July 6, 2016 Reference No. 089354

Mr. Eugene W. Melnyk, P.E.
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2915

Dear Mr. Melnyk:

Re: Work Plan to Conduct Interim Remedial Measures and Pre-Design Delineation
1130 Niagara Street Site, NYSDEC Site No. C915284

1. Introduction

The New York State Department of Environmental Conservation (NYSDEC) provided comments on the Draft Remedial Investigation/Alternatives Analysis Report (RI/AAR) for the 1130 Niagara Street Site, Buffalo, New York (Site) prepared by GHD Services, Inc. (GHD) on behalf of Jenesis Development, LLC (Jenesis). Based on these comments and discussions on a conference call held June 10, 2016 between representatives of NYSDEC Region 9, GHD, and Jenesis, GHD has prepared this Interim Remedial Measures (IRM) Work Plan for the Site. The IRM will address gross petroleum contamination in the vicinity of the former chip removal corridor in the southeast portion of the Site, as well as historical fill materials at the northern edge of Parcel 3, in the area proposed for streetscape improvement by the City of Buffalo. A work plan is also included for conducting Pre-Design Delineation to further define the efforts required in addressing TCE at the Site during remediation. Revisions to the RI/AAR will incorporate the IRM activities. Findings of the Pre-Design Delineation will be submitted after completion of these efforts. This work is being conducted under and pursuant to the NYSDEC/Jenesis Brownfield Cleanup Agreement, dated February 23, 2015.

2. Objective

The primary objective of the IRM is to complete removal of gross petroleum contamination identified in the vicinity of the former chip removal corridor. Removal of soil in this area will include soils that are suspected source materials for chlorinated volatile organic compounds (CVOCs) detected in groundwater in this area of the Site. Additionally, soil consisting of historical fill materials and expected to exhibit elevated concentrations of semivolatile organic compounds (SVOCs) and metals will be removed to eliminate potential contact with these materials during implementation of a proposed streetscape improvement project to be conducted by the City of Buffalo.

The Pre-Design Delineation is being conducted to better define concentrations of TCE in the subsurface around the former degreaser and attempt to identify the presence of dense non-aqueous

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phase liquid (DNAPL). This data will be used to design a pilot study, and ultimately to design the remedial measure(s) for the source area.

3. Proposed IRM Scope of Work

The scope of work to complete impacted soil removal is described in the following sections. Note that all work activities will be conducted in accordance with the existing Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) previously developed for the Site.

Additionally, utilities at the Site will be cleared prior to the start of intrusive activities. Dig Safely New York will be contacted as required by the subcontractors to identify all public utilities. A private utility locator will also be hired to identify and mark out any utilities within the Site boundary.

3.1 Removal of Petroleum-Impacted Soil

The area of historical petroleum impacts in the southeast corner of the Site is generally well-delineated. Based on observations during several rounds of characterization sampling by GZA GeoEnvironmental of New York (GZA), Conestoga-Rovers and Associates (CRA), and Empire-Geo Sciences, Inc. (Empire), remediation activities completed by CEM, Inc. (CEM), and observations by GHD during the RI field activities, gross petroleum impacts are identified in fill materials in the former chip removal corridor and in the vicinity of soil boring SB-113 located northwest of the area remediated by CEM. The IRM will focus on removal of the impacted fill material.

Trace amounts of petroleum were also observed trapped within silt seams in the clay matrix; however, these seams are discontinuous, thus limiting mobility. To the extent that future Site development will require excavation of clay soil in this area, the material will be managed in accordance with a Site Management Plan to be developed for the Site. The scope of the IRM is not intended to remove clay soils with trace observations of oil.

3.1.1 Excavation and Off-Site Disposal

Excavation of impacted fill will be completed within the former chip corridor and northward to SB-113 as shown on Figure 1. The vertical extent of fill varies in the area from 3 feet below grade to 11 feet below grade depending on prior activity in the area. Excavation will proceed both vertically and horizontally until no visible oil presence is observed in the fill, or the foundation footers or property boundary are reached, or native clay soil is reached.

Based on historical characterization data from the RI, excavated material from the proposed IRM area is expected to be non-hazardous and appropriate for disposal at a municipal solid waste landfill. Additional waste characterization samples will be collected as necessary as directed by the disposal facility.

3.1.2 Dewatering

Monitoring conducted during the 2015 RI field work indicated significant fluctuations in groundwater levels within this portion of the Site. As a result, there is the potential for dewatering to be required. Groundwater removed from the excavation and surface water that infiltrates into the excavation area

will be managed and treated on-site. Water removed from the excavation will be stored in a 20,000-gallon influent frac tank. Any recovered petroleum will be separated from the water and transported off-Site for disposal. Water will be treated on Site on a batch basis through a temporary mobile activated carbon treatment system into an effluent frac tank. A temporary sewer discharge permit will be obtained from the Buffalo Sewer Authority (BSA) for discharge of treated water to the sanitary sewer under Gull Street. Each batch of treated water will be analyzed for the permit-required parameter list prior to discharge.

Upon completion of treatment activities, the IRM contractor will be responsible for recycling/disposing of the spent carbon, cleaning the frac tanks, and disposing of any wash waters and residual solids in accordance with applicable regulations.

3.1.3 Post-Excavation Sampling

Post excavation soil samples will be collected from the sidewalls and bottom of the excavation to document the residual concentrations of Site COCs remaining in place. As the goal of the IRM is to remove only grossly contaminated material, the data will not be used to guide any additional excavation activities.

The number of samples collected will be based on the size of the excavation and in accordance with NYSDEC guidance document DER-10. Soil samples will be analyzed for Target Compound List (TCL) VOCs, TCL SVOCs, Target Analyte List (TAL) total metals. Soil samples for VOC analysis will be collected using TerraCore collection kits.

3.1.4 Backfill

The horizontal and vertical limits of the excavation will be measured and recorded prior to backfill. A perforated PVC piping gallery will be installed at the base of the excavation to serve as a monitoring network for recoverable oil, a means to extract product should recoverable volumes accumulate, and a delivery mechanism should future in-situ treatment or bioaugmentation be deemed appropriate. Solid PVC risers will be installed at the junction and ends of the excavation legs, and at any isolated deeper sections of the excavation. The risers will be finished similar to flush-mount monitoring wells to protect the piping from vehicle traffic. The first 1 foot above the base of the excavation surrounding the piping gallery will be backfilled with free-draining granular backfill material, with a uniform particle size (e.g., sand, pea gravel). The remainder of the excavation to within 1 foot of existing grade will be backfilled with general fill, soil, and/or stone. Any backfill material imported to the Site must meet the requirements of DER-10 Section 5.4(e).

Backfilling operations will be carried out such that adequate heavy vibration equipment is used to compact the material. The backfill will be placed in loose lifts not exceeding 1.5 feet in thickness, and will be compacted to a minimum of 95 percent Modified Proctor maximum dry density (MPMDD) in any area subject to vehicular traffic. The area will be restored with an asphalt pavement surface consisting of a 3-inch-thick binder coarse with 1.25-inch top course underlain by 8 inches of compacted 2-inch run-of-crusher stone placed over a geotextile fabric.

3.2 Removal of Historical Fill Material – North Boundary of Parcel 3

The City of Buffalo's proposed streetscape improvements along West Ferry Street include planting of trees along the south side of the south sidewalk along the northern perimeter of Parcel 3. To avoid potential contact with historical fill materials impacted with SVOCs and metals, limited soil removal is proposed. Tree planting activities are not expected to disturb soil deeper than 3 feet below existing grade. An area 5 feet wide will be excavated to a depth of 4 feet below grade along the northern boundary of Parcel 3 as shown on Figure 1. The soil will be characterized for disposal, but is anticipated to be non-hazardous based on available historical data for Parcel 3. Soil will be transported to a permitted landfill for disposal.

No confirmatory sampling of the excavation sidewalls will be completed prior to backfill. A demarcation layer will be placed at the base of the excavation and the excavation backfilled to within 6 inches of existing grade with general fill/soil. Any backfill material imported to the Site must meet the requirements of DER-10 Section 5.4(e). The backfill will be covered with 6 inches of topsoil and seeded.

4. Pre-Design Delineation

Previous investigations at the Site, including the 2015 RI, have demonstrated that there are concentrations of TCE in groundwater that indicate the potential for free phase TCE (DNAPL) to be present in the Site's subsurface. The scope of work to delineate the extent of elevated concentrations around the presumed source (the former degreaser) and to investigate the presence of DNAPL at the Site is presented below. The area exhibiting the greatest impact will be targeted for a future in-situ pilot test of the recommended alternative as presented in the RI/AAR.

4.1 Installation of Soil Borings

GHD personnel will oversee the installation of 35 soil borings on an approximate 15-foot by 15-foot grid pattern throughout the area of DNAPL investigation presented on Figure 2. The soil borings will be installed utilizing direct push methods by a local drilling contractor. The proposed soil boring locations are also presented on Figure 2. Dig Safely New York will be contacted prior to the commencement of drilling activities to perform a utility mark-out. Actual drilling locations may be adjusted to avoid underground utilities or based on findings (e.g., if positive field screening results appear to move in a specific direction). All soil borings will be advanced to the bedrock surface or probe refusal, with an estimated total depth of each soil boring approximately 16 feet below ground surface. Boreholes will be backfilled with cement grout upon completion.

4.2 Field Screening of Soil

Soil samples will be logged by GHD personnel and the soils will be classified using a modified version of the Unified Soil Classification System (USCS). During borehole logging, soil samples will be screened for VOCs and DNAPL using a hand-held FID calibrated to TCE and two dye tests. DNAPL screening will be completed in the following manner.

1. Open acetate macro-core liner.

2. Conduct initial FID VOC field screening with readings from every 2.5-foot interval for 5-foot macro-cores or 2.0-foot interval for 4-foot macro-core and document these readings.

3. Conduct a visual inspection of the soil core for evidence of DNAPL and document the observations.

4. Spray soil core with Cheiron Resources, Ltd. (Cheiron) OilScreenDNAPL-LENS (Spray)®, or equivalent product. The manufacturer's instructions will be referred to for proper application of the spray. After 3 minutes, observe sprayed soil for a royal blue color, indicating DNAPL presence and document the observations.

5. Obtain soil samples at 2.5-foot intervals for DNAPL field screening. It is anticipated that approximately 210, 2.5-foot intervals will be field screened for DNAPL. Soil samples should be collected preferentially from depths where FID, spray field screening, or visual inspection of the soil core indicates the potential for DNAPL. Uniform quantities of soil samples should be collected from each interval. The following two steps will be completed to fully field screen the soil samples.

    a. Place a portion of the sample in a glass sample jar for a dye shake test using Cheiron OilScreenSoil (Sudan IV)®, or equivalent product. The manufacturer's instructions will be referred to for the appropriate usage of the dye shake test kits. The DNAPL will turn a red color if present. Document the results.

    b. Place the remaining soil sample in a resealable plastic bag for headspace analysis. Warm the sample bags to a consistent temperature to promote VOC volatilization, measure with the FID, and document the reading.

4.3 Laboratory Analysis

Approximately 10 percent of the sample intervals field screened for DNAPL will be submitted for laboratory analysis to quantify the concentrations of the compounds in the subsurface. This will lead to the collection and submittal of approximately 21 soil samples. Intervals selected for analysis will include those samples exhibiting the presence of DNAPL or the potential presence of DNAPL based on the results of the field screening. The selected soil will be placed in laboratory provided Terracore sample containers, properly packaged and cooled, and shipped to TestAmerica under chain-of-custody protocols. The soil samples will be analyzed for TCL VOCs via method EPA 8260.

4.4 Natural Attenuation Testing

Additional groundwater samples will be collected from four locations within the general source area:

- CRA-MW-2 (overburden)
- MW-8 (overburden)
- MW-18 (overburden)
- MW-102 (bedrock)

Groundwater samples will be analyzed for the following parameters:

- Chemical analysis
  - TCL VOCs
- Natural attenuation parameters
  - Dissolved gases (ethane, methane)
  - Total Organic Carbon (TOC)
  - Total and Dissolved Iron
  - Sulfate and Sulfite
  - Nitrate and Nitrite
  - Total Nitrogen (as Ammonia)
  - Orthophosphate Phosphorus
  - pH
  - Dissolved Oxygen (DO)
  - Oxidation Reduction Potential (ORP)
- Bacterial testing
  - Dehalococcoides (DHC)
  - Total Microbial Counts (Anaerobic)

Analytical testing will be conducted by TestAmerica. Bacterial testing will be conducted by GHD at our Niagara Falls Treatability Laboratory.

4.5 Hydraulic Conductivity Testing

Hydraulic conductivity data will be assessed to aid in selection of the best eZVI product for the geologic conditions to be used for the pilot test. Data exists for CRA-MW-2, which is screened in the clay matrix with the sand pack extending to the top of bedrock. Depending on the location of potential DNAPL (i.e., fill, clay, clay/bedrock interface), it may be necessary to complete additional hydraulic conductivity of the distinct units. If so, a temporary well(s) will be installed within the zones to allow for completion of the testing.

5. Reporting

The IRM activities will be summarized in the RI/AAR and the discussions of extent of contamination and proposed remedial alternatives will be modified accordingly. The results of the pre-design delineation will be summarized in a separate report, coupled with a work plan for the proposed in-situ pilot study, so as not to delay submission of the RI/AAR.

6. Proposed Schedule

Upon approval of the IRM Work Plan, implementation of the IRM is expected to be complete within approximately 5 weeks, including contractor procurement, excavation and disposal, water treatment (if necessary), and data analysis. The results of the IRM will be incorporated into the updated RI/AA Report, estimated to be submitted approximately 4 weeks after completion of the IRM.

The updated estimated project schedule is attached as Figure 3. Issuance of the Certificate of Completion is still anticipated for calendar year 2017.

Please contact me at 716/856-2142 if you have any questions.

Sincerely,

GHD

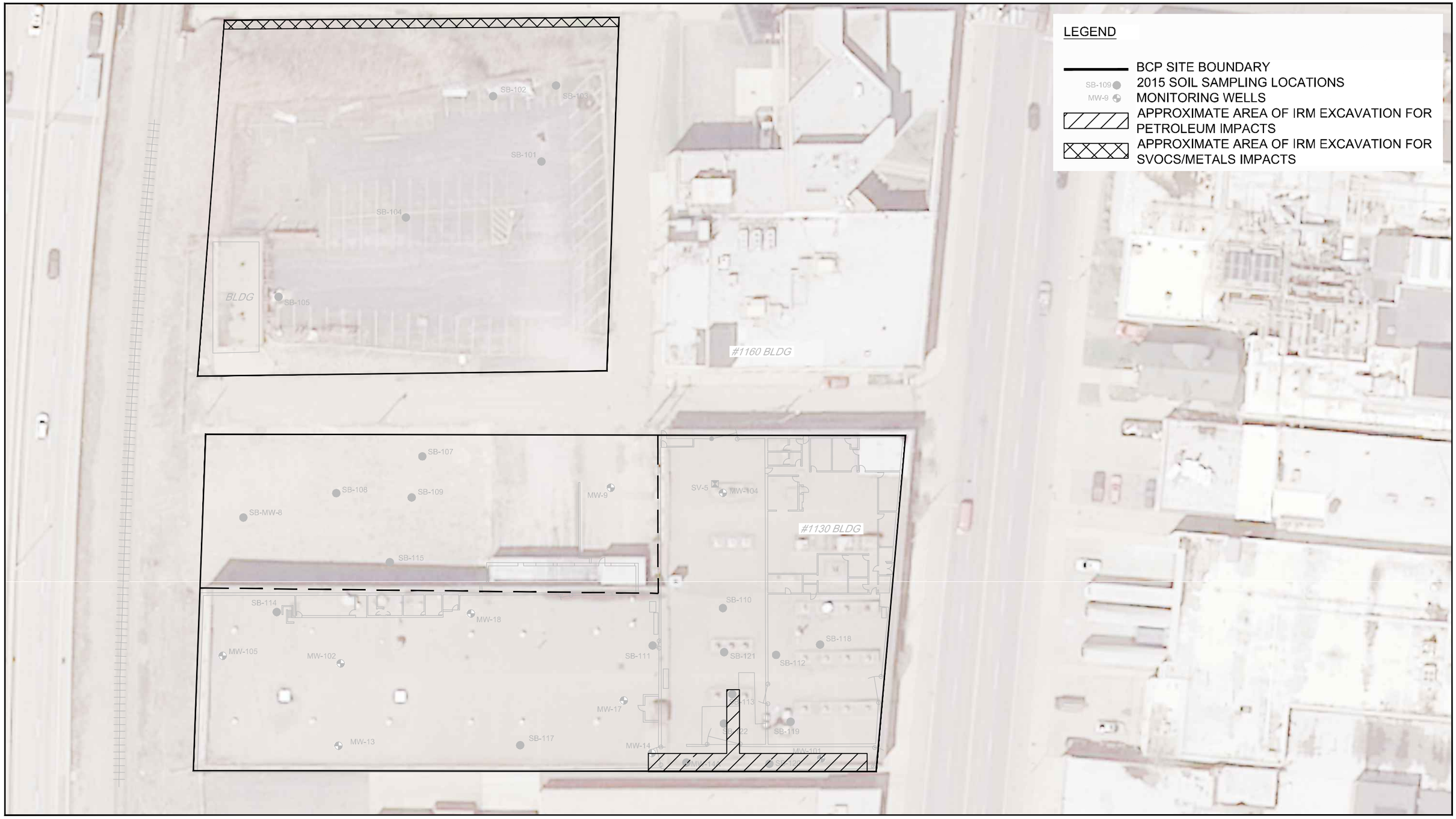
Christopher P. Martin, P.E.
Senior Project Manager

CPM/KBG/ck/002

Encl.

cc: W. Grieshober, Jenesis
D. Burgess, Jenesis
M. Graham, Phillips Lytle
R. Adams, GHD
K. Galanti, GHD

Figures



BUFFALO, NEW YORK
1130 NIAGARA STREET SITE - C915284
INTERIM REMEDIAL MEASURES WORK PLAN

PROPOSED AREAS OF EXCAVATION

89354-00(MEL003)

Jun 29, 2016

FIGURE 1

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BUFFALO, NEW YORK
1130 NIAGARA STREET SITE - C915284
INTERIM REMEDIAL MEASURES WORK PLAN

PROPOSED PRE-DESIGN DELINEATION BOREHOLES

89354-00(MEL003)

Jun 30, 2016

FIGURE 2

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FIGURE 3
ESTIMATED PROJECT SCHEDULE
BROWNFIELD CLEANUP PROGRAM PROCESS
1130 NIAGARA STREET SITE, NYSDEC SITE #C915284
BUFFALO, NEW YORK

Task	Duration
Preparation and Submittal of IRM Work Plan	Complete
NYSDEC Review of IRM Work Plan	3 Weeks
Implementation of IRM	5 Weeks
Revise RI/AA Report and Submittal	4 Weeks
DEC Review of Documents, Development of Decision Document, and Public Comment Period	13 Weeks
Implementation of Source Area Delineation	3 weeks
Preparation and Submittal of Summary Report and Pilot Study Work Plan	4 Weeks
NYSDEC Review of Pilot Study Work Plan	4 Weeks
In-Situ Pilot Study	6 Weeks
Remedial Work Plan Development	10 Weeks
DEC Review of Document	8 Weeks
RAWP Implementation	12 Weeks
Prepare and Submit Final Engineering Report and Site Management Plan	8 Weeks
NYSDEC Review and Approval of FER and SMP	12 Weeks
Issuance of COC	1 Day

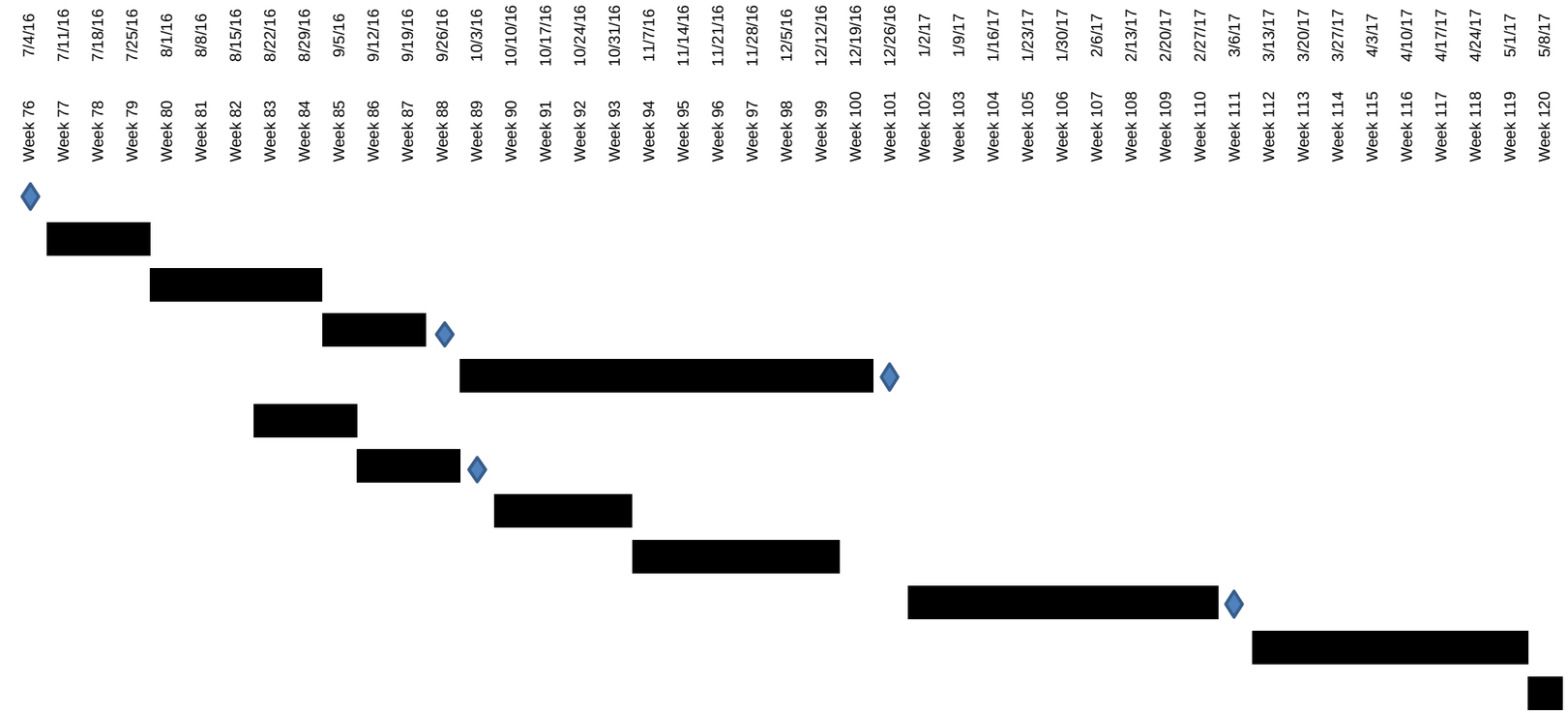

FIGURE 3
ESTIMATED PROJECT SCHEDULE
BROWNFIELD CLEANUP PROGRAM PROCESS
1130 NIAGARA STREET SITE, NYSDEC SITE #C915284
BUFFALO, NEW YORK

Task	Duration	Week Beginning Monday	5/15/17	5/22/17	5/29/17	6/5/17	6/12/17	6/19/17	6/26/17	7/3/17	7/10/17	7/17/17	7/24/17	7/31/17	8/7/17	8/14/17	8/21/17	8/28/17	9/4/17	9/11/17	9/18/17	9/25/17	10/2/17	10/9/17	10/16/17	10/23/17	10/30/17	11/6/17	11/13/17	11/20/17	11/27/17	12/4/17	12/11/17	12/18/17	12/25/17
			Week 121	Week 122	Week 123	Week 124	Week 125	Week 126	Week 127	Week 128	Week 129	Week 130	Week 131	Week 132	Week 133	Week 134	Week 135	Week 136	Week 137	Week 138	Week 139	Week 140	Week 141	Week 142	Week 143	Week 144	Week 145	Week 146	Week 147	Week 148	Week 149	Week 150	Week 151	Week 152	Week 153
Preparation and Submittal of IRM Work Plan	Complete																																
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