Scope of Work
Saugerties Town Landfill, Site #356003

Background

The Saugerties Town Landfill Site #356003 site (the "Site") is 44-acre plot, located at 1765 Route 212, Saugerties, Ulster County, New York, within which is an inactive landfill. The Site is being investigated as the potential source of perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), and 1,4-dioxane contamination in groundwater.

Sampling performed by the NYSDEC Division of Material Management (DMM) in October 2017, yielded groundwater exceedances for PFOA, PFOS, and 1,4-dioxane above the New York State Water Quality Council recommended maximum contaminant levels (MCLs) for drinking water. The New York State Department of Health (DOH) published the MCLs in the State Register on August 26th, 2020. The MCLs for drinking water are 10 nanograms per Liter (ng/L) for both PFOA and PFOS, and 1 microgram per Liter (µg /L) for 1,4-dioxane.

The sum of PFOA + PFOS in the measured well, MW-6X, also exceeds the EPA's health advisory level of 70 ng/L. PFOA+PFOS was detected at 101 ng/L and 1,4-dioxane was detected at 4.1 microgram per Liter (µg/L). This well is located to the south-southwest of the landfill and considered downgradient based on the historic landfill investigations closure documents.

Per the established Inactive Landfill Initiative (ILI) process, a focus list of potential private drinking water well receptors was prepared. Following private well sampling rounds, multiple private wells were found to exceed drinking water MCLs. Subsequently, the residents of this area have been placed in an alternate water supply program.

Following this course of action, a site characterization was recommended to be performed to evaluate whether the site is a source of contamination and if so, whether the contamination is significantly impacting the environment and/or public health.

The detailed scope of work outlined in Tasks 1 through 3 below define CDM Smith's scope of work.

Task 1 – Preliminary Activities

A site reconnaissance and well survey shall be performed under this task and include the following activities:

- CDM Smith will incorporate residential well build information into our hydrogeological database if NYSDEC is able to obtain this information from any of the residential wells within a ¼ mile radius of the landfill.
- An environmental database search and review (Environmental Data Resources or EDR Report) shall be performed by CDM Smith.

- A site reconnaissance and monitoring well survey shall be performed on the site property to locate and assess the condition of existing monitoring wells, the leachate sump, and any seeps, sediment, or surface water. The reconnaissance shall also include a walk-through of the historical dump areas outside the landfill for potential surface contamination indicators. Additional site features and potential access issues that may impact the implementation of the field program shall be documented.

Task 2 – Surveys/Investigations, Environmental Sampling and Implementation

Task 2 shall include two phases of field. The work under each phase may be adjusted based on the results of Task 1. The data collected from Phase 1 shall be used to focus Phase 2's (if needed) site characterization activities.

Activities to be performed under Task 2 include the following:

Phase 1 - Onsite Field Work and Analysis

- Existing monitoring wells and/or the leachate sump shall be rehabilitated if needed. For budgeting purposes, it is assumed two monitoring wells will be rehabilitated.
- One round of synoptic water levels shall be collected from existing Site monitoring wells. Samples shall be collected from all existing onsite monitoring wells, the leachate sump, and all identified onsite seeps, sediment, and surface water. Select aqueous samples shall be analyzed for the following:
    - Target Compound List (TCL) volatile organic compounds (VOCs) plus 10 Tentatively Identified Compounds (TICs) by United States Environmental Protection Agency (USEPA) Method 8260;
    - TCL semi-volatile organic compounds (SVOCs) plus 20 TICs by USEPA Method 8270;
    - TCL pesticides and herbicides by USEPA Methods 8081 and 8151;
    - Target Analyte List (TAL) metals plus mercury and cyanide by USEPA Methods 6010, 7471, and 9010;
    - Polychlorinated biphenyls (PCBs) by USEPA Method 8082

  All aqueous samples shall be analyzed for:

    - 1,4-Dioxane by USEPA Method 8270D Selected Ion Monitoring (SIM)
    - PFAS (21 compound list) by USEPA Method 537 Modified.

  Select non-aqueous samples shall be analyzed for the following:

    - TCL VOCs plus 10 TICs by USEPA Method 8260

- TCL SVOCs and 1,4-dioxane plus 20 TICs by USEPA Method 8270;
- TCL pesticides and herbicides by USEPA Methods 8081 and 8151;
- TAL metals plus mercury and cyanide by USEPA Methods 6010, 7471, and 9010;
- PCBs by USEPA Method 8082; and

All non-aqueous samples shall be analyzed for:

- PFAS (21 compound list) by USEPA Method 537 Modified.
- 1,4-Dioxane by USEPA Method 8270D

A subset (25%) of non-aqueous samples shall be analyzed for the following in addition to the above:

- Synthetic precipitation leaching procedure (SPLP) PFAS (21 compound list) by USEPA Method 537 Modified;
- Total organic carbon by the Lloyd Kahn Method; and
- pH by USEPA Method 9045D.

- Data will be validated by a subcontractor.
- Aqueous samples shall be collected for Total Oxidizable Precursor Assay (TOPA) and placed on hold at the laboratory for potential future analysis.

Phase 2 – Field Work and Analysis (if needed to classify the Site)

CDM Smith will compile and evaluate the Phase 1 data with respect to the objectives of this work assignment. CDM Smith will summarize the Phase 1 results, conceptual site model, and any potential data gaps and communicate the findings to NYSDEC in a technical presentation. If needed in order to accomplish the objectives, Phase 2 field work will be conducted by CDM Smith at the direction of NYSDEC. The following work is presented for budgeting purposes:

- A utility location geophysical survey, including GPR shall be conducted by the drilling subcontractor to clear all Phase 2 borings/wells of utilities.
- After evaluating the results of the data collected from existing wells, leachate, seeps, surface water, and sediment, an assumed 5 monitoring wells shall be installed onsite. For budgeting, no well repairs or rehabilitation is assumed to be required by the drillers.
- Additionally, an assumed 5 monitoring wells shall be installed offsite to characterize contaminant concentrations and groundwater flow direction in the shallow bedrock aquifer. The new and existing monitoring well network will evaluate groundwater flow direction both onsite and offsite, in the vicinity of offsite residential wells on Sawood Lane, Artist Road, and John Joy Road.

- Monitoring wells shall be installed as follows:
    - Wells shall be installed via HSA/air rotary and developed to characterize contaminant concentrations and groundwater flow direction in the shallow bedrock aquifer onsite.
    - Wells are assumed to be approximately 30 feet deep; final depths and construction shall be determined following the completion of Phase 1.
    - Newly installed wells shall be surveyed by a licensed surveyor subcontractor.
- One round of synoptic water levels shall be collected from all new and existing Site monitoring wells.
- Groundwater shall be collected from all new Phase 2 monitoring wells, and select samples shall be analyzed for the following:
    - TCL VOCs plus 10 TICs by USEPA Method 8260;
    - TCL SVOCs plus 20 TICs by USEPA Method 8270;
    - TCL pesticides and herbicides by USEPA Methods 8081 and 8151;
    - TAL metals plus mercury and cyanide by USEPA Methods 6010, 7471, and 9010;
    - PCBs by USEPA Method 8082

  With all samples being analyzed for:
    - 1,4-Dioxane by USEPA Method 8270D SIM
    - PFAS (21 compound list) by USEPA Method 537 Modified.
- Select samples will be collected for TOPA and placed on hold at the laboratory for potential future analysis.

  An assumed 10 soil borings shall be advanced via DPT to bedrock to investigate potential vadose zone sources. Continuous macrocores shall be collected, logged, and screened via PID. One surface soil sample (0-0.5 feet bgs), one subsurface soil sample (0.5-3 feet bgs), and one soil sample at the top of bedrock shall be collected.

  Select samples shall be analyzed for the following:
    - TCL VOCs plus 10 TICs by USEPA Method 8260
    - TCL SVOCs and 1,4-dioxane plus 20 TICs by USEPA Method 8270;
    - TCL pesticides and herbicides by USEPA Methods 8081 and 8151;

- TAL metals plus mercury and cyanide by USEPA Methods 6010, 7471, and 9010;
- PCBs by USEPA Method 8082

All samples will be analyzed for:

- PFAS (21 compound list) by USEPA Method 537 Modified.
- 1,4-Dioxane by USEPA Method 8270D

A subset (4 to 5) of the 0.5-3.0 feet bgs interval samples shall be analyzed for the following in addition to the above:

- SPLP PFAS (21 compound list) by USEPA Method 537 Modified;
- Total organic carbon by the Lloyd Kahn Method; and
- pH by USEPA Method 9045D.

- Depending on the results of the monitoring well sampling and hydrogeologic data collected, some or all of the TOPA samples collected and put on hold will be analyzed by a commercial laboratory. There is no established analytical method for TOPA; CDM Smith will work with the NYSDEC chemist as needed to ensure data quality.
- If required by NYSDOH, residential well sampling will be completed. Up to four days have been assumed for budgeting. The samples shall be submitted for PFAS analysis and 1,4-dioxane analysis. Method 8270D SIM will be used for the 1,4-dioxane analysis. PFAS methods will be as described in *NYSDEC Sampling, Analysis an Assessment of Per- and Polyfluoroalkyl Substances (PFAS)* (October 2020).
- Data will be validated.

Additional Requirements

- All drill cuttings and development water shall be drummed and staged in a central location during field activities and will be disposed by a licensed waste hauler.
- CDM Smith shall collect the samples as defined above and this will also include: coordination of sample bottles/coolers with standby laboratory, pre-field work preparation (labelling/organizing sample bottles, ordering rental field equipment, purchasing consumable equipment items, etc.), travel costs, and shipment of samples to standby laboratory.
- The standby laboratory shall perform the analysis, prepare Electronic Data Deliverables (EDDs) meeting the most current NYSDEC Environmental Information Management System (EIMS) format, and submit Category B ASP reports.
- It is assumed that laboratory analysis will be performed by NYSDEC's standby contract laboratory. This service is not included in this scope of work.

Task 3 – Site Characterization Report

Activities to be performed under Task 3 includes the following:

- CDM Smith will review and prepare the draft EDDs from laboratory and send the EDDs and Category B ASP lab reports for validation. Validation will be completed by submission of a Data Usability Summary Report (DUSR) and revised EDDs containing validation qualifiers.
- CDM Smith shall review the validated groundwater monitoring EDDs to ensure compliance to the NYSDEC EIMS database. CDM Smith shall submit the validated EDDs for upload to NYSDEC's EIMS database.
- CDM Smith shall prepare a draft Site Characterization Report (SCR) for the Site in accordance with DER 10 Section 3.13.
- After receiving comments on the draft from NYSDEC, CDM Smith will prepare a final SCR. CDM Smith shall complete and stamp/sign NYSDEC's Certification Questionnaire and submit with the Final Report.

Schedule

The table on the following provides the draft schedule for this work assignment.

Project Milestone	Date
Approval of Schedule 1 and 2.11s	September 28, 2020
Task 1 – Preliminary Activities	
Task 1 – Schedule 1 and 2.11s Package	March 31 – September 28, 2020
Task 1 – Site Reconnaissance and Well Survey	September 23, 2020
Task 1 – Project Management	March 31, 2020 – May 30, 2021
Task 2– Surveys/Investigations Environmental Sampling and Implementation	September 28, 2020 – December 31, 2020 (pending the lifting of COVID-19 restrictions)
Task 2 – Phase 1 Field Work and Analysis	November 2 – November 20, 2020
Task 2 – Phase 2 Field Work and Analysis (if needed to classify the Site)	November 23 – December 31, 2020
Task 3 – Final Report	
Task 3 – 2020 Data Validation Submittal	January 30, 2021 (or 30 days after Phase 1, if Phase 2 is not required)
Task 3 – Submit Final SCR	May 30, 2021 (or 120 days after Data Validation Submittal)