Final Engineering Report
for the
Depew Village Landfill Site

Village of Depew
Erie County, New York
NYSDEC Site No. 915105

August 2020

Prepared for:
New York State Department of Environmental Conservation
Division of Remediation
Remedial Bureau E
625 Broadway, Albany, New York 12233-7017

Prepared by:
Ecology and Environment Engineering and Geology, P.C.
368 Pleasant View Drive
Lancaster, New York 14086
716.684.8060

ENGINEER'S CONSTRUCTION CERTIFICATION

I, Neil Joseph Brown, certify that I am currently a registered professional engineer licensed by the State of New York. I had primary direct responsibility for the implementation of the remedial program activities, and I certify that the Remedial Action for the Depew Village Landfill Site (NYSDEC Contract Number D007617-10) was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Design.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Design and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established for the remedy.

I certify that all documents generated in support of this report have been submitted in accordance with the Division of Environmental Remediation's electronic submission protocols and have been accepted by the Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Neil Joseph Brown of Ecology and Environment Engineering and Geology, P.C., am certifying as the Owner's Designated Site Representative for the site.

Signature: _____

Neil Joseph Brown, P.E.

Date: 8/25/2020

Table of Contents

Table of Contents (cont.)

Section **Page**

Table of Contents (cont.)

Section **Page**

Section **Page**

Section **Page**

Table of Contents (cont.)

Section **Page**

Section Page

Appendices for Phase 1 (OU-1)

Appendices for Phase 2 (OU-1 and OU-2)

Table of Contents (cont.)

Table of Contents (cont.)

List of Tables

Table **Page**

List of Tables (cont.)

Table **Page**

List of Figures

Figure **Page**

List of Abbreviations and Acronyms

ALTA	American Land Transfer Association
CAMP	Community Air Monitoring Program
CAP	Contractor's Application for Payment
Cardno	Cardno JF/New Landscaping Nursery
CCS	Construction Completion Summary
CFR	Code of Federal Regulations
cfs	cubic feet per second
Clear Creek	Clear Creek Land Surveying, LLC
CO	Change Order
CRZ	Contamination Reduction Zone
CWTS	contact water treatment system
DBH	diameter at breast height
decon pad	decontamination pad
DER	Division of Environmental Remediation (NYSDEC)
DIR	Daily Inspection Report
DOR	Daily Observation Report
DUSR	Data Usability Summary Report
DPW	Department of Public Works
ECL	Environmental Conservation Law
EDD	Electronic Data Deliverable
E & E	Ecology and Environment Engineering and Geology, P.C.
EPA	United States Environmental Protection Agency
FER	Final Engineering Report
FO	field order
FPM	Final Project Manual
FS	Feasibility Study
GES	Groundwater and Environmental Services, Inc.
H2M	Holzmacher McLendon Murrell Laboratories
HASP	Health and Safety Plan

List of Abbreviations and Acronyms (cont.)

HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	high-density polyethylene
LDB	left descending bank
LEL	lowest effect level
MBE/WBE	minority-/women-owned business enterprise
MCI	Mark Cerrone, Inc.
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MMCE	McMahon & Mann Consulting Engineers, P.C.
NAVD88	North American Vertical Datum of 1988
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOL	New York State Department of Labor
NYSDOT	New York State Department of Transportation
ORF	Overflow Retention Facility
OU	Operable Unit
Paradigm	Paradigm Environmental Services, Inc.
PCB	polychlorinated biphenyl
PCO	Proposed Change Order
PP	Primary Pollutant
PPE	Personal Protective Equipment
ppm	parts per million
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RDB	right descending bank
RDI	Russo Development, Inc.
RFI	Request for Information
RI	Remedial Investigation
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SCG	Standards, Criteria and Guidance

List of Abbreviations and Acronyms (cont.)

SCO	Soil Cleanup Objective
SEL	Severe Effects Level
SI/RR	Site Investigation/Remedial Report
SMP	Site Management Plan
SPDES	storm pollutant discharge elimination system
SSO	Site Safety Officer
SVOC	semivolatile organic compound
SWPPP	Storm Water Pollution Prevention Plan
TAT	turnaround time
TREC	TREC Environmental, Inc.
USACE	United States Army Corps of Engineers
VOC	volatile organic compound
VRQ	Vendor Responsibility Questionnaire

1 Background and Site Description

This Final Engineering Report (FER) provides information and details on the completion of the phased remedial construction work at the site of a former landfill at the Depew Village Landfill Site, New York State Department of Environmental Conservation (NYSDEC) Site No. 915105. The work was completed under Remedial Action Contract D008513 between NYSDEC and Russo Development, Inc. (RDI), of Blasdell, New York, and Remedial Action Contract D009682 between NYSDEC and Mark Cerrone, Inc. (MCI), of Niagara Falls, New York.

Additional standby call-out support services for remedial work were performed by Groundwater and Environmental Services, Inc. (GES) of Cheektowaga, New York, and TREC Environmental, Inc. (TREC), of Spencerport, New York, prior to issuance of the Remedial Action Contract in Area 4 and after MCI completed the Phase 3 remedial activities. Ecology and Environment Engineering, P.C., whose name has subsequently changed to Ecology and Environment Engineering and Geology, P.C. (hereinafter cumulatively referred to as E & E) of Lancaster, New York, provided engineering design services and construction management services during remedial construction from September 2011 to October 2011 (Phase 1), August 2012 to December 2013 (Phase 2), and August 2016 to December 2017 (Phase 3).

1.1 Site Location and Description

The Depew Village Landfill Site is located in the village of Depew and town of Cheektowaga, Erie County, New York (see Figure 1-1). The approximately 20-acre site is located on a peninsula bordered by Cayuga Creek and is within the 100-year floodplain of the creek. Zurbrick Road is located across the creek to the south, Borden Road is to the west, and the Village of Depew Department of Public Works (DPW) facilities are to the north of the site (see Figure 1-2). An Erie County Sewer District No. 4 Overflow Retention Facility (ORF) sits on the site in the central section of the peninsula. A utility corridor, access road right-of-way (ROW), and a permitted State Pollution Discharge Elimination System outfall are associated with the ORF. The site's general setting is suburban.

The Village of Depew DPW and private lands are located north of the site. Other sites in the area that are being addressed under NYSDEC's remedial programs include the Land Reclamation site (Site No. 915070) and the Old Land Reclamation site (Site No. 915129), which are located approximately ½-mile downstream; and

the NL Industries site (Site No. V00353), which is located approximately 1-½ miles to the north.

Cayuga Creek is a Class C stream and a major tributary of the Buffalo River, which ultimately empties into Lake Erie. The creek forms the southern, eastern, and western boundaries of the peninsula. The stream's drainage area encompasses approximately 112 square miles and is characterized by alluvial deposits. The creek has a well-defined floodplain and floodway, a meandering channel, and a streambed consisting of riffle/pool sequences and point sand bar deposits within the active channel. The average flow rate in the stream is approximately 110 cubic feet per second (cfs); however, the stream exhibits an 85% likelihood of reaching or exceeding a flood stage depth of 8 feet each year. A mix of public and private lands borders the stream adjacent to the site area, and property boundaries extend to the stream's centerline.

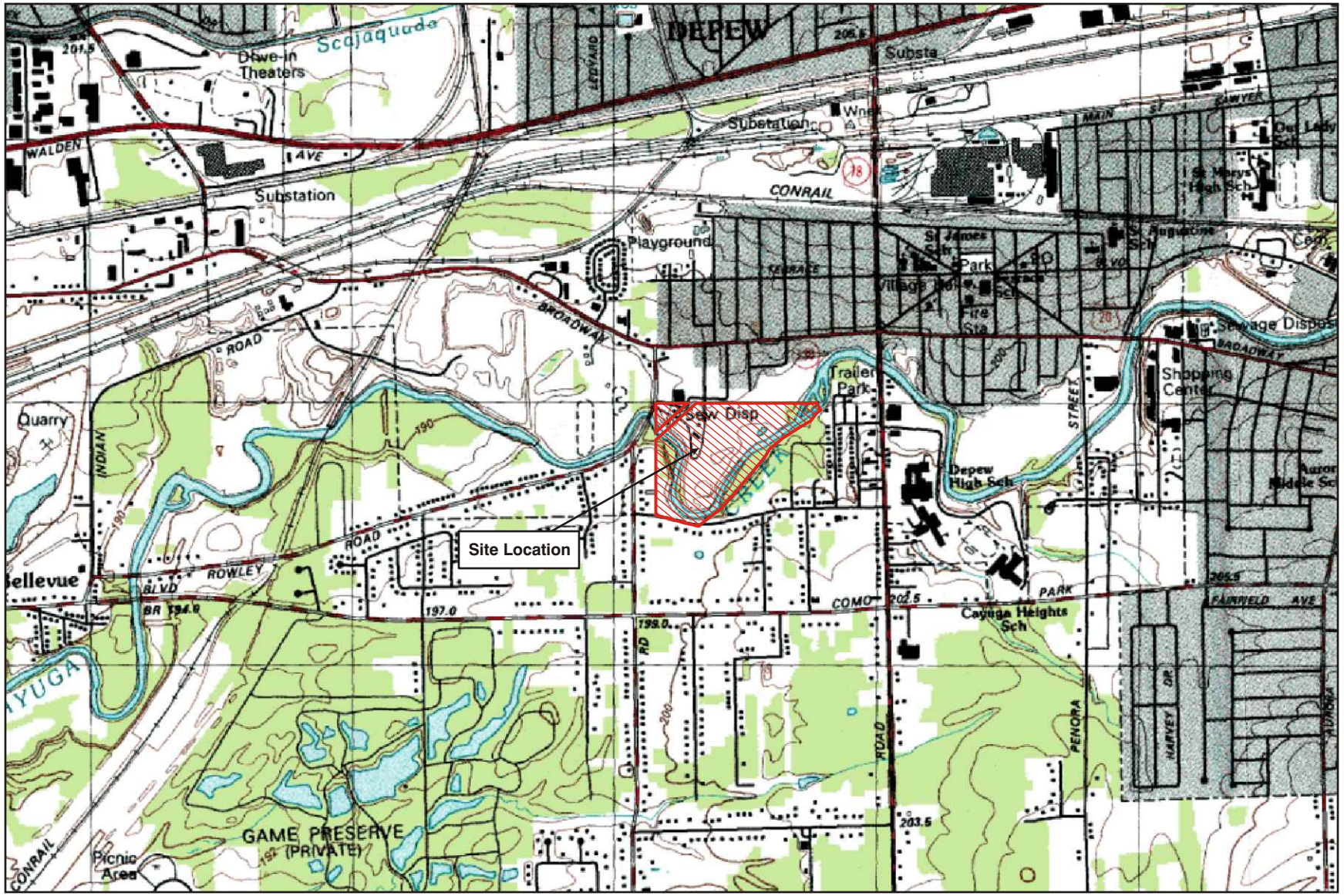
The site is underlain by fractured and jointed Onondaga limestone, which also forms the bed of Cayuga Creek in some areas. The depth to bedrock on the site varies from approximately 7 to 25 feet. The bedrock is overlain by a silty, clayey till, which in turn is overlain by lenses of alluvial sand and gravel deposits from Cayuga Creek. Above these deposits lie fill material consisting of black and grey ash residue, glass, metal, and other municipal solid waste. The fill material ranges from 1 to 19 feet deep and is typically encountered 2 feet below the ground surface. In portions of the site, the fill material is near the ground surface, particularly on the sides of the ORF and on the tip of the peninsula. Erosion has exposed fill material in sections of the on-site stream bank. The former landfill footprint encompasses much of the peninsula area.

Surface water collects in low-lying areas in the northeast portion of the site. Most precipitation infiltrates the site soils/fill material; however, the steep western portion of the site, some segments of the eastern sides of the landfill, and the impervious areas in the northwest portion of the site promote localized surface water runoff.

Groundwater occurs in the overburden/fill material at depths ranging from 8 to 15 feet below ground surface. Local groundwater flow at the site is from north to south and then radially towards Cayuga Creek on the peninsula area.

Operable Unit (OU) No. 01 (OU-01) consists of approximately 20 acres of area contained within the banks of Cayuga Creek on the peninsula south of the Village of Depew DPW facility. OU-01 includes the footprint of the former landfill, excluding the ORF and associated structures. The northern boundary of OU-01 (extending west to east) is identified as a combination of the southern perimeter of the Village of Depew DPW parking lot across to the tree line that abuts the mowed fields in the northeast, continuing to the bank of Cayuga Creek. Zurbrick Road is located south of the former landfill, across Cayuga Creek.

02:002699_ID13_09-Fig1-1.CDR-04/27/06-GRA



SOURCE: USGS 7.5' Topographic Map, Lancaster, NY Quadrangle (1982)

Approximate Scale

0 2,000 4,000 Feet

Figure 1-1 Site Location Map, Depew Village Landfill Site, Depew, NY

OU No. 02 (OU-02) includes a section of the Cayuga Creek environment (i.e., surface water, sediments, and floodplain soils) and a segment of stream bank located parallel to north side of Zurbrick Road (Zurbrick Road slope). The Zurbrick Road slope area is comprised of two property parcels: one owned by Erie County (1.12 acres) and the other owned by the Village of Depew (0.35 acres).

Waste on the Zurbrick Road slope has the same physical appearance and similar chemical makeup as the ash in OU-01. Based on the Remedial Investigation Report for the Depew Village Landfill Site, Volume I, these findings and the proximity of the Zurbrick Road slope area to the landfill indicates that the slope soils were taken from the landfill (E & E 2007a).

1.2 Landfill History and Operations

The Depew Village Landfill was operated by the Village of Depew between 1940 and 1961. During operations, the landfill received approximately 10,000 tons per year of municipal solid waste and/or other unknown waste streams. Much of the wastes were processed through an incinerator in an on-site building, and the resulting ash was disposed of in the landfill. Site hazardous waste contamination, including heavy metals and lead, appears to have been concentrated in the ash residue. The former landfill was not lined, and spent foundry sand was reportedly used as daily cover on the landfill.

A summary of the remedial history and site investigation is as follows.

- In 1983, NYSDEC first listed the site as a Class 2a site in the Registry of Inactive Hazardous Waste Disposal Sites in New York (the Registry). Class 2a was a temporary classification assigned to a site that had inadequate and/or insufficient data for inclusion in any other classifications. Also in 1983, Erie County acquired 14.5 acres of the peninsula area for the ORF project. The ORF is used to hold excess storm and wastewater prior to treatment. During ORF construction, approximately 60,000 CY of fill was removed from the Site and disposed of in the Browning Ferris Industries Landfill in Tonawanda, New York. No chemical analysis was performed on the fill. Following ORF construction, Erie County transferred 9.5 acres back to the Village of Depew.
- In 1985, the Erie County Department of Environment and Planning prepared a Hazardous Waste Site Profile Report, which concluded that no hazardous waste was disposed of at the Site.
- In 1988, NYSDEC conducted a Phase I Investigation at the site (Engineering Science, Inc., and Dames and Moore 1988). This report recommended conducting a Phase II Investigation.
- In 1990, NYSDEC delisted the Site from the Registry of Inactive Hazardous Waste Disposal Sites, based upon the determination that no hazardous wastes were present (NYSDEC 2008b).

- In 2001, the Village of Depew entered into a Section 14 (1946 Flood Control Act), Project Cooperation Agreement with the USACE to perform an emergency stream bank protection project on a section of Cayuga Creek below Zurbrick Road, south of the site. The project included excavating soils on the site peninsula tip, in order to maintain the required stream bed width and placing these soils on the opposite stream bank as fill. During the excavation, the USACOE contractor noticed the presence of fill materials and conducted sampling and analysis. The soil analysis indicated total lead concentrations as high as 86,000 ppm, and the samples also failed the United States Environmental Protection Agency's (EPA) Toxicity Characteristics Leaching Procedure for leachable lead; as a result, the material was classified as hazardous. Since hazardous waste was present, and in accordance with the Project Cooperation Agreement, the USACOE ceased operations on the streambank stabilization project.
- In 2002, the Village of Depew entered the NYSDEC Voluntary Cleanup Program and the Site was designated as number V00609-9. In 2003, a Site Investigation was conducted by the Village's consultant, who focused on the 1.3-acre area at the landfill tip.
- In 2004, the SI/RR was generated (Pan-American Environmental and URS 2004). This report confirmed the presence of hazardous wastes and it also indicated that the lead contamination most likely extends to the north, beyond the landfill tip (see Figure 1-2). Based upon the estimated volumes of hazardous material thought to be present, the Village of Depew opted out of the Voluntary Cleanup Program, the Voluntary Cleanup Agreement was terminated, and NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. Because the hazardous waste in the site represented a significant threat to public health and the environment, a RI/FS was recommended for the site.
- In early 2007, NYSDEC finalized a Site Boundary Modification Package, which increased the landfill area site size in the Registry from 1.3 to 20 acres (NYSDEC 2008a). The site boundary modification was based upon the extent of the lead contamination and landfill footprint as determined from the RI results.
- The 2007 RI report for OU-01 stated that lead concentrations in sediments were significantly above applicable New York State standards, criteria, and guidance (SCGs) in samples collected from Cayuga Creek (E & E 2007a). The investigation determined that contaminated fill materials at the landfill were placed along and above the natural stream bank elevations around the peninsula and were present on the Zurbrick Road slope. The presence of contaminated fill below the bankfull flow elevation (roughly the mean high water level) along the stream banks along the site has resulted in the erosion of these exposed materials by the flow of Cayuga Creek and their deposition within the creek sediments. The extent of the impacts on the Cayuga Creek environment and the extent of the soil contamination on the Zurbrick Road slope were not

LEGEND

- OU-1 BOUNDARY
- OU-2 BOUNDARY
- MW-04 MONITORING WELL LOCATION

NOTE

THE VILLAGE OF DEPEW LANDFILL SITE IS LOCATED WITHIN A 100 YEAR FLOOD PLAIN.

SITE LAYOUT MAP

SCALE: 1" = 200'-0"

SCALE IN FEET

0 200 400 600

ecology and environment engineering p.c.

FIGURE 1-2 SITE LAYOUT MAP
DEPEW LANDFILL
DEPEW, ERIE COUNTY, NY

fully delineated during this RI. Based upon the results of this RI, the site was divided into two OUs.

- In 2008, NYSDEC issued a Record of Decision (ROD) for OU-01 (NYSDEC 2008b).
- In 2009, the RI/FS report for OU-02 showed that soils located on the Zurbrick Road slope contain site-related lead contamination and other metals at concentrations exceeding applicable SCGs (E & E 2009). Both the unrestricted use and protection of ecological resources SCOs for lead have been exceeded in the surface and subsurface soils in this area. Further, analytical results of soil samples taken along the stream bank downstream of the Borden Road Bridge contained lead at concentrations greater than the SCO threshold concentrations for protection of ecological resources. At the time of sample collection (June 2008), the stream bank in this area was in stable condition, having a mixed coverage of vegetation, boulders, and some exposed bedrock.
- In 2009, NYSDEC issued a ROD for OU-02 (NYSDEC 2009a).

1.3 Remedial Investigations

E & E, under contract to NYSDEC, performed two RIs at the Depew Village Landfill Site. The OU-01 RI was conducted between October 2005 and August 2006 (E & E 2005), and the OU-02 RI was conducted between August 2007 and February 2009 (E & E 2007b). The objectives of the RIs were to define the nature and three-dimensional extent of lead contamination resulting from previous activities at the site.

The RIs involved an initial site reconnaissance, surface and subsurface soil investigation, sediment and surface water sampling, soil vapor sampling, groundwater monitoring well installation and sampling, laboratory analysis of field samples, surveying, data quality assurance (QA), and data interpretation.

The RIs presented detailed findings regarding the physical characteristics of the site and included analytical results, an evaluation of human health risks, potential sources of contamination, and a fish and wildlife impact analysis. They identified routes of migration and showed that physical erosion, as opposed to leaching of sediment, was the dominant mechanism by which site-related lead contamination enters Cayuga Creek. Analysis of soil samples collected along the Zurbrick Road slope indicated that waste soils removed from the Depew Village Landfill Site were used to reinforce the Zurbrick Road slope immediately adjacent to the roadway.

2 Summary of the Site Remedy

2.1 History of the Proposed Remedial Action Plans

The Proposed Remedial Action Plans issued by NYSDEC for OU-01 in January 2008 and for OU-02 in October 2009 identified the preferred remedies for the Depew Village Landfill Site (NYSDEC 2008a, 2009b). Each Proposed Remedial Action Plan summarized alternatives and discussed the rationale for selecting the proposed plan. Following a detailed investigation of the Depew Village Landfill Site and an evaluation of alternatives for remediating the contamination associated with the solid waste and incinerator ash disposal, stream bank soil removal, bank stabilization, soil cover, passive landfill gas control, institutional controls, and continued monitoring (Alternative No. 5) was selected by NYSDEC and NYSDOH for both OU-01 and OU-02.

The remedial actions were selected by NYSDEC and NYSDOH in accordance with 6 NYCRR Part 375 for the protection of human health and the environment because they would:

- Limit direct exposure to the surface and subsurface soils through the use of a soil cover;
- Remove and eliminate further release of contaminants into Cayuga Creek by installing stream bank stabilization and restoration measures in the riparian zone;
- Provide control of landfill-generated methane gas; and
- Eliminate, to the extent practicable, terrestrial exposure to contaminated surface and subsurface soils on the site.

It was recognized that the remedial actions could have short-term impacts on the environment. Construction of the stabilization and restoration measures and the erosion controls may increase turbidity levels in the stream. Further, impacts on the biota may occur during bank relocation and/or stream diversion. NYSDEC observed that these short-term impacts could be minimized by protecting excavated slopes as soon as practicable, controlling storm water runoff, limiting the use of construction equipment in the waterway, and using sediment traps; these methods were incorporated into the Erosion and Sediment Control Plan. These impacts were considered to be minor and/or controllable, and the recovery of the stream environment would occur in a reasonable time. Additionally, associated

construction work would not result in the interruption of DPW or ORF activities and would allow for some degree of flexibility in remediating OU-02, including consolidation of contaminated soils and stream sediments under the soil cover of OU-01.

Descriptions of the proposed remedies for OU-01 and OU-02 are presented in Sections 2.2 and 2.3, respectively.

2.2 Record of Decision for OU-01 - Description of the Selected Remedy

Based on the results of the RI for the Depew Village Landfill Site and the criteria identified for evaluation of alternatives, NYSDEC selected stream bank soil removal, stream bank stabilization, soil cover in unpaved areas on-site, passive landfill gas controls, monitoring, and institutional controls as the site remedy. The ROD for OU-01 at the Depew Village Landfill Site was signed on March 27, 2008 (NYSDEC 2008b). The elements of the proposed remedy for OU-01 are as follows:

1. A remedial design program, including a hydrologic and hydraulic analysis, would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.
2. The soils/wastes/fill in the areas along the stream bank up to the bankfull flow elevation would be excavated and backfilled with clean soil. The stream bank would be restored and stabilized, including erosion controls, in accordance with 6 NYCRR Part 608. In addition, a 1-foot-thick soil cover would be constructed over vegetated areas on-site above the bankfull elevation. The excavated material from along the stream bank would be integrated under the cover system. The top 6 inches of the soil cover would be of sufficient quality to support vegetation. Clean soil would constitute soil that meets the NYSDEC Division of Environmental Remediation's (DER's) criteria for backfill or local site background levels. Non-vegetated areas (e.g., buildings, roadways, and parking lots) would be covered by a paving system or concrete at least 6 inches thick. The soil cover would meet the Protection of the Public Health SCO for commercial use in this area and would be consistent with on-going DPW and ORF operations at the site.
3. Imposition of an institutional control in the form of an environmental easement that would require (a) limiting use and development of the property above the bankfull flow elevation and the buffer strip to commercial use, which would also permit industrial use; (b) complying with the approved Site Management Plan (SMP); (c) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment, as determined by NYSDOH or the local health department; and (d) completing and submitting a periodic certification of institutional and engineering controls to NYSDEC.

4. Development of an SMP, which would include the following institutional and engineering controls: (a) management of the final cover systems to restrict excavation into and below the soil cover, pavement, or buildings, including the areas within the site boundary north of the soil cover where lead contamination above the commercial SCO is located at depth; (b) continued evaluation of the potential for vapor intrusion for buildings developed on the site, including provision for mitigation of impacts identified; (c) monitoring of groundwater, surface water, sediments, and biota (pre-remedial and long term); (d) identification of use restrictions on the site; (e) installation of fencing to control site access; and (f) provisions for the continued proper operation and maintenance of the components of the remedy.

5. The property owner would provide a periodic certification of institutional and engineering controls, prepared and submitted by a professional engineer or other such expert acceptable to NYSDEC, until NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal would (a) contain certification that the institutional and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with NYSDEC-approved modifications; (b) allow NYSDEC access to the site; and (c) state that nothing has occurred that would impair the ability of the control to protect the public health or the environment, or constitute a violation or failure to comply with the SMP unless otherwise approved by NYSDEC.

6. Since the remedy would result in untreated hazardous wastes remaining at the site, a pre-remedial and long-term monitoring program would be instituted. Site groundwater and biota and the adjacent Cayuga Creek surface water and sediments would be monitored. The monitoring would confirm that the contamination is not mobilized to the Cayuga Creek environment via dissolution in the groundwater and/or by direct erosion of the soils. This program would allow the effectiveness of the soil cover system, stream bank stabilization, and restoration measures to be monitored and would be a component of the long-term management for the site.

2.3 Record of Decision for OU-02 - Description of the Selected Remedy

The ROD for OU-02 at the Depew Village Landfill Site was signed on December 31, 2009 (NYSDEC 2009a). The components of the proposed remedy for OU-02 were as follows:

1. A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. This remedial design program would be coupled with the OU-01 remedy design and would include a hydrologic and hydraulic study, and incorporate bank stabilization, restoration, and structural protection of both remedies. The design would include the requirement that all soil excavations for both OU-01 and OU-02 precede the sediment remediation.

2. Approximately 8,200 cubic yards (CY) of contaminated soils would be excavated from a 600-foot-long section of stream bank west of the Borden Road bridge. The depth of the excavation would be approximately 1.5 feet and would be conducted from the base flow elevation up to the bankfull flow elevation. Consistent with 6 NYCRR Part 608, bank stabilization and restoration would be designed to protect the stream bank without reducing flood water conveyance. Bank stabilization measures in this area would include combinations of non-structural measures (slope grading and revegetating), bioengineering (brush matting, tree root wads), and biotechnical (erosion control mats, live stakes) features where applicable.
3. Approximately 4,500 CY of contaminated soils on the Zurbrick Road slope would be excavated and disposed of off-site. Under the existing Project Cooperation Agreement, the Village of Depew and the USACE would construct a riprap revetment along approximately 370 feet of the stream bank to protect this slope. The revetment would be constructed in accordance with the USACE's design. Inspection of the stream bank protection for stability, erosion, and scour would be the responsibility of the Village of Depew, USACE, and/or their contractors.
4. Approximately 8,500 CY of sediments contaminated above the lowest effect level (LEL) sediment criterion for lead (31 mg/kg) would be excavated from a 1-mile-long section of the stream, starting on the east side of the former landfill transect D03 and extending downstream to transect D16.
5. To the extent practicable, the sediments would be excavated "in the dry" and processed through a screening system to segregate contaminated sand, silt, and clay fractions. Sediments that are fine gravel size and larger would be returned to the stream. The contaminated material would be disposed of off-site.

2.4 Cleanup Objectives and Remedial Performance Criteria

The Depew Village Landfill Site is comprised of two distinct OUs. Although they share adjacent locales, the ROD documents stipulated specific cleanup criteria for each OU. Refer to Figure 1-2 for OU-01 and OU-02 work zones and remedial areas. The following subsections reflect the governing criteria for the remediation of each OU.

2.4.1 Standards, Criteria, and Guidance and Remediation Goals for OU-01

Goals for the remediation program were established through the remedy selection process stated in 6 NYCRR Part 375. At a minimum, the remedy eliminated or mitigated significant threats to public health and the environment presented by the hazardous waste disposed of at the site through the proper application of scientific and engineering principles. To determine whether the soil, groundwater, surface water, sediments, and soil vapor contained contamination at levels of concern, data from the RI were compared to the following chemical-specific SCGs:

- Groundwater, drinking water, and surface water SCGs were based on NYSDEC's "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.
- Soil SCGs were based on NYSDEC's SCOs established in 6 NYCRR Part 375, Environmental Remediation Program Subpart 375-6.
- Sediment SCGs were based on NYSDEC's "Technical Guidance for Screening Contaminated Sediments."
- Landfill-generated methane gas in the soil vapor, measured in the monitoring well headspace, boreholes, and groundwater, was evaluated on a presence/absence basis. Measurements were recorded in terms of percentage of explosive limits and concentration of methane in order to determine the degree of concern for general health at and around the site.

Location-specific SCGs were also considered during remedy selection. Articles 15 and 16 of the Environmental Conservation Law (ECL) are location-specific SCGs applicable to the site. Work within the stream bed and stream banks was required to meet the conditions stipulated by 6 NYCRR Part 608, "Use and Protection of Waters," and work within the floodplain was required to meet the conditions stipulated under 6 NYCRR Part 500, "Floodplain Management Regulations Development Permits."

According to the OU-1 ROD, the OU-1 remediation goals are to eliminate or reduce the following to the extent practicable:

- Exposures of persons at or around the site to contaminants in surface and subsurface soils;
- Environmental exposures of flora or fauna to contaminants in surface and subsurface soils;
- The release of contaminants from the site into the surface water and sediments of Cayuga Creek through erosion; and
- Soil gas migration and potential vapor intrusion/build-up of methane gas in surrounding buildings, structures, and utilities, which could cause a health and safety concern.

Further, the remediation goals for the site include attaining the following to the extent practicable:

- The Department's SCOs for lead under the Restricted Use: Protection of Ecological Resources (63 mg/kg) in the surface, subsurface, and bank soils along Cayuga Creek from the stream bed to the bankfull flow elevation (the site-specific riparian habitat) (NYSDEC Regulations 6 NYCRR Subpart 375-6.8(b), Restricted Use Soil Cleanup Objectives);

- The Department's SCOs for lead under the Restricted Use: Commercial (1,000 mg/kg) on the landfill portion of the site above the bankfull flow elevation (NYSDEC Regulations 6 NYCRR Subpart 375-6.8(b), Restricted Use Soil Cleanup Objectives); and
- Control of the health and safety concerns caused by the continued generation of methane gas (NYSDEC 2008b).

2.4.2 Standards, Criteria and Guidance and Remediation Goals for OU-02

An RI/FS was conducted to evaluate the alternatives for addressing the significant threats to human health and/or the environment at OU-02. The RI/FS was conducted between August 2007 and February 2009 (E & E 2009).

Cayuga Creek surface water, sediments, and floodplain soils were investigated over a study area extending to approximately 13,000 feet downstream of the former landfill. In addition, a sampling grid was placed on the Zurbrick Road slope for soil sample collection in this area. To determine whether the surface waters, soils, and sediments contained contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Surface water SCGs based on NYSDEC's "Ambient Water Quality Standards and Guidance Values" (NYSDEC 1998);
- Soil SCGs based on NYSDEC's SCOs - "6 NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6.8(b) Restricted Use Soil Cleanup Objectives"; and
- Sediment criteria based on NYSDEC's "Technical Guidance for Screening Contaminated Sediments" (NYSDEC 1999).

Location-specific SCGs were also considered during remedy selection. Articles 15 and 16 of the ECL are location-specific SCGs applicable to the site. Work within the streambed and banks must meet the requirements of 6 NYCRR Part 608, "Use and Protection of Waters," and work within the floodplain must meet the requirements of 6 NYCRR Part 500, "Floodplain Management Regulations Development Permits."

According to the OU-2 ROD, the OU-2 remediation goals are to eliminate or reduce the following to the extent practicable:

- Ingestion/direct contact with contaminated soils and sediments;
- Impacts on biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chains;
- Impacts on biota from ingestion/direct contact with sediment causing toxicity or impacts from bioaccumulation through the aquatic food chain; and

- The release of contaminants from the site into the surface water and sediments of Cayuga Creek through erosion.

Further, the remediation goals for the site include attaining the following to the extent practicable:

- The Department's SCOs for lead under the Restricted Use: Protection of Ecological Resources (63 mg/kg) in the surface, subsurface, and bank soils along Cayuga Creek (NYSDEC Regulations 6 NYCRR Subpart 375-6.8(b), Restricted Use Soil Cleanup Objectives);
- The Department's Division of Fish Wildlife and Marine Resources, "Technical Guidance for Screening Contaminated Sediments", LEL criterion (31 mg/kg) for the contaminated sediments because the LEL concentration generally represents background conditions (upstream) for lead (NYSDEC 2009a).

2.5 Primary Pollutant Sample Analysis Summary

Multiple soil, groundwater, surface water, and sediment samples were collected in order to characterize the nature and determine the extent of contamination at the Depew Village Landfill Site. As noted in the RIs for OU-1 and OU-02, the primary contaminant of concern at the site was lead. Tables 2-1 and 2-2 provide a summary of the sampling effort conducted and the analytical results for OU-01 and OU-02.

2.5.1 Primary Pollutant Sample Analysis Summary for OU-01

Surface soil samples were collected in OU-01 to determine whether direct exposure to site soils could pose a threat to public health or wildlife. Twenty-eight surface soil samples (plus two duplicates) were collected from the site. Each location was strategically selected to obtain representative soil conditions within and around the landfill footprint. Lead concentrations ranged from 11.6 milligrams per kilogram (mg/kg) to 2,160 mg/kg (see Table 2-1). Of the 28 surface soil samples collected at the main landfill, six contained lead at concentrations exceeding the Part 375 Restricted Commercial Use SCO (1,000 mg/kg). In addition, a strip of the stream bank between Zurbrick Road and Cayuga Creek also contained lead at concentrations exceeding the Part 375 Restricted Commercial Use SCO.

Subsurface soil samples were collected at OU-01 to define the extent of contaminated soil and the depth to bedrock at the landfill tip. A secondary purpose was to confirm the subsurface soil data derived from test pit installation samples (PanAmerican and URS 2004). Most of the samples were submitted for primary pollutant metals, as the focus of the RI was primarily on lead and other primary pollutant metals. Seven metals were present at concentrations exceeding their respective SCGs, including lead.

Table 2-1 Primary Pollutant (Lead) Sample Analysis Summary, Depew Village Landfill Site – OU-01

Sample Location[1]	Screening Criteria	Number of Samples	Number of Samples Exceeding SCG Criteria	Contamination Range
Surface	1,000 mg/kg[2]	28	6	11.6 to 2,160 mg/kg
Subsurface Soil	1,000 mg/kg[2]	74	15	0.07 mg/kg to 21,000 mg/kg
Surface Water	7.2 µg/L[3]	10	2	3.3 to 22.0 µg/L
Sediment	31 mg/kg[4]	8	5	24.8 to 2,560 mg/kg
Groundwater/Drinking Water	25 µg/L[5]	12	12	5.0 to 4,270 µg/L
Methane	N/A	6	N/A	ND to 13,000 µg/L

Notes:
1 mg/kg = 1 ppm

[1] ROD OU-01 (NYSDEC 2008b).
[2] Restricted Use SCOs-Commercial Setting guidance (2006) in accordance with 6 NYCRR Part 375.6 Table 6.8(b).
[3] NYSDEC *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*.
[4] NYSDEC *Division of Fish Wildlife and Marine Resources Technical Guidance for Screening Contaminated Sediments* (1999) Table 2 Sediment Criteria for Metals Lowest Effect Level (LEL) Guidance Value.
[5] NYSDEC *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (June 1998), Table 1, Class GA and C.

Key:
mg/kg = milligrams per kilogram
N/A = not applicable
ND = non-detect
µg/L = micrograms per liter

During the RI field effort, eight surface water and eight sediment samples were collected from Cayuga Creek. Two additional surface water samples were later collected from ponded areas on the northeast side of the site. The purpose of the surface water/sediment sampling was to determine whether surface water quality was being adversely affected by the Depew Village Landfill Site. The sampling was conducted in an upstream direction to minimize the potential for disturbance of unsampled upstream locations. Of the eight surface water samples collected from the stream itself and the two on-site surface water samples, two of the samples contained lead at concentrations exceeding NYSDEC's Severe Effects Level (SEL) criterion. The SEL corresponds to acute toxicity thresholds for aquatic organisms. Twenty-one metals were detected in the eight sediment samples collected from Cayuga Creek; five of the samples contained lead at concentrations exceeding NYSDEC SEL screening criteria.

Groundwater/drinking water sampling was also conducted during the RI. Six overburden groundwater monitoring wells (DL-MW01 through DL-MW06) were installed and developed between February and March 2006. Each well was sampled after development and purging. NYSDEC Class GA Standards and NYSDOH public water systems criteria were used to screen the groundwater analytical data. Sixteen metals were detected in the samples, and lead was detected

in all six wells at concentrations exceeding the 25 micrograms per liter (µg/L) limitation published in the NYSDEC Class GA drinking water standard.

During the second round of groundwater sampling, samples from each well were submitted for analysis of methane, ethane, and ethylene content. Methane is a common by-product of landfilling municipal solid wastes. Most municipal solid waste is dumped in non-regulated landfills, and the generated methane is simply emitted to the atmosphere. However, the ROD for OU-01 specifically addressed landfill-generated methane gas in the soil vapor and the possibility of gas accumulating in site buildings, structures, and utilities. While there are no applicable regulatory SCGs for methane, ethane, and ethylene, measurements were recorded in terms of percentage of explosive limits and concentration of methane in order to determine the degree of concern for general health and safety at and around the site. Methane concentrations ranged from non-detect in MW-05 to 2,100 µg/L in MW-04 to 13,000 µg/L in MW-06. The remedial alternative selected for the Depew Village Landfill Site included the installation of isolated passive vents extending to the approximate bottom of the fill depth below ground surface to control gas emissions.

2.5.2 Primary Pollutant Sample Analysis Summary for OU-02

Surface and subsurface soil sampling was conducted on the Zurbrick Road slope in OU-02 to define the horizontal and vertical extent of lead-contaminated soil, determine the exposure risk, and characterize the general condition of the soil. A total of 15 surface soil and nine subsurface soil samples were collected within the 0- to 6-inch depth interval from the Zurbrick Road slope area. Based on the analytical results, five of 15 surface samples and four of nine subsurface samples contained lead at concentrations exceeding the Part 375 Restricted Commercial Use SCO. Lead contamination was detected at concentrations up to 18,600 mg/kg in surface soils, and the maximum lead concentration detected in subsurface soils was 55,100 mg/kg. A large part of the volume of this material was at or below bankfull flow elevations and thus was potentially susceptible to erosion into Cayuga Creek.

Surface and subsurface soil sampling was conducted in the upland and floodplain areas of OU-02 to determine whether these soils had been impacted through contaminant deposition. Thirty-eight surface soil samples and 15 subsurface samples were collected during the RI. Of the 38 surface soil and 15 subsurface soil samples collected within a 0- to 6-inch depth interval, 10 surface and 12 subsurface samples had lead concentrations that exceeded the Part 375 Restricted Commercial Use SCO (1,000 mg/kg). The highest concentrations of lead were encountered in soils located in and just downstream of the right descending bank (RDB) of Cayuga Creek and the Borden Road bridge. In addition, the RI estimated that approximately 1.5 acres of upland and floodplain area soils had been impacted by lead contamination above the Part 375 Restricted Use, Protection of Ecological Resources SCO of 63 mg/kg. A description of the primary pollutant (lead) screening criteria is found in Table 2-2.

Table 2-2 Primary Pollutant (Lead) Sample Analysis Summary, Depew Village Landfill Site - OU-02

Sample Location[1]	Screening Criteria	Number of Samples	Results Exceeding SCG Criteria	Contamination Range
Zurbrick Road Slope Soil	1,000 mg/kg[2]	15 surface 9 subsurface	5 surface 4 subsurface	29.6 to 55,100 mg/kg
Upland and Flood-plain Area Soils	63 mg/kg[3]	38 surface 15 subsurface	10 surface 12 subsurface	11.7 mg/kg to 18,500 mg/kg
Surface Water	7.2 µg/L[4]	13	2	1.4 to 14.0 µg/L
Sediment	31 mg/kg[5]	140	83	31.1 mg/kg to 46,800 mg/kg

Notes:
1 mg/kg = 1 ppm

[1] Record of Decision for OU-1 (NYSDEC 2008b) and Record of Decision for OU-2 (NYSDEC 2009a).
[2] Restricted Use-Commercial Soil Cleanup Objectives are in accordance with 6 NYCRR Part 375 Table 375-6.8(b).
[3] Restricted Use-Protection of Ecological Resources Soil Cleanup Objectives are in accordance with 6 NYCRR Part 375 Table 375-6.8(b).
[4] NYSDEC *Ambient Water Quality Standards, Guidance Values and GW Effluent Limitations*
[5] NYSDEC *Division of Fish Wildlife and Marine Resources Technical Guidance for Screening Contaminated Sediments* (1999) Table 2 Sediment Criteria for Metals Lowest Effect Level (LEL) Guidance Value.

Key:
mg/kg = milligrams per kilogram
µg/L = micrograms per liter

During the RI, surface water samples were collected from 13 locations within Cayuga Creek to determine the surface water quality and evaluate whether surface waters were adversely affected by the known contamination in the sediments. Two of the 13 samples were collected from Cayuga Creek upstream of the site and represent water quality conditions upstream of OU-01. Four samples were collected from each of the four tributaries to Cayuga Creek within OU-2, which are located downstream of the Borden Road bridge. The analytical results for two of the 13 samples exceeded the NYSDEC Ambient Water Quality Screening Criteria. The RI report concluded that Cayuga Creek surface water samples did not contain significant levels of site-related contamination.

The purpose of sediment sampling was to provide the data necessary to determine the extent of elevated lead contamination in Cayuga Creek around and downstream of OU-01. Over the course of three sampling events, 140 sediment samples were collected from the stream bed between the downstream boundary of OU-01 and 1,200 feet downstream of the Borden Road bridge. Lead contamination was found to be as high as 425 times (46,800 ppm) the NYSDEC SEL Guidance Value of 110 ppm. A review of sampling locations and analytical results showed that most of the lead contamination was contained within the fine sands and clay/silt fractions that comprise about 60% of the sediment volume. A total of 23 metals were detected in the sediment samples, and the concentrations of 12 metals for which sediment criteria are established were exceeded. Of the 140 sediment

samples collected, 83 contained lead at concentrations exceeding the LEL sediment criterion of 31 mg/kg.

3 Summary of Pre-Remedial Activities

3.1 Remedial Design and Contract Documents

NYSDEC issued Work Assignments Nos. D004435-15 and D007617-10 to E & E for engineering design and site services during remedial construction of the project (OU-01 and OU-02). For the purposes of this remedial project, the Depew Village Landfill Site was divided into the following eight work areas (see Figure 3-1):

Area 1 – Zurbrick Road Slope Soils: The segment of stream bank on the Zurbrick Road slope located south of the former landfill and across Cayuga Creek.

Area 2 – Depew Village Landfill Tip: The section of the former landfill located on the RDB of Cayuga Creek, directly across from Zurbrick Road.

Area 3 – Cayuga Creek Sediments: The creek along the east and south sides of the landfill. See Figure 3-1 for location and limits of Area 3.

Area 4 – Landfill Stream Bank Soils, East: The RDB of Cayuga Creek along the east side of the landfill.

Area 5 – Landfill Stream Bank Soils, West: A section of the RDB bank of Cayuga Creek along the west side of the landfill.

Area 6 – Landfill Excavation and Stream Bank, West: A section of the RDB bank, north of Area 5, along the west side of the landfill.

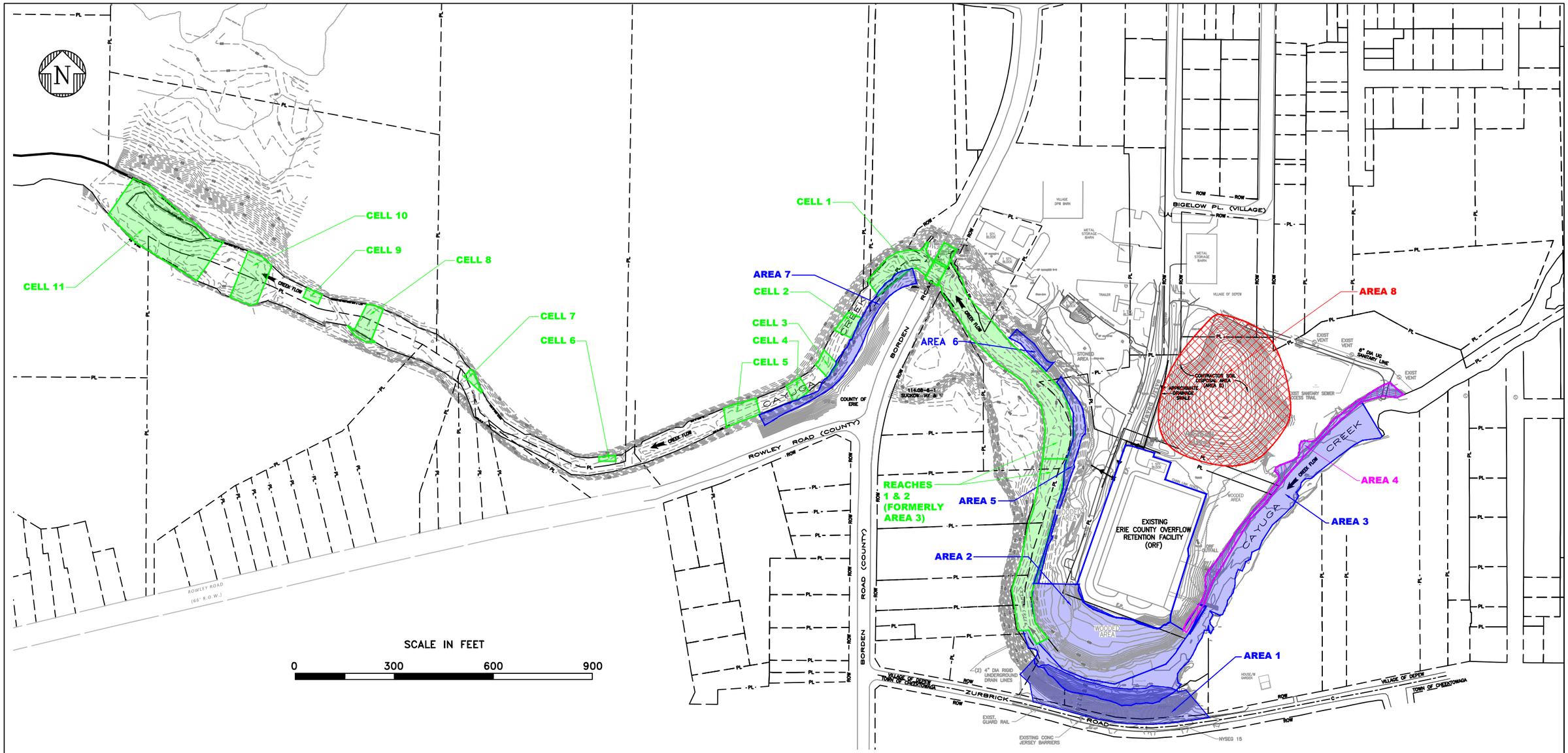
Area 7 – Creek Stream Bank, Downstream of the Borden Road Bridge: The left descending bank (LDB) of Cayuga Creek, downstream of the Borden Road bridge.

Area 8 – Landfill Soil Cap: Soil disposal area and other adjacent areas on the landfill.

Reaches 1 and 2 and Cells 1 through 11 – Cayuga Creek Sediments: The creek along the west side of the landfill (Reaches 1 and 2), and extending approximately half a mile downstream of the Borden Road bridge (Cells 1 through 11).

Table 3-1 Description of Work Areas for Remedial Activities, Depew Village Landfill Site

Phase 1	
Area 4	Landfill Stream Bank Restoration
Phase 2	
Area 1	Zurbrick Road Stream Bank Remediation and Reconstruction
Area 2	Landfill Tip Remediation and Reconstruction
Area 3	Cayuga Creek Sediment Removal (East and south sides of the landfill)
Area 4	Landfill Stream Bank Restoration
Area 5	Landfill Stream Bank Restoration
Area 6	Landfill Excavation and Stream Bank Restoration
Area 7	Cayuga Creek Stream Bank Restoration
Area 8	Landfill Soil Cap
Phase 3	
Reaches 1 and 2 (Formerly Area 3)	Cayuga Creek Sediment Removal (West side of the landfill, East of Borden Road Bridge)
Cells 1 – 11 (Formerly Area 3)	Cayuga Creek Sediment Removal (West of the Borden Road Bridge)
Area 8	Landfill Soil Cap



LEGEND

- AREA 8 LANDFILL DISPOSAL AREA W/ SOIL CAP
- PHASE 1 WORK AREA
- PHASE 2 WORK AREA
- PHASE 3 WORK AREA

DESCRIPTION OF WORK AREAS

PHASE 1
AREA 4: LANDFILL STREAM BANK RESTORATION

PHASE 2
AREA 1: ZURBRICK ROAD STREAM BANK REMEDIATION AND RECONSTRUCTION
AREA 2: LANDFILL TIP REMEDIATION AND RECONSTRUCTION
AREA 3: CAYUGA CREEK SEDIMENT REMOVAL
AREA 4: LANDFILL STREAM BANK RESTORATION
AREA 5: LANDFILL STREAM BANK RESTORATION
AREA 6: LANDFILL EXCAVATION AND STREAM BANK RESTORATION
AREA 7: CAYUGA CREEK STREAM BANK RESTORATION

PHASE 3
REACHES 1 & 2 (FORMERLY AREA 3): CAYUGA CREEK SEDIMENT REMOVAL
CELLS 1 – 11 (FORMERLY AREA 3): CAYUGA CREEK SEDIMENT REMOVAL

ecology and environment engineering and geology p.c.

FIGURE 3-1 WORK AREAS FOR PHASES 1, 2, AND 3
DEPEW VILLAGE LANDFILL SITE
DEPEW, NEW YORK

3.1.1 Summary of Work – OU-01 and OU-02

The following is a summary of work for OU-01 and OU-02 for the following general components:

- Construction on the landfill of a soil disposal area (Area 8 landfill) for the relocation of excavated lead-contaminated soils from the Zurbrick Road slope, landfill tip and stream bank; Cayuga Creek sediments; clearing and grubbing materials; invasive species (Japanese knotweed [*Fallopia japonica*]); and miscellaneous debris (e.g., tires, metal tire rims, shopping carts) at and around the site;
- Clear and grub areas as required to perform the work;
- Excavation of lead-contaminated soil from Area 1;
- Backfill of excavation and installation of riprap, drainage features, and bendway weirs on Area 1;
- Excavation of lead-contaminated soils, Japanese knotweed removal, backfill, restoration, and installation of riprap in Area 2;
- Sediment removal from Area 3;
- Vegetative stabilization of shoreline in Area 4;
- Japanese knotweed removal and vegetative stabilization of Area 5;
- Excavation and backfill along Area 6;
- Vegetative stabilization of shoreline in Area 7;
- Soil and stone capping in Area 8; and
- Hydroseeding of Areas 1, 2, 4, 5, 6, 7, and 8.

Remediation, reconstruction, and restoration work for the Depew Village Landfill Site project was performed in three phases: Phase 1, Phase 2, and Phase 3. A Final Project Manual (FPM) was prepared by E & E for Phase 1 in September 2011, and Contract Documents were prepared by E & E for Phase 2 in April 2012 and for Phase 3 in November 2015.

3.2 Project Bidding Information and Award

3.2.1 Phase 1 - Area 4

For Phase 1 of the project, drawings and specifications for remedial work were extracted from the complete drawing package developed for OU-01 and OU-02. NYSDEC issued the FPM to the proposed Standby Callout Contractor in September 2011. A copy of the FPM is provided as Appendix 1A. On September 26, 2011, a Standby Contractor Authorization was issued to GES (Remedial Callout Contract No. C100900; see Appendix 1B) to perform stream bank excavation and stabilization in Area 4. On September 30, 2011, a construction work plan based on the scope of work outlined in the FPM was submitted to NYSDEC and E & E by GES for review. Following review and approval, a pre-construction meeting and site walkover was held by NYSDEC at the project site on October 5, 2011.

Representatives of NYSDEC, E & E, GES and their subcontractor TREC attended the meeting.

Prior to construction, GES prepared and submitted a site-specific health and safety plan (HASP), a community air monitoring plan (CAMP), a sampling plan, and a construction work plan.

Initial efforts performed by E & E included a project background review, a site visit and reconnaissance, and an initial review of GES's 5-day and 14-day submittal requirements according to Section 3 Specifications of the FPM. E & E continued to provide site observation and daily reporting, including documentation photography, to NYSDEC during the construction period. GES began work at the site on October 5, 2011, and completed work on October 20, 2011. Section 5.1.1.1 discusses E & E's construction management and inspection services for Phase 1 of the remedial project.

3.2.2 Phase 2

A public advertisement announcing the availability of the Contract Documents for the public to bid on the Phase 2 remedial project was published in local newspapers (*The Buffalo News*) and the Capital District (*Albany Times Union* and *Newsday*) on December 21, 2011. Electronic copies of the advertisement were also published in various statewide plan houses (Construction Exchange of Buffalo and Western New York, Southern Tier Builders Association, BuildNY.com, and McGraw-Hill Companies - Dodge Report), and the "New York State Contract Reporter" for inclusion in the December 21, 2011, issue.

Three rounds of public bidding were required in order to identify and select a qualified contractor to complete the Phase 2 activities at the site. The bids received during the first two rounds of the bidding process (January 24, 2012 and February 7, 2012) were rejected, as NYSDEC determined that the apparent low bidders did not meet the qualifications/experience required to perform the work.

The mandatory pre-bid meeting for the third round of bidding was held on-site by NYSDEC and E & E on April 3, 2012. The meeting allowed potential bidders to view existing conditions during the site walk-throughs, discuss the project bidding requirements, technical aspects of the New York State Superfund Contract Documents, and administrative protocols to be used during performance of the work. The meeting included a question-and-answer period. Potential bidders were required to sign an attendance sheet.

Based on the results of the third pre-bid meeting and site walk-through, an addendum (Addendum No. 1) to the Contract Documents was issued during the public bidding phase to the plan holders of record on April 11, 2012. The contents of Addendum No. 1 included pre-bid meeting minutes; the Supplementary Conditions in Section IX of the Contract Documents; questions and answers received by NYSDEC following the pre-bid meeting; changes to the Contract Documents related to a text deletion on Sheet 11 of 16 of the Contract Drawings; a pre-bid

meeting attendee list; and responses to questions and answers from previous pre-bid meetings.

Eight bids were received by NYSDEC during the public bid period ending on April 17, 2012. E & E's comparison of bids received along with an engineering estimate is provided in Appendix 2A. NYSDEC and E & E determined that the apparent low bidder for the project was RDI at $2,399,863.41.

Following a review of additional post-bid information obtained from RDI, an Intent to Award letter was issued by NYSDEC to RDI on June 4, 2012. Copies of the agreement for the project were signed by RDI and transmitted to NYSDEC on June 12, 2012. The Department of Audit and Control for the New York State Comptroller approved the agreement on July 24, 2012. The Notice to Proceed date for the Depew Village Landfill Project was officially established as September 6, 2012.

Initial efforts performed by E & E included a bid summary review and an initial review of RDI's 5-day and 14-day submittal requirements according to Section III of the Contract Documents. E & E continued to provide construction management services, including site observation and daily reporting to NYSDEC, during the construction period. RDI began work at the site on September 19, 2012, and completed work on November 27, 2013. Section 5.1.1.2 discusses E & E's construction management and inspection services for Phase 2 of the remedial project.

3.2.3 Phase 3

A public advertisement announcing the availability of the Contract Documents for the public to bid on the Phase 3 remedial project was published in local newspapers (*The Buffalo News*) and the Capital District (*Albany Times Union* and *Newsday*) on December 21, 2015. Electronic copies of the advertisement were also published in various statewide plan houses (Construction Exchange of Buffalo and Western New York, Southern Tier Builders Association, Build NY.com, and McGraw-Hill Companies - Dodge Report), and the "New York State Contract Reporter" for inclusion in the December 21, 2015, issue.

NYSDEC opened public bidding on the remaining elements of the project under Phase 3 on January 19, 2016.

A mandatory pre-bid meeting was held by NYSDEC and E & E at the project site on December 15, 2015, for potential bidders to view existing conditions and to discuss the project bidding requirements, including the technical requirements of the Contract Documents and the administrative protocol to be used during performance of the work. Potential bidders were required to sign an attendance sheet at the mandatory meeting. A site walkover and a question-and-answer period were conducted at the meeting.

Based on the pre-bid meeting and site walk-through, an addendum (Addendum No. 1) to the Phase 3 Contract Documents was issued during the public bidding

phase to the plan holders of record on December 31, 2015. The contents of Addendum No. 1 included pre-bid meeting minutes; questions and answers received by NYSDEC following the pre-bid meeting; a pre-bid meeting attendee list; changes and additions to the November 2015 Contract Documents; a new Contract Agreement; new Section IX in the Supplementary Conditions; and additional information to the limited site data documents.

Seven bids were received by NYSDEC during the public bid period ending on January 19, 2016. E & E's comparison of bids received along with an engineering estimate is provided in a memo dated May 2, 2016 in Appendix 3A. NYSDEC and E & E determined that the apparent low bidder for the project was MCI at $2,477,000.00.

Following a review of additional post-bid information obtained from MCI, an Intent to Award letter was issued by NYSDEC to MCI on March 22, 2016. In a letter NYSDEC sent to MCI on July 13, 2016, the Notice to Proceed date for Phase 3 of the Depew Village Landfill Project was officially established as July 20, 2016. The Notice to Proceed letter is presented in Appendix 3B.

Initial efforts performed by E & E included a bid summary review and an initial review of MCI's 5-day and 14-day submittal requirements according to Section III of the Contract Documents. E & E continued to provide construction management services, including site inspection and daily reporting to NYSDEC, during the construction period. MCI began work at the site on August 4, 2016, and shut down for the winter on November 15, 2016. MCI resumed work on May 8, 2017, and completed work on the site on October 27, 2017. Section 5.1.1.3 discusses E & E's construction management and inspection services for Phase 3 of the remedial project.

3.3 Scope of Work – Major Elements of Remediation

3.3.1 Phase 1 – Area 4

The remedial scope of work in the Contract Documents under Phase 1 included the following major work elements:

- Clear and grub areas as required to perform the work;
- Excavation of contaminated soils along the stream bank;
- Backfill of excavated areas;
- Stream bank stabilization and restoration of the RDB of Cayuga Creek; and
- Restoration plantings in the disturbed areas.

3.3.2 Phase 2

The remedial scope of work in the Contract Documents under Phase 2 included the following major work elements:

- Construction of a soil disposal area in the Area 8 landfill for the on-site disposal of excavated lead-contaminated soils from the Zurbrick Road slope, landfill tip, and stream bank; Cayuga Creek sediments; clearing and grubbing materials; Japanese knotweed; and miscellaneous debris at and around the site;
- As required to perform the work, clear and grub areas;
- Excavation of lead-contaminated soil from Area 1;
- Backfill of excavation and installation of riprap, drainage features, and bendway weirs in Area 1;
- Excavation of lead-contaminated soils, Japanese knotweed removal, backfill, restoration, and installation of riprap in Area 2;
- Sediment removal from Area 3;
- Shoreline vegetative stabilization in Area 4;
- Japanese knotweed removal and vegetative stabilization in Area 5;
- Excavation and backfill in Area 6;
- Vegetative stabilization of shoreline in Area 7;
- Soil and stone capping on parts of Area 8;
- Sampling, analyses, and data validation;
- Dewatering and treatment of contact water; and
- Hydroseeding of Areas 1, 2, 4, 5, 6, 7, and 8.

3.3.3 Phase 3

The remedial design for Phase 3 divided the project area into 15 areas, as shown on the Contract Drawings: Reach 1, Reach 2, under the Borden Road bridge south arch, under the Borden Road Bridge north arch, and the 11 depositional cells on the west side of the Borden Road bridge (Cells 1 – 11). Contract Documents can be found in Appendix 3C. The remedial scope of work in the Contract Documents under Phase 3 included the following major work elements:

- Clearing and grubbing of areas as required to gain access to the specific work areas;
- Installation of temporary access roads to the creek remedial areas;
- Removal of Japanese knotweed by cut-and-treat herbicide application in designated areas on the RDB of Reaches 1 and 2;
- Removal of the existing cap on the Area 8 landfill;
- Dewatering of excavated sediments and treatment and management of contact water per the NYSDEC SPDES discharge requirements in sediment removal areas;

- Removal of Cayuga Creek sediments < ½-inch diameter from Reaches 1 and 2 to a depth of 1 foot, and disposal of the sediment at the sediment disposal area on the Area 8 landfill;
- Removal of Cayuga Creek sediments < ½-inch diameter from under the Borden Road Bridge south arch to a depth of one foot, and disposal of the sediment in the Area 8 landfill;
- Removal of Cayuga Creek sediments from under the Borden Road bridge north arch and disposal of the sediment in the Area 8 landfill;
- Capping and restoration of the Area 8 landfill;
- Removal of Cayuga Creek sediments < ½-inch diameter in Cells 1 – 11;
- Stabilization of the sediments as required by the disposal facility, transportation off-site, and disposal at an approved landfill;
- Installation of riprap in areas of access and egress into Cayuga Creek;
- Planting of live stakes in Japanese knotweed removal areas along Reaches 1 and 2; and
- Removal of temporary staging areas and access roads, and restoration of areas and access points into Cayuga Creek disturbed during construction.

3.4 Quality Assurance/Quality Control Plan

The Contract Documents Supplementary Specifications, Section XI, Division 1 – Section 01400 – Quality Control, outlined specific requirements of the Quality Assurance (QA)/Quality Control (QC) Plan for the project. Included in this section are requirements for QA/QC of installations, references and standards, tolerances, field sampling, inspection and testing services, testing by the Contractor, and manufacturers' field services and reports.

3.4.1 QA/QC Plan for Phase 1

A site-specific QA/QC plan was not required as part of the Phase 1 activities at the site.

3.4.2 QA/QC Plan for Phase 2

A QA/QC plan for project control and analytical work was developed by RDI and submitted to E & E on May 29, 2012. This submittal was part of RDI's work plan, which was included with their 5-day submittal package. On November 20, 2011, E & E requested additional laboratory certifications as a supplement to the QA/QC plan. RDI submitted the requested supplement to the plan on November 21, 2011. The QA/QC plan was reviewed and accepted by E & E on November 21, 2011. The firms selected by RDI for analytical services included: Paradigm Environmental Services, Inc. (Paradigm) (Grand Island, New York) for waste characterization and soils documentation analyses and the village wastewater treatment plant effluent analyses; Holzmacher McLendon Murrell Laboratories (H2M) (Melville, New York) for contact water treatment system (CWTS) effluent

certification analyses; and SJB Services (Hamburg, New York) for soils compaction testing and reporting.

3.4.3 QA/QC Plan for Phase 3

A QA/QC plan for project control and analytical work was developed by MCI and submitted to E & E on February 1, 2016. This submittal was part of MCI's Quality Assurance Project Plan (QAPP), which was included with their 5-day submittal package. On May 4, 2016, E & E requested that MCI revise and resubmit the QAPP. MCI submitted the revised plan on June 15, 2016. E & E reviewed the revised plan on July 22, 2016, and requested MCI to revise and resubmit the plan. MCI revised and resubmitted the QAPP on August 3, 2016. E & E approved the QAPP on August 30, 2016. MCI selected Paradigm for soil, sediment, and water effluent analyses.

4 Description of Remedial Actions Performed

4.1 Governing Documents

4.1.1 Phase 1 – Area 4

The FPM was prepared for the Phase 1 work and consisted of technical specifications and drawings extracted from the complete drawing package for OU-01 and OU-02 (see Appendix 1A). The work was issued through a NYSDEC Standby Contractor Callout Authorization to GES in September 2011 (see Appendix 1B).

4.1.2 Phase 2

The Contract Documents under Contract Number D008513 consisted of the technical specifications, Contract Drawings, limited site data document, and Addendum 1, which were issued for public bidding by NYSDEC in April 2012 for Phase 2 with the assistance of E & E. These documents were based on the ROD issued by NYSDEC in March 2008 for OU-01 and December 2009 for OU-02.

4.1.3 Phase 3

The Contract Documents under Contract Number D009682 consisted of the technical specifications, Contract Drawings, limited site data document, and Addendum 1, which were issued for public bidding by NYSDEC in December 2015 for Phase 3 with the assistance of E & E. These documents were based on the performance of the balance of the work required by the ROD issued by NYSDEC in March 2008 for OU-01 and December 2009 for OU-02.

4.2 Project Schedule

4.2.1 Phase 1 – Area 4

Based on the Standby Work Authorization form under Contract Number C100900 issued to GES, the length of the field work was estimated to take 8 to 10 days to complete.

4.2.2 Phase 2

Based on Contract Document D008513, Section VI, Article 6, the length of the remediation project from Notice to Proceed until Substantial Completion was established as 270 calendar days, with 117 additional days allowed for Final Completion, including a CWTS shutdown, for a total of 387 calendar days.

4.2.3 Phase 3

Based on Contract Document D009682, Section VI, Article 6, the length of the remediation project from Notice to Proceed until Substantial Completion was established as 165 calendar days. Final completion was defined as 195 calendar days from the Notice to Proceed or within 30 calendar days of Substantial Completion, whichever is sooner.

4.3 Contractors and Consultants

4.3.1 Phase 1 – Area 4

The remedial construction contractor selected to complete this phase of the project was GES, and its subcontractor was TREC.

The company responsible for construction management services during remedial construction was E & E.

4.3.2 Phase 2

The accepted low bidder for the Depew Village Landfill Phase 2 project was RDI.

The company responsible for construction management services during remedial construction was E & E.

4.3.3 Phase 3 – Area 3 Sediment Removal

The accepted low bidder for the Depew Village Landfill Phase 3 project was MCI.

The company responsible for construction management services during remedial construction was E & E.

4.4 Contractors and Subcontractors

4.4.1 Phase 1 – Area 4

The following are the contractor and subcontractors that were utilized, and the estimated costs incurred for this project.

- GES: Administration, subcontractor oversight, and final reporting ($34,100);
- Upstate Laboratories, Inc., East Syracuse, New York: Laboratory analytical ($1,420);
- Clear Creek Land Surveying, LLC (Clear Creek), Springville, New York: Surveying ($2,000); and
- TREC: Stream bank excavation and stabilization ($62,480).

4.4.2 Phase 2

RDI provided a list of subcontractors to be utilized throughout the duration of the project. Major subcontractors (i.e., with costs over $10,000) were required by the Contract to submit a Vendor Responsibility Questionnaire (VRQ). Firms that

were subcontracted to provide professional services for the project were not required to submit a VRQ.

The following subcontractors were utilized during the project. The estimated dollar value of the work performed by each subcontractor is listed in parentheses; the estimate is based on RDI's Contract Schedule of Values breakdown and change orders (COs). Subcontractors certified in New York State as minority- or women-owned business enterprises (MBE/WBE) are listed in bold.

- Cardno JF/New Landscaping Nursery (Cardno), Walkerton, Indiana: Erosion control blankets, Japanese knotweed removal, and planting ($295,000);
- Paradigm: Analytical services ($6,120);
- H2M: Geotechnical analyses ($6,000);
- Clear Creek: Surveying ($91,000);
- GES: Air monitoring, CWTS operation and maintenance, and security ($464,000);
- Ken W. Kloeber Consulting Engineers, Boston, New York: SWPPP Inspections ($25,000);
- Quality Inspection Services, Depew, New York: Well decommissioning ($1,800);
- SJB Drilling, Hamburg, New York: Compaction testing ($27,000);
- Modspace, East Syracuse, New York: Engineer and contractor field office supplier ($28,300);
- Jodi Zimmerman, Vali-Data of WNY, West Falls, New York: Data validation ($3,150);
- Buffalo Crushed Stone, Cheektowaga, New York: Backfill materials, including structural fill, bedding material, riprap, common fill, and topsoil ($401,500);
- Ernst Conservation Seeds, Meadville, Pennsylvania: Seeding material ($13,800); and
- Preferred Seed Company, Cheektowaga, New York: Fertilizer ($6,000).

4.4.3 Phase 3

MCI provided a list of subcontractors to be utilized throughout the duration of the project. Major subcontractors (i.e., those with costs over $10,000) were required by the Contract to submit a VRQ. Firms that were subcontracted to provide professional services for the project were not required to submit a VRQ.

The following subcontractors were utilized during the project. The estimated dollar value of the work performed by each subcontractor is listed in parentheses; the estimate is based on MCI's Contract Schedule of Values breakdown and COs.

Subcontractors certified in New York State as minority- or women-owned business enterprises (MBE/WBE) are listed in bold.

- Paradigm: Analytical services ($21,380);
- Modspace, East Syracuse, New York: Engineer's field office supplier ($10,000);
- A-Verdi Storage Containers: Contractor's field office supplier ($10,000);
- **Chenango Contracting, Inc.**, Johnson City, New York: Geosynthetic decontamination pad (decon pad) liner supplier and installer ($32,260);
- BakerCorp, Blasdell, New York: CWTS supplier ($162,822);
- Wendel Companies, Buffalo, New York: Surveying ($75,000);
- Ensol, Inc., Niagara Falls, New York: Storm Water Pollution Prevention Plan (SWPPP) inspections and report ($17,750);
- Applied Ecological Services, Waterloo, New York: Japanese knotweed removal ($7,760);
- Xylem Pump Rental and Sales, Batavia, New York: Bypass pump and piping rental ($98,340);
- Rain for Rent, Avon, New York: Bypass pump and piping rental ($4,560);
- K&R Day Trucking, Elma, New York: Soil and sediment hauler ($7,760);
- Dig It of New York, LLC, Cheektowaga, New York: Soil and sediment hauler ($16,730);
- Site One Landscaping, Buffalo, New York: Seed ($12,740);
- Buffalo and Orchard Park Topsoil, Orchard Park, New York: Soil and sediment hauler ($10,000);
- New Enterprises Stone & Lime Co, Inc., New Enterprise, Pennsylvania: Stone provider ($99,910);
- Mawhiney Trucking, Inc., Wilson, New York: Clay hauler ($10,220);
- Eco-Rental Solutions, Rochester, New York: Air monitors ($22,420);
- Allied Building/Keystone Builders, Cheektowaga, New York: Geotextile provider ($19,860);
- Michael C Serafini, Inc., Cheektowaga, New York: Soil and sediment hauler ($10,000); and
- Waste Management, Chaffee Landfill, Chaffee, New York: Contaminated soil disposal ($219,280).

4.5 Initial Meetings and Project Plan Submittals

4.5.1 Initial Pre-construction Meeting

4.5.1.1 Phase 1 – Area 4

On Wednesday, October 5, 2011, an initial pre-construction meeting was held between NYSDEC, E & E, GES, and TREC representatives. The meeting was held at the Village of Depew DPW office at 200 Rutherford Place, Depew, New York. The purpose of the pre-construction meeting was to introduce the project parties and establish the parameters for successful completion of the project. Meeting minutes were prepared and issued to the parties attending the pre-construction meeting (see Appendix 1C).

4.5.1.2 Phase 2

On Wednesday, August 29, 2012, an initial pre-construction meeting was attended by representatives from NYSDEC, RDI and their subcontractors GES and Cardno, the Village of Depew, and E & E. The meeting was held at the Village of Depew DPW Highway Garage Conference room located at 200 Rutherford Place, Depew, New York. The purpose of the pre-construction meeting was to introduce the administrative and field staff of the project parties and establish the construction parameters for successful completion of the project. Copies of the pre-construction agenda and progress meeting minutes for the RDI contract work are provided in Appendix 2B.

Discussions included the general introduction of project staff and responsibilities, review of the contract time and liquidated damages, coordination efforts with local officials, and review of the contract general and supplementary conditions. Also discussed were individual task schedules, project submittals (work plans and shop drawings), transport and disposal concerns, and field coordination by RDI.

On Tuesday, September 11, 2012, Progress Meeting 1 was attended by representatives of NYSDEC, RDI, the Village of Depew, and E & E. The meeting was held at the Village of Depew DPW Highway Garage Conference room located at the site. During the meeting, the Preliminary Project Progress Schedule, coordination activities, and RDI's responsibilities were discussed. The required bid submittals and the requirements for the preparation and submittal of the materials, equipment, and methods related to the Contract Documents were also discussed. Following the meeting, RDI prepared and submitted project plans and shop drawings in general compliance with the requirements. Submittals were reviewed for conformance with the Contract Documents, including plans, technical specifications, and addendums. Submittals that were found to be deficient were revised and resubmitted. Copies of the submittals and a submittal log were maintained by E & E throughout the course of the project. The submittal log and RDI's project submittals are presented in Appendix 2C. The RDI project submittals are discussed in Section 4.5.3.

4.5.1.3 Phase 3

On July 19, 2016, a pre-construction meeting was attended by representatives of NYSDEC, MCI, Village of Depew, Watts Architecture and Engineering (Buffalo

New York), and E & E. The meeting was held at E & E Headquarters located at 368 Pleasant View Drive in Lancaster, New York. The purpose of the pre-construction meeting was to introduce the administrative and field staff of the project parties and establish the construction parameters for successful completion of the project. Copies of the pre-construction agenda and progress meeting minutes for the Phase 3 contract work are provided in Appendix 3D.

Discussions included the general introduction of project staff and responsibilities, review of the contract time and liquidated damages, coordination efforts with local officials, and review of the contract general and supplementary conditions. Also discussed were individual task schedules, project submittals (work plans and shop drawings), and field coordination by MCI.

4.5.2 Initial Contractor Plan Submittals for Phase 1 – Area 4

Prior to construction, GES prepared and submitted a Construction Work Plan, which included a site-specific HASP, a CAMP, and a Sampling and Analysis Plan (SAP). The site-specific HASP was completed in accordance with 29 Code of Federal Regulations (CFR) 1910.120. A site safety officer (SSO) was designated to confirm compliance with the HASP while on-site; the SSO submitted evidence that field personnel were 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER)-trained, medically fit, and had current certificates of training. The CAMP was developed in accordance with Section 1.9 of DER-10/Technical Guidance for Site Investigation and Remediation (NYSDEC 2010). The SAP included standard operating procedures, QA/QC protocols, sample collection methodologies and equipment used, sample preservation and labeling format, sample packing type, and sample chain of custody. Copies of the submittals and a submittal log were maintained by E & E throughout the course of the project. The submittal log and GES's project submittals for Phase 1 – Area 4 are provided in Appendix 1D.

Required details of the Construction Work Plan included: a work schedule showing the sequencing, individual work item durations, and work item completion dates; and the materials storage and proposed waste stockpile staging area. When significant schedule changes occurred, GES revised and resubmitted an updated schedule to NYSDEC. The schedule also included the means and methods by which GES anticipated to complete the project. Decontamination procedures, erosion and sediment control measures, equipment details, decontamination pad and pre- and post-sampling requirements, and disposal requirements were included in the Construction Work Plan in Appendix 1D.

During construction, daily contractor field reports were prepared and submitted to NYSDEC with the following components: name, address, and telephone number of contractor(s); date, arrival time and departure time of site staff; a.m. and p.m. weather conditions, wind direction and speed, cloud cover, and rainfall; site activities performed; name of employees working on site that day and work time for

each; minutes of the safety meeting; equipment used; materials expended; samples taken and disposition; list of site visitors and their affiliation; public inquiries; and the signature, title, and printed name of the site supervisor.

NYSDEC reviewed submittals for conformance with the FPM and accepted them prior to construction.

4.5.3 Initial Contractor Plan Submittals for Phase 2

In accordance with the Contract Documents' administrative and technical requirements, RDI submitted pre-project plans and shop drawings. The submittal process was recorded by E & E.

Project submittal requirements were included in the Contract Documents, primarily in Bidding Information and Requirements (Section III), Standard Specifications (Section X), Supplementary Specifications (Section XI), and Measurement for Payment (Section XII).

The log of the project submittals associated with the Contract Documents is presented in Appendix 2C. Major project plans and submittals are discussed in the following subsections.

4.5.3.1 Contractor Operations Work Plan

According to the Contract Documents, Section III – Bidding Information and Requirements, the Plan of Operations (Work Plan) submittal is part of the Contract requirements in the original 5-day and 14-day bid information submittal. The RDI Plan of Operations provided descriptions of methods, procedures, and equipment to be used to complete the work associated with each individual area of the project. The plan detailed RDI's understanding of and proposed methods for executing the major and minor work items to be performed and was linked to a critical path method milestone schedule.

The work plan from RDI was initially accepted by E & E on November 7, 2012. RDI's Phase 2 project work plan and revisions were recorded in the project submittal log provided in Appendix 2C.

Additional details of specific tasks were provided in related project plans, as discussed below.

4.5.3.2 RDI Progress Schedule

RDI submitted a project schedule in an Excel® format with estimated durations for major work elements during the pre-construction meeting held on August 29, 2012. Since RDI did not submit the project schedule in critical path method format as required by the Supplementary Specifications, Section XI, Section 00001 – Progress Schedule, it was rejected.

RDI submitted a progress schedule using the critical path method in MS Project format during Progress Meeting 7 held on October 23, 2012. The construction

schedule provided details regarding priority, sequencing, and interdependence of activities, as well as the sequence in which the work was to be performed. The schedule also identified how RDI would comply with the contract time, named allowances, and the sequences of work indicated or required by the Contract Documents. The schedule also provided information on how RDI would anticipate foreseeable events that could affect cost, progress, performance, and completion of the work.

The Contract Documents required regular progress schedule updates, or as necessary, to evaluate the progress and performance of RDI's work. E & E requested bi-weekly schedule updates to review progress and to facilitate discussion of tasks and weather delays at progress meetings. The last schedule revision was provided by RDI on August 23, 2013. RDI's progress schedule and revisions are documented in the project submittal log provided in Appendix 2C.

4.5.3.3 Sampling and Analysis Plan (SAP)

The Contract Documents, Supplementary Specifications, Section XI, Section 01425 - Sampling, outlined specific requirements of the project-specific SAP. RDI submitted an SAP as part of the Plan of Operations on November 7, 2012. The SAP presented RDI's plan for collecting samples in accordance with the requirements identified in Supplementary Specifications, Section XI, Section 01425 – Sampling, Table 01425-1 - Collection of Samples.

RDI utilized two analytical laboratories to perform the work required by the Contract Documents: Paradigm and H2M. Paradigm was certified under the NYSDOH Environmental Laboratory Approval Program for the analytical services they performed on the project. H2M provided geotechnical analyses for the project.

The project SAP submittal milestones and plan revisions are included in the project submittal log provided in Appendix 2C.

4.5.3.4 Storm Water Pollution Prevention Plan (SWPPP)

Pursuant to the requirements in the Contract Documents, Supplementary Specifications, Section XI, Section 01560 - Erosion and Surface Water Control, RDI submitted a SWPPP in October 2012. The SWPPP included a description of practices and temporary measures to prevent erosion on the site, including the use of drainage control structures, silt fencing, straw bales, and erosion control blankets. The SWPPP also included procedures for inspection, maintenance, and repair of temporary controls. E & E reviewed and accepted the first revision of the document on October 30, 2012. The project SWPPP submittal milestones and plan revisions are included in the project submittal log provided in Appendix 2C. SWPPP inspection reports are provided in Appendix 2D.

4.5.3.5 Transportation and Disposal Plan

Per the requirements of Supplementary Specifications Section XI, Specification 02223 of the Contract Documents, the project-specific Transportation and Disposal Plan contained proposed vehicle decontamination procedures, truck weighing requirements, handling procedures for hazardous and nonhazardous wastes, haul routes and instructions, information on alternative disposal facilities and transporters, vehicle loading procedures, emergency spill/contingency response procedures, placarding, and preparation of shipping documents (manifests).

RDI did not submit a transportation plan for the transportation of excavated soils as the excavated soils were transported and disposed of within the project area. The excavated soils from the different project areas were loaded onto trucks and transported to the Area 8 landfill for disposal.

A transportation plan was prepared for the transportation of Japanese knotweed removed from Areas 5 and 7 and disposed of in the Area 8 landfill. The submittal was approved on October 22, 2012. The project transportation and disposal submittals and plan revisions are included in the project submittal log provided in Appendix 2C.

4.5.3.6 Contractor Shop Drawing Submittals

Shop drawing submittals for the project were listed in the Contract Documents, Supplementary Specifications, Section XI, Section 01011 – Project Submittals. RDI submitted shop drawings related to the project work for review and approval by E & E. After reviewing each submission, E & E determined whether to reject the shop drawings or approve them, with or without conditions. The shop drawings included a list of administrative submissions, materials, procedures, and products to be used in the completion of the project. Copies of the shop drawings from the construction were maintained by E & E throughout the course of the project and are listed in the submittal log (see Appendix 2C).

4.5.4 Initial Contractor Plan Submittals for Phase 3

In accordance with the Contract Documents' administrative and technical requirements, MCI submitted pre-project plans and shop drawings. The submittal process was recorded by E & E.

Project submittal requirements were included in the Contract Documents, primarily in Bidding Information and Requirements (Section III), Standard Specifications (Section X), Supplementary Specifications (Section XI), and Measurement for Payment (Section XII).

The log of the project submittals associated with the Contract Documents is presented in Appendix 3E. Major project plans and submittals are discussed in the following subsections.

4.5.4.1 Contractor Operations Work Plan

According to the Contract Documents, Section III – Bidding Information and Requirements, the Plan of Operations (Work Plan) submittal is part of the Contract requirements in the original 5-day and 14-day bid information submittal. The MCI Plan of Operations provided descriptions of methods, procedures, and equipment to be used to complete the work associated with each individual area of the project. The plan detailed MCI's understanding of and proposed methods for executing the work items to be performed and was linked to a critical path method milestone schedule. The work plan from MCI was initially submitted by MCI on February 1, 2016. E & E reviewed and returned the work plan to MCI on May 5, 2016, for revision and resubmission. MCI resubmitted the revised work plan on May 16, 2016. E & E reviewed and returned this revision to MCI on June 1, 2016, for revision and resubmission. MCI updated the work plan and resubmitted it on August 4, 2016. E & E reviewed and returned it to MCI on August 12, 2016, for revision and resubmission. MCI updated the work plan and resubmitted it to E & E on August 27, 2016. E & E reviewed and returned it to MCI on September 28, 2016, for revision and resubmission.

Prior to beginning work after the winter shutdown, MCI submitted a revised work plan on March 22, 2017. E & E reviewed and returned it to MCI on April 5, 2017, for revision and resubmission. MCI revised and resubmitted the work plan on April 12, 2017. E & E reviewed and returned it to MCI on April 26, 2017, for revision and resubmission. MCI revised and resubmitted the work plan to E & E on May 10, 2017. E & E reviewed and returned it to MCI on May 18, 2017, for revision and resubmission. MCI revised the work plan and resubmitted it to E & E on May 23, 2017. E & E approved this work plan as noted on June 6, 2017. E & E noted that MCI did not submit an acceptable plan for removing sediments from Cayuga Creek for flows greater than 5 cfs, which is well below the historical average of the daily mean discharge at the gauging station located approximately 4 miles upstream of the work area.

Additional details of specific tasks were provided in related project plans, as discussed below.

4.5.4.2 MCI Progress Schedule

MCI submitted a project schedule on May 13, 2016, as part of the 5-day bid information submittal. E & E reviewed and returned it to MCI on June 1, 2016, for revision and resubmission. MCI updated the progress schedule and resubmitted it on June 6, 2016. E & E reviewed and returned it to MCI on June 15, 2016, for revision and resubmission.

MCI resubmitted an updated project schedule with estimated durations for major work elements during the pre-construction meeting on July 19, 2016. During the meeting, NYSDEC requested that MCI update the progress schedule to show the completion of the project in 2016.

After E & E, NYSDEC, and MCI determined that winter shutdown was necessary, MCI revised and resubmitted the progress schedule to E & E on July 29, 2016. E & E reviewed and returned this progress schedule to MCI on August 10, 2016, for revision and resubmission. MCI updated the progress schedule to include the work under the north arch of the Borden Road bridge, the second herbicide application and the installation of the live stakes, and the work west of the Borden Road bridge.

On May 11, 2017, MCI submitted an updated progress schedule to show the timeline of work for Cells 1 – 11. E & E, NYSDEC, and MCI discussed this progress schedule during Progress Meeting 16 on May 11, 2017. MCI subsequently updated the schedule to reflect this discussion and resubmitted it to E & E on June 28, 2017. This progress schedule was discussed during Progress Meeting 19 held on June 29, 2017. MCI revised and submitted the progress schedule on September 27, 2017. On November 14, 2017, E & E approved the revised project schedule.

The Contract Documents required progress schedule updates, as necessary, to evaluate the progress and performance of MCI's work. E & E requested two week look-ahead schedule updates to review progress and facilitate discussion of tasks and weather delays at progress meetings. E & E tracked MCI's scheduled progress in their project submittals provided in Appendix 3E.

4.5.4.3 Sampling and Analysis Plan (SAP)

The Contract Documents, Supplementary Specifications, Section XI, Section 01425 - Sampling, outlined specific requirements of the project-specific SAP. MCI submitted an SAP as part of the QAPP on February 1, 2016. Section 3.4.3 includes more information on the submittal of the QAPP.

The SAP presented MCI's plan for collecting samples in accordance with the requirements identified in Supplementary Specifications, Section XI, Section 01425 – Sampling, Table 01425-1 - Collection of Samples. The SAP included standard operating procedures, QA/QC protocols, sample collection methodologies and equipment used, sample preservation and labeling format, sample packing type, and sample chain of custody.

MCI utilized Paradigm as the analytical laboratory to perform the work required by the Contract Documents. Paradigm was certified under the NYSDOH Environmental Laboratory Approval Program for the analytical services they performed on the project.

The project SAP and revisions are included in the project submittal log provided in Appendix 3E.

4.5.4.4 Storm Water Pollution Prevention Plan (SWPPP)

Pursuant to the requirements in the Contract Documents, Supplementary Specifications, Section XI, Section 01560 - Erosion and Surface Water Control, MCI

submitted a SWPPP on October 13, 2016. The SWPPP included a description of practices and temporary measures to prevent erosion on the site, including the use of drainage control structures, compost filter socks, and turbidity curtains. The SWPPP also included procedures for inspection, maintenance, and repair of temporary controls. E & E reviewed and returned the first version of the SWPPP to MCI on November 10, 2016, for revision and resubmission. Prior to beginning work after the winter shutdown, MCI submitted an updated SWPPP on April 12, 2017. E & E approved this SWPPP on April 25, 2017. The project SWPPP submittal and revisions are included in the project submittal log provided in Appendix 3E.

4.5.4.5 Transportation and Disposal Plan

Per the requirements of Supplementary Specifications Section XI, Specification 02223 of the Contract Documents, the project-specific Transportation and Disposal Plan included proposed vehicle decontamination procedures, truck weighing requirements, handling procedures for hazardous and nonhazardous wastes, haul routes and instructions, information on alternative disposal facilities and transporters, vehicle loading procedures, emergency spill/contingency response procedures, placarding, and preparation of shipping documents (manifests).

MCI did not submit a transportation plan for the transportation of excavated soils from Reaches 1 and 2 and from underneath the Borden Road bridge because this excavated material was transported and disposed of within the project area (Area 8 landfill).

A transportation plan was prepared for the transportation and disposal of soils excavated from Cells 1 – 11. MCI submitted their transportation plan on April 21, 2017. E & E reviewed this submittal and returned it to MCI on May 18, 2017, for revision and resubmission. MCI resubmitted the transportation plan to E & E on May 23, 2017. E & E approved this submittal on June 22, 2017. The project Transportation and Disposal Plan submittals and revisions are included in the project submittal log provided in Appendix 3E.

4.5.4.6 Contractor Shop Drawing Submittals

Shop drawing submittals for the project were listed in the Contract Documents, Supplementary Specifications, Section XI, Section 01011 – Project Submittals. After reviewing each submission, E & E determined whether to reject the shop drawings or approve them, with or without conditions. The shop drawings included a list of administrative submissions, materials, procedures, and products to be used in the completion of the project. Copies of the shop drawings from construction were maintained by E & E throughout the course of the project and are listed in the submittal log provided in Appendix 3E.

4.6 Health and Safety Submittals

4.6.1 Site-Specific Health and Safety Plan

4.6.1.1 Phase 1 – Area 4

As required in the FPM dated September 2011, a site-specific HASP was submitted by GES on September 30, 2011, for the Depew Village Landfill site. E & E's review of the HASP verified that GES had a site-specific plan and that the components were in compliance with the FPM requirements. The plan was approved on October 3, 2011 and is provided in Appendix 1D.

4.6.1.2 Phase 2

Project Standard Specification Section X - 00003 includes Minimum Requirements for Health and Safety. These requirements are based on (a) Occupational Safety and Health Administration Standards and Regulations contained in Title 29, CFR Parts 1910 and 1926; (b) applicable sections of the New York State Labor Law; (c) the EPA's Office of Emergency and Remedial Response Program; and (d) the National Institute for Occupational Safety and Health's procedures to provide safe operations at abandoned hazardous waste disposal sites. These requirements included the following:

- Project health and safety responsibilities and organization;
- Project-specific HASP and hazard assessment;
- Training and medical surveillance documentation;
- Personnel and equipment decontamination procedures;
- A Community Air Monitoring Program (CAMP);
- Emergency and first aid requirements; and
- Logs, reports, and recordkeeping.

In response to these requirements, RDI issued a HASP to E & E for review on September 7, 2012. E & E's review of the HASP verified that RDI had a site-specific plan and that the components were in compliance with the Contract Document requirements on September 11, 2012. RDI provided E & E with copies of medical surveillance examinations and 40-hour HAZWOPER and refresher training certifications for the individual RDI and subcontracted personnel working near or within exclusion zones. The HASP submittal milestones and the plan revisions are provided in the project submittal log provided in Appendix 2C.

In addition, NYSDEC and E & E provided copies of annual health and HAZWOPER refresher training certifications for their respective personnel to RDI for on-site record keeping purposes.

4.6.1.3 Phase 3

As required by Standard Specification Section X - 00003 Minimum Requirements for Health and Safety, MCI submitted a site-specific HASP to E & E for review on February 1, 2016. E & E reviewed and returned the HASP to MCI on May 4,

2016, for revision and resubmission. MCI revised and resubmitted the HASP on May 17, 2016. E & E approved this submittal. E & E noted that MCI was to submit a work plan, certifications, and herbicide information for the removal and treatment once MCI had procured a subcontractor to perform the work. MCI submitted this information on September 6 and October 6, 2016. E & E approved this submittal on October 7, 2016.

MCI designated an SSO and provided E & E with copies of medical surveillance examinations and 40-hour HAZWOPER and refresher training certifications for the individual MCI and subcontracted personnel working near or within exclusion zones. The HASP submittal milestones and the plan revisions are provided in project submittal log in Appendix 3E. In addition, NYSDEC and E & E provided copies of annual health and HAZWOPER refresher training certifications for their respective personnel to MCI for on-site record keeping purposes.

4.6.2 Decontamination of Personnel and Equipment

4.6.2.1 Phase 1 – Area 4

As required in the FPM dated September 2011, GES submitted a HASP document that detailed the decontamination procedures for project personnel and equipment, including construction equipment; provided guidelines for the disposal of used personal protective equipment (PPE); and provided descriptions of the equipment required and the proposed location of the decontamination station.

4.6.2.2 Phase 2

RDI's HASP provided detailed decontamination procedures for equipment and for project personnel entering and exiting the exclusion zones. The HASP detailed the use of portable boot-wash stations, provided guidelines for the disposal of used PPE, contained descriptions of the equipment required and the proposed location of the decontamination station, and identified the requirements covering the movement of equipment between contaminated and non-contaminated work zones (see Appendix 2C).

4.6.2.3 Phase 3

MCI's HASP provided detailed decontamination procedures for equipment and for project personnel entering and exiting the exclusion zones. The HASP provided guidelines for the disposal of used PPE, contained descriptions of the equipment required and the proposed location of the decontamination station, and identified the requirements covering the movement of equipment between contaminated and non-contaminated work zones (see Appendix 3E).

4.6.3 Contingency Measures

4.6.3.1 Phase 1 – Area 4

GES included an Emergency Action Plan as part of the HASP. The plan included the chain-of-command and the communication and evacuation procedures to be followed in the event of a personal injury or an emergency at the site within the exclusion zone, contamination reduction zone, and decontamination zone; PPE

failure; and equipment failure. A pre-designated route to a nearby medical facility was established, and a road map documenting the route was posted in the Contractor's field office and the Engineer's field office.

4.6.3.2 Phase 2

RDI's Emergency Management Plan was submitted as a part of their HASP. The plan included the chain-of-command and communication and evacuation procedures to be followed in the event of an emergency at the site; the locations of first aid equipment; and standard operating procedures and specific procedures to be followed in the event of an accident. A pre-designated route to a nearby medical facility was established, and a road map documenting the route was posted in the Contractor's and Engineer's field offices.

RDI compiled a comprehensive list of emergency contact information, including the names and telephone numbers of the responsible personnel involved with the Depew Village Landfill Project. The list was distributed to the Town of Depew Police, Fire, and Engineering offices; NYSDEC; E & E; and the Erie County Department of Environmental Planning. This list was periodically reviewed for accuracy during regularly scheduled progress meetings at the site, and it was redistributed to the responsible personnel whenever revisions were made.

4.6.3.3 Phase 3

MCI's Emergency Management Plan was submitted as a part of their HASP. The plan included the training of project workers in site emergency action plans, including response to incidental releases of materials that occur within the boundary of the project site. The plan included protective actions, shelter-in-place, evacuation of personnel, notifications, emergency signals, evacuation routes, assembly areas, and personnel accountability. A pre-designated route to a nearby medical facility was established, and a road map documenting the route was located in the Contractor's and Engineer's field offices.

E & E compiled a comprehensive list of emergency contact information, including emergency services contact information and the names and telephone numbers of the responsible personnel involved with the Depew Village Landfill Project. The list was distributed to MCI, NYSDEC, and the Village of Depew DPW. This list was periodically reviewed for accuracy during the progress meetings, and it was redistributed to the responsible personnel whenever revisions were made.

4.6.4 Community Air Monitoring Program (CAMP)

4.6.4.1 Phase 1 – Area 4

GES's HASP included provisions for a CAMP to comply with the requirements set forth in the FPM.

4.6.4.2 Phase 2

RDI's HASP included provisions for a CAMP to comply with the requirements set forth in the Contract Documents, Standard Specifications, Section X, Section 00003 – Minimum Requirements for Health and Safety. The CAMP and on-site

related air monitoring work was performed by RDI's subcontractor, GES. RDI's HASP called for a minimum of four (one upwind and three downwind) real-time dust monitors located outside the exclusion zones for control of dust emissions during intrusive work. Each monitor was equipped with data-logging capabilities, and the data were downloaded and reviewed by the SSO on a daily basis. Audible alarms were included with each unit for when emissions exceeded regulatory levels. The CAMP was suspended during rain and snow events. The E & E site representatives also spot-checked each monitor during the course of each workday. Depending on the contaminants and the site activities, a hand-held photo-ionization detector (PID) was carried by the SSO to monitor volatile organic compound (VOC)/semivolatile organic compound (SVOC) levels in the work area. Fugitive dust emissions that could have an impact on areas outside the site, such as emissions caused by the movement of trucks and equipment, were visually monitored. Corrective actions were taken whenever dust emanated from remedial operations. Copies of RDI's submittals of the CAMP daily air monitoring results are presented in Appendix 2E.

4.6.4.3 Phase 3

MCI's HASP included provisions for a CAMP to comply with the requirements set forth in the Contract Documents, Standard Specifications, Section X, Section 00003 – Minimum Requirements for Health and Safety. The CAMP and on-site related air monitoring work was performed by MCI's SSO. MCI's HASP called for a minimum of four (one upwind and three downwind) real-time dust monitors located outside the exclusion zones for control of dust emissions during intrusive work. Each monitor was equipped with data-logging capabilities, and the data were downloaded and reviewed by MCI's SSO on a daily basis. Audible alarms were included with each unit for use when emissions exceeded regulatory levels. CAMP was suspended during rain and snow events. The E & E site representatives also spot-checked each monitor during the course of each workday. Depending on the contaminants and the site activities, a hand-held PID was carried by MCI personnel inside the exclusion zone to monitor VOC/SVOC levels. Fugitive dust emissions that could have an impact on areas outside the site, such as emissions caused by the movement of trucks and equipment, were visually monitored by E & E's Resident Engineer. Corrective actions were taken whenever dust emanated from remedial operations. The CAMP daily air monitoring results submitted by MCI are presented in Appendix 3F.

4.6.5 On-Site Air Monitoring Program

4.6.5.1 Phase 1 – Area 4

GES performed and documented the air sampling, and real-time air monitoring was completed during excavation activities. Real-time monitoring was completed in accordance with the requirements identified in the generic CAMP that is provided in Appendix 1 of NYSDEC's *Division of Remediation (DER) – 10 Technical Guidance for Site Investigation and Remediation*. The CAMP monitoring data was submitted as part of the Construction Completion Summary (CCS) Report included as Appendix 1E.

4.6.5.2 Phase 2

RDI's subcontractor, GES performed and documented the air sampling and real-time air monitoring upwind and downwind of intrusive activities and for "at-risk" personnel while working in the established exclusion zones. Real-time air monitoring for dust was performed using DustTrak dust meters. Action levels for airborne contaminants were established per applicable regulatory guidelines and per the Standard Specifications, Section X, Section 00003 – Minimum Requirements for Health and Safety, Section 1.15 – Air Monitoring Program of the Contract Documents.

Real-time data recorded by the meteorological station in the Contractor's field office was reported to E & E and included in each Daily Observation Report (DOR). RDI personnel and GES personnel monitored real-time readouts on the DustTrak meters every 15 minutes and provided the E & E site representative with printouts of the air monitoring data before 10:00 a.m. the following day. E & E maintained a log of the downloaded data for each day that intrusive operations were performed at the project site. RDI personnel downloaded and submitted air monitoring results from DustTrak meters to E & E as part of their Substantial Completion submittal process. Air monitoring was normally suspended during days with significant rain or snow events.

Before intrusive activities began, RDI's subcontractor, GES, conducted baseline air sampling for fugitive dust emissions, both upwind and downwind of the exclusion zones, to determine ambient air quality. The SSO also conducted daily real-time air sampling for total dust, lead, and chromium at the air sampling locations upwind and downwind of exclusion zones throughout the duration of intrusive activities. The results for air samples collected during remedial operations at the Depew Village Landfill Site indicated that emissions guidelines established in the technical specifications were maintained. The on-site air monitoring was performed by GES. The analytical work associated with the on-site air monitoring program was performed by Galson Laboratories, Inc., East Syracuse, New York. The reporting and analytical results from the on-site air monitoring program are presented in Appendix 2E.

4.6.5.3 Phase 3

MCI's SSO performed and documented the air sampling and real-time air monitoring upwind and downwind of intrusive activities and for "at-risk" personnel while working in the established exclusion zones. Real-time air monitoring for dust was performed using DustTrak dust meters. Action levels for airborne contaminants were established per applicable regulatory guidelines and per the Standard Specifications, Section X, Section 00003 – Minimum Requirements for Health and Safety, Section 1.15 – Air Monitoring Program of the Contract Documents.

MCI's SSO monitored real-time readouts on the DustTrak meters every 15 minutes and, as part of their daily report, provided the E & E site representative with printouts of the air monitoring data before 10:00 a.m. the following day.

E & E maintained a log of the downloaded data for each day that intrusive operations were performed at the project site. Air monitoring was normally suspended during days with significant rain events.

MCI also placed four PIDs (one upwind and three downwind) on top of the DustTrak monitors each day CAMP monitoring was conducted. The PIDs provided air monitoring documentation for the site. At the end of each week, E & E's resident engineer told MCI's SSO which day of air monitoring data documentation from the previous week was to be sent to the lab to be analyzed.

Before intrusive activities began, MCI's SSO conducted baseline air sampling for fugitive dust emissions, both upwind and downwind of the exclusion zones, to determine ambient air quality. The SSO also conducted daily real-time air sampling for total dust and lead at the air sampling locations upwind and downwind of exclusion zones throughout the duration of intrusive activities. The results for air samples collected during remedial operations at the Depew Village Landfill Site indicated that emissions guidelines established in the technical specifications were maintained. The analytical work associated with the on-site air monitoring program was performed by Paradigm. The reporting and analytical results from the on-site air monitoring program are presented in Appendix 3F.

4.7 Contractor Site Mobilization Activities

4.7.1 Phase 1 – Area 4

GES mobilized the materials and equipment required to conduct the work to the site on October 5, 2011. GES was not required to obtain permits related to the Area 4 construction operations. The GES staging locations and decontamination area(s) did not deviate from those indicated on the Contract Documents or those approved during construction operations. Potable water, power, office space, and sanitation facilities were not available on the site; therefore, GES provided these site services for the project.

4.7.2 Phase 2

RDI mobilized to the Depew Village Landfill Site on Wednesday, September 19, 2012. The equipment mobilized included hydraulic excavators, a chipper, equipment trucks, dump trucks, tree shears, two chain saws, and other equipment necessary to initiate the work. RDI established the Contractor support trailers and support zone near the Area 8 landfill. Development of the operations/support zone area included installation of geotextile and crushed stone to serve as a parking area for site personnel and to provide a base for office trailers. The staging and support areas are shown in the initial pre-construction survey drawings prepared by Clear Creek (see Appendix 2F).

Prior to site mobilization, RDI performed pre-construction sampling in the areas of support zone activities, such as the trailer pad, decontamination pad, CWTS area, and the stockpile area, to obtain background analytical data. The site mobi-

lization samples were analyzed by Paradigm, and the analytical results were submitted to E & E on November 12, 2012. Background sampling locations and sample analytical results are provided in Appendix 2C.

4.7.2.1 Erosion Control Measures, Clearing and Grubbing, and Security Fencing

SWPPP-related work was performed jointly by RDI. The initial work included installation of silt fencing and erosion control features around Area 8 (site staging area) and Area 1 where clearing and grubbing was initially required.

A significant amount of clearing and grubbing work was performed at different areas of the site. Cutting of trees was initiated in Area 1 and the cut trees were cut chipped for placement in the Area 8 landfill. Larger trees were cut down to existing grade, trimmed, and relocated to the Area 8 landfill. Below-grade grubbed materials, including roots, root balls, and tree trunks were left intact with the soil. Once the clearing and grubbing phase was completed in these areas, the remaining erosion and sediment controls specified on the Contract Drawings (see Appendix 2G) and in the approved SWPPP (see Appendix 2C) were installed in the upland and slope toe areas.

Concurrent with the clearing and grubbing phase, temporary construction fencing and Jersey barriers were installed around the project areas. Once the clearing and grubbing phase was completed in Area 1, RDI constructed a new access road from this area to the Area 8 landfill to transport material. A decontamination station was constructed using geo-fabric and crushed stone to decontaminate the trucks entering the Area 8 landfill.

4.7.2.2 Contractor Site Services

RDI provided site services for the duration of the project, including site security and security fencing; traffic controls; field offices and support areas; temporary utilities; erosion, sediment, and surface water controls; disposal of contractor-generated solid waste; noise, odor, dust, and vapor controls; staging/stockpiling and processing areas; survey controls for grades and elevation (Clear Creek); access roads; decontamination trailers, equipment, and associated pads; and sanitary facilities. RDI mobilized two field office trailers (supplied by Modspace, East Syracuse, New York) to the site. One trailer contained an office for the Contractor, a conference area, and their general site operations facilities; the other trailer was used as an office by the Engineer (E & E). Both trailers were furnished with office furniture and an all-in-one copier (i.e., facsimile, scanning machine, telephone, and Internet access).

Potable water service was not available at the Depew Village Landfill Site. Potable water was provided either in bottles or large holding tanks for use by employees and for the sanitary facilities and showers.

A health and safety meeting was held at the start of each workday during the construction phase of the project. RDI's SSO was responsible for the day-to-day assessment of potential work hazards and was required to advise RDI, E & E, and subcontractor personnel of known or potential health and safety issues.

4.7.2.3 Project Surveying Services

RDI subcontracted the surveying work associated with the project to Clear Creek, a professional land surveyor licensed in New York State. Documentation of the surveying services included the initial (pre-construction) site topographic survey for individual areas; and post-excavation surveys for Areas 1, 2, and 6. These drawings are provided in Appendix 2F. Clear Creek established the excavation limits based on the Contract Drawings during their first week on the site. RDI and Clear Creek used the elevations and coordinate system in the Contract Documents. Following completion of the project, RDI declined to submit post-construction record drawings for the site.

4.7.2.4 Contamination Reduction Zones

A decontamination pad was constructed in accordance with project specifications at a location near Area 8. After the trucks were decontaminated, they transferred the waste off-site from Area 1 to the Area 8 landfill via Borden Road to Broadway Street to the Village of Depew DPW. No waste was disposed of off-site.

During the remediation, RDI personnel manually removed gross debris from the remedial construction equipment and transport vehicles to confirm that no contaminated materials adhered to the surfaces. RDI then rinsed the equipment using a pressure washer, prior to moving equipment off-site from the decontamination reduction zone. E & E's site representatives visually inspected vehicles and other construction equipment that exited exclusion zones, as well as vehicles that were required to pass through the on-site decontamination station. The wash water used in the on-site decontamination process was subsequently collected in the on-site frac tanks and then treated by the CWTS.

4.7.2.5 Contact Water Treatment System

The CWTS was designed and installed in accordance with the technical submittal requirements identified in Supplementary Specifications, Section XI, Section 02401 – Contact Water Treatment. Treatment provided by the CWTS included solids removal, suspended sediment filtration, and dissolved-phase VOC and SVOC treatment.

In accordance with the Supplementary Specifications, Section XI, Section 01425 – Sampling, a general State Pollutant Discharge Elimination System (SPDES) permit was obtained from NYSDEC for discharges to Cayuga Creek. Once the system was set up, approximately 1,000 gallons of water were treated and discharged into a separate holding tank. The treated water was sampled and sent to the laboratory for analysis to demonstrate whether it was in compliance with the SPDES permit for the project.

Following the approval of the treatment process, the water was discharged to Cayuga Creek. Water from the on-site decontamination process and water from the dewatering process were treated by the CWTS. Periodic effluent samples were collected from the treatment system's sample ports to document the compliance of the treatment system with the permit requirements.

4.7.3 Phase 3

4.7.3.1 Mobilization Activities – 2016 Work

MCI began mobilizing to the Depew Village Landfill Site on August 4, 2016, and completed mobilization on August 29, 2016. The equipment mobilized included hydraulic excavators, a front-end loader, a bulldozer, a roller, equipment trucks, dump trucks, tree shears, chain saws, and other equipment necessary to initiate the work. MCI placed the Contractor's and Engineer's trailers on Village of Depew DPW property. MCI established the support zone, including the decontamination pad (decon pad), to the west of Area 8. The decon pad was constructed of crushed stone, geotextile, and high-density polyethylene (HDPE) liner, and jersey barriers and temporary fencing were placed around the perimeter.

Prior to site mobilization, MCI performed pre-construction sampling in the areas of support zone activities, such as under the decontamination pad and along the existing access road, to obtain background analytical data. The pre-construction samples were analyzed by Paradigm, and the analytical results were submitted to E & E on August 16, 2016. Pre-construction sampling locations and analytical results are provided in Appendix 3G.

4.7.3.2 Mobilization Activities – 2017 Work

MCI began mobilizing to the Depew Village Landfill Site on May 8, 2017, and completed mobilization on June 20, 2017. The equipment mobilized included hydraulic excavators, a front-end loader, a bulldozer, a roller, equipment trucks, dump trucks, tree shears, chain saws, and other equipment necessary to initiate the work. The Engineer's trailer remained in its original location, near the Area 8 landfill on the Village of Depew DPW property. The MCI trailer was relocated to the Old Land Reclamation Landfill (2017) work area. MCI developed the decon/processing pad (decon pad) on the Old Land Reclamation Landfill property, approximately 150 feet south of the MCI trailer. The decon pad was constructed of crushed stone, geotextile, and HDPE liner, and Jersey barriers and temporary fencing were installed around the decon pad.

Prior to site mobilization, MCI performed pre-construction sampling in the areas of support zone activities, such as under the decon pad and the access road leading to Broadway, to obtain background analytical data. The pre-construction samples were analyzed by Paradigm, and the results were submitted to E & E on June 21, 2017. Additional pre-construction sampling was performed at the locations of additional access roads, prior to the roads being constructed, as the work progressed. These results were submitted to E & E as they were received by MCI from Paradigm. Pre-construction sampling locations and analytical results are provided in Appendix 3G.

4.7.3.3 Erosion Control Measures, Clearing and Grubbing, and Security Fencing – 2016 Work

SWPPP-related work was performed by MCI and inspected by Ensol, Inc. The initial work included installation of compost filter socks around the Area 8 landfill and imported soil stockpiles. Concurrent with the placement of filter socks, temporary construction fencing was installed around the Area 8 landfill. Turbidity curtains were installed across the creek approximately 50 feet downstream of the work area.

Clearing and grubbing was performed throughout the site for the construction of access roads. Woody debris was chipped prior to disposal in the Area 8 landfill. Below-grade grubbed materials, including roots, root balls, and tree trunks were left intact and not removed. Once clearing and grubbing was completed for the proposed access roads, compost filter socks were installed along the sides of each access road. Japanese knotweed that was cleared from the excavation limits on the left-descending bank in Reaches 1 and 2 were placed in plastic bags and buried in the Area 8 landfill.

4.7.3.4 Erosion Control Measures, Clearing and Grubbing, and Security Fencing – 2017 Work

SWPPP-related work was performed by MCI and inspected by Ensol, Inc. The initial work included installation of compost filter socks along the access roads and around imported soil stockpiles. Turbidity curtains were installed across the creek approximately 50 feet downstream of the work area.

Clearing and grubbing work was performed to facilitate construction of the access roads on the Old Land Reclamation Landfill and on the properties of Mr. Straus, Mr. Snyder, and Mr. Singh. Mr. Straus owns the Buffalo Crown Vending property at 4367 Broadway. Mr. Snyder owns the S&L Ranch property at 4447 Broadway. Mr. Singh owns the One Stop property at 4535 Broadway. NYSDEC obtained a signed property acknowledgment/consent form from each property owner prior to the start of construction, which provided right of entry for the purpose of access road construction activities associated with the project. MCI and E & E met with each property owner before conducting the clearing and grubbing activities on those properties to further explain the proposed work activities. Woody debris was transported and disposed of off-site. Below-grade grubbed materials, including roots, root balls, and tree trunks were left intact and not removed. Once clearing and grubbing was completed for the proposed access roads, compost filter socks were installed along the sides of each access road.

4.7.3.5 Contractor Site Services

MCI provided site services for the duration of the project, including site security; access road maintenance; maintenance of paved roads on the access/haul route; field office and support area maintenance; temporary utility maintenance and consumption; erosion, sediment, and surface water controls; instrument calibration, operation, and maintenance; site/security fencing maintenance; project meetings;

site superintendence; decontamination station operation and maintenance; disposal, material stockpile, and processing area covering, uncovering, and maintenance; utility and sanitary facilities operation and maintenance; maintenance of survey controls and verification of grades and elevations; noise, odor, and dust controls; and traffic control. MCI mobilized two field offices (trailers) to the site. The Engineer's field office was supplied by Modspace (East Syracuse, New York) and the Contractor's field office was supplied by A-Verdi Storage Containers (Rochester, New York). One trailer contained an office for the Contractor and storage space for equipment and materials; the Engineer's trailer contained an office for the Engineer, an office for NYSDEC, and a conference area to host the progress meetings. The Engineer's trailer was furnished with office furniture and an all-in-one copier (i.e., facsimile, scanning machine, telephone, and Internet access).

Potable water service was not available at the Depew Village Landfill Site. MCI provided potable water in a bottled water cooler or in bottles for consumption by field personnel throughout the project.

A health and safety meeting was held at the start of each workday during the construction phase of the project. MCI's SSO was responsible for the day-to-day assessment of potential work hazards and was required to advise MCI, E & E, and subcontractor personnel of known or potential health and safety issues.

4.7.3.6 Project Surveying Services

MCI subcontracted the surveying work associated with the project to Wendel Companies of Buffalo, New York, a professional land surveyor licensed in New York State. Documentation of the surveying services included the initial (pre-construction) site topographic survey (including the Area 8 landfill); intermediate post-excavation surveys for Reaches 1 and 2, under the north and south arches of the Borden Road bridge, and Cells 1 – 11; and a final as-built topographic survey (including the Area 8 landfill). These drawings are provided in Appendix 3E. Wendel established and staked the excavation limits based on the Contract Drawings during mobilization activities in 2016 and 2017. MCI and Wendel used the elevations and coordinate system in the Contract Documents. While the above drawings issued by MCI/Wendel were marked as "As-built," these are noted to be the "Record" drawings for the project.

4.7.3.7 Contamination Reduction Zones

A decon pad was constructed in accordance with project specifications. For the 2016 work, the pad was constructed at a location west of the Area 8 landfill. During intrusive work, haul trucks backed into the decon pad via the ramp that was outside the exclusion zone and unloaded the contaminated sediment onto the decon pad without the wheels or exterior of the truck contacting contaminated material. This procedure eliminated the need to decontaminate the trucks after every load.

For the 2017 work, the decon pad was constructed west of the Borden Road bridge, on the Old Land Reclamation Landfill property. A lane of travel through the decon pad was maintained outside of the exclusion zone (i.e. where contaminated sediments were being stockpiled and processed) during the course of construction activities to minimize the need to decontaminate the haul trucks prior to departing the decon pad after sediment offloading.

During project activities, MCI personnel manually removed gross debris from the remedial construction equipment and transport vehicles to confirm that no contaminated materials adhered to the surfaces. MCI then rinsed the equipment using a garden hose, prior to removing the equipment from the decon pad. E & E's site representative visually inspected vehicles and other construction equipment that exited exclusion zones, as well as vehicles that passed through the decon pads. The wash water used in the on-site decontamination process was subsequently treated through the CWTS, stored in the discharge tanks, and sampled and analyzed prior to being discharged into Cayuga Creek. E & E's site representative visually inspected the discharge location and swale during each discharge to confirm that erosion was not occurring as a result of the discharge.

4.7.3.8 Contact Water Treatment System – 2016 Work

The CWTS was designed and installed in accordance with the technical submittal requirements identified in Supplementary Specifications, Section XI, Section 02401 – Contact Water Treatment. The CWTS was provided by BakerCorp. Treatment provided by the CWTS included solids removal, suspended sediment filtration, and dissolved-phase VOC and SVOC treatment.

Supplementary Specifications, Section XI, Section 01425 – Sampling, provided MCI with a general SPDES permit from NYSDEC for discharges to Cayuga Creek. Once the system was set up, approximately 4,000 gallons of water were treated and held in the discharge tank. The discharge was sampled and sent to Paradigm for analysis to demonstrate compliance with the discharge limitations for the project.

Following E & E's approval of MCI's treatment process, the water was discharged to Cayuga Creek via the swale along the existing access road. Water from the on-site decontamination process and the dewatering process water were treated by the CWTS. The effluent was sampled and analyzed approximately every 20,000 gallons treated to confirm and document that the effluent from the treatment system was in compliance with the SPDES permit requirements.

4.7.3.9 Contact Water Treatment System – 2017 Work

A CWTS similar to that used in 2016 was provided by BakerCorp for the 2017 work. Supplementary Specifications, Section XI, Section 01425 – Sampling, provided MCI with a general SPDES permit from NYSDEC for discharges to Cayuga Creek. Once the system was set up, approximately 4,000 gallons of water were treated and held in the discharge tank. A discharge sample was collected by

MCI and sent to Paradigm for analysis to demonstrate compliance with the discharge limitations for the project. The analytical results for the initial sample did not meet discharge requirements. After the system was inspected by MCI and BakerCorp, the water was retreated, and a second sample was collected from the discharge tank; the analytical results for this sample met the discharge requirements.

Following the approval of the treatment process, the water was discharged to the ground east of the 2017 decon pad. During each discharge, E & E's Resident Engineer observed the treated water infiltrate into the ground with no erosion noted. Water from the on-site decontamination process and the dewatering process water were treated by the CWTS. The effluent was sampled approximately every 20,000 gallons treated to confirm and document that the treatment system effluent was compliant with the permit requirements.

4.8 Access Road and Site Security

4.8.1 Phase 1 – Area 4

GES improved the current access road in order to facilitate the safe passage of vehicles and equipment to/from Area 4 work areas. A temporary access way was established between two stream bank excavation areas and Area 8 to avoid wholesale transport of contaminated soil and backfill material in Cayuga Creek. No site security activities were performed during this phase of project activities.

4.8.2 Phase 2

4.8.2.1 General

On September 19, 2012, RDI initiated work on site clearing and tree trimming, prior to installation of the temporary access road. Cut trees and vegetation were reduced to wood chips, which were placed in the soil disposal area in the Area 8 landfill.

The temporary access roads were constructed using approved geotextile and stone in accordance with RDI's approved operations plan and Contract Documents. The south access road extended from Area 2 (at the south end of the property) to the staging areas in Area 8. The north access road was constructed along Area 8 on the northern end of the project area. Installation of the temporary access roads was completed on September 28, 2012.

4.8.2.2 Maintenance of the Access Road and Site Security Fencing

In accordance with the requirements of the Contract Documents, RDI provided periodic inspection and maintenance of the access roads and site security fencing during the course of the remediation project. This included grading and rolling the access roads to prevent ruts and washouts after rain events in order to maintain access to the site. Site fencing was adjusted as needed based on security or expanded excavation requirements.

4.8.2.3 Site Security and Sign-in Logs

In accordance with the requirements of the Contract Documents, RDI submitted a site security plan. In compliance with the site security plan and as a requirement of the HASP, during the entire time RDI was at the site, daily sign-in logs were required for personnel entering or leaving the site. RDI's subcontractor, GES, maintained these daily sign-in logs, which were also used for security purposes. Security logs are presented in Appendix 2H.

4.8.3 Phase 3

4.8.3.1 General

On August 8, 2016, MCI initiated work on site clearing and tree trimming, prior to installation of the 2016 temporary access roads; and on May 9, 2017, MCI initiated work on site clearing and tree trimming, prior to construction of the 2017 access road on the Old Land Reclamation Landfill.

The access roads were constructed using approved geotextile and stone in accordance with MCI's approved work plan and the Contract Documents. MCI constructed nine access roads during the 2016 work and 24 access roads during the 2017 work. The access roads were constructed during each construction season, as necessary, for MCI to access the work areas in the creek. Temporary access roads 1 through 6 were removed prior to the 2016 winter shutdown. Temporary access roads 7 through 9 remained in place over the winter shutdown so that they could be utilized during the 2017 work. At the completion of the 2017 work, MCI removed temporary access roads 7 through 9, 21 through 27, and 29 through 33. Access roads 10 through 20 and the 2017 decontamination pad were restored and left on-site at the request of the Village of Depew DPW and with NYSDEC approval.

4.8.3.2 Maintenance of the Access Road and Site Security Fencing

In accordance with the requirements of the Contract Documents, MCI provided periodic inspection and maintenance of the access roads and site security fencing during the course of the remediation project. This included grading and rolling the access roads to prevent ruts and washouts after rain events. Site fencing was adjusted as needed based on security or expanded excavation requirements. Caution tape was placed around the exclusion zone to limit unauthorized entry. Gates were placed at the entrance to access road 10 along Broadway and at the entrance to access road 27 on Mr. Singh's property to prevent unauthorized access.

4.8.3.3 Site Security and Sign-in Logs

In accordance with the requirements of the Contract Documents, MCI submitted a site security plan as part of the work plan. In compliance with the site security plan and as a requirement of the HASP, MCI maintained daily sign-in logs for personnel entering or leaving the site. These sign-in logs were also used for security purposes. Security logs are presented in Appendix 3H.

4.9 Contractor Post-construction Project Submittals

4.9.1 Phase 1 – Area 4

On July 31, 2013, as required in the FPM dated September 2011, GES submitted a CCS report that summarized the project activities that were completed at the site for Phase 1. The CCS report included site drawings, CAMP data, laboratory analytical reports, Contractor daily field reports, and material specification sheets (see Appendix 1E).

4.9.2 Phase 2

Post-construction or closeout submittal requirements for the project were listed in the Contract Documents, Supplementary Specifications, Section XI, Section 01011 – Project Submittals. Closeout documents and submittals included a list of administrative and technical documents to verify the completion of the project in accordance with the technical specification and administrative requirements of the Contract Documents. RDI submitted the post-construction submittals for E & E's review and approval. E & E determined whether to reject the post-construction submittals or approve them, with or without conditions. The project submittal log serves as the formal documentation of E & E submittal responses, and is provided in Appendix 2C.

4.9.3 Phase 3

Post-construction or closeout submittal requirements for the project were listed in the Contract Documents, Supplementary Specifications, Section XI, Section 01011 – Project Submittals. Closeout documents received from MCI included one set of site drawings marked up by MCI to show "as-built" conditions; electronic files of record drawings produced by Wendel Companies, MCI's surveyor; the surveyor's field notes; and post-construction photo/video documentation of site conditions. MCI submitted the post-construction submittals for E & E's review and approval. E & E determined whether to reject the post-construction submittals or approve them, with or without conditions.

The project submittal log for the Depew Village Landfill Project Phase 3 is provided in Appendix 3E. The substantial completion checklist is provided in Appendix 3I.

5 Remedial Program Elements

5.1 Engineering Services during Remedial Construction

5.1.1 E & E

5.1.1.1 Phase 1 – Area 4

E & E provided engineering services during the remedial construction activities under Work Assignment D004442-22. E & E reviewed and either approved or rejected the submittals from GES and TREC. E & E also provided construction oversight during the work performed by GES. Copies of the submittals and a submittal log were maintained by E & E throughout the course of the project and are presented in Appendix 1D.

E & E prepared and submitted Daily Observation Reports (DORs) to the NYSDEC Project Manager during the course of the field work. The DORs documented the construction progress at the site throughout the remedial construction period (see Appendix 1F).

No progress meetings were held during Phase 1 since the project was expected to last only eight days.

During the remediation activities, GES did not submit Requests for Information (RFIs) or Proposed Change Orders (PCOs) for consideration. E & E also did not issue Field Orders (FOs) during these activities. E & E did not review Contract Applications for Payment (CAPs) for remedial work performed by the Callout Contractor in Area 4. These documents were sent directly to the NYSDEC Project Manager for review and approval.

5.1.1.2 Phase 2

E & E provided engineering services during the remedial construction under Work Assignments D004442-22 and D007631-05. E & E prepared the design and the Contract Documents (Contract D008513), including the *Limited Site Data Documents for Depew Village Landfill, Town of Cheektowaga, Erie County, New York* (E & E 2011).

The engineering services E & E provided during the bid phase of the project are described in Section 3.2.2.

E & E reviewed the 5-day and 14-day plans submitted as a part of the evaluation to determine whether the Contractor had an understanding of the project scope of

work and for compliance with the Contract technical specifications. Supplementary Specifications, Section XI, Section 01011 – Submittals, outlined the requirements for the preparation and submittal of the materials, equipment, and methods related to the Depew Village Landfill Site remedial construction and restoration activities. RDI prepared and submitted project plans in general compliance with these requirements, and revised and resubmitted in a timely manner those found to be deficient. Submittals were reviewed for general conformance with the Contract Documents, including the plans and technical specifications. A total of 62 submissions were provided to E & E as required by the Contract Documents for review and approval. E & E's site representative and Project Manager determined whether to reject or approve the shop drawings, with or without conditions. Finally, upon completion of the work, E & E reviewed the post-construction documentation describing that the Contractor had fulfilled the technical and administrative requirements of the Contract Documents. Copies of the submittals and a submittal log for the work performed by RDI were issued to the NYSDEC Project Manager and maintained by E & E throughout the course of the project and are presented in Appendix 2C.

E & E prepared and submitted DORs to the NYSDEC Project Manager during the course of the field work. The DORs documented the construction progress at the site and the project's budgetary status throughout the remedial construction period. Each DOR documented the remedial construction monitoring performed during the day, provided photos of major aspects of the work, and presented the results of the CAMP. Copies of the DORs for the Phase 2 work performed by RDI and its subcontractors are provided in Appendix 2I. Project photos taken by E & E during the remedial work performed by RDI are included in the DORs. Additional photos taken prior to construction are provided in Appendix 2C.

In addition to the DORs, the E & E Project Manager and staff communicated with NYSDEC by telephone on a regular basis. E & E conducted a total of 33 progress meetings during the course of the project. Progress meetings were held approximately every two weeks and, if needed, the meeting dates were adjusted for the convenience of the attendees. Attendees typically included representatives of NYSDEC, RDI, E & E, subcontractors, and other parties to the project, as required. The meetings were held on-site in the Contractor's field office during the construction period. E & E prepared and distributed an agenda for each meeting and provided a sign-in sheet for documentation purposes. E & E recorded the minutes of each meeting and distributed draft copies to the attendees. Comments were received and reviewed before the meeting minutes were finalized. Final copies of the minutes were then distributed to the attendees before or at the next scheduled progress meeting. Progress meeting agendas and minutes are provided in Appendix 2B.

E & E provided clarification of the Contract Documents throughout the RFI process to facilitate the Contractor's understanding of the project. E & E worked with NYSDEC to manage and resolve 14 RFIs during Phase 2 of the project.

Copies of the RFIs issued during performance of the work and responses are provided in Appendix 2J. A summary of the project RFIs is provided in Section 5.2.2.1 and presented in Table 5-1.

E & E issued eight FOs to RDI or its subcontractors when directed by NYSDEC. The FOs included orders to re-excavate on-site areas where the results of initial confirmation sampling did not meet the SCOs stipulated in the amended ROD for the site. Copies of the FOs for the work performed by RDI are provided in Appendix 2K. A summary of the project FOs is provided in Section 5.2.2.2 and presented in Table 5-2.

E & E evaluated 14 PCOs generated by the Contractor or NYSDEC to determine whether they were appropriate and to describe additional work not covered by the original scope of work for the project. E & E evaluated each PCO for cost and time and, if appropriate, recommended the PCO to NYSDEC. Once a PCO was executed and completed, the Contractor submitted final costs and time for E & E's review and acceptance by NYSDEC. Copies of the PCOs for the work performed by RDI during the execution of the remedial contract are provided in Appendix 2L. A summary of the project PCOs is provided in Section 5.2.2.3 and presented in Table 5-3.

If the costs and time for an individual PCO was acceptable, they were included in a final project CO, which was submitted to NYSDEC for approval and then to the New York State Office of the State Comptroller for acceptance and accrual of additional funds for payment under the Contract. Two COs were issued during this phase of the project. These are presented in Sections 7.4.2.2 and 7.4.2.3. Copies of the CO documentation for the project are provided in Appendix 2M.

E & E reviewed RDI's completed bid items and quantities in the requested CAP. This included field confirmation of the project quantities requested in the CAP and review of the Contractor's and Subcontractors' certified payrolls for compliance with the New York State Department of Labor (NYSDOL)'s accepted wage rates for Phase 2 of the Depew Village Landfill Project. The Phase 2 Contractor CAPs and certified payrolls are discussed in Section 7.5.1. Copies of the CAPs for the work performed by RDI for the remedial contract are provided in Appendix 2N.

5.1.1.3 Phase 3

E & E provided engineering services during the remedial construction under Work Assignment D007617-10. E & E prepared the design and the Contract Documents (Contract D009682), including the Limited Site Data Documents for Depew Village Landfill, Town of Cheektowaga, Erie County, New York (E & E 2015).

The engineering services E & E provided during the bid phase of the project are detailed in Section 3.2.3.

E & E reviewed the 5-day and 14-day plans submitted as a part of the evaluation to determine whether the Contractor had an understanding of the project scope of work and for compliance with the Contract technical specifications. Supplementary Specifications, Section XI, Section 01011 – Submittals, outlined the requirements for the preparation and submittal of the materials, equipment, and methods related to the Depew Village Landfill Site remedial construction and restoration activities. MCI prepared and submitted project plans in general compliance with these requirements, and revised and resubmitted in a timely manner those found to be deficient. Submittals were reviewed for general conformance with the Contract Documents, including the plans and technical specifications. Fifty-three submittals were provided to E & E as required by the Contract Documents for review and approval. Revisions and resubmittals were also provided, as necessary. E & E's Resident Engineer, Project Engineer, and Project Manager determined whether to reject or approve the shop drawings and submittals, with or without conditions. Finally, upon completion of the work, E & E reviewed the post-construction documentation describing that the Contractor had fulfilled the technical and administrative requirements of the Contract Documents. Copies of the submittals and a submittal log were maintained by E & E throughout the course of the project and are presented in Appendix 3E.

E & E prepared and submitted Daily Inspection Reports (DIRs) to the NYSDEC Project Manager during the course of the field work. Each DIR documented the remedial construction monitoring performed during the day, provided photos of major aspects of the work, and outlined the work to be completed the following day. Copies of the DIRs for Phase 3 of the work performed by MCI and its subcontractors are provided in Appendix 3J. Project photos taken by E & E during the remedial work performed by MCI are also included in the DIRs. Additional photos not included in the DIRs are provided in Appendix 3E.

In addition to the DIRs, the E & E Project Manager and staff communicated with NYSDEC by telephone on a regular basis. E & E conducted a total of 26 progress meetings during the course of Phase 3 of the project. Progress meetings were held approximately every two weeks and, if needed, the meeting dates were adjusted for the convenience of the attendees. Attendees typically included representatives of NYSDEC, MCI, E & E, and other parties to the project, as required. The meetings were held on-site in the Engineer's field office during the construction period. E & E prepared and distributed an agenda for each meeting and provided a sign-in sheet for documentation purposes. E & E recorded the minutes of each meeting and distributed draft copies to the attendees for review and comment. Comments were received and reviewed by E & E before the meeting minutes were finalized. Final copies of the minutes were then distributed to NYSDEC and each attendee before the next scheduled progress meeting. Copies of the agendas and progress meeting minutes are provided in Appendix 3D.

E & E provided clarification of the Contract Documents throughout the RFI process to facilitate the Contractor's understanding of the project E & E. During Phase 3 of the project, E & E worked with NYSDEC to manage and resolve 13

RFIs. Copies of the RFIs issued during performance of the work and responses are provided in Appendix 3K. A summary of the project RFIs is provided in Section 5.2.2.1 and presented in Table 5-4.

E & E issued one FO to MCI, as directed by NYSDEC. The FO included an order to perform additional excavation in an area where the results of initial confirmation sampling did not meet the SCOs stipulated in the ROD for the site. A copy of the FO for the work performed by MCI is provided in Appendix 3L. A summary of the Phase 3 FO is provided in Section 5.2.3.2 and presented in Table 5-5.

E & E evaluated one PCO generated by NYSDEC to describe the winter shutdown not covered by the original scope of work for the project. E & E evaluated this PCO for cost and time and recommended the PCO to NYSDEC for approval. Once the PCO was executed and completed, the Contractor submitted final costs and time for E & E's review and acceptance by NYSDEC. A summary of the PCO for the Phase 3 work performed by MCI during the execution of the remedial contract is provided in Appendix 3M.

If the costs and time for the PCO were acceptable, it was included in a final project CO, which was submitted to NYSDEC for approval and then to the New York State Office of the State Comptroller for acceptance and accrual of additional funds for payment under the Contract. Three COs were issued during this project. The project COs related to the Contract are presented in Sections 7.4.2.2 and 7.4.2.3. Copies of the CO documentation for the project are provided in Appendix 3N.

E & E reviewed MCI's completed bid items and quantities in the monthly CAP. This included field confirmation of the project quantities requested in the CAP and review of the Contractor's and Subcontractors' certified payrolls for compliance with the NYSDOL's accepted wage rates for the Depew Village Landfill Project. Contractor payments and certified payrolls are discussed in Section 7.5 Copies of the CAPs for the work performed by MCI for the remedial contract are provided in Appendix 3O.

5.1.2 McMahon & Mann Consulting Engineers, P.C.

E & E retained McMahon & Mann Consulting Engineers, P.C. (MMCE) to design the slope reconstruction for Area 1 and periodically observe RDI's construction activities during Phase 2. MMCE visited the site 10 times for periodic observation of the construction progress during July, August, and September 2013. During each visit, MMCE, in consultation with E & E, discussed the ongoing construction activities with RDI's site supervisors to confirm that the construction activities were completed in accordance with the project requirements. MMCE's inspection reports are included in Appendix 2O.

5.1.3 Watts Architecture and Engineering

E & E subcontracted Watts to provide construction management and inspection services on an as-needed basis throughout Phase 3. Watts provided a total of 21 days of services during three separate weeks in September 2016, June 2017, and July 2017. This included two additional days of crossover at the site with the E & E Resident Engineer during each of these weeks. While Watts was on-site, the E & E Project Manager and Watts representative communicated daily to discuss the activities at the site and resolve construction or quality issues.

5.2 Contract RFIs, FOs, and PCOs

5.2.1 Phase 1 – Area 4

RFIs, FOs, and PCOs were not issued during the Phase 1 activities.

5.2.2 Phase 2

5.2.2.1 Requests for Information

RFIs for clarification or interpretation of the Contract Documents were prepared by RDI, E & E, or NYSDEC. Each RFI was addressed by the party it was directed to and then evaluated by E & E. A total of 14 individual RFIs were submitted to E & E and are summarized in Table 5-1. Copies of the RFIs, the responses, and an RFI log were maintained by E & E throughout the course of the project and are presented in Appendix 2J.

Table 5-1 RFI Summary for Phase 2, Depew Village Landfill Site

RFI Number	Date Received	Description
001	9/13/12	**Requested by RDI** – RDI inquired about Vendor Responsibility Questionnaires for its vendors (material suppliers). E & E responded Vendor Responsibility Questionnaire is not required for vendors and applies to subcontractors, such as trucking companies.
002	9/13/12	**Requested by RDI** – RDI inquired about whether air monitoring is required during site preparation activities or if it is limited to intrusive activities. E & E responded that a CAMP is required during activities that could generate lead-contaminated dust, including access road construction.
003	10/16/12	**Requested by RDI** – After the first round of Japanese knotweed removal and herbicide application, RDI verbally asked E & E if scraps of decayed Japanese knotweed remaining on the ground surface needed to be removed. E & E accepted the decayed debris remains on the ground post-removal "as is" in Area 5 to avoid workers from disturbing the soil and potentially exposing lead contamination. The second round of herbicide application in the spring was expected to eradicate surviving knotweed.
004	10/16/12	**Requested by RDI** – RDI requested permission to substitute black willow (*S. nigra*) for the unavailable cracked willow (*S. fragilis*) species. E & E responded that the substitution was acceptable.

Table 5-1 RFI Summary for Phase 2, Depew Village Landfill Site

RFI Number	Date Received	Description
005	11/13/12	**Requested by RDI** – RDI requested further information on bedrock elevations and the restoration scope of work for Areas 1, 2, and 3. E & E responded bedrock elevations would not affect reconstruction of Areas 1, 2, or 3 and reconstruction was to commence in accordance with Contract Drawings and E & E direction as presented in this RFI.
006	11/15/12	**Requested by RDI** – RDI requested clarification on modification of bedding material and whether standard DOT bedding material can be reconsidered. E & E responded that the bedding material be provided in accordance with the contract requirements.
007	11/30/12	**Requested by RDI** – RDI requested to sample at a lower frequency than what was specified in the Contract Documents. E & E approved one sample per 1,000 square yards for Area 2 only.
008	11/30/12	**Requested by RDI** – RDI requested to substitute pussy willow (*Salix discolor)*, black willow *(S. nigra)*, and red osier dogwood *(C. sericea)* live stakes with matching quantities of more available species in Areas 2 and 6. E & E approved substituting matching quantities of specified species at no change in cost.
009	12/4/12	**Requested by RDI** – RDI reported inadequate amounts of red osier dogwood *(C. sericea)* to populate Area 5 and would like to substitute with silky willow *(Salix sericea)*. E & E approved substituting matching quantities of specified species at no change in cost.
010	12/12/12	**Requested by RDI** – RDI reports delivery of potted material lacks a few species due to damage from rabbits and requests a substitution in container plant species. E & E responded that matching quantities of specified species may be substituted in Areas 2 and 6 at no change in cost.
011	6/12/13	**Requested by RDI** – RDI requested clarification on depth of sediment removal in Cayuga Creek (Area 3). E & E's response to the proposed depth of Area 3 dredging was that dredging should generally be between 0 to 1 foot deep and as per Resident Engineer direction.
012	8/22/13	**Requested by RDI** – RDI requested that a lower number of samples be collected for the structural fill imported for Area 1. E & E indicated that the new fill should be sampled at a frequency of 1 per 500 CY in compliance with Project Specification.
013	8/25/13	**Requested by RDI** – RDI requested additional information on areas of additional invasive species treatment in Areas 5 and 6. E & E outlined strategy (timing and treatment requirements) of invasive species management as well as payment for this work. RDI directed to reapply herbicidal agent to emergent growth observed by E & E in Area 5 in compliance with Project Specification at no additional cost to NYSDEC.

Table 5-1 RFI Summary for Phase 2, Depew Village Landfill Site

RFI Number	Date Received	Description
014	9/16/13	**Requested by RDI** – RDI requested confirmation on how work related to PCO No. 006 will be paid and more detail on the scope. RFI 014 was subsequently discussed during Progress Meeting 30 on September 17, 2013. E & E responded that soil removal and clean fill quantities would be paid under the appropriate UC bid items, and other costs associated with the work would be absorbed by the Contractor.

5.2.2.2 Field Orders

Eight FOs were issued during Phase 2 by E & E as directed by NYSDEC in response to changes in field conditions that required additional direction or where additional excavation work was required to meet the project SCOs. Descriptions and details of each FO are provided in Table 5-2. Copies of the FO log and the individual FOs are presented in Appendix 2K.

Table 5-2 Field Order List for Phase 2, Depew Village Landfill Site

Field Order Number	Issue Date	Description
001	01/03/13	RDI to perform a demobilization of labor, equipment, and respective support materials immediately (January 3, 2013) from the Depew Village Landfill Site for purposes of a winter shutdown until Monday, April 15, 2013.
002	7/23/13	RDI to prepare and submit all documentation required to execute a change to the Depew Village Landfill Project, NYSDEC Contract No. D008513 under Payment Item UC-5 – Sediment Removal – in compliance with Project Specification Section VIII Article 9.2 – Changes in the Work.
003	8/8/13	Excavate contaminated soil from an additional 125-foot-long by 2.5-foot-deep section on the Area 1 slope, beginning excavation at the bottom of the slope at elevation 629.80 feet to the top of the contaminated material at elevation 647.5 feet. In addition, clean fill placed by RDI on the Area 1 slope for temporary stabilization purposes must be placed and compacted in accordance with the Contract Documents and the work be verified by the resident engineer.
004	8/14/13	Grade and cap the landfill in Area 8 in compliance with the Contract Plans and Specifications.
005	8/23/13	Reapply herbicide treatment to invasive species in Areas 5 and 6.
006	9/13/13	Remove a 16-foot by 16-foot by 5-foot-deep area of contaminated soil in Area 2 based on analytical results from confirmatory samples collected on May 17, 2013.

Table 5-2 Field Order List for Phase 2, Depew Village Landfill Site

Field Order Number	Issue Date	Description
007	9/18/13	Remove a 120-foot-long by 6-inch-deep by full width of roadway surface area prior to completion of site restoration activities due to samples that indicated contamination exceeding SCOs on the north/south access road.
008	9/26/13	Removal of a 10-foot by 10-foot by 2-foot-deep area of soil prior to completion of site restoration activities in Area 2 due to sample data, which indicated contamination exceeding SCOs.

5.2.2.3 Proposed Change Orders

A total of 14 PCOs were issued during Phase 2 of the project. Each PCO cost and schedule was developed by RDI. PCOs were reviewed by E & E after discussions of cost and schedule impacts with both NYSDEC and the Contractor's Project Manager. PCOs were either rejected or approved by the Project Engineer and then implemented by the Contractor, or tabled for future consideration in accordance with the General Conditions of the Contract Documents. The PCOs are summarized in Table 5-3, and the complete descriptions and log are presented in Appendix 2L. All 14 PCOs resulted in cost change items. The changes in costs for the project are discussed in Section 7.4.2.

Table 5-3 Proposed Change Order List for Phase 2, Depew Village Landfill Site

PCO Number	Initiated By	Date Received	Topic
001	RDI	11/15/12	Additional quantities of Japanese knotweed were discovered during invasive species removal in Project Areas 5 and 7. E & E requested a price quotation from RDI for the cost to remove an additional 29,095.5 square feet of invasive species from the site.
002	E & E	11/21/12	E & E recommended reinforcement of the swales with a segregation layer of Mirafi FW-500 geofabric and a 12-inch-deep layer of medium riprap and requested a price quotation from RDI for the cost to install fabric and medium riprap at two existing swale locations in Area 6.
003	RDI	12/05/12	Additional contaminated soil exceeding the original quantity specified in the Contract Documents under Bid Item UC-6 – Excavation was discovered in Area 2. E & E requested a price quotation from RDI for the cost to remediate additional contaminated soil and backfill with clean fill.

Table 5-3 Proposed Change Order List for Phase 2, Depew Village Landfill Site

PCO Number	Initiated By	Date Received	Topic
004	E & E	03/21/13	Due to additional cost for the winter shutdown demobilization/remobilization of equipment and materials, E & E requested a price quotation from RDI to cover the rental costs of the Engineer's field office and wastewater treatment plant components referenced by FO No. 001- Winter Shutdown and the Conditions.
005	E & E	3/14/13	E & E proposed an extension of contract time by 117 days to reflect the winter shutdown duration of 117 days.
006	E & E	5/28/13	E & E requested a price quotation from RDI for the cost to provide labor, equipment, and materials to perform demobilization/remobilization to and from the remediation site referenced by FO No. 001 – Winter Shutdown.
007	E & E	6/19/13	E & E requested a price quotation from RDI to collect, analyze, and report analytical results of a representative soil sample of stream sediment from Area 3 to verify contamination content.
008	E & E	7/17/13	E & E proposed a decrease in contract value of $22,165.87 for time accrued (approved overtime) for E & E personnel.
009	E & E	10/14/13	Common fill installed at the site exceeded the Unrestricted Soil Guidelines for the project. E & E proposed an increase in contract value of $3,050.93.
010	E & E	10/14/13	RDI was requested to remove a 10-foot-wide by 10-foot-long by 2-foot-deep area of sediment from the stream bed prior to completion of site restoration activities. The PCO proposed an increase in contract value of $875.38 for the activities mentioned.
011	RDI	11/25/13	A change in contract value of $1,855.13 was proposed to restore the Zurbrick Road slope in Area 1. This change order would require the installation of additional materials on a time-and-materials basis.
012	RDI	11/21/13	Sampling indicated residual contamination exceeding lead SCOs for the project. RDI was requested to remove a 10-foot by 10-foot by 6-foot-deep area of contaminated soil at the sampling location. Following soil removal, sample analytical results indicated residual contamination exceeding lead SCOs. RDI was subsequently requested to remove an additional 10-foot by 10-foot by 6-foot-deep area of contaminated soil at the sampling location and complete restoration activities.

Table 5-3 Proposed Change Order List for Phase 2, Depew Village Landfill Site

PCO Number	Initiated By	Date Received	Topic
013	E & E	12/27/13	Following removal of large trees and existing guide rail located along the top of the Zurbrick Road slope during contaminated soil remediation activities, the Contractor was requested to install additional rail required to protect the Zurbrick Road right-of-way. This resulted in a proposed increase in contract value of $2,837.97.

5.2.3 Phase 3

5.2.3.1 Requests for Information

RFIs for clarification or interpretation of the Contract Documents were prepared by MCI. E & E reviewed and addressed each RFI and provided a response to MCI. A total of 13 individual RFIs were submitted to E & E and are summarized in Table 5-4. Copies of the RFIs, the responses, and an RFI log were maintained by E & E throughout the course of the project and are presented in Appendix 3K.

Table 5-4 RFI Summary for Phase 3, Depew Village Landfill Site

RFI Number	Date Received	Description
001	5/31/16	**Requested by MCI** – MCI inquired about the easements for the terms of use and reestablishment of the Crown Vending and S&J Stables properties. E & E responded by attaching the signed property owner acknowledgement/consent forms.
002	5/31/16	**Requested by MCI** – MCI inquired about the planting season for live staking and the quantity of live stakes required for the project. E & E responded that the lives stakes should be planted during their dormancy (late fall to early spring) per Supplementary Specification 02920 – Seeding and Planting, Section 3.4.B, and that the quantity of live stakes is 11,606 SF per Contract Drawings Sheet 8 of 9.
003	5/31/16	**Requested by MCI** – MCI inquired if the deposited spoils from the excavation in Area 8 can be sprayed in Area 8 prior to capping. E & E stated that herbicide should not be sprayed in the Area 8 landfill and referenced Supplementary Specification 02110 - Site Preparation, Clearing, and Grubbing, Section 3.5.B Invasive Species Management.
004	5/31/16	**Requested by MCI** – MCI asked if there are stream or aquatic restriction dates for this section of Cayuga Creek. E & E responded with reference to Addendum #1, Part A, No. 23, "Due to New York State Fish and Wildlife restrictions, all dredging in Cayuga Creek needs to be completed by the end of September 2016."

Table 5-4 RFI Summary for Phase 3, Depew Village Landfill Site

RFI Number	Date Received	Description
005	6/3/16	**Requested by MCI** – MCI requested that the location and limits of invasive species removal be defined. E & E stated that the limit of invasive species removal is defined in Sheet 7 of 9 of the Contract Drawings.
006	7/25/16	**Requested by MCI** – MCI requested more information on the capacity of the Area 8 landfill to support the sediments to be removed from Reach 1 and 2. E & E responded that the design calculations were based on the previous Contractor's post-construction survey and recommended that MCI perform a pre-construction survey for evaluation of volume and placement of material.
007	8/5/16	**Requested by MCI** – MCI requested confirmation on the quantity of live staking and invasive species removal. E & E stated that the bid quantity of 4,840 square yards for live staking and invasive species removal is correct. This response supersedes E & E's response to RFI No. 002.
008	4/6/17	**Requested by MCI** – MCI inquired if pre- and post-construction sampling is required for the access roads and the 2017 decontamination/processing pad (2017 decon pad) that are to remain on the Old Land Reclamation Landfill. E & E responded that pre-construction sampling is required and post-construction sampling of the soil is not necessary; however, post-construction sampling of the stone in these areas is required.
009	4/6/17	**Requested by MCI** – MCI asked which species (of silky dogwood, sandbar willow, silky willow) would be approved substitutes for the unavailable buttonbush species live stakes. E & E replied that silky willow is an approved substitute for the remainder of the unavailable buttonbush quantity of live stakes.
010	5/1/17	**Requested by MCI** – MCI requested an extension for the invasive species second herbicide application. MCI also stated that installation of live stakes will require a time extension. E & E responded that the application be conducted in spring 2017, as previously discussed during Progress Meeting #15. E & E also stated that NYSDEC will remove the live staking line item from the Contract and will instead use a NYSDEC call-out contractor to install the live stakes.
011	5/11/17	**Requested by MCI** – MCI inquired if the stumps of trees with diameter at breast height (DBH) 4" to 8" that will be cleared on the Old Land Reclamation Landfill should be grubbed or cut flush. E & E responded that limited selected clearing and grubbing of trees up to 8" DBH in the footprint of the 2017 decon pad and access road that will remain post-construction on the Old Land Reclamation Landfill is permitted. E & E also stated that grubbed tree and root material should be properly disposed of off-site, per the Contract requirements.

Table 5-4 RFI Summary for Phase 3, Depew Village Landfill Site

RFI Number	Date Received	Description
012	5/15/17	**Requested by MCI** – MCI requested reimbursement for the additional materials, equipment, and labor to properly prepare the subgrade for the 2017 decon pad due to garbage being encountered during tree removal. E & E denied MCI's request for reimbursement due to the Contract Drawings and Specifications clearly stating that the access road and 2017 decon pad are to be constructed on a landfill (Old Land Reclamation Landfill) and MCI is responsible for the means and methods to perform the work as required per the Contract Documents with no additional cost to the State.
013	6/5/17	**Requested by MCI** – MCI requested information on the treatment of the invasive species in the area west of the north arch of the Borden Road bridge. E & E responded that the invasive species in this area should be excavated, processed, and disposed of with the excavated and processed sediments. E & E also stated that there is no need to treat the invasive species with herbicide if they are going to be removed.

5.2.3.2 Field Orders

One FO was issued by E & E as directed by NYSDEC in response to changes in field conditions where additional excavation work was required to meet the LEL sediment criterion of 31 mg/kg. A description of the FO is provided in Table 5-5. Copies of the FO log and the individual FO are presented in Appendix 3L.

Table 5-5 Field Order List for Phase 3, Depew Village Landfill Site

Field Order Number	Issue Date	Description
001	09/26/17	MCI to perform additional excavation in Cell 10 to achieve the LEL sediment criterion of 31 mg/kg.

The cost for FO 001 issued by E & E was included in a line item extension of bid items UC-3B – Sediment Removal/Dredging (Cells 1 – 11) and UC-4 – Handling, Transport, and Off-site Disposal of Hazardous Soils and Debris.

5.2.3.3 Proposed Change Orders

One PCO was issued during Phase 3 of the project. PCO No. 001 – Winter Shutdown was requested and developed by MCI due to the delay of Contract Award and Notice to Proceed from NYSDEC. MCI submitted a price quotation for the labor, materials, equipment, and incidentals necessary to demobilize and remobilize and to prepare and protect the site during the winter shutdown period. The PCO, received on July 26, 2016, was reviewed by E & E after discussions with

NYSDEC's and MCI's project managers. The PCO was approved by E & E and then implemented by MCI. MCI's winter shutdown commenced on November 18, 2016, and ended on May 8, 2017. The individual PCO and a PCO log are presented in Appendix 3M.

The PCO developed for this project resulted in an extension in project schedule and an increase in cost. The time extension associated with PCO No. 001 was accounted for in CO No. 1. The cost increase associated with PCO No. 001 was accounted for in CO No. 3 (CO No. 2 was an additional Change Order for time only due to high-water delays and project restoration requirements). The Change Orders for time and cost during Phase 3 of the project are discussed in Section 7.4.3 and documentation is provided in Appendix 3N.

5.3 Changes to the Project Scope and Schedule

Changes to the project scope of work and schedule are discussed in Section 7.4. For a detailed list and description of each of the scope revisions and schedule changes, refer to executed CO Nos. 1 and 2 (Phase 2), which are provided in Appendix 2M, and to executed CO Nos. 1, 2, and 3 (Phase 3), which are provided in Appendix 3N.

6 Contaminated Soils and Sediment Removal and Remediation

Based on the RODs for OU-01 and OU-02, the primary remedial work at the site involved the excavation, removal, and on-site disposal of lead-contaminated soils from various areas (Areas 1, 2, and 4); and removal and on-site disposal of lead-contaminated sediments from Area 3 (Reaches 1 and 2); and removal and off-site disposal of lead-contaminated sediments from Area 3 (Cells 1 – 11). Incidental work included the removal of Japanese knotweed and stabilization of the shoreline (Areas 5, 6, and 7); stone capping on parts of Area 8; and construction associated with disposal of excavated material and soil capping on the Area 8 landfill. Remedial efforts concerning soil remediation and restoration are discussed in this section.

For the soils remediation, the Contract Documents divided the work into eight different areas based on the location of the contaminants at the site (see Section 3.1 and Figure 3-1). The work was completed in three phases: Phase 1, Phase 2, and Phase 3. The phases are defined as follows:

- Phase 1 – Area 4;
- Phase 2 – Areas 1, 2, 3, 4, 5, 6, 7, and 8; and
- Phase 3 – Reaches 1 and 2 (Formerly Area 3), Cells 1 through 11 (Formerly Area 3), and Area 8.

6.1 Phase 1 – Area 4

6.1.1 Soils Remediation during Phase 1

Phase 1 consisted of two localized excavations along the Cayuga Creek stream bank as shown on the Contract Drawings. The Phase 1 Contract Drawings are located in the FPM (see Appendix 1A), and consist of eight drawings (Sheet Nos. 1, 2, 4, and 8 through 12). Excavation limits were staked out by GES based on the coordinates shown on the Contract Drawings, and the limits were reviewed by E & E prior to excavation. Approximately 36 CY of soils was excavated from each staked-out area, and documentation sampling was performed at each area prior to backfilling. Both excavated areas were backfilled with clean common fill, graded, compacted, and seeded. The excavated soils were incorporated with

existing soils below the capped area in the Area 8 landfill. The final soil deposition location was south of the Village of Depew DPW snow dumping area located on-site.

GES/TREC employed sediment control measures to preserve the water quality in Cayuga Creek. Silt fences were installed around excavation areas to prevent excavated soil from entering the creek. A silt curtain was installed within the creek to contain silt that resulted from construction activities. Turbidity measurements of the creek water at various locations and intervals are provided in the CCS report in Appendix 1E.

CAMP monitoring was also performed during intrusive work. The air monitoring data is provided in the CCS report in Appendix 1E.

6.1.2 Soil Remediation Sampling and Analysis for Phase 1

Soil samples were collected from the bottom of excavation areas 1 and 2 (two grab samples), and from the soil that was excavated from area 1 (two composite samples). The concentrations of lead in the grab samples taken from the bottom of excavation areas 1 and 2 were 9.2 mg/kg, and Not Detected at the Reporting Limit, respectively. The concentration of lead in the grab sample in area 1 was nearly three times over the acceptable limit. The concentrations of lead in the composite samples taken from the excavated soil in area 1 was 15 mg/kg, and Not Detected at the Reporting Limit, respectively. The concentration of lead in the composite sample in area 1 was approximately four times over the acceptable limit. Samples were taken in 2011 on October 7 and 10. Analytical services were performed by Upstate Laboratories, Inc. The surveyed locations and analytical results are provided in the CCS in Appendix 1E.

6.1.3 Stream Bank Stabilization and Restoration during Phase 1

Stream bank stabilization and restoration measures were implemented in Area 4 on approximately 900 linear feet of the RDB of Cayuga Creek along the east side of the Depew Village Landfill Site. The rock toe protection installed at the stream interface consisted of New York State Department of Transportation (NYSDOT) heavy stones, approximately 2 feet in diameter. The stones were placed continuously along the toe of the stream bank. The rock toe protection was adjusted to accommodate existing conditions along the RDB. Next to the steeper banks, Type 1 rock toe protection was constructed by placing NYSDOT heavy stones along the shoreline. Along the shoreline where there was an existing floodplain bench or room for a floodplain bench, Type 2 rock toe protection was installed. Similar to Type 1, NYSDOT heavy stones were placed along the shoreline; however, filter fabric was placed behind the NYSDOT stones. Topsoil was then added behind the Type 2 toe protection, thereby creating and enhancing the existing floodplain bench to an elevation of approximately 1 foot above mean water level. Locations of Type 1 and Type 2 rock toe protection restoration construction were installed by GES and approved by E & E based on actual site condi-

tions. The final topographic survey map including the creek bank edge, topographic elevations, a four-point survey of the excavation areas, and the bottom sample locations is located in Appendix 1E.

A silt curtain was employed during the stabilization and restoration work to prevent silt and sediments from migrating downstream of the work area and entering Cayuga Creek. Daily turbidity measurements of the creek water were also collected by TREC using a Lamotte 202we Turbiditimeter before and during stabilization and restoration activities, from both upstream of the construction area (to establish the background level), and downstream of the silt curtain.

Coir logs were also installed as shown on the Contract Drawings within the floodplain bench, behind and parallel to the riprap revetment (see Appendix 1A). The ends of adjacent coir logs were securely fastened together, and free ends were anchored down and keyed into the stream bank. The rock toe protection itself was carefully keyed into the stream bank at the upstream end just south of the access trail. The rocks were placed into the stream bank at a 30^{o} angle with the direction of stream flow, until grade was met. At grade, a 4-foot-wide, 4-foot-high, and approximately 10-foot-long trench was excavated. Excavated soil was moved to the soil staging area and managed as hazardous material. The key was filled with NYSDOT medium stone, topped with clean fill and seeded. NYSDOT medium stone was placed at a constant grade from the top of the key down to the existing access trail to protect this low-lying area from being undermined by the stream flow upstream of the key. GES repositioned and consolidated pre-existing scattered rocks on the stream bed along the stream bank.

6.1.4 Plantings

Live stakes and container plants were installed from the rock toe protection up to the primary terrace at the top of the stream bank. Plants purchased for the restoration work were of the correct type and were placed at the specified density in compliance with the Contract Drawings; plants that were not installed due to preexisting tree roots or sufficiently vegetated areas were planted in a reserve bed at the upstream end of Area 4, just south of the access trail. These plants were used to replace losses that occurred prior to commencement of Phase 2 work due to extreme drought conditions, spring runoff, and deer predation. Exposed soils on the floodplain bench were covered with an erosion control blanket and seeded with a wetland mix. Upland areas where soil had been disturbed were seeded in compliance with the Contract Drawings.

6.1.5 Construction Completion Summary Report

Upon completion of the work, GES prepared a CCS report, which included photodocumentation, final project drawings, survey records, CAMP records, sample results, and Contractor Daily Field Reports, and submitted the report to NYSDEC. This report documented work completed under Phase 1. A copy of the report is provided as Appendix 1E.

6.2 Phase 2

The SCOs from the OU-1 ROD used to determine the cleanup requirements for soils contaminated with lead are discussed in Section 2.4.

For the contaminated soil areas, the initial horizontal and vertical extents of the excavation work were defined on the Contract Drawings based on previous investigation efforts (see Appendix 2G). Details of the work performed in each of the Phase 2 remedial areas are discussed in Section 6.2.2.

Daily turbidity measurements of the creek water were collected by RDI using a YSI 6920 Multi-parameter Water Quality Meter before and during soil remediation and sediment removal activities, from both upstream (to establish the background level) and downstream of the work area. Turbidity measurements are provided in Appendix 2P. CAMP monitoring was also performed during intrusive work. The air monitoring data for Phase 2 are provided in Appendix 2E.

6.2.1 Soil Remediation Sampling and Analysis for Phase 2

Preconstruction samples were collected in support and operations areas prior to the remedial work, and post-construction samples were collected in these areas after the performance of remedial work. The samples were collected by RDI, witnessed by E & E, and the sampling locations were surveyed by Clear Creek. The results from these samples were used to determine whether these areas had been contaminated as a result of the work performed. The analytical results of the preconstruction samples indicated that lead was present at concentrations above the SCOs in soil beneath the decontamination pad area and in the CWTS area. Pre- and post-construction analytical results are provided in Appendix 2Q.

Confirmation and documentation samples were collected from the floor and sidewalls of each of the remedial excavations in Areas 1, 2, and 6 using the protocols established in the Contract Documents, Supplementary Specifications, Section XI, Division 1, Section 01425 – Sampling. The samples were collected as follows:

1. Samples were collected from the floor of each excavation area and from subareas at a rate not exceeding one sample per 1,000 square feet.
2. For excavation areas deeper than 2 feet, one additional sample per sidewall was collected.
3. The final post-excavation samples consisted of 5-point composites from either the bottom of the excavation or sidewall, according the sampling protocol. The center point of the 5-point confirmation sampling location was surveyed both horizontally and vertically.

Confirmation or documentation samples were collected in Areas 1, 2, and 6 of the project following completion of excavation to the pre-determined excavation limits. The samples were collected at the final excavation elevation to document the levels of residual contamination for future site management and monitoring pur-

poses. A total of 106 documentation samples from Areas 1, 2, and 6 were analyzed by Paradigm/H2M during Phase 2. The samples were collected and analyzed in compliance with the analytical QA/QC requirements established in the project specifications.

Sample analyses was performed by two analytical laboratories during the remediation project: Paradigm (a sub-consultant to RDI) and H2M (a sub-consultant to Paradigm). Paradigm's analytical services started on November 7, 2012, and ended on October 30, 2013.

Determination of the vertical and horizontal excavation limits based on the Contract Drawings was performed by RDI's surveyor (Clear Creek) and reviewed by E & E. Clear Creek provided the grid layout plans and field stakeout for areas to be excavated. Once an initial excavation was completed by RDI, the sampling locations in the individual sub-areas were reviewed by E & E prior to collection by RDI. Confirmation and documentation sampling locations were surveyed both horizontally and vertically for later inclusion in NYSDEC's Environmental Database program (EQuIS). The samples were then collected and shipped to RDI's subcontracted laboratory (Paradigm) for analysis. The samples were analyzed using a 10-day turnaround time upon receipt by the lab. Once the analytical results were received by RDI, they were compared to the project SCOs by E & E. If the results showed achievement of the cleanup goals, those samples were designated as confirmation samples. If the SCOs had not been achieved, and additional excavation was not feasible due to critical slope issues, those samples were designated as documentation samples, and a soil cover was placed over the top of those areas to protect human health and the environment.

Confirmation or documentation sampling was completed following the completion of excavation activities in Areas 1, 2, and 6. A total of 132 samples were collected and analyzed. Analytical results showed that concentrations of lead exceeded the 6 NYCRR Part 375 Restricted Use SCO in 96 samples: 19 samples exceeded the Commercial SCO of 1,000 mg/kg, and 77 samples exceeded the Protection of Ecological Resources SCO of 63 mg/kg. The remaining 36 samples were below both SCOs for lead. The analytical data packages for the documentation samples are provided in Appendix 2Q. The post-construction sampling locations and a summary of the analytical results for Areas 1, 2, 6, and 8 are provided on Figure 6-1 and Figure 6-2. Analytical results from soil samples in the trailer pad, decontamination pad, CWTS, and stockpile areas during pre-construction and post-construction activities are provided in Table 6-1. Analytical results from the CWTS effluent samples are provided in Table 6-2.

Table 6-1 Pre- and Post-Construction Analytical Results for Phase 2, Depew Village Landfill Site, Depew, New York

Location	Sample ID	Date Sampled	Date Analyzed	Date Reported	Analytical Results (mg/kg) Lead	Comments
Pre-Construction						
Initial Trailer Pad	12:4472-01	26-Sep-12	1-Nov-12	12-Nov-12	77	SW846 3050/6010
Initial Decon Pad	12:4472-02	26-Sep-12	1-Nov-12	12-Nov-12	**1,100**	SW846 3050/6010
Initial WWTP Area	12:4472-03	26-Sep-12	1-Nov-12	12-Nov-12	975	SW846 3050/6010
Initial Stockpile Area	12:4472-04	26-Sep-12	1-Nov-12	12-Nov-12	242	SW846 3050/6010
Post-Construction						
Final Decon Pad	133662-01	23-Sep-13	25-Sep-13	26-Sep-13	593	SW846 3050/6010
Final WWTP	133662-02	23-Sep-13	25-Sep-13	26-Sep-13	329	SW846 3050/6010
Final Stockpile Area	133662-03	23-Sep-13	25-Sep-13	26-Sep-13	248	SW846 3050/6010
Final N/S Haul Road	133662-04	23-Sep-13	25-Sep-13	26-Sep-13	58	SW846 3050/6010
Final Trailer Pad	133713-02	26-Sep-13	27-Sep-13	27-Sep-13	91	SW846 3050/6010

Note:
Exceeds 6 NYCRR Part 375 Commercial Use: **1,000 mg/kg**

Clear Creek provided the final vertical elevations and horizontal coordinates for input into the NYSDEC's EQuIS program. The samples were then collected and shipped to RDI's subcontracted laboratory (Paradigm) for analysis. Once the analytical results were received by RDI, they were reviewed by E & E for achievement of the cleanup goals.

Water sampling was also performed during the Phase 2 work. RDI subcontracted GES to design and install a CWTS at the site. RDI/GES submitted a CWTS work plan on October 8, 2012, that provided the details of the proposed treatment system that would be constructed at the site (see Appendix 2C). Once the system was constructed, approximately 1,000 gallons of water was treated and discharged to the holding tank. The discharge was analyzed to demonstrate compliance with Supplementary Specification, Section XI, Section 01425 - Sampling. Effluent samples were collected every 100,000 gallons to demonstrate compliance with the SPDES permit requirements for discharge to Cayuga Creek. The analytical results for the CWTS samples are provided in Appendix 2Q, and the DUSRs are provided in Appendix 2R.

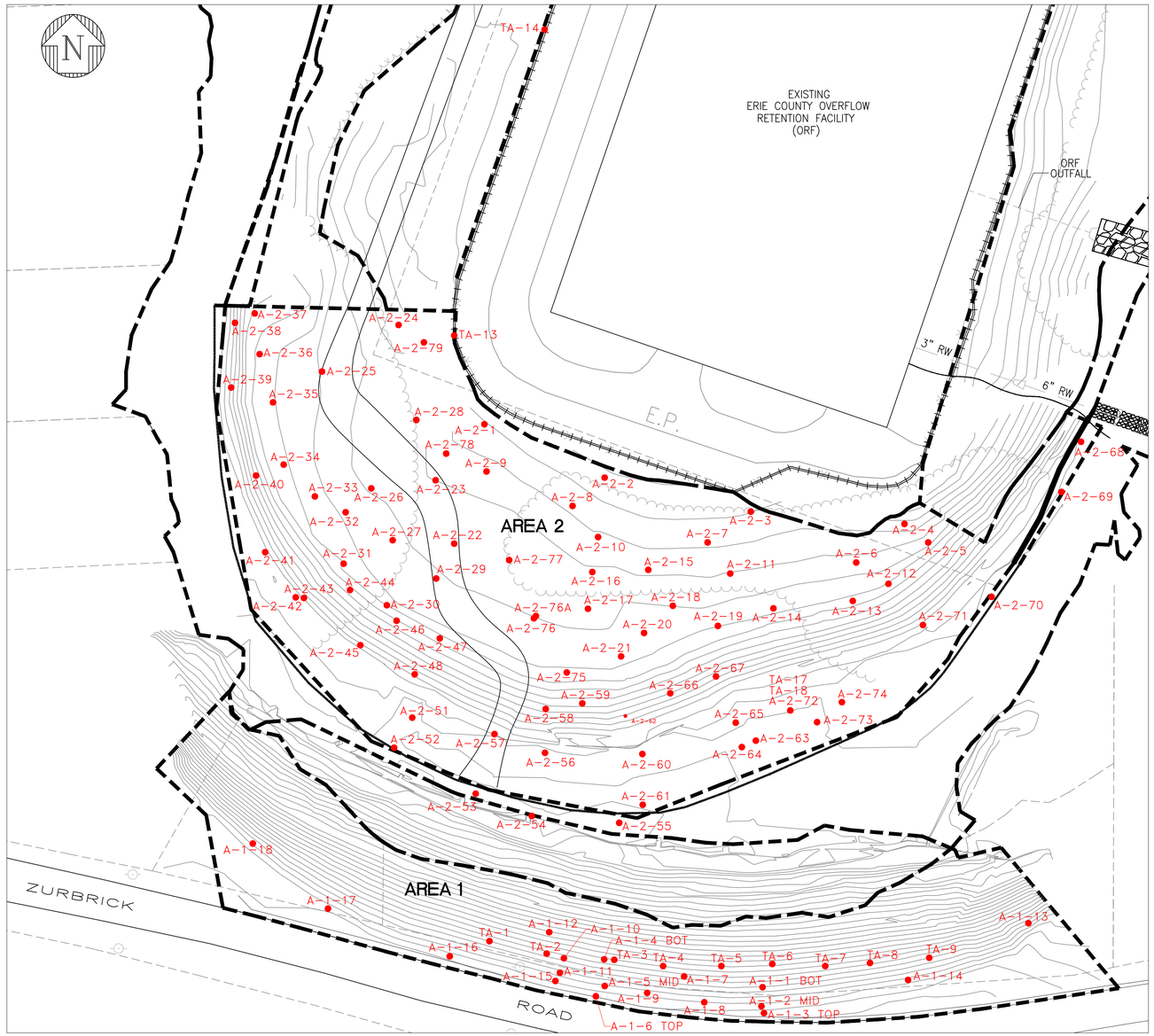
Additional details of the work, performed by area, are provided below.

Table 6-2 WWTP Effluent Sampling Analytical Results for Phase 2, Depew Village Landfill site, Depew, New York

Location	Sample ID	Date Sampled	Date Analyzed	Date Reported	Analytical Results (mg/kg)							Sample			
					Pb	As	Cd	Hg	Cr	TSS	PCB (µg/L)	NYS Cat A	NYS Cat B	DUSR	Method
Decon Holding Tank	12:4755-01	11/12/2012	11/15/2012	11/16/2012	0.136	-	-	-	-	-	-	x		Y	13 Prioity Metals/EPA 200.7/245
Cayuga Creek North - Area #3	12:4893-01	11/12/2012	11/15/2012	11/21/2012	<0.010	-	-	-	-	-	-	x		Y	Water - EPA 200.7 - Partial Report
WWTP Effluent #1	12:4893-01	11/26/2012	11/27/2012	12/5/2012	<0.010	<0.010	<0.005	<0.00020	<0.010	<4	<1.0		x	N*	Complete Report-SM19 4500HB/EPA 9040
WWTP Effluent #2	12:4996-01	12/5/2012	12/11/2012	12/14/2012	<0.013	<0.010	<0.005	<0.00020	0.045	<10	<1.14		x	N*	Water - EPA 200.7 - Complete Report
WWTP Effluent #3	12-5169	12/17/2012	12/17/2012	1/9/2013	0.022	<0.010	<0.005	<0.00020	<0.010	<10	<1.0		x	N*	Water - EPA 200.7 - Complete Report
WWTP Effluent #4	130106-01	1/8/2013	1/9/2013	1/9/2013	<0.010	<0.010	<0.005	<0.00020	<0.010	N/R	<1.0		x	N*	Water - EPA 200.7 - Complete Report
WWTP Effluent #5	131585-01	5/6/2013	5/7/2013	5/8/2013	<0.010	0.010	<0.005	<0.00020	<0.010	<4	<1.0		x	N*	Water - EPA 200.7 - Complete Report
WWTP Effluent #6	131695-01	5/10/2013	5/13/2013	5/14/2013	<0.010	0.010	<0.005	<0.00020	<0.010	<1.0 NTU	<1.0		x	N*	Water - EPA 200.7 - Complete Report
WWTP Effluent #7	131869-01	5/22/2013	5/23/2013	6/19/2013	<0.010	0.010	<0.005	<0.00020	<0.010	<10	<1.0		x	N*	Water - EPA 200.7 - Complete Report
WWTP Effluent #8	132246-01	6/18/2013	6/20/2013	6/21/2013	<0.010	0.010	<0.005	<0.00020	<0.010	<10	<1.0		x	N*	Water - EPA 200.7 - Complete Report
Area #3 Sediment PCO #007	132255-01	6/19/2013	6/25/2013	6/27/2013	<0.011	0.010	<0.005	<0.00020	<0.009	N/R	<1.0		x	N*	Water - EPA 200.7 - Partial Report
WWTP Effluent #9 *	130702016	7/1/2013	7/3/2013	7/29/2013	<0.010	0.010	<0.005	<0.00020	<0.02	<10	<1.0		x	N*	Water - EPA 200.7 - Partial Report
WWTP Effluent #10 *	130718019	7/17/2013	7/18/2013	7/29/2013	<0.010	0.010	<0.005	<0.00020	<0.010	<10	<1.0		x	N*	Water - EPA 200.7 - Partial Report

Notes:

* No DUSR agreed 5/10/13



AREAS 1 AND 2

SCALE: 1" = 40'-0"

Easting	Northing	Description	Lead (mg/kg)
1115579.6	1055026.95	A-1-1 BOT	3080
1115578.92	1055015.6	A-1-2 MID	5410
1115580.41	1055011.53	A-1-3 TOP	2060
1115485.22	1055043.51	A-1-4 BOT	2180
1115485.57	1055027.65	A-1-5 MID	3390
1115480.25	1055021.54	A-1-6 TOP	283
1115532.85	1055033.39	A-1-7	2730
1115544.87	1055017.98	A-1-8	7350
1115510.85	1055023.55	A-1-9	3750
1115461.26	1055044.23	A-1-10	220
1115458.87	1055035.54	A-1-11	26.2
1115452.5	1055059.7	A-1-12	30.7
1115737.92	1055065.07	A-1-13	71
1115666.27	1055031.29	A-1-14	22.2
1115456.17	1055030.66	A-1-15	43.2
1115393.24	1055045.33	A-1-16	290
1115320.72	1055073.77	A-1-17	216
1115275.93	1055112.51	A-1-18	10.1
-	-	A-1-19	33.8
1115413.889	1055362.236	A-2-1	70.3
1115485.481	1055330.471	A-2-2	23.7
1115572.54	1055310.184	A-2-3	133
1115664.119	1055302.888	A-2-4	141
1115678.245	1055291.868	A-2-5	225
1115635.349	1055279.87	A-2-6	449
1115546.82	1055291.867	A-2-7	95.4
1115466.386	1055313.58	A-2-8	61.7
1115415.155	1055334.114	A-2-9	364
1115481.606	1055295.059	A-2-10	127
1115560.305	1055273.336	A-2-11	153
1115654.562	1055267.206	A-2-12	541
1115633.314	1055256.996	A-2-13	82.6
1115586.025	1055252.583	A-2-14	535
1115511.495	1055275.543	A-2-15	275
1115478.151	1055274.217	A-2-16	496
1115475.576	1055252.334	A-2-17	233
1115526.114	1055254.133	A-2-18	486
1115552.976	1055242.125	A-2-19	433
1115509.003	1055237.928	A-2-20	176
1115495.299	1055223.983	A-2-21	124
1115395.892	1055291.126	A-2-22	720
1115384.813	1055328.892	A-2-23	253
1115362.748	1055421.369	A-2-24	126
1115317.144	1055393.607	A-2-25	88.7
1115346.506	1055324.054	A-2-26	406
1115359.259	1055293.165	A-2-27	178
1115373.356	1055364.806	A-2-28	234
1115385.159	1055270.357	A-2-29	420
1115355.747	1055254.458	A-2-30	134
1115330.036	1055279.18	A-2-31	205
1115331.222	1055309.813	A-2-32	162
1115312.923	1055319.249	A-2-33	163
1115294.314	1055338.194	A-2-34	109
1115287.946	1055375.277	A-2-35	260
1115279.999	1055403.986	A-2-36	150
1115277.075	1055428.227	A-2-37	97

Easting	Northing	Description	Lead (mg/kg)
1115265.288	1055422.645	A-2-38	82.2
1115263.032	1055384.127	A-2-39	6.0
1115277.824	1055331.652	A-2-40	10.9
1115283.299	1055286.057	A-2-41	50.9
1115301.513	1055259.156	A-2-42	26.5
1115306.373	1055258.774	A-2-43	27.4
1115333.828	1055263.529	A-2-44	67.3
1115339.979	1055230.655	A-2-45	3.4
1115361.601	1055245.216	A-2-46	246
1115387.304	1055234.689	A-2-47	59.4
1115372.345	1055213.299	A-2-48	7.92
-	-	A-2-49	954
-	-	A-2-50	447
1115370.904	1055187.501	A-2-51	6.7
1115360.103	1055169.622	A-2-52	133
1115408.682	1055142.219	A-2-53	186
1115442.133	1055128.933	A-2-54	27.4
1115494.144	1055124.849	A-2-55	199
1115449.992	1055166.545	A-2-56	201
1115418.436	1055177.566	A-2-57	70.2
1115450.409	1055192.679	A-2-58	124
1115472.176	1055195.981	A-2-59	21.7
1115507.999	1055165.838	A-2-60	18.9
1115508.199	1055135.614	A-2-61	57.7
1115497.873	1055188.506	A-2-62	64.5
1115575.57	1055173.8	A-2-63	43.1
1115567.223	1055169.951	A-2-64	57.1
1115563.596	1055184.497	A-2-65	38.9
1115524.608	1055202.016	A-2-66	187
1115551.849	1055212.036	A-2-67	106
1115769.234	1055351.792	A-2-68	38.7
1115757.648	1055321.894	A-2-69	111
1115715.963	1055259.466	A-2-70	14400
1115675.094	1055242.666	A-2-71	324
1115596.083	1055191.757	A-2-72	175
1115612.048	1055184.828	A-2-73	106
1115626.818	1055196.721	A-2-74	115
1115462.953	1055214.406	A-2-75	144
1115443.364	1055246.666	A-2-76	1770
1115444.602	1055248.069	A-2-76A	6760
1115428.622	1055281.356	A-2-77	17.6
1115391.109	1055344.77	A-2-78	753
1115377.827	1055411.017	A-2-79	74.6
1115416.91	1055054.38	TA-1	14.3
1115450.97	1055046.95	TA-2	17.3
1115491.22	1055043.24	TA-3	3540.0
1115520.33	1055039.53	TA-4	180.0
1115555.01	1055039.53	TA-5	72.2
1115585.35	1055040.77	TA-6	288.0
1115616.93	1055039.53	TA-7	248.0
1115643.56	1055041.38	TA-8	13.2
1115678.86	1055044.48	TA-9	12.3
1115395.879	1055415.128	TA-13	11.6
1115449.735	1055597.273	TA-14	12.3
1115596.083	1055191.757	TA-17	3840.0
1115596.083	1055191.757	TA-18	2330.0

LEGEND

A-2-70● SOIL SAMPLE LOCATION

3080 EXCEEDS 6 NYCRR PART 375 RESTRICTED USE SOIL CLEANUP OBJECTIVES, TABLE 375-6.8(B), COMMERCIAL (1000 MG/KG)

283 EXCEEDS 6 NYCRR PART 375 RESTRICTED USE SOIL CLEANUP OBJECTIVES, TABLE 375-6.8(B), PROTECTION OF ECOLOGICAL RESOURCES (63 MG/KG)

NOTES

1. COORDINATES ARE IN NEW YORK STATE PLANE WEST (NAD83), FEET.
2. LOCATIONS OF A-1-19, A-2-49, AND A-2-50 ARE UNKNOWN. USE A-1-18, A-2-48 and A-2-51 FOR CLOSEST KNOWN LOCATIONS IN VICINITY.
3. ALL TA SAMPLES ARE APPROXIMATE.
4. ALL RESULTS ARE IN MILLIGRAMS PER KILOGRAM.

SCALE IN FEET
0 40 80 120

DWG NO.	DATE	DESCRIPTION
REFERENCE DRAWINGS		

NO.	DATE	DWN	APP'D	DESCRIPTION
C	12/10/18	KMK	TRH	REVISED SAMPLE LOCATION MAP
B	8/30/18	KMK	TRH	REVISED SAMPLE LOCATION MAP
A	9/16/14	KMK	TRH	SAMPLE LOCATION MAP
REVISIONS				

ecology and environment engineering p.c.

DESIGNED BY	CHECKED BY
JJ KOHLER	M STEFFAN
DRAWN BY	APPROVED BY
KM KRAJEWSKI	T HEINS P.E.

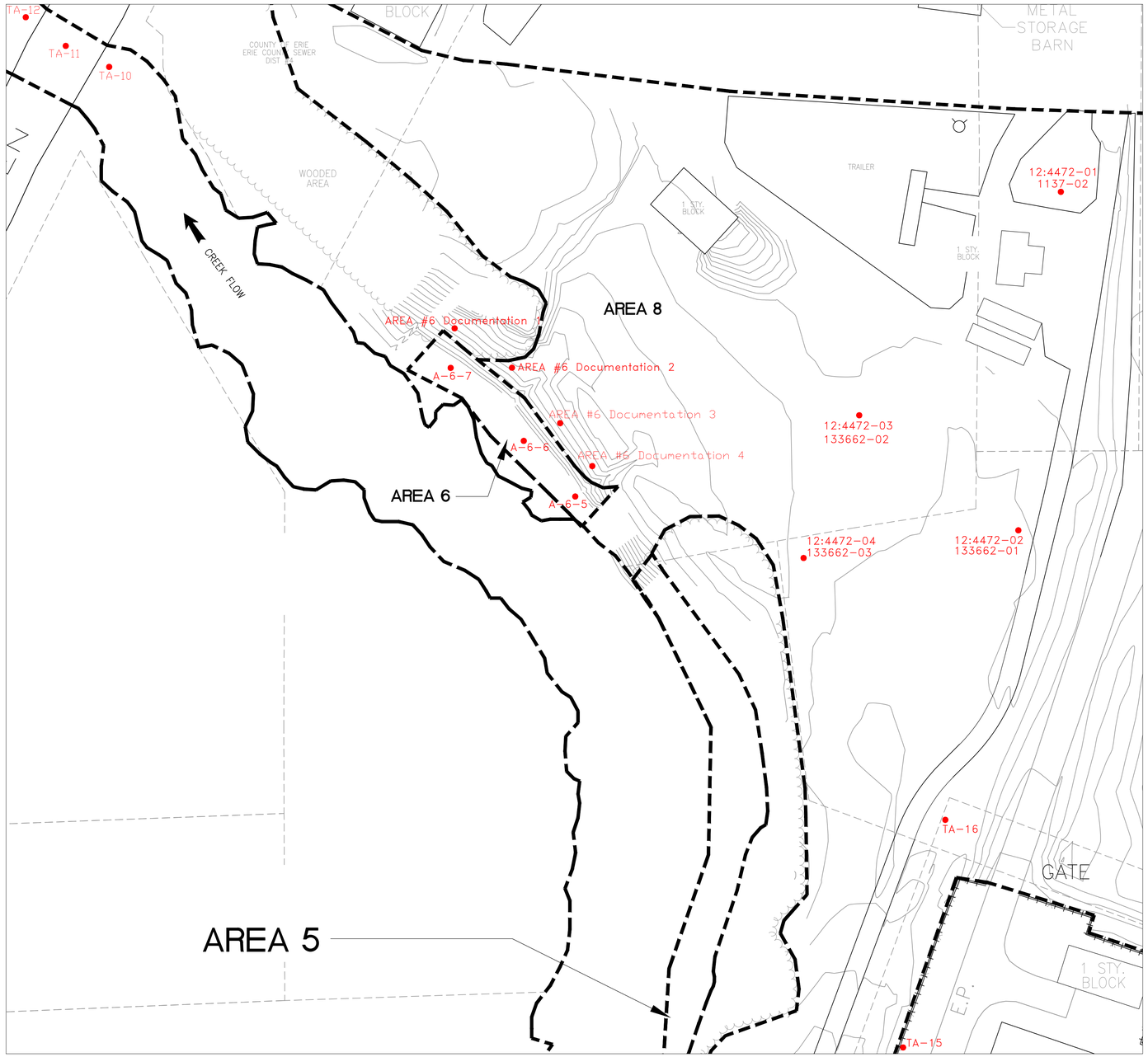
DEPEW VILLAGE LANDFILL SITE

NYSDEC CONTRACT No. D008513

VILLAGE OF DEPEW ERIE COUNTY NEW YORK

FIGURE 6-1
SAMPLE LOCATION MAP AND ANALYTICAL RESULTS AREAS 1 AND 2

SCALE	FIRST ISSUED	CAD FILE NO.	SHEET NO.	REV.
NOTED	9/6/14	Soil Samples.dwg	Sheet 1 of 2	C



AREAS 6 AND 8

SCALE: 1" = 40'-0"

Easting	Northing	Description	Lead (mg/kg)
1115604.528	1056290.788	12:4472-01	**77**
1115604.528	1056290.788	133713-02	**91**
1115577.311	1056074.068	12:4472-02	**1100**
1115577.311	1056074.068	133662-01	**593**
1115475.463	1056147.723	12:4472-03	**975**
1115475.463	1056147.723	133662-02	**329**
1115439.845	1056056.35	12:4472-04	**242**
1115439.845	1056056.35	133662-03	**248**
1115216.437	1056203.395	Area #6 Documentation 1	**407**
1115253.163	1056178.178	Area #6 Documentation 2	**1450**
1115284.017	1056142.679	Area #6 Documentation 3	**2660**
1115304.559	1056115.202	Area #6 Documentation 4	**2220**
1115293.665	1056095.709	A-6-5	**795**
1115260.689	1056131.337	A-6-6	44.2
1115213.891	1056178.068	A-6-7	**5570**
1114995.313	1056370.764	TA-10	5.0
1114967.501	1056384.215	TA-11	26.0
1114941.904	1056402.562	TA-12	**67.6**
1115503.537	1055742.974	TA-15	7.4
1115530.544	1055888.714	TA-16	**86**

LEGEND

12:4472-04 ● SOIL SAMPLE LOCATION

3080 EXCEEDS 6 NYCRR PART 375 RESTRICTED USE SOIL CLEANUP OBJECTIVES, TABLE 375-6.8(B), COMMERCIAL (1000 MG/KG)

283 EXCEEDS 6 NYCRR PART 375 RESTRICTED USE SOIL CLEANUP OBJECTIVES, TABLE 375-6.8(B), PROTECTION OF ECOLOGICAL RESOURCES (63 MG/KG)

NOTES

1. COORDINATES ARE IN NEW YORK STATE PLANE WEST (NAD83), FEET.
2. ALL TA SAMPLES ARE APPROXIMATE.
3. ALL RESULTS ARE IN MILLIGRAMS PER KILOGRAM.

SCALE IN FEET
0 40 80 120

DWG NO.	DATE	DESCRIPTION
REFERENCE DRAWINGS		

NO.	DATE	DWN	APP'D	DESCRIPTION
C	12/10/18	KMK	TRH	REVISED SAMPLE LOCATION MAP
B	8/30/18	KMK	TRH	REVISED SAMPLE LOCATION MAP
A	9/16/14	KMK	TRH	SAMPLE LOCATION MAP
REVISIONS				

ecology and environment engineering p.c.

DESIGNED BY	CHECKED BY
JJ KOHLER	M STEFFAN
DRAWN BY	APPROVED BY
KM KRAJEWSKI	T HEINS P.E.

DEPEW VILLAGE LANDFILL SITE

NYSDEC CONTRACT No. D008513

VILLAGE OF DEPEW ERIE COUNTY NEW YORK

FIGURE 6-2
SAMPLE LOCATION MAP AND ANALYTICAL RESULTS AREAS 6 AND 8

SCALE	FIRST ISSUED	CAD FILE NO.	SHEET NO.	REV.
NOTED	9/6/14	Soil Samples.dwg	Sheet 2 of 2	C

6.2.2 Phase 2 Soils and Sediment Remediation

6.2.2.1 Area 1 – Zurbrick Road Slope Soils

Prior to starting the excavation activities, RDI began clearing trees on September 19, 2012, from the Zurbrick Road slope area (Area 1). The trees were cut down to the stumps, chipped, and transported to the Area 8 landfill. Following tree removal, RDI installed a construction fence along the perimeter of the Area 1 slope and installed Jersey barriers to secure the area from the public. On October 4, 2012, Clear Creek performed a pre-construction topographic survey of the project area to confirm the existing site grades (see Appendix 2F).

The excavation of contaminated soil from Area 1 began on June 24, 2013. The contaminated soils along the Zurbrick Road slope (Area 1) were removed, and the material was loaded onto dump trucks for transfer to the Area 8 landfill. The total quantity of hazardous soils removed from Area 1 was approximately 2,820 tons. The post-excavation depths on the Area 1 slope were surveyed by Clear Creek.

Once soil excavation was completed in a designated area, the surveyor measured the final excavation elevations and the horizontal extent of the excavations to calculate the volume of soils removed. When the final excavation depth was achieved, documentation samples were collected in accordance with the criteria established in the Supplementary Specifications, Section XI, Division 1, Section 01425 – Sampling. The samples were then shipped to RDI's subcontracted laboratory (Paradigm) for analysis with a 10-day turnaround time.

A total of 32 documentation samples were collected from the excavated areas and submitted for analysis (see Figure 6-1). The analytical results for the documentation samples were independently validated through the DUSR process by Vali-Data of WNY, LLC. The independent validation of the analytical data indicated the proper execution of the analytical process. The DUSRs for the documentation samples for Area 1 are provided in Appendix 2R.

In October 2012, prior to initiation of remediation activities in Area 1, slope monitoring activities were undertaken on the Zurbrick Road slope. A slope movement indicator (length of rebar) was installed, and daily readings were collected from through October 2013 and documented in the DORs. No subsidence in slope was observed during this period.

A post-excavation survey of the excavated area was completed prior to the start of backfilling operations. The restoration of Area 1 was completed with the installation of common fill material and compaction to meet the 90% compaction required by the Contract Documents. Compaction testing was performed by SJB Drilling; test results are provided in Appendix 2C. Topsoil was installed on top of the compacted common fill material for planting. Erosion control blankets were installed to minimize the erosion of the fill materials during rain events.

RDI's subcontractor, Cardno, installed plants and live stakes as per the details shown on the Contract Documents. Large rock and riprap was placed at the toe of

the slope and bendway weirs were installed, as per the details of the Contract Documents.

6.2.2.2 Area 2 – Depew Village Landfill Tip

RDI began removal of Japanese knotweed from Area 2 on October 1, 2012. The Japanese knotweed was then loaded into a dump truck for transport to a designated area on the southeast corner of the Area 8 landfill. Following the removal of Japanese knotweed, RDI cut and chipped trees located in the area. The chipped material was temporarily stockpiled on-site in Area 2 so it could be transported with the contaminated soil to the Area 8 landfill.

A pre-construction topographic survey was performed within the boundaries of Area 2 to confirm the existing site grades and to enable calculation of the volume of contaminated soils removed for payment. RDI then began excavating the fill material and contaminated soil from the east end of the Area 2 excavation area. The material was staged near the access road for transport to the Area 8 landfill. Following the completion of the east side excavation activities, RDI began excavating soil south to north in the center of Area 2, near the toe of the slope, as per Section 02220 of the Contract Documents.

A cofferdam was installed to divert the water away from the toe of the slope in Area 2 to facilitate removal of the contaminated soil. The cofferdam consisted of Jersey barrier sections, with foam serving as gaskets between the barriers, covered with linear low-density polyethylene (LLDPE) sheeting and sand bags. The barriers were placed approximately 6 feet from the shoreline to re-direct the water away from the toe of the slope. Water seeped under the cofferdam and into the work area, and multiple pumps were used. RDI completed excavating the contaminated soil from the Area 2 to the depths indicated on the Contract Drawings. The horizontal and vertical limits of excavation were established by RDI's surveyor, Clear Creek, in accordance with the Contract Drawings.

The excavations in Area 2 were considered complete when the vertical limits established on the Contract Drawings had been achieved. The impacted soils that remained in this area will be monitored and managed under NYSDEC's site management program and in accordance with the amended ROD.

The samples collected at the bottom and along sidewalls of the excavations were considered documentation samples. A total of 78 documentation samples were collected prior to the placement of the final fill material. These samples were shipped to Paradigm's laboratory for analysis on a 10-day turnaround time per the original contract requirements.

The excavated soils were temporarily stockpiled on a high-density polyethylene (HDPE) liner near the access road prior to transport and disposal. The soils were loaded onto individual transport vehicles and transported on prepared on-site access roads to the Area 8 landfill. These soils were incorporated into the landfill area under the cap.

Figure 6-1 presents the surveyed locations and a comparison of the analytical results for the final documentation samples to the NYCRR Part 375-6 Restricted SCO. The remedial objectives for this area were to excavate to a specified depth only and report the final analytical results.

The analytical results for the documentation samples, as discussed in Section 6.2.1, were independently validated through the DUSR process by Vali-Data of WNY, LLC. The independent validation of the analytical data confirmed the proper execution of the analytical process. The DUSRs for the documentation samples from this area are provided in Appendix 2R.

A post-excavation survey of the excavated area was performed to confirm that the excavation limits had been reached and was completed prior to the start of backfilling operations. Restoration of Area 2 was completed with the installation of common fill material and compaction to meet the 90% compaction required by the Contract Documents. Topsoil was installed on top of the compacted common fill for planting. Erosion control blankets were installed to minimize erosion of the topsoil during rain events.

RDI's subcontractor, Cardno, installed plants and live stakes per the details shown on the Contract Documents. Large rock and riprap was placed at the landfill tip per the details of the Contract Documents.

6.2.2.3 Area 3 – Cayuga Creek Sediments

A pre-construction topographic survey of Cayuga Creek (Area 3) was completed prior to sediment removal activities. Per the Contract Documents, removal of sediment from Cayuga Creek was expected to take place only during low flows. Prior to commencing dredging operations, turbidity curtains were installed in accordance with the Contract Documents.

The portion of Cayuga Creek between Areas 1 and 2 were cordoned off using cofferdams for better control of dredging activities. Cofferdams were constructed using Jersey barriers covered with linear low-density polyethylene (LLDPE) sheeting and sand bags. Multiple pumps were used to dewater the work area so sediment could be removed from the stream.

Each delineated area was excavated to bedrock as indicated on the Contract Drawings. Dredging/removal of contaminated sediment from this Area 3 began on May 24, 2013. RDI employed a loader with a broom to disturb the sediments and a vacuum truck to capture the sediment. Larger material (greater than 12 inches in diameter) was removed and loaded directly into haul trucks. The contact water from the Area 3 activities was pumped directly to the CWTS for treatment, analysis, and discharge. Analyses of the CWTS effluent is presented in Appendix 2Q.

The horizontal and vertical limits of excavation were established by RDI's surveyor, Clear Creek, in accordance with the coordinates and excavation limits shown on the Contract Drawings. The lower vertical elevation was specified in the Contract Documents to be the final elevation of the remedial excavation work to be performed in this area.

Following the completion of dredging activities, crusher run stone (gravel) was installed in Area 3.

6.2.2.4 Area 4 – Landfill Stream Bank Soils (Upstream of the ORF SPDES Outfall)

For Phase 2, Area 4 is defined as the RDB of Cayuga Creek along the east side of the landfill from the ORF outfall to the upstream end of Area 2. To stabilize this bank, live stakes and container plants were installed at the locations shown on the Contract Drawings. RDI's planting subcontractor, Cardno, installed the live stakes and container plants at the site.

No other work was completed in Area 4.

6.2.2.5 Area 5 – Landfill Stream Bank, West

A pre-construction survey of the proposed limits for clearing and grubbing of Japanese knotweed in this Area was completed by Clear Creek on October 15, 2012. The Japanese knotweed had been cut and the first application of the approved herbicide (2% glyphosate) was applied by Cardno in October 2012 in accordance with the Contract Documents. The Japanese knotweed was stockpiled on a poly sheet before being transported to a designated disposal area in the Area 8 landfill.

A second round of herbicide application was completed in June 2013 per FO 005 to remove remaining Japanese knotweed at the site. Following removal of the Japanese knotweed, live stakes and container plants were installed at locations identified in the Contract Documents.

6.2.2.6 Area 6 – Landfill Excavation Area, West

The contaminated fill materials along the Area 6 shoreline contained lead, and erosion and bank scour of these soils have deposited fill-related contaminants in the stream sediment. The analytical results obtained during the RI phase indicated that the soils in Area 6 were above the SCO for lead.

A pre-construction survey of the proposed limits for clearing and grubbing of Japanese knotweed in this Area was completed by Clear Creek on October 15, 2012. RDI's subcontractor, Cardno, began removing the Japanese knotweed within the clearing and grubbing limits in October 2012. The Japanese knotweed was stockpiled on a poly sheet prior to being transported to a designated area in the Area 8 landfill. After the Japanese knotweed had been cut, the first application of the approved herbicide was completed in accordance with the Contract Documents.

RDI excavated the contaminated fill material along the shoreline and directly loaded that material into a haul truck using an excavator. The haul truck transferred the material to the Area 8 landfill.

As in the other areas, the horizontal and vertical limits of excavation were re-established by RDI's surveyor, Clear Creek, in accordance with the Contract Drawings.

Following excavation work, documentation samples were collected and shipped to Paradigm for analysis with a 10-day turnaround time. The excavated hazardous soils from Area 6 were temporarily stockpiled and covered in a segregated area prior to being transported to the Area 8 landfill.

Figure 6-2 presents the analytical results and surveyed locations of the documentation samples.

The analytical results of the documentation samples were validated through the DUSR process by Vali-Data of WNY, LLC. The validation of the analytical data confirmed the proper execution of the analytical process. The DUSRs for the documentation samples from this area are provided in Appendix 2R.

Once the excavation work was completed and the documentation samples were collected, approved imported common fill was delivered to the site and used for backfilling, site grading, and restoration. Compaction testing for the restored area was performed by SJB Drilling, and site restoration was completed by Cardno, as discussed in Section 7.3.2. Compaction testing results are provided in Appendix 2C.

Two swales (east and west swales) leading to Cayuga Creek that were removed during the excavation process were reconstructed. Geofabric was placed from the top of the slope to the interface of the existing stone at the toe of the slope. Large diameter rock was placed at the slope toe with medium stone installed to the top of the slope in accordance with the requirements in the Contract Documents.

Following the completion of excavation work, the horizontal and vertical limits of excavation were re-established by RDI's surveyor, Clear Creek, in accordance with the Contract Drawings, and were used to calculate the volume of soils removed.

6.2.2.7 Area 7 – Stream Bank Restoration near the Borden Road Bridge

A pre-construction survey of the proposed limits for clearing and grubbing of Japanese knotweed in this area was completed by Clear Creek on October 15, 2012. Cardno began removing the Japanese knotweed within the clearing and grubbing limits in October 2012. The Japanese knotweed was stockpiled on a poly sheet prior to being transported to a designated area in the Area 8 landfill.

After the Japanese knotweed had been cut, the first application of the approved herbicide was completed in October 2012 in accordance with the Contract Documents. A second round of herbicide application was completed in June 2013 per FO 005 to remove remaining Japanese knotweed at the site. Following removal of the Japanese knotweed, live stakes and container plants were installed by Cardno at locations identified in the Contract Documents.

6.2.2.8 Area 8 – Landfill Soil Cap

The Area 8 landfill was used as the soil disposal area during the remediation activities at the project. The soil from the existing cap was removed and stockpiled before the excavated soils from Areas 1, 2, and 6; the sediments from Area 3; and knotweed debris were placed in this area. In addition to the soils/sediments, mechanically removed Japanese knotweed material was also placed in this area. Following completion of the disposal activities, the Area 8 landfill was recapped and graded in accordance with the Contract Documents.

6.2.3 Phase 2 Restoration

As specified in the Contract Documents, excavation areas (Areas 1, 2, and 6) were to be restored to the proposed grading plans with imported clean common and/or select fill. Supplementary Specifications, Section XI, Division 2, Section 02510 – Backfilling – Common Fill, Topsoil, Gravel Fill and Stone established requirements for the installation and compaction of clean fill materials and restoration of the site.

Imported fill samples were obtained from the Buffalo Crushed Stone, Inc., facility located in Buffalo, New York. The samples were analyzed for physical properties and grain size by H2M for Paradigm, and the analytical results were reviewed and evaluated for acceptability by E & E. The analytical results indicated that the common fill was acceptable for use. The submittal information for the imported fill is provided in Appendix 2C.

6.2.3.1 Backfill Placement at Excavated Areas

Delivery of common backfill and stockpiling to the project area (Areas 1, 2, and 6) began on November 14, 2012. Stockpiling of backfill stopped in Area 2 after RDI requested demobilization on January 4, 2013, due to adverse weather conditions. Upon return to the site by RDI in April 18, 2013, initial backfill placement from the stockpiled area was restarted. The placement of backfill material, which included grading and compacting the common fill to achieve the contours per the grading/drainage plan, was performed by RDI. Once backfilling had achieved the proposed grades after rolling, compaction testing was performed by SJB Drilling. The compacted fill requirements established for the site were 90% of the Modified Proctor maximum dry density method. The results of the on-site compaction tests performed by SJB Drilling for RDI are provided in Appendix 2C.

For areas where compaction of common fill was required by the Contract Document, compaction requirements were achieved.

6.2.3.2 Erosion Control Matting, Soil Supplements, and Seeding

Supplemental Specification, Section XI, Section 02920 – Seeding and Planting established the requirements for the installation of erosion control matting, seeding, and planting for the restoration of Areas 1, 2, 4, 5, 6, 7, and 8.

The erosion control matting specifications were supplied for review and conformance with the Contract Documents. The submittal log is provided in Appendix 2C.

The seed mixtures used by RDI's planting subcontractor, Cardno, were obtained from Ernst Conservation Seeds. Per the requirements in the Contract Documents, the seed mixes provided were ERNMX-120, ERNMX-122, ERNMX-154, and ERNMX-181. Documentation of the seed bags delivered to the site was reviewed by E & E. The seed mix was applied by hydroseeding. The hydroseeding application was performed by Cardno. Information regarding the seed mixtures was submitted to E & E for review and conformance with the Contract Documents. The submittal log is provided in Appendix 2C.

The fertilizer used by RDI's planting subcontractor, Cardno, was supplied by Preferred Seed Company, Inc., located in Buffalo, New York. Information regarding the fertilizer was submitted to E & E for review and conformance with the Contract Documents.

E & E monitored the installation of the erosion control matting and the application of topsoil and the seed mixture with respect to quality, moisture content, and required application rates. Topsoil and mulch deliveries were received and stockpiled at the project site until application could be performed.

6.2.3.3 Live Stake and Container Plant Installation

Live stakes and container plants were installed by Cardno following the completion of excavation and sediment removal activities at the site. In accordance with the Supplementary Specifications, Section XI, Division 2, Section 02920 – Seeding and Planting, live stakes and container plants were installed in Areas 1, 2, 4, 5, 6, and 7 following the completion of the activities.

6.2.3.4 Area 3, Cayuga Creek Sediments - Restoration

Following the completion of sediment removal activities from Cayuga Creek, certified bank-run gravel was placed in the creek to replace the contaminated gravel that had been excavated. Bank-run gravel was procured and installed in accordance with the requirements identified in Supplementary Specifications, Section XI, Division 2, Section 02510 – Backfilling – Common Fill, Topsoil, Gravel Fill and Stone.

6.2.3.5 Monitoring Well Decommissioning

For the project, one monitoring well was decommissioned: MW-03 was located in the proposed excavation area for Area 2. The well decommissioning work was performed by RDI's subcontractor, Quality Inspection Services of Buffalo, New

York. Information regarding the well materials, bentonite, and the installation subcontractor was included in a work plan and submitted for review and conformance with the Contract Documents. A submittal log is provided in Appendix 2C.

A total of 18 linear feet of monitoring well was decommissioned at the site; the estimated length of well identified in the Contract Documents was 18 linear feet. Documentation of the monitoring well decommissioning was submitted by RDI as a submittal and is provided in Appendix 2S.

6.2.3.6 Area 8 Landfill Restoration

Following the completion of disposal activities at the soil disposal area in Area 8, the disposal area was capped with 6 inches of common fill and 6 inches of topsoil. In the Japanese knotweed-designated area of the landfill, the area was covered with geotextile, 2.5 feet of common fill, and 6 inches of topsoil. Following the completion of grading activities, the area was hydroseeded and fertilizer was added as specified in Supplementary Specifications, Section XI, Division 2, Section 02920 – Seeding and Planting.

6.3 Phase 3

The sediment criterion of 31 mg/kg from the OU-2 ROD was provided in the Contract Documents; the criterion used to determine the cleanup requirements for sediments contaminated with lead are discussed in Section 2.3.2.

A pre-construction topographic survey of Cayuga Creek was completed prior to the sediment removal activities. The horizontal and vertical limits of excavation were established by MCI's surveyor, Wendel, in accordance with the coordinates and excavation limits shown on the Contract Drawings. Details of the work performed during the 2016 and 2017 Phase 3 work are discussed in Section 6.3.3.

Per the Contract Documents, removal of sediment from Cayuga Creek was expected to take place during low flows. Prior to commencing dredging operations, turbidity curtains were installed in accordance with the Contract Documents. Daily turbidity measurements of the creek water were also collected before and during sediment removal activities, from both upstream of the construction area (to establish the background level), and downstream of the turbidity curtain. Turbidity measurements are provided in Appendix 3P. CAMP monitoring was also performed during intrusive work. The air monitoring data for Phase 3 is provided in Appendix 3F.

For both the 2016 and 2017 Phase 3 work, MCI constructed a decontamination/processing pad for the CWTS and sediment processing and decontamination activities. The 2016 decontamination/processing pad (2016 decon pad) utilized during the Phase 3 work in Reaches 1 and 2 and under the Borden Road bridge was constructed on the Village of Depew DPW property, to the west of the existing access road prior to the 2016 Phase 3 sediment removal activities. The 2017 decontamination/processing pad (2017 decon pad) utilized during the Phase 3

work in Cells 1 – 11 was constructed on the Old Land Reclamation Landfill site prior to the 2017 Phase 3 sediment removal activities.

Both the 2016 and 2017 decon pads were constructed by placing between zero and 2 feet of 2-inch stone on top of the existing grade. This layer of stone was compacted and graded towards the proposed location of the sump in the southwest corner of the pad. MCI then placed jersey barriers around the perimeter of the pad and installed one layer of woven geotextile over the entire pad. Chenango Contracting installed a layer of 40-mil impervious HDPE over the woven geotextile. A second layer of woven geotextile was installed on top of the HDPE liner. Six inches of 2-inch stone was placed and compacted on top of the second layer of woven geotextile liner. Temporary fencing with screening was installed around the perimeter of the decon pad. The CWTS and sediment screening equipment were installed on the decon pad. Sediment dewatering, screening, and processing were conducted on the decon pad.

6.3.1 Soil and Sediment Remediation Sampling and Analysis for Phase 3 – 2016 Work

Pre- and post-construction documentation samples were collected from the 2016 decon pad and access road areas using the protocols established in the Contract Documents, Supplementary Specifications, Section XI, Division 1, Section 01425 – Sampling. The samples were collected as follows:

1. One sample per decontamination/processing pad prior to project mobilization and one sample upon project completion.
2. One sample per access road prior to project mobilization and one sample upon project completion.

The pre- and post-construction samples were collected by MCI, witnessed by E & E, and surveyed by Wendel. The analytical results of the pre-construction samples collected indicated that five of the access roads (access roads 4, 5, 7, and 8) contained lead concentrations above the SCO. The analytical results for post-construction samples showed lead concentrations to be above both the OU-1 SCO and the pre-construction concentrations for access roads 1, 4, and 5. The post-construction concentration at access road 4 was higher than the pre-construction concentration; the post-construction lead concentrations at access roads 5 and 8 were lower than the pre-construction concentrations but still above the SCO; the post-construction lead concentrations at access road 1 was higher than pre-construction concentrations and were also above the SCO; and the pre-construction concentration at access road 7 was above the SCO, but was below the SCO after construction.

Determination of the vertical and horizontal excavation limits based on the Contract Drawings was performed by MCI's surveyor, Wendel, and reviewed by E & E. Wendel provided the field stakeout of the sediment removal and excavation limits.

Documentation samples were collected from sediment removal areas using the protocols established in the Contract Documents, Supplementary Specifications, Section XI, Division 1, Section 01425 – Sampling. The samples were collected as follows:

1. Three-point composite samples were collected from the floor of each excavation area at approximately one sample per 900 square feet.
2. For excavation areas deeper than 2 feet, one additional sample per sidewall was collected.

The samples were collected by MCI, witnessed by E & E, and the sample locations were surveyed by Wendel. Once sediment removal and excavation was completed in each area by MCI, samples were collected in Reaches 1 and 2 and under the north and south arches of the Borden Road bridge. The samples were collected from the bottom of excavation in each area and along the sidewall of excavations greater than 2 feet under the north arch of the Borden Road bridge. These documentation samples were collected to document the levels of residual contamination for future site management and monitoring purposes. Documentation sampling locations were surveyed both horizontally and vertically for later inclusion in NYSDEC's Environmental Data program.

The samples were then picked up from the site by MCI's subcontracted laboratory (Paradigm) for analysis. Paradigm's analytical services for the 2016 work started on August 5, 2016, and ended on November 8, 2016.

In Reaches 1 and 2 and under the south arch of the Borden Road bridge, documentation sampling was performed following the removal of sediment to a depth of 1 foot, or until bedrock was encountered, within each work area. A total of 103 sediment samples were collected and analyzed during the 2016 Phase 3 work. The analytical data packages for the 2016 work are provided in Appendix 3G. Summaries of the analytical results are provided in Table 6-3. The surveyed locations are provided on the record drawings prepared by Wendel (see Appendix 3E).

Confirmation sampling was conducted during excavation activities beneath the north arch of the Borden Road Bridge. Confirmation samples were collected after removing approximately 2 feet of sediment in the excavation area. After the analytical results showed that the lead concentrations were above the sediment criterion, excavation continued until bedrock was reached. Documentation samples were collected after excavation. A total of eight samples were collected from beneath the north arch of the Borden Road Bridge.

Table 6-3 Final Analytical Results for Phase 3 2016 Documentation Sediment Samples, Depew Village Landfill Site, Depew, New York

MCI Submittal #	Sample ID	Approximate Control Point Location	Work Cell Number	Date Sampled	Date Analyzed	Date MCI submitted to E & E	Analytical Results (mg/kg) Lead
018.05	DL-DR1-1	CP 1 - CP 2	0	8/30/2016	9/1/2016	9/7/2016	39.6
018.05	DL-DR1-2	CP 1 - CP 2	0	8/30/2016	9/2/2016	9/7/2016	4,960
018.07	DL-DR1-3	CP 2 - CP 3	1	9/1/2016	9/7/2016	9/12/2016	33.6
018.07	DL-DR1-4	CP 2 - CP 3	1	9/1/2016	9/7/2016	9/12/2016	22.5
018.07	DL-DR1-5	CP 2 - CP 3	1	9/1/2016	9/7/2016	9/12/2016	31.2
018.07	DL-DR1-6	CP 2 - CP 3	1	9/1/2016	9/7/2016	9/12/2016	29.9
018.07	DL-DR1-7	CP 2 - CP 3	1	9/1/2016	9/7/2016	9/12/2016	10.7
018.07	DL-DR1-8	CP 2 - CP 3	1	9/1/2016	9/7/2016	9/12/2016	59.3
018.07	DL-DR1-9	CP 3 - CP 4	1	9/1/2016	9/7/2016	9/12/2016	21.6
018.07	DL-DR1-10	CP 3 - CP 4	1	9/1/2016	9/7/2016	9/12/2016	23.2
018.08	DL-DR1-11	CP 3 - CP 4	2	9/8/2016	9/13/2016	9/14/2016	86.7
018.08	DL-DR1-12	CP 3 - CP 4	2	9/8/2016	9/13/2016	9/14/2016	9.35
018.08	DL-DR1-13	CP 3 - CP 4	2	9/8/2016	9/13/2016	9/14/2016	19.3
018.08	DL-DR1-14	CP 3 - CP 4	2	9/8/2016	9/13/2016	9/14/2016	18.6
018.08	DL-DR1-15	CP 3 - CP 4	2	9/8/2016	9/13/2016	9/14/2016	503.0
018.08	DL-DR1-16	CP 3 - CP 4	2	9/8/2016	9/13/2016	9/14/2016	22.1
018.08	DL-DR1-17	CP 3 - CP 4	2	9/8/2016	9/13/2016	9/14/2016	21.5
018.08	DL-DR1-18	CP 4 - CP 5	2	9/8/2016	9/13/2016	9/14/2016	23.9
018.10	DL-DR1-19	CP 4 - CP 5	3	9/13/2016	9/15/2016	9/19/2016	26.4
018.10	DL-DR1-20	CP 4 - CP 5	3	9/13/2016	9/15/2016	9/19/2016	15.2
018.10	DL-DR1-21	CP 4 - CP 5	3	9/13/2016	9/15/2016	9/19/2016	55.9
018.10	DL-DR1-22	CP 4 - CP 5	3	9/13/2016	9/15/2016	9/19/2016	149
018.10	DL-DR1-23	CP 4 - CP 5	3	9/13/2016	9/15/2016	9/19/2016	22.8
018.10	DL-DR1-24	CP 4 - CP 5	3	9/13/2016	9/15/2016	9/19/2016	72.4
018.10	DL-DR1-25	CP 5 - CP 6	3	9/13/2016	9/15/2016	9/19/2016	56.5
018.10	DL-DR1-26	CP 5 - CP 6	3	9/13/2016	9/15/2016	9/19/2016	233
018.10	DL-DR1-27	CP 5 - CP 6	3	9/13/2016	9/15/2016	9/19/2016	68.6
018.10	DL-DR1-28	CP 5 - CP 6	3	9/13/2016	9/15/2016	9/19/2016	234
018.10	DL-DR1-29	CP 5 - CP 6	3	9/13/2016	9/15/2016	9/19/2016	64.0
018.11	DL-DR1-30	CP 5 - CP 6	4	9/15/2016	9/19/2016	9/21/2016	38.0

Table 6-3 Final Analytical Results for Phase 3 2016 Documentation Sediment Samples, Depew Village Landfill Site, Depew, New York

MCI Submittal #	Sample ID	Approximate Control Point Location	Work Cell Number	Date Sampled	Date Analyzed	Date MCI submitted to E & E	Analytical Results (mg/kg) Lead
018.11	DL-DR1-31	CP 5 - CP 6	4	9/15/2016	9/19/2016	9/21/2016	42.9
018.11	DL-DR1-32	CP 6 - CP 7	4	9/15/2016	9/19/2016	9/21/2016	188
018.11	DL-DR1-33	CP 6 - CP 7	4	9/15/2016	9/19/2016	9/21/2016	85.2
018.11	DL-DR1-34	CP 6 - CP 7	4	9/15/2016	9/19/2016	9/21/2016	5.40
018.11	DL-DR1-35	CP 6 - CP 7	4	9/15/2016	9/19/2016	9/21/2016	20.3
018.11	DL-DR1-36	CP 6 - CP 7	4	9/15/2016	9/19/2016	9/21/2016	30.2
018.15	DL-DR1-37	CP 7	4	9/23/2016	9/27/2016	9/30/2016	54.9
018.15	DL-DR1-38	CP 7	4	9/23/2016	9/27/2016	9/30/2016	135
018.15	DL-DR1-39	CP 7	4	9/23/2016	9/27/2016	9/30/2016	37.7
018.15	DL-DR1-40	CP 7	4	9/23/2016	9/27/2016	9/30/2016	138
018.15	DL-DR1-41	CP 7 - CP 8	4	9/23/2016	9/27/2016	9/30/2016	337
018.15	DL-DR1-42	CP 7 - CP 8	4	9/23/2016	9/27/2016	9/30/2016	14.6
018.15	DL-DR1-43	CP 8	4	9/23/2016	9/27/2016	9/30/2016	22.4
018.15	DL-DR1-44	CP 8	4	9/23/2016	9/27/2016	9/30/2016	22.1
018.15	DL-DR1-45	CP 8	4	9/23/2016	9/27/2016	9/30/2016	29.8
018.15	DL-DR1-46	CP 8	4	9/23/2016	9/27/2016	9/30/2016	54.9
018.15	DL-DR1-47	CP 8 - CP 9	4	9/23/2016	9/27/2016	9/30/2016	20.9
018.15	DL-DR1-48	CP 8 - CP 9	4	9/23/2016	9/28/2016	9/30/2016	31.8
018.15	DL-DR1-49	CP 8 - CP 9	4	9/23/2016	9/28/2016	9/30/2016	18.0
018.15	DL-DR1-50	CP 8 - CP 9	4	9/23/2016	9/28/2016	9/30/2016	31.1
018.15	DL-DR1-51	CP 9	4	9/23/2016	9/28/2016	9/30/2016	25.4
018.15	DL-DR1-52	CP 9	4	9/23/2016	9/28/2016	9/30/2016	92.7
018.17	DL-DR2-1	CP 9 - CP 10	5	9/26/2016	9/29/2016	9/30/2016	6,640
018.17	DL-DR2-2	CP 9 - CP 10	5	9/26/2016	9/28/2016	9/30/2016	406
018.17	DL-DR2-3	CP 9 - CP 10	5	9/26/2016	9/28/2016	9/30/2016	751
018.17	DL-DR2-4	CP 9 - CP 10	5	9/26/2016	9/28/2016	9/30/2016	157
018.17	DL-DR2-5	CP 9 - CP 10	5	9/26/2016	9/28/2016	9/30/2016	1,960
018.17	DL-DR2-6	CP 9 - CP 10	5	9/26/2016	9/28/2016	9/30/2016	1,500
018.17	DL-DR2-7	CP 9 - CP 10	5	9/26/2016	9/28/2016	9/30/2016	2,200
018.17	DL-DR2-8	CP 9 - CP 10	5	9/26/2016	9/28/2016	9/30/2016	1,260

Table 6-3 Final Analytical Results for Phase 3 2016 Documentation Sediment Samples, Depew Village Landfill Site, Depew, New York

MCI Submittal #	Sample ID	Approximate Control Point Location	Work Cell Number	Date Sampled	Date Analyzed	Date MCI submitted to E & E	Analytical Results (mg/kg) Lead
018.17	DL-DR2-9	CP 9 - CP 10	5	9/26/2016	9/29/2016	9/30/2016	8,220
018.17	DL-DR2-10	CP 9 - CP 10	5	9/26/2016	9/28/2016	9/30/2016	418
018.17	DL-DR2-11	CP 9 - CP 10	5	9/26/2016	9/29/2016	9/30/2016	26,700
018.17	DL-DR2-12	CP 9 - CP 10	5	9/26/2016	9/28/2016	9/30/2016	98.3
018.17	DL-DR2-13	CP 9 - CP 10	5	9/26/2016	9/28/2016	9/30/2016	221
018.17	DL-DR2-14	CP 9 - CP 10	5	9/26/2016	9/28/2016	9/30/2016	58.4
018.18	DL-DR2-15	CP 10 - CP 11	6	10/5/2016	10/7/2016	10/11/2016	1,630
018.18	DL-DR2-16	CP 10 - CP 11	6	10/5/2016	10/7/2016	10/11/2016	1,500
018.18	DL-DR2-17	CP 10 - CP 11	6	10/5/2016	10/7/2016	10/11/2016	2,440
018.18	DL-DR2-18	CP 10 - CP 11	6	10/5/2016	10/7/2016	10/11/2016	76.2
018.18	DL-DR2-19	CP 10 - CP 11	6	10/5/2016	10/7/2016	10/11/2016	456
018.18	DL-DR2-20	CP 10 - CP 11	6	10/5/2016	10/7/2016	10/11/2016	748
018.18	DL-DR2-21	CP 10 - CP 11	6	10/5/2016	10/7/2016	10/11/2016	1,570
018.18	DL-DR2-22	CP 11 - CP 12	6	10/5/2016	10/7/2016	10/11/2016	2,050
018.18	DL-DR2-23	CP 11 - CP 12	6	10/5/2016	10/7/2016	10/11/2016	494
018.18	DL-DR2-24	CP 11 - CP 12	6	10/5/2016	10/7/2016	10/11/2016	1,180
018.19	DL-DR2-25	CP 11 - CP 12	6	10/6/2016	10/10/2016	10/12/2016	171
018.19	DL-DR2-26	CP 11 - CP 12	6	10/6/2016	10/10/2016	10/12/2016	2,270
018.19	DL-DR2-27	CP 11 - CP 12	6	10/6/2016	10/10/2016	10/12/2016	1,280
018.19	DL-DR2-28	CP 11 - CP 12	6	10/6/2016	10/10/2016	10/12/2016	265
018.19	DL-DR2-29	CP 11 - CP 12	6	10/6/2016	10/10/2016	10/12/2016	1,950
018.19	DL-DR2-30	CP 11 - CP 12	6	10/6/2016	10/10/2016	10/12/2016	59.4
018.19	DL-DR2-31	CP 11 - CP 12	6	10/6/2016	10/10/2016	10/12/2016	126
018.19	DL-DR2-32	CP 12 - CP 13	6	10/6/2016	10/10/2016	10/12/2016	542
018.19	DL-DR2-33	CP 12 - CP 13	6	10/6/2016	10/10/2016	10/12/2016	1130
018.19	DL-DR2-34	CP 12 - CP 13	6	10/6/2016	10/10/2016	10/12/2016	193
018.19	DL-DR2-35	CP 12 - CP 13	6	10/6/2016	10/10/2016	10/12/2016	30.3
018.20	DL-DR2-36	CP 12 - CP 13	6	10/7/2016	10/11/2016	10/12/2016	390
018.20	DL-DR2-37	CP 12 - CP 13	6	10/7/2016	10/11/2016	10/12/2016	71
018.20	DL-DR2-38	CP 13 - CP 14	6	10/8/2016	10/11/2016	10/12/2016	138

Table 6-3 Final Analytical Results for Phase 3 2016 Documentation Sediment Samples, Depew Village Landfill Site, Depew, New York

MCI Submittal #	Sample ID	Approximate Control Point Location	Work Cell Number	Date Sampled	Date Analyzed	Date MCI submitted to E & E	Analytical Results (mg/kg) Lead
018.20	DL-DR2-39	CP 13 - CP 14	6	10/8/2016	10/11/2016	10/12/2016	940
018.20	DL-DR2-40	CP 13 - CP 14	6	10/8/2016	10/11/2016	10/12/2016	1,330
018.20	DL-DR2-41	CP 31 - CP 32	under south arch	10/8/2016	10/11/2016	10/12/2016	123
018.20	DL-DR2-42	CP 31 - CP 32	under south arch	10/8/2016	10/11/2016	10/12/2016	1,560
018.20	DL-DR2-43	CP 31 - CP 32	under south arch	10/8/2016	10/11/2016	10/12/2016	3,760
018.24	BBNA-1	CP 37 - CP 38	under north arch	10/17/2016	10/19/2016	10/19/2016	8,180
018.24	BBNA-2	CP 37 - CP 38	under north arch	10/17/2016	10/18/2016	10/19/2016	325
018.24	BBNA-3	CP 37 - CP 38	under north arch	10/17/2016	10/18/2016	10/19/2016	354
018.24	BBNA-WS	CP 37 - CP 38	north arch sidewall	10/17/2016	10/18/2016	10/19/2016	1,770
018.24	BBNA-ES	CP 37 - CP 38	north arch sidewall	10/17/2016	10/18/2016	10/19/2016	249
018.25	BBNA-1A	CP 37 - CP 38	under north arch	10/26/2016	10/31/2016	11/1/2016	2,700
018.25	BBNA-2A	CP 37 - CP 38	under north arch	10/26/2016	10/31/2016	11/1/2016	1,170
018.25	BBNA-3A	CP 37 - CP 38	under north arch	10/26/2016	10/31/2016	11/1/2016	1,330

Notes:
Documentation samples greater than the sediment LEL of 31 mg/kg are shaded in gray.

In addition to soil and sediments samples, water samples were also collected during the 2016 Phase 3 work. MCI subcontracted BakerCorp to design and install a CWTS on the 2016 decon pad. MCI submitted a work plan for the treatment plant on August 27, 2016, which included the process flow diagram for the CWTS. BakerCorp began delivering equipment for the water filtration system on August 19, 2016, and completed installation on August 23, 2016. Once the system was constructed, approximately 4,000 gallons of creek water was treated and discharged to the holding tank. The discharge was analyzed to demonstrate compliance with Supplementary Specification, Section XI, Section 01425 – Sampling and Analysis. Effluent samples were collected after 20,000 gallons were treated, in compliance with the SPDES permit requirements for analysis and discharge to Cayuga Creek.

The water samples were picked up at the site by Paradigm and taken to their laboratory for analysis. The analytical results for the water treatment effluent samples are provided in Appendix 3G, and the DUSRs for both sets of analytical results are provided in Appendix 3Q.

6.3.2 Soil and Sediment Remediation Sampling and Analysis for Phase 3 – 2017 Work

Pre- and post-construction documentation samples were collected from the 2017 decon pad and access road areas on the Old Land Reclamation Landfill and on the properties of Mr. Straus, Mr. Snyder, and Mr. Singh using the protocols established in the Contract Documents, Supplementary Specifications, Section XI, Division 1, Section 01425 – Sampling. The samples were collected as follows:

1. One sample per decontamination/processing pad prior to project mobilization, and one sample upon project completion. Since the 2017 decon pad was not removed and remained in place at the end of the project, the post-construction sample was collected from the stone on the 2017 decon pad.
2. One sample per every linear 250 feet of access road prior to construction of the access road and after removal of the access road. Since access roads 10 through 20 and 28, located on the Old Land Reclamation Landfill, were not removed and remained in place, those post-construction samples were collected from the stone on the access roads instead of from the soil beneath.

The pre- and post-construction samples were collected by MCI, witnessed by E & E, and surveyed by Wendel. The 2017 pre-construction samples indicated that access roads 10, 11, 12, 14, 15, 18, 22, 23, 24, 27, and 28 contained lead concentrations above the SCO. The analytical results for the post-construction samples showed that lead concentrations were above both the SCO and pre-construction concentrations for access roads 21 and 23, located on the Old Land Reclamation Landfill. Post-construction lead concentrations at access roads 10, 11, 12, 14, 15, 18, 24, and 28 were lower than pre-construction concentrations and below the SCO; lead concentrations at access roads 22 and 27 were lower than pre-construction concentrations but still above the SCO; and lead concentrations at access

roads 21 and 23 were higher than pre-construction concentrations and above the SCO.

Determination of the vertical and horizontal excavation limits based on the Contract Drawings was performed by MCI's surveyor, Wendel, and reviewed by E & E. Wendel provided the field stakeout of the excavation limits.

Documentation samples were collected from the sediment removal areas according to the protocols established in the Contract Documents, Supplementary Specifications, Section XI, Division 1, Section 01425 – Sampling. The samples were collected as follows:

1. Three-point composite samples were collected from the floor of each excavation area at approximately one sample per 900 square feet.

The documentation and confirmation samples were collected by E & E's Resident Engineer during the 2017 Phase 3 work, and the sample locations were surveyed by Wendel. Samples were collected following completion of sediment removal activities in Cells 1 through 11. Samples were collected at the bottom of the excavation in each area. These documentation samples were collected to determine whether the sediment criterion had been met, and to document the levels of residual contamination for future site management and monitoring purposes. Documentation sampling locations were surveyed both horizontally and vertically for later inclusion into NYSDEC's EQuIS program.

E & E's Resident Engineer transported the samples to NYSDEC's call-out laboratory, TestAmerica Laboratories, for analysis with a 72-hour turnaround time. TestAmerica's analytical services for the 2017 work started on May 9, 2017, and ended on October 31, 2017. Once the analytical results were received by E & E, E & E compared them to the sediment criterion to determine whether the cleanup goal had been achieved.

A total of 106 sediment samples were collected by E & E and analyzed by Test America in Cells 1 – 11 during the 2017 work. The analytical data packages for the documentation samples are provided in Appendix 3G. Summaries of the analytical results are provided in Table 6-4. The surveyed locations are provided on the record drawings prepared by Wendel (see Appendix 3E).

In addition to the sediment samples, water samples were also collected. MCI subcontracted BakerCorp to design and install a CWTS on the 2017 decon pad on the Old Land Reclamation Landfill. BakerCorp began delivering equipment for the water filtration system on June 5 and completed installation on June 8, 2017.

Table 6-4 Final Analytical Results for Phase 3 2017 Documentation Sediment Samples, Depew Village Landfill Site, Depew, New York

Sample ID	Lab Sample ID	Approximate Control Point Location	Work Cell Number	Date Sampled	Date Analyzed	Date E & E Received Results from TestAmerica	Analytical Results (mg/kg) Lead
DL-WS-1	480-120007-1	34, 35, 37	area west of bridge - bottom of excavation (at bedrock)	6/22/2017	6/26/2017	6/27/2017	3,040
DL-WS-1-DUP	480-120007-2	34, 35, 37	area west of bridge - bottom of excavation (at bedrock)	6/22/2017	6/26/2017	6/27/2017	2,150
DL-WS-2	480-120007-3	35	area west of bridge - sidewall	6/22/2017	6/26/2017	6/27/2017	1,340
DL-CELL1-1	480-122185-1	32, 34	Cell 1	8/3/2017	8/7/2017	8/8/2017	70.6
DL-CELL1-2	480-122185-2	32, 34	Cell 1	8/3/2017	8/7/2017	8/8/2017	345
DL-CELL1-3	480-122185-3	32, 35	Cell 1	8/3/2017	8/7/2017	8/8/2017	549
DL-CELL1-4	480-122185-4	32, 36	Cell 1	8/3/2017	8/7/2017	8/8/2017	128
DL-CELL1-5	480-122185-5	32, 36	Cell 1	8/3/2017	8/7/2017	8/8/2017	1,010
DL-CELL1-6	480-122185-6	32, 36	Cell 1	8/3/2017	8/7/2017	8/8/2017	98.1
DL-CELL1-7	480-122185-7	32, 36	Cell 1	8/3/2017	8/7/2017	8/8/2017	61.3
DL-CELL1-8	480-122185-8	39, 40	Cell 1	8/3/2017	8/7/2017	8/8/2017	51.1
DL-CELL1-9	480-122185-9	39, 40	Cell 1	8/3/2017	8/7/2017	8/8/2017	9.3
DL-CELL1-10	480-122185-10	39, 40	Cell 1	8/3/2017	8/7/2017	8/8/2017	18.1
DL-CELL1-11	480-122185-11	39, 40	Cell 1	8/3/2017	8/7/2017	8/8/2017	24.9
DL-CELL1-12	480-122185-12	39, 40	Cell 1	8/3/2017	8/7/2017	8/8/2017	4.9
DL-CELL1-13	480-122185-13	39, 40	Cell 1	8/3/2017	8/7/2017	8/8/2017	9.3
DL-CELL1-14	480-122185-14	39, 40	Cell 1	8/3/2017	8/7/2017	8/8/2017	40.3
DL-CELL1-15	480-122185-15	39, 40	Cell 1	8/3/2017	8/7/2017	8/8/2017	14.9
DL-CELL2-1	480-122666-1	41, 42	Cell 2	8/11/2017	8/15/2017	8/15/2017	67.7
DL-CELL2-2	480-122666-2	41, 42	Cell 2	8/11/2017	8/15/2017	8/15/2017	8.4
DL-CELL2-3	480-122666-3	43, 44	Cell 2	8/11/2017	8/15/2017	8/15/2017	390
DL-CELL2-4	480-122666-4	43, 44	Cell 2	8/11/2017	8/15/2017	8/15/2017	18.3
DL-CELL-3-1	480-122666-5	45, 46	Cell 3	8/11/2017	8/15/2017	8/15/2017	6.9
DL-CELL-3-2	480-122666-6	45, 46	Cell 3	8/11/2017	8/15/2017	8/15/2017	317
DL-CELL-3-2-DUP	480-122666-7	45, 46	Cell 3	8/11/2017	8/15/2017	8/15/2017	60.2
DL-CELL3-3	480-122802-1	47, 48	Cell 3	8/16/2017	8/18/2017	8/22/2017	3.8
DL-CELL5-1	480-123348-1	53, 54	Cell 5	8/29/2017	8/31/2017	8/31/2017	5.1
DL-CELL5-2	480-123348-2	53, 54	Cell 5	8/29/2017	8/31/2017	8/31/2017	14.5

Table 6-4 Final Analytical Results for Phase 3 2017 Documentation Sediment Samples, Depew Village Landfill Site, Depew, New York

Sample ID	Lab Sample ID	Approximate Control Point Location	Work Cell Number	Date Sampled	Date Analyzed	Date E & E Received Results from TestAmerica	Analytical Results (mg/kg) Lead
DL-CELL5-3	480-123348-3	53, 54	Cell 5	8/29/2017	8/31/2017	8/31/2017	4.6
DL-CELL5-4	480-123348-4	55, 56	Cell 5	8/29/2017	8/31/2017	8/31/2017	4.3
DL-CELL5-5	480-123348-5	55, 56	Cell 5	8/29/2017	8/31/2017	8/31/2017	3.9
DL-CELL5-6	480-123348-6	55, 56	Cell 5	8/29/2017	8/31/2017	8/31/2017	5.3
DL-CELL4-1	480-123421-1	49, 50	Cell 4	8/30/2017	9/1/2017	9/1/2017	21.9
DL-CELL4-2	480-123421-2	49, 50	Cell 4	8/30/2017	9/1/2017	9/1/2017	35.6
DL-CELL4-3	480-123421-3	51, 52	Cell 4	8/30/2017	9/1/2017	9/1/2017	4.1
DL-CELL8-1	480-12350-1	66	Cell 8	8/31/2017	9/5/2017	9/6/2017	43.9
DL-CELL8-2	480-12350-2	66	Cell 8	8/31/2017	9/5/2017	9/6/2017	17.9
DL-CELL8-3	480-12350-3	68	Cell 8	8/31/2017	9/5/2017	9/6/2017	64.2
DL-CELL8-4	480-12350-4	68	Cell 8	8/31/2017	9/5/2017	9/6/2017	182
DL-CELL11-1	480-124225-1	80	Cell 11	9/14/2017	9/22/2017	9/25/2017	14.8
DL-CELL11-2	480-124225-2	80	Cell 11	9/14/2017	9/22/2017	9/25/2017	22.2
DL-CELL11-3	480-124225-3	80	Cell 11	9/14/2017	9/22/2017	9/25/2017	10.3
DL-CELL11-4	480-124225-4	80	Cell 11	9/14/2017	9/22/2017	9/25/2017	13.2
DL-CELL11-5	480-124307-1	80	Cell 11	9/15/2017	9/20/2017	9/20/2017	14.5
DL-CELL11-6	480-124307-2	80	Cell 11	9/15/2017	9/20/2017	9/20/2017	16.4
DL-CELL11-7	480-124307-3	80	Cell 11	9/15/2017	9/20/2017	9/20/2017	24.1
DL-CELL11-8	480-124307-4	80	Cell 11	9/15/2017	9/20/2017	9/20/2017	9.2
DL-CELL11-9	480-124307-5	80	Cell 11	9/15/2017	9/20/2017	9/20/2017	14.7
DL-CELL11-10	480-124307-6	80	Cell 11	9/15/2017	9/20/2017	9/20/2017	13.9
DL-CELL11-11	480-124307-7	81	Cell 11	9/15/2017	9/20/2017	9/20/2017	17.3
DL-CELL11-12	480-124307-8	81	Cell 11	9/15/2017	9/20/2017	9/20/2017	5.9
DL-CELL11-13	480-124307-9	81	Cell 11	9/15/2017	9/20/2017	9/20/2017	6.5
DL-CELL11-14	480-124307-10	81	Cell 11	9/15/2017	9/20/2017	9/20/2017	18.0
DL-CELL11-15	480-124307-11	81	Cell 11	9/15/2017	9/20/2017	9/20/2017	18.1
DL-CELL11-16	480-124307-12	81	Cell 11	9/15/2017	9/20/2017	9/20/2017	36.6
DL-CELL11-17	480-124307-13	81	Cell 11	9/15/2017	9/20/2017	9/20/2017	27.8
DL-CELL11-18	480-124307-14	81	Cell 11	9/15/2017	9/20/2017	9/20/2017	11.8
DL-CELL11-19	480-124307-15	81	Cell 11	9/15/2017	9/20/2017	9/20/2017	12.7

Table 6-4 Final Analytical Results for Phase 3 2017 Documentation Sediment Samples, Depew Village Landfill Site, Depew, New York

Sample ID	Lab Sample ID	Approximate Control Point Location	Work Cell Number	Date Sampled	Date Analyzed	Date E & E Received Results from TestAmerica	Analytical Results (mg/kg) Lead
DL-CELL11-20	480-124382-1	82	Cell 11	9/18/2017	9/20/2017	9/21/2017	23.4
DL-CELL11-21	480-124382-2	82	Cell 11	9/18/2017	9/20/2017	9/21/2017	29.4
DL-CELL11-22	480-124382-3	82	Cell 11	9/18/2017	9/20/2017	9/21/2017	161
DL-CELL10-1	480-124458-1	76, 77	Cell 10	9/19/2017	9/22/2017	9/22/2017	12.5
DL-CELL10-2	480-124458-2	76, 77	Cell 10	9/19/2017	9/22/2017	9/22/2017	12.1
DL-CELL10-3	480-124458-3	76, 77	Cell 10	9/19/2017	9/22/2017	9/22/2017	75.1
DL-CELL10-4	480-124458-4	76, 77	Cell 10	9/19/2017	9/22/2017	9/22/2017	61.9
DL-CELL10-5	480-124458-5	76, 77	Cell 10	9/19/2017	9/22/2017	9/22/2017	21.7
DL-CELL10-6	480-124458-6	74, 78	Cell 10	9/19/2017	9/22/2017	9/22/2017	72.3
DL-CELL11-23	480-124458-7	82	Cell 11	9/19/2017	9/22/2017	9/22/2017	29.6
DL-CELL11-24	480-124458-8	82	Cell 11	9/19/2017	9/22/2017	9/22/2017	55.6
DL-CELL11-25	480-124545-1	82	Cell 11	9/20/2017	9/23/2017	9/25/2017	43.0
DL-CELL11-26	480-124545-2	82	Cell 11	9/20/2017	9/23/2017	9/25/2017	48.5
DL-CELL11-27	480-124545-3	82	Cell 11	9/20/2017	9/23/2017	9/25/2017	33.6
DL-CELL11-28	480-124545-4	82	Cell 11	9/20/2017	9/23/2017	9/25/2017	67.6
DL-CELL10-7	480-124607-1	74, 78	Cell 10	9/21/2017	9/23/2017	9/26/2017	28.0
DL-CELL10-8	480-124607-2	74, 78	Cell 10	9/21/2017	9/23/2017	9/26/2017	22.0
DL-CELL10-9	480-124607-3	74, 78	Cell 10	9/21/2017	9/23/2017	9/26/2017	14.5
DL-CELL10-10	480-124607-4	74, 78	Cell 10	9/21/2017	9/23/2017	9/26/2017	33.8
DL-CELL11-29	480-124707-1	82	Cell 11	9/22/2017	9/26/2017	9/27/2017	65.5
DL-CELL11-30	480-124707-2	82	Cell 11	9/22/2017	9/26/2017	9/27/2017	302
DL-CELL11-31	480-124707-3	82	Cell 11	9/22/2017	9/26/2017	9/27/2017	59.6
DL-CELL11-32	480-124707-4	82	Cell 11	9/22/2017	9/26/2017	9/27/2017	21.2
DL-CELL11-33	480-124707-5	82	Cell 11	9/22/2017	9/26/2017	9/27/2017	66.1
DL-CELL11-34	480-124707-6	79	Cell 11	9/22/2017	9/26/2017	9/27/2017	46.2
DL-CELL11-35	480-124707-7	79	Cell 11	9/22/2017	9/26/2017	9/27/2017	82.4
DL-CELL11-36	480-124707-8	79	Cell 11	9/22/2017	9/26/2017	9/27/2017	23.6
DL-CELL11-37	480-124707-9	79	Cell 11	9/22/2017	9/26/2017	9/27/2017	38.2
DL-CELL10-6-A	480-124779-1	74, 78	Cell 10	9/25/2017	9/28/2017	9/29/2017	23.3
DL-CELL10-7-A	480-124779-2	74, 78	Cell 10	9/25/2017	9/28/2017	9/29/2017	14.5

Table 6-4 Final Analytical Results for Phase 3 2017 Documentation Sediment Samples, Depew Village Landfill Site, Depew, New York

Sample ID	Lab Sample ID	Approximate Control Point Location	Work Cell Number	Date Sampled	Date Analyzed	Date E & E Received Results from TestAmerica	Analytical Results (mg/kg) Lead
DL-CELL10-8-A	480-124779-3	74, 78	Cell 10	9/25/2017	9/28/2017	9/29/2017	16.7
DL-CELL10-9-A	480-124779-4	74, 78	Cell 10	9/25/2017	9/28/2017	9/29/2017	16.6
DL-CELL10-10-A	480-124779-5	74, 78	Cell 10	9/25/2017	9/28/2017	9/29/2017	14.8
DL-CELL11-38	480-124779-6	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	68.1
DL-CELL11-39	480-124779-7	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	221
DL-CELL11-40	480-124779-8	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	90.8
DL-CELL11-41	480-124779-9	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	267
DL-CELL11-42	480-124779-10	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	40.2
DL-CELL11-43	480-124779-11	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	57
DL-CELL11-44	480-124779-12	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	49.8
DL-CELL11-45	480-124779-13	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	41.9
DL-CELL11-46	480-124779-14	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	160
DL-CELL11-47	480-124779-15	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	1,540
DL-CELL11-48	480-124779-16	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	126
DL-CELL11-49	480-124779-17	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	52.3
DL-CELL11-50	480-124779-18	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	49.4
DL-CELL11-51	480-124779-19	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	37.5
DL-CELL11-52	480-124779-20	79	Cell 11	9/25/2017	9/28/2017	9/29/2017	145

Notes:
Documentation samples greater than the sediment LEL of 31 mg/kg are shaded in gray.

Once the system was constructed, approximately 4,000 gallons of creek water was treated and stored in the holding tank. The effluent was analyzed to determine whether it was in compliance with the SPDES permit. The analytical results of the first sample, collected on June 19, 2017, showed concentrations of copper, lead, and zinc that were above the discharge limits. MCI emptied the discharge tank onto the 2017 decon pad and re-treated the water. Another water sample was collected on June 27, 2017, and the analytical results showed that the treated water met the discharge requirements. Effluent samples were also collected after 20,000 gallons were treated, in compliance with the SPDES System permit requirements for discharge to Cayuga Creek. The analytical results for the water treatment effluent samples are provided in Appendix 3G, and the DUSRs for both sets of analytical results are provided in Appendix 3E.

Additional details of the remedial work, performed by area, are provided below.

6.3.3 Phase 3 Sediment Removal

6.3.3.1 Area 8 Landfill (2016)

The Area 8 landfill was used as the soil disposal area during the 2016 remediation activities. The soil from the existing cap was removed and stockpiled before the sediment was excavated from Reaches 1 and 2 and beneath the Borden Road bridge were placed in this area. In addition to these soils/sediments, mechanically removed Japanese knotweed material was also placed in the Area 8 landfill. Following completion of the disposal activities, the disposal area was recapped and graded with the staged topsoil and seeded in accordance with the Contract Documents. No work was performed at the Area 8 landfill in 2017.

6.3.3.2 Reaches 1 and 2 (2016)

MCI dredged the first approximately 100 feet of Reach 1 without dewatering the work area. MCI was unable to construct a cofferdam to dewater this section because of the offsets from this property. One hydraulic excavator dredged the sediment from the creek and temporarily stockpiled the dredged sediment in the work area adjacent to the RDB. A second hydraulic excavator, located on the RDB, placed the material into and dump truck that transported the material to the 2016 decon pad for processing.

After moving downstream into the next work area, MCI constructed a cofferdam across the entire width of the creek. The cofferdam was constructed by placing one layer of jersey barriers across the width of the creek. LLDPE sheeting was placed over the jersey barriers to minimize seepage through the joints and under the bottom of the barriers. Clay was then placed and compacted on the upstream side of the cofferdam to provide additional support to the jersey barriers. MCI constructed another cofferdam with the same materials approximately 150 feet downstream from the first cofferdam. The clay for the second cofferdam was placed and compacted on the downstream side of this cofferdam. Three sections of 150-foot-long, 12-inch-diameter HDPE pipes were placed along the LDB to transport water around the exclusion zone. Two 4-inch pumps were used to pump water through the HDPE piping. MCI removed 1 foot of sediment from this cell;

however, issues were encountered with this dewatering method. These issues are discussed in Section 7.6.3.

In response to the issues encountered, MCI changed their water diversion method. MCI joined the three HDPE diversion pipes together to create one, 450-foot-long diversion pipe. MCI then connected the pipes up to a 12-inch pump to increase the volume of water that could be pumped around the exclusion zone. MCI also upgraded the strength of their upstream cofferdam. The new upstream cofferdam was constructed by placing a single layer of jersey barriers across the creek. A second layer of jersey barriers was placed approximately 15 feet downstream of the first layer. LLDPE was then placed over each layer of jersey barriers. MCI placed and compacted clay between the two layers of jersey barriers. Clay was also placed on the upstream side of the upstream jersey barriers and the downstream side of the downstream jersey barriers. The 12-inch pump intake was placed on the upstream side of the cofferdam and the discharge was placed approximately 450 feet further downstream. This water diversion method was used for the remainder of the project; however, some problems were still encountered with this method. These issues are discussed in Section 7.6.3.

MCI used this new water diversion method to dewater the work area and excavate the sediment for the remainder of the project. MCI's first 450-foot-long diversion pipe stretched through the remainder of Reach 1 and approximately 150 feet into Reach 2. MCI then removed their cofferdam and constructed a new one, using the same updated methods, approximately 150 feet into Reach 2. The 12-inch bypass pump was moved to the RDB next to the new cofferdam, and the diversion pipe stretched approximately 50 feet downstream of the Borden Road bridge.

Each dewatered work area was excavated to a depth of 1 foot or to bedrock as indicated on the Contract Drawings. Sediment removal from Reach 1 began on August 29, 2016. MCI used two hydraulic excavators to remove sediment from the creek. One excavator moved large boulders off to the side of the creek bed, removed the sediment, and placed the sediment near the RDB. The second excavator either assisted the first excavator in removing the sediment from the creek or loaded the excavated material into the dump truck. The dump truck transported material to the 2016 decon pad, where it offloaded the material without entering the exclusion zone. A third excavator was stationed on the 2016 decon pad to assist the dump truck and process the excavated material through the Powerscreen. The Powerscreen contained a bulk screen that filtered out large material (greater than 12 inches in diameter). The material that passed through the bulk screen then moved up a conveyor belt and through another screen. This screen sorted the material into two piles: one pile of material ½-inch diameter or larger, and one pile of material less than ½-inch diameter.

The material that was ½-inch in diameter and larger was returned to the creek in the approximate location of where it had been removed. The material that was less than ½-inch diameter was transported to the onsite Area 8 landfill, via dump trucks.

After an area of the creek had been excavated and approved by the Resident Engineer, MCI's SSO collected post-excavation documentation samples in the presence of the Engineer. Wendel surveyed the location of the post-excavation documentation samples. Table 6-5 presents the analytical results for the samples from Reaches 1 and 2. The surveyed locations of the documentation samples are provided in the record drawings prepared by Wendel in Appendix 3E. After the samples had been collected and the locations had been surveyed, MCI loaded the overburden (material ½-inch diameter and larger) into the dump truck and hauled the overburden back to the creek bed. One excavator then placed this material in the approximate location of where the overburden had been removed. After the overburden had been returned to the work area, the cofferdam was removed and reconstructed downstream. The screened material less than ½-inch diameter was transported to the Area 8 landfill for on-site disposal.

The analytical results of the documentation samples were validated through the DUSR process by Kenneth R. Applin of KR Applin & Associates, Dansville, New York. The validation of the analytical data confirmed the proper execution of the analytical process. The DUSRs for the documentation samples from this area are provided in Appendix 3E.

6.3.3.3 RDB of Reaches 1 and 2 - Japanese Knotweed Removal and Live Stake Planting (2016)

MCI's subcontractor, Applied Ecology, performed Japanese knotweed removal and first application of herbicide from September 6 to September 9, 2016. Applied Ecology worked in teams of two to conduct the cut-and-treat herbicide application to remove the Japanese knotweed along the RDB of Reaches 1 and 2. One team member cut the stalks of the Japanese knotweed, and the following team member dabbed the top of the stalks with herbicide. After clearing a small section, the team members collected the cut stalks and placed them in plastic trash bags. MCI stockpiled the trash bags on the 2016 decon pad until the Area 8 landfill was opened. Per the Contract Specifications, a second round of herbicide was applied by Applied Ecology on June 5, 2017.

The specifications required that two treatments with herbicide be applied, the first treatment in May/June and the second treatment in August/September. Because of the delay in issuing the Notice to Proceed, it was not possible to apply the first treatment in May/June. Therefore, Applied Ecology treated for the first time in September 2016 and applied the second treatment in June 2017.

In December 2017, NYSDEC's call-out contractor, GES, and their subcontractor, TREC, installed live stakes along the RDB in Reaches 1 and 2 where Japanese knotweed had been removed. Additional information on the live staking completed by GES and TREC is provided in Section 6.3.4.3 and the Daily Inspection Reports in Appendix 3J.

Table 6-5 Pre- and Post-Construction Analytical Results for Phase 3 2016 Documentation Soil Samples in Support Areas, Depew Village Landfill Site, Depew, New York

MCI Submittal #	Sample ID	Location	Date Sampled	Date Analyzed	Date MCI Submitted to E & E	Pre-con Analytical Results (mg/kg)	Post-con Analytical Results (mg/kg)
						Lead	Lead
018.00	PC-080416-DP1	Decon area	8/4/2016	8/5/2016	8/17/2016	7.27	93.50
018.00	PC-080416-DC1	Decon area	8/4/2016	8/5/2016	8/17/2016	17.8	610
018.01	PC-081116-AR1	Access Road 1	8/11/2016	8/16/2016	8/17/2016	26.4	82.9
018.02	PC-081516-AR2	Access Road 2	8/15/2016	8/17/2016	8/30/2016	43.6	23.7
018.06	PC-083116-AR3	Access Road 3	8/31/2016	9/7/2016	9/12/2016	23.9	23.4
018.09	PC-090716-AR4	Access Road 4	9/7/2016	9/13/2016	9/15/2016	92.2	348.0
018.12	PC-091516-AR5	Access Road 5	9/15/2016	9/16/2016	9/21/2016	182	108.0
018.14	PC-091916-AR6	Access Road 6	9/19/2016	9/27/2016	9/30/2016	23.0	29.3
018.14	PC-092016-AR7	Access Road 7	9/20/2016	9/27/2016	9/30/2016	65.2	29.0
018.16	PC-092116-AR8	Access Road 8	9/21/2016	9/28/2016	9/30/2016	906	1,480
018.23	PC-101316-AR9	Access Road 9	10/13/2016	10/17/2016	10/18/2016	63.3	93.5
018.21	AC-101116-AR6	Access Road 6	10/11/2016	10/13/2016	10/14/2016	--	29.3
018.22	AC-101216-AR1	Access Road 1	10/12/2016	10/13/2016	10/17/2016	--	82.9
018.22	AC-101216-AR3	Access Road 3	10/12/2016	10/13/2016	10/17/2016	--	23.4
018.22	AC-101216-AR4	Access Road 4	10/12/2016	10/13/2016	10/17/2016	--	348
018.22	AC-101216-AR5	Access Road 5	10/12/2016	10/13/2016	10/17/2016	--	108
018.29	AC-110716-AR2	Access Road 2	11/7/2016	11/11/2016	11/21/2016	--	23.7
018.29	AC-110816-DP1	Decon area	11/8/2016	11/11/2016	11/21/2016	--	2.46
018.29	AC-110816-DC1	Decon area	11/8/2016	11/11/2016	11/21/2016	--	19
018.45	AC-090717-AR-1	Access Road 7	9/7/2017	9/11/2017	9/15/2017	--	29.0
018.45	AC-090717-AR-2	Access Road 8	9/7/2017	9/11/2017	9/15/2017	--	1,480
018.45	AC-090717-AR-3	Access Road 9	9/7/2017	9/11/2017	9/15/2017	--	93.5
	AC-100517-1	Access Road 8 Resample	10/5/2017	10/9/2017	10/10/2017	--	610

MCI Submittal #	Sample ID	Location	Date Sampled	Date Analyzed	Date MCI Submitted to E & E	Pre-con Analytical Results	Post-con Analytical Results (mg/L)
							TCLP
018.26	ARP-103116-1	Access Road Pile	10/31/2016	11/2/2016	11/2/2016	-	<0.100 mg/L
018.27	DCD-101916-1	Decon Pad Stone Pile	10/19/2016	10/21/2016	11/3/2016	-	<0.100 mg/L

6.3.3.4 Under the North and South Arches of the Borden Road Bridge (2016)

The Contract Documents specified the removal of sediment beneath the north and south arches of the Borden Road bridge. MCI removed 1 foot of sediment from beneath the south arch of the Borden Road Bridge and placed riprap at the center abutment of the bridge. The riprap was installed to the top of the footer from the upstream end of the abutment to the downstream end of the abutment.

The Contract Documents specified the removal of sediment to a depth of 3 feet from beneath the north arch of the Borden Road bridge. After MCI removed 3 feet of material, MCI's SSO collected three samples from the bottom of the excavation and two samples from the sidewall of the excavation. Table 6-3 includes the analytical results for the samples collected from this area. The analytical results showed that contaminant levels in all five samples were above the SCO for site soils. The remaining soil beneath the north arch was removed until bedrock was reached. E & E observed MCI use a mini-excavator to remove the remaining soil until the bucket scraped the bedrock under the entire north arch. The sediment on the downstream end of the north arch was also removed to provide a 5-foot-wide channel for water to flow out of the north arch. During these operations, MCI maintained 5-foot offsets from each abutment of the Borden Road bridge.

After E & E confirmed that bedrock had been reached, MCI's SSO collected three more samples from beneath the north arch by scraping soil from within the cracks of the bedrock. These locations were surveyed by Wendel. The surveyed locations of the documentation samples are provided on the record drawings in Appendix 3E. After the sample locations had been surveyed, MCI placed riprap under the north arch to an elevation 3 feet higher than the south arch. Riprap around the outside of the north arch was tapered up to existing grade. After MCI completed the placement of riprap, MCI informed E & E that a representative from the Erie County Division of Highways inspected the riprap and gave verbal approval for its layout. E & E acquired verbal approval from Ms. Svilokos from the Erie County Division of Highways on December 27, 2017.

NYSDEC requested that MCI remove the soil and sediment to the west of the north arch of the Borden Road Bridge because the analytical results for sidewall samples collected while excavating beneath the north arch of the bridge showed contaminant levels were above the site SCOs. NYSDEC requested that MCI remove this material during the 2016 work; however, MCI stated that they would remove it prior to completing excavation in Cells 1 – 11. MCI began excavation in the area west of the north arch of Borden Road bridge on June 20, 2017, and completed excavation on June 27, 2017. MCI excavated 195 CY of material in this area, which was paid for under Line Item UC-3B – Sediment Removal/Dredging (Cells 1 – 11), and Line Item UC-4 – Handling, Transport, and Disposal of Non-Hazardous Soils and Debris.

The analytical results of the documentation samples were validated through the DUSR process by Kenneth R. Applin of KR Applin & Associates. The validation

of the analytical data confirmed the proper execution of the analytical process. The DUSRs for the documentation samples from this area are provided in Appendix 3E.

6.3.3.5 Cells 1-11 (2017)

The Contract Documents specified the removal of sediment to a depth of 1 foot from Cells 1 – 11, which were located downstream of the Borden Road bridge. The depth of excavation was modified during Progress Meeting No. 15 on April 26, 2017, when NYSDEC stated that MCI should remove 2 feet of sediment from each cell to expedite the project.

Prior to sediment removal in Cells 1 – 11, MCI collected sediment characterization samples as required by the landfill. MCI estimated the weight of the sediment in each cell and, based on this estimate, collected enough samples to satisfy the landfill's quality control/permit requirements for one sample for every 500 tons of material.

While observing MCI collect the sediment characterization samples, E & E's Resident Engineer also took note of the approximate depth to bedrock or impermeable clay in each area. Based on these observations, minimal sediment was present in cells 6, 7, and 9; therefore, MCI did not conduct remedial activities in these three areas.

MCI began sediment removal in Cell 1 on August 2, 2017, and completed sediment removal in Cell 11 on September 25, 2017. In each cell, MCI initially removed approximately 2 feet of material. The excavated sediment was transported from the cells to the 2017 decon pad via off-road dump trucks. MCI used one excavator to remove sediment from the creek and stationed one excavator on the 2017 decon pad to sort and process material as it was offloaded from the dump trucks. The excavated sediment was placed through the Powerscreen that separated the sediment into two piles. The material that was ½-inch in diameter and larger was returned to the creek in the approximate location of where it had been removed. The material that was less than ½-inch diameter was transported to the Chaffee Landfill in Chaffee, New York, via dump trucks. Because all of the sediment characterization samples tested below the 5 mg/L hazardous waste regulatory limit for leachable lead, the material did not need to be stabilized prior to being transported to the Chaffee Landfill; therefore, no portland cement or ferrous sulfate was used for stabilization.

MCI began the 2017 work using an 18-inch pump to pump water around the cells that were to be dewatered. After experiencing issues with this pump, MCI replaced it with a 24-inch pump that could handle a greater flow rate. A discussion of these issues and resolutions is presented in Section 7.6.3.3. The 24-inch pump was used to dewater the three work areas around which MCI had constructed cofferdams to complete the excavation in Cells 1 – 11. The first cofferdam was constructed across the width of the creek in Reach 2, approximately 30 feet upstream of the Borden Road bridge. This cofferdam was used to dewater cells 1, 2, and 3.

The second cofferdam was constructed across the creek approximately 20 feet upstream from the downstream end of Cell 3. The second cofferdam was used to dewater cells 4 and 5. The third cofferdam was constructed across the creek approximately 10 feet upstream of Cell 10. This cofferdam was used to dewater cells 10 and 11.

The only cell that was excavated without being dewatered was Cell 8. It was determined that the only sediment present in this cell was along the LDB. The Resident Engineer, in conjunction with discussions with the NYSDEC PM, permitted MCI to remove this sediment without dewatering provided that the work was performed within a turbidity curtain and that compliance with the water quality requirements was maintained.

The material excavated from the creek was processed through the Powerscreen. The material ½-inch diameter and larger were returned to the creek, and the fines (material less than ½-inch diameter) were transported to the landfill, with the exception of the material that was removed from the island in Cell 11. Since it was determined that the material from the island consisted mostly of fines (material less than ½-inch diameter), it was loaded directly into dump trucks and transported to the landfill. The larger material was not removed from the island to the extent practicable.

Approximately 2 feet of sediment was removed in each cell, except for two areas where the excavation was deeper than 2 feet. The first area was on the island in Cell 11. The Contract Documents specified the removal of material from the island from existing elevation (determined to be 620 feet, based on the North American Vertical Datum of 1988, NAVD88) to an elevation of 617 feet (NAVD88). Based on the pre-construction survey, the maximum elevation of the island was approximately 621.25 feet. During excavation, MCI determined that bedrock was located approximately 1 to 2 feet below the 617-foot elevation. Consistent with NYSDEC's previous decision to excavate an approximately 2-foot depth of sediment to bedrock in previous cells, the island in Cell 11 was excavated to bedrock.

The other location where excavation was deeper than 2 feet was in Cell 10. After MCI removed approximately 2 feet of sediment from the cell, E & E's Resident Engineer collected soil confirmation samples. The analytical results for two of the samples collected from areas of the cell that had not yet reached bedrock were above the sediment criterion of 31 mg/kg. After discussion with the NYSDEC PM, E & E directed MCI (FO #01) to excavate additional sediments in Cell 10 to bedrock.

E & E's Resident Engineer collected post-construction confirmation soil samples. Confirmation sampling procedures are discussed in Section 6.3.2. The only sediment samples that exhibited lead concentrations above the sediment criteria were collected at the clay boundary or from within the cracks of the bedrock where ad-

ditional excavation was not possible, with the exception of Cell 10, which was addressed through additional excavation issued in FO 001. The analytical results for the other sediment samples were below the sediment criteria.

The analytical results of the documentation samples were validated through the DUSR process by E & E. The independent validation of the analytical data confirmed the proper execution of the analytical process. The DUSRs for the documentation samples from this area are provided in Appendix 3Q.

6.3.4 Phase 3 Restoration

As specified in the Contract Documents, access roads and other disturbed areas were to be restored to their original condition. Supplementary Specifications, Section XI, Division 2, Section 02510 – Backfilling – Common Fill, Topsoil, Gravel Fill and Stone establishes requirements for the installation and compaction of clean fill materials; and Supplementary Specifications, Section XI, Division 2, Section 02775 – Site Restoration, and Supplementary Specifications, Section XI, Division 2, Section 02920 – Seeding and Planting specify restoration requirements for the site. The exception to these requirements was the restoration of the access roads and 2017 decon pad on the Old Land Reclamation Landfill, which the Village of Depew DPW requested remain in place after the project was completed.

6.3.4.1 Topsoil Placement

Imported topsoil samples were obtained from an MCI site in Youngstown, New York. The samples were analyzed for physical properties by Paradigm and for grain size by SJB Services, Inc. The analytical and gradation results were supplied to E & E and were found to be in conformance with Contract Documents. The topsoil submittals for Phase 3 are provided in Appendix 3F.

The first loads of topsoil were delivered to the site between November 1 and November 10, 2016. MCI placed and graded the topsoil to achieve the proposed grades on the Area 8 landfill. MCI also placed and graded topsoil at the former locations of access roads 2 and 6 to aid in vegetation growth.

Additional topsoil was delivered to the site on May 16, 2017, to complete restoration activities on the Village of Depew DPW property. This topsoil was placed on access roads 1, 4, and 5 as a cap to cover soils with lead concentrations either above the SCO and/or with post-construction lead concentrations greater than pre-construction concentrations, and to aid in vegetation growth.

On August 25, 2017, more topsoil was delivered to the site and placed along the north bank of access roads 7 and 8 to restore the bank to pre-construction elevations. MCI also placed topsoil over access road 6 and 7 to aid in vegetation growth.

Approximately 11 more loads of topsoil were delivered to the site between October 4 and October 6, 2017. MCI placed and graded topsoil on access roads 31 and 32 to restore the roads to pre-construction elevations and to facilitate vegetation growth. MCI also placed and graded topsoil on access roads 21 and 23 to provide a cover over the areas with lead concentrations either above the SCO and/or with post-construction lead concentrations greater than pre-construction concentrations.

6.3.4.2 Hydroseeding

Supplemental Specification, Section XI, Section 02920 – Seeding and Planting established the requirements for seeding and planting for the restoration of the Area 8 landfill and other disturbed areas on-site.

The seed mixtures used by MCI were obtained from John Deere Landscapes of Troy, Michigan and SiteOne Landscape Supply of Troy, Michigan. Per the requirements in the Contract Documents, the seed mixes provided were ERNMIX-122 and ERNMIX-181. John Deer Landscapes supplied the Natural Steep Slope Mix with Ryegrass (ERNMX-181), and SiteOne Landscape Supply provided the FACW Meadow Mix (ERNMX-122). Documentation of the seed bags delivered to the site was reviewed by E & E. MCI applied the seed mix by hydroseeding. MCI also placed straw to facilitate seed growth on access road 7. Information regarding the seed mixtures was submitted to E & E for review and conformance with the Contract Documents. The submittal log is provided in Appendix 3E.

E & E monitored the application of topsoil and seed mixtures for quality, moisture content, and required application rates. E & E notified MCI's hydroseeder of the locations that required hydroseeding and also notified MCI's hydroseeder of areas that were not adequately covered with seed.

6.3.4.3 Live Stake Installation

MCI's subcontractor applied the second herbicide treatment on June 2, 2017, rather than in early spring as planned; therefore, the live staking could not be completed during the spring planting season. The delay in the second herbicide treatment was due to the recommendation of MCI's subcontractor to broadcast the second application after the invasive species produce foliage. MCI issued an RFI (No. 010) to request clarification on the live staking schedule because planting in the Fall would require a time extension. E & E responded to MCI by stating that live staking would be removed from the Contract and a NYSDEC call-out contractor would instead be used for the live stake installation. Details of the RFI are located in Appendix 3L.

NYSDEC's call-out contractor, GES, performed the live stake installation. GES used the scope of work written by E & E to request bids for the work. TREC was the apparent low bidder with a bid of $49,500.

TREC began installing the live stakes on December 6, 2017, and completed installation on December 13, 2017. Live stakes were installed along the RDB of reaches 1 and 2 in the locations where Japanese knotweed had been removed. TREC planted 3,226 silky dogwoods, 3,227 buttonbushes, and 3,227 sandbar willows. The order form for the live stakes is provided in Appendix 3R.

Table 6-6 Pre- and Post-Construction Analytical Results for Phase 3 2017 Documentation Soil Samples in Support Areas, Depew Village Landfill Site, Depew, New York

MCI Submittal #	Sample ID	Lab Sample ID#	Location	Date Sampled	Date Analyzed	Date MCI Submitted to E & E	Pre-con Analytical Results (mg/kg)	Post-con Analytical Results (mg/kg)
							Lead	Lead
018.35	PC-050917-AR10	171960-01	Access Road 10	5/9/2017	5/12/2017	6/21/2017	113	8.68
018.35	PC-050917-AR11	171960-02	Access Road 11	5/9/2017	5/12/2017	6/21/2017	100	8.92
018.35	PC-050917-AR12	171960-03	Access Road 12	5/9/2017	5/12/2017	6/21/2017	64.8	9.25
018.35	PC-050917-AR13	171960-04	Access Road 13	5/9/2017	5/12/2017	6/21/2017	57.8	8.41
018.35	PC-050917-AR14	171960-05	Access Road 14	5/9/2017	5/12/2017	6/21/2017	114	14.3
018.35	PC-050917-AR15	171960-06	Access Road 15	5/9/2017	5/12/2017	6/21/2017	137	10.7
018.30	PC-051517-AR-16	172096-01	Access Road 16	5/15/2017	5/19/2017	6/21/2017	45.1	17.0
018.30	PC-051517-AR-17	172096-02	Access Road 17	5/15/2017	5/19/2017	6/21/2017	56.5	18.1
018.30	PC-051517-AR-18	172096-03	Access Road 18	5/15/2017	5/19/2017	6/21/2017	50.1	8.81
018.34	PC-051717-AR-18	172108-01	Access Road 18	5/17/2017	5/19/2017	6/21/2017	73.8	8.81
018.34	PC-051717-AR-19	172108-02	Access Road 19	5/17/2017	5/19/2017	6/21/2017	45.4	9.66
018.34	PC-051717-AR-20	172108-03	Access Road 20	5/17/2017	5/19/2017	6/21/2017	39.4	18.8
018.33	PC-051817-AR-21	172139-01	Access Road 21	5/18/2017	5/25/2017	6/21/2017	61.4	94.0
018.33	PC-051817-AR-22	172139-02	Access Road 22	5/18/2017	5/25/2017	6/21/2017	212	161
018.33	PC-051817-AR-23	172139-03	Access Road 23	5/18/2017	5/25/2017	6/21/2017	81.5	133
018.36	PC-060117-AR-24	172339-01	Access Road 24	6/1/2017	6/3/2017	6/30/2017	68.1	62.4
018.36	PC-060117-AR-25	172339-02	Access Road 25	6/1/2017	6/3/2017	6/30/2017	36.7	54.5
018.36	PC-060117-AR-26	172339-03	Access Road 26	6/1/2017	6/3/2017	6/30/2017	36.2	50.0
018.36	PC-060117-AR-27	172339-04	Access Road 27	6/1/2017	6/3/2017	6/30/2017	96.5	78.3
018.31	PC-060217-AR-28	172370-01	Access Road 28	6/2/2017	6/6/2017	6/21/2017	102	10.2
018.43	PC-080117-AR-29	173428-01	Access Road 29	8/1/2017	8/4/2017	8/8/2017	33.4	32.5
--	PC-082217-AR-30	173824-01	Access Road 30	8/22/2017	8/25/2017	8/30/2017	49.9	44.2
018.44	PC-083117-AR-31	173988-01	Access Road 31	8/31/2017	9/8/2017	9/13/2017	39.6	38.6
018.44	PC-083117-AR-32	173988-02	Access Road 32	8/31/2017	9/8/2017	9/13/2017	58.1	50.8
018.44	PC-083117-AR-33	173988-03	Access Road 33	8/31/2017	9/8/2017	9/13/2017	13.0	40.8
018.46	AC-092817-AR-29	174389-04	Access Road 29	9/28/2017	10/3/2017	10/4/2017	--	32.5
018.46	AC-092817-AR-30	174389-05	Access Road 30	9/28/2017	10/3/2017	10/4/2017	--	44.2
018.46	AC-092917-AR-27	174389-06	Access Road 27	9/29/2017	10/3/2017	10/4/2017	--	78.3
018.46	AC-092917-AR-26	174389-07	Access Road 26	9/29/2017	10/3/2017	10/4/2017	--	50.0
018.46	AC-092917-AR-25	174389-09	Access Road 25	9/29/2017	10/3/2017	10/4/2017	--	54.5
018.46	AC-092917-AR-33	174389-10	Access Road 33	9/29/2017	10/3/2017	10/4/2017	--	40.8

Table 6-6 Pre- and Post-Construction Analytical Results for Phase 3 2017 Documentation Soil Samples in Support Areas, Depew Village Landfill Site, Depew, New York

MCI Submittal #	Sample ID	Lab Sample ID#	Location	Date Sampled	Date Analyzed	Date MCI Submitted to E & E	Pre-con Analytical Results (mg/kg)	Post-con Analytical Results (mg/kg)
							Lead	Lead
018.47	AC-100217-AR-24	174417-01	Access Road 24	10/2/2017	10/4/2017	10/5/2017	--	62.4
018.47	AC-100217-AR-23	174417-02	Access Road 23	10/2/2017	10/4/2017	10/5/2017	--	133
018.48	AC-100317-AR-22	174433-03	Access Road 22	10/3/2017	10/5/2017	10/6/2017	--	161
018.49	AC-100417-AR-21	174452-03	Access Road 21	10/4/2017	10/5/2017	10/9/2017	--	94.0
018.49	AC-100417-AR-31	174452-04	Access Road 31	10/4/2017	10/5/2017	10/9/2017	--	38.6
018.51	AC-100617-AR-32	174492-01	Access Road 32	10/6/2017	10/9/2017	10/9/2017	--	50.8
--	AC-101917-AR-21	174684-01	Access Road 21	10/19/2017	10/20/2017	10/20/2017	--	50.7
--	AC-101917-AR-23	174684-03	Access Road 23	10/19/2017	10/20/2017	10/20/2017	--	46.8
--	AC-102717-AR-20	174844-01	Access Road 20	10/27/2017	10/31/2017	11/29/2017	--	18.8
--	AC-102717-AR-19	174844-02	Access Road 19	10/27/2017	10/31/2017	11/29/2017	--	9.66
--	AC-102717-AR-18	174844-03	Access Road 18	10/27/2017	10/31/2017	11/29/2017	--	8.81
--	AC-102717-AR-28	174844-04	Access Road 28	10/27/2017	10/31/2017	11/29/2017	--	10.2
--	AC-102717-AR-17	174844-05	Access Road 17	10/27/2017	10/31/2017	11/29/2017	--	18.1
--	AC-102717-AR-16	174844-06	Access Road 16	10/27/2017	10/31/2017	11/29/2017	--	17.0
--	AC-102717-AR-15	174844-07	Access Road 15	10/27/2017	10/31/2017	11/29/2017	--	10.7
--	AC-102717-AR-14	174844-08	Access Road 14	10/27/2017	10/31/2017	11/29/2017	--	14.3
--	AC-102717-AR-13	174844-09	Access Road 13	10/27/2017	10/31/2017	11/29/2017	--	8.41
--	AC-102717-AR-12	174844-10	Access Road 12	10/27/2017	10/31/2017	11/29/2017	--	9.25
--	AC-102717-AR-11	174844-11	Access Road 11	10/27/2017	10/31/2017	11/29/2017	--	8.92
--	AC-102717-AR-10	174844-12	Access Road 10	10/27/2017	10/31/2017	11/29/2017	--	8.68

7 Remedial Performance and Project Completion

7.1 Volume of Soils and Sediments Excavated

7.1.1 Phase 1

Approximately 36 CY of soil was excavated during Phase 1 and disposed of on-site in the Area 8 landfill.

7.1.2 Phase 2

The Contract Documents estimated that approximately 11,567 CY of nonhazardous/ hazardous soil needed to be excavated from Areas 1, 2, 3, and 6 at the Depew Village Landfill site. In addition, it was estimated that approximately 1,437 CY of sediment would be removed from Cayuga Creek. These volume estimates were used to evaluate bid item quantities for the Contractor's application for payments (CAPs).

During the remedial work, the volumes of soils and sediments removed were calculated by the difference between the pre-construction topographic surveys and the final post-construction surveys that were performed by RDI's licensed surveyor. A final survey was performed once the excavation limits had been reached in each of the project areas that had contaminated soils (Areas 1, 2, and 6) and sediment (Area 3). The surveys are included in Appendix 2F.

Per the Contract Documents, the bid items for the excavation of soils were paid on a cubic-yard basis. The descriptions of the bid items were:

- Bid Item UC-5: Sediment Removal (Area 3); and
- Bid Item UC-6: Excavation (Areas 1, 2, and 6).

Table 7-1 summarizes the quantities of the nonhazardous waste, and contact water disposed of at the Depew Village Landfill Site during Phase 2.

Table 7-1 Depew Village Landfill Site Phase 2 - Quantities of Materials, by Waste Stream, Disposed of On-site

Disposal Materials	Disposal Locations	Amount
Nonhazardous waste (Areas 1, 2, 3, and 6)	Area 8 landfill	11,823 CY
Contact water 2016	Discharged to Cayuga Creek after on-site treatment in CWTS, sampling, and analysis	42,700 gallons

The nonhazardous soil generated at the Depew Village Landfill Site was transported by RDI-owned vehicles meeting 6 NYCRR Part 364 Waste Transporter Permit requirements.

7.1.3 Phase 3

The Contract Documents estimated that 8,300 CY of sediment was to be removed from Cayuga Creek. Of the 8,300 CY, 3,740 CY of sediment was to be excavated from Reaches 1 and 2 and beneath the Borden Road bridge and 4,560 CY of sediment was to be excavated from Cells 1 – 11. During the remedial work, the total volume of sediment removed (prior to replacing overburden) was calculated using the pre-construction topographic surveys and the post-excavation (intermediate) surveys. The post-excavation survey showed the depth and limits of excavation throughout the creek. The total volume of sediment hauled to the Area 8 landfill (sediment with less than ½-inch diameter) was determined from the pre-construction and post-construction surveys of the Area 8 landfill. The total weight of material transported to the Chaffee Landfill was determined from the weight slips provided by the landfill.

The volume of soils disposed of in the Area 8 landfill and Chaffee Landfill was estimated daily by E & E based on the number of truckloads of material transported to their respective disposal locations. These volume estimates were used to evaluate the bid item quantities for the CAPs during the remedial work. The pre-construction and post-construction surveys of the Area 8 landfill and the Chaffee Landfill weight slips were used to determine the total volume of soils disposed of for the final CAPs.

The Contract Documents specified that the sediments from Reaches 1 and 2 be disposed of at the onsite Area 8 landfill since there was sufficient capacity for the material. The Contract Documents specified that the sediments from Cells 1 through 11 be transported to and disposed of at the Chaffee Landfill since there was not enough capacity for those sediments at the Area 8 landfill.

Per the Contract Documents, the bid items for the dredging of sediments were paid on a CY basis. The descriptions of the bid items are:

- Bid Item UC-3A: Sediment Removal/Dredging (Reaches 1 and 2 and under Borden Road Bridge); and

- Bid Item UC-3B: Sediment Removal/Dredging (Cells 1 – 11).

7.1.3.1 Reaches 1 and 2 and beneath the Borden Road Bridge

For the remedial work performed during 2016, sediments to a depth of one foot were removed from Cayuga Creek in Reaches 1 and 2 and beneath the Borden Road bridge. The sediments were dewatered and screened, and sediments measuring less than ½-inch diameter were transported to the Area 8 landfill for on-site disposal. Sediments larger than ½ inch were placed back into the stream in approximately the same location from which they removed.

Japanese knotweed material removed from the RDB of Reaches 1 and 2 was transported to and disposed of in the Area 8 landfill.

Table 7-2 summarizes the quantities of the nonhazardous waste and contact water disposed of at the Depew Village Landfill Site during Phase 3.

Table 7-2 Depew Village Landfill Site Phase 3 - Quantities of Materials, by Waste Stream, Disposed of at the Approved Locations

Material being Disposed	Source Location	Disposal Location	Quantity
Nonhazardous sediments	Reaches 1 and 2 and beneath the Borden Road bridge	Area 8 Landfill	1,323 CY
Nonhazardous sediments	Cells 1 – 11	Chaffee Landfill	10,734.93 tons (~6,200 CY)
Contact water		Cayuga Creek after on-site treatment in CWTS, sampling, and analysis	42,700 gallons (in 2016) 58,000 gallons (in 2017)

7.1.3.2 Cells 1 – 11

For the remedial work performed during 2017, sediments to a depth of two feet were removed from Cayuga Creek in Cells 1 - 11. The sediments were dewatered and screened, and sediments measuring less than ½-inch diameter were transported to the Waste Management Chaffee Landfill for off-site disposal. Sediments larger than ½ inch were placed back into the stream in approximately the same location from which they removed.

Manifests for the nonhazardous material transport to the Chaffee Landfill are provided in Appendix 3S.

The record drawings prepared by Wendel identify the locations and extent of the original boundaries and areas where excavation was performed. Topographical surveys, conducted prior to (pre-construction), after sediment removal (post-exca-

vation), and following the placement of overburden back into the creek (post-construction) were used to document the depth of excavation and the final grades of the site. The surveys are included in Appendix 3E.

7.2 Data Usability Summary Report (DUSR) Review of Analytical Data

The Contract Documents Supplementary Specifications, Section XI, Division 1, Section 01425 – Sampling, included NYSDEC Data Usability Summary Report (DUSR) requirements for environmental samples collected by the Contractor. This process was a part of the QC procedures established by NYSDEC to verify the accuracy of laboratory analysis of samples collected by the Contractor. DUSRs were required as part of Phases 2 and 3 of the project.

7.2.1 Phase 1

DEC approved that DUSRs were not required by the Phase 1 FPM; therefore, DUSRs were not completed for the samples that were analyzed during Phase 1 activities.

7.2.2 Phase 2

As required by E & E, RDI submitted details for compliance with the DUSR requirements as a supplement to the sampling and QA/QC plan. At the time of their initial submittal, RDI had not selected a DUSR professional. RDI subsequently selected Vali-Data of WNY, LLC, located in West Falls, New York, to prepare the DUSR for Phase 2 of the project.

The DUSRs provided by Vali-Data were for the analytical test data generated by RDI from November 7, 2012 through September 6, 2013. The samples were analyzed for lead. The analyses were performed using EPA Standard Method SW-6010B for metals in compliance with the prescriptive requirements of the standards.

No discrepancies were noted in the chains-of-custody for sample handling, preservation, and transport to the laboratory as stipulated for the designated samples. The following items were reviewed as part of the DUSR process:

- Sample data package narrative and deliverables compliance;
- Holding times;
- Surrogate compound recoveries;
- Matrix spike/matrix spike duplicate recovery summary forms;
- Laboratory check sample/laboratory check duplicate recovery summary forms;
- Positive results reported for method blanks;
- Gas chromatography/mass spectroscopy tuning summary forms;

- Initial and continuing calibration summaries; and
- Internal standard area and retention time summary forms.

Vali-Data certified that the data packages for the samples collected at the site contained the required deliverables consistent with the requirements outlined in the Supplementary Specifications, Section XI, Section 01425 – Sampling, Appendix A.

The data usability summary review performed by Vali-Data identified several analytical issues with the initial laboratory packages. These analytical issues were flagged in the final data tables (provided in the DUSR) using standard qualifiers. No major concerns were encountered regarding the usability of the Paradigm analytical data. Vali-Data certified that the data was validated according to the protocols and QA requirements of the analytical methods detailed in the Contractor's Quality Assurance Project Plan and by the project specifications.

DUSRs were submitted to E & E at the completion of the analytical services provided by the Contractor's approved analytical laboratories. DUSR submittals were reviewed by E & E and are provided in Appendix 2R.

7.2.3 Phase 3

MCI selected KR Applin and Associates located in Dansville, New York, to prepare the DUSR for Phase 3 of the project. The DUSRs provided by KR Applin and Associates were for the analytical data generated by Paradigm from August 2016 through November 2016.

No discrepancies were noted in the chains-of-custody for sample handling, preservation, and transport to the laboratory as stipulated for the designated samples. In addition, Dr. Applin reviewed the following items for the DUSR:

- Completeness of the data package;
- Compliance with established analyte holding times;
- Adherence to QC limits and specifications for blanks, instrument tuning and calibration, surrogate recoveries, spike recoveries, laboratory duplicate analyses, and other QC criteria;
- Adherence to established analytical protocols;
- Conformance of data summary sheets with raw analytical data; and
- Use of correct data qualifiers.

KR Applin and Associates certified that the data packages for the post-construction documentation samples collected for the 2016 work contained the required deliverables consistent with the requirements outlined in the Supplementary Specifications, Section XI, Section 01425 – Sampling and Analysis, Appendix A. The samples were analyzed for lead. The analyses were performed using EPA Standard

Method SW-6010C for metals in compliance with the prescriptive requirements of the standards.

The data usability summary review performed by KR Applin and Associates found the analytical results associated with the samples to be usable. No results were rejected. KR Applin and Associates found that the analytical results qualified as estimated (J) are still considered usable, although the accuracy of the results may be questionable.

DUSRs for 2016 work were submitted to E & E at the completion of the analytical services provided by the Contractor's approved analytical laboratories. DUSR submittals were delivered to and reviewed by E & E.

MCI submitted the DUSRs on March 16, 2017. E & E approved this submittal as noted because the DUSRs were compliant with the Contract Documents' requirements; however, several DUSRs were still outstanding. The remaining DUSRs for 2016 work were submitted to E & E on May 8, 2017. The DUSRs for the analytical data are provided in Appendix 3F.

NYSDEC chose to remove UC-8 – Sampling and Analysis from the Contract for the 2017 work. Instead, E & E's Resident Engineer collected the post-excavation documentation and confirmation sediment samples from Cells 1 – 11 and NYSDEC utilized a call-out laboratory, TestAmerica Laboratories, to complete the analysis and the preliminary Electronic Data Deliverables (EDDs). For these sample reports, E & E completed a DUSR review and submitted the completed EDDs to NYSDEC's EQuIS database (Appendix 3R).

MCI collected the 2017 post-construction samples from the access road and 2017 decon pad locations. MCI's subcontractor, Paradigm, performed the sample analyses and, MCI provided the results to E & E for review. DUSRs for the post-construction documentation samples from access roads 10 through 33 and the 2017 decon pad were completed by KR Applin and Associates. MCI submitted the 2017 DUSRs to E & E on January 4, 2019 (Appendix 3F).

7.3 Project Completion

7.3.1 Phase 1

Work was completed in substantial compliance with the Phase 1 FPM and the approved field changes on October 20, 2011. GES submitted the CCS report on July 31, 2013 that describes the work performed and includes the final survey map, turbidity readings, site drawings, CAMP data, laboratory analytical reports, daily reports, and material specification sheets (see Appendix 1E).

7.3.2 Phase 2

7.3.2.1 Substantial Completion

Section VIII, Article 13.6, of the General Conditions provided requirements for Substantial Completion under the terms of the Contract. When the Contractor "considered all or part of the work ready for its intended use, the Contractor shall

notify NYSDEC and [the] Engineer in writing that the work, or specified part thereof, is substantially complete" and shall "request that the Engineer issue a Certificate of Substantial Completion for the Work." Within a reasonable time thereafter, not to exceed 30 days, NYSDEC, the Engineer, and the Contractor "shall make an inspection of the Work" to determine the status of completion.

Substantial Completion was initially requested by RDI on August 15, 2013, for work completed in Areas 3, 4, 5, 6, and 7. E & E subsequently scheduled an inspection with representatives of NYSDEC, RDI, and E & E, and the inspection was performed on August 27, 2013. The letter of acknowledgement for Substantial Completion inspection was issued to RDI by E & E on August 23, 2013. E & E, in conjunction with NYSDEC, prepared a punch-list of remaining work items and an Estimate of Cost Value for Final Completion on August 27, 2013.

Substantial Completion was again requested by RDI on September 27, 2013, and E & E subsequently scheduled an inspection with representatives of NYSDEC, RDI, and E & E. The inspection was performed on September 27, 2013. While the Substantial Completion inspection indicated that the field effort was substantially complete, a number of outstanding post-construction critical project submittal items still needed to be provided before Final Project Completion could be granted.

The list of incomplete work items, including repair to asphalt on Zurbrick Road, documentation sampling in Area 1, repair of a guide rail on Zurbrick Road, demobilization of office trailers, final post-construction sampling results, record drawings, submittal of surveyed excavation and in-place backfill volumes, as-built surveys, American Land Transfer Association (ALTA) survey, and the remaining project submittals. Upon acceptance of the punch-list, the RDI completed the remedial work and removed project equipment and materials. The Substantial Completion documents are provided in Appendix 2T.

7.3.2.2 Final Completion

Section VIII, Article 13.9, of the General Conditions provided requirements for Final Completion under the terms of the Contract, stating that, "Upon written notice from the Contractor that the entire work or an agreed portion thereof is complete, Engineer shall make a final inspection with NYSDEC and Contractor and will notify the Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to remedy such deficiencies."

On December 17, 2013, E & E prepared a final completion checklist of outstanding items that RDI declined to submit following project completion. These items included as-built and ALTA surveys.

7.3.3 Phase 3

7.3.3.1 Substantial Completion

Section VIII, Article 13.6, of the General Conditions provided requirements for Substantial Completion under the terms of the Contract. Substantial Completion was requested by MCI on October 5, 2017, for work completed during 2016 and 2017. E & E subsequently scheduled an inspection with representatives of NYSDEC, MCI, and E & E, and the inspection was performed on October 26, 2017. The letter of acknowledgement for Substantial Completion was issued to MCI by E & E on November 16, 2017. On November 16, 2017, E & E, in conjunction with NYSDEC, prepared a punch-list of remaining work items and an Estimate of Cost Value for Final Completion. While the Substantial Completion inspection indicated that the field effort was substantially complete, a number of outstanding post-construction critical project submittal items still needed to be provided before Final Project Completion could be granted.

Appended to E & E's November 16, 2017, letter was a list of incomplete work items. This list included removing the NYSDEC/Engineer field office, and submitting the 2016 and 2017 EDDs for samples east and west of the Borden Road bridge, the 2017 DUSRs for samples east and west of Borden Road bridge, 2017 pre- and post-construction photo/video documentation of project conditions, post-construction survey files for reaches 1 and 2 and under the Borden Road bridge (including soil sample locations), pre-construction, intermediate, and post-construction survey files for Cells 1 – 11 (including soil sampling locations), surveyor's field notes, pre-testing for characterization, QAPP addendum, waste transporter permit for Dig It (subcontractor), documentation from NYSDOT for access onto Broadway, final redline drawings for the 2017 work, final record drawings from Wendel for the entire project, waiver of liens for subcontractors over $10,000, the security log for October 2017, outstanding disposal weight slips from Chaffee Landfill, and analytical results for the post-construction soil samples for access roads 10 through 20 and 28. This list, along with the values assessed to each item, is provided in Appendix 3I.

The outstanding post-construction submittals were to be submitted to avoid the estimated cost values being held against future payment requests. Letters pertaining to Substantial Completion are provided in Appendix 3I.

7.3.3.2 Final Completion

Section VIII, Article 13.9, of the General Conditions provided requirements for Final Completion under the terms of the Contract, stating that, "Upon written notice from the Contractor that the entire work or an agreed portion thereof is complete, Engineer shall make a final inspection with NYSDEC and Contractor and will notify the Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to remedy such deficiencies."

In June 2018, E & E provided MCI with a list of remaining work items required for release of final payment. Outstanding items included scarifying and reseeding

the temporary access roads to the west and to the east of the Borden Road bridge; cleaning out the drain lines to the west of the Borden Road bridge that had been covered and blocked during construction of the access road; removal of the temporary fence panels located at the access road off of Broadway; removal of silt socks; and signed certification of final stabilization.

MCI completed the remaining work items at the site and submitted Final CAP No. 10 to E & E on October 14, 2019. As part of the Payment Request was the submission of Prime and Subcontractor Certification's Payment affidavits. E & E reviewed and submitted CAP No. 10 to NYSDEC on October 28, 2019. Based on the performance of the Contract work, no formal liens were filed against the project. The Final CAP No. 10 is included in Appendix 3E.

7.4 Changes to the Contract

7.4.1 Phase 1

There were no changes to the project scope of work or schedule during Phase 1; therefore, E & E did not administer COs during Phase 1 of the project.

7.4.2 Phase 2

7.4.2.1 Changes to the Project Schedule

Major revisions to the Depew Village Landfill Project Scope of Work are discussed in the following subsections. For a detailed list and description of the scope revisions, refer to CO Nos. 1 and 2 (see Appendix 2M).

7.4.2.2 Change Order No. 1

CO No. 1 comprised the following five items:

- Removal of additional Japanese knotweed at multiple locations in Area 2 and Area 5 (PCO No. 001);
- Installation of reinforced drainage swales at two locations in Area 6 (PCO No. 002);
- Excavation of additional contaminated soil volume from Area 2 (PCO No. 003);
- Increase in contract price and time to cover the winter shutdown (PCO No. 004, PCO No. 005); and
- Replacement of Appendix A, dated 2011, of the Contract Documents with Appendix A, dated 2012.

The original Contract time for RDI was 270 calendar days to Substantial Completion, resulting in a Substantial Completion date of June 3, 2013. Construction delays in the project schedule were incurred due to the adverse weather conditions and changes in the scope of work in excavated areas.

CO No. 1 added 117 additional calendar days to the project schedule due to adverse winter weather conditions and resulted in an increase in Contract cost of

$48,968.95. With the additional days, the Substantial Completion date was recalculated to be September 28, 2013, and the Final Completion date was recalculated to be November 27, 2013. CO No. 1 was executed by the New York State Office of the State Comptroller on June 25, 2013. A fully executed copy of CO No. 1 is presented in Appendix 2M, and a summary of CO No. 1 is presented in Table 7-3.

Table 7-3 Depew Village Landfill Site, Phase 2 - Change Order No. 1 Summary

Change Order Description	Bid Payment Item No.	PCO No.	Cost	Days
Additional Invasive Species Management	UC-4	001	$7,629.48	0
Area 6 Drainage Swales	UC-9	002	$5,193.87	0
Additional Excavation/Backfill of Contaminated Soil	UC-6, UC-13	003	$13,745.60	0
Winter Shutdown	UC-1	004, 005	$22,400.00	117
2011 Appendix A of the Contract Documents updated to 2012 Appendix A			$0.00	0
		Totals:	**$48,968.95**	**117**

7.4.2.3 Change Order No. 2

CO No. 2 was submitted on November 3, 2013, during completion of the remediation, for a total of $366,649.68 over RDI's original bid. CO No. 2 comprised of the following items (bid item payment numbers):

- Increased sediment removal quantity for Area 3 (UC-5);
- Increased excavation quantity for Area 1 (UC-6);
- Increased structural fill quantity for Area 1 (UC-7);
- Decreased bedding material quantity placement and compaction for Area 1 (UC-8);
- Increased medium riprap quantity during reconstruction of Area 2 (UC-9);
- Increased heavy riprap quantity during reconstruction of Area 1 (UC-10);
- Increased common fill quantity during reconstruction of Area 8 (UC-13);
- Increased topsoil quantity during reconstruction of Area 8 (UC-14);
- Decreased quantity of erosion control blankets requiring placement (UC-15);
- Decreased quantity of soil cover material requiring placement (UC-11);
- Increased stone cover quantity during reconstruction of Area 8 (UC-17);
- Decreased hydroseed quantity (UC-19);
- Decreased number of confirmatory samples (UC-20);

- Increased costs for winter demobilization and remobilization (PCO No. 006);
- Increased costs from collecting, analyzing, and reporting PCB contamination in Cayuga Creek prior to sediment removal (PCO No. 007);
- Decrease in Resident Engineer's overtime costs (PCO No. 008);
- Decrease in costs due to rejected common fill (PCO No. 009);
- Increased sediment removal in Area 3 at Sample A-2-72 (PCO No. 010);
- Additional fill materials for Area 1 (PCO No. 011);
- Additional soil removal in Area 2 at Sample A-2-76 (PCO No. 012); and
- Reinstallation of a guide rail at Zurbrick Road (PCO No. 013).

There was no change to the Contract time added by CO No. 2, the Substantial Completion date remained as September 27, 2013, and the Final Completion date remained as November 26, 2013.

CO No. 2 was issued to adjust the total costs associated with increases and decreases in unit cost quantities during Phase 2 of the project. The final project cost, including CO No. 2 and the unit quantity adjustments, totaled $2,815,482.04, for a 17% increase over the original Contract amount of $2,399,863.41. The revisions to the project scope are documented in executed CO No. 2, which is presented in Appendix 2M. A summary of CO No. 2 is presented in Table 7-4.

Table 7-4 Depew Village Landfill Site, Phase 2 - Change Order No. 02 Summary

Change Order Description	Bid Payment Item or PCO	Cost	Days
Increased sediment removal quantity for Area 3	UC-5	$2,853.09	0
Increased excavation quantity for Area 1	UC-6	$8,455.44	0
Increased structural fill quantity for Area 1	UC-7	$71,525.96	0
Decreased bedding material quantity placement and compaction for Area 1	UC-8	($3,554.75)	0
Increased medium riprap quantity during reconstruction of Area 2	UC-9	$52,667.94	0
Increased heavy riprap quantity during reconstruction of Area 1	UC-10	$61,848.91	0
Increased common fill quantity during reconstruction of Area 8	UC-13	$154,099.16	0
Increased topsoil quantity during reconstruction of Area 8	UC-14	$43,045.20	0
Decreased quantity of erosion control blankets requiring placement	UC-15	($2,445.57)	0
Decreased quantity of soil cover material requiring placement	UC-11	($9,283.39)	0
Increased stone cover quantity during reconstruction of Area 8	UC-17	$6,915.91	0
Decreased hydroseed quantity	UC-19	($4,387.31)	0

Table 7-4 Depew Village Landfill Site, Phase 2 - Change Order No. 02 Summary

Change Order Description	Bid Payment Item or PCO	Cost	Days
Decreased number of confirmatory samples	UC-20	($765.00)	0
Increased costs for winter demobilization and remobilization	PCO No. 006	$2,627.94	0
Increase in costs from collecting, analyzing, and reporting PCB contamination in Cayuga Creek prior to sediment removal	PCO No. 007	$225.00	0
Decrease in Resident Engineer's overtime costs	PCO No. 008	($22,165.87)	0
Decrease in costs due to rejected common fill	PCO No. 009	($3,050.93)	0
Increased sediment removal in Area 3 at Sample A-2-72	PCO No. 010	$874.87	0
Additional fill materials for Area 1	PCO No. 011	$1,855.13	0
Additional soil removal in Area 2 at Sample A-2-76	PCO No. 012	$2,469.98	0
Installation of a guide rail at Zurbrick Road	PCO No. 013	$2,837.97	0
	Totals	**$366,649.68**	**0**

A summary of the change order amounts is included in Table 7-5.

Table 7-5 Depew Village Landfill Site, Phase 2 – Change Order Summary

Items	Cost
Original Bid	$2,399,863.41
CO No. 1	$48.968.95
CO No. 2	$366,649.68
Total	**$2,815,482.04**

7.4.2.4 Contract Quantities and Costs

The total cost of several unit-cost bid items changed due to changes in schedule and/or quantity, including excavation and disposal of waste types not previously identified in the Contract Documents. A comparison of RDI's bid with the estimated bid quantities versus the actual quantities and cost of those bid items that changed is presented in Table 7-6.

Table 7-6 Depew Village Landfill Site Phase 2 - Estimated vs. Actual Quantities and Cost

Bid Payment Item No.	Bid Item Description[1]	Estimated Quantity	RDI Bid (dollars)	Actual Quantity	Actual Cost
LS-1	Site Preparation	1 LS	$318,000.00	1 LS	$318,000.00
LS-2	Site Survey	1 LS	$91,000.00	1 LS	$91,000.00
LS-3	Dewatering	1 LS	$98,000.00	1 LS	$98,000.00

Table 7-6 Depew Village Landfill Site Phase 2 - Estimated vs. Actual Quantities and Cost

Bid Payment Item No.	Bid Item Description[1]	Estimated Quantity	RDI Bid (dollars)	Actual Quantity	Actual Cost
UC-1	Site Services	150 Days	$75,000.00	**267 Day**	**$97,400.00**
UC-2	Health and Safety	150 Days	$349,950.00	150 Day	$349,950.00
UC-3	Clearing and Grubbing	2,835 SY	$54,999.00	2,835 SY	$54,999.00
UC-4	Invasive Species Management	8,457 SY	$19,958.52	**11,689.8 SY**	**$27,588.00**
UC-5	Sediment Removal	1,437 CY	$79,997.79	**1,488.25 CY**	**$82,850.88**
UC-6	Excavation	11,567 CY	$170,034.90	**12,398.6 CY**	**$182,259.42**
UC-7	Structural Fill	7,229 CY	$236,966.62	**9,411 CY**	**$308,492.58**
UC-8	Bedding Material	594 CY	$35,788.50	*535 CY*	*$32,233.75*
UC-9	Medium Riprap	297 Tons	$20,397.96	**1,113.86 Tons**	**$78,259.77**
UC-10	Heavy Riprap	6,186 Tons	$199,993.38	**8,099.05 Tons**	**$261,842.29**
UC-11	Bendway Weir	11 EA	$33,000.00	11 EA	$33,000.00
UC-12	Drainage System	128 LF	$4,000.00	128 LF	$4,000.00
UC-13	Common Fill	1,028 CY	$39,999.48	**5,244.8 CY**	**$204,075.16**
UC-14	Topsoil	1,767 CY	$69,973.20	**2,854 CY**	**$113,018.40**
UC-15	Erosion Control Blankets	8,383 SY	$54,908.65	*8,009.63 SY*	*$52,463.08*
UC-16	Plantings	14,706 SY	$232,943.04	14,706 SY	$232,943.04
UC-17	Soil Cover	30,583 SY	$124,778.64	**28,307.66 SY**	**$115,495.25**
UC-18	Stone Cover	7,121 SY	$18,016.13	**9,854.56 SY**	**$24,932.04**
UC-19	Hydroseed	44,620 SY	$66,037.60	*41,655.6 SY*	*$61,650.29*
UC-20	Sampling	68 EA	$6,120.00	*59.5 EA*	*$5,355.00*
		Totals	**$2,399,863.41**		**$2,829,807.95**
		Balance of Approved Changes			**$429,944.54**

Notes:
Bold font indicates quantities exceeding the estimated quantity.
Italic font indicates quantities less than the estimated quantity.

Key:
CY = cubic yards
EA = each
LF = linear feet
LS = lump sum
SY = square yards

7.4.3 Phase 3

7.4.3.1 Changes to the Project Schedule and Scope

Major revisions to the Scope of Work are discussed in the following subsections. For a detailed list and description of the scope revisions, refer to CO No. 3 (see Appendix 3N).

7.4.3.2 Change Order No. 1

CO No. 1, which was approved on May 19, 2017, increased the Contract time to account for the winter shutdown. With a Notice to Proceed issued on July 20, 2016, the final completion date had been established as December 31, 2016.

Based on delay of Contract Award, and New York State Fish & Wildlife restrictions for work in Cayuga Creek during fish spawning seasons, the construction schedule was extended. CO No. 1 added 243 additional calendar days to the project schedule. With the additional days, the Substantial Completion date was recalculated to be September 1, 2017, and the Final Completion date was reestablished as October 1, 2017. CO No. 1 was executed by the New York State Office of the State Comptroller on May 19, 2017. A fully executed copy of CO No. 1 is presented in Appendix 3N.

7.4.3.3 Change Order No. 2

CO No. 2, which was approved on October 6, 2017, increased the Contract time to account for delays experienced during the summer 2017 work due to the ineffectiveness of the dewatering system employed by MCI. The Contract time, including CO No. 1, for MCI was 438 calendar days to Substantial Completion, resulting in a Substantial Completion date of September 1, 2017. CO No. 2 added 87 additional calendar days to the project schedule due to delays experienced during the summer 2017 work. With the additional days, the Substantial Completion date was recalculated to be November 27, 2017, and the Final Completion date was recalculated to be December 27, 2017. No cost increase was associated with CO No. 2. CO No. 2 was executed by the New York State Office of the State Comptroller on October 6, 2017. A fully executed copy of CO No. 2 is presented in Appendix 3N.

7.4.3.4 Change Order No. 3

CO No. 3 was approved on May 7, 2018, after completion of the remediation, for a total of $464,088.24 over MCI's original bid. CO No. 3 comprised of the following items (bid item payment numbers):

- Decreased number of days of health and safety (UC-2);
- Decreased volume of sediment removed/dredged from Reaches 1 and 2 and under the Borden Road Bridge (UC-3A);
- Increased volume of sediment removed/dredged from Cells 1 – 11 (UC-3B);
- Increased weight of material handled, transported, and disposed off-site (UC-4);
- Increased surface area of soil cover for the Area 8 landfill (UC-5);
- Decreased volume of riprap (UC-6);
- Decreased surface area of hydroseeding for restoring the Area 8 landfill (UC-7);
- Decreased number of sediment samples and analyses (UC-8);
- Decreased number of live stakes planted along the RDB of Cayuga Creek (UC-10); and
- Costs for winter demobilization and remobilization (PCO No. 001).

CO No. 3 did not change the Contract time. The Substantial Completion date remained as November 27, 2017, and the Final Completion date remained as December 27, 2017.

CO No. 3 was issued to adjust the total costs associated with increases and decreases in unit cost quantities during Phase 3 of the project and the cost increase associated with PCO No. 001 – Winter Shutdown. CO No. 3 added $464,088.24 to the project cost, resulting in a revised project cost of $2,941,088.24. CO No. 3 was executed by the New York State Office of the State Comptroller on May 7, 2018. A summary of CO No. 3 is presented in Table 7-7 and the fully executed CO No. 3 is presented in Appendix 3N.

Table 7-7 Depew Village Landfill Site, Phase 3 - Change Order No. 3 Summary

Change Order Description	Bid Payment Item or PCO	Cost
Decreased number of days of health and safety	UC-2	($8,100.00)
Decreased volume of sediment removed/dredged from Reach 1 and 2 under the Borden Road bridge	UC-3A	($3,570.00)
Increased sediment removed/dredged from Cells 1 – 11	UC-3B	$159,600.00
Increased weight of material handled, transported, and disposed off-site	UC-4	$248,843.70
Increased surface area of soil cover for the Area 8 landfill	UC-5	$11,100.00
Decreased volume of riprap	UC-6	($98.56)
Decreased surface area of hydroseeding to restore the Area 8 landfill	UC-7	($320.40)
Decreased number of sediment samples analyzed from Cayuga Creek	UC-8	($20,650.00)
Decreased number of live stakes planted along the RDB of Reach 1 and 2	UC-10	($24,200.00)
Cost for winter demobilization and remobilization	PCO No. 001	$101,483.50
	Total	**$464,088.24**

A summary of the change order amounts is presented in Table 7-8.

Table 7-8 Depew Village Landfill Site – Change Order Summary

Items	Cost
Original Bid	$2,477,000.00
Change Order No. 3	$464,088.24
Total	**$2,941,088.24**

7.4.3.5 Contract Quantities and Costs

The total cost of several unit-cost bid items changed due to changes in schedule and/or quantity, including excavation and disposal of waste types not previously

included in the Contract Documents. A comparison of MCI's bid with the estimated bid quantities versus the actual quantities and cost of those bid items is presented in Table 7-9.

Table 7-9 Depew Village Landfill Site, Phase 3 - Estimated vs. Actual Quantities and Cost

Bid Payment Item No.	Bid Item Description	Estimated Quantity	MCI Bid	Actual Quantity	Actual Cost
LS-1	Site Preparation	1 LS	$244,909.00	1 LS	$244,909.00
LS-2	Site Survey	1 LS	$75,000.00	1 LS	$75,000.00
LS-3	Dewatering	1 LS	$375,000.00	1 LS	$375,000.00
UC-1	Site Services	165 Days	$226,875.00	165 Days	$226,875.00
UC-2	Health and Safety	130 Days	$58,500.00	*112 Days*	*$50,400.00*
UC-3A	Sediment Removal/Dredging (Reaches 1 and 2 and under the Borden Road bridge)	3,740 CY	$261,800.00	*3,689 CY*	*$258,230.00*
UC-3B	Sediment Removal/Dredging (Cells 1 – 11)	4,560 CY	$228,000.00	**7,752 CY**	**$387,600.00**
UC-4	Handling, Transport, and Off-site Disposal of Hazardous Soils and Debris	7,970 Tons	$717,300.00	10,734.93 Tons	$966,143.70
UC-5	Soil Cover	4,450 SY	$44,500.00	**5,560 SY**	**$55,600.00**
UC-6	Rip Rap	1,000 CY	$44,000.00	*997.76 CY*	*$43,901.44*
UC-7	Hydroseed	37,600 SY	$376.00	*5,560 SY*	*$55.60*
UC-8	Sampling and Analysis	100 Each	$147,500.00	*86 Each*	*$126,850.00*
UC-9	Invasive Species Removal	4,840 SY	$29,040.00	4,840 SY	$29,040.00
UC-10	Live Stakes	4,840 SY	$24,200.00	*0 SY*	*$0.00*
		Totals	**$2,477,000.00**		**$2,941,088.24**
		Balance of Approved Changes			**$464,088.24**

Notes:
Bold font indicates quantities exceeding the estimated quantity.
Italic font indicates quantities less than the estimated quantity.

Key:
CY = cubic yards
EA = each
LF = linear feet
LS = lump sum
SY = square yards

7.5 Contractor Application for Payment (CAPs)

7.5.1 Phase 2 CAPs

RDI submitted 10 CAPs during the Contract period, including a final release of retention in accordance with the Contract Documents. E & E evaluated the accuracy of each CAP for quantities and percentage of completion of individual bid items in the Contract according to Section XII – Measurement for Payment in the Contract Documents. The individual CO items were reviewed for Contractor accuracy prior

to inclusion in the CAP. When errors were encountered, E & E discussed discrepancies with the Contractor and requested the Contractor to revise and resubmit the request. After the CAP was accepted and recommended for payment by E & E, each CAP was submitted to NYSDEC for processing. Table 7-10 provides a list of the CAPs submitted by RDI for the Depew Village Landfill Project. Copies of the E & E-approved CAPs submitted to NYSDEC for approval are included in Appendix 2N.

Table 7-10 Depew Village Landfill Site, Phase 2 – Contractor Applications for Payment

CAP No.	Date Submitted to NYSDEC	Amount
1	10/19/2012	$322,625.23
2	12/1/2012	$322,615.61
3	1/2/2013	$195,784.37
4	1/2/2013	$209.001.68
5	1/2/2013	$134,174.58
6	7/31/2013	$221,775.49
7	8/31/2013	$476,680.48
8	10/30/2013	$444,391.80
9	11/1/2013	$75,289.07
Final[1,2]	11/3/2013	$413,143.73
	Total	**$2,815,482.04**

Notes:
[1] Includes Change Order No. 002
[2] Release of Retention Payment

7.5.1.1 Phase 2 Certified Payroll

For work performed under the Depew Village Landfill Project Contract, NYSDEC required that the Contractor and its subcontractors pay at least the prevailing wage and pay or provide the prevailing supplements, including premium rates for overtime pay, as issued by the NYSDOL.

RDI submitted certified payrolls in conformance with prevailing wage rates published in the Contract Documents (and updated annually to E & E) with each CAP. Current wage rates were included in the Contract Documents under Section XIII. E & E provided verification that the proper wage rate for individual RDI employees and the subcontractors working on the project were accurate before approving each CAP.

A copy of each CAP along with certified payroll information is presented in Appendix 2N.

7.5.2 Phase 3 CAPs

MCI submitted 10 CAPs during the Contract period, including a final release of retention in accordance with the Contract Documents. E & E evaluated the accuracy

of each CAP for quantities and percentage of completion of individual bid items in the Contract according to Section XII – Measurement for Payment in the Contract Documents. The individual CO items were reviewed for Contractor accuracy prior to inclusion in the CAP. Form A, Summary of Green Remediation Metrics, was also reviewed. When errors were encountered, E & E discussed discrepancies with the Contractor and requested the Contractor to revise and resubmit the request. After the CAP was accepted and recommended for payment by E & E, each CAP was submitted to NYSDEC for processing. Table 7-11 provides a list of the CAPs submitted by MCI for Phase 3. Copies of the E & E-approved CAPs submitted to NYSDEC for approval are included in Appendix 3O.

Table 7-11 Depew Village Landfill Site, Phase 3 – Contractor Applications for Payment

CAP No.	Date Submitted to NYSDEC	Amount
1	9/20/2016	$162,115.32
2	11/2/2016	$246,013.81
3	2/28/2017	$265,170.82
4	5/15/2017	$157,648.32
5	7/18/2017	$75,863.96
6	9/15/2017	$254,593.72
7	11/6/2017	$1,165,782.19
8	1/16/2018	$25,961.87
9[1]	8/27/18	$440,883.83
Final[2]		$147,054.41
	Total	**$2,941,088.24**

Notes:
[1] Includes Change Order No. 03
[2] Release of Retention Payment

7.5.2.1 Phase 3 Certified Payroll

For work performed under the Depew Village Landfill Project Contract, NYSDEC required that the Contractor and its subcontractors pay at least the prevailing wage and pay or provide the prevailing supplements, including premium rates for over-time pay, as issued by the NYSDOL.

MCI submitted certified payrolls in conformance with prevailing wage rates published in the Contract Documents (and updated annually to E & E) with each CAP. Current wage rates were included in the Contract Documents under Section XIII. E & E provided verification that the proper wage rate for individual MCI employees and the subcontractors working on the project were accurate before approving each CAP.

A copy of each CAP along with certified payroll information is presented in Appendix 3O.

7.6 Deviations from the Remedial Design and Issues Encountered

7.6.1 Phase 1

No deviations were encountered during the work performed during Phase 1.

7.6.2 Phase 2

7.6.2.1 Weather Conditions during Construction

Weather conditions at the site during the construction phase of the project are documented in the E & E DORs that were prepared and submitted daily to the NYSDEC Project Manager. The DORs for the RDI project are provided in Appendix 2I.

Due to unforeseen delays in NYSDEC procuring and awarding the Contractor, the construction phase resulted in the Contractor working through the late fall of 2012 and during difficult winter conditions in early 2013. These conditions included freezing overnight temperatures and accumulation of substantial rain and snowmelt in excavated areas. Significant snowfall events during the winter of 2013 caused the project to be suspended under FO No. 001 on January 3, 2013, with remobilization occurring on April 15, 2013. PCO No. 004 accounted for the additional $22,400 cost incurred with the demobilization and remobilization.

7.6.2.2 Water Diversion Strategy

As discussed in Section 6.2.2.2, the cofferdam RDI constructed and employed experienced seepage into the work area through the joints and from underneath the cofferdam. RDI unsuccessfully attempted to keep the work area dewatered by using multiple pumps, continually had issues managing creek flow and contact water, and did not have enough storage capacity in the CWTS.

As RDI increasingly fell behind schedule, E & E and NYSDEC repeatedly expressed concern that RDI's water diversion strategy was not effectively keeping Area 2 dewatered. Despite being strongly advised to submit a different dewatering method for Areas 1 and 3, RDI continued to utilize the same method throughout the duration of Phase 2.

7.6.2.3 Additional Invasive Species Removal

During the Japanese knotweed removal activities at Areas 5 and 7, additional quantities of Japanese knotweed were discovered. The project required the removal of Japanese knotweed from an area measuring approximately 8,457 square yards. However, during the removal activities an additional 3,233 square yards of Japanese knotweed were identified and removed. PCO No. 001 accounted for the additional $7,629 in costs incurred with the Japanese knotweed removal activities.

7.6.2.4 Reinstallation of Live Stakes

E & E performed a site visit in December 2014 to assess the success of the live s that were installed in Areas 1, 2, 5, and 6. It was determined that because there was a less than reasonable success rate and bare spots at the shoreline, additional live stakes should be installed. On December 1, 2014, as part of warranty work,

RDI reinstalled 300 silky willow live stakes in the riprap and along a portion of the upland grassy area along the shoreline in Area 1.

7.6.2.5 Area 1 Slope

On July 15, 2013, the Resident Engineer noted visible cracks in the upper areas of the Area 1 slope. On July 25, 2013, E & E advised RDI to get consultation on the correct method to stabilize the tension crack area in the Area 1 slope, and this request was again made at Progress Meeting 27 on August 6, 2013. On September 9, 2013, MMCE inspected the slope and submitted a report to RDI, NYSDEC, and E & E on the results and conclusions of their inspection. On September 11, 2013, RDI placed and compacted structural fill on the compromised western end of Area 1, per MMCE's recommendation (see PCO No. 011).

7.6.2.6 Winter Shutdown/Resumption of Services

Due to unworkable conditions at the site, project activities were shut down for winter on January 3, 2013. RDI installed protection measures around completed work areas on the site that would remain intact for the duration of the shutdown period in compliance with the Project Specification, particularly with respect to topsoil and erosion control blankets in place in Area 2 and Area 6. Equipment that was in the exclusion zone was decontaminated prior to removal from the site. The CWTS was decommissioned for the duration of the winter shutdown period.

The site activities resumed on April 25, 2013, with the delivery of granulated activated carbon vessels and excavators to the site.

7.6.2.7 Final Demobilization of Equipment and Support Facilities

Site services provided to RDI were terminated upon Substantial Completion of the Contract, and RDI's office trailers were demobilized. Copies of Substantial and Final Completion documents from NYSDEC are provided in Appendix 2T.

7.6.2.8 Phase 2 Work Not Completed

RDI did not complete remediation of Area 3 as specified in the Contract Documents. The Area 3 work completed during Phase 2 included the section on the eastern side of the Depew Village Landfill, and the section between Areas 1 and 2. The remaining downstream section of Area 3 DVL that was not remediated during Phase 2 was transferred to Phase 3, as described in Section 7.6.3.1.

7.6.3 Phase 3

7.6.3.1 Phase 2 Work Reassigned to Phase 3

The section of Cayuga Creek located in Area 3 along the west side of the landfill and that was not remediated during Phase 2 was reassigned to Phase 3. In accordance with the Phase 3 Contract Documents, the Area 3 sediments along the west side of the landfill were renamed Cells 1 – 11 and the Area 3 sediments extending approximately half a mile downstream of the Borden Road bridge were referred to as Cells 1 – 11. Cells 1 through 5 were previously part of Area 3 work in Phase 2. Cells 6 through 11 were added to the Phase 3 work (see Figure 3-1).

7.6.3.2 Weather Conditions during Construction

Weather conditions at the site during the construction phase of the project are documented in the E & E DIRs that were prepared and submitted daily to the NYSDEC Project Manager. The DIRs for the project are provided in Appendix 3J.

During the summer of 2017, greater than average rainfall in the watershed caused flows in Cayuga Creek to stay above average for an extended period of time. The rain event on July 13, 2017, caused flows to reach 10,000 cfs, which resulted in significant damage and/or washout to MCI's access roads, pumps, and equipment. Each rainfall during the 2017 work resulted in MCI removing the cofferdam from the creek until the flows had fallen below the capacity of their pumps and then reconstruction of the cofferdam. The negative effects of the rainfall were magnified due to inadequate water diversion strategies implemented by MCI. These strategies are discussed in Section 7.6.3.3.

7.6.3.3 Water Diversion Strategy for 2016 Phase 3 Work

MCI encountered issues with their initial water diversion strategy for the Phase 3 work in Cayuga Creek. At the beginning of the 2016 work, at the upstream end of Reach 1, the Creek water either flowed underneath or around the sides of the upstream cofferdam and entered the work area. MCI tried alleviating this issue by placing more clay on the upstream side of the cofferdam; however, water did not flow through the gravity-fed pipes along the left side of the cofferdam and instead continued to flow into the work area. Water also breached the cofferdam on the downstream side of the work area. MCI addressed this problem by placing and compacting more clay on the downstream side of the downstream cofferdam, but the problem continued.

MCI modified both the upstream and downstream cofferdams by placing two sets of jersey barriers across the width of the creek, approximately 6 feet apart. LLDPE was placed over and in between the jersey barriers, and clay was placed and compacted in the area between the sets of jersey barriers. MCI welded three 150-foot-long sections of pipe together to create an approximately 450-foot-long pipe. The pipe, which discharged past the downstream cofferdam, was connected to a 12-inch pump, which was placed at the top of bank on the RDB near the upstream cofferdam.

According to the pump specifications, the pump should have been able to handle flows of approximately 11 cfs. However, the actual flow capacity of the pump under site conditions was approximately 4 cfs. When flows were greater than 4 cfs, the cofferdam was overtopped, the work area became flooded, and MCI did not work in the creek.

E & E repeatedly suggested that another water diversion strategy be implemented that would manage at least the average of the mean daily flow of the creek, as recorded at the gaging station located approximately 4 miles upstream of the project area. The daily flows were well below average during the 2016 work; therefore,

MCI was able to complete the work in reaches 1 and 2 with the water diversion method that was implemented.

7.6.3.4 Water Diversion Strategy for 2017 Phase 3 Work

Before the start of the 2017 work, E & E reiterated that the water diversion method should be able to manage at least the average of the mean daily flow for the period June – September, which was approximately 50 cfs. MCI changed two components of the water diversion method for the 2017 work. An 18-inch pump was used that, based on field observations, could manage flows of approximately 14 cfs. MCI also stopped using LLDPE as part of the cofferdams. The clay was placed directly in between the jersey barriers and on the upstream side of, and downstream side of, the cofferdam. The reinforced cofferdam effectively prevented water from seeping into the work area; however, when flows exceeded approximately 14 cfs, the creek flow overtopped the cofferdam. MCI replaced the 18-inch pump with a 24-inch pump that could manage flows up to approximately 28 cfs, and the 18-inch bypass piping was replaced with 24-inch bypass piping.

When flows were greater than approximately 28 cfs, the cofferdam was overtopped, the work area became flooded, and MCI did not work in the creek. However, there were enough days during the 2017 work period where the daily flows were below average that MCI was able to complete the work in Cells 1 – 11 with the water diversion method that was implemented.

7.6.3.5 Winter Shutdown

As discussed in Section 5.2.3.3, project activities were shut down for winter on November 18, 2016. MCI installed protection measures around completed work areas on the site that would remain intact for the duration of the shutdown period in compliance with the Project Specification. Special attention was placed on installing the silt socks along access roads 7 through 9 due to their location in the floodplain of the creek. The CWTS was decommissioned for the duration of the winter shutdown period.

7.6.3.6 Documentation Sample Results (2016)

Approximately 75% of the analytical results for the documentation samples collected in Reaches 1 and 2 and under the Borden Road Bridge were above the sediment criterion of 31 mg/kg. The section of creek beneath the north arch of the Borden Road Bridge serves as an overflow channel and is an area of significant sediment deposition. Samples were collected and analyzed after excavation, and additional sediments in this area were removed to bedrock. Documentation samples were collected after re-excavation by scraping soil from within the cracks of the bedrock. Riprap was then placed to achieve a grade approximately 3 feet higher in elevation than the main creek channel beneath the south arch per the Erie County DPW Borden Road bridge drawings that were included in the Limited Site Data Documents.

In Reaches 1 and 2 and under the south arch of the Borden Road Bridge, sediment was excavated to a depth of 1 foot as specified in the remedial design (or less if

bedrock was encountered). In the areas where bedrock was encountered, documentation samples were collected by scraping soil from the bedrock. The excavated sediments were screened, and the overburden material (sediments greater than ½-inch diameter, which were approximately 70% of the excavated sediments) was returned to the creek. No additional sediment removal was performed after samples were collected and analyzed. It was determined that excavation and removal of the sediments less than ½-inch to a depth of one foot, and capping of the excavation area with the overburden material met the specifications of the remedial design and, to the extent practicable, the remediation goals outlined in the OU-2 ROD.

7.7 Engineering and Institutional Controls

Since contaminated soil remains beneath the site after completion of the Remedial Action, Institutional and Engineering Controls are required to protect human health and the environment. These Engineering and Institutional Controls (ECs/ICs) are provided in the Site Management Plan for the Depew Village Landfill Site. Long-term management of these EC/ICs and residual contamination will be performed under the Site Management Plan (SMP) approved by the NYSDEC. The SMP is provided in Appendix 4.

7.7.1 Engineering Controls

During the three phases of remedial activities at the Depew Village Landfill Site, several ECs were installed to limit contaminant migration by preventing contamination from entering Cayuga Creek. The ECs installed during site remediation and the procedures for inspection and maintenance are summarized below.

- **Area 1 (OU-02):** The stream bank along the north side of Zurbrick Road was remediated, reconstructed, and stabilized to prevent migration of contaminated soil and collapse of the roadway embankment into Cayuga Creek as a result of erosion. This is a permanent control, and the stream bank slope and surrounding areas must be inspected every two years. Inspection will focus on the presence of erosion around the edges of riprap and live stakes as well as the detection of significant slope movement. Live stakes are anticipated to grow and further stabilize the stream bank over time. A guiderail that was installed at the northern edge of Zurbrick Road will also be inspected for damage and for the presence of erosion or undue settlement.
- **Area 2 (OU-01):** The stream bank along the southwestern tip of the peninsula was remediated, relocated, reconstructed, and stabilized to prevent migration of contaminated soil into Cayuga Creek as a result of erosion, settlement, or displacement. This permanent control must be inspected semiannually and will focus on the presence of erosion and the growth of live stakes over time.
- **Area 3 (OU-02):** Contaminated sediment from Cayuga Creek was removed to prevent lead contaminants leached from the landfill from spreading downstream. Semiannual sampling of the remediated creek bed around the perimeter of the landfill will be conducted to monitor sediment contamination.

- **Area 4 (OU-01):** The stream bank along the eastern edge of the peninsula was remediated and then stabilized with a row of heavy riprap, a rock key, coir logs, filter fabric, topsoil, ECBs, and live stakes. These are permanent controls, and the stream bank and surrounding areas will be inspected semiannually. Inspections will focus on the presence of erosion around the ECs. Displacement of these controls will be noted and repaired within a reasonable timeframe to minimize erosion of the exposed stream bank. Live stakes are anticipated to grow and further stabilize the area over time. Additionally, inspections will focus on the potential presence of ash/fill material from the landfill exposed at the surface due to elevated creek flow.
- **Area 5 (OU-01):** The stream bank along the western edge of the peninsula was stabilized with container plantings and live stakes as an erosion control measure. Semiannual inspections will focus on the presence of erosion and the growth of live stakes over time.
- **Area 6 (OU-01):** The stream bank along the northwestern edge of the peninsula was remediated, reconstructed, and then stabilized with ECB, grass, container plantings, and large trees. These are permanent controls, and the stream bank and surrounding areas must be inspected semiannually. Inspections will focus on evidence of erosion and the growth of the trees and containers over time.
- **Area 7 (OU-01):** The stream bank along the left descending bank of Cayuga Creek, west of Borden Road, was stabilized with live stakes and container plantings as an erosion control measure. Semiannual inspections will focus on the presence of erosion and the growth of live stakes over time.
- **Area 8 (OU-01):** The landfill in Area 8 was capped, graded, and seeded to prevent lead exposure to humans and wildlife and to reduce further migration of contaminants via wind or soil erosion into Cayuga Creek. This is a permanent control, and the cap must be inspected semiannually. Inspections will focus on evidence of erosion along the graded surfaces of the cap to the creek, exposure of ash/fill materials from the original and newly landfilled areas at the surface or stream banks, and settlement or ponding of water that may be observed on the cap. Additionally, semiannual inspections will document areas of the cap that may need filling or reseeding.

7.7.2 Institutional Controls

The site remedy requires that an environmental easement be placed on the property to (1) implement, maintain and monitor the Engineering Controls in the approved SMP; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination and restricting the use of groundwater as a source of potable or process water; (3) limit the use and development of the site above the bankfull flow elevation and the buffer strip to commercial or industrial use; and (4) the property owner to complete and submit to NYSDEC a periodic certification of institutional and engineering controls.

As of August 2020, the environmental easement for the site has not been filed. A copy of the SMP and the easement survey is provided in Appendix 4.

7.8 Contractor and Subcontractor Affidavits

7.8.1 Phase 1

Final Waiver of Liens Affidavits from GES and its subcontractors were not required for Phase 1 of the project.

7.8.1 Phase 2

Final Waiver of Liens Affidavits from RDI and its subcontractors are provided in Appendix 2U.

7.8.2 Phase 3

Final Waiver of Liens Affidavits from MCI and its subcontractors are provided in Appendix 3T.

8 References

Engineering Science, Inc. and Dames and Moore. 1988. *Engineering Investigations at Inactive Hazardous Waste Sites, Phase l Investigation, Village of Depew, Site No. 915105, Erie County*, January 1988.

Ecology and Environment Engineering, P.C. (E & E). 2015. *Limited Site Data Documents for Depew Village Landfill, Town of Cheektowaga, Erie County, New York, Site No. 9-15-105,* Prepared for NYSDEC DER in November 2015.

_____. 2011. *Limited Site Data Documents for Depew Village Landfill, Town of Cheektowaga, Erie County, New York, Site No. 9-15-105,* Prepared for NYSDEC DER in December 2011.

_____. 2009. *Remedial Investigation and Feasibility Study for Operable Unit 2 of the Depew Village Landfill Site No. 9-15-105 Depew, New York,* Prepared for NYSDEC DER in June 2009.

_____. 2007a. *Remedial Investigation Report for the Depew Village Landfill Operable Unit - 01, Site No. 91510, Depew, New York,* Volumes 1 and 2, Prepared for NYSDEC DER in March 2007.

_____. 2007b. *Technical Workplan for the Remedial Investigation and Feasibility Study of Operable Unit 2 at the Depew Village Landfill*, Site No. 915105, Prepared for NYSDEC DER in August 2007.

_____. 2005. *Technical Workplan for the Remedial Investigation and Feasibility Study at the Depew Village Landfill*, Site No. 915105, November 2005.

New York State Department of Environmental Conservation (NYSDEC). 2010. *Program Policy DER-10, Technical Guidance for Site Investigation and Remediation,* Division of Environmental Conservation (DEC), May 3, 2010.

_____. 2009a. *Record of Decision, Depew Village Landfill Site, Operable Unit No. 02, Village of Depew Erie County, New York,* NYSDEC Division of Environmental Remediation (DER), Site No. 915105. December 2009.

_____. 2009b. *Proposed Remedial Action Plan for the Village of Depew Landfill Site, Operable Unit No. 02, Village of Depew Erie County, New York.* NYSDEC Division of Environmental Remediation (DER), Site No. 915105, October 2009.

_____. 2008a. *Proposed Remedial Action Plan for the Village of Depew Landfill Site, Operable Unit No. 01, Village of Depew Erie County, New York.* NYSDEC Division of Environmental Remediation (DER), Site No. 915105, January 2008.

_____. 2008b. *Record of Decision, Depew Village Landfill Site, Operable Unit No. 01, Village of Depew Erie County, New York.* NYSDEC Division of Environmental Remediation (DER), Site No. 915105. March 2008.

_____. 1999. *Technical Guidance for Screening Contaminated Sediments.* Division of Fish, Wildlife, and Marine Resources. January 1999.

_____. 1998. *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.* Division of Water. June 1998.

Pan-American Environmental, Inc. and URS Corporation for the Village of Depew. 2004. *Site Investigation/Remedial Report*, June 2004.

1A Final Project Manual

See files in the appendix folder “1 Phase 1” provided electronically via FTP site.

1B Depew Standby Contractor Authorization

See files in the appendix folder “1 Phase 1” provided electronically via FTP site.

1C Pre-Construction Meeting Minutes

See files in the appendix folder “1 Phase 1” provided electronically via FTP site.

1D Submittals and Submittal Log

See files in the appendix folder “1 Phase 1” provided electronically via FTP site.

1E Construction Completion Summary

See files in the appendix folder “1 Phase 1” provided electronically via FTP site.

1F E & E Daily Observation Reports

See files in the appendix folder “1 Phase 1” provided electronically via FTP site.

2A Summary of Public Bids

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2B Progress Meeting Agendas and Minutes

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2C Project Submittals and Submittal Log

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2D Contractor SWPPP Inspection Reports

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2E Community Air Monitoring

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2F Surveys

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2G Contract Drawings

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2H Security Logs

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2I Daily Observation Reports

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2J Requests for Information (RFIs)

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2K Field Orders (FOs)

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2L Proposed Change Orders (PCOs)

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2M Change Orders (COs)

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2N Contractors' Applications for Payment (CAPs)

See files in the appendix folder "2 Phase 2" provided electronically via FTP site.

2O McMahon & Mann Report

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2P Turbidity Monitoring

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2Q Analytical with EDD

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2R DUSR Paradigm

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2S Monitoring Well Documentation

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2T Substantial and Final Completion Documents

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

2U Contractor (RDI) Waiver of Liens Affidavits

See files in the appendix folder “2 Phase 2” provided electronically via FTP site.

3A Summary of Public Bids

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3B Notice to Proceed

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3C Contract Documents

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3D Progress Meeting Agendas and Minutes

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3E Project Submittals and Submittal Log

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3F Contractor CAMP Reports

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3G Analytical Results

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3H Contractor Security Logs

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3I

Substantial and Final Completion Documents

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3J E & E Daily Inspection Reports

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3K Requests for Information (RFIs)

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3L Field Orders (FOs)

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3M Proposed Change Orders (PCOs)

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3N Change Orders (COs)

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3O Contractor's Applications for Payment (CAPs)

See files in the appendix folder "3 Phase 3" provided electronically via FTP site.

3P Turbidity Monitoring Reports

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3Q DUSR for Cells 1-11 Samples

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3R Live Stake Order Forms

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3S Soil Disposal Manifests (off-site) and Tracking Log

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

3T Contractor Waiver of Liens Affidavits

See files in the appendix folder “3 Phase 3” provided electronically via FTP site.

4

Site Management Plan and Environmental Easement

See files in the appendix folder “4 SMP_Easement” provided electronically via FTP site.