SCHEDULE 1 – SCOPE OF WORK
QUEENSBURY LANDFILL
WA NO. D009812-21
SITE CHARACTERIZATION
NOVEMBER 2021

The New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER) has issued this Work Assignment (WA No. 21) under Standby Engineering Contract D009812 for the Queensbury Landfill ("the Site") (NYSDEC Site No. 557005), located on Ridge Road, Queensbury, Warren County, New York. This Scope of Work (SOW) includes the following Site Characterization (SC) activities:

- File review;
- Site visit;
- WA Package preparation;
- Site survey;
- Surface soil sampling;
- Mud Pond surface water and sediment sampling;
- Leachate and landfill seep/surface water sampling;
- Groundwater elevation surface gauging;
- Groundwater monitoring well sampling;
- Mine supply well sampling; and
- Site Characterization Report preparation.

This WA SOW has been prepared in accordance with the July 9, 2021 WA Issuance/Notice to Proceed (WAI/NTP) letter, subsequent correspondence with the NYSDEC Project Manager (PM), and a preliminary Site visit. A schedule is provided at the end of this SOW and includes anticipated milestone dates for the completion of each WA task. The proposed tasks, based on the NYSDEC July 2021 WAI/NTP letter and subsequent correspondence with the NYSDEC PM, are listed below and described in detail on the following pages:

- Task 1 – Preliminary Activities
- Task 2 – Site Characterization Field Activities
- Task 3 – Site Characterization Report

Task 1 – Preliminary Activities

As part of Task 1, TRC Engineers, Inc. (TRC) will complete the following activities: a review of available historic Site information, a Site visit, and development of the WA Package. Each Task 1 activity is described below.

File Review (Completed)

TRC will review available project documents provided by the NYSDEC under this subtask. The intent will be to gain an understanding of known and potential contamination and the historic operations at the Site for the purposes of developing SC recommendations. TRC will prepare a detailed approach for the SC activities that will serve as the basis for the Schedule 1 – Scope of Work.

Site Visit (Completed)

TRC will conduct a Site inspection with the NYSDEC Project Manager under this subtask to examine the physical features, topography, and access associated with the Site, surrounding properties, and the Mud Pond. Additionally, under this subtask, TRC will communicate with representatives of the NYSDEC and NYSDOH as warranted to discuss previous environmental investigation results and the approach for executing the SC.

WA Package

As part of this subtask, TRC will prepare the WA Package for this assignment, including a cover letter and Schedule 1, Schedule 2, and Schedule 3 documentation. The complete WA Package will be sent to the NYSDEC Contract Manager and PM for review and approval. TRC will review comments provided by the NYSDEC and revise the WA Package (as necessary), also as part of this subtask.

Task 2 – Site Characterization Field Activities

General

- NYSDEC will coordinate and arrange access with property owners.
- A site-specific Health and Safety Plan (HASP) will be prepared for the investigation activities based on the generic HASP and site-specific HASP template.
- Investigation activities, including sample collection and analysis, will be completed in accordance with the Standby Engineering Services Contract, 6 NYCRR Part 375 Environmental Remediation Programs, NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC DER-10), Guidelines for Sampling and Analysis of PFAS under NYSDEC's Part 375 Programs (NYSDEC PFAS Guidance), the HASP, Field Activities Plan (FAP), and Quality Assurance Project Plan (QAPP).
- Used personal protective equipment (PPE) and disposable sampling equipment will be bagged as regular refuse and disposed of as solid waste, unless grossly contaminated.

- Environmental samples collected as part of this task will be submitted to the NYSDEC call-out laboratory for the following analyses:
    - Target Compound List (TCL) Volatile Organic Compounds (VOCs) plus 10 tentatively identified compounds (TICs) by United States Environmental Protection Agency (USEPA) Method 8260;
    - 1,4-Dioxane by USEPA Method 8270 (solid) and USEPA 8270 Selective Ion Monitoring (aqueous); and
    - Per- and polyfluoroalkyl substances (PFAS) by USEPA Method 537 Modified.
- Approximately 40% of the environmental samples collected as part of this task will also be submitted to the NYSDEC call-out laboratory for the following additional analyses:
    - TCL Semivolatile Organic Compounds (SVOCs) plus 20 TICs by USEPA Method 8270;
    - TCL Pesticides and Herbicides by USEPA Methods 8081 and 8151, respectively;
    - Target Analyte List (TAL) Metals plus Cyanide by USEPA Methods 6010, 7470 (aqueous) or 7471 (solid), and 9010; and
    - Seven Aroclor List Polychlorinated Biphenyls (PCBs) by USEPA Method 8082.
- Proposed locations for samples to be collected as part of Task 2 can be found on **Figure 1**. To aid the NYSDEC in determining call-out laboratory analytical costs, an estimated sample count is provided in **Table 1**.
- In addition to the sampling described below, quality control samples consisting of one field duplicate and one matrix spike/matrix spike duplicate (MS/MSD) sample will be collected in accordance with the QAPP (i.e., at a frequency of one per 20 sample matrix). Trip blanks will be included in each cooler shipped to the laboratory containing groundwater samples for VOC analysis. Equipment blanks will be collected in accordance with the QAPP utilizing water provided and certified to not contain PFAS by the call-out laboratory. The laboratory will provide NYSDEC Analytical Services Protocol (ASP) Category B data deliverable packages and a Data Usability Summary Report (DUSR) will be prepared. The DUSR will provide an evaluation of analytical data with the primary objective of determining if the data, as presented, satisfies the project specific criteria for data quality and use. Electronic Data Deliverables (EDDs) in EQuIS format will be submitted to NYSDEC and the results will be presented in the SC Report.

Site Survey

The Site Survey will include all monitoring wells located on the four subject landfills and supply wells identified on the neighboring mines (if any). Surveying of up to 46 monitoring wells and 5 supply wells has been included in the Work Assignment budget. The subcontracted surveyor will collect the following:

- Locations and elevations of monitoring/supply wells including elevations of adjacent ground surface, top of protective casing elevations, and top of riser elevations;
- Significant Site physical features of interest to the SC activities.

A survey report, documenting the coordinates/elevations of the well locations, including a table showing surveyed points, and a figure showing significant Site features, signed and sealed will be provided by a Professional Land Surveyor (PLS) licensed to practice in the State of New York, and included in the SC Report.

Surface Soil Sampling

To determine if potential contaminated runoff or seeps from the Queensbury or Finch Paper landfills have impacted surface soil adjacent to Mud Pond, TRC will collect up to five surface soil samples within the vegetated areas shown on **Figure 1**. Surface soil samples will be collected at 0 to 2 inches below the encountered vegetation.

The surface soil samples will be located in the field using a hand-held global positioning system (GPS) unit.

Mud Pond Surface Water and Sediment Sampling

To determine if potentially contaminated runoff, seeps, or groundwater has impacted the Mud Pond, TRC will collect co-located surface water and sediment samples from the three locations shown on **Figure 1** and described below:

- One location in the northern portion of Mud Pond and directly downgradient of the Queensbury Landfill.
- One location representing the approximate midpoint of Mud Pond.
- One location in the southern portion of Mud Pond prior to its distributary.

Due to the width, anticipated depth, and configuration of Mud Pond, it will be necessary to use a small row boat to access the proposed surface water and sediment sample locations. Since there are no public boat launches near the Site, TRC will use the trails identified during the September 28, 2021 site visit, south of the Finch Paper landfill. Alternatively, if access can be obtained by the Department to one of the residences adjacent to the southern limits of Mud Pond, TRC will use this as an area for launching and recovering the boat.

Surface water samples will be collected at a depth of 1-foot beneath the water surface. Sediment samples will be collected from the boat via a ponar dredge sampling device at an approximate depth interval of 0 to 6-inches below the sediment surface.

At each surface water sampling location, water column thickness and water quality (dissolved oxygen, pH, turbidity, oxidation-reduction potential, etc.) will be measured. Sediment samples will be screened for evidence of contamination and characterized using the Unified Soil Classification System (USCS). Observations will be recorded in a field log book.

The surface water/sediment samples will be located in the field using a hand-held GPS unit.

Leachate and Landfill Seep/Surface Water Sampling

To determine if leachate and/or seeps are impacting groundwater, TRC will sample up to two leachate/landfill seep/surface water drainage locations at each landfill (i.e., a total of eight samples). TRC will mobilize to the Site within 24-hours following a precipitation event generating at least 0.1-inches of rainfall. Based on the September 28, 2021 Site visit, several potential sample points have been identified and include:

- Ciba-Geigy Landfill – Leachate collection system.
- Queensbury Landfill – Historical leachate collection manholes located on the southeastern portion of the Site.
- Finch Paper Landfill – Drainage culverts located along the eastern landfill boundary.
- McLaughlin Landfill – No sample points identified.

Each sample will be located in the field using a hand-held GPS.

Groundwater Elevation Surface Gauging

To determine groundwater flow direction in the vicinity of the landfills, TRC will collect depth to water, total well depth, and depth to non-aqueous phase liquid (NAPL) – not anticipated to be encountered – measurements from accessible monitoring wells on all four landfills. Top of riser elevations collected during the survey subtask described above will be used to prepare a groundwater surface elevation contour map, to be provided in the SC Report. Due to the number and areal extent of monitoring wells, it is anticipated that two teams of TRC personnel will collect measurements simultaneously.

Groundwater Sampling

In order to reduce labor, material, and equipment costs associated with sampling a number of monitoring wells in excess of 100 to 170 feet deep, TRC will collect groundwater samples via new high-density polyethylene (HDPE) bailers after purging a minimum of 3 well volumes. Care will be taken to reduce sample turbidity and, if necessary, samples will be placed into larger containers, the fines will be allowed to settle out, and the water will be decanted into bottles prepared for laboratory analysis. If dedicated sampling equipment is found in the proposed monitoring wells to be sampled, the materials will be removed and replaced upon the conclusion of TRC's activities. If any individual monitoring well purges dry, TRC will return the following day to collect a sample without purging. Water quality measurements (i.e., temperature, dissolved oxygen, oxidation-reduction potential, turbidity, pH, etc.) will be collected every well volume. Alternate groundwater sampling methods will be proposed if it is determined that total purge volumes will exceed 10 gallons. For field QA/QC purposes, one duplicate sample will be collected from a monitoring well suspected to contain concentrations of 1,4-dioxane via USEPA low-flow methods.

Groundwater samples will be collected at each of the four landfills from the purple and yellow highlighted monitoring wells shown on **Figure 1** and listed below.

- Finch Paper Landfill (5 locations) – MW-B, MW-C, MW-3AR, MW-4D, and MW-4E.
- Queensbury Landfill (9 locations) – MW-1, MW-2, MW-3, MW-4, MW-5, E-1, E-2, E-3, and DO-1.
- Ciba-Geigy Landfill (up to 10 locations) – To be determined after reviewing groundwater gauging and monitoring well depth to bottom measurements.
- McLaughlin Landfill (5 locations) – MW-1, MW-2, MW-3, MW-4, and MW-5.

Mine Supply Well Sampling

To determine if groundwater contamination is present offsite and surrounding the four subject landfills, samples will be collected from supply wells potentially located on the property of the five adjacent mines. Proposed analyses for each mine sample can be found in **Table 1**. The selected mines are highlighted in purple and yellow on **Figure 1** and listed below:

- Torrington Pit Mine (Mine No. 50001)
- Ridge Road Pit #1 (Mine No. 50232)
- McLaughlin Pit (Mine No. 50074)
- Jenkinsville Pit (Mine No. 50296)
- Harris Mud Pond Mine (Mine No. 50453)

As found during the September 28, 2021 Site visit, TRC understands that one such well exists on the Harris Mud Pond Mine (Mine No. 50453) property. As observed at this supply well, it is anticipated that all mine supply wells will contain a pump. If functioning, TRC will collect supply well samples utilizing the existing downhole pump and associated tap/spigot. If not functioning, TRC will attempt to carefully sample using an HDPE bailer.

Task 3 – Site Characterization Report

The SC Report will be prepared in accordance with the applicable provisions of NYSDEC DER-10 and include the following:

- Background information for the Site.
- Applicable information for each landfill, to be provided by the Division of Materials Management (DMM).
- Description of the characteristics of the area investigated, including physical features, topography, geology, hydrogeology, etc. as reported by others.
- Description of field investigation activities performed.

- Identification of applicable standards, criteria, and guidance (SCGs).
- Investigation, testing, and sampling results including a comparison to SCGs (as applicable).
- Data usability evaluation.
- Figures showing site location, site features, sample locations, groundwater surface elevations, contaminant distribution, etc.
- Conclusions regarding the significance of SC findings including an evaluation for reclassification/delisting and recommendations for additional investigation activities, as appropriate.
- Supporting documentation (photograph logs, groundwater sampling logs, etc.) as appendices.

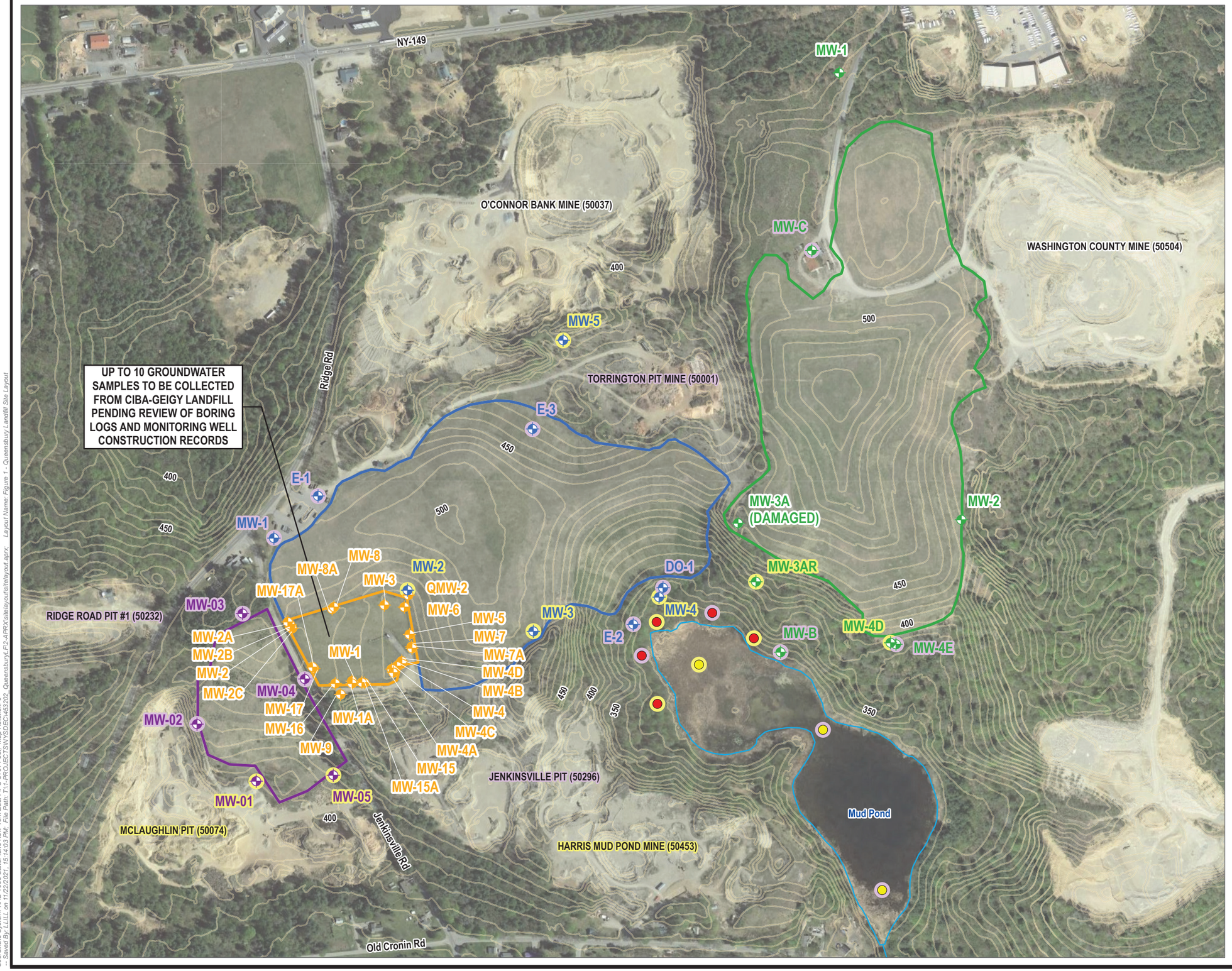
Project Schedule

Presented below is a milestone schedule for implementation of each of the tasks described above. The schedule will be updated periodically and summarized in the regular monthly project progress reports during project implementation.

Task No.	Task Description	Estimated Completion Date
1	*Preliminary Activities*	
	File Review (Completed)	August 2021
	Site Visit (Completed)	September 2021
	WA Package	November 2021
2	*Site Characterization Field Activities*	
	Site Survey	November – December 2021 *As weather conditions allow[1]
	Surface Soil Sampling	
	Mud Pond Surface Water and Sediment Sampling	
	Leachate and Landfill Seep/Surface Water Sampling	
	Groundwater Elevation Surface Gauging	
	Groundwater Sampling	
	Mine Supply Well Sampling	
3	*Site Characterization Report*	July 2022[2]

[1]Due to the size, location, and accessibility of each landfill, if inclement weather prevents the completion of any individual subtask, the incomplete subtasks will be completed in Spring 2022.

[2]Subject to change based upon completion date of Task 2 Field Activities.



LEGEND

- MCCLAUGHLIN LANDFILL MONITORING WELL
- CIBA-GEIGY LANDFILL MONITORING WELL
- QUEENSBURY LANDFILL MONITORING WELL
- FINCH PAPER LANDFILL MONITORING WELL
- PROPOSED SURFACE WATER/SEDIMENT SAMPLE LOCATION
- PROPOSED SURFACE SOIL SAMPLE LOCATION
- TOPOGRAPHIC CONTOURS (10' INTERVALS)
- MCCLAUGHLIN LANDFILL
- CIBA-GEIGY LANDFILL
- FINCH PAPER LANDFILL
- QUEENSBURY LANDFILL
- MUD POND

NOTES:

1. ALL MONITORING WELL LOCATIONS, PROPOSED SAMPLE LOCATIONS AND LANDFILL BOUNDARIES ARE APPROXIMATE.

2. PROPOSED SAMPLE LOCATIONS HIGHLIGHTED IN PURPLE WILL BE ANALYZED FOR TCL VOCS, 1,4-DIOXANE, AND PFAS (21 COMPOUND LIST).

3. PROPOSED SAMPLE LOCATIONS HIGHLIGHTED IN YELLOW WILL BE ANALYZED FOR THE FOLLOWING:

   - TCL VOCS + 10
   - TCL SVOCS + 20
   - TCL PESTICIDES
   - TCL HERBICIDES
   - TAL METALS + CYANIDE
   - PCBS (7 AROCHLOR LIST)
   - PFAS (21 COMPOUND LIST)
   - 1,4-DIOXANE

4. NOT SHOWN, SAMPLES WILL BE COLLECTED FROM UP TO 10 WELLS ASSOCIATED WITH THE CIBA-GEIGY LANDFILL. UP TO FOUR SAMPLES WILL BE ANALYZED FOR THE PARAMETERS LISTED UNDER NOTE 3. THE REMAINING SAMPLES WILL BE ANALYZED FOR THE PARAMETERS LISTED IN NOTE 2.

5. PROPOSED LEACHATE AND SEEP/SURFACE WATER SAMPLE LOCATIONS ARE NOT SHOWN AND WILL BE DETERMINED IN THE FIELD BASED ON OBSERVED CONDITIONS.

N

1:5,400
1" = 450'

BASE MAP: GOOGLE EARTH IMAGERY
DATA SOURCES: TRC
SHEET SIZE: 11X17L

0 450 900 FEET

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
QUEENSBURY LANDFILL - SITE NO. 557005
RIDGE ROAD
QUEENSBURY, NEW YORK 12801

TITLE:
PROPOSED SAMPLE LOCATION MAP

DRAWN BY:	L. LILL	PROJ. NO.:	453202.0000.0000
CHECKED BY:	J. KING		FIGURE 1
APPROVED BY:	J. MAGDA		
DATE:	NOVEMBER 2021		

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FILE: sitelayout.aprx

Coordinate System: NAD 1983 StatePlane New York East FIPS 3101 Feet; Map Rotation: 0
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Table 1
New York State Department of Environmental Conservation
Queensbury Landfill (Site No. 557005)
Queensbury, New York
Site Characterization
Sample Analysis Summary

Sample Location	Sample Quantity	Proposed Analysis								
		TCL VOCs	1,4-Dioxane	PFAS (21 Compounds)	TCL SVOCs	TCL Pesticides	TCL Herbicides	TAL Metals	Cyanide	PCBs (7 Aroclors)
Surface Soil Sampling										
Downgradient of Finch Paper and Queensbury Landfills										
Various	2	x	x	x						
	3	x	x	x	x	x	x	x	x	x
Quality Assurance/Quality Control										
Blind Duplicate	1	x	x	x	x	x	x	x	x	x
MS/MSD	2	x	x	x	x	x	x	x	x	x
Sub-Total	**8**	**8**	**8**	**8**	**6**	**6**	**6**	**6**	**6**	**6**
Mud Pond Surface Water and Sediment Sampling										
Mud Pond Surface Water										
Northern End	1	x	x	x	x	x	x	x	x	x
Midpoint	1	x	x	x						
Southern End	1	x	x	x						
Mud Pond Sediment										
Northern End	1	x	x	x	x	x	x	x	x	x
Midpoint	1	x	x	x						
Southern End	1	x	x	x						
Quality Assurance/Quality Control										
Trip Blank	1	x								
Blind Duplicate	2	x	x	x	x	x	x	x	x	x
MS/MSD	4	x	x	x	x	x	x	x	x	x
Sub-Total	**13**	**13**	**12**	**12**	**8**	**8**	**8**	**8**	**8**	**8**
Leachate and Landfill Seep/Surface Water Sampling										
Landfill Location										
Queensbury Landfill	1	x	x	x	x	x	x	x	x	x
	1	x	x	x						
Ciba-Geigy	1	x	x	x	x	x	x	x	x	x
	1	x	x	x						
Finch Paper Landfill	1	x	x	x	x	x	x	x	x	x
	1	x	x	x						
McLauglin Landfill	1	x	x	x	x	x	x	x	x	x
	1	x	x	x						
Quality Assurance/Quality Control										
Trip Blank	1	x								
Blind Duplicate	1	x	x	x	x	x	x	x	x	x
MS/MSD	2	x	x	x	x	x	x	x	x	x
Sub-Total	**12**	**12**	**11**	**11**	**7**	**7**	**7**	**7**	**7**	**7**
Groundwater Sampling										
Queensbury Landfill										
MW-1	1	x	x	x						
MW-2	1	x	x	x	x	x	x	x	x	x
MW-3	1	x	x	x	x	x	x	x	x	x
MW-4	1	x	x	x	x	x	x	x	x	x
MW-5	1	x	x	x	x	x	x	x	x	x
E-1	1	x	x	x						
E-2	1	x	x	x						
E-3	1	x	x	x						
DO-1	1	x	x	x						
Ciba Geigy Landfill										
Various	6	x	x	x						
Various	4	x	x	x	x	x	x	x	x	x
Finch Paper Landfill										
MW-B	1	x	x	x						
MW-C	1	x	x	x	x	x	x	x	x	x

Table 1
New York State Department of Environmental Conservation
Queensbury Landfill (Site No. 557005)
Queensbury, New York
Site Characterization
Sample Analysis Summary

Sample Location	Sample Quantity	Proposed Analysis								
		TCL VOCs	1,4-Dioxane	PFAS (21 Compounds)	TCL SVOCs	TCL Pesticides	TCL Herbicides	TAL Metals	Cyanide	PCBs (7 Aroclors)
Finch Paper Landfill (cont.)										
MW-3AR	1	x	x	x	x	x	x	x	x	x
MW-4D	1	x	x	x	x	x	x	x	x	x
MW-4E	1	x	x	x						
McLaughlin Landfill										
MW-1	1	x	x	x	x	x	x	x	x	x
MW-2	1	x	x	x						
MW-3	1	x	x	x						
MW-4	1	x	x	x						
MW-5	1	x	x	x	x	x	x	x	x	x
Quality Assurance/Quality Control										
Trip Blank	3	x								
Blind Duplicate	2	x	x	x	x	x	x	x	x	x
MS/MSD	4	x	x	x	x	x	x	x	x	x
Sub-Total	**38**	**38**	**35**	**35**	**19**	**19**	**19**	**19**	**19**	**19**
Mine Supply Well Sampling										
Mine Name										
Torrington Pit Mine	1	x	x	x						
Ridge Road Pit	1	x	x	x						
McLaughlin Pit	1	x	x	x	x	x	x	x	x	x
Jenkinsville Pit	1	x	x	x						
Harris Mud Pond Mine	1	x	x	x	x	x	x	x	x	x
Quality Assurance/Quality Control										
Trip Blank	1	x								
Blind Duplicate	1	x	x	x	x	x	x	x	x	x
MS/MSD	2	x	x	x	x	x	x	x	x	x
Sub-Total	**9**	**9**	**8**	**8**	**5**	**5**	**5**	**5**	**5**	**5**
Total	***80***	***80***	***74***	***74***	***45***	***45***	***45***	***45***	***45***	***45***

Notes:
MS/MSD : Matrix Spike/Matrix Spike Duplicate
PCBs : Polychlorinated Biphenyls (7 Aroclor List)
PFAS : Per- and Polyfluoroalkyl Substances (21 Compound List)
SVOCs : Semivolatile Organic Compounds
TAL : Target Analyte List
TCL : Target Compound List
VOCs : Volatile Organic Compounds