium-226	4.728	+/- 0.698	7	
	Radium-228	0.994	+/- 0.310	7	
SD1-3	Gross Alpha	70.0	+/- 16.6		
	Gross Beta	11.0	+/- 4.12		
	Radium-226	8.696	+/- 1.243	7	YES
	Radium-228	0.275	+/- 0.461	7	
SD1-4	Gross Alpha	80.1	+/- 18.9		
	Gross Beta	14.3	+/- 4.76		
	Radium-226	4.618	+/- 0.716	7	
	Radium-228	0.807	+/- 0.359	7	
SD2-1	Gross Alpha	61.8	+/- 15.1		
	Gross Beta	11.8	+/- 4.28		
	Radium-226	3.756	+/- 0.670	7	
	Radium-228	0.693	+/- 0.521	7	
SD2-2	Gross Alpha	165	+/- 34.0		
	Gross Beta	19.3	+/- 6.04		
	Radium-226	14.426	+/- 2.112	7	YES
	Radium-228	0.850	+/- 0.775	7	
SD2-3	Gross Alpha	50.3	+/- 13.3		

 $^{^{7}}$ For solid samples: 95% confidence interval. For gamma spec: 95.4% confidence interval

⁸ For solid samples: 40 CFR 192 Subpart B ("5 pCi/g over the first 15cm of soil below the surface")

⁹ EPA Method 9310

¹⁰ EPA Method 9310

¹¹ EPA Method 901.1

¹² EPA Method 901.1

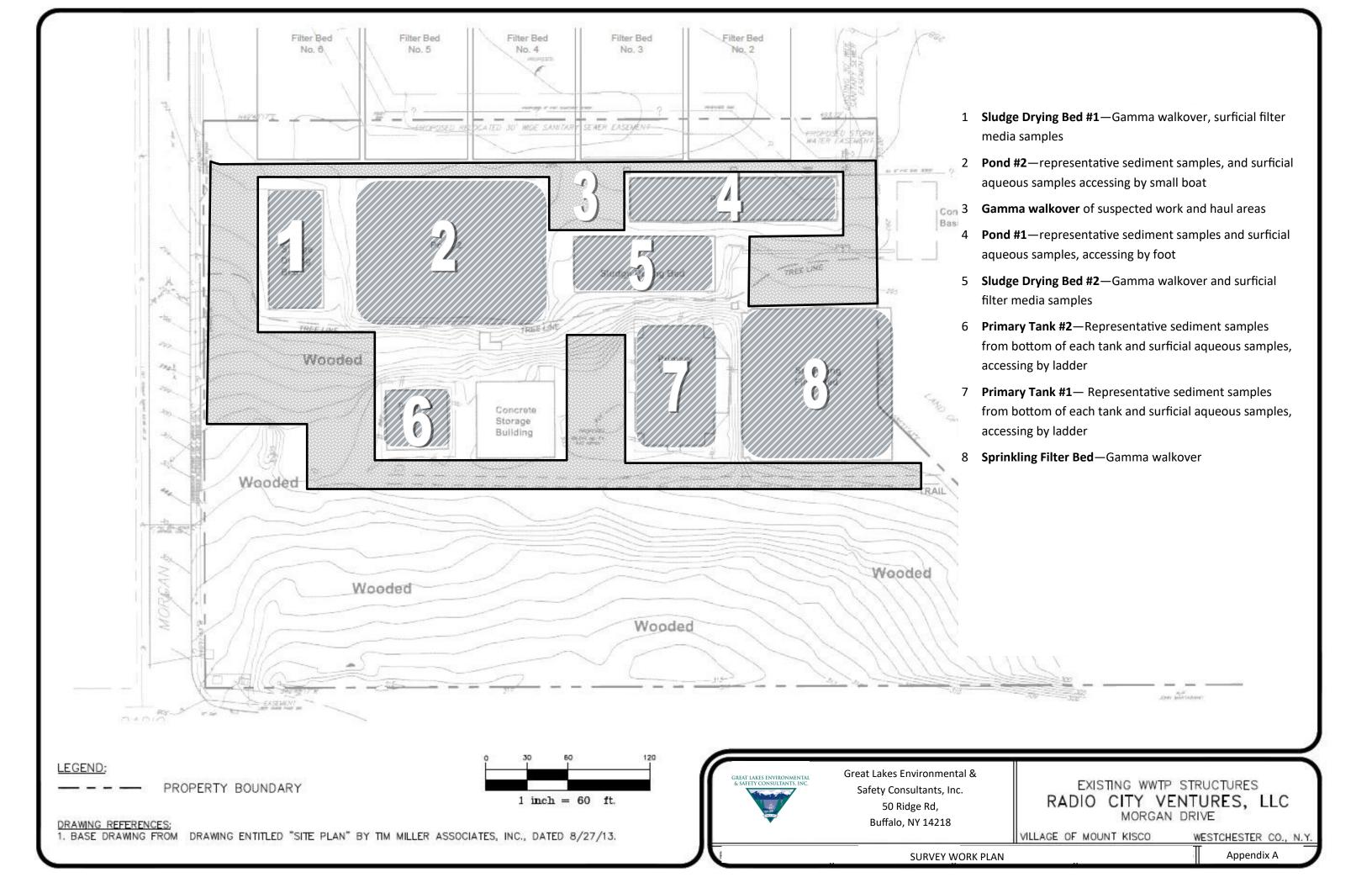
Sample	Parameter	Radioactivity (pCi/g)	Uncertainty ⁷	Threshold ⁸	Exceed?
	Gross Beta	9.62	+/- 3.85		
	Radium-226	6.748	+/- 1.033	7	
	Radium-228	0.619	+/- 0.488	7	
SD2-4	Gross Alpha	94.2	+/- 21.3		
	Gross Beta	14.8	+/- 4.93		
	Radium-226	13.242	+/- 1.817	7	YES
	Radium-228	0.578	+/- 0.484	7	
HS-1	Gross Alpha	1,563	+/- 284		
	Gross Beta	81.2	+/- 17.8		
	Radium-226	65.038	+/- 8.669	7	YES
	Radium-228	2.279	+/- 0.947	7	
HS-2	Gross Alpha	561	+/- 105		
	Gross Beta	61.4	+/- 14.1		
	Radium-226	25.526	+/- 3.584	7	YES
	Radium-228	1.132	+/- 0.825	7	
HS-3	Gross Alpha	1,370	+/- 250		
	Gross Beta	78.5	+/- 17.6		
	Radium-226	53.292	+/- 7.225	7	YES
	Radium-228	1.519	+/- 1.107	7	

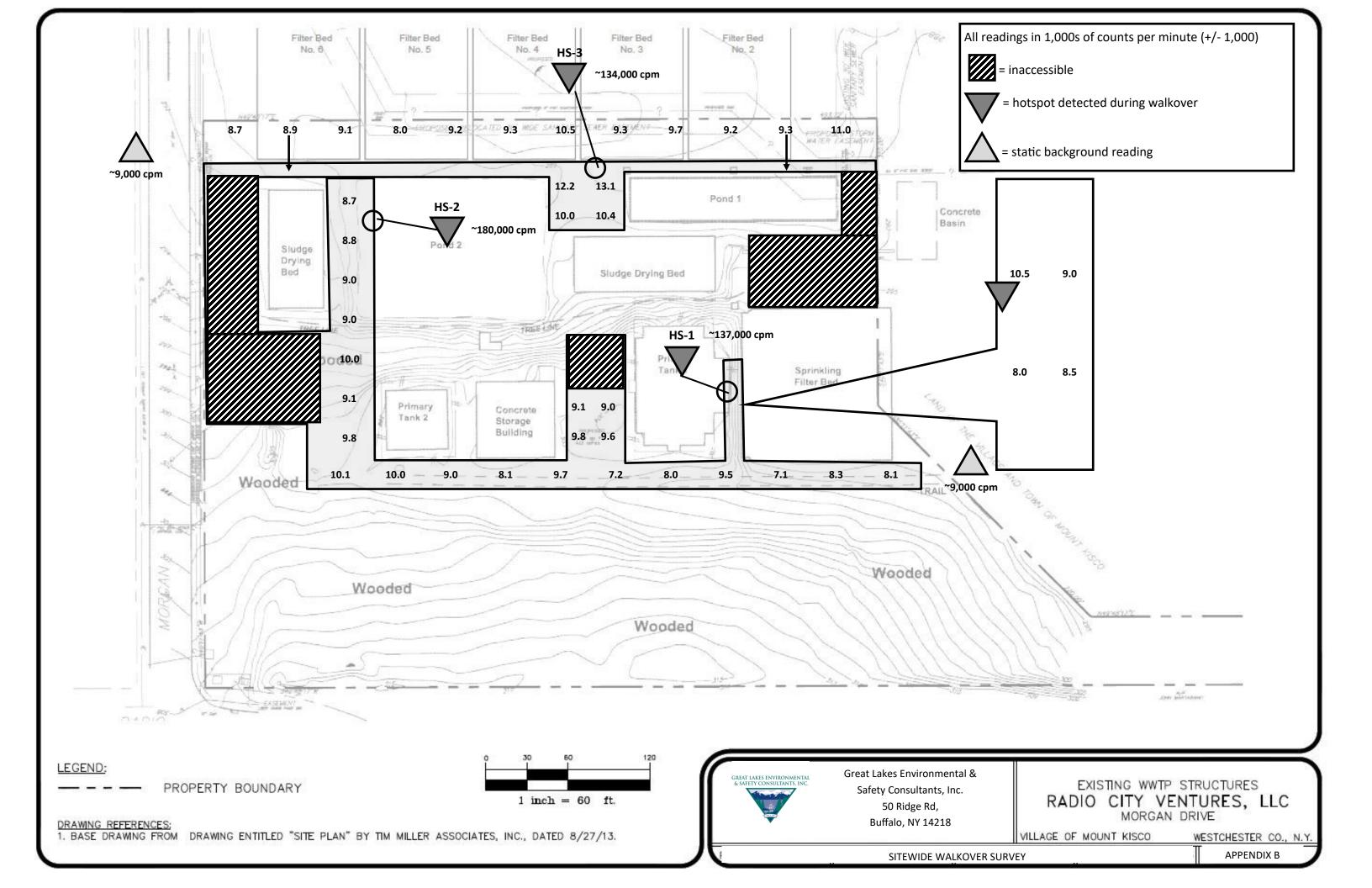
CONCLUSIONS

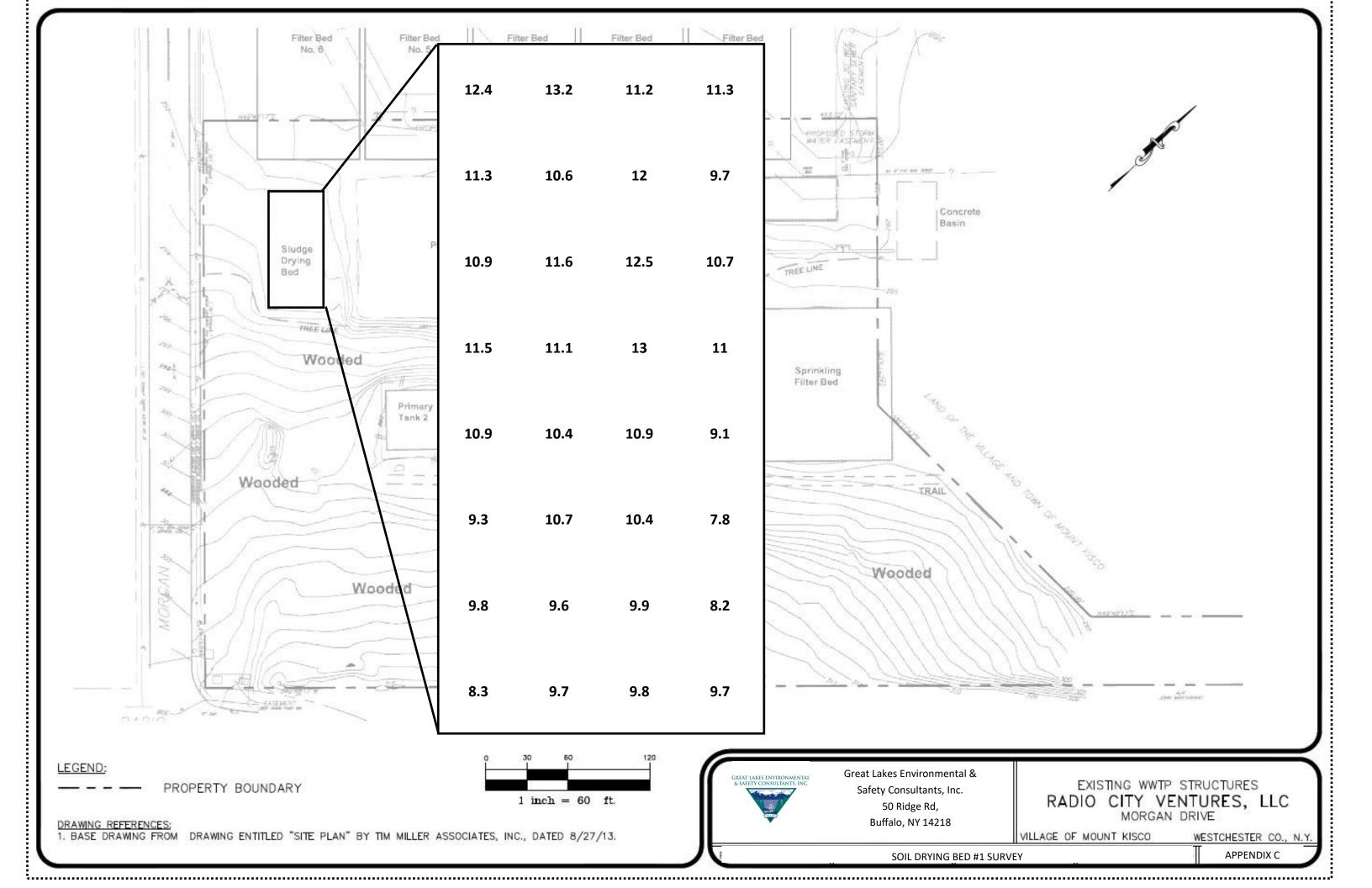
Based on the findings of the radiological survey, radionuclide contaminated waste material appears to be present in some concentration in select areas of the Site. Great Lakes recommends a remedial action plan be developed that includes the following:

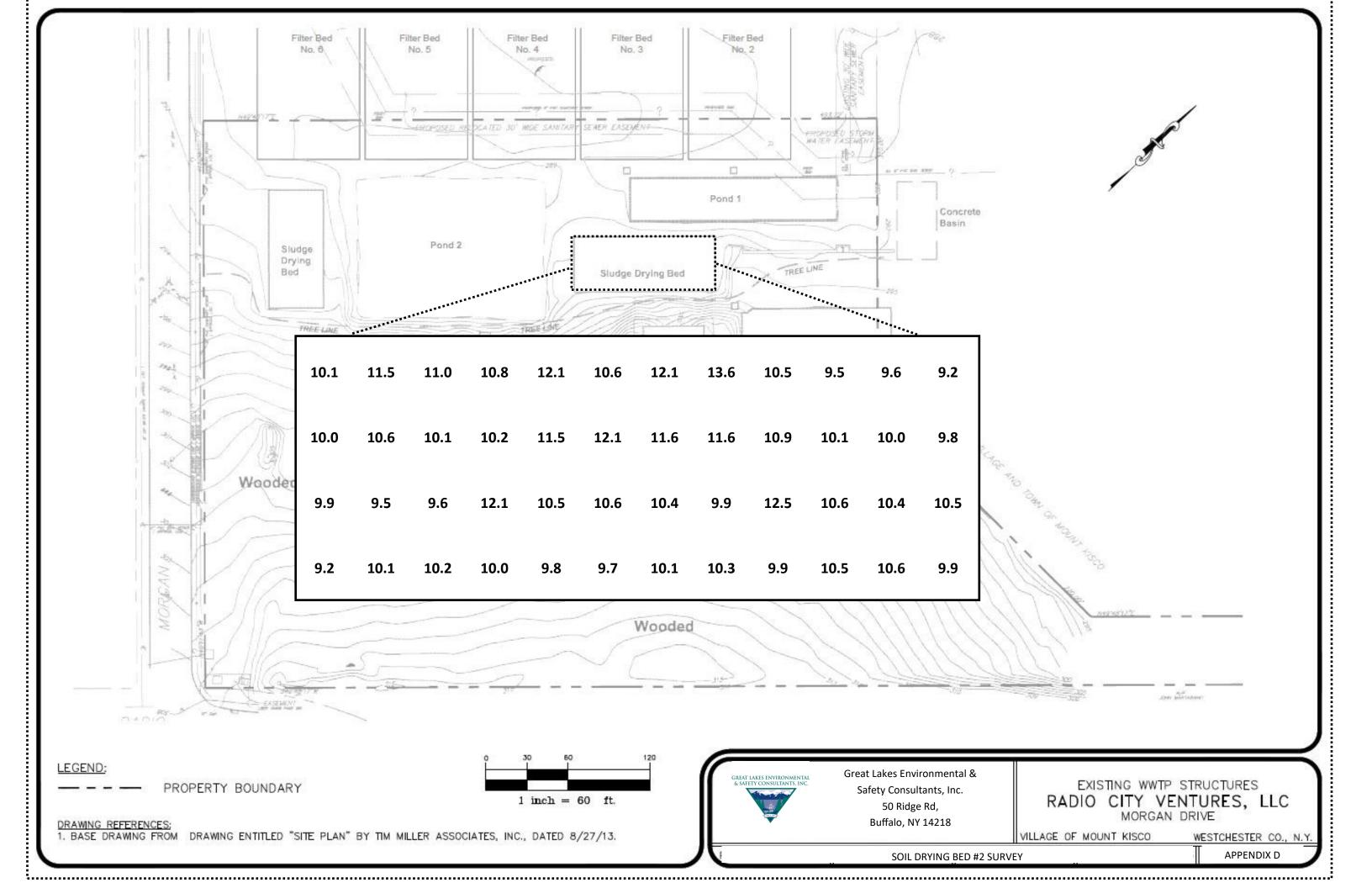
- Selective soil removal in areas identified with elevated radioactivity.
- Radiation surveys of excavation surface, excavated material, and stockpiled material; and
- Transportation of radioactive materials to an off-site appropriately licensed facility for disposal (NYSDEC has regulations that require disturbed radioactive material above background to be disposed of properly outside of NYS borders)

The hotspots identified during the gamma walkover appear to be localized and may potentially be able to be removed on an individual basis, but further investigation is necessary to determine the extent of the contamination associated with these hotspots. Additionally, due to the inaccessibility of much of the Site, there exists the potential for additional, undiscovered hotpots across the Site.





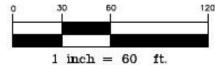






LEGEND:

PROPERTY BOUNDARY



DRAWING REFERENCES:

1. BASE DRAWING FROM DRAWING ENTITLED "SITE PLAN" BY TIM MILLER ASSOCIATES, INC., DATED 8/27/13.



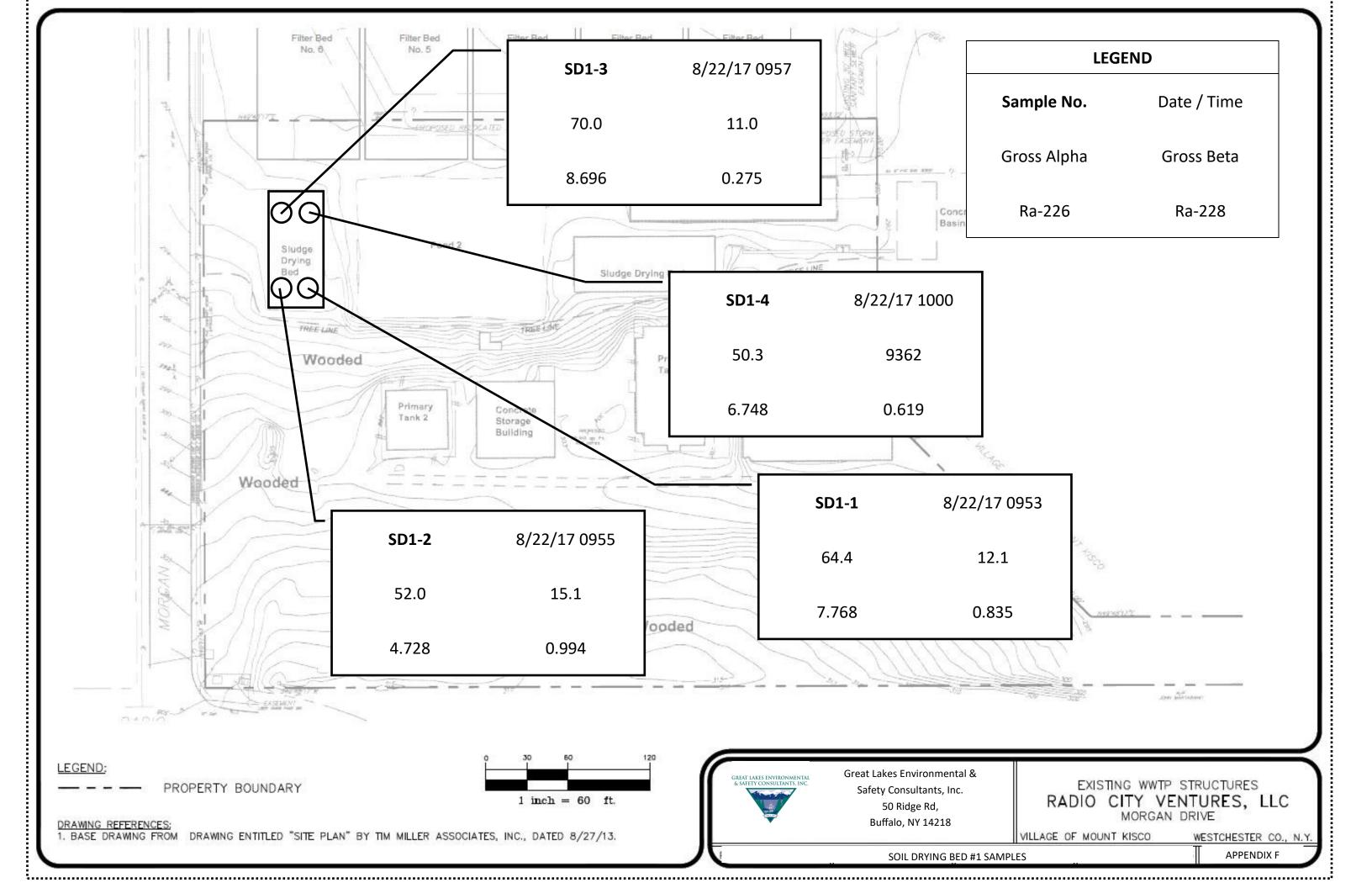
Great Lakes Environmental &
Safety Consultants, Inc.
50 Ridge Rd,
Buffalo, NY 14218

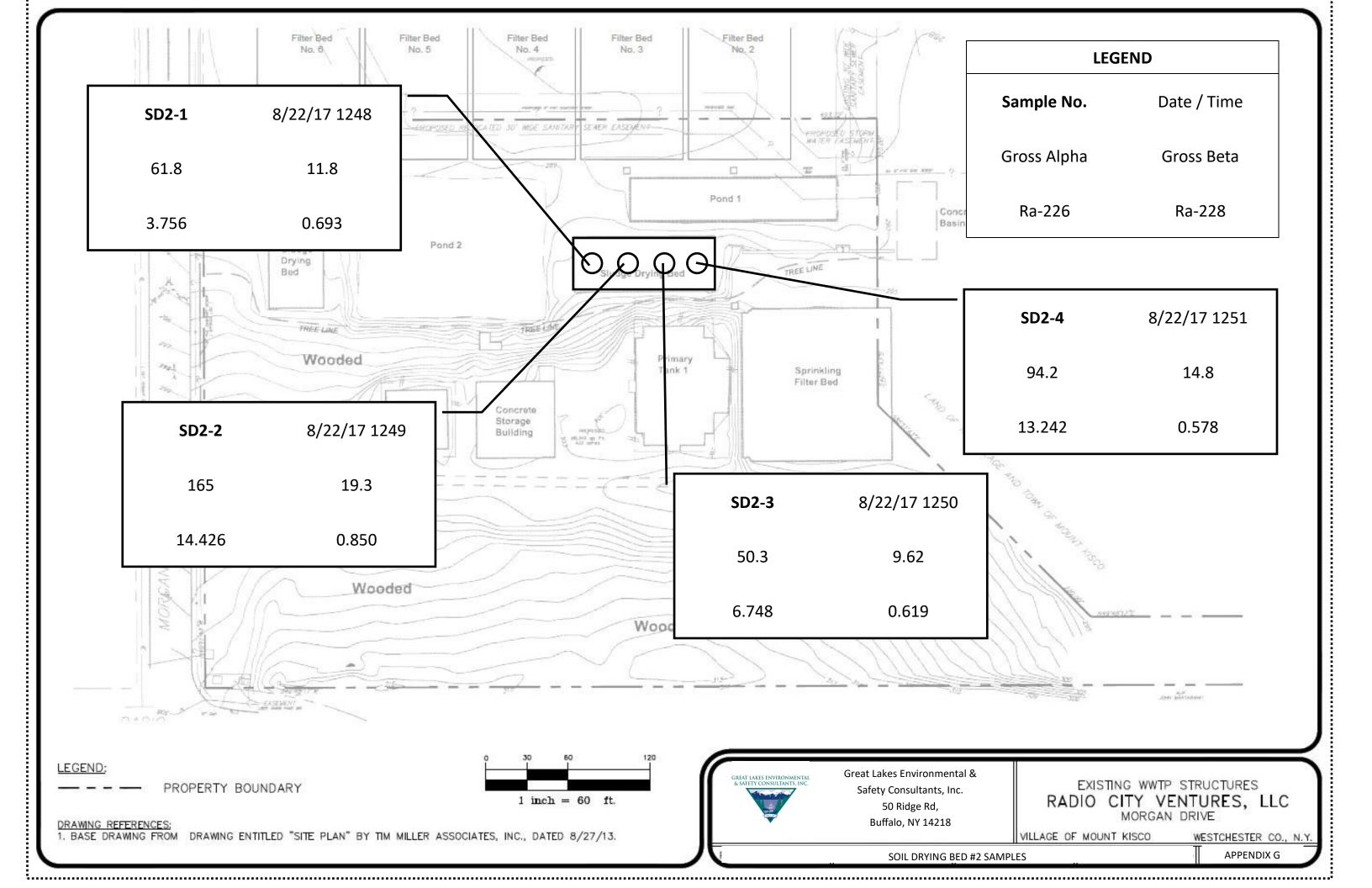
RADIO CITY VENTURES, LLC
MORGAN DRIVE

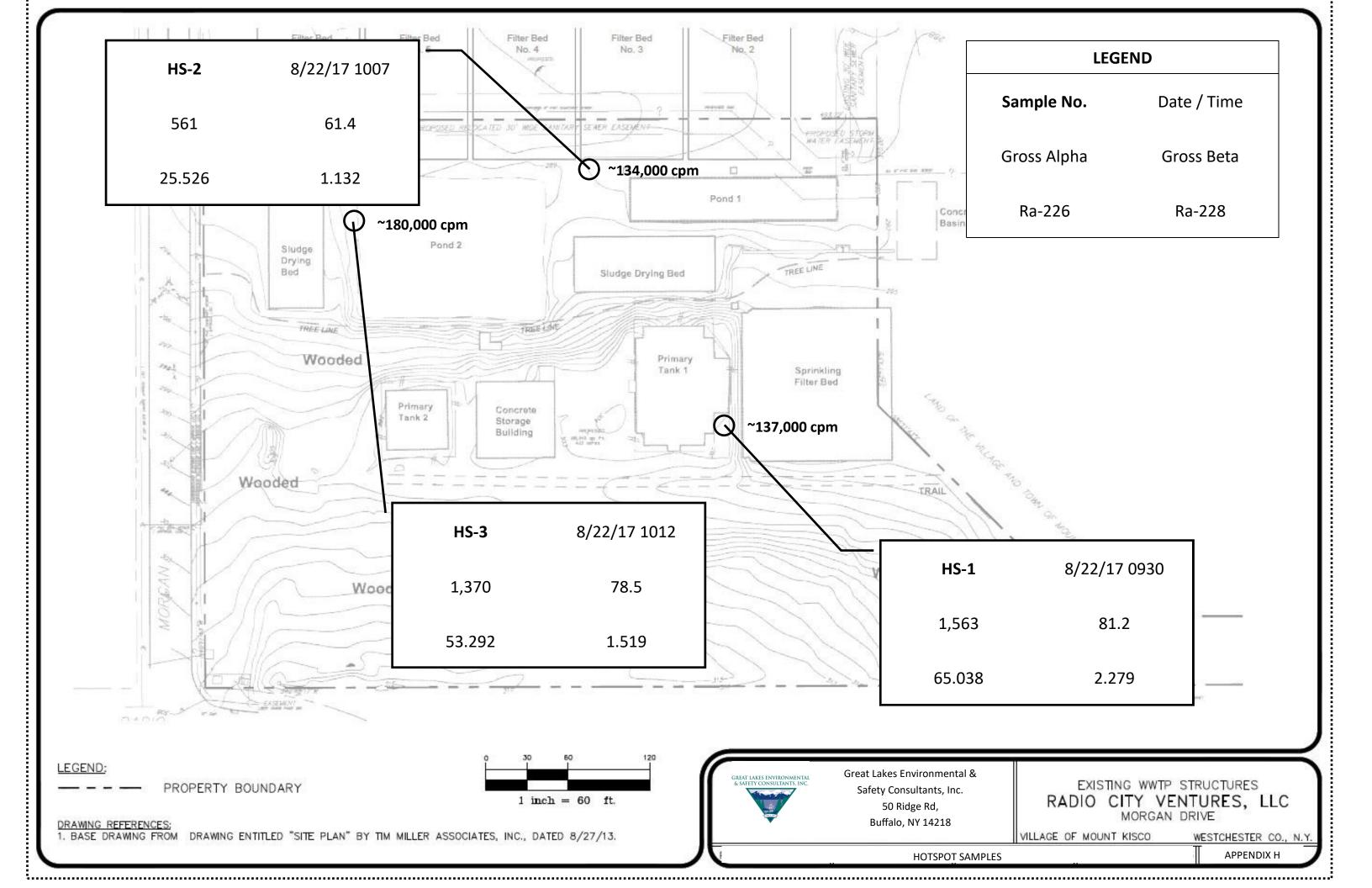
VILLAGE OF MOUNT KISCO

WESTCHESTER CO., N.Y.

APPENDIX E







SAMPLE GEOLOCATION

GIS data was collected for each sample were recorded with a Trimble Geo XT handheld

HS-1	41°11′35.81307″N 73°44′07.72843″W
HS-2	41°11′36.50505″N 73°44′10.42287″W
HS-3	41°11′34.92970″N 73°44′11.45933″W
SD1-1	41°11′34.24054″N 73°44′11.53886″W
SD1-2	41°11′34.14361″N 73°44′11.70997″W
SD1-3	41°11′34.46318″N 73°44′11.95603″W
SD1-4	41°11′34.72539″N 73°44′11.74862″W
SD2-1	41°11′36.94317″N 73°44′09.71508″W
SD2-2	41°11′36.01334″N 73°44′09.57585″W
SD2-3	41°11′36.30238″N 73°44′09.21707″W
SD2-4	41°11′36.41946″N 73°44′09.11656″W
P1-S1	41°11′37.40485″N 73°44′08.75183″W
P2-S1	41°11′35.46901″N 73°44′10.61453″W
P2-S2	41°11′35.04244″N 73°44′11.37837″W

(724)850-5600



October 23, 2017

Mark Mol Great Lakes Environmental 50 Ridge Road Buffalo, NY 14218

RE: Project: Mt. Kisco Radiolgical Pace Project No.: 30228089

Dear Mark Mol:

Enclosed are the analytical results for sample(s) received by the laboratory on August 24, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Revision 1 - This report replaces the Sept. 22, 2017 report. This report has been reissued on Oct. 23, 2017 to include the client location code. Please replace the original report with the revised report enclosed.

Revision 2 - This report replaces the Oct. 23, 2017 report. This report has been reissued on Oct. 23, 2017 to correct the solid matrix from 900.0 to 9310 per the client's request. Please replace the original report with the revised report enclosed.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

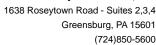
Robbin Robl robbin.robl@pacelabs.com (724)850-5613

RIHHAM L. ROLL

Project Manager

Enclosures







CERTIFICATIONS

Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683 Georgia Certification #: C040

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091
Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification Missouri Certification #: 235 Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14 Nevada Certification #: PA014572015-1 New Hampshire/TNI Certification #: 2976 New Jersey/TNI Certification #: PA 051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706

North Dakota Certification #: R-190 Oregon/TNI Certification #: PA200002 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

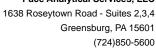
South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L





SAMPLE SUMMARY

Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30228089001	P1-W1	Water	08/22/17 13:47	08/24/17 09:55
30228089002	P2-W1	Water	08/22/17 13:25	08/24/17 09:55
30228089003	HS-1	Solid	08/22/17 12:00	08/24/17 09:55
30228089004	HS-2	Solid	08/22/17 12:15	08/24/17 09:55
30228089005	HS-3	Solid	08/22/17 12:20	08/24/17 09:55
30228089006	SD1-1-	Solid	08/22/17 12:07	08/24/17 09:55
30228089007	SD1-2	Solid	08/22/17 12:09	08/24/17 09:55
30228089008	SD1-3	Solid	08/22/17 12:11	08/24/17 09:55
30228089009	SD1-4	Solid	08/22/17 12:13	08/24/17 09:55
30228089010	SD2-1	Solid	08/22/17 12:45	08/24/17 09:55
30228089011	SD2-2	Solid	08/22/17 12:47	08/24/17 09:55
30228089012	SD2-3	Solid	08/22/17 12:50	08/24/17 09:55
30228089013	SD2-4	Solid	08/22/17 12:54	08/24/17 09:55
30228089014	P1-S1	Solid	08/22/17 13:59	08/24/17 09:55
30228089015	P2-S1	Solid	08/22/17 13:15	08/24/17 09:55
30228089016	P2-S2	Solid	08/22/17 13:22	08/24/17 09:55

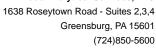


SAMPLE ANALYTE COUNT

Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30228089001	P1-W1	EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
30228089002	P2-W1	EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
30228089003	HS-1	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089004	HS-2	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089005	HS-3	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089006	SD1-1-	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089007	SD1-2	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089008	SD1-3	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089009	SD1-4	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089010	SD2-1	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089011	SD2-2	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089012	SD2-3	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089013	SD2-4	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089014	P1-S1	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089015	P2-S1	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA
30228089016	P2-S2	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	NEG	2	PASI-PA





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Method: EPA 900.0

Description: 900.0 Gross Alpha/Beta **Client:** Great Lakes Environmental

Date: October 23, 2017

General Information:

2 samples were analyzed for EPA 900.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

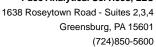
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Method: EPA 901.1

Description: 901.1 Gamma Spec INGROWTH **Client:** Great Lakes Environmental

Date: October 23, 2017

General Information:

14 samples were analyzed for EPA 901.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

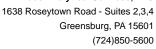
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Method: EPA 903.1

Description: 903.1 Radium 226

Client: Great Lakes Environmental

Date: October 23, 2017

General Information:

2 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

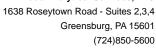
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Method: EPA 904.0

Description: 904.0 Radium 228

Client: Great Lakes Environmental

Date: October 23, 2017

General Information:

2 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

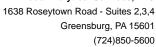
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Method: EPA 9310

Description: 9310 Gross Alpha/Beta **Client:** Great Lakes Environmental

Date: October 23, 2017

General Information:

14 samples were analyzed for EPA 9310. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

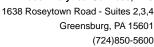
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Sample: P1-W1 Lab ID: 30228089001 Collected: 08/22/17 13:47 Received: 08/24/17 09:55 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 3 mls of nitric acid were added to the samples to meet the sample preservation requirement of pH

<2 for radiological analyses.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	317 ± 61.0 (15.7) C:NA T:NA	pCi/L	09/06/17 18:29	12587-46-1	
Gross Beta	EPA 900.0	114 ± 22.1 (7.60)	pCi/L	09/06/17 18:29	12587-47-2	
Radium-226	EPA 903.1	C:NA T:NA 11.3 ± 2.21 (0.756)	pCi/L	09/05/17 21:08	13982-63-3	
Radium-228	EPA 904.0	C:NA T:77% 0.409 ± 0.502 (1.06) C:75% T:60%	pCi/L	09/05/17 15:17	15262-20-1	

Sample: P2-W1 Lab ID: 30228089002 Collected: 08/22/17 13:25 Received: 08/24/17 09:55 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 3 mls of nitric acid were added to the samples to meet the sample preservation requirement of pH

<2 for radiological analyses.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	6.39 ± 2.78 (2.97) C:NA T:NA	pCi/L	09/07/17 08:11	12587-46-1	
Gross Beta	EPA 900.0	2.92 ± 1.23 (1.94) C:NA T:NA	pCi/L	09/07/17 08:11	12587-47-2	
Radium-226	EPA 903.1	1.16 ± 0.556 (0.511)	pCi/L	09/05/17 21:08	13982-63-3	
Radium-228	EPA 904.0	C:NA T:93% 0.630 ± 0.378 (0.686) C:76% T:78%	pCi/L	09/05/17 15:17	15262-20-1	

Sample: HS-1 Lab ID: 30228089003 Collected: 08/22/17 12:00 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

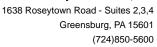
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	65.038 ± 8.669 (0.657) C:NA T:NA	pCi/g	09/21/17 11:43	13982-63-3	Ra
Radium-228	EPA 901.1	2.279 ± 0.947 (0.839) C:NA T:NA	pCi/g	09/21/17 11:43	15262-20-1	
Gross Alpha	EPA 9310	1,563 ± 284 (8.75) C:NA T:NA	pCi/g	08/31/17 07:55	12587-46-1	
Gross Beta	EPA 9310	81.2 ± 17.8 (4.71) C:NA T:NA	pCi/g	08/31/17 07:55	12587-47-2	

Sample: HS-2 Lab ID: 30228089004 Collected: 08/22/17 12:15 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	25.526 ± 3.584 (0.582) C:NA T:NA	pCi/g	09/21/17 11:44	13982-63-3	Ra
Radium-228	EPA 901.1	1.132 ± 0.825 (1.295) C:NA T:NA	pCi/g	09/21/17 11:44	15262-20-1	





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Sample: HS-2 Lab ID: 30228089004 Collected: 08/22/17 12:15 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 9310	561 ± 105 (8.80) C:NA T:NA	pCi/g	08/31/17 07:55	12587-46-1	
Gross Beta	EPA 9310	61.4 ± 14.1 (6.11) C:NA T:NA	pCi/g	08/31/17 07:55	12587-47-2	

Sample: HS-3 Lab ID: 30228089005 Collected: 08/22/17 12:20 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	53.292 ± 7.225 (1.215) C:NA T:NA	pCi/g	09/21/17 12:00	13982-63-3	Ra
Radium-228	EPA 901.1	1.519 ± 1.107 (1.381) C:NA T:NA	pCi/g	09/21/17 12:00	15262-20-1	
Gross Alpha	EPA 9310	1,370 ± 250 (8.88) C:NA T:NA	pCi/g	08/31/17 07:55	12587-46-1	
Gross Beta	EPA 9310	78.5 ± 17.6 (4.98) C:NA T:NA	pCi/g	08/31/17 07:55	12587-47-2	

Sample: SD1-1- Lab ID: 30228089006 Collected: 08/22/17 12:07 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	7.768 ± 1.213 (0.331) C:NA T:NA	pCi/g	09/21/17 12:01	13982-63-3	Ra
Radium-228	EPA 901.1	0.835 ± 0.765 (1.095) C:NA T:NA	pCi/g	09/21/17 12:01	15262-20-1	
Gross Alpha	EPA 9310	64.4 ± 16.2 (9.28) C:NA T:NA	pCi/g	08/31/17 07:55	12587-46-1	
Gross Beta	EPA 9310	12.1 ± 5.05 (7.11) C:NA T:NA	pCi/g	08/31/17 07:55	12587-47-2	

Sample: SD1-2 Lab ID: 30228089007 Collected: 08/22/17 12:09 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	4.728 ± 0.698 (0.231) C:NA T:NA	pCi/g	09/21/17 12:17	13982-63-3	Ra
Radium-228	EPA 901.1	0.994 ± 0.310 (0.225) C:NA T:NA	pCi/g	09/21/17 12:17	15262-20-1	
Gross Alpha	EPA 9310	52.0 ± 13.5 (8.23) C:NA T:NA	pCi/g	08/31/17 07:55	12587-46-1	
Gross Beta	EPA 9310	15.1 ± 4.50 (4.59) C:NA T:NA	pCi/g	08/31/17 07:55	12587-47-2	



Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Sample: SD1-3 Lab ID: 30228089008 Collected: 08/22/17 12:11 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	8.696 ± 1.243 (0.204) C:NA T:NA	pCi/g	09/21/17 12:18	13982-63-3	Ra
Radium-228	EPA 901.1	0.275 ± 0.461 (0.829) C:NA T:NA	pCi/g	09/21/17 12:18	15262-20-1	
Gross Alpha	EPA 9310	70.0 ± 16.6 (7.73) C:NA T:NA	pCi/g	08/31/17 09:17	12587-46-1	
Gross Beta	EPA 9310	11.0 ± 4.12 (4.81) C:NA T:NA	pCi/g	08/31/17 09:17	12587-47-2	

Sample: SD1-4 Lab ID: 30228089009 Collected: 08/22/17 12:13 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	4.618 ± 0.716 (0.223) C:NA T:NA	pCi/g	09/21/17 12:33	13982-63-3	Ra
Radium-228	EPA 901.1	0.807 ± 0.359 (0.331) C:NA T:NA	pCi/g	09/21/17 12:33	15262-20-1	
Gross Alpha	EPA 9310	80.1 ± 18.9 (11.0) C:NA T:NA	pCi/g	08/31/17 07:55	12587-46-1	
Gross Beta	EPA 9310	14.3 ± 4.76 (5.20) C:NA T:NA	pCi/g	08/31/17 07:55	12587-47-2	

Sample: SD2-1 Lab ID: 30228089010 Collected: 08/22/17 12:45 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	3.756 ± 0.670 (0.393) C:NA T:NA	pCi/g	09/21/17 12:34	13982-63-3	Ra
Radium-228	EPA 901.1	0.693 ± 0.521 (0.696) C:NA T:NA	pCi/g	09/21/17 12:34	15262-20-1	
Gross Alpha	EPA 9310	61.8 ± 15.1 (7.83) C:NA T:NA	pCi/g	08/31/17 07:55	12587-46-1	
Gross Beta	EPA 9310	11.8 ± 4.28 (5.25) C:NA T:NA	pCi/g	08/31/17 07:55	12587-47-2	

Sample: SD2-2 Lab ID: 30228089011 Collected: 08/22/17 12:47 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	14.426 ± 2.112 (0.463) C:NA T:NA	pCi/g	09/21/17 12:50	13982-63-3	Ra
Radium-228	EPA 901.1	0.850 ± 0.775 (0.954) C:NA T:NA	pCi/g	09/21/17 12:50	15262-20-1	
Gross Alpha	EPA 9310	165 ± 34.0 (7.01) C:NA T:NA	pCi/g	08/31/17 07:55	12587-46-1	



Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Sample: SD2-2 Lab ID: 30228089011 Collected: 08/22/17 12:47 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

 Parameters
 Method
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 CAS No.
 Qual

 Gross Beta
 EPA 9310
 19.3 ± 6.04 (5.44)
 pCi/g
 08/31/17 07:55 12587-47-2
 12587-47-2

 C:NA T:NA
 ORA T:NA
 <

Sample: SD2-3 Lab ID: 30228089012 Collected: 08/22/17 12:50 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	6.748 ± 1.033 (0.278) C:NA T:NA	pCi/g	09/21/17 12:51	13982-63-3	Ra
Radium-228	EPA 901.1	0.619 ± 0.488 (0.496) C:NA T:NA	pCi/g	09/21/17 12:51	15262-20-1	
Gross Alpha	EPA 9310	50.3 ± 13.3 (8.62) C:NA T:NA	pCi/g	08/31/17 07:56	12587-46-1	
Gross Beta	EPA 9310	9.62 ± 3.85 (5.02) C:NA T:NA	pCi/g	08/31/17 07:56	12587-47-2	

Sample: SD2-4 Lab ID: 30228089013 Collected: 08/22/17 12:54 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	13.242 ± 1.817 (0.287) C:NA T:NA	pCi/g	09/21/17 13:07	13982-63-3	Ra
Radium-228	EPA 901.1	0.578 ± 0.484 (0.459) C:NA T:NA	pCi/g	09/21/17 13:07	15262-20-1	
Gross Alpha	EPA 9310	94.2 ± 21.3 (8.46) C:NA T:NA	pCi/g	08/31/17 07:56	12587-46-1	
Gross Beta	EPA 9310	14.8 ± 4.93 (5.17) C:NA T:NA	pCi/g	08/31/17 07:56	12587-47-2	

Sample: P1-S1 Lab ID: 30228089014 Collected: 08/22/17 13:59 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	5.244 ± 0.901 (0.495) C:NA T:NA	pCi/g	09/21/17 13:25	13982-63-3	Ra
Radium-228	EPA 901.1	1.124 ± 0.837 (0.914) C:NA T:NA	pCi/g	09/21/17 13:25	15262-20-1	
Gross Alpha	EPA 9310	40.9 ± 11.7 (9.33) C:NA T:NA	pCi/g	08/31/17 07:56	12587-46-1	
Gross Beta	EPA 9310	16.7 ± 5.13 (5.83) C:NA T:NA	pCi/g	08/31/17 07:56	12587-47-2	



Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

Sample: P2-S1 Lab ID: 30228089015 Collected: 08/22/17 13:15 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

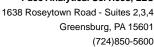
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	21.046 ± 2.971 (0.649) C:NA T:NA	pCi/g	09/21/17 13:24	13982-63-3	Ra
Radium-228	EPA 901.1	2.109 ± 0.707 (0.557) C:NA T:NA	pCi/g	09/21/17 13:24	15262-20-1	
Gross Alpha	EPA 9310	272 ± 53.7 (11.1) C:NA T:NA	pCi/g	08/31/17 07:56	12587-46-1	
Gross Beta	EPA 9310	45.6 ± 10.7 (5.82) C:NA T:NA	pCi/g	08/31/17 07:56	12587-47-2	

Sample: P2-S2 Lab ID: 30228089016 Collected: 08/22/17 13:22 Received: 08/24/17 09:55 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	18.709 ± 2.585 (0.402) C:NA T:NA	pCi/g	09/21/17 13:08	13982-63-3	Ra
Radium-228	EPA 901.1	0.297 ± 0.407 (1.043) C:NA T:NA	pCi/g	09/21/17 13:08	15262-20-1	
Gross Alpha	EPA 9310	441 ± 83.4 (8.11) C:NA T:NA	pCi/g	08/31/17 07:56	12587-46-1	
Gross Beta	EPA 9310	33.7 ± 8.99 (5.40) C:NA T:NA	pCi/g	08/31/17 07:56	12587-47-2	





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

QC Batch: 276475 Analysis Method: EPA 9310

QC Batch Method: EPA 9310 Analysis Description: 9310 Gross Alpha/Beta

Associated Lab Samples: 30228089003, 30228089004, 30228089005, 30228089006, 30228089007, 30228089008, 30228089009,

30228089010, 30228089011, 30228089012, 30228089013, 30228089014, 30228089015, 30228089016

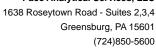
METHOD BLANK: 1359004 Matrix: Solid

Associated Lab Samples: 30228089003, 30228089004, 30228089005, 30228089006, 30228089007, 30228089008, 30228089009,

30228089010, 30228089011, 30228089012, 30228089013, 30228089014, 30228089015, 30228089016

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.011 ± 0.0996 (0.242) C:NA T:NA	pCi/g	08/31/17 07:54	
Gross Beta	0.094 ± 0.111 (0.234) C:NA T:NA	pCi/g	08/31/17 07:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

QC Batch: 270066 Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0 Analysis Description: 900.0 Gross Alpha/Beta

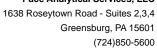
Associated Lab Samples: 30228089001, 30228089002

METHOD BLANK: 1328869 Matrix: Water

Associated Lab Samples: 30228089001, 30228089002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.075 ± 0.450 (1.11) C:NA T:NA	pCi/L	09/06/17 08:59	
Gross Beta	0.110 ± 0.589 (1.44) C:NA T:NA	pCi/L	09/06/17 08:59	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

QC Batch: 269708 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Associated Lab Samples: 30228089001, 30228089002

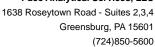
METHOD BLANK: 1327579 Matrix: Water

Associated Lab Samples: 30228089001, 30228089002

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-228 0.555 ± 0.339 (0.607) C:80% T:73% pCi/L 09/05/17 15:16

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

QC Batch: 270262 Analysis Method: EPA 901.1

QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec Ingrowth

 $Associated \ Lab \ Samples: \qquad 30228089003, \ 30228089004, \ 30228089005, \ 30228089006, \ 30228089007, \ 30228089008, \ 30228089009, \ 3022$

30228089010, 30228089011, 30228089012, 30228089013, 30228089014, 30228089015, 30228089016

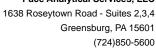
METHOD BLANK: 1329879 Matrix: Solid

Associated Lab Samples: 30228089003, 30228089004, 30228089005, 30228089006, 30228089007, 30228089008, 30228089009,

30228089010, 30228089011, 30228089012, 30228089013, 30228089014, 30228089015, 30228089016

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.080 (0.237) C:NA T:NA	pCi/g	09/21/17 10:19	Ra
Radium-228	0.058 ± 0.102 (0.172) C:NA T:NA	pCi/g	09/21/17 10:19	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.





Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

QC Batch: 269696 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 30228089001, 30228089002

METHOD BLANK: 1327558 Matrix: Water

Associated Lab Samples: 30228089001, 30228089002

Parameter Act \pm Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-226 0.122 \pm 0.279 (0.165) C:NA T:89% pCi/L 09/05/17 20:34

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



1638 Roseytown Road - Suites 2,3,4 Greensburg, PA 15601 (724)850-5600



QUALIFIERS

Project: Mt. Kisco Radiolgical

Pace Project No.: 30228089

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

Date: 10/23/2017 02:36 PM

Ra

The reported Ra-226 results were determined by hermetically sealing the dried, processed sample in an appropriatesized can. Each sample was stored for a minimum of 21 days to ensure that equilibrium between Ra-226 and daughters Bi-214 and Pb-214 was achieved. Reported Ra-226 results were inferred from gamma peaks attributable to Bi-214 and Pb-214.

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

The Chain-of-Custody is a LEGAL DOCUMENT.

Pace Analytical

Pace Project No./ Lab I.D. Ĩ DRINKING WATER SAMPLE CONDITIONS OTHER ъ GROUND WATER <u>z</u> Residual Chlorine (Y/N) Page: 053 REGULATORY AGENCY ž RCRA TIME Requested Analysis Filtered (Y/N) 一方で Site Location STATE DATE NPDES UST ACCEPTED BY LAFFILIATION 50 Ridge Road, Buffalo, NY 14218 조조 82S/82S mulbsR かから 7 Company Name: Great Lakes Environmental ioss Alpha & Beta Radi taseT sisylsnAt TN /A Other Methanol Preservatives _EO_SS_SBN HOSN Mark Mo HCI ^EONH OS^zH Pace Quote Reference: Pace Project Manager: Pace Profile #: Section C Опргеѕегуед TIME Attention: (ddress: MM # OF CONTAINERS SAMPLER NAME AND SIGNATURE SAMPLE TEMP AT COLLECTION Report To: Mark Mol mmol@greatlakesenvironmental.com 8/23/17 DATE TIME COMPOSITE END/GRAB DATE COLLECTED RELINQUISHED BY / AFFILIATION 13:25 Ch 21 13:47 6 8/22 12:00 2:32 8/22 12:07 St 6 8/22 12: 09 Sh 21 22/8 9 92 B 4/22 17:50 Sr 6 8/22 12:15 St 6 8/22 12:13 G 8/22 12:11 Project Name: Mt. Kisco Radiolgical START **Mark Mol** 8122 27 8 27.00 3/22 Required Project Information: ا الا SE G |S||S| ۵ (G=GRAB C=COMP) **BAYT BJGMA8** Purchase Order No.: Y, Ž (see valid codes to left) MATRIX CODE Project Number: Section B Copy To: Valid Matrix Codes DRINKING WATER DW
WASTER WA
PRODUCT P
SOLISOLID SI, OL
OLIN WIFE WHE
WIFE WHE
WIFE WF
ARR ARR
TISSUE TS WO#:30228089 mmol@greatlakesenvironmental.com Great Lakes Environmental ADDITIONAL COMMENTS (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE SAMPLE ID SD2-1 SD2-2 SD2-3 Fax Buffaio, NY 14218 HS-2 SD1-3 75-3 P2- W -1-US p-195 50 Ridge Road 501-2 Section D Required Client Information HS-1 3-2 Section A Required Client Information: Requested Due Date/TAT: 7169499451 mail To: (ddress: Phone: ιΩ 7 9 Ξ 7 m ဖ 6 **∞** # M3TI

F-ALL-Q-020rev.08, 12-Oct-2007

(N/A)

Samples Intac

(V/V)

Custody Sealed Coole

Received on Ice (Y/N)

O° ni qmaT

DATE Signed (MM/DD/YY):

PRINT Name of SAMPLER: Mark Mol

SIGNATURE of SAMPLER:

Page 21 of 23

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Face Analytical

Pace Project No./ Lab I.D. DRINKING WATER SAMPLE CONDITIONS 0 OTHER Od CO ö 00 GROUND WATER Residual Chlorine (XIV) Page: REGULATORY AGENCY ž RCRA TIME Requested Analysis Filtered (Y/N) Site Location STATE क्षित्रं DATE NPDES UST ACCEPTED BY / AFFILIATION 50 Ridge Road, Buffalo, NY 14218 K Radium 226/228 company Name: Great Lakes Environmental ibsЯ ste8 & sdqlA eaore tiseT sisylsnA t N/A Jedic Methanol Preservatives Va₂S₂O₃ HOBN Mark Mo HCI Invoice Information: ^EONH Reference: Pace Project Manager: Pace Profile #: *OSZH Section C TIME Unpreserved ttention: Pace Quote ddress: # OF CONTAINERS SAMPLE TEMP AT COLLECTION Report To: Mark Mol mmol@greatlakesenvironmental.com DATE 8/23/17 TIME COMPOSITE END/GRAB DATE COLLECTED RELINQUISHED BY / AFFILIATION 8/22 13:59 8122 12:54 G 8/22 13:15 27:81 2218 3 roject Name: Mt. Kisco Radiolgical Ī COMPOSITE Mark Mol Required Project Information: J (в=евмв с=сомр) **BAYT BJ9MA**8 Purchase Order No. ž (see valid codes to left) MATRIX CODE Project Number Section B Sopy To: Valid Matrix Codes DRINKING WATER DW WASTE WATER WW PRODUCT P SOLISOLID SL WIPE WP AIR AR OTHER OT TISSUE 155 mmoi@greatiakesenvironmental.com Great Lakes Environmenta ADDITIONAL COMMENTS (A-Z, 0-97,-) Sample IDs MUST BE UNIQUE P1-51 P2-51 P2-52 Fax: SAMPLE ID Buffalo, NY 14218 50 Ridge Road Required Client Information Section A Required Client Information: Requested Due Date/TAT Phone: 7169499451 Section D Company: Email To: 6 9 Ξ 12 S ω # W31!

(N/A)

Samples Intac

(N/X)

aled Coole Custody

(N/X) eoi Received on

J° ni qməT

DATE Signed (MM/DD/YY):

PRINT Name of SAMPLER: Mark Mol

SIGNATURE of SAMPLER:

SAMPLER NAME AND SIGNATURE

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0455

Pittsburgh Lab Sample Co	mainon	υþ	UIIF	receibi
Pace Analytical Client Name	: <u> </u>	<u>ً ک</u> (ec.	+ lakes Env. Project #3022808
Courier: Fed Ex UPS USPS				· · · · · · · · · · · · · · · · · · ·
Tracking #: 81067479(5123			LIMS Login XM
Custody Seal on Cooler/Box Present:		-	Sea	ls intact: ☐ yes ☐ no
Thermometer Used NIA				et Blue None
Cooler Temperature Observed Temp				rection Factor: C Final Temp: C
Temp should be above freezing to 6°C	~	-		
				Date and initials of person examining contents: 77+ 872417
Comments:	Yes	No	N/A	
Chain of Custody Present:				1.
Chain of Custody Filled Out:				2.
Chain of Custody Relinquished:			<u> </u>	3.
Sampler Name & Signature on COC:		april.	<u> </u>	4.
Sample Labels match COC:		.om	<u> </u>	5. no date / time on soil
-Includes date/time/ID Matrix:_	V~1 .	1-3	<u></u>	Samples
Samples Arrived within Hold Time:			<u> </u>	6.
Short Hold Time Analysis (<72hr remaining)	:	,,,,,		7.
Rush Turn Around Time Requested:		مسمعة	<u> </u>	8.
Sufficient Volume:				9.
Correct Containers Used:	-			10. NOT used For soils
-Pace Containers Used:			<u>.</u>	
Containers Intact:	/		<u> </u>	11.
Orthophosphate field filtered			na-	12.
Hex Cr Aqueous Compliance/NPDES sample field fil	tered		-	13.
Organic Samples checked for dechlorination	on:			14.
Filtered volume received for Dissolved tests			_	15.
All containers have been checked for preservation.				16. Added 3 mls of HNO3
All containers needing preservation are found to be in compliance with EPA recommendation.	۱			to water samples
exceptions: VOA, coliform, TOC, O&G, Pheno	lics			Initial when 214 Date/time of completed 214 preservation \$124 14:00
				Lot#of added preservative DC171 1058
Headspace in VOA Vials (>6mm):				17.
Trip Blank Present:				18.
Trip Blank Custody Seals Present				
Rad Aqueous Samples Screened > 0.5 mrem	/hr			Initial when completed: 711 Date: 8724107
Client Notification/ Resolution:				completed. FLT Date. 8 2011 4
	ø · .		Date/I	Time; Contacted By:
Person Contacted: Date/Time: Contacted By: Comments/ Resolution:				

☐ A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.