



**Revitalizing Auto Communities
Environmental Response Trust**

July 3, 2013

Mr. Richard Mustico, P.E.
Bureau of Central Remedial Action
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, New York 12233

Re: RACER Trust – Former Syracuse IFG Facility and Deferred Media (Registry #7-34-057) Site –
Off-Site (OU-2) Pre-Design Investigation Work Plan

Dear Mr. Mustico:

RACER Trust is pleased to transmit the Work Plan (WP) for proposed pre-design investigations (PDI) in connection with the Off-Site (OU-2) remediation efforts for the Former Syracuse IFG Facility and Deferred Media Site in Syracuse, New York. The investigation activities proposed in this PDI WP are envisioned to be necessary for the completion of design efforts related to remediation activities presented in the May 17, 2013 Feasibility Study Report, currently under NYSDEC review. In order to be better positioned for completion of the design during the fall of 2013, should the Record of Decision be finalized this summer, these activities are proposed to be conducted this summer. Please contact me at (201) 247 – 4890 should you have any questions or require further information.

Sincerely,

A handwritten signature in blue ink that reads "Mr. Brendan Mullen".

Brendan Mullen, P.E.
Cleanup Manager, NY

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WORK PLAN

**Off-Site Pre-Design Investigation
Former IFG Facility and Deferred Media Site
Syracuse, New York**



July 2013



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1. INTRODUCTION

This Off-site Pre-design Investigation Work Plan (PDI Work Plan) has been prepared for the Revitalizing Auto Communities Environmental Response (RACER) Trust (formerly General Motors Corporation (GM) and Motors Liquidation Company) Former Inland Fisher Guide (IFG) and Deferred Media Site (Site) located in the Towns of Salina and DeWitt, New York (**Figure 1**). The New York State Department of Environmental Conservation (NYSDEC) and RACER (then GM) entered into an Administrative Order on Consent (Index # D-7-0001-97-06; Order), which became effective September 25, 1997. The Order requires RACER to conduct a Remedial Investigation/Feasibility Study (RI/FS) and risk assessments.

A RI Report, which included a Human Health Risk Assessment and a Baseline Ecological Risk Assessment, was submitted to NYSDEC on March 12, 2013 (O'Brien & Gere 2013a), and subsequently approved by NYSDEC in a letter dated April 11, 2013 (NYSDEC 2013). A FS Report was submitted to NYSDEC on May 17, 2013 (O'Brien & Gere 2013b). The FS Report documents the evaluation of remedial alternatives for off-site media which includes soil along Factory Avenue, soil in a wetland located on adjacent property owned by National Grid, and sediment and soil in the portion of Ley Creek and portions of its associated floodplain between Townline Road and Route 11 (**Figure 2**). Based on a detailed evaluation of three remedial alternatives presented in the FS Report (O'Brien & Gere 2013b), RACER recommended Alternative 2A as the final remedy for the facility. Alternative 2A includes the following remedial elements:

- Excavation of soil in areas exhibiting constituent concentrations greater than acceptable concentrations given the reasonably anticipated future property use and potential receptors
- Restoration of excavated areas, as appropriate, given reasonably anticipated future property use and potential receptor needs
- Excavation of sediments in Ley Creek with concentrations greater than selected Preliminary Remediation Goals (PRGs) that take into account risks to receptors
- Institutional controls, environmental easement, periodic reviews, and a site management plan.

To expedite design and implementation of the final remedy, RACER is proposing that PDI activities be conducted during the summer of 2013 to facilitate completion of the Remedial Design during the fall of 2013, once the Record of Decision (ROD) for off-site media has been finalized by NYSDEC.

This PDI Work Plan presents the scope of work for nine proposed PDI activities to be conducted off-site. The proposed PDI activities consist of the following:

- Wetland delineation
- Wetland functional assessment
- Ley Creek riparian area habitat assessment
- Instrument survey in the National Grid wetland, Ley Creek Floodplain and transects of Ley Creek
- Sediment probing of Ley Creek
- Hydraulic modeling of Ley Creek
- Soil pre-characterization of Ley Creek Floodplain, Factory Avenue, and the National Grid wetland
- Ley Creek substrate pre-characterization
- Geotechnical soil sampling and analysis

The objectives and scope of each of these activities is described below.

2. WETLAND DELINEATION

2.1 BACKGROUND AND OBJECTIVES

The recommended alternative (Alternative 2A), presented in the Off-site FS Report, includes excavation of surface and subsurface soil within the National Grid property. Wetland habitats are present on the National Grid property located to the west of the Former IFG Facility. Remedial activities associated with the implementation of Alternative 2A will impact these habitats. The objective of this PDI is to identify the boundaries of potentially regulated wetland habitats for inclusion on off-site area design drawings and to assist in the restoration design of this area.

2.2 SCOPE OF WETLAND DELINEATION

O'Brien & Gere will perform a wetland delineation of the National Grid property in accordance with the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (USACE 2012) within the anticipated footprint of wetland remedial activities (project limits) depicted on **Figure 2**. The USACE wetland delineation methodology will be used to meet the substantive permitting requirements for this project. NYSDEC (1995) delineation methods will be factored into the field work for the wetland delineation.

The wetland delineation scope of work consists of a combination of data review and field inspection. Data review activities include review of NYSDEC Freshwater Wetland Maps, National Wetland Inventory (NWI) maps published by the U.S. Fish and Wildlife Service (USFWS), and the County Soil Survey. Historical reports and aerial photographs of the project area and surrounding area will also be reviewed.

Field activities include evaluation of vegetation, soil and hydrologic characteristics to identify and delineate wetland boundaries. Field data will be gathered at sample plots chosen in potential wetland areas and adjacent upland areas within the project limits. Identified wetland boundaries will be delineated in the field with sequentially numbered surveyor's tape/flags tied to existing vegetation or staking. Individual flag locations will be recorded using a Global Positioning System (GPS) unit with sub-meter accuracy.

The results of the wetland delineation will be summarized in a technical memorandum that can be used to help designers avoid potential wetland impacts and identify the limits of wetland restoration on associated design drawings. Components of the technical memorandum will include:

- wetland and soil mapping review results
- field methodologies and findings of the wetland delineation
- figure showing delineation limits
- wetland data summary forms documenting the wetland-related information collected during the field activities
- representative photographs of the delineated wetlands.

3. WETLAND FUNCTIONAL ASSESSMENT

3.1 BACKGROUND AND OBJECTIVES

Following completion of the wetland delineation on the National Grid property, the functions and values of the delineated wetlands will be evaluated using a standardized approach. Identification of the wetland functions and values will assist in the preparation of the restoration design documents.

3.2 SCOPE OF WETLAND FUNCTIONAL ASSESSMENT

The wetland functional assessment will utilize the USACE *Highway Methodology Workbook Supplement: Wetland Functions and Values - A Descriptive Approach* (USACE 1999). This assessment methodology has been utilized on other wetland sites associated with subsites of the Onondaga Lake NPL Site. This method evaluates thirteen functions and values as listed below:

Functions: Groundwater Recharge/Discharge, Flood Flow Alterations (Storage and Desynchronization), Fish and Shellfish Habitat, Sediment/Toxicant/Pathogen Retention, Nutrient Removal/Retention/Transformation, Production Export (Nutrient), Sediment/Shoreline Stabilization, and Wildlife Habitat.

Values: Recreation (Consumptive and Non-Consumptive), Educational/Scientific Value, Uniqueness/Heritage, Visual Quality/Aesthetics, and Threatened or Endangered Species Habitat.

Similar to the wetland delineation scope of work, described above, the wetland functional assessment scope of work will consist of a combination of data review and field inspection. The wetland functional assessment field activities will be performed concurrently with the wetland delineation field efforts. Field observations will be recorded on Wetland Function-Value Evaluation Forms adopted from the USACE 1999 guidance document. A figure will be prepared that identifies the assessed areas. The figure and completed forms for each of the assessed areas will be included as part of a technical memorandum that will present a qualitative description of the primary functions and values identified.

4. LEY CREEK RIPARIAN AREA HABITAT ASSESSMENT

4.1 BACKGROUND AND OBJECTIVES

As discussed above, the recommended alternative (Alternative 2A), presented in the Off-site FS Report, includes excavation of sediment within Ley Creek and surface and subsurface soil in areas of the associated floodplain between Townline Road and Route 11. The objectives of this task are to identify pertinent habitat-related information to document baseline conditions and obtain information for use in the restoration design.

4.2 SCOPE OF LEY CREEK RIPARIAN AREA HABITAT ASSESSMENT

Stream, bank and riparian area physical characteristics will be documented on standardized field data forms. Data and information to be recorded includes: dominant creek substrate (*e.g.*, percent sand, gravel, aquatic vegetation, etc.), presence of pool/riffle/run, presence of structure (*e.g.*, coarse woody debris), creek bank slope, stability and vegetation, riparian area vegetative covertype and dominant species observed, percent vegetative cover, wildlife observed and presence of anthropogenic influences (*e.g.*, culverts, bridges, buildings). A figure will be prepared that identifies the vegetative covertypes of the assessed areas. The figure and completed forms will be included as part of a technical memorandum that will present a qualitative description of the Ley Creek and riparian area habitat. This effort is expected to be conducted concurrent with Ley Creek Sediment Probing efforts.

5. INSTRUMENT SURVEY IN THE NATIONAL GRID WETLAND, LEY CREEK FLOODPLAIN AND TRANSECTS OF LEY CREEK

5.1 BACKGROUND AND OBJECTIVES

As discussed above, the recommended alternative (Alternative 2A), presented in the Off-site FS Report, included the excavation of surface and subsurface soil within portions of the National Grid wetland and excavation of sediment and soil from certain areas within Ley Creek and portions of the associated floodplain between Townline Road and Route 11. An instrument survey will be required to complete the following pre-design and design activities related to excavation and restoration of these off-site areas:

- *Hydraulic model of Ley Creek.* The survey of transects of Ley Creek and its banks will be utilized to generate a hydraulic model of Ley Creek. The objectives and scope of the pre-design hydraulic modeling effort is further discussed below.
- *Evaluation of extent of soil contamination.* Soil samples will be collected at select locations in the Ley Creek Floodplain, along Factory Avenue and within the National Grid wetland for the purpose of soil characterization and refinement of the proposed extents of excavation. Soil boring locations will be surveyed for inclusion in off-site base maps. The objectives and scope of the pre-design soil characterization efforts are further discussed below.
- *Excavation limits within National Grid wetland.* An instrument survey of current National Grid wetland topography will be utilized during the design of wetland excavation and restoration.

5.2 SCOPE OF INSTRUMENT SURVEY

A licensed professional land surveyor will perform a topographic instrument survey of portions of the National Grid wetland, Ley Creek and associated floodplain in addition to PDI soil boring locations. Horizontal and vertical data will be surveyed using NAD83 State Plane New York Central zone and NAVD88 coordinates, respectively. Survey data will be supplied by the land surveyor in AutoCAD format for use in subsequent PDI and design activities. The anticipated limits of the instrument survey are illustrated on **Figure 3**, and generally described as follows:

- Topographic Survey of National Grid wetland:
 - » Approximately 10 acres of the National Grid property
- Topographic Survey of Ley Creek Floodplain:
 - » 100 ft in each direction of the top of bank for Ley Creek
- Ley Creek Survey:
 - » Cross-sections on 100 ft centers for the width of the creek on top of sediment and bottom of erodible sediment.
 - » Additional five cross-sections extending 500 ft each side of top of bank. Sections north of creek will end at NYS Thruway right-of-way if within 500 ft of top of north bank.

Topographic survey features will include 1-ft contours, tree/vegetation line, driveways, parking areas, buildings, roadways, fences and utility features. In-creek survey will include top and bottom of erodible sediment (where encountered). Top of sediment will be recorded using the survey rod and bottom of erodible sediment will be recorded by pushing the rod into the sediment until refusal is encountered.

6. SEDIMENT PROBING OF LEY CREEK

6.1 BACKGROUND AND OBJECTIVES

As described above, the recommended alternative (Alternative 2A) presented in the Off-site FS Report included the excavation of sediment within Ley Creek between Townline Road and Route 11. The extent of sediment removal in the Off-site FS Report assumed an average sediment excavation depth of 1.25 feet, based on historical sampling and a 1998 sediment probing effort.

Updated sediment probing will be conducted within Ley Creek as part of pre-design activities to identify sediment depositional areas in Ley Creek between Townline Road and Route 11 and measure approximate depths of sediment present. Sediment depositional areas and depths identified during this effort will be utilized in conjunction with information obtained as part of the topographic survey to refine Ley Creek sediment excavation volumes and depths.

6.2 SCOPE OF SEDIMENT PROBING

Sediment probing will be conducted by advancing a steel rod through Ley Creek sediment until refusal. Multiple probing locations will be advanced across the stream width to develop a representative sediment profile of each transect. Sediment probing across Ley Creek transects will be conducted at a frequency of one transect per 100 linear feet of creek. The area of localized, relatively small depositional areas will be measured manually.

Ley Creek transect locations will be geo-referenced using a GPS unit with sub-meter accuracy. Data to be recorded include:

- Water depth
- Sediment depth
- Pertinent habitat-related items on standardized data forms

The results of the sediment probing of Ley Creek will be summarized in a technical memorandum and combined with relevant data obtained from the topographic survey to estimate sediment volumes, sediment excavation limits, and substrate characteristics for use in the remedial design. Information included in the technical memorandum will include field methodologies and findings and representative photographs and figures to depict field conditions and probing locations.

7. HYDRAULIC MODELING OF LEY CREEK

7.1 BACKGROUND AND OBJECTIVES

As discussed above, the recommended alternative (Alternative 2A) presented in the Off-site FS Report, includes the excavation of sediment from certain areas within Ley Creek between Townline Road and Route 11. In order to complete design activities related to sediment removal in this segment of Ley Creek, it is necessary to understand the hydraulics of the creek. A Hydraulic Engineering Center River Analysis System (HEC-RAS) hydraulic model was developed by O'Brien & Gere for a portion of this segment in 2005 in connection with the remedy for the Ley Creek Polychlorinated Biphenyl (PCB) Dredgings Site. In addition, a Storm Water Management Model (SWMM) hydraulic model was developed for portions of this segment by Clough Harbor & Associates, LLP in 2006 for Onondaga County Department of Water Environment Protection (OCDWEP).

As part of pre-design activities for remedial efforts anticipated for the segment of Ley Creek between Townline Road and Route 11, a HEC-RAS hydraulic model will be completed to provide information for sediment removal and in-creek/bank restoration (development of proposed channel geometry design) and to support obtaining floodplain development approval (evaluate and document effects of proposed work).

7.2 SCOPE OF HYDRAULIC MODELING OF LEY CREEK

A HEC-RAS hydraulic model will be completed for the segment of Ley Creek between Townline Road and Route 11. Existing models that include segments of Ley Creek and its floodplain will be utilized as a basis to develop the hydraulic model. The hydraulic modeling task will include:

- Review of data inputs and results from the existing HEC-RAS model developed by O'Brien & Gere in 2005 for permitting purposes for the Ley Creek PCB Dredgings Site remedial work.
- Review of data inputs and results from the existing SWMM model developed by Clough Harbor & Associates, LLP in 2006 for OCDWEP.
- Review available background information, including the reports and attachments associated with the two previously developed models.
- Update the 2005 HEC-RAS model with surveyed stream and floodplain geometry (survey provided under separate task) to create an existing conditions model.
- Develop proposed condition model by adjusting the updated stream geometry with proposed design geometry.
- Meeting with the Town of Salina to understand permitting implications regarding work within the Ley Creek Floodplain, as they pertain to hydraulic documentation needs.
- Field verification of model input data.

The results of the hydraulic modeling of Ley Creek will be summarized in a technical memorandum, with necessary attachments, documenting modeling inputs, methodology, and simulation results.

8. SOIL PRE-CHARACTERIZATION OF LEY CREEK FLOODPLAIN, FACTORY AVENUE, AND THE NATIONAL GRID WETLAND

8.1 BACKGROUND AND OBJECTIVES

As discussed above, the recommended alternative (Alternative 2A) presented in the Off-site FS Report, includes the excavation of soils to varying assumed depths along portions of the Ley Creek Floodplain, along Factory Avenue between Route 11 and LeMoyne Avenue, and within portions of the National Grid wetland. To implement Alternative 2A remedial elements for the off-site soils, a soil pre-characterization program is proposed for select off-site areas to identify the volumes to be excavated in the design and eliminate or minimize the need for post-excavation confirmatory samples.

Based on historical data and comparison of analytical results to PRGs, soil removal in portions of the Ley Creek Floodplain and along Factory Avenue will be based on PCB concentrations that exceed the PRGs, and soil removal in the National Grid wetland will be based on PCB and site-related metals (arsenic, chromium, copper, lead, nickel and zinc) concentrations that exceed the PRGs.

The objective of the soil characterization program is to provide additional data to identify the horizontal and vertical extent of excavation areas for off-site soils along the Ley Creek Floodplain, in the vicinity of Factory Avenue between Route 11 and LeMoyne Avenue, and within the National Grid wetland. These data will be used to estimate the volumes of soil to be excavated and will be utilized during the design of excavation, soil management, and restoration remedy components. The intent of this effort is to minimize the uncertainty relative to excavation and disposal volumes and minimize construction delays related to the collection and interpretation of post-excavation samples.

8.2 SCOPE OF LEY CREEK FLOODPLAIN, FACTORY AVENUE AND NATIONAL GRID WETLAND SOIL CHARACTERIZATION

Five off-site areas are included in the soil pre-characterization program as shown on **Figures 3 through 6**:

- Ley Creek floodplain hot spot area
- Ley Creek Floodplain in the vicinity of existing soil sample locations LCFP-06 and LCFP-07
- Factory Avenue between LeMoyne Avenue and Route 11
- National Grid wetland
- Drainage swale along National Grid access road

8.2.1 Field Investigation

Underground Facilities Protection Organization (UFPO) Activities

Prior to initiation of the soil characterization program, Dig Safely New York will be contacted to mark the utilities that may be present in the proposed work areas.

Soil Borings

Ley Creek floodplain hot spot area

The Ley Creek floodplain hot spot area represents an area of soil containing elevated PCB concentrations as identified and evaluated in the RI and FS Reports (O'Brien & Gere 2013a and 2013b, respectively). Thirteen soil borings are proposed in the Ley Creek floodplain hot spot area as shown on **Figure 4**. The proposed soil borings will be located approximately 10 feet from existing soil borings where soil with PCB concentrations above Part 375 Soil Cleanup Objectives (SCOs) for residential use has been documented.

The proposed soil borings will be advanced to the depths shown on **Table 1** below. To further evaluate the vertical extent of impacted soil with PCB concentrations exceeding 1 parts per million in the Ley Creek

floodplain hot spot area, the proposed soil boring depths will be advanced 1 foot deeper than existing soil borings in the vicinity. **Table 1** below details the distribution of the existing soil borings and depths for the proposed soil borings within the Ley Creek floodplain hot spot area.

Table 1: Existing Soil Borings and Proposed Soil Borings – Ley Creek Floodplain Hot Spot Area

Existing Soil Boring	Deepest Sample Interval with PCB Concentration Exceeding PRG (ft)	PCBs Concentration Results (mg/kg)	Proposed Number of Soil Borings	Proposed Soil Boring Depth (ft)	Approximate Distance from Existing Soil Boring
LCFP-03S	1.0-2.0	2.3 J	3	3	10-ft east, 10-ft west, and 10-ft south
B18	0.0-2.0	3.2	1	3	10-ft north
LCFP-03W	1.0-2.0	56 J	1	3	10-ft north
LCFP-03E	1.0-2.0	130	1	3	10-ft north
B17	2.0-4.0	8.4 D	1	5	10-ft north
B7	0.0-4.0	24 D	1	5	10-ft north
B14	0.0-4.0	1 D	1	5	10-ft north
B29	4.0-6.0	11 D	1	7	10-ft north
B30	4.0-6.0	21 D	1	7	10-ft north
B31	4.0-6.0	6.2 D	2	7	10-ft north, 10-ft east

Soil Sampling and Analyses

Soil samples for laboratory analyses will be collected at three sampling depth intervals in each of the proposed soil boring locations for a total of 39 soil samples. One set of QA/QC samples (e.g., field duplicate and MS/MSD samples) will be collected per 20 soil samples. The collected soil samples will be analyzed for PCBs using USEPA Method 8082. Data validation is not proposed for these samples. **Table 2** shows the proposed soil sampling depth intervals and laboratory analysis.

LCFP-06 and LCFP-07 - Ley Creek Floodplain

Four soil borings are proposed in the vicinity of former sample location LCFP-06 and four soil borings are proposed in the vicinity of former sample location LCFP-07 located on the Ley Creek Floodplain as shown on **Figure 5**. The proposed soil borings will be located approximately 10 feet from existing soil borings where soil with PCB concentrations above Part 375 SCOs for residential use has been documented.

To further evaluate the vertical extent of PCB concentrations in soil in the LCFP-07 and LCFP-06 areas, the proposed soil borings will be advanced 1 foot deeper than previous soil borings in the vicinity. **Table 3** below details the distribution of the existing soil borings and proposed depths for the new soil borings located in the vicinity of LCFP-07 and LCFP-06.

Table 3: Existing Soil Borings and Proposed Soil Borings – LCFP-06 and LCFP-07 Areas

Existing Soil Boring	Deepest Sample Interval with PCB Concentration Exceeding PRG (ft)	PCBs Concentration Results (mg/kg)	Proposed Number of Soil Borings	Proposed Soil Boring Depth (ft)	Approximate Distance from Existing Soil Boring
LCFP-06W	0.5-1.0	17 J	1	2	10-ft west
LCFP-06N	1.0-1.58	15 J	2	2	10-ft north
LCFP-06E	0.5-1.0	11 J	1	2	10-ft east
LCFP-07W	1.0-2.0	3.1	1	3	10-ft west
LCFP-07N	1.0-1.4	9.6 J	2	3	10-ft north
LCFP-07E	1.0-2.0	17 J	1	3	10-ft east

Soil Sampling and Analyses

Soil samples for laboratory analyses in the LCFP-06 and LCFP-07 areas will be collected at two sampling depth intervals in each of the proposed soil borings for a total of sixteen soil samples (eight samples at each area). One set of QA/QC samples (e.g., field duplicate and MS/MSD samples) will be collected per 20 soil samples. The collected soil samples will be analyzed for PCBs using USEPA Method 8082. Data validation is not proposed for these samples. **Table 2** shows the proposed soil sampling intervals and laboratory analysis.

Factory Avenue between LeMoyne Avenue and Route 11

Eight soil borings are proposed in the vicinity of former sample locations along Factory Avenue between LeMoyne Avenue and Route 11. As presented in **Figure 5**, the proposed soil borings will be located approximately 10 feet from previous soil borings where soil with concentrations above Part 375 SCOs for commercial use has been documented.

To further evaluate the vertical extent of PCB concentrations in soil along Factory Avenue between LeMoyne Avenue and Route 11, the proposed soil boring depths will be advanced 1 foot deeper than the previous soil borings. The distribution of the existing soil borings and proposed depths for the new soil borings within the soil boring area along Factory Avenue between LeMoyne Avenue and Route 11 are detailed below on **Table 4**.

Table 4: Existing Soil Borings and Proposed Soil Borings – Along Factory Avenue Between LeMoyné Avenue and Route 11

Existing Soil Boring	Deepest Sample Interval with PCB Concentration Exceeding PRG (ft)	PCBs Concentration Results (mg/kg)	Proposed Number of Soil Borings	Proposed Soil Boring Depth (ft)	Approximate Distance from Existing Soil Boring
A-8	0.0-3.0	8.8 D	3	4	10-ft north, 10-ft east, 10-ft west
A-6	0.0-3.0	1.7 D	3	4	10-ft north, 10-ft east, 10-ft west
S-4*	0.67-1.33	4	2	2	10-ft north, 10-ft east

Soil Sampling and Analyses

Soil samples for laboratory analyses will be collected at two sampling depth intervals in each of the proposed soil boring for a total of eighteen soil samples. One set of QA/QC samples (e.g., field duplicate and MS/MSD samples) will be collected per 20 soil samples. The collected soil samples will be analyzed for PCBs using USEPA Method 8082. Data validation is not proposed for these samples. **Table 2** shows the proposed soil sampling intervals and laboratory analysis.

National Grid wetland

Fifty soil borings are proposed in the National Grid wetland in the vicinity of both former sample locations and areas of the National Grid wetland where limited sampling has been conducted to date. As shown on **Figure 6**, most of the proposed soil boring locations are based on a 50-foot grid.

The proposed soil borings will be advanced to varying depths based on existing soil sample intervals and PCB concentrations exceeding the Part 375 SCOs for the protection of ecological resources. To further evaluate the vertical extent of PCB concentrations in soil in the vicinity of existing soil borings, the proposed soil borings will be advanced 1 to 3 feet deeper than the deepest existing interval with soil concentration exceeding the Part 375 SCOs for the protection of ecological resources for PCBs. To evaluate the extent of PCBs in National Grid wetland soil in areas with limited soil samples to date, soil borings will be advanced 3 to 4 feet below grade.

Soil Sampling and Analyses

Soil samples for laboratory analysis will be collected at up to four sampling depth intervals at each of the proposed soil boring locations for a total of 136 soil samples. One set of QA/QC samples (e.g., field duplicate and MS/MSD samples) will be collected per 20 soil samples. The collected soil samples will be analyzed for PCBs using USEPA Method 8082, in a phased manner, based on results from shallower intervals. **Table 2** shows the proposed soil sampling intervals and laboratory analyses.

Drainage Swale along National Grid Access Road

Two surface soil samples are proposed for collection in the drainage swale that parallels the western side of the National Grid access road, directly south of the forested portion of the wetland, as shown on **Figure 6**. The proposed surface soil samples will be collected from the 0 to 6 inch depth interval. Samples will be collected using a manually driven auger or stainless steel shovel.

Soil Sampling and Analyses

Soil samples for laboratory analysis will be collected along with one set of QA/QC samples (*e.g.*, field duplicate MS/MSD and equipment blank samples). The collected soil samples will be analyzed for PCBs using USEPA Method 8082, and site-related metals (arsenic, chromium, copper, lead, nickel, and zinc) using USEPA Method 6010. Data validation is not proposed for these samples. **Table 2** shows the proposed soil sampling intervals and laboratory analyses.

8.2.2 Soil Boring Advancement Methodology

Proposed soil borings will be advanced using a Macro-Core® soil sampler manually driven with a slide bar hammer. An O'Brien & Gere geologist will be on-site during the advancement of the soil borings and sample collection to describe the soil samples. Each soil sample will be qualitatively described by the field geologist using the modified Wentworth scale, as to its color, moisture content, density, and grain-size distribution. This descriptive information will be recorded on boring logs.

The O'Brien & Gere geologist will be responsible for collecting the discrete soil sampling intervals for laboratory analyses as specified in **Table 2**. Samples will be transferred to a dedicated aluminum pan using dedicated disposable scoops for homogenization. Subsequent to homogenization, soils will be transferred to the laboratory container appropriate for the analyses and placed in a cooler containing ice for transport to the laboratory.

Soil sampling equipment will be decontaminated between samples (washed with a non-phosphate detergent solution and rinsed with deionized water). If reusable sampling equipment is utilized, decontamination measures will be employed between samples to avoid cross-contamination. Soil borings will be backfilled with bentonite or soil cuttings and staked for surveying.

8.2.3 Investigation-Derived Waste Handling

Investigation-derived waste (IDW) expected to be produced during the implementation of this Work Plan includes soil, groundwater, decontamination water, and personal protective equipment (PPE). PPE and disposable sampling equipment produced during the field activities will be placed in a dumpster for disposal. Soil generated during advancement of the soil boring installations will be containerized in 55-gallon drums and disposed in accordance with state and federal regulations. Water produced during decontamination will be temporarily containerized and decanted to the Facility stormwater treatment plant.

8.2.4 Survey

Each soil boring location will be surveyed for horizontal and vertical control to provide the locations of sampling points. Horizontal and vertical data will be surveyed using NAD83 and NAVD88 coordinates, respectively.

The results of the soil pre-characterization sampling in the Ley Creek Floodplain, along Factory Avenue, and in the National Grid wetland will be summarized in a technical memorandum. Information included in the technical memorandum will include field methodologies, analytical results, sample location figures, and the extent of soil contamination.

9. LEY CREEK SUBSTRATE PRE-CHARACTERIZATION

9.1 BACKGROUND AND OBJECTIVES

While the sediment quality of Ley Creek has been evaluated during the Remedial Investigation, samples have not been collected of the substrate material underlying the sediment. At the request of NYSDEC, creek substrate samples will be collected as part of the PDI. The intent of this sampling is to verify that the substrate beneath the sediment may be used in the delineation of PCB-affected sediment and thereby minimize construction delays related to the collection and interpretation of post-excavation samples.

9.2 SCOPE OF LEY CREEK SUBSTRATE SAMPLING AND ANALYSIS

Four samples of the substrate underlying the Ley Creek sediment will be collected. Samples will be collected such that cross-contamination from nearby creek sediments is minimized (*i.e.*, samples will be collected from areas lacking in overlying, erodible sediment and preferably from areas where prior sampling indicated sediment concentrations were below PRGs). Proposed locations are presented on **Figure 7**. However, a site reconnaissance will be performed prior to sample collection to identify the preferred sampling locations. The selected sample locations will be recorded with a GPS unit.

The substrate samples will be collected from the 0 to 6 inch depth interval and will not include erodible sediment or other natural debris (*e.g.*, aquatic vegetation, gravel) that may be present. Samples will be collected using a manually driven Lexan tube, auger or stainless steel shovel. Each soil sample will be photographed and qualitatively described as to its color, moisture content, density, and grain-size distribution. One QA/QC sample will be collected. The collected soil samples will be analyzed for PCBs using USEPA Method 8082. Data validation is not proposed for these samples.

The results of the Ley Creek substrate pre-characterization sampling will be summarized in a technical memorandum. Information included in the technical memorandum will include field methodologies, sample location figure, photographs, substrate material characteristics, and analytical results. Relevant information from the geotechnical sampling efforts (described below) will be incorporated into the memorandum, as applicable.

10. GEOTECHNICAL SOIL SAMPLING AND ANALYSIS

10.1 BACKGROUND AND OBJECTIVES

As discussed above, the recommended alternative (Alternative 2A) presented in the Off-site FS Report, includes excavation of surface and subsurface soil within the National Grid wetland and along Factory Avenue and excavation of sediment and soil within Ley Creek and the associated floodplain between Townline Road and Route 11. To implement Alternative 2A remedial elements for the off-site soils, geotechnical soil sampling will be conducted as part of pre-design activities to establish soil engineering properties. Existing soil conditions will be evaluated for the purpose of design and evaluation of potential construction techniques. The objectives of geotechnical soil sampling in off-site areas include:

- *National Grid wetland.* Evaluation of soil stability and engineering properties for the purpose of designing access roads and phasing of wetland excavation.
- *Ley Creek and associated floodplain.*
 - » Evaluation of soil engineering properties and depth to bedrock for the purpose of designing the dewatering approach to be implemented during Ley Creek sediment excavation activities
 - » Evaluation of soil engineering properties for the purpose of Ley Creek and associated floodplain restoration design, specifically, to minimize erosion following excavation and restoration activities.

10.2 SCOPE OF GEOTECHNICAL SOIL SAMPLING AND ANALYSIS

Pre-design investigation geotechnical soil boring activities will be conducted during two phases for the purpose of gathering preliminary information during Phase 1, followed by more refined design information during Phase 2. The scopes of Phase 1 and 2 pre-design geotechnical activities are provided below.

10.2.1 Phase 1 – Preliminary Information

Underground Facilities Protection Organization (UFPO) Activities

Prior to initiation the geotechnical pre-design investigation program, Dig Safely New York will be contacted to mark the utilities that may be present in the proposed work areas.

Subsurface Investigation

It is proposed that six soil borings be installed within the proposed excavation limits in the National Grid wetland. It is also proposed that four borings be drilled adjacent to the wetlands in the ditch along Factory Avenue at a spacing of 200 feet on-center. The six borings proposed to be installed within the wetland will be installed to a depth of 10 feet below grade or refusal (50 blows/inch), whichever is less. The borings drilled along Factory Avenue will be drilled to a depth of 25 feet or refusal, whichever is less.

The geotechnical investigation of the Ley Creek excavation limits will consist of installing up to six borings to evaluate subsurface conditions relative to the use of sheeting for temporary dewatering systems. It is anticipated that the borings will be installed at the approximate locations illustrated on **Figure 8**, dependent upon accessibility. The borings will be installed to a depth of 25 feet or refusal, whichever is less. Should conceptual design progress and eliminate the possibility of sheeting use, this subtask may be eliminated.

An O'Brien & Gere field engineer experienced in geotechnical investigations will be present during installation of the borings. Soil samples will be collected and blow count information required to calculate N-values will be recorded on a continuous basis for the first 10 feet of each boring in accordance with ASTM D1586. Soil samples will be collected and N-values will be recorded on a standard basis (every 5 feet) below a depth of 10 feet. The depth to groundwater, if encountered, will be recorded for each boring at the time of discovery and at the completion of the boring. Collected soil samples will be classified by the field engineer using the Unified Soil Classification System (USCS). The field engineer will record the field classification of encountered soil and rock strata on boring logs. Each boring will be backfilled with concrete grout to the surface.

If auger refusal or bedrock is encountered prior to reaching the specified depth, a 5-foot rock core will be collected in accordance with ASTM D2113. The rock cores will be collected to confirm that the auger refusal is due to bedrock and to evaluate the quality of the bedrock. Each of the borings will be surveyed by recording the actual location and elevation. Based on existing subsurface information it is not anticipated that rock coring will be required.

Geotechnical Laboratory Analysis

O'Brien & Gere will select representative soil samples for geotechnical laboratory testing to assist in soil identification and to assess sample density, compressive strength, and consolidation properties of soil strata. Depending upon the soils encountered, the specific tests may include grain size analysis (ASTM D422), Atterberg limits (ASTM D424), moisture content (ASTM D2216), and specific gravity (ASTM D854). It is assumed that up to three grain size analyses with hydrometer, three Atterberg limits tests, and up to ten natural moisture content tests will be submitted for laboratory analysis.

10.2.2 Phase 2 – Final Design Information

Subsurface Investigation

The second phase of the geotechnical investigation, if needed, will consist of installation of additional borings within the National Grid wetland and along the bank of Ley Creek. The borings will be drilled to a depth of 10 to 25 feet or refusal, whichever is less depending on the area being investigated. The borings will be equally spaced across the proposed investigation footprint to provide adequate coverage and subsurface information. This phase of the geotechnical fieldwork will only be executed if additional subsurface information is required based on the final design and the information collected during Phase 1. The scope of Phase 2 will be provided following interpretation of Phase 1 results.

The results of the geotechnical investigation(s) will be summarized in a technical memorandum. Information included in the technical memorandum will include field methodologies, subsurface characteristics, and laboratory testing results.

11. REPORTING

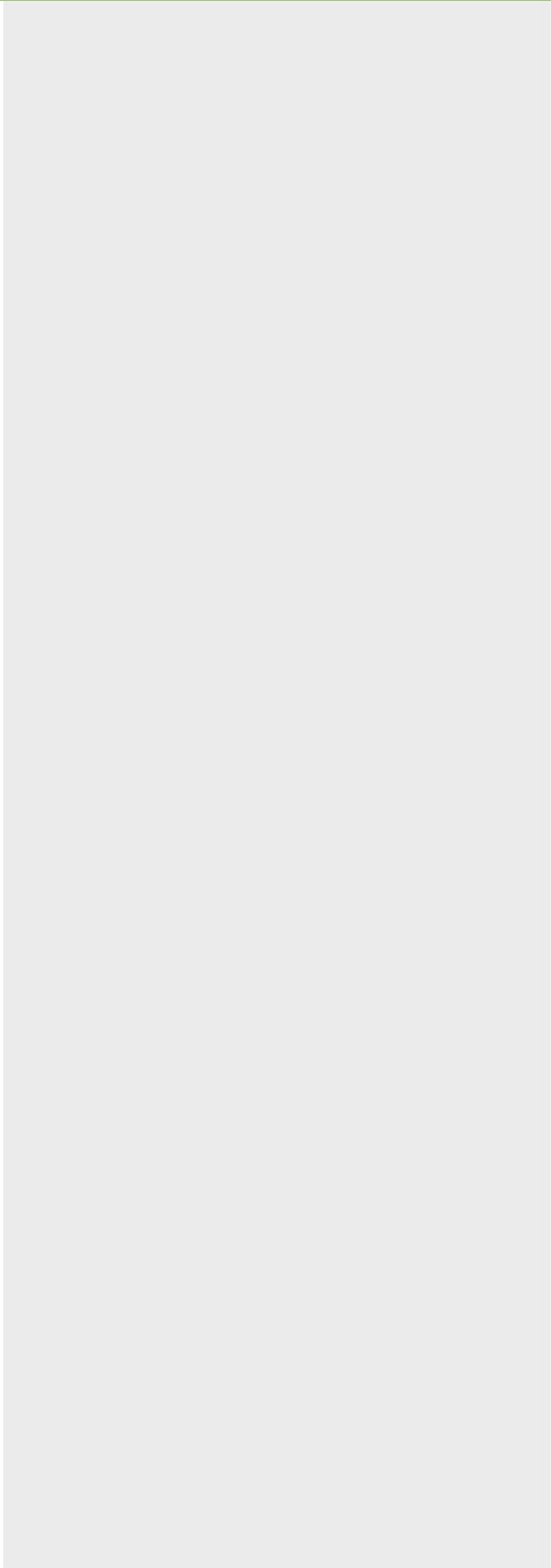
A series of technical memoranda will be developed and submitted to the NYSDEC. As described above for each field activity, the memoranda will summarize the PDI findings and results, and document information to be used during the design phase. The instrument survey will be documented in AutoCAD format and used in the preparation of figures accompanying the technical memoranda.

12. SCHEDULE

The anticipated Work Plan schedule is presented in **Figure 9**.

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- New York State Department of Environmental Conservation (NYSDEC). 2013. Letter from Richard Mustico (NYSDEC) to Brendan Mullen (RACER) regarding approval of the Revised Off-Site Remedial Investigation Report. April 11, 2013.
- NYSDEC. 1995. *Freshwater Wetlands Delineation Manual*. Division of Fish and Wildlife. Albany, New York.
- O'Brien & Gere. 2013a. *Revised Off-Site Remedial Investigation, Former IFG Facility and Deferred Media Site*. Syracuse, New York. March 12, 2013.
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- U.S. Army Corps of Engineers (USACE). 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)*. ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble and J.F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- USACE. 1999. *Highway Methodology Workbook Supplement: Wetland Functions and Values - A Descriptive Approach*
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OFF-SITE PRE-DESIGN INVESTIGATION WORK PLAN

TABLE 2: SOIL BORING AND LEY CREEK SUBSTRATE SAMPLE AND ANALYSIS SUMMARY

Area	Sampling Event	Boring Locations	Samples per Boring Location	Boring End Depth (ft)	Sampling Interval (ft)	Sampling Method	Analyte(s)	Method(s)	No. of Samples	Field Duplicate	MS	MSD	EB	Total Samples	Laboratory TAT
Ley Creek floodplain hot spot area and LCFP-03S area	Soil Pre-Characterization Program	6	3	3	0-1 1-2 2-3	Macro-Core® sampler with slide bar hammer	PCBs	PCBs by USEPA Method 8082	18	2	2	2		45	Standard
		3	3	5	0-2 2-4 4-5				9						
		4	3	7	2-4 4-6 6-7				12						
Ley Creek floodplain LCFP-06 and LCFP-07 areas		4	2	3	1-2 2-3				8	2	2	2		36	
		4	2	2	0-1 1-2				8						
Factory Avenue/LeMoyne Avenue intersection and S-4* area		6	2	4	0-3 3-4				12	2	2	2		157	
		2	1	2	0-2				2						
National Grid wetland		38	3	4	1-2 2-3 3-4				114	7	7	7		2	
		10	2	4	2-3 3-4				20						
		2	1	4	3-4				2						
Drainage swale along National Grid access road ²	2	1	0.5	0-0.5	2	0	0	0	2						
Ley Creek substrate ²	Ley Creek Substrate Pre-Characterization Program	4	1	0.5	0-0.5	4	1	1	1	7					
Total		85						211	12	12	12	5	252		

Note:

¹ Site related metals include arsenic, chromium, copper, lead, nickel, and zinc.

² Manual auger or shovel may be used, if appropriate.

EB - equipment blank

MS - matrix spike

MSD - matrix spike duplicate

PCBs - polychlorinated biphenyls

TAT - turn around time

USEPA - United States Environmental Protection Agency

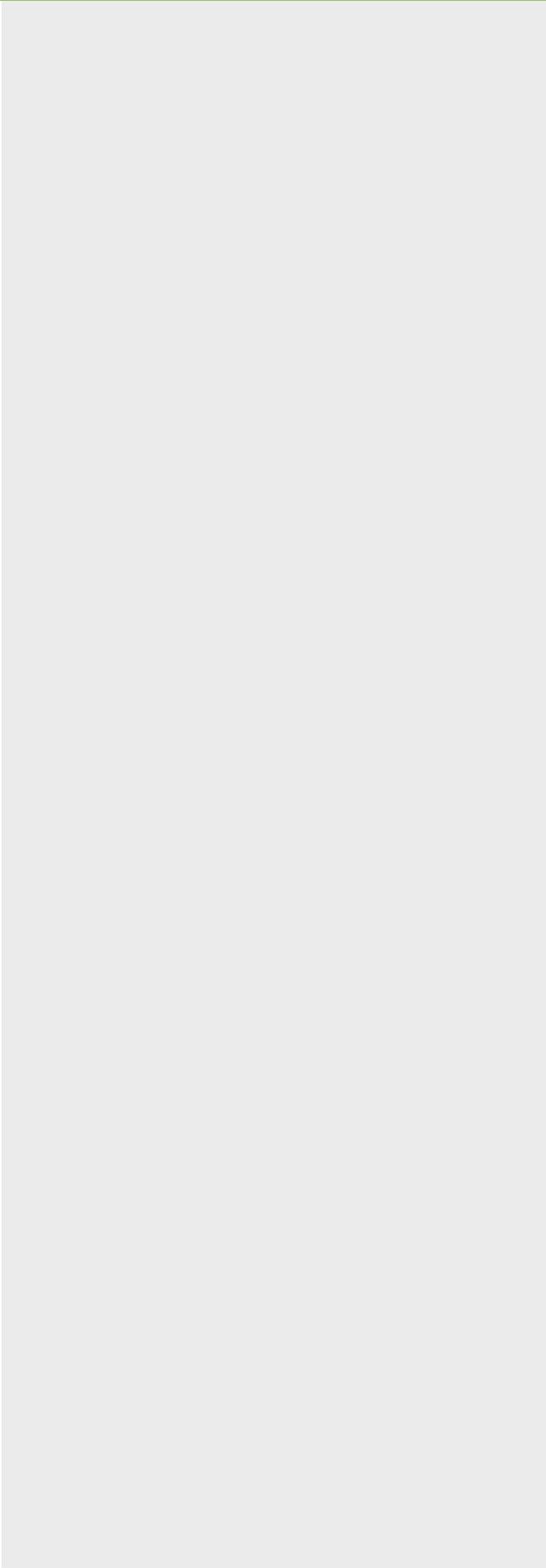
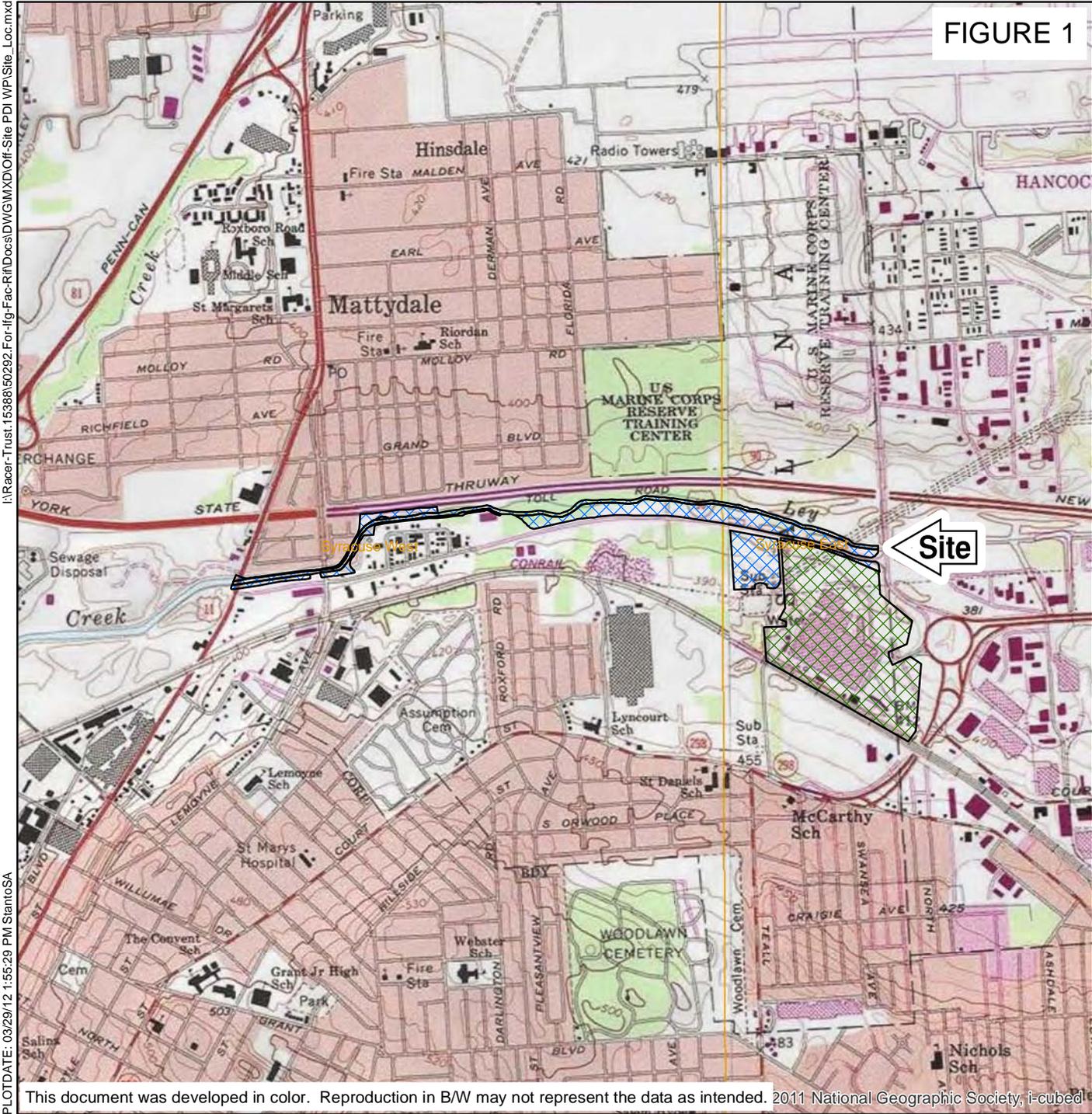


FIGURE 1



ADAPTED FROM: SYRACUSE WEST, SYRACUSE EAST NEW YORK USGS QUADRANGLE.

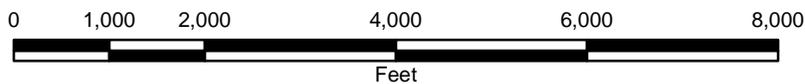
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SITE LOCATION



-  OFF-SITE AREAS
-  FORMER IFG FACILITY



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FIGURE 2



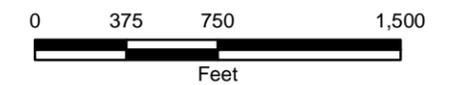
LEGEND

- FORMER IFG FACILITY PROPERTY BOUNDARY
- FACTORY AVENUE
- LEY CREEK 100-YEAR FLOODPLAIN AREA
- LEY CREEK 100-YEAR FLOODPLAIN HOT SPOT AREA
- LEY CREEK
- NATIONAL GRID WETLANDS
- FACTORY AVENUE / LEMOYNE AVENUE INTERSECTION

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OFF-SITE AREAS



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FIGURE 3



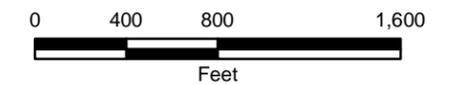
LEGEND

-  FORMER IFG FACILITY PROPERTY BOUNDARY
-  LEY CREEK INSTRUMENT SURVEY LIMITS (Approximate)
-  NATIONAL GRID WETLAND INSTRUMENT SURVEY (Approximate)

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**LEY CREEK FLOODPLAIN,
 FACTORY AVENUE, AND
 NATIONAL GRID WETLAND
 AREAS**



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FIGURE 4



LEGEND

▲ PROPOSED SOIL BORING

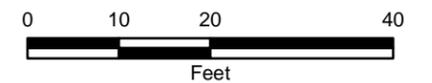
NOTE:
▲ PCB CONCENTRATION > PART 375 UNRESTRICTED SCO

▲ PCB CONCENTRATION > PART 375 UNRESTRICTED SCO AND SCO FOR PROTECTION OF ECOLOGICAL RESOURCES

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**PROPOSED SOIL BORING
LOCATIONS -
LEY CREEK FLOODPLAIN
HOT SPOT AREA**



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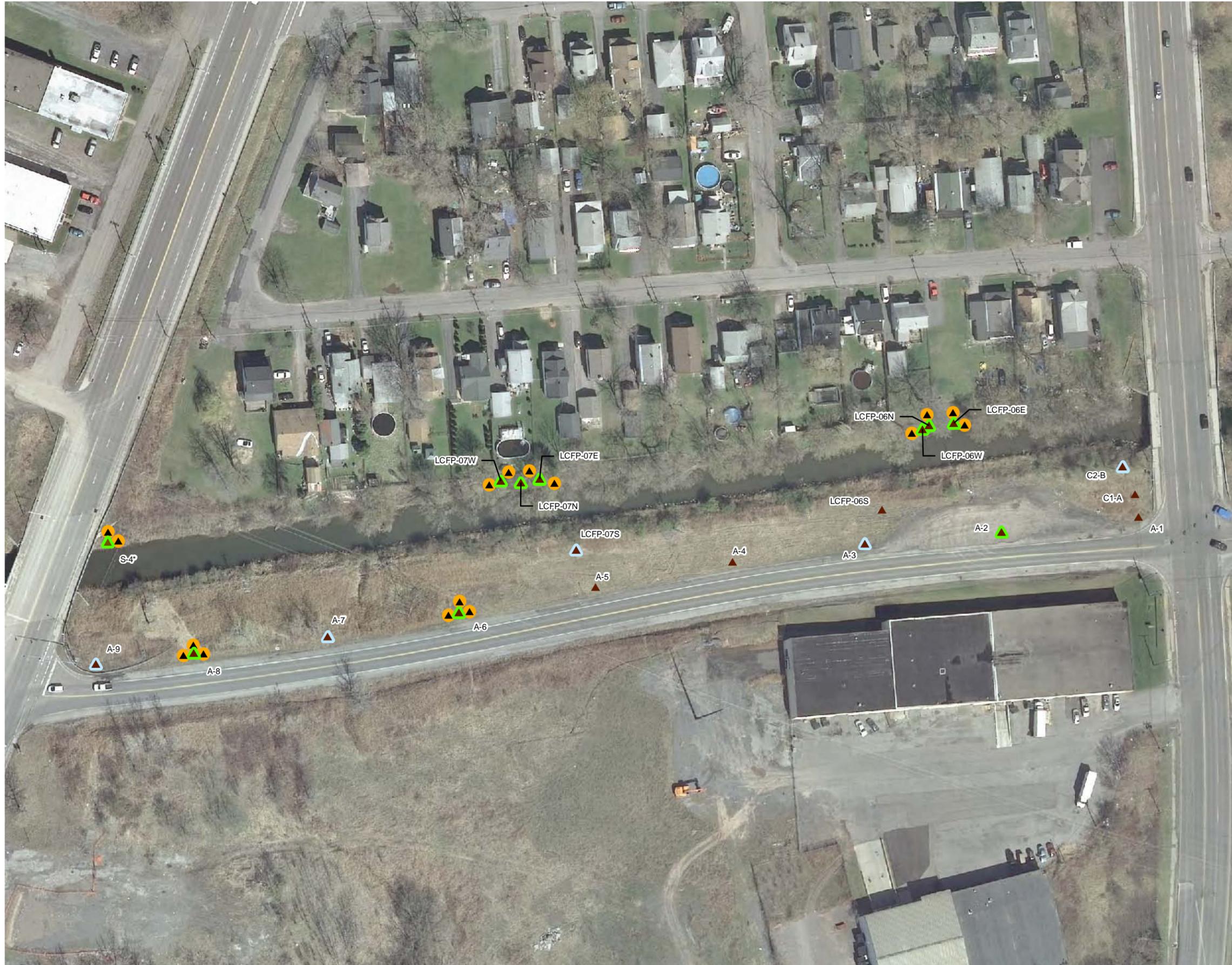


FIGURE 5



LEGEND

- ▲ PROPOSED SOIL BORING
- ▲ SOIL BORING

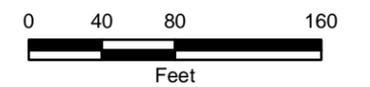
NOTE:

- ▲ PCB CONCENTRATION > PART 375 UNRESTRICTED SCO
- ▲ PCB CONCENTRATION > PART 375 UNRESTRICTED SCO AND SCO FOR PROTECTION OF ECOLOGICAL RESOURCES

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**PROPOSED SOIL BORINGS
 LOCATIONS -
 LEY CREEK FLOODPLAIN
 AND FACTORY
 AVENUE AREAS**



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FIGURE 6



LEGEND

- ▲ PROPOSED SOIL BORING (0-0.5ft)
- ▲ PROPOSED SOIL BORING (1-2ft, 2-3ft, 3-4ft)
- ▲ PROPOSED SOIL BORING (2-3ft, 3-4ft)
- ▲ PROPOSED SOIL BORING (3-4ft)
- ▲ SOIL SAMPLE
- ▭ FACTORY AVENUE DITCH
- ▭ APPROXIMATE PARCELS
- ▬ FORMER IFG FACILITY PROPERTY BOUNDARY

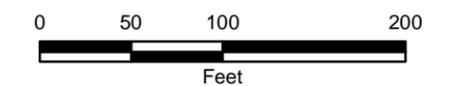
NOTE:

- ▲ PCB CONCENTRATION > ECOLOGICAL SCOs - NYCRR PART 375 SCOs FOR PROTECTION OF ECOLOGICAL RESOURCES
- ▲ PCB CONCENTRATION > INDUSTRIAL SCOs - NYCRR PART 375 SOIL CLEANUP OBJECTIVES (SCOs) FOR INDUSTRIAL LAND USE

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PROPOSED SOIL
BORING LOCATIONS -
NATIONAL GRID
WETLAND



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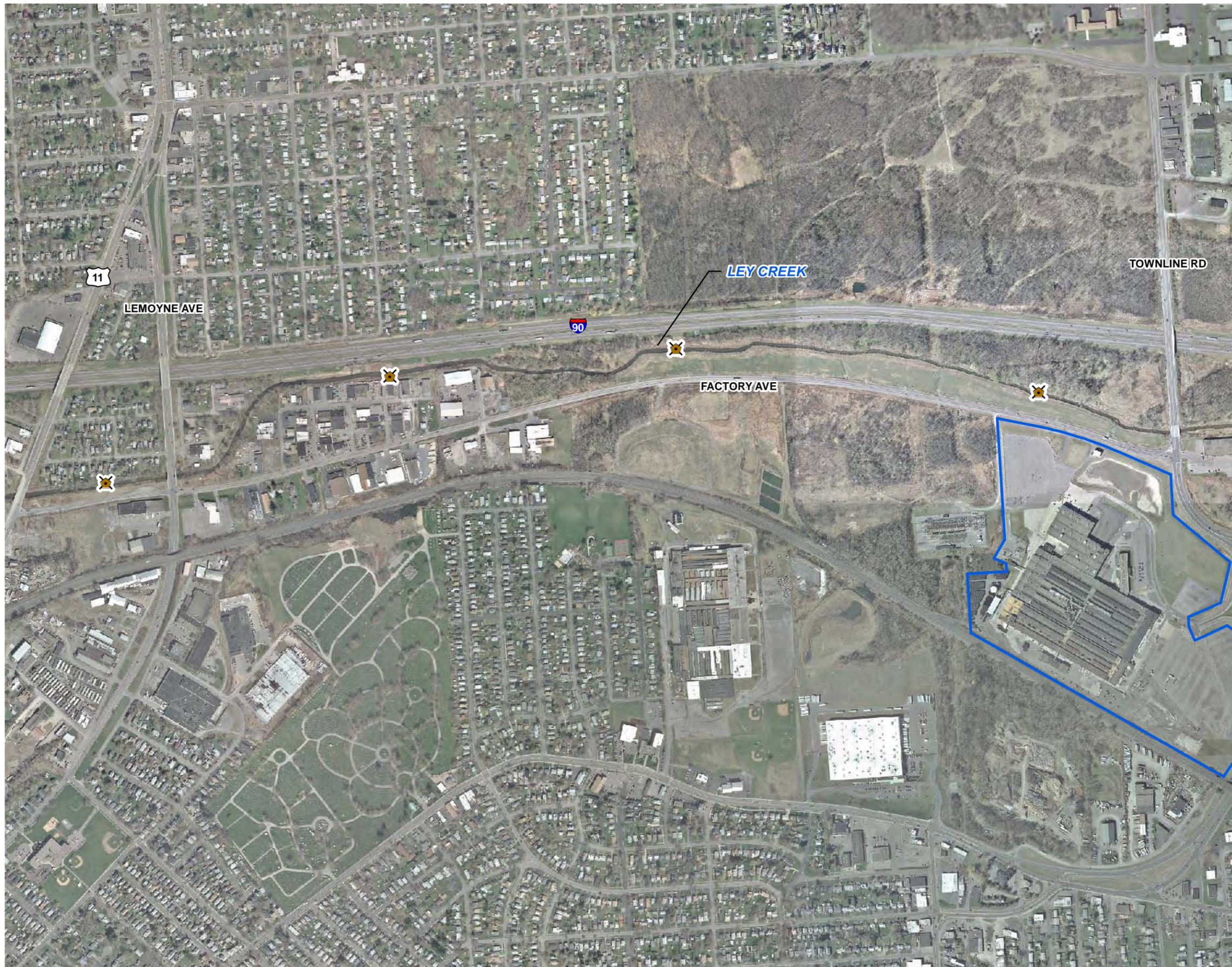


FIGURE 7



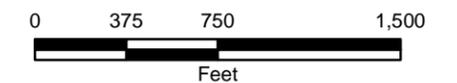
LEGEND

-  PROPOSED SUBSTRATE SAMPLE
-  FORMER IFG FACILITY PROPERTY BOUNDARY

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**PROPOSED LEY CREEK
 SUBSTRATE SAMPLE
 LOCATIONS**



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FIGURE 8



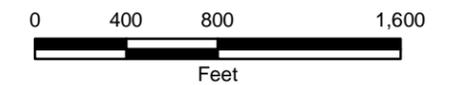
LEGEND

-  PROPOSED GEOTECHNICAL SOIL BORING (25ft)
-  PROPOSED GEOTECHNICAL SOIL BORING (10ft)
-  FORMER IFG FACILITY PROPERTY BOUNDARY

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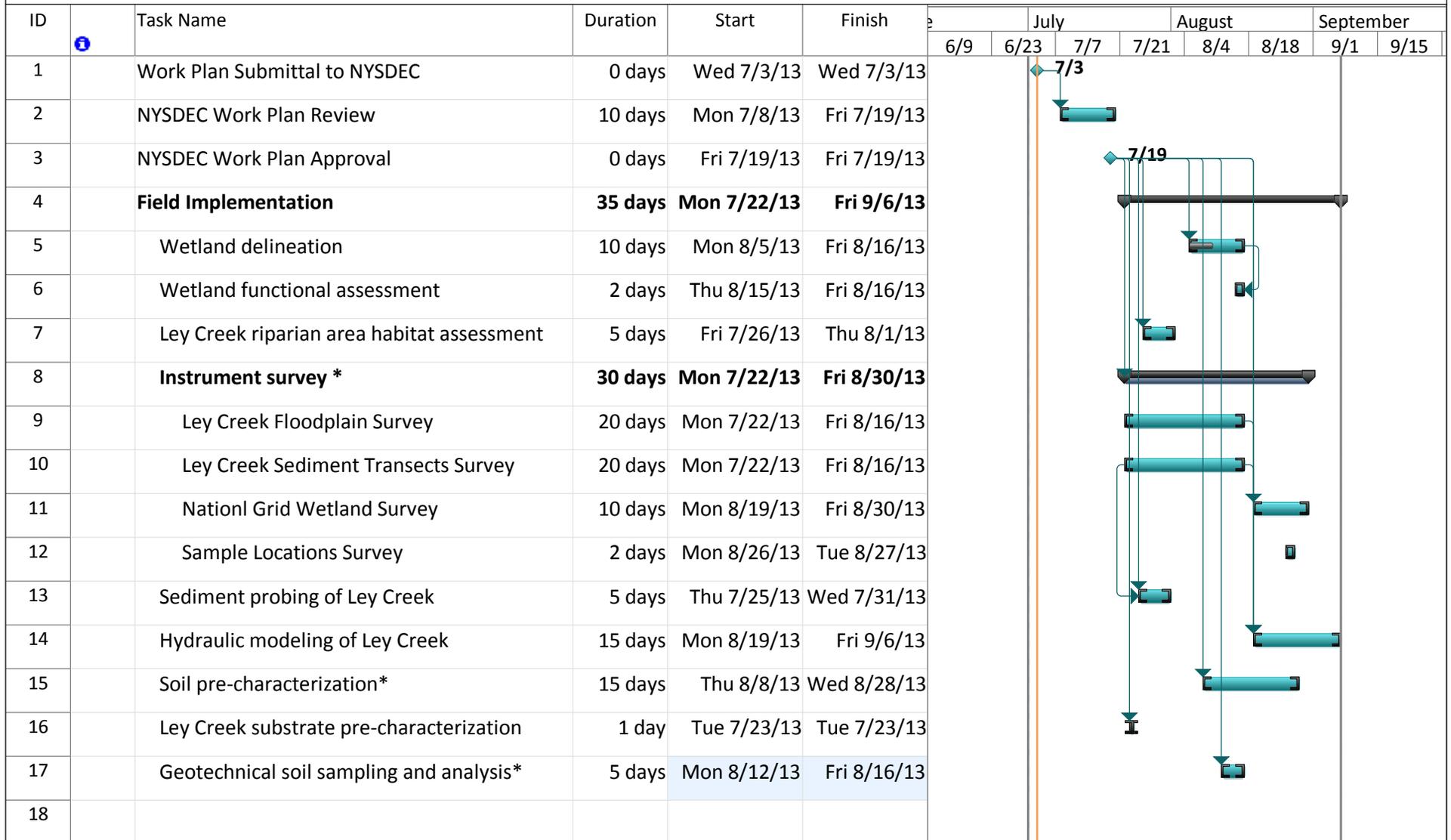
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**PROPOSED LEY CREEK
GEOTECHNICAL SOIL
BORING LOCATIONS**



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Figure 9
Off-site Predesign Investigation Work Plan
Proposed Field Schedule



Project: Figure 9_Project Schedul
 Date: Wed 7/3/13

Summary  Task  Milestone 

*Schedule of surveyor and soil sampling activities is subject to the availability of subcontractor mobilization dates.
 Schedule of in-creek activities is subject to weather conditions.