Covanta Rail-to-Truck Intermodal Facility Site

NIAGARA COUNTY, NEW YORK

Final Engineering Report

NYSDEC Site Number: C932160

Abridged Version - Please refer to the document repository for the complete document

Prepared for:

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139 47th Street

Niagara Falls, New York

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NOVEMBER 2015

CERTIFICATIONS

I, Timothy M. Webber, am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Action Work Plan was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Action Work Plan.

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

I certify that all use restrictions, Institutional Controls, Engineering Controls, and/or any operation and maintenance requirements applicable to the Site are contained in an environmental easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, and that such plan has been approved by Department.

I certify that all documents generated in support of this report have been submitted in accordance with the DER'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, Timothy Webber, PE, of LaBella Associates, D.P.C, am certifying as Owner's Designated Site Representative for the Site.

083570	11/11/15	
NYS Professional Engineer #	Date	Signature

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LIST OF ACRONYMS

Acronym	Definition
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CAMP	Community Air Monitoring Plan
COC	Certificate of Completion
CPM	Counts Per Minute
CPP	Citizen Participation Plan
DD	Decision Document
DER-31	Division of Environmental Remediation
FER	Final Engineering Report
EC	Engineering Controls
HASP	Health & Safety Plan
IC	Institutional Controls
LP	Limited Partnership
MH	Manhole
NFWB	Niagara Falls Water Board
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OM&M	Operation, Maintenance & Monitoring
OSHA	Occupational Safety and Health Administration
PEMB	Pre-Engineered Metal Building
PID	Photoionization Detector
PPM	Parts Per Million
RAOs	Remedial Action Objectives
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
RTIF	Rail to Truck Intermodal Facility
SBL	Section-Block-Lot
SCOs	Soil Cleanup Objectives
SMP	Site Management Plan
SU	Standard Units
SVOCs	Semi-volatile organic compounds
SWMP	Soil & Water Management Plan
TENORM	Technologically Enhanced Naturally Occurring Radioactive Material
TLD	Thermoluminescent Dosimeter
USTs	Underground Storage Tanks
VOCs	Volatile Organic Compounds

FINAL ENGINEERING REPORT

1.0 BACKGROUND AND SITE DESCRIPTION

Covanta Niagara I, LLC entered into a BCA with the NYSDEC on April 10, 2013, to investigate and remediate a 15-acre property located at 139 47th Street (Rear), City of Niagara Falls, Niagara County, New York. The property was remediated to enable industrial use and will be utilized as a Rail-to-Truck Intermodal Facility (RTIF).

The site is located in the City of Niagara Falls, County of Niagara, New York and is identified as Section-Block-Lot (SBL) #160.09-1-21 on the Niagara Tax Map (see Appendix 1 for a copy of the Tax Record Report). The site is an approximately 15-acre area bounded by vacant property to the north, beyond which lies Niagara Falls Boulevard, active railroad tracks to the south and to the east, and the Covanta energy-from-waste facility and vacant property to the west (see Figure 1). The boundaries of the site are depicted on Figure 2 and more fully detailed within the metes and bounds description included in the Environmental Easement (Appendix 2).

The site, formerly part of a larger industrial complex, was owned and operated by the Union Carbide Corporation Metals Division, which first developed the complex in the early 1900's. The plant reportedly produced special alloys, tungsten, ferroalloys, calcium carbide and ferrovanadium ferrotungsten. Processes used at the plant included submerged arc, open arc, and globar electric furnaces, as well as exothermic and induction furnaces. Wastes generated by the plant included furnace slag (ferroalloys), hydrated lime and miscellaneous plant waste, which were reportedly disposed of at Union Carbide's former disposal site at 56th Street and Pine Avenue in Niagara Falls.

In 1942, the Atomic Energy Commission (AEC) and Manhattan Engineer District (MED) contracted for the construction and operation of a facility on the Union Carbide plant property that came to be known as Electromet. The Electromet facility produced uranium metal from uranium tetrafluoride by reacting it with magnesium in induction furnaces. The uranium metal was recast into ingots that were shipped off-site for testing or rolling. Process residue, including dolomite slag, uranium chips and crucible dross, was shipped to other sites for uranium recovery, storage or disposal. Electromet also recast scrap metal, supplied calcium metal to other facilities and conducted research and development activities. In 1948, Electromet became a subsidiary of the Union Carbide Metals Division called the Electro Metallurgical Company, and the last casting of uranium was conducted in 1949. The facility was reactivated in 1950 for casting zirconium metal sponge into ingots. During the early 1950s, portions of the facility were used under contract to the AEC for research and development activities that may have involved uranium, as well as titanium processing. The MED/AEC operations took place in one building that was demolished in 1957. This building was formerly located approximately 1,250 feet to the west of the site.

Union Carbide's Linde Division also operated a welding flux manufacturing facility on the plant property. Waste from this operation included sludge from a rotary air filter, which was reportedly disposed of off-site.

In February 2013, the site was acquired by Covanta from Praxair, Inc., a corporate successor to Union Carbide's Linde Division. Other industrial operators on the Praxair property have included ESAB, L-Tech, Stratcor, Inc., US Vanadium and UMETCO.

From the time of the initial development of the Union Carbide plant, the site was primarily utilized for rail facilities that serviced the plant and other adjacent industries. A portion of the welding flux manufacturing facility that was operated by Union Carbide's Linde Division and later by ESAB/L-TEC, however, was located on the western portion of the site.

At the time of acquisition by Covanta, the site was occupied by an inactive rail yard, concrete floor slabs representing remnants of the former industrial complex, and a 13,700 square foot building that was formerly utilized for locomotive maintenance and repair.

2.0 SUMMARY OF SITE REMEDY

2.1 REMEDIAL ACTION OBJECTIVES

A RI was conducted at the proposed Covanta Niagara RTIF Site in 2012 prior to application to the BCP Program. The RI was performed to characterize the nature and extent of contamination at the site. The results of the RI are described in detail in the following report:

- Remedial Investigation Report – March 2013, LaBella Associates, D.P.C.

Generally, the RI determined that a number of contaminants of concern were present within the fill material and perched groundwater at the Site at concentrations above the applicable standards and/or cleanup objectives. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in the sections below, while the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are listed in Table 1.

The contaminant(s) of concern were present in surface soil/fill, subsurface soil/fill, and perched groundwater at concentrations that exceeded the applicable SCGs as summarized on Table 2.

Below is a summary of site conditions when the RI was performed in 2012:

<u>Soil/Fill</u>

As summarized in the RI report, contaminants were detected in the surface and subsurface soil/fill samples collected from across the Site during the RI. The following sections describe the results:

Surface Soil/Fill

Surface soil/fill throughout the site contains SVOCs and metals at levels that exceed the Industrial Use SCOs. Pesticides were also encountered in the surface soil/fill in the vicinity of the inactive rail yard at concentrations exceeding these SCOs.

Slag material exhibiting gamma radiation levels greater than two times the background level is intermingled with surface fill on the project site. This slag is commonly referred to as Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) slag. At the surface, the TENORM slag was primarily encountered in a handful of radiological hot spots located in the northern portion of the site, although sporadic occurrences of this material were noted in other areas of the site.

Subsurface Soil/Fill Material

Contaminants of concern in the subsurface soil/fill include SVOCs and metals. Elevated concentrations of arsenic and manganese that are likely related to the deposition of slag, off-specification welding materials and other byproducts of former manufacturing operations, were detected in the fill material across the site.

Petroleum impacted fill displaying nuisance characteristics (e.g., staining, odor, etc.) was also encountered in the vicinity of the locomotive house and former UST area.

Additionally, TENORM slag was found to be interspersed with shallow subsurface fill across the site. Gamma radiation levels detected in this slag were greater than two times the background level.

<u>Site-Related Groundwater</u>

Metals, including arsenic, manganese and chromium, were detected in the perched water contained in the fill across the site at levels that exceeded the groundwater standards. Low concentrations of aromatic hydrocarbons were also encountered in the perched water occurring within the fill in the vicinity of the former UST area near the locomotive house. The RI report also summarizes the contaminant concentrations in the groundwater samples collected during the RI.

Groundwater encountered within the upper-most water bearing zone, which occurs within the glaciolacustrine and glacial till deposits, contained low levels of aromatic hydrocarbons and PAHs. Metals detected above the groundwater standards in the samples from this hydrostratigraphic unit were limited to aluminum, iron, magnesium and sodium.

The presence of contaminants in the perched groundwater likely reflects the chemistry of the fill in on the site. The constituents detected above the groundwater standards in the overburden groundwater unit were those commonly encountered in uncontaminated, natural environments and do not appear to be associated with the contaminated fill on the project site. No other contraventions of the applicable water quality standards were detected in the overburden groundwater. For these reasons, groundwater remediation and long-term groundwater monitoring were not required in the remedy for the Site.

Site-Related Soil Vapor Intrusion

During the performance of the RI, the former locomotive house was the only building that remained on-site. However, the building was open to the atmosphere and was slated for demolition. Therefore, a soil vapor intrusion study was not performed at the Site.

Pits and Sumps

Water and sediment/scale occurring in the pit within the locomotive house was determined to be non-hazardous. Low concentrations of VOCs commonly associated with solvents and degreasers were detected in the water within the pit.

SVOCs were detected in the liquid within the sewer system discovered around the perimeter of the locomotive house. Liquid phase hydrocarbon globules were also observed on the surface of the liquid in the manhole closest to the former UST area, and petroleum sheen and odor were also observed in all manholes when the sediment was disturbed. The integrity and extent of this abandoned sewer system were not known, although no flow was observed within the system during the RI field program.

Regulated Building Material

Non-friable asbestos containing material (ACM) and limited quantities of friable ACM, lead-based paint and mercury-containing light fixtures were found in the locomotive house.

Underground Storage Tanks

Two USTs were formerly located near the southeast corner of the locomotive house. As part of the RI, this area was investigated via a geophysical survey, test probes, monitoring well installation and soil, and groundwater sampling. The RI confirmed that the USTs were no longer located on the Site. However, impacts to soil consisting of petroleum staining and odors were noted in the vicinity of the former USTs. Although some contaminants were detected in wells proximal to the former USTs, the results indicated that impacts to groundwater were not significant.

Based on the results of the RI, and as detailed in the RAWP, the following RAOs were identified for this Site.

2.1.1 Fill RAOs

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated fill.
- Prevent exposure to elevated radiation levels within slag fill.
- NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (RPSCOs) for the Protection of Public Health/Industrial Use.
- NYSDEC CP-51 Supplemental Soil Cleanup Objectives (SSCOs) for the Protection of Ecological Resources.
- NYCRR Subpart 375-6 RPSCOs for the Protection of Groundwater.

RAOs for Environmental Protection

- Prevent the discharge of contaminants to surface water.
- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with fill causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

2.1.2 Pits and Sumps RAOs

RAOs for Public Health Protection

- Prevent ingestion of water impacted by contaminants.
- Prevent contact with contaminants in the impacted water.
- Prevent surface water contamination.

RAOs for Environmental Protection

- Prevent impacts to biota from ingestion/direct contact with surface water causing toxicity and impacts from bioaccumulation through the marine or aquatic food chain.

2.1.3 Regulated Building Materials RAOs

RAOs for Public Health Protection

- Prevent contact with or inhalation of contaminants in building materials.
- Prevent the release of contaminants via wind erosion of deteriorated asbestos containing materials.

2.2 DESCRIPTION OF SELECTED REMEDY

The Site was remediated in accordance with the remedy selected by the NYSDEC in the Decision Document dated April 2013.

The factors considered during the selection of the remedy are those listed in 6NYCRR 375-1.8. The following are the components of the selected remedy:

1. Green remediation principals and techniques were implemented to the extent feasible in the Site management of the remedy as per DER-31. The major green remediation components included:

    - considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
    - reducing direct and indirect greenhouse gas and other emissions;
    - increasing energy efficiency and minimizing use of non-renewable energy;
    - conserving and efficiently managing resources and materials; and,
    - reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste.

2. Remedial actions addressing contaminant source areas, including:

    - Removal and off-site disposal of all fill material excavated in conjunction with site grading and the construction of intermodal facility infrastructure (e.g., utilities, storm water management system, building/scale foundations, asphalt roadways, concrete slabs, etc.);
    - Removal and off-site disposal of TENORM slag excavated during site grading and intermodal facility infrastructure construction;
    - The in-place closure or removal of subsurface vaults, sumps and manholes encountered during site grading and intermodal facility construction, including the removal and disposal of fluids and sediment from these structures;
    - Excavation and off-site disposal of the grossly contaminated fill impacted with petroleum nuisance characteristics in the vicinity of the former USTs previously located near the Locomotive House;
    - Removal and off-site disposal of contaminated water and sediment contained within pits and sumps located within the Locomotive House and

removal of these structures;

- Removal and off-site disposal of contaminated water and sludge contained within the Historic Sewer in the vicinity of the Locomotive House and closure of this sewer;
- Removal and off-site disposal of Regulated Building Materials (e.g., asbestos, light ballasts, etc.) from the Locomotive House and demolition of the structure;
- The proper closure of on-site groundwater monitoring wells;
- Construction and maintenance of a cover system consistent with that prescribed in the RAWP (electronic version included herein) Section 7.1.2. and consisting of clean quarry stone (e.g., crushed stone, stone rip rap and railroad sub-ballast and ballast), asphalt, concrete, and clean top soil to prevent human exposure to remaining contaminated soil/fill remaining at the site. All fill material brought to the Site met the requirements for industrial use of the Site as set forth in 6 NYCRR Part 375-6.7(d).;

3. An IC in the form of an Environmental Easement has been imposed at the Site that:

    - requires the remedial party or Site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3);
    - allows the use and development of the Site for industrial uses as defined by Part 375-1.8(g) (subject to local zoning laws);
    - restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and,
    - requires compliance with the Department approved Site Management Plan.

4. A SMP requiring the following:

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the Site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective: (IC-the Environmental Easement/EC-the soil cover);

- an excavation plan which details the provisions for soil/fill placement management for future excavations in areas of remaining contamination including provisions for the proper handling of TENORM material;
- descriptions of the provisions of the environmental easement including any land use and/or groundwater and/or surface water restrictions;
- provisions for the management and inspection of the identified engineering controls;
- maintaining Site access controls and Department notification; and,
- the steps necessary for the periodic review and certification of the institutional and/or engineering controls.

b. a monitoring plan to assess the performance and effectiveness of the remedy.

3.0 INTERIM REMEDIAL MEASURES, OPERABLE UNITS AND REMEDIAL CONTRACTS

The remedy for this Site was performed as a single project, and no interim remedial measures, operable units or separate construction contracts were performed.

4.0 DESCRIPTION OF REMEDIAL ACTIONS PERFORMED

Remedial activities completed at the Site were conducted in accordance with the NYSDEC-approved RAWP for the Covanta RTIF Site, dated March 2013. All deviations from the RAWP are noted below in Section 4.9. It should be noted that remedial activities at the Site were conducted in two separate phases. Phase A was carried out from July 2013 through December 2014 and included site clearing and grubbing; demolition of remaining buildings and concrete slabs; and Site-wide grading, including grading within the five pre-designated TENORM slag hot spots. Phase B was carried out from March through October 2015 and included excavations associated with the construction of intermodal facility infrastructure (e.g., utilities, storm water management system, building/scale foundations, asphalt roadways, concrete slabs, etc.) and site cover installation. Site preparation was conducted at the beginning of each Phase. Specific details pertaining to remedial activities performed at the Site during each Phase are discussed below in Section 4.3.

4.1 GOVERNING DOCUMENTS

4.1.1 Site-Specific HASP

All remedial work performed under this Remedial Action was in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA.

The Site-specific HASP was complied with for all remedial and invasive work performed at the Site.

4.1.2 Site-Specific SWMP

Detailed plans for managing all materials and dewatering fluids that were disturbed at the Site, including excavation, handling, storage, transport and disposal, and all of the controls that were applied to these efforts to assure effective, nuisance free performance in compliance with all applicable Federal, State and local laws and regulations can be identified within the Site-specific SWMP prepared by Iyer Environmental Group, PLLC (IEG) included as Appendix 3. It should be noted that the SWMP that was submitted for Phase A was revised in 2015 prior to the start of Phase B. The purpose of this revision was to better tailor the plan to the work that was performed during the latter phase.

4.1.3 Site-Specific CAMP

The Site-specific CAMP monitoring approach, instruments, action levels, response measures, etc. are included herein as Appendix 4. Actual CAMP results and response actions are provided in a later section.

4.1.4 Site-Specific CPP

Site-specific Community Participation activities were guided by standard NYSDEC citizen participation procedures of the BCP and specifically the CPP included herein as Appendix 5. Following the RI of the Site, a draft RAWP was submitted to the NYSDEC for approval. During review of this document, a 45-day public comment period was established. Subsequently, public comments were considered and a final RAWP was approved. Upon completion of remedial activities at the Site, this FER was submitted to the NYSDEC for approval. Upon approval of the FER, a COC will be issued to Covanta Niagara I, LLC. Once the COC has been issued, the SMP must be followed under NYSDEC oversight in perpetuity.

4.2 REMEDIAL PROGRAM ELEMENTS

4.2.1 Contractors and Consultants

- Contractors who performed work and their associated tasks included the following:
  - LaBella Associates (LaBella)-remedial construction oversight and environmental monitoring

- LP Ciminelli (LPC and LPCC)-general contractor and construction company (LPCC)
- Pinto Construction Services, Inc. (Pinto)-construction company
- Innovated GPS Solutions (IGS)-surveyor
- Iyer Environmental Group, PLLC (IEG)-Pinto's environmental subconsultant
- Wargo Construction, Inc. (Wargo)-demolition company
- Northeast Paving (Northeast)-construction company
- Kandey Co., Inc. (Kandey)-hydro-excavation contractor and construction company
- Greater Radiological Dimensions, Inc. (GRD)- licensed radiation contractor and radiological safety/monitoring company
- Austin Master Services (AMS)-licensed radiological materials removal contractor
- SJB Services, Inc./Empire Geo Services, Inc. (SJB)-geotechnical engineer
- AECOM-construction wastewater management and sanitary/storm water system design/oversight
- CIR-electrical contractor
- MLP-plumbing contractor
- Del Prince-asphalt paving contractor
- Tedesco-PEMB contractor
- Picard-construction company
- Northland-concrete contractor
- Precision Scale & Balance (Precision)- truck scale contractor
- Frantz Construction (Frantz)-construction company
- Lee Fulton Associates-railroad design firm
- Amtrac of Maryland (Amtrac)-railroad construction company
- Darling Construction (Darling)-sheet pile subcontractor
- Plastech Werks- underground storm water storage system welding company
- Progress Rail Services-rail engineering firm

    - The Railroad Associates Corporation (TRAC)-rail engineering firm
    - LTR-rigging and hauling company
    - Thomas Johnson, Inc.-masonry contractors
    - ALP Steel-steel contractors
    - FRS Contracting-masonry contractors
    - NY Fence-fence contractor
    - RW Painting-painting contractor
    - Hamburg Overhead Door-door contractor
    - Elderlee, Inc.-guard rail contractor
    - Innovative Mechanical-HVAC and insulation contractor
    - Baughman Magic Seal, Inc.-striping contractor
    - Scrufari Construction Co., Inc.-general contractor
    - Heritage Contract Flooring-flooring contractor
- Transporters associated with the movement of materials on this project included:
    - Pariso Trucking and Logistics (Pariso)
    - Austin Master Services (AMS)
    - Price Trucking (Price)
    - US Bulk Transport, Inc. (US Bulk)
    - Mawhiney Trucking, Inc. (Mawhiney)
    - Laraba Enterprises
- Laboratories associated with analytical testing on this project included:
    - Alpha Analytical (Alpha)
    - Test America, Inc.
    - Pace Analytical Services, Inc.
    - Paradigm Environmental Services

4.2.2 Site Preparation

Pre-construction meetings were held at the Site prior to initiation of each major component of the remedial construction program. These meetings included the NYSDEC and all major contractors associated with the project. Such were held June 2013, September 8, 2014 and March 25, 2015. Site boundaries and known utility locations were established and staked out by IGS/Pinto. A Buried Utility Plan was prepared by LaBella and is included as Appendix 6.

Phase A was initiated with the decommissioning and demolition of the former locomotive house. In conjunction with the RI, a pre-demolition regulated building materials inspection was conducted by LaBella on the former locomotive house in May 2012. Based on the results of this inspection and in accordance with the RAWP, the following activities commenced in July 2013:

- Proper removal and disposal of all ACMs and mercury vapor-containing light bulbs from the interior of the former locomotive house;
- Proper removal and disposal of all liquid and sludge materials from the pit(s)/sump(s) located within the former locomotive house; and,
- Proper demolition and regrading of the former locomotive house area for reuse.

Specific details pertaining to the proper decommissioning and demolition of the former locomotive house are discussed in the Decommissioning and Demolition Report included as Appendix 9.

The proposed areas of the radiological material staging and decontamination pads were established by Pinto. A pre-construction walk-over of these areas was conducted by GRD on September 9, 2014, April 18, 2015 and June 16, 2015. Two separate radiological material staging areas were utilized over the course of Phase B. All gamma radiation measurements were identified within background (3,500-8,900 CPM) with the exception of a small area along the eastern portion of the radiological staging area established for Phase A. A small amount of surface material in this area was identified between 40,000-50,000 CPM at the surface. This material was excavated and removed with the Class 3 and 4 materials in the staging area. See Appendix 7 for GRD gamma radiation surveys completed during the course of this project. Pinto constructed the radiological staging areas and decontamination pads per the specifications identified in the RAWP and SWMP.

On September 9 and 10, 2014, IEG conducted 17 test pits at locations throughout the Site to collect Class 1 material disposal characterization samples as well as 6 test pits in the former UST field area south of the former locomotive house to collect Class 2 material disposal characterization samples (Figure 3). Three representative waste characterization samples were also taken from railroad ties located throughout the Site that day. GRD conducted radiological scanning and LaBella conducted VOC and dust monitoring of the materials excavated from the test pits. The analytical results were then submitted with the appropriate waste disposal applications to Republic Services and approval for off-site disposal of Class1 and 2 materials, and railroad ties to the Allied Landfill (Allied) in Niagara Falls, New York, was granted on October 6, 2014. Prior to initiation of Phase B, it was estimated that an additional 20,000 tons of Class 1 material would likely require off-site disposal at Allied during this latter Phase. As a result, Allied Landfill required the collection of additional Class 1 material waste characterization samples from the site to address the increase in waste volume. In response, on March 27, 2015, IEG conducted Geoprobe sampling across the Site to collect additional waste characterization samples (Figure 4). Again, GRD conducted radiological scanning and LaBella conducted VOC and dust monitoring of the materials extracted from the Geoprobe liners. On April 29, 2015, approval was granted for the disposal of the additional volume of Class 1 material at Allied Landfill during the course of Phase B. Refer to Appendix 8 for documentation pertaining to waste approvals.

Grubbing of Site vegetation commenced on September 10, 2014, by Pinto and continued for several weeks across the Site. Grubbed materials were transported off of the Site with Class 1 material to Allied Landfill.

It was also determined that any concrete generated at the Site during excavation activities would be transported off-site to Swift River Associates, Inc. (Swift River) for staging, crushing and subsequent return to the Site for re-use; refer to Section 4.3.5.1 below for further details. Accordingly, an area was designated at Swift River for staging of the concrete from the site prior to and after crushing. On September 10, 2014, and April 22, 2015, GRD conducted gamma radiation walk-over surveys of this staging area at Swift River to establish background radiation levels at the property. A background gamma radiation range of 5,200-8,500 CPM was established. Following complete removal of crushed concrete staged at Swift River, post-staging gamma radiation walk-over surveys were conducted by GRD on December 20, 2014 and July 8, 2015. All measurements within the staging area were within the background range previously established. Figure 5 identifies the volume of the recycled crushed concrete pile staged at the Site for reuse under the cover system.

Documentation of agency approvals required by the RAWP is included in Appendix 26.

All SEQRA requirements and all substantive compliance requirements for attainment of applicable natural resource or other permits were achieved during this Remedial Action.

4.2.3 General Site Controls

Access to and egress from the Site for all applicable personnel was accomplished through the security gate located to the west of the site on Simmons Avenue. This gate was secured during the evening hours and monitored by a professional security company during the day. In addition, daily sign-in sheets were kept and were submitted to Covanta on a weekly basis. For a majority of the overall project, Site boundaries were secured by temporary or permanent fencing. No security issues were encountered during the course of this project.

On April 13 and 16, 2015, Pinto completed a temporary access road on a temporary construction easement that was located west adjoining to the Site boundary on Praxair property. This temporary roadway was utilized by all on-Site personnel for the duration of Phase B.

Daily field reports were created and cataloged by LaBella and Pinto/LPC. Such included but were not limited to: VOC and dust monitoring forms, material handling forms and daily field reports. Information pertaining to this record-keeping will be discussed in latter sections of this report.

4.2.4 Nuisance controls

Per NYSDEC request, Simmons Avenue and various areas of the Site were watered with water trucks several times per day in order to eliminate dust concerns associated with daily Site operations. As indicated above, decontamination pads were established by Pinto on the northern and southern portions of the Site. Equipment decontamination procedures followed protocols established in the SWMP. Any general refuse generated during the course of this project was contained in Pinto construction dumpsters at the Site for off-site transport and disposal.

During Phase A of the project, Greenpac Mill was storing bails of cardboard on the west adjoining Praxair property. On several occasions during periods of high winds, cardboard was identified blowing onto the project Site. As a result, Covanta and the NYSDEC requested that Greenpac clean up this loose cardboard from the Site. In the end, a majority of these materials were addressed.

4.2.5 CAMP Results

Fugitive dust and particulate monitoring was conducted by LaBella during all excavation activities utilizing TSI 8530 Dust Track 2 monitors. Measurements were collected in micrograms per cubic meter (mg/m^3) in real time for 15 minute averages. Per NYSDEC requirements, any readings greater than 150 mg/m^3 require temporary stoppage of work and remedy of the situation. An upwind station and downwind station were set up daily. Stations were adjusted accordingly based on changes in wind direction. The downwind station was placed proximate excavation work if applicable. Throughout the duration of this project, no dust/particulate readings were identified above 1 mg/m^3, thus no stoppage of work was required. Copies of all analytical reports relating to the CAMP are available upon request from LaBella.

VOCs were monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis for the duration of this project. Upwind concentrations were measured at the start of each workday and every 15 minutes thereafter to establish background conditions, particularly if wind direction changed. No

VOC levels exceeding background concentrations or the 5 PPM action level prescribed in the CAMP were identified throughout the duration of this project, and no stoppage of work was required. Copies of VOC monitoring logs are available upon request from LaBella.

Radiological air monitoring was conducted for the duration of the project by GRD. Upwind, downwind and crosswind monitoring locations were established during the work. Readings were collected in 60-minute averages in CPM. The reading averages were converted from CPM to picocuries per milliliter (uCi/ml). All averages were compared to Federal Regulation Guidelines (10CFR20 Appendix B, Table 2) and were identified below the applicable method detection concentrations. Results of such are available upon request from LaBella.

4.2.6 Reporting

Daily reports for the progression of work during the course of this project were recorded by LaBella (see Appendix 13). The digital photo log required by the RAWP is included in electronic format in Appendix 14. Photos included within the digital photo log typically occur in chronological order.

Weekly progress meetings were conducted on-Site by LaBella for the purposes of keeping the NYSDEC informed on the progression of Site work. All relevant Site personnel were present for these weekly meetings. See Appendix 15 for a copy of the minutes associated with the weekly progress meetings.

Monthly progress reports were also completed by LaBella and submitted electronically to the NYSDEC on a monthly basis. Monthly reports included:

- activities completed in the previous month and activities planned for the coming month;
- any applicable sampling/testing results which occurred;
- anticipated schedule moving forward;
- percentage of job completed; and,

- activities undertaken in support of the CPP (if any).

Monthly reports are included in Appendix 16.

4.3 CONTAMINATED MATERIALS REMOVAL

As indicated above, remedial activities at the Site were conducted in two separate phases. Phase A included site clearing and grubbing; the demolition of remaining structures and concrete slabs; and Site-wide grading, including grading within five TENORM slag hot spot areas. Phase B included excavations associated with the construction of intermodal facility infrastructure (e.g., utilities, storm water management system, building/scale foundations, asphalt roadways, concrete slabs, etc.) and site cover installation. During each Phase of this project, several types of contaminated media were properly excavated and removed from the Site. Per the RAWP and SWMP, excavated materials were classified as one of the following:

Class of Material	Physical Description	Removal, Handling and Loading Responsibility	Packaging, Transportation and Disposal Responsibility
Class 1	Fill materials exhibiting gamma radiation less than 10,000 CPM with PID readings less than 5 PPM, and no observable free product	Pinto	Pinto
Class 2	Fill materials exhibiting gamma radiation less than 10,000 CPM with PID readings greater than 5 PPM, and/or observable free product.	Pinto	Pinto
Class 3	Fill materials exhibiting gamma radiation of 10,000 to 30,000 CPM	Pinto	GRD
Class 4	Fill materials exhibiting gamma radiation of over 30,000 CPM	Pinto	GRD
Class 5	Non-impacted, native soils	Pinto	Pinto

During all excavation activities, VOC monitoring was conducted by LaBella, radiological monitoring was conducted by GRD and overall materials management was conducted by Pinto. At the completion of the each remedial construction Phase, GRD conducted gamma radiation exit surveys (Appendix 7) for all applicable construction equipment that was utilized during excavation activities. No concerns were identified.

A list of the SCOs for the contaminants of concern for this project are provided in Table 2. Areas of Concern previously identified following the RI are included herein as Figure 6. The total quantities of each category of material removed from the Site and their disposal locations are identified in the following sections.

4.3.1 Class 1 Material

As indicated above, Class 1 materials excavated and removed from the Site included any fill materials exhibiting gamma radiation less than 10,000 CPM with PID readings less than 5 PPM, and no observable free product. During Phase A of the project, Class 1 material was removed from various areas of the Site as a result of grading activities advanced to pre-designated sub-grade elevations and/or for geotechnical purposes (as directed by SJB). Removal of Class 1 material also included vegetation that was grubbed throughout the Site as well as deteriorated railroad ties, which were identified in many locations at the surface and/or buried. During Phase B of this project Class 1 material was excavated from various areas of the Site for the purposes of constructing RTIF infrastructure, including new subsurface utilities; utility poles, bollards and fencing; sanitary and storm water management systems; building/truck scale foundations; diesel fueling station; and concrete and asphalt pavements.

Any historical utilities identified during the course of the Class 1 excavations were handled in accordance with the Buried Utility Plan (Appendix 6). Refer to the Daily Field Reports for specific details pertaining to such included as Appendix 13.

Some of the noteworthy historical utilities that were identified included the following:

A 1-inch natural gas line was historically connected to the former locomotive house on-Site. During excavation activities, the location/route of the natural gas line was identified and traced. It was determined that the line ran onto the west adjoining Covanta property. It was at that location, per Covanta approval, that Pinto excavated and exposed the line. The line was then capped by National Fuel approximately 8 feet onto the west adjoining Covanta property. Once the line was secure, Pinto filled the excavation back in with original materials at the off-site location. Figure 13 references the location of the natural gas line.

In addition to the natural gas line identified above, a buried utility cluster was depicted on historical site plans of the Site. Such included the following historical utility lines:

- One 4-inch lime slurry line;
- One 6-inch sludge line; and
- Five acetylene lines (one 3-inch, one 4-inch and three 6-inch).

In the summer of 2014, LaBella conducted background research on this historical utility cluster to attempt to verify the ownership, status and condition of the lines. As a result of that research, it was determined that exploration of the cluster would occur during Phase A of this project. On December 29, 2014, Pinto located the presumed area of the utility cluster where such would intersect the planned new storm water system to be installed at the Site during Phase B. The exploratory excavation in this area did not encounter any buried utility lines. Figure 13 references the location of the exploratory excavation. Although this historical utility cluster was not identified during Phase B of this project, a cluster of piping was identified further north, on the south side of new MH 201, during installation of the main storm water trunk line. This cluster was not disturbed and was left in place.

Furthermore, an active, overhead electrical line located proximate the western Site boundary along Simmons Avenue was decommissioned by Praxair. The line was cut further west along Simmons Avenue and the utility pole associated with such was removed from the Site by Pinto as Class 1 material during grading activities.

Moreover, a 6-inch presumed historical hydrogen line was identified during excavation of the main storm water trunk line southward between MHs 107 and 108. Based on construction design, Pinto was able to install the main trunk line piping beneath the historical line and leave such undisturbed and in place.

Lastly, a 12-inch historical utility pipe was identified during excavation activities for the main trunk line southward between MHs 104 and 105. Said 12-inch line was in direct conflict with the new trunk line, and was, therefore, investigated for removal. Upon cutting open the pipe it was determined that such was in fact a casing for two smaller lines; one 3-inch steel pipe and one 6-inch clay tile line. Pinto then tapped each of the two lines and determined that such were in fact empty/abandon. As a result, each pipe including the 12-inch casing was removed from the limits of the excavation and transported off-site by Pinto as Class 1 material.

The location and extent of Class 1 material excavation at the Site are illustrated in Figure 7.

4.3.1.1 Disposal Details for Class 1 Material

As indicated above, NYSDEC approvals were granted for off-site disposal of Class 1 material at the Allied Landfill on October 6, 2014 and April 29, 2015. Approximately 22,263 tons of Class 1 material was shipped to Allied during Phase A of this project while 20,709 tons of Class 1 material was shipped to Allied during Phase B of this project. Pinto shipped materials to Allied via Pariso and Mawhiney.

Approximately 267 tons of deteriorated railroad ties were shipped to Allied during Phase A of the project. A small amount of deteriorated railroad ties were excavated during Phase B of the project. As such, these ties were incorporated with the overall Class 1 disposal during Phase B. Refer to Appendix 11 for waste manifests and weight tickets associated with the removal of Class 1 material and railroad ties from the Site during the course of this project.

In addition to the 267 tons of railroad ties removed by Pinto as Class 1 material during Phase A of this project, a separate rail tie removal event was conducted by Northeast between October 17-21, 2014. Approximately 649 tons of rail ties were removed from the Site and transported to the Zoladz construction yard in Buffalo, New York by Pariso. All such ties were scanned by GRD for gamma radiation during the load out process; no concerns were identified. Radiological survey records for this rail tie load out are presented in Appendix 7. The ties were then ground at that location and shipped to an approved waste-to-energy facility in Watertown, New York for processing. Refer to Appendix 12 for documentation pertaining to this process.

4.3.2 Class 2 Material

As indicated above, Class 2 materials excavated and removed from the Site included any fill materials exhibiting gamma radiation less than 10,000 CPM with PID readings greater than 5 PPM, and/or observable free product. Class 2 material was excavated primarily from the area of petroleum-impacted soils located in the vicinity of the USTs formerly present near the locomotive house. Class 2 material was also generated during the decommissioning of the historical sewer system in this area and proximate Structures #9 and #27.

Historical Sewer Decommissioning

Decommissioning of the historical sewer system proximate the former locomotive house occurred from September 15-18, 2014. Kandey cleaned out each of the three MHs/vaults (Structure #0-A through 0-C) associated with the system utilizing a vacuum truck. Water generated during this process was placed into frac tanks for later testing. Class 2 material generated during this process was placed into a Pinto dewatering box for later off-site disposal. After cleaning out the system, a remote video inspection was conducted by Kandey in order to develop a feasible closure method for the sewer system. Based on the video inspection results, it was determined that the system would be closed in place with concrete to above any open inlets in the bottom of the MHs and/or four feet beneath the proposed sub-grade elevation to avoid new utility installations planned for the RTIF. Closure of the system also included filling the piping between the manholes with concrete as well as plugging the surcharged inlet that was identified within MH3. Pinto completed closure of the system on October 9, 2014.

The report associated with the closure of the historical sewer system conducted by Kandey is included Appendix 18. Figure 13 references the historical sewer system.

Decommissioning of Structures #9 and #27

During decommissioning of these Structures, Class 2 material was removed and placed into the Pinto dewatering box for later off-site disposal; such amounts are included in the overall Class 2 material tonnage associated with Phase A. Water generated during this process was placed into a frac tank for later testing.

Refer to Section 4.3.7 below for a discussion of the overall structure decommissioning that took place during the course of this project.

Class 2 Material Excavation

The area south and southeast of the former locomotive house formerly contained several USTs and petroleum-impacted soil/fill was identified in this area during the RI. As part of the remedial program for this site, the Class 2 material located in this area was excavated and transported off-site for disposal. As indicated in Section 4.2.2, the Class 2 material from the site was approved for disposal at the Allied Landfill. The remediation of this Class 2 material occurred between October 29 and November 6, 2014. The excavation in this area proceeded from the area of the former USTs northward into the footprint of the former locomotive house. The vertical and horizontal limits of the excavation were determined by LaBella based upon visual observations and PID measurements. The excavation proceeded until soil/fill displaying nuisance characteristics were no longer present. De-watering fluid generated during this excavation was placed into frac tanks for later testing. The location and extent of the Class 2 material excavation at the Site are illustrated in Figure 8.

During the course of this work less than five gallons of hydraulic fluid leaked from a ruptured hose on a piece of construction equipment owned by Pinto. The equipment dealer, Monroe Tractor, came to the Site to attend to the spill. A majority of the hydraulic fluid that had leaked was cleaned directly off of the machine. A small amount however did make its way onto the clean stone at ground level. The hydraulic fluid was cleaned at the ground surface with absorbent pads and the small amount of effected stone was removed and disposed of as Class 2 material. The spent absorbent pads were removed from the Site by the equipment dealer. Mike Hinton (NYSDEC Project Manager) was made aware of this minor spill following clean up of such. Per Mr. Hinton, reporting of this minor spill to the NYSDEC was not warranted.

In addition to the specific Class 2-related excavations identified above, small pockets of Class 2 material were also encountered at various locations on the Site during Phase B, shallow excavation work associated with construction of new utilities and infrastructure.

4.3.2.1 Disposal Details for Class 2 Material

Approximately 5,110 tons of Class 2 material was shipped to Allied during Phase A of this project while approximately 553 tons of Class 2 material was shipped to Allied during Phase B of this project. Pinto shipped Class 2 material to Allied via Pariso and Mawhiney. As indicated above, the overall tonnage of Class 2 material generated and disposed off-site came as a result of the cumulative tasks outlined in Section 4.3.2. This included some of the material stored in the Pinto dewatering box throughout the course of this project, as determined by a LaBella representative on-Site. Refer to Appendix 11 for waste manifests and weigh tickets associated with the removal of Class 2 material from the Site.

4.3.3 Class 3 and 4 Material

Class 3 and 4 materials excavated and removed from the Site included any fill materials excavated during site grading and RTIF infrastructure construction that exhibited gamma radiation levels exceeding 10,000 CPM. Class 3 and 4 material was removed during Phase A grading activities conducted in the TENORM slag hot spot areas 1-5 and throughout the site, and during Phase B excavations for RTIF infrastructure construction.

Grading in the area of the 5 pre-designated TENORM slag hot spots took place during Phase A of this project between September 11-26, 2014. Prior to initiating grading within each hot spot, GRD conducted a gamma walk-over survey of each area to re-establish the horizontal extent of each hot spot; refer to Appendix 7 for records of these surveys. Grading proceeded to the design sub-grade elevations in these areas, or as directed by the Geotechnical Engineer to remove geotechnically-unsuitable material below the sub-grade elevation. Once the desired elevation was reached, GRD performed gamma surveys to determine if Class 3 or 4 materials remained. Where post-grading gamma radiation levels exceeded 10,000 CPM, GRD calculated the level of shielding that would be provided by the cover system at that location in order to verify acceptable post-construction exposure levels for site workers. If acceptable exposure levels would not be afforded by the cover system, excavation of additional TENORM slag was performed until acceptable levels could be achieved. Refer to Figure 6 for the pre-determined TENORM slag hot spot locations. The actual location and extent of Class 3 and 4 material excavations at the Site are illustrated in Figure 9.

In addition to the TENORM hot spots, radiological screening of all material excavated during site grading and/or RTIF infrastructure construction was conducted and resulted in the identification and segregation of Class 3 or 4 material at various locations throughout the site.

All Class 3 and 4 materials excavated on the site were staged in one of the pre-designated staging areas until removal from the site for proper off-site disposal. As indicated above, the staging areas were scanned by GRD prior to and following complete removal of all radiological materials. GRD and Pinto worked together to ensure that all applicable safety measures associated with the staging areas were in place on a daily basis. This included covering, temporary fencing and proper labeling of the radiological material at the conclusion of each working day.

Historical utilities were encountered during excavation of the hot spots. Such were handled in accordance with the Buried Utility Plan. Refer to the Daily Field Reports for specific details pertaining to the historical utilities included as Appendix 13.

4.3.3.1 Disposal Details for Class 3 and 4 Material

Approximately 8,916 tons (5,856-Phase A and 3,060-Phase B) of Class 3 and 4 material was generated throughout the remedial construction phases of this project. Off-site transport and disposal of the Class 3 and 4 material was conducted over a series of separate load-out and shipping events. Refer to Appendix 19 for waste approval documentation. Such are detailed in the following narrative.

AMS Load Out Events

During Phase A of this project, AMS was contracted by GRD to conduct the radiological pre-screening and proper transport and disposal of Class 3 and 4 material from the project Site to the Waste Management landfill in New Springfield, Ohio. Approximately 4,617 tons of material was shipped via 194 US Bulk trucks to the landfill between September 30-November 25, 2014. AMS utilized a Canberra High-Purity Germanium in-situ Object Counting System meter to measure the radiation levels associated with each truckload of Class 3 and 4 material. Each side of the trucks were scanned in 5-foot increments and an average reading for each truckload was recorded and submitted to the landfill in real-time prior to the trucks departing for the landfill. Individual trucks were not released from the site until the landfill verified that radiation levels were below their acceptance limit. Refer to Appendix 20 for analytical reports, waste manifests and weight tickets associated with this overall load out event.

EQ Northeast Load Out Events

Due to scheduling issues with AMS and their transporter, a second and separate radiological material load out occurred during Phase A of this project. This load out was overseen by GRD following material disposal approval from EQ Northeast on December 5, 2014. Between December 15-31, 2014, 51 US Bulk trucks transported approximately

1,240 tons of Class 3 and 4 material to the EQ/Wayne Disposal, Inc. landfill in Belleville, Michigan. During the loading of each truck, excavator buckets were scanned by GRD to ensure that radiation levels in the trucks were below the landfill acceptance limits. Additionally, once each truck was loaded, GRD surveyed the load as an added measure to confirm compliance with landfill acceptance limits. Refer to Appendix 7 for truck surveys associated with Wayne Disposal landfill shipments. As of December 31, 2014, all radiological material excavated during Phase A of this project had been removed from the Site for proper off-site disposal. GRD conducted a close-out gamma walk-over survey of the radiological materials staging area on December 31, 2014. No concerns were identified. Refer to Appendix 7 for the survey records for the close-out of the staging area.

During the course of Phase B of this project, 14 separate radiological material load outs occurred. These load outs were overseen by GRD following re-approval from EQ Northeast on May 12, 2015. Between May 12 and July 22, 2015, 126 US Bulk trucks transported approximately 3,060 tons of Class 3 and 4 material to the EQ/Wayne Disposal, Inc. landfill in Belleville, MI. During the loading of each truck, excavator buckets were scanned by GRD to ensure that radiation levels in the trucks were below the landfill acceptance limits. Additionally, once each truck was loaded, GRD surveyed the load as an added measure to confirm compliance with landfill acceptance limits. Refer to Appendix 7 for truck surveys associated with Wayne Disposal landfill shipments. Close out gamma walk over surveys of the radiological material staging areas and decontamination pads associated with Phase B of this project were conducted on June 16, 2015 and July 22, 2015. All levels were identified within the background range previously established.

Refer to Appendix 20 for Certificates of Disposal, waste manifests and weigh tickets associated with these load out events.

4.3.4 Class 5 Material

Class 5 materials excavated from the Site consisted of non-impacted, native soil originating from deep excavations. Approximately 6,195 tons of Class 5 material was generated during excavation of various areas of the Site during Phase B of this project.

The location and extent of Class 5 excavation activities at the Site are illustrated in Figure 10.

4.3.4.1 Disposal Details for Class 5 Material

While a majority of the Class 5 material excavated was re-utilized on-Site (refer to the subsequent section for details), approximately 291 tons of Class 5 material were shipped to Allied by Pinto via Pariso and Mawhiney to be utilized at the landfill as daily cover material. Refer to Appendix 11 for waste manifests and weight tickets associated with the removal of Class 5 material during Phase B of this project.

4.3.4.2 On-Site Reuse of Class 5 Material

The majority of the Class 5 material removed during excavation activities, amounting to approximately 5,904 tons, was re-used on the project Site during Phase B to construct landscape berms and reach final grades in green space areas of the Site. Refer to Section 4.6 below for further details pertaining to re-use of the Class 5 material at the Site.

4.3.5 Concrete

Concrete and masonry materials generated from the demolition of the former locomotive house were staged on the concrete slab located in the south central portion of the Site between May-August 2013. This material was crushed on-site by Wargo between September 22-30, 2014. Covanta requested approval from NYSDEC to place the crushed concrete material on an adjoining property owned by Covanta that abuts the western boundary of the Site for the purpose of establishing a construction lay-down area to be utilized for the RTIF construction project and future WTE plant projects. As directed by NYSDEC, LaBella collected six representative samples of the material and submitted them to Alpha for chemical analysis. Upon NYSDEC review of the analytical results, approval was granted to Covanta on September 26, 2014 for placement of the crushed concrete in the off-site construction lay-down area. Wargo completed placement of the 2,463 tons of crushed concrete in the off-site construction lay-down area on September 30, 2014. Appendix 10 includes analytical results pertaining to the crushed concrete.

All other concrete generated from the removal of concrete slabs, foundation remnants and other structures (e.g., manholes, vaults, etc.) on the Site was transported to Swift River Associates, Inc. for temporary staging, crushing and subsequent transport back to the Site. As indicated above in Section 4.2.2, a pre-designated area was established at Swift River during project initiation for temporary storage of the concrete. The resulting crushed concrete was re-used below the cover system on the Site as described in the subsequent section.

4.3.5.1 On-Site Reuse of Concrete

The NYSDEC approved the re-use of the concrete crushed at Swift River at the Site without conducting analytical testing on the material under the condition that it be utilized beneath the final cover system established at the Site. Based on this requirement, LPC determined that the crushed concrete would be re-used during backfill of the new utility and storm water system trenches constructed throughout the Site. Approximately 2,856 cubic yards of crushed concrete was returned to the Site following processing at Swift River throughout the course of this project. A majority of the crushed concrete was staged on the western portion of the Site (Figure 11) and was utilized to backfill storm water management system trenches. Throughout the course of Phase B, LPC was able to re-use the entire amount of crushed concrete that had been staged on-Site. As each application of the crushed concrete was placed as backfill, SBJ conducted compaction testing to ensure that required compaction metrics were achieved. In all such instances, the material was deemed satisfactory.

4.3.5.2 Disposal Details for Concrete

While a majority of the concrete was reused on-Site, an incidental amount of concrete generated during remedial construction activities was intermingled with Class 1 material and disposed of with such. This material is included in the Class 1 totals identified above in Section 4.3.1.1.

4.3.6 Recycled Metals

Scrap metal (including fencing materials and buried steel beams) removed from various areas of the Site during excavation activities were placed into Pinto construction dumpsters located throughout the Site and transported to Niagara Metals for recycling. Furthermore, rail steel (including spikes) was transported directly to Niagara Metals for recycling. In total, approximately 539 tons of scrap metal/steel was removed from the Site during this project. It should also be noted that a small amount of rail steel was removed from the Site by CSX during Phase A. Such had been located proximate Track 266 and was subsequently stockpiled on the east adjoining CSX property.

4.3.7 Well Decommissioning

Ten permanent, groundwater monitoring wells (three one-inch flush mount wells and seven two-inch stick up wells) associated with the RI of the Site were tasked for decommissioning during Phase A of this project. Between October 1-2, 2014, nine of these wells were properly decommissioned by SJB with LaBella oversight. One of the one-inch flush mount wells previously installed at the Site proximate the south side of the former locomotive house could not be located during this work. The protective casing for this well may have been removed during the demolition of the locomotive house and efforts to locate the well were unsuccessful. All materials associated with the nine wells located on the Site were properly removed from the subsurface and the resulting boreholes were filled with a grout mixture. Removed well materials were scanned by GRD for gamma radiation prior to off-site transport to Allied Landfill as Class 1 material; no radiological concerns were identified. Refer to Appendix 21 for well decommissioning logs associated with this specific task and Figure 12 for the location of the former wells.

4.3.8 Structure Decommissioning

During the course of this project, 36 Structures were identified and fully decommissioned per recommendations provided by SJB. Refer to Table 3 for specific details pertaining to the decommissioning of each structure. Lastly, refer to Figure 13 for specific locations of the identified Structures.

4.3.8.1 Disposal Details Associated with Structure Decommissioning

Class 2 material was only identified in association with Structures #9 and #27; such material was transported off-site to Allied Landfill. In addition, Class 3/4 material was only identified in association with Structure #26; this material was staged in the radiological staging area on the north end of the Site during Phase A. During Phase A, all structure water was collected in frac tank 567B with the exception of Structure #20, Structure #27 and the side vault associated with Structure #9. As frac tank 567B was full prior to decommissioning these particular structures, such were dewatered to frac tank P101 (side vault associated with Structure #9 and Structure #27) and frac tanks 546C, 515C and P051 (Structure #20). During Phase B, all structure water was collected in frac tank 567B.

4.3.9 Construction Water Management

Construction water management for the duration of this project was coordinated through AECOM and executed by Pinto with field oversight by LaBella. Protocols for such are identified within the SWMP(s) created by IEG on behalf of Pinto.

It was anticipated that water would be encountered during remedial construction and RTIF construction activities throughout the course of this project. Various types of water were anticipated including excavation water (groundwater), structure water and/or decontamination water.

Groundwater that collected in excavations was observed for signs of contamination (e.g., discoloration, odor, sheen). Per the RAWP, groundwater that did not exhibit field evidence of impairment was pumped directly from the excavation, discharged to the ground surface of the Site and allowed to infiltrate the fill. No discharges were allowed to leave the Site. Groundwater that did exhibit field evidence of impairment was pumped from the excavation through bag filters and into frac tanks for characterization, pre-treatment, if necessary, and discharge to the John Avenue Sewer in accordance with Niagara Falls Water Board (NFWB) requirements. All fluids generated from the decommissioning and closure of the historic sewer proximate the former locomotive house and the various underground structures encountered across the site were also handled in this manner. Some dewatering fluid was transported to select frac tanks via a portable Baker tank rented by Pinto. Dewatering fluid stored in the Pinto dewatering box was also transferred to select frac tanks during the project.

Fluids collected in the frac tanks were sampled by IEG and analyzed for the following parameters, as prescribed by the NFWB, by Test America:

- VOCs
- Acid Extractable Organics
- Base/Neutral Extractable Organics
- PCBs and Pesticides
- Metals
- Total Phenols
- Soluble Organic Carbon
- Total Suspended Solids
- Phosphorus
- Cyanide
- Radionuclides
- pH

The resulting analytical data were reviewed by AECOM to determine the appropriate pre-treatment and/or discharge procedures necessary to satisfy NFWB requirements. Pre-treatment was required to address elevated pH levels in a number of the frac tanks, and is described in the subsections pertaining to individual tanks below. Following pre-treatment, IEG collected field measurements of pH to verify the effectiveness of the neutralization process, and submitted said results to AECOM for final discharge approval.

Upon approval of dewatering fluids for discharge to the NFWB system, Pinto recorded the date, volume, source tank and discharge location for each discharge of contained fluid. A total of seven frac tanks were utilized during the course of this project; four of which were utilized for two to three separate dewatering events. Appendix 22 includes discharge summary tables created by Pinto for each phase of the project. All dewatering fluids which met the NFWB criteria were properly discharged to MH C of the John Avenue sewer system located on-Site; refer to Figure 14 for the location of MH C.

Additionally, three temporary piezometers and three dewatering wells were installed at the Site on April 7 and 9, 2015. LPC decided to install such in an effort to further assist them in developing a more specific dewatering plan as it related to the work prescribed for Phase B of this project. Ultimately, such were installed but conditions did not necessitate their use. These temporary piezometers and dewatering wells were removed by Pinto following construction of the Contech storage system. All waste materials associated with the dewatering wells and piezometers were scanned by GRD and subsequently transported off-site to Allied as Class 1 material.

The following discusses the laboratory results of the analyses conducted on each frac tank and pre-treatment/discharge procedures that took place for each frac tank.

Frac Tank P051

Frac tank P051 was utilized for two separate dewatering events. The initial event was related to excavation water. LaBella requested testing of this tank due to petroleum-related concerns in the water. The concentration of all target analytes was below NFWB's limits for discharge loadings. As a result, the entire frac tank (5,000 gallons) was discharged to MHC on December 5, 2014. The second event was related to structure water. It should be noted that sampling results for the second event associated with P051 (and 515C) were actually taken as a representative sample from frac tank #546C as the water in each tank originated from the same structure.   The concentration of all target analytes was below NFWB's limits for discharge loadings with the exception of elevated chromium. As a result, this frac tank was discharged in conjunction with 546C and 515C over a two-day period to MH C between January 12-13, 2015. More specifically, a majority of P051 (3,500 gallons) was discharged on January 12, 2015. It should also be noted that the interior of P051 contained ice build-up that was subsequently thawed, resulting in an additional discharge of 1,500 gallons to MH C on April 17, 2015.

In addition to elevated chromium levels, the pH of this frac tank's second event initially tested caustic (12.9 SUs). As a result, neutralization measures were taken to stabilize the pH of the frac tank (refer to Appendix 23 for the pH Stabilization Report.) This included mixing sulfuric acid (93% sulfuric acid in 5-gallon pails) and sodium bicarbonate (in 50-pound bags) into the frac tank until a stable pH could be achieved. The final pH of this frac tank was identified as 8.6 SUs.

Frac Tank P101

Frac tank P101 was utilized for three separate dewatering events. The initial event was related to decommissioning of the historic sewer system proximate the former locomotive house. LaBella requested testing of this tank due to petroleum-related concerns in the water. The concentration of all target analytes was below NFWB's limits for discharge loadings with the exception of elevated radium levels. As a result, dilution of the water was required by the NFWB. Approximately 6,000 gallons of potable water from the hydrant on the west adjoining Covanta plant was added to the 9,000 gallons of frac tank water (totaling 15,000 gallons) and discharged to MH C on November 18, 2014. The second event was related to structure water. The concentration of all target analytes was below NFWB's limits for discharge loadings. As a result, a majority of the frac tank (9,000 gallons) was discharged to MHC on January 7, 2015. It should be noted that the interior of P101 contained ice build-up that was subsequently thawed, resulting in an additional discharge of 1,000 gallons to MH C on April 14, 2015.

The third event was related to excavation water from small excavations exhibiting petroleum-related concerns during Phase B of this project. While this water was temporarily stored in P101, such was moved to 515C on June 22, 2015. The concentration of all target analytes was below NFWB's limits for discharge loadings. As a result, the frac tank (5,940 gallons) was discharged to MH C on August 18, 2015.

Frac Tank 546C

This frac tank was utilized for structure water only. The concentration of all target analytes was below NFWB's limits for discharge loadings with the exception of elevated chromium. It should be noted that sampling results for this frac tank were utilized as representative samples for P051 and 515C as well, as the water in each tank originated from the same structure. As a result, this frac was discharged in conjunction with P051 and 515C over a two-day period to MH C between January 12-13, 2015. More specifically, 1,000 gallons were discharged on January 12, 2015, and an additional 13,340 gallons were discharged on January 13, 2015. It should also be noted that the interior of 546C contained ice build-up that was subsequently thawed, resulting in an additional discharge of 5,660 gallons to MH C on April 15, 2015.

In addition to elevated chromium levels, the pH of this frac tank initially tested caustic (12.7 SUs). As a result, neutralization measures were taken to stabilize the pH of the frac tank. This included mixing sulfuric acid (93% sulfuric acid in 5-gallon pails) and sodium bicarbonate (in 50-pound bags) into the frac tank until a stable pH could be achieved. The final pH of this frac tank was identified as 7.4 SUs.

Frac Tank 515C

Frac tank 515C was utilized for three separate dewatering events. The initial event was related to decommissioning of the historic sewer system. LaBella requested testing of this tank due to petroleum-related concerns in the water. The concentration of all target analytes was below NFWB's limits for discharge loadings. As a result, the entire frac tank (20,000 gallons) was discharged to MH C on November 15, 2014. The second event was related to structure water. It should be noted that sampling results for the second event associated with 515C (and P051) were actually taken as a representative sample from frac tank #546C as the water in each tank originated from the same structure. The concentration of all target analytes was below NFWB's limits for discharge loadings with the exception of elevated chromium. As a result, this frac tank was discharged in conjunction with 546C and P051 over a two-day period to MHC between January 12-13, 2015. More specifically, 515C (10,000 gallons) was discharged on January 12, 2015. It should be noted that the interior of 515C contained ice build-up that was subsequently thawed, resulting in an additional discharge of 3,950 gallons to MH C on April 16, 2015.

In addition to elevated chromium levels, the pH of this frac tank's second event initially tested caustic (12.8 SUs). As a result, neutralization measures were taken to stabilize the pH of the frac tank. This included mixing sulfuric acid (93% sulfuric acid in 5-gallon pails) and sodium bicarbonate (in 50-pound bags) into the frac tank until a stable pH could be achieved. The final pH of this frac tank was identified as 8.1 SUs.

The third event was related to excavation water from small excavations exhibiting petroleum-related concerns during Phase B of this project. While this water was temporarily stored in P101, such was moved to 515C on June 22, 2015. The concentration of all target analytes was below NFWB's limits for discharge loadings. As a result, the frac tank (5,940 gallons) was discharged to MHC on August 18, 2015.

Frac Tank 567B

Frac tank 567B was utilized for structure water only. However, such included two separate dewatering events; one for each phase of the project. Pertaining to the initial event, the concentration of all target analytes was below NFWB's limits for discharge loadings with the exception of elevated chromium. As a result, the frac tank was discharged over a two-day period to MH C between January 7-8, 2015. Approximately 8,388 gallons were discharged each day. It should be noted that the interior of 567B contained ice build-up that was subsequently thawed, resulting in an additional discharge of 3,225 gallons to MH C on April 16, 2015.

In addition to elevated chromium levels, the pH of this frac tank initially tested caustic (12.3 SUs). As a result, neutralization measures were taken to stabilize the pH of the frac tank. This included mixing sulfuric acid (93% sulfuric acid in 5-gallon pails) and sodium bicarbonate (in 50-pound bags) into the frac tank until a stable pH could be achieved. The final pH of this frac tank was identified as 6.7 SUs.

Pertaining to the second event, the concentration of all target analytes was below NFWB's limits for discharge loadings; however, chromium was identified just below NFWB limits. As a result, the frac tank was discharged over a two-day period to MH C between August 18-19, 2015. Approximately 4,311 gallons were discharged each day.

In addition to slightly elevated chromium levels, the pH of this frac tank initially tested caustic (12.22 SUs). As a result, neutralization measures were taken to stabilize the pH of the frac tank. This included mixing sulfuric acid (93% sulfuric acid in 5-gallon pails) and sodium bicarbonate (in 50-pound bags) into the frac tank until a stable pH could be achieved. The final pH of this frac tank was identified as 7.82 SUs.

Frac Tank 523B

This frac tank was utilized for excavation water only. Excavation water pumped into this particular tank came from an area which had exhibited high pH in the groundwater. Per the NYSDEC, this water was to be containerized and treated accordingly prior to discharge back to the ground surface. Per analytical results, the pH of this frac tank initially tested at 12.8 SUs. As a result, neutralization measures were taken to stabilize the pH of the frac tank. This included mixing sulfuric acid (93% sulfuric acid in 5-gallon pails) and sodium bicarbonate (in 50-pound bags) into the frac tank until a stable pH could be achieved. The final pH of this frac tank was identified as 7.85 SUs.

Per AECOM, this tank was discharged to MH C in accordance with NFWB procedures. The entire frac tank (10,000 gallons) was discharged to MHC on December 3, 2014.

Frac Tank 571B

This frac tank was utilized for excavation water only. LaBella requested testing of this tank due to petroleum-related concerns in the water. However, it should be noted that sampling results associated with 571B were actually taken as a representative sample from the first event associated with frac tank P051 as the water in each tank originated from the same excavation. The entire frac tank (2,000 gallons) was discharged to MH C on November 26, 2014.

This frac tank was inadvertently discharged to MH C prior to approval of P051 by the NFWB. However, analytical results for P051 did not identify any contaminants of concerns that would have required a limitation on discharge volume for the tank or dilution of the water prior to discharge.

Rail Scale Pit #1 (Structure #9)

Due to the large volume of structure water (40,000 gallons) located within rail scale pit #1, it was decided that such would be discharged directly to MH C via a portable Baker tank owned by Pinto. As a result of this decision, the water from this structure was tested on October 7, 2014. The concentration of all target analytes was below NFWB's limits for discharge loadings; however, due to the sheer volume of water within the structure, all 40,000 gallons were discharged over a three-day period to MH C from November 12-14, 2014. More specifically, discharge volumes included 4,000 gallons on the 12th, 16,000 gallons on the 13th and 20,000 gallons on the 14th.

The following table illustrates information pertaining to the frac tanks and their means of utilization.

Tank #	Total Water Volume in Tank	Source of Water	Water Sample		Date Discharged Approved by NFWB	Date and Volume Discharged
			Sample ID	Sample Date		
#P051	5,000 gallons	Excavation water	PW4	11/5/14	12/4/14	5,000 gallons on 12/5/14
#P051	5,000 gallons	Structure water	PW-7	12/19/14	1/9/15	3,500 gallons on 1/12/15 and 1,500 gallons on 4/17/2015
#P101	9,000 gallons	Excavation water	PW-3	10/10/14	11/17/14	15,000 gallons (9,000 gallons + 6,000 gallons of fresh water) on 11/18/14
#P101	10,000 gallons	Structure water	PW-6	12/17/15	1/6/15	9,000 gallons on 1/7/15 and 1,000 gallons on 4/14/15
#P101	5,940	Excavation Water	UPW-4S	7/10/15	8/13/15	5,940 gallons on 8/18/15
#546C	20,000 gallons	Structure water	PW-7	12/19/14	1/9/15	14,340 gallons between 1/12/15-1/13/15 and 5,660 gallons on 4/15/15
#515C	20,000	Excavation water	PW-2	10/10/14	11/12/14	20,000 gallons on 11/15/14

Tank #	Total Water Volume in Tank	Source of Water	Water Sample		Date Discharged Approved by NFWB	Date and Volume Discharged
#515C	10,000 gallons	Structure water	PW-7	12/19/14	1/9/15	10,000 gallons of 1/12/15 and 3,950 gallons on 4/16/15
#515C	5,940	Excavation Water	UPW-4S	7/10/15	8/13/15	5,940 gallons on 8/18/15
#567B	20,000 gallons	Structure water	PW-5	12/11/14	1/6/15	16,775 gallons between 1/7/15-1/8/15 and 3,225 gallons on 4/16/15
#567B	8,622 gallons	Structure Water	UVW-2	7/10/15	8/13/15	8,622 gallons between 8/18/15-8/19/15
#523B	10,000 gallons	Excavation water	CW-1	9/25/14	Not applicable	10,000 gallons on 12/3/14
#571B	2,000 gallons	Excavation water	PW-4	11/5/14	12/4/14	2,000 gallons on 11/26/14
Rail Scale Pit #1	40,000 gallons	Structure Water	PW-1	10/7/14	10/28/14	40,000 gallons between 11/12/14-11/14/14

Sediment cleaned out of the portable Baker tank and frac tanks following the final discharge of their contents was placed into a Pinto dewatering box and transported to Allied as either Class 1 or Class 2 material. These material amounts are included in the overall Class 1 and Class 2 tonnages identified above in Section 4.3. Once the frac tanks, portable Baker tank and dewatering box had been decontaminated, radiological exit surveys were conducted by GRD prior to off-site transport of such. No concerns were identified. Refer to Appendix 7 for records associated with these surveys.

4.4 REMEDIAL PERFORMANCE/DOCUMENTATION SAMPLING

In order to verify the effectiveness of the cover system constructed on the Site, a post-remedial radiological survey of the Site was performed by GRD following completion of site cover system construction. The survey results indicated that the post-remediation gamma levels measured above the site cover system are generally consistent with natural gamma radiation background levels for the western New York area, which range from 5,000-7,000 cpm. Furthermore, a comparison of the survey results with applicable occupational and public exposure limits established by the Nuclear Regulatory Commission (NRC) and New York State Department of Health (NYSDOH) indicates that gamma radiation levels detected above the site cover system are substantially below the levels that would represent a concern for site workers or the public. A copy of the GRD report is included in Appendix 7.

4.5 IMPORTED BACKFILL

During the course of this project, various types of imported backfill were utilized throughout the Site. For each type/source of backfill, one of the following was completed prior to importing the backfill.

a. Documentation was provided as to the source of the material and the consistency of the material in accordance with the exemption for no chemical testing listed in DER-10 Section 5.4(e) (5); or,

b. Chemical testing was completed in accordance with the following table:

Recommended Number of Soil Samples for Soil Imported To or Exported From a Site			
Contaminant	**VOCs**	**SVOCs, Inorganics & PCBs/Pesticides**	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER		

*Taken from DER-10-Table 5.4(e)10

The following imported backfill materials were utilized at the Site for activities such as backfilling excavations, bedding rail lines, utilities and infrastructure, and decommissioning structures, sewers and wells; total quantities included:

- clean top soil (2,064 tons);
- concrete sand (136 tons);
- #1-inch crusher run stone (5,735 tons);
- #2-inch crusher run stone (71,892 tons);
- #1 bedding stone (5,382 tons);
- light/medium fill stone (2,425 tons);

- #57 crushed drainage stone (mix of #1-inch and #2-inch crusher run stone) (6,984 tons);
- rail ballast (9,916 tons);
- Dry 3-4 mix (619 tons);
- asphalt pavement (6,478 tons); and,
- Poured concrete (5,192 cubic yards).

Imported stone backfill and asphalt pavement was provided by the LaFarge Aggregates & Concrete quarry in Lockport, New York; rail ballast was provided by the Buffalo Crushed Stone quarry in Lancaster, New York; poured concrete was provided by LaFarge and/or United Materials in North Tonawanda, New York; and clean top soil was provided from the Pinto construction yard in Buffalo, New York.

Submittals summarizing chemical analytical results for backfill, in comparison to allowable levels, are provided in Appendix 24.

In addition to the above-mentioned imported backfill, the following materials were imported to the Site for various applications during remedial construction activities.

Mirafi 140N non-woven drainage separation fabric was utilized during activities such as backfilling excavations and decommissioning of select Structures. The extent to which this material was utilized was at the discretion of SJB based on geotechnical requirements encountered throughout the Site. Additionally, Mirafi 600X woven geotextile fabric was utilized as a stabilizer beneath asphalt paved areas of the Site. Furthermore, Tensar TriAx TX5 geogrid was utilized as a stabilizer beneath the sub-grade stone base placed for the concrete pad areas on the Site and as a demarcation layer on the south end of the Site. Moreover, BX114GG BiAxial geogrid was utilized as a base reinforcement in order to improve sub-grade conditions beneath the new RTIF building. Lastly, a lawn seed mix including a seed fertilizer was applied to areas of the site that received clean cover soil.

Mirafi 140N and 600X were provided by the Allied Building Products Corporation in Cheektowaga, New York. Tensar TriAx TX5 geogrid was provided by

Everett J. Prescott, Inc. in Blasdell, New York. BX114GG BiAxial geogrid was provided by K&S Contractor Supply, Inc. in Lancaster, New York. Lawn seed mix including seed fertilizer was provided by Preferred Seed in Buffalo, New York.

4.6 CONTAMINATION REMAINING AT THE SITE

Per the RAWP, the approved remedy for the Site was "Selected Fill Removal and Cover System Installation." Remediation at the Site included removal and disposal of fill material excavated to facilitate site redevelopment (i.e. for the construction of the storm water management system, utilities (including poles), general grading, a truck scale, a diesel fueling station, a storm water overflow basin, bollards and building(s)) and removal and disposal of grossly contaminated fill impacted with significant nuisance characteristics in the area of the former UST field proximate the southeast corner of the former locomotive house. Specific details pertaining to the work conducted in an effort to facilitate site redevelopment are discussed later in this section.

This remedy reduces the toxicity, mobility and volume of impacted media via removal of a portion of the fill from the Site and effectively reduces or eliminates potential exposure routes through the construction of a cover system; the placement of an environmental easement; annual certification of the IC/ECs; and the implementation of an SMP. Such items will be discussed in greater detail in latter sections of this report.

With the exception of several areas of the Site where utility excavations were advanced to the depth where native, clean material was encountered (Class 5 material), contaminated fill remains beneath the cover system established throughout the Site. Based upon the RI, the contaminated fill that remains below the cover system contains SVOC and metals at concentrations exceeding the industrial use SCOs, as well as TENORM slag. Since contaminated soil/fill remains beneath the Site after completion of the Remedial Action, Institutional and Engineering Controls are required to protect human health and the environment. These ECs/ICs are described in Sections 4.7 and 4.8. Long-term management of these EC/ICs and residual contamination will be performed under the SMP approved by the NYSDEC.

The following narrative discusses the work conducted at the Site to facilitate Site redevelopment during Phases A and B of this project, and relates details pertaining to the remaining contamination associated with each major component of site redevelopment.

4.6.1 Phase A

During Phase A, vegetation, railroad tracks/ties, debris (e.g., railroad ties, demolition debris, etc.) and surface soil/fill was removed from the site in conjunction with site-wide grading. Additionally, areas of subsurface soil/fill determined by the Geotechnical Engineer to be unsuitable for the planned RTIF components were excavated or "undercut" to the depths at which suitable soils were encountered. Clean, 2-inch crusher run stone backfill was placed and compacted across the site to the design sub-grade elevation and all undercuts were likewise backfilled with clean stone backfill to the prescribe sub-grade elevation. The thickness of the clean stone fill placed during Phase A is shown on Figure 15.

4.6.2 Phase B

4.6.2.1 Storm Water Management System

The storm water system was installed by Kandey and Pinto per AECOM's design and the supervision of a Licensed Plumber from MLP. Overall system installation included the main trunk line, lateral lines (6 and 8-inch corrugated piping), MHs, catch basins, stormceptors, underdrain and the Contech storage system. Such also included rehabilitation of active MHs C and D of the City of Niagara Falls John Avenue Sewer System. The storm water system was constructed at the Site between April 18-August 3, 2015. Several components of the overall storm water system were excavated into the native Class 5 material and/or to bedrock at the Site. This included but was not limited to, the Contech storage system, MHs 110-114 and Stormceptors 1 and 2. Following placement of these components, clean stone fill and/or crushed concrete originating from the site was used to backfill around the newly installed structures. See Section 4.5 above pertaining to the various types of imported backfill utilized at the Site.

The remaining components of the overall storm water system (including all of the piping) were excavated and placed at various depths within the contaminated fill layer located throughout the Site. Prior to placing these components, Mirafi 140N non-woven drainage separation fabric was placed in the bottom of the excavation followed by at least 6 inches of #1 bedding stone. Figure 16 identifies the depth to top of contaminated fill material that remains beneath select components of the Storm Water system throughout the Site.

A pre-assembled monitoring station building was placed at the Site proximate MH 114 where the new storm water system is connected to the NFWB John Avenue Sewer system. Work associated with the placement and connection of this building to the storm water system was conducted between August 12-November 13, 2015. Excavation activities associated with placement of this building were conducted by Pinto, foundation work was conducted by LPCC, placement and connection of the building was conducted by Kandey, electrical was conducted by CIR and plumbing was conducted by MLP. Figure 16 identifies the depth to the top of contaminated fill material which remains beneath the monitoring station building.

A storm water overflow basin was constructed at the Site by Pinto. The overflow basin was constructed and connected to the storm water system between June 22-July 2, 2015. Per the RAWP, construction of the overflow basin was to include excavation to specified elevations within the contaminated fill layer followed by placement of a demarcation layer (i.e. orange fencing) and 12 inches to top soil. Upon completion of the excavation into the contaminated fill layer, LaBella identified concerns relating to the slag fill substrate and potential erosion of the planned overlying top soil cover. As an alternative, LaBella submitted a request to the NYSDEC on June 26, 2015, to use Mirafi 140N non-woven drainage separation fabric as the demarcation layer and at least 12 inches of 3-8-inch clean stone fill in lieu of orange fencing and top soil. It was agreed that this alternative would be more practical and would minimize erosion of the cover material along the side-slopes of the overflow basin, and the NYSDEC approved this substitution on June 29, 2015. See Appendix 25 for correspondence related to this change in scope. Figure 16 identifies the depth to top of contaminated fill material which remains beneath the area of the storm water overflow basin.

4.6.2.2. Rail Yard

Six sets of railroad tracks were constructed at the Site by Amtrac under the direction of Lee Fulton Associates (and to some extent, CSX Transportation). Such work was conducted between May 26 and approximately September 11, 2015. This included main line Tracks #1 through #5 on the eastern/central portion of the Site and the Special Services Track (SS Track) on the western portion of the Site. It should be noted that CSX Transportation completed construction of two turn-outs from Track 266 just north of the Site boundary; one turn-out for the main lines (Tracks #1-5) and one turn-out for the SS Track. Prior to assembly of the tracks, Pinto placed six inches of clean 2-inch crusher run sub-ballast. Thereafter, Amtrac installed the various components including railroad ties, rail steel and plates/spikes. Following placement of the rail steel along the designated track routes, two independent rail steel inspections were conducted by TRAC and Progress Rail. Based upon the results of those inspections, select pieces of rail steel which did not meet thickness requirements were replaced prior to assembly. Amtrac then proceeded in a southerly direction from the north end of the Site assembling each of the rail lines. Assembly within the area of the main rail lines also included switches and timber crossings both on the north and south ends of the Site. Once the rail lines were assembled, such were flooded with Area 5 or Arema 4A ballast stone and tampered to required specifications; this included the recesses between each set of tracks. Lastly, Amtrac installed a bumper at the southern-most point of the tail-end track and SS Track. Figure 16 identifies the depth to top of contaminated fill material which remains beneath the area of the rail lines throughout the Site.

A portion of the Site located between Track #5 and the eastern Site boundary was originally prescribed to receive top soil which included seeding and fertilization of such. Upon further discussion, it was determined that placing clean 2-inch crusher run stone in this area would be more practical relative to operation and maintenance of the rail yard. Consequently, an additional 6 inches of clean 2-inch crusher run stone was added to the previously-placed, clean stone along this stretch of the Site in order to meet the 12-inch thickness requirement for final Site cover. Such was conducted by Pinto between September 28-29, 2015. Figure 16 identifies the depth to top of contaminated fill material which remains beneath the eastern stone area at the Site.

Toward the latter stage of Phase B, 12 inches of clean, #57 crushed drainage stone was placed on the southern end of the Site, just south of the southern turn-around concrete pad. Prior to placement of this stone, vegetation was cleared from this area and a demarcation layer (Tensar TriAx TX5 geogrid) was installed directly on top of the contaminated fill material located in this area of the Site. Refer to Figure 18 for the specific location of this stone placement. Also, Figure 16 identifies the depth to top of contaminated fill material that remains beneath the southern area of clean stone cover.

4.6.2.3 Earthen Berms

Native, Class 5 material excavated during storm water system work was re-used on-site to the greatest extent practical to construct two berms (northeast berm and northwest berm), a snow storage area on the northern portion of the Site, and a grass area along the western Site boundary between the SS track and new fence line. Construction of the berms, snow storage area and western grass area was handled by Pinto and occurred between April 23 and approximately October 6, 2015.

The Class 5 material utilized in these areas was chemically characterized to verify compliance with DER-10 requirements for use as site cover material. IEG collected samples from the Class 5 stockpile and two northern berms on September 15 and 17, 2015, respectively. Based on analytical results, the Class 5 material was deemed satisfactory for use as clean cover soil. Consequently, only 4 inches of clean top soil was placed on top of the Class 5 cover areas to support vegetative growth.

As indicated above in Section 4.5, top soil utilized at the Site was transported from the Pinto construction yard in Buffalo, New York. In addition to chemical analysis of this imported material, GRD conducted radiological screening of the material during load outs at the Pinto construction yard prior to delivery to the Site. See Appendix 7 for

GRD surveys pertaining to this work and transport documentation pertaining to the movement of this material. Lastly, the top soil was seeded and fertilized. It should be noted that LaBella submitted a request to the NYSDEC on June 26, 2015, to eliminate the demarcation layer in areas of Class 5 reutilization as such were constructed of non-impacted, native overburden generated from deep excavations at the Site. The NYSDEC approved this substitution on June 29, 2015. See Appendix 25 for correspondence related to this change in scope. Figure 16 identifies the depth to top of contaminated fill material which remains beneath the areas of the berms, snow storage area and grassy area.

4.6.2.4 RTIF Building

A new RTIF building was constructed at the Site proximate the former location of the locomotive house between June 9-October 30, 2015. Excavation activities associated with completion of the building were conducted by Pinto, plumbing was completed by MLP, electrical was completed by CIR, foundation components were completed by LPCC and PEMB assembly was completed by Tedesco and Picard construction. A majority of this building was constructed on top of clean 2-inch crusher run stone that was placed following the Class 2 excavation in this area during Phase A of this project, much of which was excavated into the Class 5, native overburden in this area. Select areas of the new building footprint including the western and northwestern edges were constructed within the contaminated fill layer at the Site. Site cover elements associated with the new building include BX114GG BiAxial geogrid which was utilized as a base reinforcement in order to improve sub-grade conditions beneath the building and a concrete slab-on-grade foundation. Figure 16 identifies the depth to top of contaminated fill material which remains beneath the new RTIF building.

4.6.2.5 Utility Poles and Bollards

Numerous utility poles and bollards were placed throughout the Site to various depths by Pinto between June 22 and approximately October 30, 2015. While some of the poles and/or bollards were placed into the Class 5, native overburden, most were placed within the contaminated fill layer at the Site.

4.6.2.6 Truck Scale

A truck scale was constructed at the Site between July 1 and approximately September 24, 2015. Excavation activities associated with completion of the scale were conducted by Pinto, electrical was conducted by CIR and Precision, and overall scale construction was conducted by Frantz and Precision. Following placement of clean 2-inch crusher run by Pinto, Frantz constructed the forms for the scale concrete wash-out pad and footers prior to such being poured. Following placement of the scale over top of the wash-out pad, the ramps, approaches, RFID readers and radiation detector were put into place. Figure 16 identifies the depth to top of contaminated fill material which remains beneath the scale.

4.6.2.7 Exterior Concrete Pads and Asphalt Pavements

Various concrete pads were constructed throughout the Site between July 7-October 27, 2015. This work was completed by Northland and/or LPCC. The various concrete pads constructed at the Site included the reach stacker pad, the temporary container storage pad, the southern truck turn-around pad, the new RTIF building floor slab (including exterior aprons), the monitoring station building pad, the diesel fueling station foundation pad and the truck scale foundation components. Prior to Northland and/or LPCC forming the pad areas, Pinto placed a stabilizing demarcation layer of Tensar TriAx TX5 geogrid followed by at least 12 inches of 2-inch crusher run sub-base. Once pad areas were properly formed, Northland and/or LPCC proceeded with pouring concrete in designated sections. Figure 16 identifies the depth to top of contaminated fill material which remains beneath the various concrete pads located throughout the Site.

Asphalt paving was completed throughout various areas of the Site by Del Prince between August 17-November 10, 2015. Paving included application of a binder, base course and top course on top of the previously-placed stone sub-base. Figure 16 identifies the depth to top of contaminated fill material which remains beneath the various asphalt-paved areas located throughout the Site.

4.6.2.8 Diesel Fueling Station

The diesel fueling station was constructed at the Site between October 7-November, 9, 2015. Excavation activities for the fueling station foundation were conducted by Pinto. The excavation was then backfilled and tampered with clean imported backfill. The foundation and piers were formed and poured by LPCC, the electrical was conducted by CIR and the plumbing was conducted by MLP. Figure 16 identifies the depth to top of contaminated fill material which remains beneath the diesel fueling station.

4.6.2.9 Utilities

Several utilities were installed in the subsurface of the Site related to overall Site redevelopment including natural gas lines, electrical lines, water lines and sewer lines. More specifically, sewer components included an oil/water separator that receives waste water from the operation and maintenance areas of the new RTIF building via floor drains and a grinder pump that handles sanitary wastewater from the new RTIF building prior to discharge to the City of Niagara Falls sewer system via a force main located at the Site. Such activities were conducted by one or more of the following entities: Pinto, Kandey, CIR and MLP. Depending on the type of utility being installed in the subsurface, various types of imported stone backfill were placed beneath the utility on top of the contaminated fill layer to varying thicknesses prior to placing said utility. Such stone backfill serves as a demarcation layer. The only exception to this would be the placement of electrical duct banks by CIR. Once Pinto completed the excavation for such, the electrical duct banks were placed directly on top of the contaminated fill layer. LPCC then pour concrete into the trenches encasing the duct banks. Figure 16 identifies the depth to top of contaminated fill material which remains beneath the various utilities placed throughout the Site.

4.6.2.10 Fencing

Select stretches of old fencing located along the Site boundary were removed during each of the remedial construction phases and replaced with new fencing by Pinto.

4.7 SITE COVER SYSTEM

Since residual contamination exists in the soil/fill at the Site, Engineering Controls (EC) are required to protect human health and the environment. As indicated in the RAWP, exposure to remaining contamination in soil/fill at the Site is prevented by a site cover system placed over the Site. The cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity as defined in the SMP. This plan also addresses inspection procedures that must occur after any severe weather condition has taken place that may affect on-Site ECs. As mentioned above in Section 4.6, this cover system is comprised of clean quarry stone (e.g., crushed stone, stone rip rap and railroad sub-ballast and ballast), asphalt, concrete, and clean soil. Cover system details include the following:

Cover Type	Cross-Section
Asphalt	Top Course-1.5 inches Binder-3.5 inches Base Course-4 inches Subbase-12 inches
Railroad Ballast	Ties intermixed with ballast-7 inches Ballast-6 inches Sub-ballast-4 inches
Concrete	*Concrete-4 to 20 inches Subbase-12 inches (min)
Clean Stone/Soil	Clean Stone/Soil-12 inches (min)

*Concrete thickness varies depending on the particular concrete structure, but combined thickness of all concrete slabs and underlying clean stone subbase material is a minimum of 20 inches. Refer to Figure 17.

In areas covered by clean soil, such was graded, seeded and fertilized. In the case of the railroad ballast, asphalt and concrete, sub-base layers for each medium were placed on top of the clean crushed stone layer installed during Phase A of the project in accordance with standard construction practices.

Figure 17 shows the as-built cross sections for each remedial cover type used on the Site. Figure 18 shows the location of each cover type built at the Site. An Excavation Work Plan, which outlines the procedures required in the event the cover system and/or underlying residual contamination are disturbed, is provided in Appendix B of the SMP.

4.8 INSTITUTIONAL CONTROLS

The Site remedy requires an environmental easement be placed on the property that:

- requires the remedial party or Site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3);
- allows the use and development of the Site for industrial uses as defined by Part 357-1.8(g);
- restricts the use of groundwater as a source of potable or process water, without the necessary water quality treatment as determined by the NYSDOH or Niagara County DOH; and,
- requires compliance with the NYSDEC approved SMP.

The environmental easement for the Site was executed by the Department on June 26, 2014, and filed with the Niagara County Clerk on July 18, 2014. The County Recording Identifier number for this filing is 2014-11633. A copy of the easement and proof of filing is provided in Appendix 2.

4.9 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

As discussed in Section 4.6 above, two deviations occurred from the RAWP. Such included the following:

1. Cover System for Storm Water Overflow Basin-Per the RAWP, construction of the storm water overflow basin was to include excavation to specified elevations within the contaminated fill layer followed by placement of a demarcation layer (i.e. orange fencing) and 12 inches of top soil. As a result of concerns relating to the potential for erosion of the top soil cover on the side slopes of the overflow basin, LaBella submitted a request to the NYSDEC on June 26, 2015, to substitute Mirafi 140N non-woven drainage separation fabric as the demarcation layer and at least 12 inches of 3-8-inch clean stone fill for the orange fencing and top soil, respectively. The NYSDEC approved this substitution on June 29, 2015. See Appendix 25 for correspondence related to this change in scope.

2. Elimination of Demarcation Layer on the Berms-LaBella submitted a request to the NYSDEC on June 26, 2015, to eliminate the demarcation layer in areas of Class 5 reutilization as such were constructed of non-impacted, native overburden generated from deep excavations at the Site. The NYSDEC approved this request on June 29, 2015. See Appendix 25for correspondence related to this change in scope.

TABLES

Table 1

Analytical Parameters	Surface Fill/Soil [1]	Subsurface Fill/Soil [1]	Groundwater [2]	
			Perched	Overburden
Volatile Organic Compounds (VOCs)				
Acetone		X [3]		X
n-Propylbenzene			X	
Semi-Volatile Organic Compounds (SVOCs)				
Benzo(a)anthracene	X			
Benzo(b)flouranthene	X			
Benzo(a)pyrene	X	X		
Indeno(1,2,3-cd)pyrene	X			
Dibenzo(a,h)anthracene	X			
Pesticides and PCBs				
Alpha-BHC	X			
Delta-BHC	X			
Dieldrin	X			
Metals				
Arsenic	X	X	X	
Aluminum			X	X
Barium			X	
Chromium			X	
Iron			X	X
Magnesium			X	X
Manganese	X	X	X	
Sodium			X	X
Vanadium			X	
Other				
Gamma Radiation	X [4]	X [4]		

[1] Exceedance of NYCRR Part 375-6.8(b) Industrial Soil Cleanup Objectives

[2] Exceedance of NYSDEC TOGS 1.1.1 Groundwater Standards

[3] Exceedance of NYSDEC CP-51 Soil Cleanup Levels for Gasoline Contaminated Soils

[4] Exceedance of background level

Table 2

(b) Restricted use soil cleanup objectives.

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Metals							
Arsenic	7440-38-2	16[f]	16[f]	16[f]	16[f]	13[f]	16[f]
Barium	7440-39-3	350[f]	400	400	10,000 [d]	433	820
Beryllium	7440-41-7	14	72	590	2,700	10	47
Cadmium	7440-43-9	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent [h]	18540-29-9	22	110	400	800	1[e]	19
Chromium, trivalent [h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50-8	270	270	270	10,000 [d]	50	1,720
Total Cyanide [h]		27	27	27	10,000 [d]	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63[f]	450
Manganese	7439-96-5	2,000[f]	2,000[f]	10,000 [d]	10,000 [d]	1600[f]	2,000[f]
Total Mercury		0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	7440-02-0	140	310	310	10,000 [d]	30	130
Selenium	7782-49-2	36	180	1,500	6,800	3.9[f]	4[f]
Silver	7440-22-4	36	180	1,500	6,800	2	8.3
Zinc	7440-66-6	2200	10,000 [d]	10,000 [d]	10,000 [d]	109[f]	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	93-72-1	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e]	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e]	136
4,4'- DDD	72-54-8	2.6	13	92	180	0.0033 [e]	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04[g]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47	1.3	2.9

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
delta-BHC	319-86-8	100[a]	100[a]	500[b]	1,000[c]	0.04[g]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000[c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan II	33213-65-9	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	1031-07-8	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2
Semivolatiles							
Acenaphthene	83-32-9	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	208-96-8	100[a]	100[a]	500[b]	1,000[c]	NS	107
Anthracene	120-12-7	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	56-55-3	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	50-32-8	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1[f]	3.9	56	110	NS	1[f]
Dibenz(a,h)anthracene	53-70-3	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	206-44-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	86-73-7	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd)pyrene	193-39-5	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	91-20-3	100[a]	100[a]	500[b]	1,000[c]	NS	12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
o-Cresol	95-48-7	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	106-44-5	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	85-01-8	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	108-95-2	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	129-00-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Volatiles							
1,1,1-Trichloroethane	71-55-6	100[a]	100[a]	500[b]	1,000[c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33
1,2-Dichlorobenzene	95-50-1	100[a]	100[a]	500[b]	1,000[c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02[f]
cis-1,2-Dichloroethene	156-59-2	59	100[a]	500[b]	1,000[c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	100[a]	500[b]	1,000[c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1[e]	0.1[e]
Acetone	67-64-1	100[a]	100[b]	500[b]	1,000[c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100[a]	100[a]	500[b]	1,000[c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100[a]	100[a]	500[b]	1,000[c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100[a]	100[a]	500[b]	1,000[c]	100[a]	0.12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Methyl tert-butyl ether	1634-04-4	62	100[a]	500[b]	1,000[c]	NS	0.93
Methylene chloride	75-09-2	51	100[a]	500[b]	1,000[c]	12	0.05
n-Propylbenzene	103-65-1	100[a]	100[a]	500[b]	1,000[c]	NS	3.9
sec-Butylbenzene	135-98-8	100[a]	100[a]	500[b]	1,000[c]	NS	11
tert-Butylbenzene	98-06-6	100[a]	100[a]	500[b]	1,000[c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100[a]	100[a]	500[b]	1,000[c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5- Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20-7	100[a]	100[a]	500[b]	1,000[c]	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm).
NS=Not specified. See Technical Support Document (TSD).

Footnotes

[a] The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

[b] The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

[c] The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

[d] The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

[e] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

[f] For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

[g] This SCO is derived from data on mixed isomers of BHC.

[h] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

[i] This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.

[j] This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See TSD Table 5.6-1.

375-6.9 Development or modification of soil cleanup objectives.

(a) Applicability. This section identifies when and the procedures under which a contaminant-specific soil cleanup objective may be developed or modified.

(1) Soil cleanup objectives for contaminants not included in Tables 375-6.8(a) and (b) may be developed by the remedial party or required by the Department.

(2) Soil cleanup objectives for contaminants included in Tables 375-6.8(a) and (b), may be modified based on site-specific data if desired by the remedial party; as set forth in:

(i) subpart 375-3 for Tracks 3 or 4, as set forth in paragraphs 375-3.8(e)(3) or (4), respectively; or

(ii) subparts 375-2 and 375-4, as set forth in subparagraph 375-2.8(b)(1)(iii) and subparagraph 375-4.8(c)(1)(iii).

(3) Protection of ecological resources soil cleanup objectives were not developed for certain contaminants, which are identified in Table 375-6.8(b) as "NS". Where such contaminants:

(i) appear in Table 375-6.8(a), the applicant may be required by the Department to calculate a protection of ecological resources soil cleanup objective for the contaminant for use in Track 1 and apply such soil cleanup objective where it is lower than the soil cleanup objective set forth in Table 375-6.8(a); or

(ii) are identified as impacting or threatening an ecological resource for a restricted use remedial program the Department may require a protection of ecological resources soil cleanup objective be developed.

(b) New soil cleanup objectives must:

(1) Be developed utilizing the same methodologies that were used by the Department to develop the respective soil cleanup objective, as provided in the Technical Support Document.

(2) Apply the following caps, as set forth in section 9.3 of the Technical Support Document, on any soil cleanup objective included in Tables 375-6.8(a) and (b), with the exception of metals, as set forth in paragraph (3) below, developed for:

(i) unrestricted use, residential use, restricted-residential use and the protection of ecological resources, a maximum value of 100 ppm;

(ii) commercial use, a maximum value of 500 ppm; and

(iii) industrial use and the protection of groundwater a maximum value of 1000 ppm, and

(3) Apply a cap for metals at a maximum value of 10,000 ppm.

(c) Development of unrestricted use soil cleanup objectives. The unrestricted use soil cleanup objective for a compound will be the lowest of the soil cleanup values, calculated as set forth in appendix E of the Technical Support Document, for the protection of groundwater, protection of ecological resources and protection of public health.

(d) Development of restricted use soil cleanup objectives. The protection of:

(1) Groundwater soil cleanup objective will be the values calculated for the protection of groundwater as set forth in appendix E of the Technical Support Document;

(2) Ecological resources soil cleanup objectives will be the values calculated for the protection of ecological resources as set forth in appendix E of the Technical Support Document; and

(3) Public health cleanup objective will be the values calculated for the protection of public health for the identified use of the site, as set forth in appendix E of the Technical Support Document.

(e) Modification of soil cleanup objectives. The contaminant-specific soil cleanup objectives set forth at Tables 675-6.8(a) and (b)[1] may be modified by site specific data as set forth in this subdivision.

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[1] Original should read "Tables 375-6.8(a) and (b)"

(1) Contaminant-specific soil cleanup objectives modified in accordance with this subdivision may be utilized by the remedial party for a site remedial program undertaken pursuant to:

(i) subpart 375-3 in Tracks 3 or 4, as set forth in paragraphs 375-3.8(e)(3) or (4), respectively; or

(ii) subparts 375-2 and 375-4, as set forth in subparagraph 375-2.8(b)(1)(ii) and subparagraph 375-4.8(c)(1)(ii).

(2) For the calculation of a protection of groundwater or ecological resources contaminant -specific soil cleanup objective, the site-specific percentage of total organic carbon in the soil at the site may be substituted in the algorithms provided in appendix E of the Technical Support Document.

(3) For the calculation of a protection of public health contaminant-specific soil cleanup objective, site-specific data may be used to modify two of the five exposure pathways, as follows:

(i) for the particulate inhalation pathway six parameters rely on site-specific data; and

(ii) for the volatile inhalation pathway, four parameters rely on site-specific data.

(4) The algorithms to be used for each protection of public health pathway and details on the parameters which can be substituted are included in appendix E of the Technical Support Document.

(f) Use of soil cleanup objectives developed or modified. Once approved by the Department, contaminant-specific soil cleanup objectives developed or modified as set forth in this section may be utilized by the Department at other sites consistent with paragraphs (1) and (2) below.

(1) Contaminant-specific soil cleanup objectives developed for contaminants not included in Tables 375-6.8(a) and (b), as set forth in subdivision 375-6.9(b) above, will be used as guidance and shall be considered by the Department for inclusion in the Tables in this subpart during any subsequent reevaluation of the soil cleanup objectives, as set forth by ECL 27-1415.

(2) Contaminant-specific soil cleanup objectives modified for site specific parameters, as set forth in subdivision 375-6.9(e) above, may be utilized at sites manifesting similar parameters, if approved by the Department.

Table 3

Covanta R.T.I.F. Site
Niagara Falls, New York
Project #212399
NYSDEC Site #C932160
Structure Decommissioning

Structure #	Structure Type	Material Handling	Pipes & Inlets	Method of Closure	Date of Closure
1	Large historical electrical vault; 16.5x9 feet in size, 7 feet deep	Small amount of debris cleaned out of vault as Class 1 material. Vault dewatered to frac tank.	No conduit present in vault but such did contain open inlets	Vault filled with concrete to above the open inlets; remainder of vault filled with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/9/2014
2	Surcharged manhole; 3 foot diameter	Displaced water during pouring of concrete to frac tank	Open inlets present within the manhole	Manhole filled with concrete to above the open inlets; remainder of manhole filled in with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/9/2014
3	Small historical electrical vault; 7.5x7.5 feet in size, 6.3 feet deep	Small amount of debris left in place. Vault dewatered to frac tank.	Electrical conduit and open inlets along west and south walls	Vault filled with concrete to above the open inlets; remainder of vault filled with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/5/2014
4	Large circular self-contained manhole; 3 foot diameter; ~7-8 feet deep	Small amount of debris left in place. No dewatering necessary.	One 6 inch pipe within Structure running in an east/west direction; nature of pipe is unknown. No open inlets present.	Manhole filled with #57 stone and sidewalls broken down to 2 feet below sub-grade elevation.	10/13/2014
5	Vault; 7x7 feet in size, 5.2-6.5 feet deep	Small amount of debris cleaned out of vault as Class 1 material. Vault dewatered to frac tank.	Two pipes (one 4 inch pipe and one 8 inch pipe) within the Structure running in an east/west direction; nature of pipes is unknown. No open inlets present.	Vault filled with #57 stone and sidewalls broken down to 2 feet below sub-grade elevation.	12/4/2014
6	Vault; 5x5 feet in size, 7 feet deep	Small amount of debris left in place. Vault dewatered to frac tank.	One pipe within the Structure elbowing to the east and north-pipe splits into two at the north wall of the vault; nature of pipe is unknown. Pipe varied in size from 4-8 inches.	Vault filled with #57 stone and sidewalls broken down to 2 feet below sub-grade elevation.	12/4/2014
7	Vault; 4x4 feet in size, 8 feet deep	Small amount of debris cleaned out of vault as Class 1 material. Vault dewatered to frac tank.	Drain tile in the vault.	Vault filled with concrete to above the drain tile; remainder of vault filled in with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/5/2014
8	Small catch basin; 3x3 feet in size, 5 feet deep	Unknown; Structure was handled by Pinto during grading activities.	Unknown	Based on subsequent investigation of the area of Structure #8 it appears as though the catch basin was completely removed by Pinto and replaced with #57 stone.	Unknown
9	Rail Scale Pit #1; 57x10 feet in size, 11 feet deep	Steel and debris cleaned out as Class 1 material. Scale pit water dewatered directly to Manhole C via a portable Baker tank. Petroleum-contaminated water from side-vault dewatered to frac tank.	No open inlets present within main areas of Scale Pit; however, a lateral associated with the Scale pit was identified west adjoining to such. Lateral was 13x15 feet in size, 11 feet deep. Filled with brick and wood. A ruptured and mangled 250-gallon waste oil AST was also identified within the debris.	Entire scale pit including lateral filled in with #57 stone and sidewalls broken down to two feet below sub-grade elevation.	12/12/14-12/16/14
10	Surcharged manhole; 4x4 feet in size, 6.5 feet deep	Displaced water during pouring of concrete to frac tank	Open inlets present within the manhole	Manhole filled with concrete to above the open inlets; remainder of manhole filled in with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/4/2014
11	Surcharged manhole D of the City of Niagara Falls active sewer system	Not applicable	Not applicable	Redevelopment of this manhole is planned for the construction phase	Not applicable
12	Surcharged manhole C of the City of Niagara Falls active sewer system	Not applicable	Not applicable	Redevelopment of this manhole is planned for the construction phase	Not applicable
13	Surcharged manhole; City of Niagara Falls confirmed in February 2015 that this manhole is inactive and can be decommissoned	Not applicable	Not applicable	Manhole filled with concrete to above the open inlets; remainder of manhole filled in with #57 stone.	6/25/2015
14	Vault; 6.5x5 feet in size, 7.5 feet deep	Bentonite-like material cleaned out as Class 1 material. Vault dewatered to frac tank.	Two pipes (one 8 inch pipe and one 16 inch pipe) within the Structure running in a north/south direction; nature of pipes is unknown but appear to be historic water lines. No open inlets present.	Vault filled with #57 stone and sidewalls broken down to 2 feet below sub-grade elevation.	12/5/2014
15	Vault; 6.5x6.5 feet in size, 6.75 feet deep	Debris cleaned out as Class 1 material. Vault dewatered to frac tank.	Two pipes (one 8 inch pipe and one 18 inch pipe) elbowing to the north and west; nature of pipes is unknown but appear to be historic water lines. No open inlets present.	Vault filled with #57 stone and sidewalls broken down to 2 feet below sub-grade elevation.	12/8/2014
16	Surcharged manhole; 6x6 feet in size, 7 feet deep	Displaced water during pouring of concrete to frac tank	Open inlets present within the manhole	Manhole filled with concrete to above the open inlets; remainder of manhole filled in with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/4/2014
17	Small catch basin; 3x3 feet in size, 5 feet deep	Displaced water during pouring of concrete to frac tank	Drain tile in catch basin	Catch basin filled with concrete to above the drain tile; remainder of catch basin filled with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/4/2014
18	Small catch basin; 3x3 feet in size, 5 feet deep	Debris cleaned out as Class 1 material. Catch basin dewatered to frac tank.	Drain tile in catch basin	Catch basin filled with concrete to above the drain tile; remainder of catch basin filled with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/5/2014
19	Surcharged manhole; 3x3 feet in size, 5.2 feet deep	Displaced water during pouring of concrete to frac tank	Open inlets present within the manhole	Manhole filled with concrete to above the open inlets; remainder of manhole filled in with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/4/2014
20	Large Basement (AKA three connected vaults); total area at 1,191 square feet in size	Debris cleaned out as Class 1 material. Eastern vault dewatered to frac tanks. Per SJB, water in northwest and southwest vault can remain in place as such are located beneath a proposed berm.	Each of the three vaults were interconnected. In addition, the northwest vault extended off-site to the west onto Praxair property via a small opening in the vault wall.	Each of the three vaults were filled with #57 stone and the sidewalls were broken down to 2 feet below sub-grade elevation. In addition, #57 stone was chinked into the opening at the northwest vault in order to create an impromptu wall of sorts at that location to support the weight of the proposed berm to be installed there.	12/16/14-12/30/14
21	Catch basin; 3x3 feet in size, 10 feet deep	Small amount of debris left in place. Catch basin dewatered to frac tank.	Unconfirmed	Although it was not confirmed if any open inlets or pipe were present within this Structure, such is located beneath a proposed berm. Therefore, such was filled with #57 stone up to sub-grade elevation.	12/9/2014
22	Vault; 6x6 feet in size, 5 feet deep	Small amount of debris left in place. Vault dewatered to frac tank.	Piping-details associated with such unconfirmed. Open inlets unconfirmed.	Although it was not confirmed if any open inlets were present within this Structure, such is located beneath a proposed berm. Therefore, such was filled with #57 stone up to sub-grade elevation.	12/9/2014
23	Surcharged manhole; 4x4 feet in size, 6 feet deep	Displaced water during pouring of concrete to frac tank	Open inlets present within the manhole	Manhole filled with concrete to above the open inlets; remainder of manhole filled in with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/9/2014
24	Vault; 6x4.5 feet in size, 6 feet deep	Small amount of debris left in place. Vault dewatered to frac tank.	One 8-inch pipe within the Structure running in an east/west direction; nature of pipe is unknown. Open inlets unconfirmed.	Although it was not confirmed if any open inlets were present within this Structure, such is located beneath a proposed berm. Therefore, such was filled with #57 stone up to sub-grade elevation.	12/9/2014
25	Historical electrical vault; 6x6 feet in size, 6 feet deep	Small amount of debris cleaned out of vault as Class 1 material. Vault dewatered to frac tank.	Electrical conduit and open inlets present along north, south and west walls.	Vault filled with concrete to above the open inlets; remainder of vault filled with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/11/2014
26	Rail Scale Pit #2; 13x60 feet in size; Scale pit originally identified as two parallel concrete walls at the ground surface. Once excavation began in the area, it was determined that such was a scale pit which had been completely filled in with fill material.	Fill material and steel cleaned out of scale pit as Class 1 material; small amount of Class 3/4 material moved to staging area. No dewatering necessary.	No piping or open inlets present	Scale pit filled with #57 stone. Sidewalls broken down to 2 feet below sub-grade elevation.	12/12/2014
27	Manhole; 2x2 feet in size, 4 feet deep	Class 2 material identified surrounding manhole. Entire Structure was removed as Class 1 material. Fill material was cleaned out proximate the Structure as Class 2 material. Petroleum-contaminated water from manhole dewatered to frac tank.	Open inlets present along north and east sides of the excavation	Area of manhole filled with concrete to above the open inlets; remainder of excavation filled with #2 crusher run clean stone.	12/16/2014
28	Historical electrical vault; 4x5 feet in size, 8 feet deep	Small amount of debris cleaned out of vault as Class 1 material. Vault dewatered to frac tank.	Open inlet present on the north wall.	Vault filled with concrete. Sidewalls broken down to 2 feet below sub-grade elevation.	4/27/2015
29	Historical electrical vault; 7x7 feet in size, 7 feet deep	Small amount of debris cleaned out of vault as Class 1 material. Vault dewatered to frac tank.	Electrical conduit and open inlets present along north and west walls.	Vault filled with concrete to above the open inlets; remainder of vault filled in with #1 bedding stone. Sidewalls broken down to 2 feet below sub-grade elevation.	5/9/2015
30	Historical electrical vault; 6x6 feet in size, 6.5 feet deep	Small amount of debris cleaned out of vault as Class 1 material. Vault dewatered to frac tank.	Open inlets present along north east and west walls.	Vault filled with concrete to above the open inlets; remainder of vault filled in with #1 bedding stone. Sidewalls broken down to 2 feet below sub-grade elevation.	5/12/2015
31	Small vault, 4x6 feet in size, 1 foot deep	Small amount of debris cleaned out of vault as Class 1 material. Vault water displaced to the north into underdrain while the vault was filled with concrete; very little water was present within the area of the vault.	No piping or open inlets present	Vault filled with concrete.	5/11/2015
32	Surcharged manhole; 2.2 feet in size, 12 feet deep	Displaced water during pouring of concrete to frac tank	Open inlets present within the manhole	Manhole filled with concrete to above the open inlets; remainder of manhole filled in with #1 bedding stone.	5/12/2015
33	Catch basin; 4x4 feet in size, 4 feet deep	Small amount of debris cleaned out of vault as Class 1 material. Vault dewatered to frac tank.	Drain tile in catch basin	Catch basin filled with concrete.	5/20/2015
34	Catch basin; 2x2 feet in size, 2 feet deep	Small amount of debris cleaned out of vault as Class 1 material. Vault dewatered to frac tank.	Drain tile in catch basin	Catch basin filled with #57 stone.	5/29/2015
35	Abandoned combined-sewer manhole associated with Structures #11-13 above.	Small amount of debris cleaned out of vault as Class 1 material. Vault dewatered to frac tank.	One pipe within the Structure coming out of west wall; nature of pipe is unknown. No open inlets present.	Manhole filled with concrete.	6/1/2015
36	Large, concrete catch basin; 5x5 feet in size, approximately 8 feet deep	Small amount of debris cleaned out of vault as Class 1 material. Vault dewatered to frac tank.	Two 16-inch stormwater pipes entering catch basin on north and west walls.	Catch basin filled with #57 stone to pipe inverts. Concrete then poured in catch basin to above piping. Remainder of catch basin then filled in with #57 stone.	6/25/2015

Refer to Figure 13 for the location of each identified Structure.
It should be noted that the size of some Structures was not identified during this project.
Class 2 material was only identified associated with Structures #9 and #27.
Class 3/4 material was only identified associated with Structure #26.
All Structure water was discharged to frac tank 567B with the exception of Structure #20, Structure #27 and the side vault identified associated with Structure #9. Such were dewatered to frac tanl P101 (side vault associated with Structure#9 and Structure#27) and frac tanks 546C, 515C and P051 (Structure#20).