Remedial Investigation / Interim Remedial Measures / Alternative Analysis Report
for
125 Main Street Site
Buffalo, NY
NYSDEC BCP Site No. C915262

Volume I of III

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Table of Contents

VOLUME I OF III

Tables

Figures

Appendices

VOLUME II OF III

VOLUME III OF III

1. Introduction

This Remedial Investigation/Interim Remedial Measures/Alternative Analysis (RI/IRM/AA) Report has been prepared on behalf of Harbor District Associates, LLC (HDA) for the 125 Main Street Site (Site), located at 125 Main St. Buffalo, New York. A Regional Location Map and a Vicinity Location Map are provided as Figures 1 and 2, respectively.

The Remedial Investigation (RI) activities were conducted in June – September 2012 by TurnKey Environmental Restoration, LLC (TurnKey), in association with Benchmark Environmental Engineering & Science, PLLC (Benchmark). As part of the RI activities, additional groundwater sampling was conducted by EnSol, Inc. (EnSol) in April 2013 (see Section 2 for further details). Interim Remedial Measures (IRM) were documented by EnSol in January – June 2013. The RI and IRM activities were conducted in general accordance with the approved RI/IRM Work Plan (Work Plan) (TurnKey, February 2012, revised June 2012) on behalf of HDA.

On January 31, 2012, HDA submitted an application to the New York State Department of Environmental Conservation (NYSDEC or Department) to participate in the Brownfield Cleanup Program (BCP) as a volunteer. A Brownfield Cleanup Agreement (BCA) was fully executed in August 2012 and Site No. C915262 was assigned. Erie County Harbor Development Corporation (ECHDC) is the current Site owner.

1.1 Purpose and Scope

The Site is currently undergoing redevelopment, with the final property use to be as retail space, hotel, and law offices. The primary objective of the RI/IRM was to assess the environmental quality of the soils and groundwater within the area subject to the BCP for which a release from liability is desired, and to produce data of sufficient quality and quantity to support the development of remedial alternative analyses.

This RI/IRM/AA Report describes and presents the findings of the 2012-2013 RI/IRM and evaluates the IRM as the final remedial alternative for the Site.

1.2 Background

A 2007 Phase I Environmental Site Assessment (ESA) Report (May 2007) and subsequent Phase II ESA Report (November 2007), were completed on the former Donovan Building by URS Corporation (URS). The Phase II investigation revealed evidence of subsurface contamination, including elevated levels of semi-volatile organic compounds (SVOCs), particularly polycyclic aromatic hydrocarbons (PAHs) exceeding the NYSDEC Part 375 Commercial soil cleanup objectives (SCOs). Acetone was detected in excess of technical and operational guidance series (TOGS) water quality standards in monitoring wells MW-1 and MW-2, both of which were located on the east side of the building, in close proximity to the 30,000-gallon #6 fuel oil underground storage tank (UST). The concentration in MW-2 (7,300 and 8,000 ppb) exceeded the groundwater quality standard, however, the concentration in MW-1 (14 parts per billion (ppb)) did not.

Three USTs were removed from the Site in 2008. The USTs included one 2,000-gallon diesel fuel, one 4,000-gallon gasoline, and one 30,000-gallon #6 fuel oil.

During the fall of 2011, additional subsurface data collected by Benchmark revealed Site-wide elevated concentrations of PAHs and metals above NYSDEC Part 375 Commercial SCOs.

Details of the previous investigations are presented in Section 1.2.3 below and Appendix A.

1.2.1 Site Description

The Site is comprised of three separate parcels, identified as parcels D1, D2, and D3. Parcel D1 is the main development parcel and is approximately 1.61 acres. Parcel D2 is approximately 0.32 acres and is located south of D1 along Scott St. Parcel D3 is approximately 0.34 acres and is located between parcels D1 and D2. Parcel D3 is the historic location of the former Hamburg Canal and is currently being developed by ECHDC. All three parcels were initially included in the executed BCA until recently. A formal request to modify the existing BCA Site boundary to exclude parcel D3 from the BCA was approved by the NYSDEC on July 9, 2013.

The Site is located in the historic canal district of the City of Buffalo, New York and currently includes one vacant eight story commercial building that is presently undergoing renovation (parcel D1) and a vacant, paved area south of the former Hamburg Canal (parcel D2). The Site formerly contained a small maintenance garage in the northeast corner of the property which has recently been removed as part of Site renovation activities. The Site is bounded by Interstate 190 to the north, Washington Street and Buffalo News building to the east, Scott Street to the south, and Main Street to the West. A Regional Location Map and a Vicinity Location Map are provided as Figures 1 and 2, respectively.

1.2.1.1 Previous Investigations

A summary of investigations previously conducted at the Site is presented below. Complete copies of the reports referenced below are included in Appendix A.

Phase I Environmental Site Assessment – May 2007

A Phase I ESA of the subject property was conducted by URS. The findings at the time of completion of the Phase I ESA are summarized below:

- Miscellaneous hazardous materials observed at the subject property include paints, water treatment chemicals (e.g. aquacides, acids, etc.), solvents, coolants, compressor oil, diesel fuel, and gasoline.
- Mercury-containing gauges were reported to be observed on Site.
- Suspect asbestos-containing materials (ACM) observed at the subject property included: vinyl asbestos floor tiles, floor tile mastic, cove base molding, cove base molding mastic, spray on ceiling fire proofing, thermal insulation on boilers and pipes, window glazing, window caulking, built-up roofing, and flashing.
- PCB-containing fluorescent light ballasts may still be present on Site.

- Two active USTs containing petroleum products associated with the Site. One inactive UST is known to be on Site.
- Based on the age of Site development (1961), there may be lead-based paint (LBP) on surfaces at the subject property.
- One off-Site property, The Buffalo News, located upgradient of the subject property is listed in the Leaking Tanks (LTANKS), historic leaking tanks (HIST LTANK), spills (SPILLS), and historic spills (HIST SPILLS) databases. With potential for contaminant migration onto the subject property.
- The former Hamburg Canal, which runs through the current south parking lot, was filled between 1899 and 1925. The source and nature of the fill material is not known.

Although not specifically identified in the URS Phase I ESA, historic Sanborn maps from 1889 to 1951 show former on-Site operations to include: Wire works (weaving and painting), paint shop, tin shop, junk yard/storage, contractor's yard, medicine manufacturing, a bit brace factory (including machine shop), and a boot and shoe manufacturer. The Lehigh Valley Railroad passenger terminal was also once located on the southern half of the Site.

Phase II ESA – November 2007

A Phase II ESA of the subject property was conducted by URS. The Phase II ESA included the completion of 22 soil borings, soil sampling for VOCs, SVOCs, PCBs, and/or metals, and groundwater sampling from three existing monitoring wells. The findings are summarized below:

- Certain PAHs were found to exceed NYSDEC Part 375 Commercial SCOs.
- Acetone was detected in groundwater at concentrations exceeding TOGS water quality standards.

UST Closure Report – December 2008

Lender Consulting Services (Lender) conducted UST closure activities at the Site, and findings are summarized below:

- One diesel fuel day tank for the emergency generator was removed.
- One 2,000 gallon diesel fuel UST was removed.
- One 4,000 gallon gasoline UST was removed.
- One 30,000 gallon #6 fuel oil UST was removed.

Supplemental Phase II Investigation – November 2011

Benchmark conducted a Supplemental Phase II Subsurface Investigation of the subject property, and the findings are summarized below:

- Certain SVOCs were found to exceed NYSDEC Part 375 Commercial and Unrestricted SCOs.
- Barium and arsenic were found in concentrations exceeding NYSDEC Part 375 Commercial SCOs.
- Chromium, Lead, and Mercury were found in concentrations exceeding Unrestricted SCOs.

1.2.1.2 Constituents of Potential Concern (COPCs)

Based on findings to-date and as presented in the approved Work Plan, the Constituents of Potential Concern (COPCs) include:

- Soil: SVOCs and Metals
- Groundwater: VOCs

2. Remedial Investigation Approach

RI activities were conducted by TurnKey and Benchmark in May-September 2012 and EnSol in May-June 2013 (see Section 2.2 below). The purpose of the RI field activities was to define the nature and extent of Site contamination and to collect data of sufficient quantity and quality to perform the remedial alternatives evaluation. The field investigation was completed across the BCP Site (parcels D1, D2, and D3) to supplement previous environmental data and to delineate areas requiring remediation. On-Site field activities included: advancement of soil borings; excavation of test pits; surface and subsurface soil sampling; monitoring well installation; groundwater sampling; and, collection of hydrogeologic data. Based on a review of TurnKey/Benchmark field documents available to EnSol, the 2012 RI investigation was conducted in general accordance with the approved Work Plan and there were no significant variances from the Work Plan, with the exception of the following:

- Groundwater samples were not analyzed for total metals, only dissolved metals. This issue is discussed in further detail below in Section 2.2.1.

Samples for chemical analysis were analyzed in accordance with USEPA SW-846 methodology with an equivalent Category B deliverable package to meet the data requirements. Analytical results were also evaluated by a third-party data validation expert.

Soil/fill samples were collected from the test pits and soil borings and field-screened for the presence of VOCs using a field photoionization detector (PID). RI soil/fill samples were analyzed for Target Compound List (TCL) VOCs, TCL SVOCs, Target Analyte List (TAL) metals, PCBs, herbicides, and pesticides. Soil samples were transported under chain-of-custody to Alpha Analytical, located in Westborough, Massachusetts.

The investigation activities are described below. Tables 1 and 2 present the summary of RI soil and groundwater analytical results. Figure 3 presents the RI sample locations, including historic sample locations. Appendix B contains RI analytical reports and field reports are included as Appendix G (TurnKey and EnSol Field Reports).

2.1 Soil/Fill Investigation

A soil/fill investigation was completed across the Site to supplement previous environmental data and to further delineate contamination on-Site. The soil/fill investigation included the advancement of soil borings and excavation of test pits across the Site. One surface sample (SS-1) was also collected.

2.1.1 Soil Borings, Test Pits, and Surface Soil

The subsurface soil/fill investigation included the advancement of fourteen (14) soil borings and included borings identified as SB-1 through SB-3, SB-7, BH-20R, BH-20R(E), BCP MW-1 through BCP MW-7, and MW-2R. Soil borings SB-1 through SB-3 were conducted within the existing on-Site building. The subsurface investigation also included the excavation of seven test-pits, identified as TP- 1 through TP-8 (TP-7 was modified to soil boring SB-7). Subsurface soil/fill samples collected from test borings and test

pits were field-screened for the presence of VOCs using a field PID. Surface soil sample SS-1 was a composite sample from three grab samples (identified as SS-1a, SS-1b, and SS-1) collected across the southwest portion of the Site. The discrete TCL VOC grab sample was collected from SS-1b. Soil samples were transported under chain-of-custody to Alpha Analytical for laboratory analysis.

2.1.2 Soil/Fill Sample Analysis

Subsurface soil/fill samples were analyzed for those parameters presented on Table 1 of this Report, and included TCL VOCs and SVOCs, TAL metals, PCBs, herbicides, and pesticides. Some samples were analyzed for only select parameters. Waste characterization samples (Waste Char 1-4) were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) VOCs, SVOCs, Metals, ignitability, pH, sulfides, and reactivity. The composite surface sample was tested for TCL SVOCs, PCBs, Pesticides, Herbicides, and TAL Metals. Analysis for TCL VOCs was performed at the grab sample collected from SS-1b.

2.2 Groundwater Investigation

2.2.1 Monitoring Well Installation

Eight monitoring wells, identified as BCP-MW-1 through MW-5, MW-1, and MW-2(R), were constructed by converting previously installed soil boreholes into groundwater monitoring wells. TurnKey oversaw the monitoring well installation that was conducted in June 2012.

Considering laboratory analysis of groundwater samples collected during the 2012 RI was not sufficiently completed (see Section 2.2.2), the NYSDEC requested that additional samples be collected and analyzed. This request came after monitoring wells MW-1, MW-2(R), BCP MW-4, BCP MW-5, and BCP MW-6, located in the IRM area, were removed during mass waste excavation.

As approved by the NYSDEC, EnSol attempted to locate the monitoring wells installed outside the IRM area and collect additional samples from those wells. In addition, two replacement wells would be installed in the vicinity of original RI wells MW-1 and BCP MW-6. EnSol was able to locate BCP MW-2 and BCP MW-3 and replacement wells MW-1R and BCP MW-6R were installed. EnSol was unable to locate any other original RI monitoring well due to current Site construction activities.

Monitoring wells MW-1R and BCP MW-6R were installed on May 1, 2013. Russo Development conducted the installation using a Geoprobe 9500. EnSol conducted installation oversight and air monitoring during installation of the replacement monitoring wells.

Details of monitoring wells installed in 2012 and 2013 are presented in Appendix G (TurnKey and EnSol Field Reports).

2.2.2 Groundwater Sample Collection and Analysis

TurnKey personnel collected samples from the original installed monitoring wells on June 20, 2012. All collected groundwater samples were transported under chain-of- custody to Alpha Analytical for analysis.

Upon review of the RI groundwater data, the NYSDEC requested that additional groundwater samples be collected as total metals analysis was not conducted as required by the approved Work Plan. Only analysis for dissolved metals was conducted. Based on the Departments request, EnSol collected groundwater samples from existing monitoring wells BCP MW-2 and BCP MW-3 and replacement monitoring wells MW-1R and BCP MW-6R. The additional sampling was conducted in May 2013 and the samples were analyzed for TCL VOCs and SVOCs and TAL metals (total and dissolved). EnSol also collected field parameter data and groundwater elevation data from each of the four wells prior to sampling.

In June 2013, the Department requested that additional groundwater samples be collected from existing monitoring wells BCP MW-2 and BCP MW-3 and replacement monitoring wells MW-1R and BCP MW-6R. The Department requested this supplemental sampling based on the turbidity of the samples collected in May 2013 and requested that an alternative method be utilized to decrease the turbidity of the samples. EnSol conducted the supplemental sampling of these monitoring wells on June 27-28, 2013. Considering the hydraulic conductivities of the monitoring wells, the low-flow sampling method (bladder pump) was utilized at wells BCP MW-2 and BCP MW-3 only. Based on data collected during the May 2013 sampling event, the hydraulic conductivity (recharge rate) of replacement wells MW-1R and BCP MW-6R is too low to utilize the low-flow method. The bailer method was utilized for the replacement wells. Both wells were bailed dry and samples were collected once the wells had sufficiently recharged. Field parameter and groundwater elevation data from each of the four wells was collected prior to sampling. Samples collected during the June 2013 supplemental sampling event were analyzed for TAL metals (total and dissolved).

All samples were transported under chain-of-custody to Accutest Laboratories (Accutest) located in Marlborough, Massachusetts for analysis. Table 2 presents analytical results from groundwater samples collected in 2012 and 2013.

2.3 Field Specific Quality Assurance & Quality Control Sampling

In addition to the surface soil/fill, subsurface soil/fill and groundwater samples described above, field-specific quality assurance/quality control (QA/QC) samples were collected and analyzed to ensure the reliability of the generated data and to support the required third-party data usability assessment effort. Site-specific QA/QC samples included matrix spikes, matrix spike duplicates, blind duplicates, and trip blanks (as required).

2.4 Site Mapping

An isopotential map showing the locations of the monitoring wells, both original and replacement, and groundwater elevations is presented on Figure 4. The isopotential map includes groundwater elevation

data collected in May 2013 from wells MW-1R, BCP MW-2, BCP MW-3, and BCP MW-6R only. Groundwater elevation data from all other wells is not available.

3. Site Physical Characteristics

The physical characteristics of the Site observed during the RI are described in the following sections.

3.1 Site Topography and Drainage

The Site slopes gently from the north to the south and has limited distinguishable features. At the time of the RI, the surface across the Site was covered with a former state office building, asphalt and concrete, and vegetated areas. Any precipitation (i.e., rain or melting snow) which does not infiltrate through the impermeable surface would move to the storm drains on-Site and in the roadways via overland flow.

3.2 Geology and Hydrogeology

3.2.1 Overburden

The geology at the Site was investigated during the RI and is generally described as fill materials, mainly slag, overlying native sand and lean clay. Figure 7 depicts historical soil boring locations and cross-section details, illustrating approximate overburden thickness, from the 2007 URS Phase II ESA.

3.2.2 Bedrock

The 2007 URS Phase II ESA investigation describes the bedrock as being encountered at a depth of 51 fbgs. Bedrock was not encountered during the RI.

3.2.3 Hydrogeology

Based on the groundwater gauging completed during installation of the replacement groundwater monitoring wells (installed May 2013), localized groundwater flow was determined to be southwest based on the depth to groundwater measurements. Figure 4 depicts the groundwater isopotential map generated from the May 2013 data.

4. Remedial Investigation Results by Media

The following sections discuss the analytical results of the RI. A summary of the RI sampling program results is presented in Tables 1 and 2. Appendix B includes the RI laboratory analytical reports. Figures 3 and 4 present the sample locations.

For discussion purposes, the data is compared with Standards, Criteria and Guidance values (SCGs) applicable to each medium as follows:

- Table 1 presents a comparison of the detected subsurface soil/fill and surface soil/fill parameters to 6NYCRR Part 375 Unrestricted and Commercial Use SCOs (December 2006).
- Table 2 presents a comparison of the detected groundwater parameters to the Class GA Groundwater Quality Standards (GWQS) per NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (June1998).

4.1 Soil/Fill

4.1.1 Volatile Organic Compounds

The majority of samples analyzed for VOCs were reported as non-detectable or at trace (estimated) concentrations below the laboratory sample quantitation limit. No VOCs were detected above Part 375 Commercial SCOs. Acetone and methylene chloride were the only two VOCs detected at concentrations exceeding the unrestricted SCOs. In four samples, from three locations, acetone was found at concentrations of 0.058 to 0.09 ppb. Methylene chloride was found in just one sample at 0.37 ppb. The SCO for both contaminants is 0.05 ppb. At two of the three locations where the acetone was slightly elevated, the closely placed boreholes BH-20(R) and BH-20(R)E, sampled soils exhibited a petroleum odor. SVOC concentrations were however either below unresctricted SCOs or non-detect at these locations.

4.1.2 Semi-Volatile Organic Compounds

The majority of samples analyzed for SVOCs were reported as non-detectable or at trace (estimated) concentrations below the laboratory sample quantitation limit. Five sample locations had SVOC concentrations slightly above Commercial SCOs, however, two of the five locations were within the excluded D3 parcel. One of the five locations was a composite sample of surface soils (SS-1) collected from the small grass-covered area along the site's southwest perimeter. The SVOCs exceeding the commercial SCOs are the carcinogenic polycyclic aromatic hydrocarbons (cPAHs): benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h) anthracene. The concentrations in excess of the commercial SCOs (0.56 and 5.6 ppm) ranged from 0.67 to 11 ppm. The only other SVOCs found at concentrations exceeding unrestricted SCOs were other cPAHs: benzo(k)fluoranthene, chrysene, and indeno(1,2,3-c,d)pyrene.

4.1.3 Metals

The majority of samples analyzed for inorganic compounds (metals) were reported as non-detectable or at trace (estimated) concentrations below the laboratory sample quantitation limit. No metals were detected above Part 375 Commercial SCOs.

4.1.4 PCBs, Pesticides, and Herbicides

PCBs, pesticides, and herbicides were reported as non-detectable, at trace (estimated) concentrations below the sample quantitation limit, and/or below Unrestricted Use SCOs, with the exception of one pesticide, chlordane, which was detected above the Unrestricted Use SCO at sample location SS-1.

4.1.5 Summary

As described above, concentrations of VOCs, SVOCs, metals, PCBs, pesticides, and herbicides were generally below Unrestricted Use SCOs, although some sample locations across the Site were slightly above Commercial SCOs for SVOCs, primarily PAHs. As part of the IRM, a majority of the in-place soil/fill material was excavated and disposed off-Site at a commercial landfill. A concrete and asphalt cover system will also be installed across the Site as part of the IRM. All soil/fill laboratory analytical data generated during the 2012 RI were found to be valid and usable with the qualifications noted in Data Usability Summary Report (DUSR).

4.2 Groundwater

The sampling results for groundwater monitoring completed in 2012 and 2013 are discussed in the following sections. Installation and sampling of replacement monitoring wells conducted in 2013 was discussed previously in Section 2.2.

4.2.1 Volatile Organic Compounds

The majority of samples collected in 2012 and 2013 and analyzed for VOCs were reported as non-detectable or at trace (estimated) concentrations below the laboratory sample quantitation limit. No VOCs were detected above GWQS, with the exception of BCP MW-2 which reported a value for 1,2-dichloroethane slightly above the GWQS during the 2012 RI. Subsequent sampling and analysis of BCP MW-2 in May 2013 did not detect 1,2-dichloroethane. During the 2007 URS Phase II ESA, acetone was detected in excess of water quality standards in monitoring well MW-2. During the 2012 RI, replacement well MW-2R was installed in the vicinity of the original MW-2 as this well could not be located. Acetone was not detected in MW-2R during the 2012 RI.

4.2.2 Semi-Volatile Organic Compounds

The majority of samples collected in 2012 and 2013 and analyzed for SVOCs were reported as non-detectable or at trace (estimated) concentrations below the laboratory sample quantitation limit. Several compounds, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)flouranthene, benzo(k)flouranthene, chrysene, and indeno[1,2,3-cd]pyrene were detected slightly above GWQS in monitoring well MW-1;

however, the soils in the vicinity of MW-1 were removed during IRM activities. Subsequent sampling and groundwater analysis of replacement monitoring well MW-1R, conducted in May 2013, resulted in non-detection of all SVOCs analyzed.

4.2.3 Metals

As discussed previously in Section 2.2, groundwater sampling and analysis was conducted in 2012 and 2013 (May and June). The 2012 sampling event did not include analysis for total metals, only dissolved metals. The 2013 sampling events included both total and dissolved metals analysis; however, samples were only collected from four on-Site monitoring wells, as approved by the Department.

During the 2012 sampling event, soluble metal concentrations above GWQS included exceedances of naturally occurring minerals iron, magnesium, manganese, and sodium. Soluble lead was detected slightly above the GWQS in the groundwater samples collected from monitoring wells BCP MW-2, BCP MW-3, and BCP MW-4.

During the May 2013 sampling event, total metal concentrations detected above GWQS included exceedances of naturally occurring minerals iron, magnesium, manganese, and sodium. Concentrations of total lead, thallium, arsenic, chromium, manganese, silver, beryllium, cadmium, copper, mercury, nickel, and selenium were also detected above GWQS. Soluble metal concentrations above GWQS included magnesium, manganese, selenium, sodium, and thallium. Based on the results from the soluble metals analysis as compared to total analysis, it is believed that the turbidity of the groundwater samples collected during the May 2013 sampling event, indicating the presence of suspended sediment in the samples, resulted in elevated concentration of total metals and is not indicative of overall groundwater quality. As discussed previously in Section 2.2, supplemental sampling was conducted in June 2013 using alternative sampling methods in order to decrease the turbidity of the collected sample.

As discussed in Section 2.2, EnSol utilized alternative sample collection methods in order to collect less turbid samples. Turbidity values ranged from 971 to 6,000 nephelometric turbidity units (NTUs) in May 2013 to 203 to 959 NTUs in June 2013. The June 2013 groundwater sampling event resulted in a significant reduction in total metal concentrations, as compared to the May 2013 sampling event. Total metal concentrations detected above GWQS included naturally occurring minerals iron, manganese, magnesium, and sodium. Total selenium concentrations were detected slightly above the GWQS in wells BCP MW-3 and BCP MW-6R. Total thallium concentrations were detected above the GWQS, but below the quantitation limit in all four monitoring wells. Total lead was detected slightly above the GWQS at MW-1R, however, it was significantly lower (2,110 to 32.8 ug/L) compared to the May 2013 event. Soluble magnesium was detected above the GWQS in BCP MW-6R. Soluble manganese was detected slightly above the GWQS in BCP MW-2. Soluble sodium concentrations exceeded the GWQS in all four monitoring wells. Soluble selenium concentrations were detected slightly above the GWQS in wells BCP MW-3 and BCP MW-6R. Soluble thallium concentrations were detected above the GWQS in wells BCP MW-3, BCP MW-6R, and MW-1R, but reported as below the quantitation limit.

4.2.4 Pesticides, Herbicides, and PCBs

The majority of analytes were reported as non-detectable or trace (estimated) concentrations below the laboratory quantitation limit for pesticides, herbicides, and PCBs. As approved by the Department,

groundwater analysis for pesticides, herbicides, and PCBs was not required during the 2013 sampling events.

4.2.5 Summary

One VOC (1,2-dichloroethane) was detected slightly above the GWQS during the 2012 sampling event. No VOCs, including 1,2-dichloroethane, were detected during the May 2013 event.

SVOCs benzo(a)anthracene, benzo(a)pyrene, benzo(b)flouranthene, benzo(k)flouranthene, chrysene, and indeno[1,2,3-cd]pyrene were detected slightly above GWQS in monitoring well MW-1 during the 2012 sampling event; however, subsequent sampling and SVOC analysis conducted in May 2013 resulted in non-detection of all SVOCs.

During the 2012 sampling event, soluble metal concentrations above GWQS included exceedances of naturally occurring minerals iron, magnesium, manganese, and sodium. Soluble lead was detected slightly above the GWQS in the groundwater samples collected from upgradient monitoring wells BCP MW-2, BCP MW-3, and downgradient monitoring well BCP MW-4. Soluble lead concentrations were slightly above the GWQS during the 2012 sampling event and below the quatitation limit in samples collected during the 2013 events. Trace concentrations, below GWQS, of soluble selenium were detected during the 2012 sampling event. Total and soluble selenium were detected slightly above the GWQS in downgradient monitoring wells BCP MW-3 and BCP MW-6R during the 2013 sampling events. Trace amounts of soluble thallium detected in 2012, however, total and soluble thallium were detected slightly above the GWQS, but below the quatitation limit during the 2013 sampling events. Detectable concentrations of selenium and thallium are typical characteristics of slag, which is the predominant fill material at the Site.

When compared to the May 2013 sampling event, analytical results for inorganic parameters were significantly lower. Naturally occurring minerals iron, magnesium, manganese, and sodium were detected above the GWQS. These parameters are commonly encountered in uncontaminated, natural environments and, in general, concentrations are consistent with regional background concentrations for these parameters.

The majority of analytes were reported as non-detectable or trace (estimated) concentrations below the laboratory quantitation limit for pesticides, herbicides, and PCBs.

Based on the findings of the RI, only minor impacts to groundwater have been identified at the Site. The placement of a restriction on the use of groundwater at the Site is appropriate and will be included in the recommended remedy. Additionally, any future placement of impervious surfaces on the Site (i.e., asphalt or concrete) would help to limit the percolation of precipitation through the soil/fill left in place and reduce impacts to groundwater quality. All groundwater laboratory analytical data generated during the 2012 RI and the subsequent sampling conducted in 2013 were found to be valid and usable with the qualifications noted in DUSR.

4.3 Soil Vapor Intrusion

EnSol responded to correspondence from the New York State Department of Health (NYSDOH) regarding the potential for vapors from residual subsurface contaminated soil. EnSol's response letter,

dated April 22, 2013, summarizes the findings of the RI, as it relates to potential contaminated soil vapor, and proposes that no further investigation appears to be necessary. The NYSDOH's response letter, dated May 20, 2013, agrees with EnSol's assessment regarding no further investigation. Appendix H includes correspondence with the NYSDOH.

4.4 Data Usability Summary

In accordance with the Work Plan, the laboratory analytical data collected during RI and IRM activities at the Site was assessed and submitted for independent review. Data Validation Services located in North Creek, NY and Vali-Data of WNY located in West Falls, NY performed the data usability summary assessment, which involved a review of the summary form information and sample raw data, and a limited review of associated QC raw data.

The DUSR was conducted using guidance from the USEPA Region 2 validation Standard Operating Procedures, the USEPA National Functional Guidelines for Data Review, as well as professional judgment.

4.4.1 DUSR Summary

The laboratory analytical data was qualified, where appropriate, based on the data usability evaluation. Qualifier codes were used to indicate the qualitative and quantitative reliability of the data. All laboratory analytical data generated during the 2012 RI and 2013 IRM were found to be valid and usable with the qualifications noted in DUSR. DUSR reports for the RI and IRM are included as Appendix C and E, respectively.

5. Fate and Transport of COPCs

The subsurface soil/fill, surface soil/fill, and groundwater sample analytical results were incorporated with the physical characterization of the Site to evaluate the fate and transport of COPCs in Site media. The mechanisms by which the COPCs can migrate to other areas or media are briefly outlined below. In all instances, the potential pathways are evaluated in the context of post-remedial activities conditions.

5.1 Airborne Pathways

5.1.1 Fugitive Dust Generation

Volatile and non-volatile chemicals present in the remaining underlying soil/fill can be released to ambient air as a result of fugitive dust generation. As part of IRM activities, approximately 19,000 tons of impacted soil/fill was excavated and disposed of off-Site. Furthermore, a majority of the Site is to be covered by a compoSite cover system consisting of a geotextile fabric, crushed stone subbase, and either concrete, asphalt, or concrete pavers. Based on the IRMs completed, the current and future commercial land use, and the construction of a compoSite cover system, fugitive dust migration is not a significant pathway under the current and reasonably anticipated future land use, as long as the surface cover across the Site is maintained in accordance with the SMP for the Site.

5.1.2 Volatilization

During ground intrusive activity, such as soil/fill excavation during utility trenching or general construction, volatile COPCs could volatilize into ambient air and be inhaled by a construction/utility worker. Also, COPCs that adhere to soil particles, such as metals, may become suspended in the air column and could also be inhaled by the construction/utility worker. During potential future excavation activities, groundwater may accumulate or pool in the bottom of the excavation, therefore direct contact with groundwater by a construction/utility worker would be considered to be a complete exposure pathway both on-Site and off-Site.

VOC concentrations in surface and subsurface soil/fill did not exceed the Commercial Use SCOs, with the exception of minor exceedances for SVOCs. Several post-excavation soil/fill samples contained SVOC concentrations that exceeded Commercial Use SCOs; however, they were not significant. VOC concentrations in groundwater were detected below the GWQS, with the exception of two sampling points which slightly exceeded GWQS for VOCs and SVOCs. Additionally, future intrusive Site activities will be managed by the SMP. Based on this, the release of VOCs from surface and subsurface soil/fill and groundwater is not considered a potential pathway in current and future use scenarios.

5.2 Waterborne Pathways

5.2.1 Groundwater Transport

Groundwater underlying the Site migrates to the southwest. Chemicals present in groundwater may be transported across the Site via this pathway. The Site and surrounding area are serviced by a municipal (supplied) water service, with no evidence of potable wells in the area of the subject property. Analytes

that were detected in on-Site groundwater were slightly above GWQS. The Site cover system will also provide an impermeable barrier to surface water infiltration to impacted soil/fill. As such, transport off-Site via groundwater migration is not a potential migration pathway.

5.2.2 Surface Water Runoff

The potential for soil particle transport with surface water runoff is low, as the majority of the Site is covered by the compoSite cover system, which includes asphalt and concrete pavement. Stormwater runoff will be collected in on-Site catch basins and conveyed to the Buffalo Sewer Authority (BSA) sewer collection and treatment system. As such, surface water runoff is not considered a potential migration pathway.

5.2.3 Leaching

Leaching refers to chemicals present in soil/fill migrating downward to groundwater as a result of infiltration of precipitation. Excavation and off-Site disposal of a significant amount of impacted soil/fill from the Site mitigates potential leaching of chemicals to groundwater. Those COPCs remaining on Site below the compoSite cover system are not considered highly mobile, with the exception of naturally occurring metals. PAHs tend to attach to soil particles and are not considered highly leachable. As such, leaching is not considered a potential migration pathway for this Site.

5.3 Exposure Pathways

Based on the analysis of chemical fate and transport provided above, the pathway through which Site COPCs could reach receptors at significant exposure point concentrations is limited to incidental contact with residual contaminants in soil/fill and groundwater during future intrusive activities beneath the cover system. A SMP, which is a component of the final remedy, that describes procedures to be followed in the event of future intrusive activities, mitigates this concern.

6. Qualitative Risk Assessment

6.1 Potential Human Health Risks

The Site is currently undergoing renovations to convert the formerly vacant 8-story commercial building into a mixed-use commercial building including retail space, lodging, and office space. This commercial use is consistent with the surrounding property use and Site zoning. Accordingly, the potential exposed receptors for the Site are comprised of employees and customers of the various businesses. Customers of the retail space and lodging portions of the building are assumed to consist of both adults and children. Should ground-intrusive activities need to be conducted at the Site in the future, potential exposed receptors for the Site also include construction workers potentially exposed to contaminated soil/fill and groundwater during excavation activities. As a portion of the Site use will be as a hotel, which is a continuous operation, the potential for trespassers is not considered in this evaluation.

For soil/fill, extensive remedial activities were conducted as IRMs related to COPCs in the surface and subsurface soil/fill. Certain COPCs were detected above their respective Commercial Use SCOs in excavation floor soil/fill sample locations, indicating a potential unacceptable human health risk for incidental ingestion, dermal contact, and/or inhalation of re-suspended particulates. However, those areas exceeding Commercial Use SCOs are located under the Site cover system. Within the IRM area, the cover system will consist of a geotextile fabric overlain by a minimum of twelve inches of crushed stone fill overlain by a minimum of four inches of concrete pavement. Outside the footprint of the IRM area, fill/soil material will be covered by a minimum of one foot of crushed stone fill overlain by sand and concrete pavers. The presence of this cover system eliminates this potential exposure pathway and associated health risk. Institutional controls in association with the SMP, which will include an Environmental Easement, will also be utilized to reduce the potential for soil/fill exposure during non-routine intrusive activities.

For groundwater, non-routine contact with Site groundwater is expected to be limited to short durations under specific construction conditions (e.g., a construction worker managing groundwater during deep excavation work). Given the limited frequency and duration of these non-routine activities, direct groundwater exposure pathways for on-Site receptors are not considered significant. Institutional controls in association with the SMP, which will include an Environmental Easement, will also be utilized to reduce the potential for groundwater exposure during non-routine intrusive activities.

The IRM was completed to reduce/eliminate exposure to COPCs; however minor, residual contaminants remain in on-Site subsurface soil/fill and groundwater. Under the future use conditions (commercial), potential exposure routes are: incidental ingestion and dermal contact of soil/fill, inhalation of re-suspended particulates and/or COPCs in air; and, dermal contact with compounds in groundwater. Based on the presence of these constituents and as discussed with the NYSDEC, there will be engineering controls (soil cover system) and institutional controls (Environmental Easement) implemented in accordance with the SMP for the Site as part of the final remedy. Section 8.0 (Remedial Alternative Analysis) includes a discussion of the engineering and institutional controls that may be used at the Site. These controls will serve to eliminate potential human health risks at the Site.

6.2 Potential Ecological Risks

The Site is a commercial facility located within a highly developed, urban area in the City of Buffalo. The Site will be occupied by a multi-story commercial building with associated paved parking lot, which provides little or no wildlife habitat or food value. No natural waterways are present on or adjacent to the Site. The reasonably anticipated future use is commercial with the majority of the Site covered by a building, concrete, and asphalt. As such, no unacceptable ecological risks are anticipated under the current or reasonably anticipated future use scenario.

7. Interim Remedial Measures

7.1 Parcel D1 (Main Development Area)

In accordance with the NYSDEC-approved Work Plan, immediately following the RI fieldwork, an IRM was implemented within the D1 parcel based on the nature and extent of the impacts identified during the RI in this area, as well as conditions found during previous Site investigations. As stated in the Work Plan, impacted soil/fill material was excavated to the approximate subgrade of the proposed parking ramp to be constructed in the IRM area. Additionally, HDA's intent was for the IRM to substantially constitute the final NYSDEC-approved BCP remedy for the Site. Figure 4 presents the location of IRM excavation areas.

In order to quickly mitigate the potential for exposure from impacted soil/fill material that was found to exceed the NYSDEC Part 375 Commercial Use SCO's, impacted soil/fill was removed by excavation and transported off-Site for disposal at the Town of Tonawanda Landfill located in Tonawanda, New York. Specific elements of the IRM, as implemented, included:

- Prior to initiating excavation of impacted soil/fill, waste characterization samples were collected by TurnKey and EnSol from the proposed IRM excavation areas located north and east of the existing building as presented in the Work Plan. A total of 23 waste characterization samples were collected and analyzed for the parameters required by the disposal facility. The material was then approved for disposal by the NYSDEC based on a review of the analytical results. Waste shipment and disposal documents are included as Appendix I.
- Mass waste excavation of the IRM area was conducted December 2012 through March 2013. Approximately 19,000-tons of non-hazardous soil/fill was excavated from the IRM area and disposed of off-Site at the Town of Tonawanda Landfill. DDS Constructors, LLC (DDS) of West Henrietta, New York conducted the mass excavation of the IRM area. The vertical limits of the excavation were determined by the design for the parking structure to be constructed in the IRM area. DDS was also contracted to install the Site utilities. Mass waste excavation began in the northwest corner of parcel D1, north of the on-Site building and continued east to the property line. At this point, waste excavation continued south on the east side of the building to within approximately 40-feet of the south end of the building. The approximate lateral extents of the IRM excavation are shown on Figure 5 and approximate IRM excavation depths are presented on Figure 6.
- EnSol provided all field monitoring during IRM activities. Air Monitoring Field Logs and Data are included as Appendix F and EnSol Field Reports are included in Appendix G.
- 29 of the 38 post-excavation confirmation samples collected by TurnKey and EnSol during the IRM were collected once mass waste excavation reached the design subgrade (floor) elevation. Eight samples were collected from behind the steel sheeting on the west and east walls. These samples were collected by TurnKey during the 2012 RI activities. During IRM activities, EnSol collected six samples from the North Wall, 13 samples from the North Floor, 15 samples from the East Floor, and four samples from the East Wall (area with no steel sheeting). All samples were analyzed for PAHs and TAL metals. Post-excavation sample East Floor-7 was also analyzed for TCL VOCs. This sample was collected in the area of the former 30,000-gallon fuel UST. Over-excavation of North Floor sample locations 3, 6, and 8 and East Floor sample location 2 was required as initial post-excavation analytical results indicated significant exceedances of

Commercial Use SCOs, specifically for lead and PAH constituents. These locations were over-excavated a minimum of six inches and the floor re-sampled. All post-excavation soil sample results were below Commercial Use SCOs, with minor exceptions as noted in Tables 3-7. Post-excavation sampling locations are presented on Table 5. IRM Post-Excavation and Sampling and Analytical Reports are included as Appendix D.

- Approximately 4,000 tons of soil/fill was removed during excavation of the on-Site storm sewer. Recycled crushed concrete was used as backfill for the storm sewer trench. The crushed concrete was provided by Buffalo Recycled Aggregate (BRA) located at 1037 Seneca St., Buffalo, New York. BRA is a NYSDEC registered concrete processing facility (registration No. 15W31). Mr. Peter Battaglia Jr. provided EnSol laboratory analytical results for gradation testing on the crushed concrete material. Based on a review of the analytical results, it was determined that the crushed concrete met the minimum requirements presented in the NYSDEC DER-10. A copy of the analytical results are included in Appendix I. The recycled crushed concrete was not used as fill or backfill anywhere else on Site.
- Placement of the cover system, consisting of a geotextile fabric demarcation layer, twelve inches of compacted crushed stone, and four inches of concrete is expected to be completed before November 1, 2013. The crushed stone will be tested to confirm it meets NYSDEC criteria prior to placement. Figure 6 presents details of the Site cover system.

7.2 Parcel D2 (Future Development Area)

At this time, the majority of parcel D2 is covered with concrete paving or crushed stone and is currently being utilized as a staging area for Site trailers and equipment laydown area for construction activities on-going in parcels D1 and D3. A cover system, consisting of two inches of crushed stone and three inches of asphalt paving, is planned for this parcel until future development activities commence. The SMP will manage future intrusive activities conducted at parcel D2 until development commences.

7.3 Parcel D3 (ECHDC Area)

As discussed previously in Section 1.2.1, parcel D3 is currently being developed by ECHDC and a formal request to modify the existing BCA Site boundary to exclude parcel D3 from the BCA was approved on July 9, 2013. As requested by the Department, ECHDC was asked to provide specific elements of the remedial activities implemented at parcel D3 during construction conducted in 2013. ECHDC provided waste shipment and disposal documents for material that was disposed of at an approved off-Site disposal Facility (Town of Tonawanda Landfill). Waste shipment and disposal records are included in Appendix I.

The Final Engineering Report, to be submitted as a separate document, includes additional details and supporting documentation of the IRM.

8. Remedial Alternatives Evaluation

8.1 Remedial Action Objectives

The final remedial measures for the Site must satisfy Remedial Action Objectives (RAOs). RAOs are Site-specific statements that convey the goals for minimizing or eliminating substantial risks to public health and the environment. Appropriate RAOs for the Site include:

- Removal and off-Site disposal of impacted soil/fill material to levels protective of human health (Part 375 Commercial Use SCOs);
- Prevention of ingestion or direct contact with soil/fill material that contains COPCs above Part 375 Commercial Use SCOs; and
- Prevention of ingestion or direct contact with groundwater containing concentrations of COPCs above GWQS.

In addition to achieving Site-specific RAOs, the BCP calls for remedy evaluations to be performed in accordance with DER-10 Technical Guidance for Site Investigation and Remediation (DER-10). As defined in Section 4.2 of DER-10, remedial alternatives will be evaluated based on the following criteria:

- Overall Protection of Public Health and the Environment - This criterion is an evaluation of the remedy's ability to protect public health and the environment, assessing how risks posed through each existing or potential pathway of exposure are eliminated, reduced, or controlled through removal, treatment, engineering controls, or institutional controls.
- Compliance with Standards, Criteria, and Guidance (SCGs) - Compliance with SCGs addresses whether a remedy will meet applicable environmental laws, regulations, standards, and guidance.
- Long-Term Effectiveness and Permanence - This criterion evaluates the long-term effectiveness of the remedy after implementation. In the event that residual impacts will remain as part of the alternative, then the risks and adequacy/reliability of the controls are also evaluated.
- Reduction of Toxicity, Mobility or Volume with Treatment - This criterion evaluates the remedy's ability to reduce the toxicity, mobility, or volume of Site contamination. Preference is given to remedies that permanently and significantly reduce the toxicity, mobility, or volume of the wastes at the Site.
- Short-Term Effectiveness - Short-term effectiveness is an evaluation of the potential short-term adverse impacts and risks of the remedy upon the community, the workers, and the environment during construction and/or implementation. This includes a discussion of how the identified adverse impacts and health risks to the community or workers at the Site will be controlled, and the effectiveness of the controls. This criterion also includes a discussion of engineering controls that will be used to mitigate short term impacts (i.e., dust control measures), and an estimate of the length of time needed to achieve the remedial objectives.
- Implementability - The implementability criterion evaluates the technical and administrative feasibility of implementing the remedy. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated

along with potential difficulties in obtaining specific operating approvals, access for construction, etc.

- Cost - Capital, operation, maintenance, and monitoring costs are estimated for the remedy and presented on a present worth basis.
- Community Acceptance - This criterion evaluates the public's comments, concerns, and overall perception of the remedy. Any public comments and overall public perception are addressed as part of the criterion.
- Land Use - This criterion evaluates the proposed remedial approach against the current, intended, and reasonably anticipated future use of the land and its surroundings.

8.2 Summary of Remedial Alternatives

In developing and screening remedial alternatives, NYSDEC's Part 375 regulations require that the reasonableness of the anticipated future land use be factored into the evaluation. This evaluation supports Commercial Use as the reasonably anticipated future use of the Site, which is consistent with past use. Accordingly, remedial alternatives to clean up the Site to Commercial Use are identified and evaluated herein.

Although the Site is intended to be used for commercial purposes, evaluating a more restricted-use scenario is a requirement of the BCP. Therefore, an evaluation of cleanup to BCP Track 1, Unrestricted Use, is included. Additionally, at the request of the NYSDEC, an evaluation of cleanup to Track 2, Restricted Use, levels is also included. Per DER-10, evaluation of a "no-action" alternative is also required to provide a baseline for comparison against other alternatives. Since an IRM has already been completed for the Site, the alternatives discussed in greater detail in Section 8.3 include:

8.2.1 No Action

The No Action Alternative is included as a procedural requirement and as a baseline to evaluate other alternatives. Under this alternative, no further remedial or monitoring activities would occur, no IC/ECs would be put in place and there would be no SMP or Environmental Easement. The Site would remain virtually as-is and change in property use would not be limited other than existing land use controls such as zoning.

8.2.2 Track 4 - Completed IRM and SMP Implementation

The IRM achieved removal of the contaminated soil/fill in the IRM area (north and east of the building) to below Commercial SCOs with the exception of various SVOC and TAL Metals compounds still present in the North Floor, East Floor, and East Wall. IRM activities (mass waste excavation) were not conducted west and south of the building, with the exception of the excavation of soil/fill for the stormwater retention and infiltration system located in these areas, and, thus, soil/fill exceeding the Commercial SCOs may still be present in this area of the Site. Refer to Tables 3-7 and Section 7 for a complete summary of post IRM analytical data. Under this alternative, the Site would remain in its current state and a SMP would be developed, implemented, and maintained in order to address remaining COPCs and achieve RAOs. The SMP will include the following components:

- Institutional and Engineering Controls (IC/EC) Plan – Institutional controls at the Site will consist of restrictions on land use which allow Restricted Residential and/or Commercial land use of the property but prevent more restrictive land uses such as Unrestricted Use. There will also be restrictions on groundwater use that would prohibit the use of groundwater for potable water supply(s) without proper treatment and approval(s). Engineering controls at the Site will consist of physical barriers to eliminate potential exposure pathways to COPCs still present in Site-related soils and groundwater.
- Excavation Work Plan – Will provide provisions to ensure that any ground intrusive activities conducted at the Site in the future will be conducted in a safe and environmentally responsible manner with respect to COPCs remaining in Site-related soils and groundwater.
- Site Monitoring Plan – Will consist of a Site-wide inspection and monitoring program designed to ensure that IC/ECs remain in-place, effective, and un-altered.
- Environmental Easement – Will include legal property use restrictions ensuring the protection of public health and the environment by prohibiting more restrictive uses of the property as well as use of groundwater without proper treatment and approvals. The Environmental Easement will be filed with Erie County.

8.2.3 Track 2 - Restricted Use Cleanup

A Track 2 Restricted Use cleanup would require excavation of additional impacted soil/fill material to a depth of at least 15 feet below grade (ftbg). Based upon previously collected Site characterization data and IRM post-excavation soil sample analytical data, it is estimated that 38,598 tons of soil/fill would need to be removed from the Site to achieve a Track 2 remedy. Under Track 2, soil/fill material at depths greater than 15 ftbg with COPCs above Commercial SCOs may be left in place provided that; the soils do not represent a source of contamination, an Environmental Easement is put in place which requires that the remaining impacted soils be managed pursuant to a SMP, off-Site groundwater does not exceed GWQS and on-Site groundwater use is restricted. During the 2012 RI, there were no exceedances of Commercial SCOs at depths greater than 15 ftbg.

In order to achieve the Track 2 Restricted Use cleanup, the following issues would be encountered:

- Existing Building Foundation - Further investigation to characterize the material beneath the building would be required in order to determine the quantity of existing soil/fill and the structural stability of the building foundation should this material be removed. Building renovation is significantly completed at this time.
- Utilities – Installation of the Site storm sewer and groundwater infiltration system are significantly completed. Relocating existing utilities, particularly along Main St. (west side), would be at a significant cost.
- Steel Sheeting/Shoring – In order to facilitate soil removal to depths of at least 15 ftbg, the existing steel sheeting at the eastern and western walls of the IRM excavation area would need to be removed and re-installed to a greater depth as the current steel sheeting is at the maximum allowable depth. Shoring would require permanent off-site anchoring which would require an easement from the City. Shoring would also be required on the south property line in order to stabilize the ECHDC construction project.

- Parking Ramp Foundation – The foundation system for the parking ramp has already been constructed in the IRM area. The foundations would need to be removed or shored during additional mass waste excavation in this area.
- Market Conditions/Tenants - Tenants are expected to begin moving in starting in November 2013, with an opening scheduled for January 2014. Additional construction would set project completion dates back an additional four to six months.
- Significant Schedule and Cost Impacts – The above issues would prevent the planned occupancy, business openings, and cause project delays and costs far beyond that which could be managed by the project stakeholders.

8.2.4 Track 1 - Unrestricted Use Cleanup

An Unrestricted Use alternative would typically include the excavation and off-Site disposal of all impacted soil/fill material, as Unrestricted Use alternatives cannot be supplemented by institutional controls. To attain Unrestricted Use objectives at the Site, all remaining impacted soil/fill material would need to be excavated and removed from the Site. Based upon previously collected Site characterization data and IRM post-excavation soil sample analytical data, it is estimated that 57,499 tons of soil/fill would need to be removed from the Site to achieve a Track 1 remedy. This additional material includes soil/fill that would be removed from beneath the building. Achievement of the Track 1 Cleanup remedy would encounter the same issues as discussed in the previous section (8.2.3), although the cost would be significantly higher and set the project completion dates back approximately eight to ten months.

8.3 Alternatives Evaluation

An analysis of each alternative with regards to the nine evaluation criteria established by DER-10 is presented in Sections 8.3.1 through 8.3.9 below.

8.3.1 Overall Protection of Public Health and the Environment

- No Action – With a lack of IC/ECs limiting the use of the property and exposure to contaminated media, this alternative is not protective of Public Health and the Environment and does not satisfy Site specific RAOs.
- Track 4 – Within the IRM area, a majority of impacted fill/soil materials has been excavated and disposed of off-Site. Remaining fill/soil materials with COPCs above Commercial Use SCOs will be covered by a cover system consisting of a geotextile fabric overlain by a minimum of 12 inches of crushed stone fill overlain by a minimum of four inches of concrete paving. Outside the footprint of the IRM area, fill/soil material will be covered by geotextile fabric overlain by a minimum of one foot of crushed stone fill, one inch of sand, and concrete pavers. In effect there will be minimal potential for exposure to fill/soil materials as there will be no exposed and/or impermeable surfaces on the Site as all surfaces will be either concrete drive areas or concrete paver courtyard areas. To further protect human health, any future ground intrusive work would be performed in accordance with an NYSDEC-approved SMP, and certification of the institutional/engineering controls would be performed on an annual basis. Additionally, an Environmental Easement will also be utilized to reduce the potential for groundwater exposure.

Therefore, this alternative is in compliance with overall protection of public health and the environment.

- Track 2 – The Restricted Use alternative, consisting of further excavation of impacted fill/soil materials to a minimum depth of 15 ftbg and the implementation of an SMP, if needed, would achieve Site specific RAOs and be protective of human health and the environment provided proper adherence to the SMP.
- Track 1 – The Unrestricted Use alternative would achieve the Site specific RAOs and the corresponding Part 375 Unrestricted Use SCOs, which are designed to be protective of human health under any reuse scenario.

8.3.2 Compliance with Standards, Criteria, and Guidance (SCGs)

- No Action – Fill/soil materials with concentrations of COPCs exceeding both Unrestricted and Commercial Use SCOs remain in place in various areas of the IRM. Accordingly, this Alternative does not result in compliance with SCGs and does not satisfy Site specific RAOs.
- Track 4 – A majority of the post-excavation confirmatory soil samples and results from groundwater analysis exhibited concentrations of COPCs in general compliance with applicable Commercial Use SCOs and GWQS, although some minor exceedances of these standards were reported. Exposure routes to areas where samples exhibit concentrations above SCOs are eliminated by the placement of the cover system, implementation of the SMP, and the Environmental Easement. Therefore, this option is in compliance with SCGs.
- Track 2 – The Restricted Use alternative, consisting of further excavation of impacted fill/soil materials to a minimum depth of 15 ftbg would either result in the total removal of all impacted soils (if none are present below 15 ftbg) or an SMP and IC/ECs would be put in place if impacts remained below 15 ftbg. Under either scenario, this alternative would be in compliance with SCGs
- Track 1 – This Alternative to meet Unrestricted Use SCOs would meet all applicable SCGs.

8.3.3 Long Term Effectiveness and Permanence

- No Action – The no further action alternative involves no additional equipment, material removal, or IC/ECs and therefore provides no long-term effectiveness toward achieving the Site specific RAOs. Without the application of IC/ECs, an SMP, or Environmental Easement for the Site, this objective does not satisfy the DER-10 permanence RAO.
- Track 4 – With proper implementation of the SMP and Environmental Easement, which requires the property use to remain Restricted Residential/Commercial, this Alternative will provide long-term effectiveness and permanence.
- Track 2 – The excavation of impacted soil/fill to a minimum depth of 15 fbgs would result in minimal amounts of soil/fill exceeding the Commercial Use SCOs remaining on the Site. Furthermore, the excavated area would be replaced with clean backfill and then overlaid with a cover system. The SMP and Environmental Easement would also be implemented. Under this scenario, this alternative would provide long-term effectiveness and permanence.

- Track 1 – The Unrestricted Use alternative would achieve removal of all residual impacted soil/fill; therefore, no soil/fill exceeding the Unrestricted Use SCOs would remain on the Site. As such, the Unrestricted Use alternative would provide the highest degree long-term effectiveness and permanence. Post-remedial monitoring and certifications would not be required.

8.3.4 Reduction of Toxicity, Mobility or Volume with Treatment

- No Action – The IRMs completed at the Site have reduced the toxicity, mobility and volume of COPCs. However, certain COPCs above Commercial SCOs do remain on-Site, and therefore, no further action is not protective of public health and does not satisfy the RAOs.
- Track 4 – The removal of the majority of the impacted soil/fill results in the reduction of the mobility and volume of COPCs at the Site. The placement of the impermeable cover system further reduces the mobility of organic and metal analytes in the remaining material. The overall toxicity of the material remains unchanged, however the excavated materials have been disposed of at a landfill and remaining materials will be inaccessible due to the overlying cover system; both resulting in the elimination for inadvertent public exposure to COPCs in contaminated soil/fill material from the Site.
- Track 2 – With the assumption that soils exceeding SCOs will be left in place at depths greater than 15 ftbg, which would require the implementation of an SMP and associated IC/ECs, this Alternative would have a similar level of reduction of toxicity, mobility, or volume to the Track 4 Alternative as both scenarios would implement the SMP and IC/ECs as the final remedy for overall protection of human health and the environment. The primary difference from the Track 4 Alternative is that greater volume of soil/fill material would be removed from the Site and disposed of in a landfill.
- Track 1 – This Alternative would result in the greatest degree of reduction of the mobility and volume of COPCs at the Site as it would consist of complete removal and landfill disposal of all impacted soil/fill materials. The toxicity of excavated material will remain the same however the final disposition at a landfill will result in the elimination for inadvertent public exposure to COPCs in contaminated soil/fill material from the Site.

8.3.5 Short Term Effectiveness

- No Action – There would be no short-term adverse impacts and risks to the community, workers, or the environment attributable to implementation of the no further action alternative.
- Track 4 – As compared to the No Action Alternative, the short-term adverse impacts and risks to the community, workers, and environment during implementation of the Track 4 Alternative are considered significant, though controllable, and would significantly increase the duration of time that the community, workers, and the environment are exposed to fugitive dust and potential off-Site exposures during remediation. During soil/fill excavation activities at the Site, air monitoring for particulate and volatile organics was conducted on a continuous basis in accordance with the Work Plan (see Appendix F). Additional environmental controls included limiting access to the excavation area, covering all waste disposal loads, and conducting routine cleaning of the construction entrance and adjacent public right-of-way.

- Track 2 – The implementation of this Alternative would result in a greater level of potential short-term adverse impacts and risks to the community, workers, or the environment than the Track 4 Alternative as additional soil excavation, transportation, and disposal activities would be conducted. Additionally, this option would require an additional four months of Site-work to complete the removal and re-installation of steel sheeting to the required greater depth and the additional soil/fill material excavation. Accordingly this option would also delay the completion of Site development and commencement of intended Site use by approximately four months.
- Track 1 – The implementation of this Alternative would result in the greatest level of potential short-term adverse impacts and risks to the community, workers, or the environment as additional soil excavation, transportation, and disposal activities would be conducted. Additionally this option would require an additional six months of Site-work to complete the removal and re-installation of steel sheeting to the required greater depth and the additional soil/fill material excavation. Accordingly this option would also delay the completion of Site development and commencement of intended Site use by approximately six months.

8.3.6 Implementability

- No Action – No technical or administrative implementability issues are associated with the no further action alternative.
- Track 4 – There are no prohibitive technical or administrative implementability issues associated with the Track 4 Alternative as the IRM has already been completed and the completion of the SMP and Environmental Easement can be completed within the project completion timeframes discussed previously in Section 2.
- Track 2 – As discussed previously in Section 8.2.3, technical implementability would be a major barrier to this Alternative. Based on this, further excavation of the Site is not considered a reasonable alternative given the current and reasonably anticipated future use of the Site.
- Track 1 – Due to an anticipated greater maximum excavation depth associated with this Alternative, complete excavation of all Site-related impacted fill/soil materials would present an even greater challenge than the discussion of implementability for the Track 2 Alternative.

8.3.7 Cost

- No Action – Upon completion of the IRM, there would be no additional capital or long-term operation, maintenance, or monitoring costs associated with the no further action alternative.
- Track 4 – $5,519,204 (see Table 8)
- Track 2 – $12,569,120 (see Table 9)
- Track 1 – $16,711,035 (see Table 10)

8.3.8 Community Acceptance

There were no public comments received during the community review period for the Work Plan. Community acceptance will be further evaluated based upon comments to be received from the public in response to Fact Sheets and other planned future citizen participation activities.

8.3.9 Land Use

All available historical records for the Site indicate that the property use has always been either industrial or commercial. Based upon the location of the Site and current City of Buffalo zoning rules, it is reasonable to assume that the property will remain as Commercial Use for the foreseeable future, however Restricted Residential Use is also allowable. Each alternative satisfies and intended Restricted Residential/Commercial end use with the exception of the no action alternative.

8.4 Recommended Remedial Measure

Based on the Alternatives Analysis evaluation, the Track 4 Alternative, completed IRM, and implementation of a SMP, fully satisfies the RAOs and is fully protective of human health and the environment. The completed IRM included the removal of approximately 19,000 tons of on-Site soil/fill material. The soil/fill material consisted of predominantly historic fill and urban soils that are commonly encountered in municipal environments. Based on a review of the post-excavation samples collected from behind the steel sheeting at the west and east property boundary, the historic fill and urban soils encountered on-Site appear to extend off-Site as well and are indicative of surrounding soil types.

Consistent with the Track 4 Alternative, the Track 1 and Track 2 Alternatives satisfy RAOs and are fully protective of human health and the environment, however, these options are determined to be infeasible due to the increased costs, implementability, and short-term exposure risks associated with them. The increased cost and time to achieve either the Track 1 or 2 Alternative would not equate to a greater degree of protection of human health or the environment.

Accordingly, the completed IRM and implementation of a SMP is the recommended final remedial approach for the Site.

9. Remedial Action Work Plan

The soil/fill material excavation portion of the selected Remedial Alternative, Track 4, has already been completed in accordance with the Work Plan. Complete details of the IRM were previously discussed in Section 7. The remaining portions of the selected Alternative to be completed, as of the date of this report, are; installation of the final cover system, preparation and DEC approval of the SMP, and post-remedial inspections and monitoring of the IC/ECs implemented by the SMP.

9.1 Installation of the Final Cover System

As previously indicated in Section 8.3.1 above, the final cover system for parcel D1 IRM areas of the Site will consist of a geotextile fabric overlain by a minimum of 12 inches of crushed stone fill overlain by a minimum of four inches of concrete paving. Outside the footprint of the parcel D1 IRM area, fill/soil material will be covered by geotextile fabric overlain by a minimum of one foot of crushed stone fill, one inch of sand, and concrete pavers. The parcel D2 final cover system will consist of a geotextile fabric overlain by a minimum of 2 inches of crushed stone fill overlain by a minimum of three inches of asphalt paving. The final cover system is expected to be completed by November 1, 2013.

For specific sources of backfill that is imported to the Site, documentation will be provided to NYSDEC 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).

9.2 Preparation/Approval of the SMP

The SMP will include three major components; the IC/EC Plan detailing controls intended to eliminate potential exposure pathways to COPCs remaining in Site-related soil/fill and groundwater, an Excavation Work Plan detailing required methods for handling Site soils if future excavation work is required, and the Site Monitoring Plan describing inspection and monitoring activities that will be required to ensure that IC/ECs remain in-place and are effective. As per the BCP Milestones previously established with the NYSDEC, the draft SMP will be submitted to the NYSDEC for review on or before August 1, 2013. The NYSDEC will review the SMP and provide comments as needed. The BCP Milestone date for the final approval of the SMP is October 1, 2013.

9.3 Preparation and Execution of the Environmental Easement

As per the BCP Milestones previously established with the NYSDEC, a draft of the Environmental Easement was submitted to the NYSDEC by June 1, 2013. The easement will be executed by September 30, 2013 and recorded by October 15, 2013.

9.4 Long Term Maintenance and Inspections

Long term maintenance and inspection requirements for the IC/ECs will be established and discussed in further detail in the SMP which, as previously indicated in Section 2 above, will be submitted to the NYSDEC for review on or before August 1, 2013.