

**REMEDIAL INVESTIGATION  
PHASE II WORK PLAN**

**OLD CHENANGO CANAL SITE  
NYSDEC SITE No. 633051  
UTICA, NEW YORK**

Prepared for:

**Honeywell**

Morristown, New Jersey  
Honeywell Project Number: 35051

Prepared by:

**amec** 

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511 Congress St.  
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**MAY 4, 2012**

**Amec Project No. 3616106030**

REMEDIAL INVESTIGATION/FEASIBILITY STUDY  
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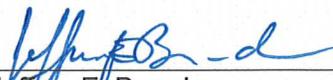
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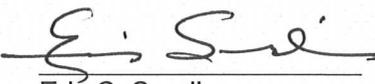
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## TABLE OF CONTENTS

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|   |     |
|---|-----|
| 1.0 INTRODUCTION.....                                       | 1-1 |
| 2.0 SITE DESCRIPTION AND HISTORY .....                      | 2-1 |
| 2.1 SITE DESCRIPTION .....                                  | 2-1 |
| 2.2 PHYSICAL SETTING.....                                   | 2-1 |
| 2.3 SITE HISTORY .....                                      | 2-2 |
| 2.4 PREVIOUS INVESTIGATIONS .....                           | 2-2 |
| 3.0 SCOPE OF WORK.....                                      | 3-1 |
| 3.1 SAMPLING APPROACH – OLD CHENANGO CANAL/NAIL CREEK ..... | 3-1 |
| 3.2 SAMPLING APPROACH – LOWER NAIL CREEK .....              | 3-5 |
| 3.3 ANALYTICAL PROGRAM.....                                 | 3-8 |
| 4.0 REPORTING AND SCHEDULE .....                            | 4-1 |
| 5.0 REFERENCES.....   | 5-1 |

## LIST OF FIGURES

---

|            |  |
|------------|--|
| Figure 2.1 | Site Location  |
| Figure 3.1 | Phase II RI Sample Locations – Old Canal / Nail Creek        |
| Figure 3.2 | Phase II RI Sample Locations – Nail Creek to Burrstone Road  |
| Figure 3.3 | Phase II RI Sample Locations – Burrstone Road to Box Culvert |
| Figure 3.4 | Phase II RI Sample Locations – Lower Nail Creek              |
| Figure 4.1 | Phase II RI Schedule   |

## LIST OF TABLES

---

|           |                                    |
|-----------|------------------------------------|
| Table 3-1 | Phase II Sampling Program Overview |
|-----------|------------------------------------|

## APPENDICES

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|             |                                      |
|-------------|--------------------------------------|
| Appendix A: | Quality Assurance Project Plan       |
| Appendix B: | NYSDOH Community Air Monitoring Plan |

## ACRONYMS AND ABBREVIATIONS

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|           |   |
|-----------|---|
| Amec      | Amec Environment & Infrastructure                             |
| CLP       | Contract Laboratory Program                                   |
| COC       | Contaminant of Concern  |
| DEC       | Department of Environmental Conservation                      |
| ELAP      | Environmental Laboratory Accreditation Program                |
| FS        | Feasibility Study   |
| Honeywell | Honeywell Inc.  |
| Mactec    | Mactec Engineering and Consulting, Inc. (predecessor of Amec) |
| mg/kg     | milligrams per kilogram                                       |
| NYSDEC    | New York State Department of Environmental Conservation       |
| NYSDOH    | New York State Department of Health                           |
| PCB       | polychlorinated biphenyl                                      |
| PISCES    | Passive In-Situ Concentration Extraction Sampler              |
| QAPP      | Quality Assurance Project Plan                                |
| RI        | Remedial Investigation  |
| RI/FS     | Remedial Investigation/Feasibility Study                      |
| Site      | Old Chenango Canal NYSDEC Site No. 633051                     |
| SOP       | Standard Operating Procedures                                 |
| SVOC      | Semi-volatile Organic Contaminant                             |
| TAL       | Target Analyte List   |
| TCL       | Target Compound List  |
| TOC       | total organic carbon  |
| USEPA     | United States Environmental Protection Agency                 |
| VOC       | Volatile Organic Contaminant                                  |

## 1.0 INTRODUCTION

On behalf of Honeywell Inc. (Honeywell), Amec Environment & Infrastructure (Amec) has prepared this Work Plan for Remedial Investigation (RI) activities at the Old Chenango Canal Site (Site) in Utica, New York. The Site is currently listed in the New York State Department of Environmental Conservation (NYSDEC) Registry of Inactive Hazardous Waste Disposal Sites as Site No. 633051. Honeywell is performing the RI as specified in the Order on Consent and Administrative Settlement Index #B6-776-08-02 as issued by the NYSDEC and fully executed on March 19, 2009.

This document is identified as the Phase II RI Work Plan, indicating that it presents additional site characterization activities that will supplement data from an initial RI sampling event that was performed in October 2009.

The Old Chenango Canal Site is an engineered drainage watercourse which receives storm water from various road grates and developed properties near French Road. Water contaminated with polychlorinated biphenyls (PCBs) was discharged via the French Road storm sewer from one or more upstream sources, possibly including the former Bendix facility, located at 211 Seward Avenue, Utica, New York. The Site, as defined in the Order on Consent, has its upstream (western) origin at the point where the French Road storm sewer discharges into a remnant of the Old Chenango Canal. The canal becomes Nail Creek and flows variously as open channel and within culverts until it discharges to the Mohawk River. PCBs are the principal contaminant of concern (COC). The Phase II sampling activities will result in additional data to evaluate the distribution of PCBs along various segments of the Nail Creek drainage pathway. In particular, additional sampling data will be collected from that portion of the drainage corridor that was previously sampled in 2009 and initial data will be obtained from the lower reach of Nail Creek, where it flows as an open channel to the Mohawk River. A subsequent Feasibility Study (FS) will examine remediation alternatives, as may be determined to be necessary. This Work plan has been prepared and will be implemented in accordance with 6 NYCRR 375-1.6(a).

## 2.0 SITE DESCRIPTION AND HISTORY

### 2.1 Site Description

Old Chenango Canal/Nail Creek is an engineered drainage pathway that runs initially alongside and to the south of the North-South Arterial highway (Route 5; Route 8; Route 12) in Utica, New York. Figure 2.1 shows the drainage network, its relationship with the former Bendix facility on Seward Avenue, and the principal route it follows as it extends to the Mohawk River.

The Site and downstream storm water pathway can be best described as segments that have differing attributes, as shown on Figure 2.1 and as described below:

Old Chenango Canal/Nail Creek. The old Chenango Canal and Nail Creek section of the watercourse extends from the French Road discharge sewer to the entrance into the Utica box culvert. This is predominantly an open channel between the two sewers. This segment initially follows the footprint of the old canal, becoming Nail Creek where a tributary (Upper Nail Creek) enters from the south. Nail Creek continues as an engineered drainage feature that runs alongside the highway and through culverts beneath roadways until it reaches the Utica Box Culvert. The total length of this section is approximately 3,600 feet.

Utica Box Culvert. The Utica Box Culvert was constructed to carry Nail Creek storm flow beneath the City of Utica. It is a concrete box structure that extends a total of approximately 9,350 feet from its entrance east of Burrstone Road to its terminus northeast of Haak Avenue. In 1980, the City of Utica replaced the lower section of the box culvert with a new storm sewer that extends from Columbia Street to a receiving basin near Haak Avenue. The new storm sewer, consisting of a 108-inch diameter reinforced concrete pipe, discharges into a riprap lined basin that the old box culvert channel also flows into. The box culvert remains active as a storm overload relief sewer. No discharge was observed during a site visit during a dry period (several days of no precipitation).

Lower Nail Creek. Lower Nail Creek is identified as the open channel that conveys water from the discharge openings of the box culvert and current storm sewer to the Mohawk River, a total distance of approximately 1,200 feet. This reach includes a receiving basin downstream from the current storm sewer, passage beneath an active rail corridor and an abandoned rail bed, and flow as an open channel through a floodplain before discharge to the Mohawk River.

### 2.2 Physical Setting

The Old Chenango Canal/Nail Creek exhibits a relatively flat bed with an apparent consistent horizontal gradient. The width of the channel increases from about 15 feet wide at the western culvert to about 30 feet wide near the downstream box culvert. It generally follows the original footprint of the Chenango Canal until it nears the Burrstone Road highway cloverleaf.

The Chenango Canal operated from 1836 to 1878, linking Binghamton to the Erie Canal at Utica, New York ([chenangocanal.org](http://chenangocanal.org)). There are a few remnants of the canal walls as evidenced by vertically-set rock blocks; however Amec presumes that the majority of the canal blocks were historically mined for other uses. Generally the sides of the canal and the immediate downstream portion of Nail creek are sloped banks with shrubs or tree growth. Bank height varies from a few feet to more than 15 feet above the creek bed. Historical topographic maps and aerial photographs that trace the development of the area are presented in the Records Search Letter Report (Mactec Engineering and Consulting, Inc. [Mactec], 2009a). The Site and immediate downstream portion of Nail Creek appear to coincide with the original canal footprint. Highway construction circa 1960 included relocation of the creek as a drainage ditch constructed alongside the highway (within the Burrstone cloverleaf of off-ramps and on-ramps).

Prior studies of the geology or natural resources of the Site were not discovered during the Record Search. Soils adjacent to the watercourse are presumed to have been altered by the canal construction and subsequent use. In general, surficial soils along the north side of the creek are a gravelly sandy fill that was placed or graded during construction of the highway. Soils along the south side of the canal (east of the railroad) are more fine-grained loam within forested undeveloped land. The canal bottom is varied with areas of accumulated silt and sand as well as sections of rock shingle and possible rock-block facing. Sand and silt are likely transported to the watercourse during storm events from entry points along city roads and highway grates. These deposits would be expected to migrate and/or scour during periods of high flow.

Specific information on the nature of the soils, sediments, and general environmental setting will be developed as part of this RI/FS via the activities described in Section 3.0.

## **2.3 Site History**

The Old Chenango Canal/Nail Creek received water from a series of storm sewers, including the City of Utica French Road Sewer. The French Road sewer received discharge from the former Bendix facility located at 211 Seward Avenue. Discharge water from the former Bendix facility allegedly contained PCBs, as asserted in the Order on Consent (NYSDEC, 2009).

## **2.4 Previous Investigations**

In 2003, the NYSDEC conducted a sediment sampling event in the Old Chenango Canal and Nail Creek. Sediment was collected from inside the culvert and from eight locations along the initial 850-foot reach of the Old Chenango Canal/Nail Creek. The results identified Aroclor-1254, a commercial mix of PCB congeners, at concentrations up to 1300 parts per million in sediment from the Old Chenango Canal samples. PCBs were not identified in a sample from Upper Nail Creek.

Honeywell International Inc.  
NYSDEC Site No, 633051 - Utica Bendix Old Chenango Canal  
Remedial Investigation/Feasibility Study - Phase II Work Plan

In March, 2009, the State of New York executed an Order on Consent with Honeywell to perform a RI/FS. The initial submittal under the order, a Record Search Report was issued on April 30, 2009 (Mactec 2009a).

An initial RI Work Plan, the "Focused Remedial Investigation Work Plan", was issued on September 14, 2009 (Mactec, 2009b). The field sampling investigation, conducted in October, 2009, included sampling along Old Chenango Canal/Nail Creek downstream to the culvert beneath Burrstone Road. Results and findings from this initial investigation were documented in an interim report, the "Focused Remedial Investigation Data Report" (Mactec, 2010). The focused RI identified PCBs in sediment and some bank and bordering soils, and identified the need for additional sampling to further characterize the extent of impact from PCBs.

### **3.0 SCOPE OF WORK**

To address the data gaps identified in the Focused RI Data Report, the Phase II RI will collect samples along two sections of the Nail Creek watercourse:

1. The Old Chenango Canal/Nail Creek from the Site origin (French Road storm sewer) to the entrance to the Utica box culvert, and
2. The Lower Nail Creek from the outfall of the Utica box culvert/storm sewer to the Mohawk River.

The sampling approaches for these two segments are described in the subsection below.

Honeywell is not planning on accessing and sampling the Utica Box Culvert as part of this Phase II field event. Further information is required on the construction, condition, and extent of the storm sewer network that includes the Utica Box Culvert, the current Nail Creek storm sewer, any network of feeder culverts, etc. As part of this Phase II RI, Honeywell will search further for historical literature on the alignment of the former canal, the construction and history of the Utica Box Culvert, and any changes to the course of Nail Creek, particularly since the approximate time of the construction of the former Bendi Plant in the 1950s.

Amec's working hypothesis is that the box culvert and current sewer are high volume sewers that are flushed every time there is a significant storm event. If PCB-impacted sediment is being mobilized from the upstream portions of Nail Creek or from other sources within the City of Utica, it would be expected to flush to Lower Nail Creek during storm events. Additionally, the storm culverts are effectively not accessible to human or ecological communities and therefore there is no risk of incidental exposure to any material present within. Based on this reasoning, the priority for Phase II will be to characterize conditions along Lower Nail Creek and to develop further information from the City of Utica on the storm sewer network. This Work Plan includes the initial RI characterization sampling for Lower Nail Creek, and subsequent RI phase(s) may be necessary to close data gaps. If inspection and/or sampling of the storm sewer network are identified as a data gap, it would be performed in a subsequent RI sampling event.

#### **3.1 Sampling Approach – Old Chenango Canal/Nail Creek**

The Phase II RI primarily focuses on obtaining additional data needed to complete a Feasibility Study for the section of the watercourse that was investigated during 2009. That Focused RI effort involved sampling of stream sediment and bordering soil between the French Road culvert to Burrstone Road. Results indicated that PCBs were present in all sediment samples. Samples from the westernmost section (the initial 900-foot long section of Old Chenango Canal/Nail Creek), exhibited the highest levels of PCBs (>500 milligrams per kilogram [mg/kg]). Concentrations downstream from that point to Burrstone Road were lower (1 – 20 mg/kg). Within the creek bed, the general levels of PCBs in near

surface sediments (e.g. up to two feet below the sediment surface) and the nature of sediments is believed to be understood sufficiently to identify and evaluate potential remediation alternatives. More information on sediment thickness and PCB concentration at depths greater than two feet is needed and will be part of this additional effort. This will be targeted for borings during Phase II (discussed below) and coordinated in terms of ability to access the stream as vehicular access onto the streambed is limited to a few possible locations.

PCBs were reported in some bank and bordering soils however the sample density was not sufficient to establish the vertical and lateral extent of impact. Some soil samples, collected at low points along the bordering bank, suggest that storm water may have overtopped the banks during historic flood event(s). Therefore, more sampling is required to assess the presence or absence of PCBs in adjacent soils. The NYSDEC has also required analysis for metals in soil and sediment samples. The proposed Phase II approach will include:

- additional surficial soil samples from soils that border the creek to delineate the lateral and vertical extent of PCBs;
- sediment samples from the remaining (not previously sampled) highway cloverleaf section between Burrstone Road and the Utica box culvert to establish the levels of PCBs and the depth and nature of sediment;
- borings within the creek bed, if possible, to develop additional data on the vertical distribution of PCBs and the thickness of sediment;
- soil borings beyond the canal or creek banks to supplement the near-surface hand-sampling and provide information on the characteristics of the overburden and the depth distribution of PCBs.
- analysis of all soil and sediment samples for PCBs and Target Analyte List (TAL) metals.

Figure 3.1 through Figure 3.3 illustrate the planned sampling density along the Nail Creek watercourse to the Utica box culvert. The sampling approach varies slightly along sections of the watercourse based on information derived from the Focused RI data results. These are discussed below and identified on Table 3.1.

As shown on Figure 3.1, an approximate grid-based approach will be used to develop additional data on the levels of PCBs and metals in surficial soils along the westernmost (canal) section of the watercourse. PCBs were reported in all soil and sediment samples collected west of the railroad corridor and therefore the lateral and vertical extent of impact remains to be determined. Shallow soil samples will be collected at an approximate 50-foot spacing from at least twelve locations using hand methods (soil augers, shovels, and stainless steel hand tools). At each location, a surface interval (0.0 to 0.5 feet), an intermediate interval (0.5 to 1.0 feet), and a deeper interval (1.0 to 2.0 feet) will be collected.

Borings will be completed at three or more locations depending on ability to access. A gap in the canal bank appears to provide access to one location within the stream bed. A Geoprobe-type rig will access the stream at several locations; if possible, collect sediment and underlying soil samples from the streambed. Soils will be collected continuously until drilling refusal or a maximum depth of 20 feet. Samples will be submitted from three or more intervals to profile PCBs and metals at depths deeper than 2.0 feet (the limit of prior hand-sampling methods). Direct-push borings will also be completed to either side of the canal to profile overburden characteristics and provide soil samples. The borings will be completed with continuous soil sampling until drilling refusal and samples will be selected from two intervals for analysis for PCBs and metals. Two samples per boring will also be selected for grain size analysis to provide information for use in the FS. The direct-push rig may also be used to collect deeper samples at some of the surficial sampling locations. Locations will be chosen in the field based on conditions that are observed during hand sampling.

The overall objective is to obtain sufficient information on the lateral and vertical distribution of PCBs to support the screening and selection of remedial options in the FS. The final methodology for advancing borings within the stream bed to ascertain PCB vertical distribution will be determined based on consultation with potential drilling firms and the planned methods and techniques will be communicated to NYSDEC prior to field start.

Nail Creek flows as an open channel from the railroad corridor to the easternmost point on Figure 3.1 (i.e. the Match Line on the figure), a distance of about 1000 feet. Upper Nail Creek enters from the south approximately 450 feet downstream from the railroad crossing. The 2009 Focused RI results indicated PCBs in the stream bed and along the immediate bordering banks of Nail Creek. PCBs are not present in Upper Nail Creek. The results along Nail Creek suggested that there is little impact to soils beyond the banks with the exception of some low-lying floodplain areas. Therefore, the Phase II objective will be to develop additional lateral density to determine the practical extent of PCB impact and provide a larger data set to base remediation decisions on. Sampling will be based on an approximate grid spacing of 100 feet and will be biased towards areas of lower-lying floodplain soils. All samples will be analyzed for PCBs and metals. PCBs reported at prior sampling location SS-14 (collected from a low gap in the south bank of the creek) suggest that storm water may have overtopped the bank at this location during an historic flood event. Therefore, an expanded grid is shown to the south and southwest of SS-14 in a topographically low area. Samples will be collected from a surface interval (0.0 to 0.5 feet), an intermediate interval (0.5 to 1.0 feet), and from a deeper interval (typically 1.0 feet to 2.0 feet) at all locations. Samples may also be obtained at a deeper interval (e.g. 3.0 to 3.5 feet) to provide additional data on PCB levels with increasing depth. Deeper intervals would be archived at the laboratory and then analyzed, as needed, based on the levels of PCBs reported to be present in the surficial soil.

Arcadia Avenue extends as a discontinued (paper) street to Nail Creek and it may be possible to mobilize a direct-push drilling rig onto the streambed at this location. If

possible, Amec will complete a direct-push boring within the streambed to develop additional information on the depth and character of the sediments and the vertical distribution of PCBs and metals. Samples will be collected continuously until direct-push refusal and a minimum of two intervals will be selected for analysis. Two grain size samples will also be collected to provide data for use in the FS.

The next segment of the creek, running approximately 700 feet to the culvert beneath the Burrstone Road highway off-ramp (Figure 3.2), is an open channel with continuous high banks. Mactec expects that that PCBs would be limited by elevation and will collect samples along several transects that will augment the data collected in 2009. Samples will be collected from a surficial interval (0.0 to 0.5 feet bgs), from an intermediate interval (0.5 to 1.0 feet) and, from a deeper interval (typically 1.0 to 2.0 feet), as practicable based on the ability to collect hand samples between the rock blocks.

After crossing underneath the Burrstone Road highway off-ramp, Nail Creek flows as an open channel and through culverts within the highway cloverleaf. The creek flows within an engineered drainage ditch that includes rock facing on the banks and bottom. Prior sampling identified PCBs in sediment at levels of up to 20 mg/kg. Soil samples collected above (beyond) the top of the banks indicate PCBs at levels of less than 2 mg/kg. Amec will collect additional surficial soil samples to provide a larger data set to confirm the low levels of PCBs in surface soils. Samples will be obtained from a surficial interval (0.0 to 0.5 feet), from an intermediate interval (0.5 to 1.0 feet), and a deeper interval (typically 1.0 to 2.0 feet). The deeper interval will be analyzed if the surface sample contains PCBs above 1 mg/kg. All samples analyzed for PCBs will also be analyzed for metals. In the drainage ditch, Amec believes that there is sufficient understanding of the levels of PCBs, the depth of sediment, and the construction characteristics of the ditch to support the evaluation of potential remedial measures. Therefore, additional sediment sampling is not planned for this segment.

Figure 3.3 shows the remaining segment of open drainage channel from Burrstone Road to the entrance into the Utica box culvert. This stretch of open channel is approximately 220 feet in length and there has been no prior sampling. Amec will examine the construction of the channel and will collect sediment samples from transects at two locations. Samples will be collected from multiple depths if sufficient sediment thickness is present. If the channel bottom is scoured and the rock-lining is present, samples will be collected by probing between bottom rocks. Samples will also be collected from the banking opposite the sediment samples and from soils beyond the top of the bank to determine the levels of PCBs and metals within this section.

Based on discussions with the NYSDEC, additional surface soil samples will be collected from areas outside of the stream bed from the 0" to 2" inch depths to be able to evaluate potential human exposures. Up to 10 shallow samples will be collected from the study area upstream of the Utica Box Culvert, with the locations being determined in the field after consultation with and input from Department of Environmental Conservation (DEC) and New York State Department of Health (NYSDOH) personnel. Targeted locations will

be along any evident trails or paths where people may traverse. The DEC and NYSDOH have indicated an interest in directing the location of these samples based on walkover observations that will be made at the commencement of the field program. These soil samples will be analyzed for PCBs and metals.

### **3.2 Sampling Approach – Lower Nail Creek**

Lower Nail Creek is the last segment of open channel from the outfall of the Utica box culvert to the Mohawk River (Figure 3.4). Lower Nail Creek is approximately 1,200 feet in length and passes beneath two railroad bridges. It has not been sampled previously during the RI.

Prior to 1980, the Utica Box Culvert channelized Nail Creek between the Burrstone Road highway onramp and its discharge outlet near Haak Avenue. In 1980, the City of Utica replaced the lower section of the Utica Box Culvert (from a brewery near Columbia Street) with a new storm sewer consisting of 108-inch diameter reinforced concrete pipe. The lower section of the box culvert was apparently left in place. It may still serve a storm water function however it was dry during a site visit (during an extended period of no rainfall).

When viewed on July 7, 2010, after approximately seven days without measurable precipitation (wunderground.com), the current storm sewer was actively discharging water that had the appearance of gray water. There was no active discharge from the abandoned box culvert and the channel between the end of the box culvert and the storm sewer receiving basin was dry. According the engineering drawings obtained from the City of Utica, the basin between the current storm sewer discharge and the active rail lines was reconstructed when the current sewer was built and was lined with stone. This basin had up to approximately one foot of water when viewed in July.

After passing under two railroad bridges, Lower Nail Creek flows as an open channel to the Mohawk River. The first section of creek to the north of the rail bed appears to have a rocky bed and is bordered by steep banks that expose approximately 10 feet of landfilled material (glass, cinders, possible slag, etc). The banks rise approximately 15 feet and are actively eroding. The creek flows through undeveloped and generally flat surface topography. The northern half of the creek channel and its junction with the Mohawk River has not yet been examined.

The sampling objective of the Phase II RI will be to characterize the creek setting and determine the presence or absence of PCBs and other potential environmental contaminants in stream water, sediment and in bank soils. Sample locations will target depositional areas and may therefore be adjusted in the field as detailed observations are made on the character of the creek bed.

Surface water samples are planned for four locations (see Figure 3.4):

- discharge from the current storm sewer;
- discharge from the box culvert outfall (if flow is observed after a rainfall event);
- surface water from the middle of the discharge basin between the outfalls and the active rail lines; and
- surface water from the lower reaches of the creek before its entry into the Mohawk River.

Water samples will be analyzed for PCBs, volatile organic contaminants (VOCs), semi-volatile organic contaminants (SVOCs), metals, and hardness.

The NYSDEC has requested that passive in-situ concentration extraction samplers (PISCES) be deployed at the planned surface water locations to collect supplemental data. The PISCES samplers will be constructed, deployed and analyzed per the June 2007 version of the document titled Contaminant Track-down With PISCES – Standard Operating Procedures (SOP). This SOP is included in the Quality Assurance Project Plan (QAPP) (appendix A). Samples will be analyzed for PCBs by method 8082.

Sediment and bank soil samples will be collected within the discharge basin and along four transects across the creek (see Figure 3.4):

- one sediment profile location will be in the creek bed between the box culvert outfall and the receiving basin to characterize sediment conditions in this pre-1980 Nail Creek drainage pathway;
- one sediment profile location is planned from within the receiving basin from material deposited between rocks that line the bottom of the receiving basin downstream from the storm sewer outfall;
- a sediment and bank soil transect will be located north (downstream) of the rail lines to characterize conditions where the channel leaves the defined bed beneath the rail bridges and becomes a v-shaped channel passing through unconsolidated landfill and underlying native (presumed) soil;
- a second sediment and bank soil transect will be located approximately 200 feet north of the rail lines;
- a third sediment and bank soil transect will be located approximately 600 feet north of the rail lines (two-thirds of the distance to the Mohawk); and
- a fourth transect will be located near the outlet of Lower Nail Creek into the Mohawk River to characterize conditions at the end of the Nail Creek drainage pathway.

Within the receiving basin, the bottom will be examined to determine the thickness and extent of stone lining. If possible, rock will be removed to allow for collection of a sample from the soil underlying the rip-rap.

In addition to the sampling, an ecologist will perform a habitat assessment to document the ecological setting and the communities observed along the length of Nail Creek. The assessment will follow a standard method such as the EPA Rapid Bio-Assessment Protocols for Use in Streams and Wadeable Rivers (United States Environmental Protection Agency [USEPA], 1999). Representative locations along the creek will be qualitatively characterized in terms of dominant plant species, vegetative strata, invasive species, habitat features, and presence of human disturbance/alteration or stressed vegetation (including leachate or other seeps, exposed waste, odors and type of surface water discharge, absence of biota, dead and dying vegetation, etc.). Natural communities and wetlands will be qualitatively characterized in terms of dominant plant species, vegetative strata, invasive species, and presence of human disturbance/alteration or stressed vegetation (including leachate or other seeps, exposed waste, odors and type of surface water discharge, absence of biota, dead and dying vegetation, etc.). The information developed in a qualitative habitat assessment performed upstream of Burrstone Road in 2009 will be updated and the assessment will be extended to cover all of the open segments of Nail Creek downstream to the Mohawk River. A report will document the findings and will include photographs, field forms, maps and other pertinent material.

The sampling transects will obtain sediment from depositional areas of the stream bed at multiple depths. Similar to the 2009 Focused RI, the general sampling objective will be to collect sediment samples from up to three depths using hand sampling methods. Each transect will include samples of sediment collected from the upper six-inches of the stream bottom (0.0 to 0.5 feet) and deeper samples collected from target depths of 0.5 to 1.0 feet and 1.0 to 2.0 feet below the stream bed. Sampling will be accomplished using hand methods such as a sediment auger or a split-spoon advanced using a slide hammer. Soil samples will be collected of prominent bank strata (e.g. landfilled material and underlying native material, if exposed). Sample locations will target both flood stage elevations, as may be evidenced by erosion or other visual clues, and bank top elevations to characterize soils that would be above flood deposition.

Based on discussions with the NYSDEC, additional surface soil samples will be collected from areas outside of the stream bed from the 0" to 2" inch depths to be able to evaluate potential human exposures. Up to 10 shallow samples will be collected from the Lower Nail Creek study area, with the locations being determined in the field after consultation with and input from DEC and NYSDOH personnel. Targeted locations will be along any evident trails or paths where people may traverse. These soil samples will be analyzed for PCBs.

All samples will be analyzed for PCBs and metals. In addition, a subset of field samples (a minimum 33%) will be analyzed for additional USEPA Target Compound List (TCL) analytes to develop information on the general levels of organic and inorganic constituent concentrations other than PCBs. TCL analyses will be for PCBs, VOCs, SVOCs and total organic carbon (TOC). These will provide data to evaluate the creek setting and other historical influences (railroad, landfilled waste, etc). Samples selected for the full organic

analytical suite will be biased from shallow samples that are ecologically available (e.g. from the initial 0.0 to 0.5 foot range rather than from deeper intervals). A secondary objective is to characterize each type of material observed such as surficial fill exposed on banks, underlying native bank soil, and depositional areas of sediment within the lower creek corridor.

### 3.3 Analytical Program

Sampling methods for the activities described above are presented in a QAPP attached as Appendix A. The QAPP includes information on project organization, data quality objectives, sample collection procedures, data management and Health and Safety. The general analytical program is discussed below.

Soil, sediment, and water samples will be submitted to an off-site laboratory for analysis using USEPA SW-846 analytical procedures (USEPA, 1996).

Sample analyses will be completed by a Honeywell-approved laboratory that is certified by the NYSDOH Environmental Laboratory Accreditation Program (ELAP). Samples will be analyzed as specified in Table 3-1 for the following parameters using the specified methods:

- PCBs by Method 8082
- VOCs by Method 8260
- SVOCs by Method 8270
- Inorganics by Method 6010 / 7471 / 7470 / 9012
- TOC by Loyd-Kahn
- Hardness by Method 2340

Specific information on the proposed project laboratory, method detection limits and quantitation levels, and accreditation is provided in the QAPP (Appendix A). Field Quality Control samples will be collected at the following frequencies:

|                                      |   |
|--------------------------------------|---|
| Field Duplicates                     | 5% per media                                  |
| Matrix Spike/Matrix Spike Duplicates | 5% per media                                  |
| Trip Blanks<br>samples               | 1 per container with shipped VOC              |
| Field Blanks                         | 1 per event (decontamination source<br>water) |
| Equipment Blanks                     | 1 per soil sampling method                    |

## 4.0 REPORTING AND SCHEDULE

Following the completion of the field activities described in this Phase II RI Work Plan and subsequent data management and validation, Amec will prepare a report that describes the scope of sampling performed and presents tabulated final analytical data. Data tables will indicate the detection limit for non-detect results. The report will include figures showing the locations of samples and results for key COCs. Laboratory analytical deliverables will be provided separately in electronic format, if requested by the NYSDEC. Recommendations for further delineation, if necessary, will be provided.

Honeywell will request a meeting with NYSDEC to discuss the data findings and evaluate potential steps to complete the RI and FS. Additional sampling tasks, should they be necessary, will be presented in a subsequent Work Plan for NYSDEC approval.

When RI/FS field work has been completed, Honeywell will prepare a Remedial Investigation Report to present the findings from all field tasks. The report will follow the format outlined in Section 3.14 of the Final DER-10 (NYSDEC 2010) and will include an electronic copy of the full report plus an electronic copy of laboratory analytical data.

A draft schedule of project activities is presented as Figure 4.1. The schedule assumes field sampling will be accomplished in July 2012. The schedule is dependent on agreement on access to the various parcels where sampling will occur. Honeywell will notify the NYSDEC of any issues that may affect the schedule as they arise. The schedule shows a projected date in November 2012 for submittal of an RI Report covering the Old Chenango Canal/Nail Creek segment (the 3,600 foot long segment from the French Road sewer outfall to the entrance into the Utica box culvert). This assumes that the Phase II RI will collect sufficient information to allow the completion of a FS for this section of the drainage pathway. Investigation of the Nail Creek drainage downstream from the entrance of the Utica Box Culvert will likely require additional sampling events and a separate RI/FS Report will be prepared for this portion of the drainage system.

## 5.0 REFERENCES

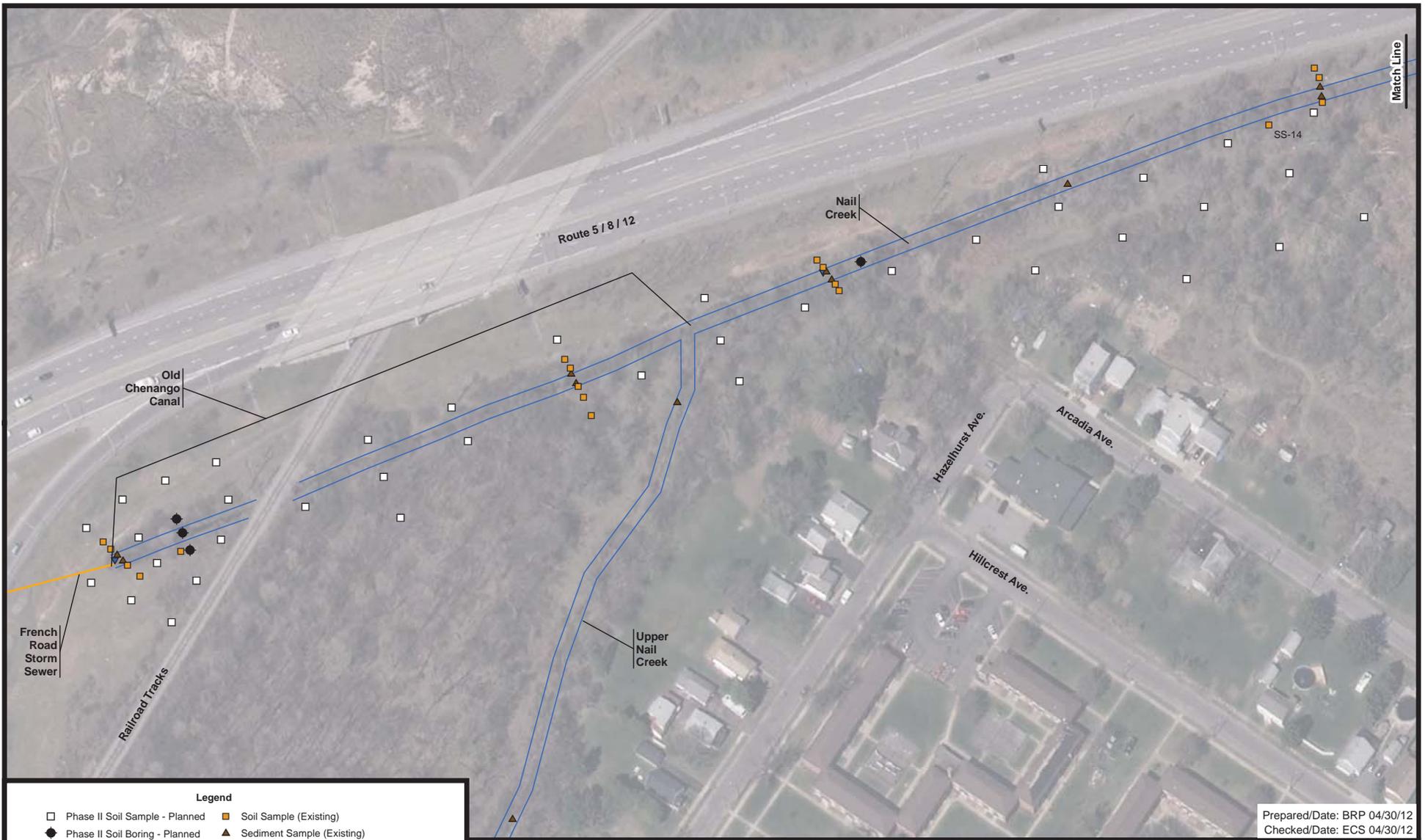
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NYSDEC Site No, 633051 - Utica Bendix Old Chenango Canal  
Remedial Investigation/Feasibility Study - Phase II Work Plan

U.S. Environmental Protection Agency (USEPA), 2006c. "Validation of Metals Data for the Contract Laboratory Program (CLP) based on SOW ILM05.3"; USEPA Region II; HW-2; Revision 13; September 2006.

## FIGURES





**Legend**

- Phase II Soil Sample - Planned
- ◆ Phase II Soil Boring - Planned
- Soil Sample (Existing)
- ▲ Sediment Sample (Existing)
- ▼ Surface Water Sample (Existing)

Oneida County color digital orthoimagery (2008) obtained from New York State GIS Clearinghouse at: <http://www.nysgis.state.ny.us>

0 50 100 Feet

N

PHASE II RI WORK PLAN  
 OLD CHENANGO CANAL - NYSDEC 633051  
 HONEYWELL UTICA-BENDIX  
 UTICA, NEW YORK

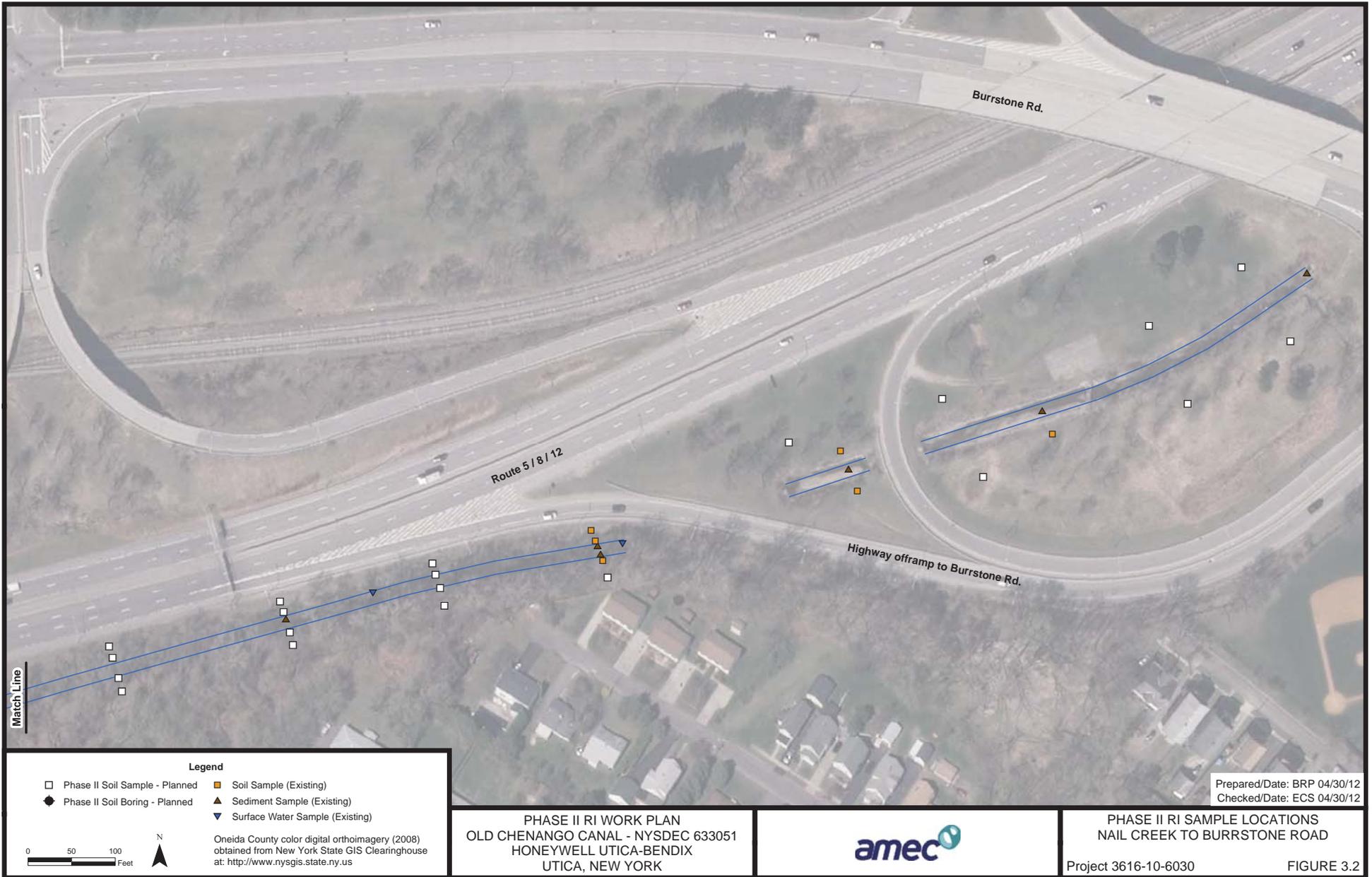


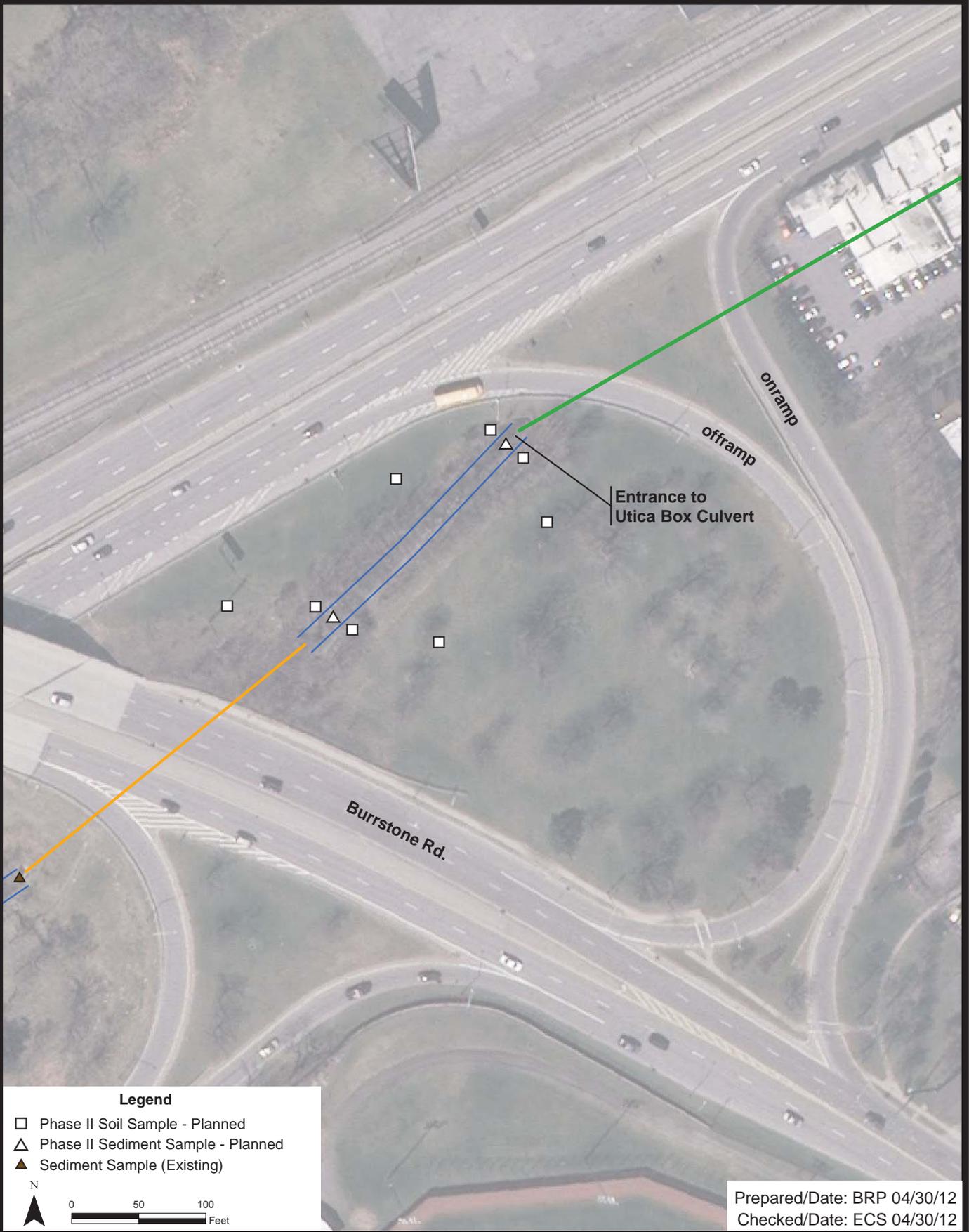
PHASE II RI SAMPLE LOCATIONS  
 OLD CANAL / NAIL CREEK

Project 3616-10-6030

FIGURE 3.1

Prepared/Date: BRP 04/30/12  
 Checked/Date: ECS 04/30/12



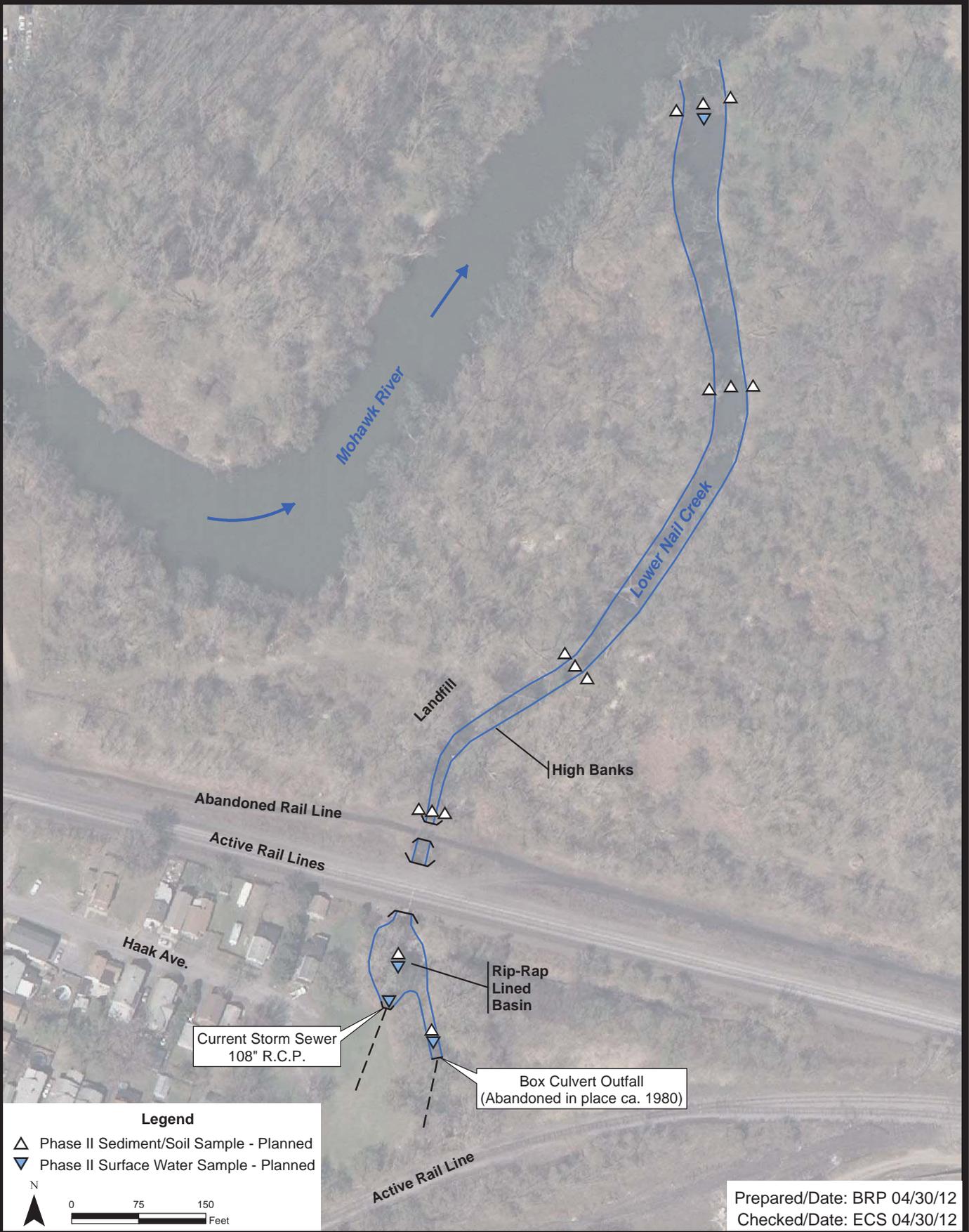


PHASE II RI WORK PLAN  
OLD CHENANGO CANAL - NYSDEC 633051  
HONEYWELL UTICA-BENDIX  
UTICA, NEW YORK



PHASE II RI SAMPLE LOCATIONS  
BURRSTONE RD TO UTICA CULVERT

Project 3616-10-6030      FIGURE 3.3



**Legend**

- △ Phase II Sediment/Soil Sample - Planned
- ▽ Phase II Surface Water Sample - Planned

N

0 75 150 Feet

Prepared/Date: BRP 04/30/12  
 Checked/Date: ECS 04/30/12

PHASE II RI WORK PLAN  
 OLD CHENANGO CANAL - NYSDEC 633051  
 HONEYWELL UTICA-BENDIX  
 UTICA, NEW YORK

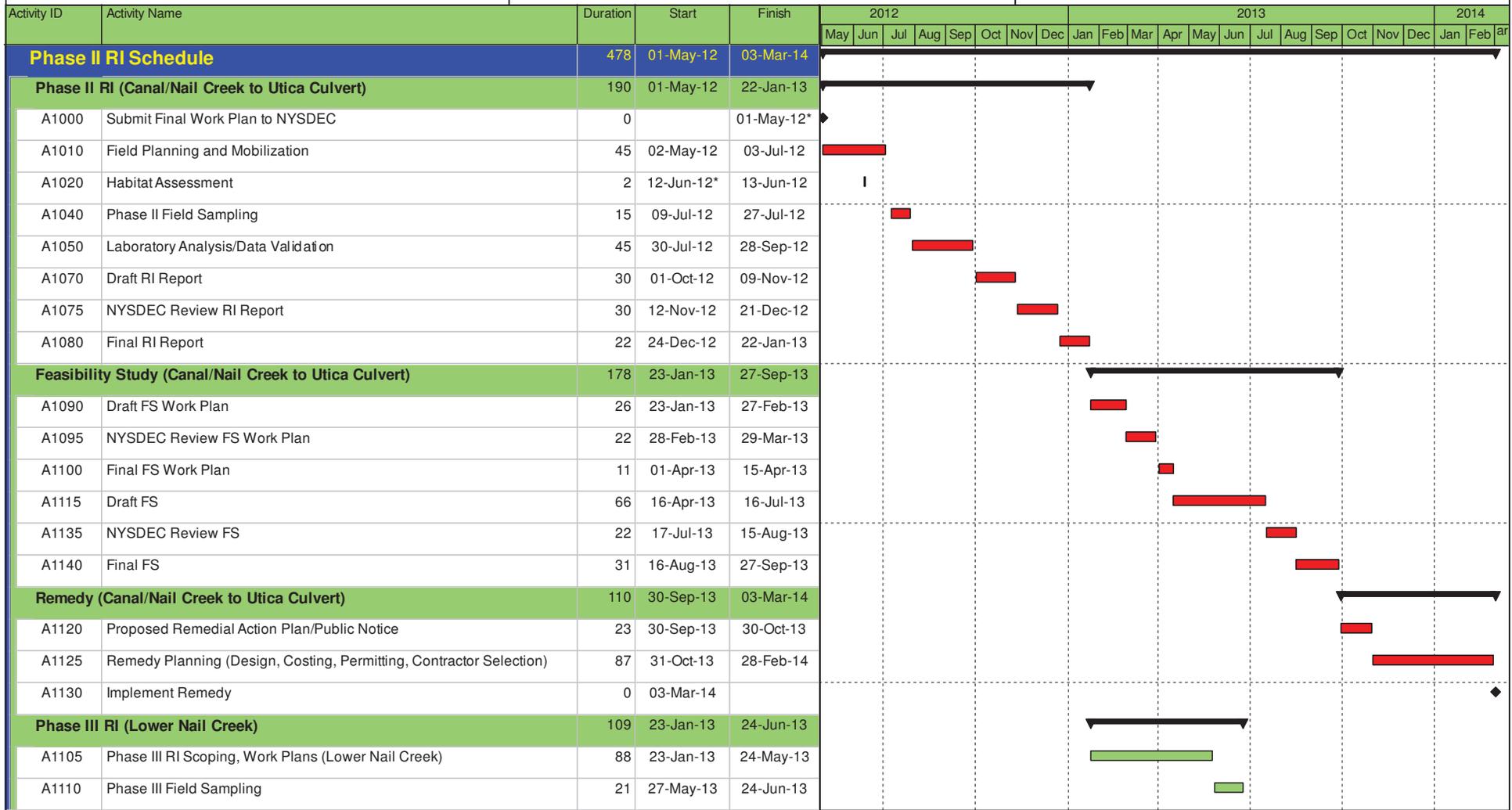


PHASE II RI SAMPLE LOCATIONS  
 LOWER NAIL CREEK

Project 3616-10-6030      FIGURE 3.4



**Figure 4-1  
Phase II RI Schedule  
Old Chenango Canal Site, Utica NY  
Project Schedule - 3616106030**



█ Actual Work      ◆ Milestone  
█ Remaining Work      ⇐ Summary  
█ Critical Remaining Work

MACTEC PM: ECS  
 Controls: RMA  
 Manager: JJS

## **TABLES**

**Table 3.1: Phase II Sampling Program Overview**

| Drainage Section                                | Phase II Element            | General Approach  | Sampling Objective   | Analytical Objective   | Locations(1) | Samples(1) |
|---|-----------------------------|---|--|--|--------------|------------|
| French Road Culvert to SS14<br>(Figure 3.1)     | Soil Borings                | Through creek bed at accessible locations and in bordering land to characterize conditions and profile PCB levels deeper than hand sampling allows. | Drill to the deeper of refusal or 20 feet bgs with continuous soil retrieval. Select three or more depths per boring for analysis                                      | PCBs, metals   | 3            | 9          |
|   | Surface Water Sample        | Discreet sample of water discharging from the French Road culvert to address data gap.  | One grab sample from culvert to establish water quality being discharged to the canal/creek  | PCBs, VOCs, SVOCs, metals  | 1            | 1          |
|   | PISCES Water Sample         | Discreet sample of water discharging from the French Road culvert to address data gap; at same location as surface water sample                     | One grab sample from culvert to establish water quality being discharged to the canal/creek  | PCBs   | 1            | 2          |
|   | Soil Samples (hand-methods) | Grid-based array to profile the lateral and vertical extent of PCBs   | Three depths all locations (e.g. 0.0 to 0.5 ft, 0.5 to 1.0 ft, and 1.0 - 2.0 ft) plus deeper interval at locations TBD in field <sup>2</sup>                           | PCBs, metals   | 38           | 114        |
|   | Surface Soil Samples        | Locations being determined in the field after consultation with and input from DEC and NYSDOH personnel; to evaluate potential human exposures      | Collected from 0" to 2" depths   | PCBs, metals   | 10           | 10         |
| Nail Creek to Burrstone Road<br>(Figure 3.2)    | Soil Samples (hand-methods) | Transects up creek banks (west of highway off ramp) to assess PCB levels versus height above stream (high Banks are present)                        | 0.0 - 0.5 ft., 0.5 to 1.0 ft, and 1.0 to 2.0 ft plus deeper samples <sup>2</sup> as practical based on observed conditions   | PCBs, metals   | 13           | 39         |
|   | Soil Samples (hand-methods) | Solitary locations within highway cloverleaf to confirm low PCB impacts beyond creek banks  | 0.0 - 0.5 ft., 0.5 to 1.0 ft, and 1.0 to 2.0 ft  | PCBs, metals   | 7            | 21         |
| Burrstone Road to Utica Culvert<br>(Figure 3.3) | Sediment Samples            | Two locations to determine PCB levels and thickness of sediment along section not previously sampled  | 0.0 - 0.5, 0.5 - 1.0, and 1.0 - 2.0 feet if sufficient sediment thickness or access between rock lining  | PCBs   | 2            | 6          |
|   | Soil Samples (hand-methods) | Bank samples and surface soil samples to determine general levels of PCBs, if present   | 0.0 - 0.5 ft., 0.5 to 1.0 ft, and 1.0 to 2.0 ft  | PCBs   | 8            | 24         |
|   | Surface Water Sample        | At entry point to Utica culvert to provide water quality to compare with Lower Nail Creek   | Grab sample from surface water at entrance to culvert  | PCBs, VOCs, SVOCs, metals  | 1            | 1          |
|   | PISCES Water Sample         | At entry point to Utica culvert to provide water quality to compare with Lower Nail Creek; at same location as surface water sample                 | Grab sample from surface water at entrance to culvert  | PCBs   | 1            | 2          |
| Lower Nail Creek<br>(Figure 3.4)                | Surface Water Samples       | Samples of water discharging from culverts and from two locations along pathway to Mohawk River   | Grab samples from Utica storm sewer and abandoned box culvert; sample of creek water from receiving basin and from lower reach of creek prior to discharge into Mohawk | PCBs, VOCs, SVOCs, metals  | 4            | 4          |
|   | PISCES Water Samples        | Samples of water quality at same locations as surface water samples   | Grab samples from Utica storm sewer and abandoned box culvert; sample of creek water from receiving basin and from lower reach of creek prior to discharge into Mohawk | PCBs   | 4            | 8          |
|   | Sediment                    | Through creek bed at 6 planned locations to characterize levels of environmental constituents   | 0.0 - 0.5; plus deeper intervals (e.g. 0.5 to 1.0 and 1.0 to 2.0) if sufficient sediment thickness or access between rocks in creek bed                                | PCBs, VOCs, SVOCs, metals (top interval); PCBs (lower intervals) | 6            | 18         |
|   | Soil Samples (hand-methods) | Bank samples and surface soil samples to determine general levels of PCBs, if present   | 0.0 - 0.5 ft., 0.5 to 1.0 ft, and 1.0 to 2.0 ft  | PCBs, VOCs, SVOCs, metals top interval); PCBs (deeper interval)  | 8            | 24         |
|   | Surface Soil Samples        | Locations being determined in the field after consultation with and input from DEC and NYSDOH personnel; to evaluate potential human exposures      | Collected from 0" to 2" depths   | PCBs, metals   | 10           | 10         |

Prepared/Date: ECS 09/27/10  
 Checked/Date: JB 09/27/10

Notes:

- Locations and number of samples are projected numbers based scope of work discussed in Work Plan. Locations and additional samples and sample intervals may be adjusted based on observed field conditions at the time of sampling.
- Deepest soil sample at a location may be archived at the laboratory and analyzed if necessary once PCB levels in shallow samples have been determined
- Refer to QAPP (Appendix A) for information on analytical methods, quality control, and data quality objectives

**APPENDIX A**  
**QUALITY ASSURANCE PROJECT PLAN**

**APPENDIX A:**  
**QUALITY ASSURANCE PROJECT PLAN**

**1.0 INTRODUCTION**

This Quality Assurance Project Plan (QAPP) Plan has been prepared for Honeywell, Inc. (Honeywell) by MACTEC Engineering and Consulting (MACTEC) for the Honeywell Old Chenango Canal Site (Site). The Site is a watercourse that has its headwaters in a remnant section of the Old Chenango Canal in Utica New York. The Site received storm water discharge from a former Bendix facility located at 211 Seward Avenue in Utica. This QAPP provides guidance for Honeywell's environmental investigations and monitoring at the Site and presents the project organization, data quality objectives, quality assurance and quality control (QA/QC) activities, sample collection procedures; analytical methods, analytical data management, and chemistry data review procedures associated with initial Remedial Investigation (RI) work activities at the Site.

This QAPP has been updated in September 2010 for the Phase II RI Work Plan

**1.1 QAPP OBJECTIVES**

This QAPP provides a framework of procedures, functional activities, and organization to be used during the execution of environmental work at this Site. The procedures and criteria outlined in this document describe a level of performance required to achieve the project objectives.

The objectives of this document are to:

- Provide a consistent framework for collecting samples and generating analytical data throughout the project.
- Identify detection limit and QC goals for analytical methodologies used to generate chemistry data.
- Set forth review procedures used to demonstrate that the analytical systems are achieving project objectives.
- Set forth record-keeping procedures for field activities, sample collection and handling, and analytical data reporting.
- Provide for generation and documentation of data of known and acceptable quality.
- Set forth procedures that limit the effect of non-laboratory activities on analytical data.

When implemented, the activities described in this document will assure that documentation is generated so that field and analytical measurements can be verified. QA activities include the use of a management system to produce valid data that supports the program and includes a system of checks and reports to monitor the attainment of data quality objectives (DQOs). This management system includes plans that will allow the traceability, completeness, and security of field and analytical documents, and procedures for evaluating data quality relative to DQOs. QC includes specific technical activities performed by field or laboratory personnel to demonstrate that system performance is maintained within established criteria. To document precision, accuracy, and comparability of results, QC activities are included within this QA system.

## **1.2 SITE DESCRIPTION.**

The Site consists of a storm water drainage pathway that located alongside and to the south of the North-South Arterial highway (Route 5; Route 8; Route 12) in Utica, New York. The watercourse originates at a 60-inch concrete storm sewer culvert located on the south bank of an on-ramp to the highway. It runs within a remnant section of the Old Chenango Canal for approximately 700 feet at which point a tributary (Upper Nail Creek) enters from the south. The drainage continues as Nail Creek, running largely as open channel and occasionally beneath highway ramps until it enters the Utica box culvert, to the east of Burrstone Road and at a distance of about 3,600 feet from the French Road storm culvert. Channelized Nail Creek continues for approximately 9,350 feet within the Utica box culvert and storm sewer network, discharging to the north of the city near Haak Avenue. Lower Nail Creek continues as an open channel for 1,200 feet until it reaches the Mohawk River. The watercourse received water contaminated with polychlorinated biphenyls (PCBs) which were discharged via a series of underground storm sewers from the former Bendix facility located at 211 Seward Avenue in Utica, New York.

## **1.3 QAPP ORGANIZATION**

This QAPP is organized as follows:

Section 2.0 provides information on the project team and responsibilities;

Section 3.0 discusses data quality objectives;

Section 4.0 describes field procedures;



approach that meets the project objectives; ensuring that the technical approach is properly implemented in the field; and providing technical direction during the execution of work tasks

**Principal Engineer/Senior Technical Reviewer:** Jeffrey Brandow, P.E. will provide senior-level guidance and input throughout the project and will be responsible for all technical services provided. Mr. Brandow will monitor and review deliverables to check for completeness, consistency, and overall quality of the data interpretations. Specific portions of each project deliverable may be reviewed by other senior-level technical personnel based on their experience in specific disciplines.

**Field Operations Leader** Jerry Rawcliffe: will act as the Field Operations Leader for this project. In this capacity, he will be responsible for implementing and documenting field-related investigation activities. Specific responsibilities include day-to-day coordination and management of technical staff; coordination and oversight of subcontractors assisting the field team; and communication between the field team and necessary persons at the Site. Mr. Rawcliffe will report directly to the Technical Lead.

**Project Engineer** Stuart Pearson: will be responsible for coordinating the development of design documents. In this role, he will be responsible for guidance of project engineers during the preparation of the individual interim deliverables in support of remedial designs.

**Project Chemist** Chris Ricardi: will be responsible for collection and evaluation of analytical chemistry data. He will provide technical over-sight to the subcontractor laboratories, and review laboratory data deliverable and coordinate data quality reviews and data validation.

**Project Data Manager** William Colby-George: will be responsible for the management of project data. This will include loading field data and analytical data into the project data base and preparing data outputs to support data evaluation and interpretation activities.

**Subcontractors** MACTEC will use the services of Honeywell-approved and MACTEC-approved contractors during this project. These will be retained on an as-needed basis for each phase of field work. Initial RI activities require an off-site laboratory for soil, sediment, and water analysis.

Honeywell expects to retain Life Sciences Laboratories, Inc (LSL) of Syracuse New York for off-site analyses. LSL is a NELAP accredited, New York certified laboratory and will meet NYSDEC

Analytical Services Protocols and was the laboratory used during the 2009 Focused RI. Additional information on LSL laboratory methods and detection and reporting limits are provided in Table A-3 and Attachment 1. Honeywell has not yet retained LSL for Phase II and reserves the right to evaluate LSL pricing and quality assurance versus other accredited laboratories. Should Honeywell wish to select an alternative laboratory, the recommendation and rationale for selection will be transmitted to NYSDEC for approval along with the lab-specific detection and reporting limits that will be used during Phase II.

### **3.0 QUALITY ASSURANCE OBJECTIVES**

The overall QA objective is to develop and implement procedures for field sampling, sample management, laboratory analysis, and reporting that will provide results which are defensible.

#### **3.1 REGULATORY COMPLIANCE OBJECTIVES**

Site investigation activities will be completed in accordance with NYSDEC regulations and guidelines. Regulations and guidelines provided by the United States Environmental Protection Agency (USEPA) may also be applied. When planning and implementing site-specific investigations, the MACTEC project team will incorporate requirements and procedures described in the following documents into their planning documents and technical evaluations of site conditions:

Draft DER-10 “Technical Guidance for Site Investigation and Remediation”; New York Department of Environmental Conservation; Division of Environmental Remediation; FINAL, May 2010.

6 NYCRR PART 375 “Environmental Remediation Program”; New York Department of Environmental Conservation; Division of Environmental Remediation; October 2006.

Title 6, Part 371 “Identification and Listing of Hazardous Wastes”; New York Codes, Rules, and Regulations; September 2006.

Title 6, Part 700-705 “Water Quality Regulations Surface Water and Groundwater Classifications and Standards”; New York Codes, Rules, and Regulations; August 1999.

“Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels”; New York Department of Environmental Conservation; Division of Hazardous Waste Remediation; January 1994.

Technical and Operational Guidance Series (TOGs) 1.1.1. “Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations”; New York Department of Environmental Conservation; Division of Water; June 1998.

USEPA 542-S-02-001 “Ground-Water Sampling Guidelines for Superfund and Resource Conservation and Recovery Act (RCRA) project Managers”; United State Environmental Protection Agency (USEPA); Office of Solid Waste and Emergency Response; May 2002.

“Analytical Services Protocols (ASP)”; New York Department of Environmental Conservation; June 2000; revised July 2005.

“Draft Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis”; New York State Department of Environmental Protection; Division of Fish, Wildlife, and Marine Resources; Bureau of Habitat; October 2002.

### **3.2 PROJECT DATA QUALITY OBJECTIVES**

DQOs are established during the development of each project Work Plan to specify the quality of data and project specific goals for each particular data collection activity. The DQOs will ensure that data collected can support project-specific decisions. The DQOs are the starting point in the design of the investigation and based on the concept that the intended use of the data determines the quality and type of the data required. DQOs are established based on site conditions, project objectives, and available measurement systems. The DQO process matches sampling and analytical capabilities to the data targeted for specific uses and ensures that the quality of the data does not underestimate project requirements.

During the development of project-specific Work Plans, the guidance documents identified in Section 3.1 will be used to establish sampling and analytical testing goals. The MACTEC project team will evaluate site historical information and data, and recommend a plan for each site. Each Work Plan will include descriptions of the following information:

- Project description and site investigation objectives
- Planned explorations and sampling procedures
- Summaries of proposed samples for all media at the site
- Summary of analytical procedures
- Data quality goals for each sampling task
- Applicable standards for groundwater, surface water, sediment, and soils

### **3.3 ANALYTICAL DATA QUALITY LEVELS**

The data quality levels identified for this project will be USEPA DQO Level 1 for monitoring for health and safety, field measurements taken during sample collection, and VOC screening, and Level 3 Laboratory Analysis to provide data for comparison with risk-based cleanup criteria and evaluate response activities effectiveness. Analytical DQOs for the Focused RI are shown on Table A-1.

### **3.4 QUALITY CONTROL SAMPLES**

Several types of field QC samples will be collected to provide additional data that can be used to evaluate whether the sample collection and handling procedures have affected sample quality. QC sample frequency and type will be specified within the description of Scope of Work section within each Work plan that is specific to the Site.

QC samples that may be collected during the Old Chenango Canal RI/FS include:

- Field Duplicates (5 percent) consisting of replicate or co-located samples to evaluate precision;
- Matrix Spike/Matrix Spike Duplicates (5 percent) performed by the laboratory to evaluate the effect of sample matrix on the preparation and analytical procedures;
- Field Blanks to document cleanliness of water sources used for decontamination procedures during the field program;
- Equipment Blanks to evaluate the effectiveness of equipment decontamination
- Trip Blanks to assess potential VOC contamination during sample transport.

Routing laboratory QC procedures defined by the methods (SW-846) will be established and defined in the contract arrangement with the subcontracted laboratory. The laboratory procedure for sediment sampling may be adjusted to account for high moisture content, including:

- decanting liquid prior to sample preparation and total solids determination;
- centrifuging samples, followed by decanting;
- sample extraction of larger aliquots; and
- sample preparation/cleanup procedures to remove potential interferences.

QC limits for surrogates, spikes and duplicates are summarized in Table A-2.

### **3.5 ANALYTICAL METHODS**

Samples will be submitted to the offsite laboratory for organic and inorganic analyses as specified in the Work Plan. Table A-3 lists the analytical methods that may be required during the Focused RI and the associated method-specific field preservatives and maximum holding times prior to analysis. Laboratory detection and reporting limits are provided in Attachment 1.

### **4.0 FIELD PROCEDURES**

This section describes field procedures such as including sampling and decontamination procedures. For each sample collection event, specific sampling procedures, including sample types, sampling locations, frequency of collection, and the types of analytical samples will be designated in task-specific work plans.

#### **4.1 SAMPLE MEDIA**

The following types of samples may be collected at the Site:

- Sediment samples
- Soil samples
- Surface water samples
- Groundwater samples

- Waste characterization samples (solid and/or water)

## 4.2 SAMPLE DESIGNATIONS

Field samples will be identified as follows:

|                     |
|---------------------|
| <b>BUAABBxxyyzz</b> |
|---------------------|

where:

BU = Bendix Utica

AA = Project Phase

RI – Remedial Investigation

FS – Feasibility Study

BB = Sample Type

BS – boring soil

SS – surface soil (hand collected)

SD - sediment

GW - groundwater

SW - surface water

WC - waste characterization

FB - field blank

EB - equipment blank

TB - trip blank

xx = Location Number (01, 02, etc.)

yy = Depth (top of interval)

Soil (and groundwater collected from soil boring) – feet below ground surface

Groundwater - feet below top of well casing

Surface water - feet below top of water

Sediment – tenths of feet below sediment surface

zz = Quality Control Designation

XX - regular sample

FD - field duplicate (replicated or collocated) sample

MS - matrix spike

### 4.3 SAMPLE COLLECTION PROCEDURES

The following procedures are for the sampling that is anticipated for this project. Sample collection will be documented on field data records (FDRs). FDRs are provided as Attachment 2.

#### 4.3.1 Shallow Soil Sampling.

Shallow soil sampling provides samples of surface and near surface soils suitable for chemical analysis. Shallow soil samples may be obtained by using one of the following devices:

- split-spoon sampler
- hand auger or corer
- trowel or spoon
- spade

The split-spoon sampler consists of a split steel tube or sample barrel threaded at both ends that may be hand-driven using a slide hammer. Two distinct types of hand augers are available: a cup-type auger and a screw-type auger. Use of either device is generally limited to the upper portion of the soil profile (i.e., less than 5 ft). These augers are best suited for obtaining composite samples from relatively shallow depths and in relatively loose soils. Use of trowels or spades is straightforward but usually limited to sampling very shallow depths (i.e., less than 18 inches).

Soil samples can be either grab or composite, depending on the objective of the sampling program described in the project-specific Work Plan. In grab sampling, the soil jar is filled directly. In composite sampling, several methods are available:

- Samples can be composited over depth at a single location.
- Samples can be composited laterally, in which one sample comprises several, usually three or four, soil specimens from the same depth in the vicinity of the sampling site.

During composite sampling, several depths or locations are selected and a stainless steel bucket is filled with samples from all locations. The material is then mixed and put into appropriate containers.

Samples for VOCs will not be mixed. A specific location is chosen and the sample is placed immediately in the appropriate containers with as little agitation or disturbance as possible.

Immediately after taking a sample, COC procedures are initiated and a Surface Soil Sample FDR is completed (see Attachment 2). Information recorded on the FDR will include the sample type, depth, date, time and sample identification. Any special observations (staining, odor, etc.) will also be recorded in the "Notes" portion of the FDR.

#### **4.3.2 Soil Sampling from Direct-push Borings.**

A direct-push drilling rig may be employed to advance soil borings to characterize subsurface conditions and collect soil samples for analysis. Direct-Push drilling technique consist of a hydraulic ram unit, usually mounted on a small vehicle (ATV, cargo van, or pick-up truck) that advances small diameter drill rods to obtain overburden soil samples. Advantages in environmental investigations include low cost, maneuverability and access to irregular terrain, minimization of investigation derived wastes.

The direct push device may employ either dual tube methodology which allows the collection of subsurface soil samples through an outer casing that is set to maintain the integrity of the boring or single-rod method that collects soil into a sleeve liner (e.g., macrocore) within the lead rod.

In the dual-tube method borings are advanced by simultaneously driving an outer stainless steel casing and inner Lexan<sup>®</sup> tube into the ground. Upon reaching the desired penetration depth, the inner Lexan<sup>®</sup> tube is extracted to collect the discrete subsurface soil samples, leaving the outer casing in place. To sample the next interval of soil, a new length of Lexan<sup>®</sup> tubing is then inserted into the outer casing (already in the ground) attached to a length of drive pipe, and another length of outer casing is attached to the top of the outer casing that is already in the ground.

In the single-rod method, 3/4-inch diameter rods are advanced in 4-ft sections. The lead section is fitted with an inner polyethylene sleeve. When the top of the desired sampling interval is reached, a tool is used to unlock the drive point and the rod is driven ahead to obtain the soil sample. The entire drill rod is retrieved and the liner removed for characterization. The process is then repeated to collect the next desired sample.

Mactec will use a qualified field geologist or technician to collect soil samples for physical and analytical testing and geologic classification during completion of soil borings and direct push explorations.

The samples for laboratory analysis shall be collected using a split-spoon (soil borings) or sampling probe with disposable acrylic liner (direct push). The collection of the samples shall be in accordance with the following procedures:

1. Remove the rods and sampler from the borehole/exploration. Open the sampler by unscrewing the cutting shoe and retrieve the liner containing the soil sample. In the case of direct push explorations cut open the acetate liner. Recovered soils contained in the sampler shall be characterized using the USCS, as described previously.
2. Scan the soil sample with a PID and record measurements.
3. Collect sample for chemical analysis as described for Surface Soil Sampling.
4. Decontaminate the sampling device.
5. Record the boring lithology on a Soil Boring Log (Figure 4-4).

Information regarding sample location, depth, and character shall be recorded on the Soil Boring Log (Figure 4.4).

#### **4.3.3 Surface Water Sampling.**

Surface water samples will be collected from locations within the canal and Nail Creek. Samples will be collected by directly filling sample containers, to the extent practical. If samples are co-located with sediment samples, the surface water sample will be collected first. Care will be taken to avoid disturbing and suspending bottom sediment. The location of each sample will be established using a field stake, if practical.

The sample will be taken in the following manner:

1. Measure water depth
2. Collect the sample from the surface water body by immersing a clean sample bottle at mid-depth. If a stream is being sampled, collect the sample while facing upstream with the opening of the sampling device oriented upstream but avoiding floating debris.
3. For containers with preservative (e.g., VOCs with HCL) a beaker will be used to retrieve water and the bottles then filled from the beaker.

4. Inorganics will be collected by using a peristaltic pump will be used to draw water directly from the water body, if practical, or from a beaker, through a filter and tubing that discharges directly into the sample container.
5. Measure the following parameters directly in the water body:
  - Temperature,
  - pH,
  - DO,
  - Specific conductivity, and
  - Any other specific field measurements that are required
6. After all sample bottles have been filled, measure the water depth at the sample location using a weighted tape or ruler
7. Complete the Surface Water Sampling FDR and field logbook entry. Include any observations of special conditions such as color, odor, etc.

When field duplicates or other QC samples are collected, the samplers should fill all containers for a given set of parameters before moving on to the next parameter.

#### **4.3.4 Sediment Sampling**

The exact location of each sediment sample will be established in the field at the time of sampling. Sediment sampling points are often collocated with surface water samples. Sediment samples should always be collected after the surface water sample. Sediments in shallow water conditions may be collected without the use of a boat if agitation of sediment prior to collection can be avoided.

Sediment samples will be collected in the following manner:

1. Proceed to the sampling location from a downstream to upstream direction and observe the condition of the stream bottom. Remove large stones and plant debris that are not an integral component of this sediment media. Exercise caution to avoid disturbing the sediments at the sampling point.
2. Use a gravity corer, hand corer, hand auger, trowel, Ponar<sup>®</sup> dredge, or other equivalent equipment to collect sediment samples. A stainless steel spoon and bowl may be used for locations that are shallow (i.e., less than 6-inches). If the water is shallow enough, push the gravity corer or hand auger directly into the substrate until approximately one inch or less of the sampling device is above the sediment/water interface. If the substrate is hard or coarse, the corer may be rotated gently while it is pushed to facilitate greater penetration and reduce core compaction.

3. Remove the sampling apparatus gently from the sediment to avoid losing the sample, and rise to the surface.
4. Hold the sampling device above the water to allow residual surface water to run off the device. When water is no longer running off the device, transfer the sediment sample to a stainless steel bowl. Collect a minimum of 500 grams of sediment at each location. For example, with the gravity corer, one tube with a 4-inch-long core, 2-inch outside diameter, and wall thickness of 1/8-inch is adequate for one sample, as the volume of each core would be approximately 750 ml. For other tube sizes and core lengths, the number of tubes necessary can be calculated by using the formula for the volume of a cylinder (i.e.,  $\pi r^2 h$ ).
5. Sediment samples may have high percent moisture content. Prior to transferring sample aliquots to appropriate containers, standing water should be decanted from the stainless steel bowl.
6. If soil samples are scheduled for VOC analysis, this parameter will be collected first. VOC samples will not be homogenized to minimize volatilization during collection. Both a low concentration (water preserved) and high concentration (methanol-preserved) sample will be collected to ensure that analytical results will be within method limits.

**Preserved VOC Collection** - Advance a latex free, medical grade 10 cubic centimeter (cc) plastic syringe, designed to reduce the exposure of the sediment sample to air, directly into the sediment core or contents in the stainless steel bowl. Transfer the sediment sample into the pre-labeled, pre-preserved and pre-weighed vial and replace the cap. Do not attach any labels or tape to the pre-weighed sample vials. The volume of sediment collected will depend on the volume of methanol. An approximate equal volume of sediment and methanol will be added to the sample vials. The required volume will be identified by the laboratory prior to field mobilization. Collect an additional sediment jar for percent solids determination. Label this additional jar "VOC percent solid" and the same sample information as the original sample.

7. For soils and sediment samples scheduled for non-VOC analysis, samples will be collected after homogenization in a mixing bowl. Transfer sample material from the collection device to a stainless steel mixing bowl. Decant excess liquid and remove stones and cobbles, if present. Homogenize the sediment within the bowl with a stainless steel spoon so that each sample aliquot is representative of the whole. Take care to ensure that sufficient sediment is present in the stainless steel bowl to fill all of the associated sample fractions (containers) and duplicate fractions, if necessary. Collect the remaining sample fractions (e.g., SVOCs, PCBs, and metals) using a stainless steel spoon and transfer the sediment into the sample containers.

Sediment sampling information is recorded on a Sediment Sampling FDR and in the logbook (see Attachment 2).

#### **4.4 MANAGEMENT OF INVESTIGATION-DERIVED WASTES**

The activities described in the Focused RI Work Plan are expected to produce limited amounts of excess sampling material and waste. Care will be taken to excavate only the approximate volume of material needed to fill the sample containers. Any extra soil or sediment that is removed during the advancement of an excavation to a required sample depth will be temporarily staged on plastic or in a steel bucket and will be returned to the excavation at the end of sampling as long as it doesn't exhibit visual contamination (e.g. oil) or chemical odor and positive PID screening response.

Small amounts of waste water will be generated by washing hand tools between sample locations and by pressure washing direct-push downhole tools between borings. Pressure washing will be accomplished at a designated spot adjacent to the drainage course near the head of the canal. This water will be allowed to infiltrate into surface soils as long as it does not exhibit odor, VOCs above background when screened with a PID, or shows evidence of residual oil. Waste water that contains evidence of such contamination will be containerized and staged at the Site in an appropriate location pending analysis and disposal.

Wastes such as personal protective equipment (e.g. gloves), Geoprobe acetate liners, paper and cardboard trash will be cleaned of any loose soil or sediment and will be bagged and disposed of as municipal waste.

#### **4.5 SAMPLE LOCATION SURVEY**

Sample locations will be surveyed by use of a GPS system. GPS coordinates will be recorded or converted to New York State Plane Coordinate System using the North American Datum of 1983.

#### **5.0 DATA MANAGEMENT**

Management of chemical data includes the following tasks:

- Organization and storage of project field records including logbooks, instrument calibration records, exploration records, field sample collection records, and sample handling Chain of Custody (CoC) records.
- Tracking of off-site laboratory samples and receipt of laboratory deliverables.

- Receipt, organization, and storage of laboratory data packages.
- Receipt of electronic data and entry of results into the project database.
- Data quality review at a validation level specified in the QAPP.
- Entry of data validation qualifiers and preparation of final data tables.
- Preparation of tables and figures for use in the RI/FS report(s).

The data management process will include procedures necessary to ensure consistent and complete collection of field data, tracking of the laboratory analytical and validation processes, consistent and timely production of electronic data deliverables (EDDs) from laboratories, and accurate and timely entry of EDDs into the Locus Technologies EIM™ system.

Prior to the field program, the Site data manager will set up the valid values in the project database. Valid values consist of the contractor names, laboratory names, method names, units of measure, parameter lists for each method, and QC codes for the field QC samples. Validation requirements, such as holding times and surrogate recoveries for each method and appropriate validation qualifiers are entered at this time as well.

Information specific to each sample will be entered in the field on appropriate field data records (FDRs), a Site-dedicated logbook, and on COCs. MACTEC will use the CoCs and supporting field records to review laboratory EDDs to track the completeness of the laboratory data deliverables.

The Site Data Manager will upload the analytical result EDDs. Imperfect EDDs will not be uploaded to the holding table, but rather will be returned to the laboratory for correction. Returning the EDDs to the laboratory for correction prior to upload minimizes discrepancies between hard copy analytical reports and electronic data. Field data will be uploaded using an EXCEL template after it has been documented as being checked. Field data such as Site photographs or logbooks will be stored in the project files, along with supporting metadata such as author/creator of data, date, location, brief description. Ten percent of the analytical data and field data entered and uploaded to the database will be compared against hard copy. Additional data review will be completed if errors are noted.

Hardcopy data deliverables will be specified for each field program depending on the level of review planned for the sample set and the planned use of the data. If a full validation (Level 4) is scoped for the sample set, or a subset of samples in the sample set, the data deliverables will

include a full hardcopy data package. Full validation is planned for the Focused RI sampling event. Therefore a Level 4 data package will be provided by the laboratory. Modified CLP type forms are acceptable provided they contain equivalent information. Deliverable packages will include a narrative that summarizes activities and any problems or issues, forms summarizing sample and QC blank results, forms summarizing QC measurement parameters specified in the method, and associated raw data generated in support of the reported results. Results of QC measurements including calibration data summaries, laboratory control data summaries, MS/MSD summaries (for samples requested on the CoC), surrogate summaries, and laboratory duplicate summaries. A modified CLP Form 10, or equivalent, summarizing dual column results will be provided for each sample. Raw data will include copies of associated instrument printouts and laboratory notebook records that were generated during sample preparation and analysis.

## **6.0 DATA REVIEW AND VALIDATION**

Analytical data will be validated by a data validator. Validation will be completed prior to use as final data in investigation reports.

The data validation scope for the sediment sampling program at the Site is designated as a Honeywell Level 4 validation. Level 4 validation includes QC and calculation checking and raw data checks as described in USEPA guideline documents. Data validation actions will be based on USEPA guidance documents including: National Functional Guidelines (USEPA, 1999); method-specific validation guidelines (USEPA, 2006a; USEPA, 2006b; USEPA, 2006c); USEPA Region II guidelines (USEPA, 2002); and the professional judgment of the project chemist.

A data validation summary report will be prepared by MACTEC for data sets reported from each distinct sample collection effort. The validation report will include the findings of the third-party validator, a summary of analytical methods performed, listings of samples included in the review, and summaries of data validation actions or observations.

## **7.0 HEALTH AND SAFETY**

A Health and Safety Plan (HASP) has been prepared to govern the specific field tasks identified in this Work Plan. The site-specific HASP has been prepared in accordance with NYSDEC DER-10

(NYSDEC, 2010). The HASP will be reviewed and updated, as necessary, prior to every field mobilization to the Site. Site workers will be required to review and sign the plan and a copy of the plan will be available at the Site to govern field activities.

The field activities discussed in this Work Plan are not anticipated to cause increased potential exposure to Site contaminants to the community during sampling. Hand sampling methods for surficial soil, sediment, and water are not likely to release any airborne particulate or chemical contamination. PCBs, the principal COCs at this Site, do not volatilize readily to air and, based on prior data, are not present at levels that will require respiratory protection to Site workers or the public.

Although VOCs are not expected to be encountered at levels that would be a potential concern to workers, periodic monitoring for VOCs will be performed during sampling activities to document actual conditions. Monitoring will be performed using a photoionization detector (PID). Results will be compared to the action levels specified in DER-10 and listed in the HASP. Work activities will be halted if total organic vapors exceed 5 ppm over background at the downwind perimeter of the work area. A copy of the NYSDOH Community Air Monitoring Plan is included in Appendix B.

The HASP will be amended to cover additional activities, as identified in any subsequent field sampling plans.

## **QAPP TABLES**

Table A-1  
Analytical DQO Levels

| Parameter  | Use  | Data Quality level |
|--|--|--------------------|
| pH, Temperature, Specific Conductance, Turbidity       | Provides physical and chemical data on water samples at the time of collection   | Level I            |
| PID Screening  | Provides qualitative instantaneous information on air quality for worker health and safety and identifies potential contamination in sampled media   | Level I            |
| TCL VOCs, SVOCs, Inorganics, PCBs using SW-846 methods | Provides analytical information to compare to standards and guidance values; determine the nature and extent of impact; evaluate potential risk to humans and the environment; support remedial action and risk-management decisions | Level III          |

Notes:

TCL - target compound list

VOCs = volatile organic compounds

SVOCs = semi-volatile organic compounds

Inorganics = TAL metals

PCBs = polychlorinated biphenyls

TOC = Total organic carbon

**Table A-2  
Summary of QC Limits for Surrogates, Spikes and Duplicates**

| PARAMETER     | QC TEST         | ANALYTE                 | WATER (%R) | SOIL (%R) | Water RPD | Soil RPD |
|---------------|-----------------|-------------------------|------------|-----------|-----------|----------|
| Volatiles     | Surrogate       | All Surrogate Compounds | 80 - 120   | 70 - 130  |           |          |
|               | LCS             | All Target Compounds    | 70 - 130   | 70 - 130  |           |          |
|               | MS/MSD          | All Target Compounds    | 70 - 130   | 70 - 130  | 20        | 50       |
|               | Field Duplicate | All Target Compounds    |            |           | 50        | 100      |
| Semivolatiles | Surrogate       | BN Fraction             | 50 - 140   | 40 - 140  |           |          |
|               | Surrogate       | Acid Fraction           | 30 - 140   | 30 - 140  |           |          |
|               | LCS             | All Target Compounds    | 50 - 140   | 40 - 140  |           |          |
|               | MS/MSD          | All Target Compounds    | 50 - 140   | 40 - 140  | 20        | 50       |
|               | Field Duplicate | All Target Compounds    |            |           | 50        | 100      |
| PCBs          | Surrogate       | All Surrogate Compounds | 30 - 150   | 30 - 150  |           |          |
|               | LCS             | All Target Analytes     | 50 - 140   | 70 - 130  |           |          |
|               | MS/MSD          | All Target Analytes     | 30 - 150   | 70 - 130  | 20        | 50       |
|               | Field Duplicate | All Target Analytes     |            |           | 50        | 100      |
| Inorganics    | LCS             | All Target Analytes     | 80 - 120   | 75 - 125  |           |          |
|               | MS/MSD          | All Target Analytes     | 75 - 125   | 75 - 125  | 20        | 50       |
|               | Lab Duplicate   | All Target Analytes     |            |           | 50        | 100      |
|               | Field Duplicate | All Target Analytes     |            |           | 50        | 100      |
| TOC           | LCS             | TOC                     | 60 - 140   | 60 - 140  |           |          |
|               | MS/MSD          | TOC                     | 60 - 140   | 60 - 140  | 20        | 50       |
|               | Lab Duplicate   | TOC                     |            |           | 50        | 100      |
|               | Field Duplicate | TOC                     |            |           | 50        | 100      |

Prepared/Date: CRR 05/05/09

Checked/Date: ECS 05/07/09

Notes:

LCS - Laboratory Control Sample

MS/MSD - Matrix Spike/ Matrix Spike Duplicate

RPD = Relative Percent Difference

%R = Percent Recovery

BN = base/neutral

TOC = Total Organic Carbon

**Table A-3  
Analytical Methods, Preservation, and Holding Time Requirements**

| Analyte       | Medium  | Reference Analytical Method | Preservative           | Holding Time           |
|---------------|---------|-----------------------------|------------------------|------------------------|
| PCBs          | Aqueous | SW-846 8082 / 3520          | 4°C                    | indefinite             |
| VOCs          | Aqueous | SW-846 8260B / 5030         | HCL, 4°C               | 14 days                |
| SVOCs         | Aqueous | SW-846 8270C / 3520         | 4°C                    | extract within 14 days |
| TAL Metals    | Aqueous | SW-846 6010B / 6020 / 7470A | HNO <sub>3</sub> ; 4°C | 6 months; 28 days Hg   |
| Total Cyanide | Aqueous | SW-846 9012B                | NaOH; 4°C              | 6 months               |
| Hardness      | Aqueous | SM2340                      | 4°C                    | 28 days                |
| PCBs          | Solid   | SW-846 8082 / 3540C         | 4°C                    | indefinite             |
| VOCs          | Solid   | SW-846 8260B / 5035         | water / methanol       | 14 days                |
| SVOCs         | Solid   | SW-846 8270C / 3550B        | 4°C                    | extract within 14 days |
| TAL Metals    | Solid   | SW-846 6010B / 6020 / 7471A | 4°C                    | 6 months; 28 days Hg   |
| TOC           | Solid   | Lloyd-Kahn                  | 4°C                    | 28 days                |

Notes

Number and type of containers to be determined during procurement of the analytical laboratory

PCBs = polychlorinated biphenyls

VOCs = volatile organic compounds

SVOCs = semi-volatile organic compounds

TOC = total organic carbon

HCL - hydrochloric acid

°C = degrees centigrade

**ATTACHMENT 1**

**LABORATORY DETECTION AND REPORTING LIMITS**

Test Code: 8260W\_OLM42  
 Test Number: SW8260B  
 Test Name: Volatile Organic Compounds by GC/MS  
 Matrix: Aqueous Units: µg/L

**METHOD DETECTION /  
 REPORTING LIMITS**

Updated: 29-Apr-09

| Type | Analyte                               | MDL  | PQL |
|------|---------------------------------------|------|-----|
| A    | (m+p)-Xylene                          | 0.2  | 1   |
| A    | 1,1,1-Trichloroethane                 | 0.1  | 0.5 |
| A    | 1,1,2,2-Tetrachloroethane             | 0.1  | 0.5 |
| A    | 1,1,2-Trichloro-1,2,2-trifluoroethane | 0.1  | 0.5 |
| A    | 1,1,2-Trichloroethane                 | 0.16 | 0.5 |
| A    | 1,1-Dichloroethane                    | 0.1  | 0.5 |
| A    | 1,1-Dichloroethene                    | 0.16 | 0.5 |
| A    | 1,2,3-Trichlorobenzene                | 0.1  | 1   |
| A    | 1,2,4-Trichlorobenzene                | 0.1  | 1   |
| A    | 1,2-Dibromo-3-chloropropane           | 1    | 5   |
| A    | 1,2-Dibromoethane                     | 0.16 | 0.5 |
| A    | 1,2-Dichlorobenzene                   | 0.1  | 0.5 |
| A    | 1,2-Dichloroethane                    | 0.16 | 0.5 |
| A    | 1,2-Dichloropropane                   | 0.16 | 0.5 |
| A    | 1,3-Dichlorobenzene                   | 0.1  | 0.5 |
| A    | 1,4-Dichlorobenzene                   | 0.16 | 0.5 |
| A    | 2-Butanone                            | 1    | 10  |
| A    | 2-Hexanone                            | 1    | 5   |
| A    | 4-Methyl-2-pentanone                  | 1    | 5   |
| A    | Acetone                               | 1    | 10  |
| A    | Benzene                               | 0.1  | 0.5 |
| A    | Bromodichloromethane                  | 0.1  | 0.5 |
| A    | Bromoform                             | 0.33 | 1   |
| A    | Bromomethane                          | 0.33 | 1   |
| A    | Carbon disulfide                      | 0.11 | 0.5 |
| A    | Carbon tetrachloride                  | 0.1  | 0.5 |
| A    | Chlorobenzene                         | 0.1  | 0.5 |
| A    | Chloroethane                          | 0.33 | 1   |
| A    | Chloroform                            | 0.1  | 0.5 |
| A    | Chloromethane                         | 0.33 | 1   |
| A    | cis-1,2-Dichloroethene                | 0.1  | 0.5 |
| A    | cis-1,3-Dichloropropene               | 0.16 | 0.5 |
| A    | Cyclohexane                           | 0.1  | 0.5 |
| A    | Dibromochloromethane                  | 0.1  | 0.5 |
| A    | Dichlorodifluoromethane               | 0.1  | 1   |
| A    | Ethylbenzene                          | 0.1  | 0.5 |
| A    | Isopropylbenzene                      | 0.1  | 0.5 |
| A    | Methyl acetate                        | 1    | 5   |
| A    | Methyl tert-butyl ether               | 0.16 | 1   |
| A    | Methylcyclohexane                     | 0.1  | 0.5 |
| A    | Methylene chloride                    | 0.16 | 2   |
| A    | o-Xylene                              | 0.1  | 0.5 |

**Test Code:** 8260W\_OLM42  
**Test Number:** SW8260B  
**Test Name:** Volatile Organic Compounds by GC/MS  
**Matrix:** Aqueous      **Units:** µg/L

**METHOD DETECTION /  
REPORTING LIMITS**

Updated: 20-Nov-08

| Type | Analyte                   | MDL  | PQL |
|------|---------------------------|------|-----|
| A    | Styrene                   | 0.1  | 0.5 |
| A    | Tetrachloroethene         | 0.1  | 0.5 |
| A    | Toluene                   | 0.1  | 0.5 |
| A    | trans-1,2-Dichloroethene  | 0.1  | 0.5 |
| A    | trans-1,3-Dichloropropene | 0.16 | 0.5 |
| A    | Trichloroethene           | 0.1  | 0.5 |
| A    | Trichlorofluoromethane    | 0.1  | 1   |
| A    | Vinyl chloride            | 0.33 | 1   |
| M    | Xylenes (total)           | 0.3  | 1   |
| S    | 1,2-Dichloroethane-d4     | 0.16 | 0.1 |
| S    | 4-Bromofluorobenzene      | 0.1  | 0.1 |
| S    | Toluene-d8                | 0.1  | 0.1 |

Test Code: 8260S\_OLM42  
 Test Number: SW8260B  
 Test Name: Volatile Organic Compounds by GC/MS  
 Matrix: Solid Units: µg/Kg

**METHOD DETECTION /  
 REPORTING LIMITS**

Updated: 29-Apr-09

| Type | Analyte                               | MDL | PQL |
|------|---------------------------------------|-----|-----|
| A    | (m+p)-Xylene                          | 1   | 5   |
| A    | 1,1,1-Trichloroethane                 | 1   | 2.5 |
| A    | 1,1,2,2-Tetrachloroethane             | 0.5 | 2.5 |
| A    | 1,1,2-Trichloro-1,2,2-trifluoroethane | 1   | 2.5 |
| A    | 1,1,2-Trichloroethane                 | 0.5 | 2.5 |
| A    | 1,1-Dichloroethane                    | 1   | 2.5 |
| A    | 1,1-Dichloroethene                    | 1   | 2.5 |
| A    | 1,2,3-Trichlorobenzene                | 0.5 | 2.5 |
| A    | 1,2,4-Trichlorobenzene                | 0.5 | 5   |
| A    | 1,2-Dibromo-3-chloropropane           | 1   | 5   |
| A    | 1,2-Dibromoethane                     | 0.5 | 2.5 |
| A    | 1,2-Dichlorobenzene                   | 0.5 | 2.5 |
| A    | 1,2-Dichloroethane                    | 1   | 2.5 |
| A    | 1,2-Dichloropropane                   | 1   | 2.5 |
| A    | 1,3-Dichlorobenzene                   | 0.5 | 2.5 |
| A    | 1,4-Dichlorobenzene                   | 0.5 | 2.5 |
| A    | 2-Butanone                            | 20  | 40  |
| A    | 2-Hexanone                            | 2   | 5   |
| A    | 4-Methyl-2-pentanone                  | 2   | 5   |
| A    | Acetone                               | 20  | 40  |
| A    | Benzene                               | 0.5 | 2.5 |
| A    | Bromodichloromethane                  | 1   | 2.5 |
| A    | Bromoform                             | 1   | 2.5 |
| A    | Bromomethane                          | 1.5 | 5   |
| A    | Carbon disulfide                      | 0.5 | 2.5 |
| A    | Carbon tetrachloride                  | 1   | 2.5 |
| A    | Chlorobenzene                         | 1   | 2.5 |
| A    | Chloroethane                          | 1.5 | 5   |
| A    | Chloroform                            | 0.5 | 2.5 |
| A    | Chloromethane                         | 0.5 | 5   |
| A    | cis-1,2-Dichloroethene                | 0.5 | 2.5 |
| A    | cis-1,3-Dichloropropene               | 0.5 | 2.5 |
| A    | Cyclohexane                           | 1   | 2.5 |
| A    | Dibromochloromethane                  | 0.5 | 2.5 |
| A    | Dichlorodifluoromethane               | 1   | 5   |
| A    | Ethylbenzene                          | 0.5 | 2.5 |
| A    | Isopropylbenzene                      | 0.5 | 2.5 |
| A    | Methyl acetate                        | 10  | 20  |
| A    | Methyl tert-butyl ether               | 0.5 | 2.5 |
| A    | Methylcyclohexane                     | 1   | 2.5 |
| A    | Methylene chloride                    | 0.5 | 5   |
| A    | o-Xylene                              | 0.5 | 2.5 |

Test Code: 8260S\_OLM42  
 Test Number: SW8260B  
 Test Name: Volatile Organic Compounds by GC/MS  
 Matrix: Solid Units: µg/Kg

**METHOD DETECTION /  
 REPORTING LIMITS**

Updated: 29-Apr-08

| Type | Analyte                   | MDL | PQL |
|------|---------------------------|-----|-----|
| A    | Styrene                   | 0.5 | 2.5 |
| A    | Tetrachloroethene         | 1   | 2.5 |
| A    | Toluene                   | 0.5 | 2.5 |
| A    | trans-1,2-Dichloroethene  | 0.5 | 2.5 |
| A    | trans-1,3-Dichloropropene | 0.5 | 2.5 |
| A    | Trichloroethene           | 1   | 2.5 |
| A    | Trichlorofluoromethane    | 1   | 5   |
| A    | Vinyl chloride            | 1   | 5   |
| M    | Xylenes (total)           | 1.5 | 5   |
| S    | 1,2-Dichloroethane-d4     | 0.5 | 0.1 |
| S    | 4-Bromofluorobenzene      | 0.5 | 0.1 |
| S    | Toluene-d8                | 0.5 | 0.1 |

Test Code: 8260SM\_OLM42  
 Test Number: SW8260B  
 Test Name: Volatile Organic Compounds by GC/MS-MED  
 Matrix: Solid Units: µg/Kg

**METHOD DETECTION /  
 REPORTING LIMITS**

Updated: 29-Apr-09

| Type | Analyte                               | MDL  | PQL  |
|------|---------------------------------------|------|------|
| A    | (m+p)-Xylene                          | 100  | 500  |
| A    | 1,1,1-Trichloroethane                 | 100  | 250  |
| A    | 1,1,2,2-Tetrachloroethane             | 50   | 250  |
| A    | 1,1,2-Trichloro-1,2,2-trifluoroethane | 100  | 250  |
| A    | 1,1,2-Trichloroethane                 | 50   | 250  |
| A    | 1,1-Dichloroethane                    | 100  | 250  |
| A    | 1,1-Dichloroethene                    | 100  | 250  |
| A    | 1,2,3-Trichlorobenzene                | 50   | 500  |
| A    | 1,2,4-Trichlorobenzene                | 50   | 500  |
| A    | 1,2-Dibromo-3-chloropropane           | 100  | 500  |
| A    | 1,2-Dibromoethane                     | 50   | 250  |
| A    | 1,2-Dichlorobenzene                   | 50   | 250  |
| A    | 1,2-Dichloroethane                    | 100  | 250  |
| A    | 1,2-Dichloropropane                   | 100  | 250  |
| A    | 1,3-Dichlorobenzene                   | 50   | 250  |
| A    | 1,4-Dichlorobenzene                   | 50   | 250  |
| A    | 2-Butanone                            | 2000 | 4000 |
| A    | 2-Hexanone                            | 200  | 500  |
| A    | 4-Methyl-2-pentanone                  | 200  | 500  |
| A    | Acetone                               | 2000 | 4000 |
| A    | Benzene                               | 50   | 250  |
| A    | Bromodichloromethane                  | 100  | 250  |
| A    | Bromoform                             | 100  | 250  |
| A    | Bromomethane                          | 150  | 500  |
| A    | Carbon disulfide                      | 50   | 250  |
| A    | Carbon tetrachloride                  | 100  | 250  |
| A    | Chlorobenzene                         | 100  | 250  |
| A    | Chloroethane                          | 150  | 500  |
| A    | Chloroform                            | 50   | 250  |
| A    | Chloromethane                         | 50   | 500  |
| A    | cis-1,2-Dichloroethene                | 50   | 250  |
| A    | cis-1,3-Dichloropropene               | 50   | 250  |
| A    | Cyclohexane                           | 100  | 250  |
| A    | Dibromochloromethane                  | 50   | 250  |
| A    | Dichlorodifluoromethane               | 100  | 500  |
| A    | Ethylbenzene                          | 50   | 250  |
| A    | Isopropylbenzene                      | 50   | 250  |
| A    | Methyl acetate                        | 1000 | 2000 |
| A    | Methyl tert-butyl ether               | 50   | 250  |
| A    | Methylcyclohexane                     | 100  | 250  |
| A    | Methylene chloride                    | 50   | 500  |
| A    | o-Xylene                              | 50   | 250  |

**Test Code:** 8260SM\_OLM42  
**Test Number:** SW8260B  
**Test Name:** Volatile Organic Compounds by GC/MS-MED  
**Matrix:** Solid                      **Units:** µg/Kg

**METHOD DETECTION /  
REPORTING LIMITS**

**Updated:** 30-Apr-08

| Type | Analyte                   | MDL | PQL |
|------|---------------------------|-----|-----|
| A    | Styrene                   | 50  | 250 |
| A    | Tetrachloroethene         | 100 | 250 |
| A    | Toluene                   | 50  | 250 |
| A    | trans-1,2-Dichloroethene  | 50  | 250 |
| A    | trans-1,3-Dichloropropene | 50  | 250 |
| A    | Trichloroethene           | 100 | 250 |
| A    | Trichlorofluoromethane    | 100 | 500 |
| A    | Vinyl chloride            | 100 | 500 |
| M    | Xylenes (total)           | 150 | 500 |
| S    | 1,2-Dichloroethane-d4     | 50  | 50  |
| S    | 4-Bromofluorobenzene      | 50  | 50  |
| S    | Toluene-d8                | 50  | 50  |

Test Code: 8270W\_SOM11  
 Test Number: SW8270C  
 Test Name: Semivolatile Organic Compounds by GC/MS  
 Matrix: Aqueous Units: µg/L

**METHOD DETECTION /  
 REPORTING LIMITS**

Updated:

| Type | Analyte                     | MDL | PQL |
|------|-----------------------------|-----|-----|
| A    | 1,1'-Biphenyl               | 0.4 | 5   |
| A    | 1,2,4,5-Tetrachlorobenzene  | 10  | 5   |
| A    | 1,4-Dioxane                 | 0.4 | 5   |
| A    | 2,3,4,6-Tetrachlorophenol   | 10  | 5   |
| A    | 2,4,5-Trichlorophenol       | 0.4 | 10  |
| A    | 2,4,6-Trichlorophenol       | 0.4 | 5   |
| A    | 2,4-Dichlorophenol          | 0.4 | 5   |
| A    | 2,4-Dimethylphenol          | 0.4 | 5   |
| A    | 2,4-Dinitrophenol           | 10  | 50  |
| A    | 2,4-Dinitrotoluene          | 0.4 | 5   |
| A    | 2,6-Dinitrotoluene          | 0.4 | 5   |
| A    | 2-Chloronaphthalene         | 0.4 | 5   |
| A    | 2-Chlorophenol              | 0.4 | 5   |
| A    | 2-Methylnaphthalene         | 0.4 | 5   |
| A    | 2-Methylphenol              | 0.4 | 5   |
| A    | 2-Nitroaniline              | 0.4 | 10  |
| A    | 2-Nitrophenol               | 0.4 | 5   |
| A    | 3,3'-Dichlorobenzidine      | 0.4 | 5   |
| A    | 3-Nitroaniline              | 0.4 | 10  |
| A    | 4,6-Dinitro-2-methylphenol  | 5   | 50  |
| A    | 4-Bromophenyl phenyl ether  | 0.4 | 5   |
| A    | 4-Chloro-3-methylphenol     | 0.4 | 5   |
| A    | 4-Chloroaniline             | 0.4 | 5   |
| A    | 4-Chlorophenyl phenyl ether | 0.4 | 5   |
| A    | 4-Methylphenol              | 0.4 | 5   |
| A    | 4-Nitroaniline              | 2   | 10  |
| A    | 4-Nitrophenol               | 5   | 50  |
| A    | Acenaphthene                | 0.4 | 5   |
| A    | Acenaphthylene              | 0.4 | 5   |
| A    | Acetophenone                | 0.4 | 5   |
| A    | Anthracene                  | 0.4 | 5   |
| A    | Atrazine                    | 0.4 | 5   |
| A    | Benzaldehyde                | 0.4 | 5   |
| A    | Benzo[a]anthracene          | 0.4 | 5   |
| A    | Benzo[a]pyrene              | 0.4 | 5   |
| A    | Benzo[b]fluoranthene        | 0.4 | 5   |
| A    | Benzo[g,h,i]perylene        | 0.4 | 5   |
| A    | Benzo[k]fluoranthene        | 0.4 | 5   |
| A    | bis(2-Chloroethoxy)methane  | 0.4 | 5   |
| A    | bis(2-chloroethyl)ether     | 0.4 | 5   |
| A    | bis(2-chloroisopropyl)ether | 0.4 | 5   |
| A    | bis(2-Ethylhexyl)phthalate  | 0.4 | 5   |

Test Code: 8270W\_SOM11  
 Test Number: SW8270C  
 Test Name: Semivolatile Organic Compounds by GC/MS  
 Matrix: Aqueous Units: µg/L

**METHOD DETECTION /  
 REPORTING LIMITS**

Updated:

| Type | Analyte                    | MDL | PQL |
|------|----------------------------|-----|-----|
| A    | Butyl benzyl phthalate     | 0.4 | 5   |
| A    | Caprolactam                | 0.4 | 5   |
| A    | Carbazole                  | 0.4 | 5   |
| A    | Chrysene                   | 0.4 | 5   |
| A    | Di-n-butyl phthalate       | 0.4 | 5   |
| A    | Di-n-octyl phthalate       | 0.4 | 5   |
| A    | Dibenz[a,h]anthracene      | 0.4 | 5   |
| A    | Dibenzofuran               | 0.4 | 5   |
| A    | Diethyl phthalate          | 0.4 | 5   |
| A    | Dimethyl phthalate         | 0.4 | 5   |
| A    | Fluoranthene               | 0.4 | 5   |
| A    | Fluorene                   | 0.4 | 5   |
| A    | Hexachlorobenzene          | 0.4 | 5   |
| A    | Hexachlorobutadiene        | 0.4 | 5   |
| A    | Hexachlorocyclopentadiene  | 20  | 50  |
| A    | Hexachloroethane           | 0.4 | 5   |
| A    | Indeno[1,2,3-cd]pyrene     | 0.4 | 5   |
| A    | Isophorone                 | 0.4 | 5   |
| A    | N-Nitroso-di-n-propylamine | 0.4 | 5   |
| A    | N-Nitrosodiphenylamine     | 0.4 | 5   |
| A    | Naphthalene                | 0.4 | 5   |
| A    | Nitrobenzene               | 0.4 | 5   |
| A    | Pentachlorophenol          | 10  | 50  |
| A    | Phenanthrene               | 0.4 | 5   |
| A    | Phenol                     | 0.4 | 5   |
| A    | Pyrene                     | 0.4 | 5   |
| S    | 2,4,6-Tribromophenol       | 0.4 | 0.1 |
| S    | 2-Fluorobiphenyl           | 0.4 | 0.1 |
| S    | 2-Fluorophenol             | 0.4 | 0.1 |
| S    | Nitrobenzene-d5            | 0.4 | 0.1 |
| S    | Phenol-d5                  | 0.4 | 0.1 |
| S    | Terphenyl-d14              | 0.4 | 0.1 |

Test Code: 8270S\_SOM11  
 Test Number: SW8270C  
 Test Name: Semivolatile Organic Compounds by GC/MS  
 Matrix: Solid Units: µg/Kg

**METHOD DETECTION /  
 REPORTING LIMITS**

Updated:

| Type | Analyte                     | MDL  | PQL  |
|------|-----------------------------|------|------|
| A    | 1,1'-Biphenyl               | 13.3 | 170  |
| A    | 1,2,4,5-Tetrachlorobenzene  | 13.3 | 170  |
| A    | 1,4-Dioxane                 | 16   | 170  |
| A    | 2,3,4,6-Tetrachlorophenol   | 330  | 170  |
| A    | 2,4,5-Trichlorophenol       | 13.3 | 330  |
| A    | 2,4,6-Trichlorophenol       | 40   | 170  |
| A    | 2,4-Dichlorophenol          | 13.3 | 170  |
| A    | 2,4-Dimethylphenol          | 66.7 | 170  |
| A    | 2,4-Dinitrophenol           | 333  | 1700 |
| A    | 2,4-Dinitrotoluene          | 13.3 | 170  |
| A    | 2,6-Dinitrotoluene          | 13.3 | 170  |
| A    | 2-Chloronaphthalene         | 13.3 | 170  |
| A    | 2-Chlorophenol              | 13.3 | 170  |
| A    | 2-Methylnaphthalene         | 13.3 | 170  |
| A    | 2-Methylphenol              | 40   | 170  |
| A    | 2-Nitroaniline              | 13.3 | 330  |
| A    | 2-Nitrophenol               | 13.3 | 170  |
| A    | 3,3'-Dichlorobenzidine      | 13.3 | 170  |
| A    | 3-Nitroaniline              | 40   | 330  |
| A    | 4,6-Dinitro-2-methylphenol  | 167  | 1700 |
| A    | 4-Bromophenyl phenyl ether  | 13.3 | 170  |
| A    | 4-Chloro-3-methylphenol     | 13.3 | 170  |
| A    | 4-Chloroaniline             | 13.3 | 170  |
| A    | 4-Chlorophenyl phenyl ether | 13.3 | 170  |
| A    | 4-Methylphenol              | 40   | 170  |
| A    | 4-Nitroaniline              | 40   | 330  |
| A    | 4-Nitrophenol               | 66.7 | 1700 |
| A    | Acenaphthene                | 13.3 | 170  |
| A    | Acenaphthylene              | 13.3 | 170  |
| A    | Acetophenone                | 13.3 | 170  |
| A    | Anthracene                  | 13.3 | 170  |
| A    | Atrazine                    | 13.3 | 170  |
| A    | Benzaldehyde                | 13.3 | 170  |
| A    | Benzo[a]anthracene          | 13.3 | 170  |
| A    | Benzo[a]pyrene              | 13.3 | 170  |
| A    | Benzo[b]fluoranthene        | 13.3 | 170  |
| A    | Benzo[g,h,i]perylene        | 13.3 | 170  |
| A    | Benzo[k]fluoranthene        | 13.3 | 170  |
| A    | bis(2-Chloroethoxy)methane  | 13.3 | 170  |
| A    | bis(2-chloroethyl)ether     | 13.3 | 170  |
| A    | bis(2-chloroisopropyl)ether | 13.3 | 170  |
| A    | bis(2-Ethylhexyl)phthalate  | 13.3 | 170  |

Test Code: 8270S\_SOM11  
 Test Number: SW8270C  
 Test Name: Semivolatile Organic Compounds by GC/MS  
 Matrix: Solid Units: µg/Kg

**METHOD DETECTION /  
 REPORTING LIMITS**

Updated:

| Type | Analyte                    | MDL  | PQL  |
|------|----------------------------|------|------|
| A    | Butyl benzyl phthalate     | 13.3 | 170  |
| A    | Caprolactam                | 13.3 | 170  |
| A    | Carbazole                  | 13.3 | 170  |
| A    | Chrysene                   | 13.3 | 170  |
| A    | Di-n-butyl phthalate       | 13.3 | 170  |
| A    | Di-n-octyl phthalate       | 13.3 | 170  |
| A    | Dibenz[a,h]anthracene      | 13.3 | 170  |
| A    | Dibenzofuran               | 13.3 | 170  |
| A    | Diethyl phthalate          | 13.3 | 170  |
| A    | Dimethyl phthalate         | 13.3 | 170  |
| A    | Fluoranthene               | 13.3 | 170  |
| A    | Fluorene                   | 13.3 | 170  |
| A    | Hexachlorobenzene          | 13.3 | 170  |
| A    | Hexachlorobutadiene        | 13.3 | 170  |
| A    | Hexachlorocyclopentadiene  | 660  | 1700 |
| A    | Hexachloroethane           | 13.3 | 170  |
| A    | Indeno[1,2,3-cd]pyrene     | 13.3 | 170  |
| A    | Isophorone                 | 13.3 | 170  |
| A    | N-Nitroso-di-n-propylamine | 13.3 | 170  |
| A    | N-Nitrosodiphenylamine     | 13.3 | 170  |
| A    | Naphthalene                | 13.3 | 170  |
| A    | Nitrobenzene               | 13.3 | 170  |
| A    | Pentachlorophenol          | 660  | 1700 |
| A    | Phenanthrene               | 13.3 | 170  |
| A    | Phenol                     | 13.3 | 170  |
| A    | Pyrene                     | 13.3 | 170  |
| S    | 2,4,6-Tribromophenol       | 13.3 | 0    |
| S    | 2-Fluorobiphenyl           | 13.3 | 0    |
| S    | 2-Fluorophenol             | 13.3 | 0    |
| S    | Nitrobenzene-d5            | 13.3 | 0    |
| S    | Phenol-d5                  | 13.3 | 0    |
| S    | Terphenyl-d14              | 13.3 | 0    |

Test Code: 8082W  
Test Number: SW8082  
Test Name: Polychlorinated Biphenyls in Water by GC/ECD  
Matrix: Aqueous Units: µg/L

**METHOD DETECTION /  
REPORTING LIMITS**

Updated: 05-Jun-06

| Type | Analyte              | MDL    | PQL |
|------|----------------------|--------|-----|
| A    | Aroclor 1016         | 0.0147 | 0.5 |
| A    | Aroclor 1221         | 0.1096 | 0.5 |
| A    | Aroclor 1232         | 0.0617 | 0.5 |
| A    | Aroclor 1242         | 0.082  | 0.5 |
| A    | Aroclor 1248         | 0.1285 | 0.5 |
| A    | Aroclor 1254         | 0.1395 | 0.5 |
| A    | Aroclor 1260         | 0.0163 | 0.5 |
| A    | Aroclor 1262         | 0.0159 | 0.5 |
| A    | Aroclor 1268         | 0.0068 | 0.5 |
| S    | Decachlorobiphenyl   | 0      | 0   |
| S    | Tetrachloro-m-xylene | 0      | 0   |

Test Code: 8082S  
Test Number: SW8082  
Test Name: Polychlorinated Biphenyls by GC/ECD  
Matrix: Solid Units: mg/Kg

**METHOD DETECTION /  
REPORTING LIMITS**

Updated: 16-Feb-06

| Type | Analyte              | MDL     | PQL   |
|------|----------------------|---------|-------|
| A    | Aroclor 1016         | 0.00219 | 0.017 |
| A    | Aroclor 1221         | 0.00222 | 0.017 |
| A    | Aroclor 1232         | 0.00135 | 0.017 |
| A    | Aroclor 1242         | 0.00183 | 0.017 |
| A    | Aroclor 1248         | 0.00357 | 0.017 |
| A    | Aroclor 1254         | 0.00474 | 0.017 |
| A    | Aroclor 1260         | 0.002   | 0.017 |
| A    | Aroclor 1262         | 0.00152 | 0.017 |
| A    | Aroclor 1268         | 0.00294 | 0.017 |
| S    | Decachlorobiphenyl   | 0       | 0     |
| S    | Tetrachloro-m-xylene | 0       | 0     |

Test Code: 6010S  
 Test Number: SW6010B  
 Test Name: Total Metals by ICP  
 Matrix: Soil Units: mg/Kg

**METHOD DETECTION /  
 REPORTING LIMITS**

Updated: 03-Jan-07

| Type | Analyte    | MDL  | PQL |
|------|------------|------|-----|
| A    | Aluminum   | 6    | 10  |
| A    | Antimony   | 0.45 | 6   |
| A    | Arsenic    | 0.4  | 1   |
| A    | Barium     | 0.1  | 10  |
| A    | Beryllium  | 0.02 | 1   |
| A    | Boron      | 0.5  | 5   |
| A    | Cadmium    | 0.1  | 1   |
| A    | Calcium    | 4    | 100 |
| A    | Chromium   | 0.4  | 1   |
| A    | Cobalt     | 0.4  | 5   |
| A    | Copper     | 0.2  | 1   |
| A    | Iron       | 1    | 5   |
| A    | Lead       | 0.4  | 1   |
| A    | Magnesium  | 2    | 100 |
| A    | Manganese  | 0.05 | 5   |
| A    | Molybdenum | 0.5  | 5   |
| A    | Nickel     | 0.2  | 5   |
| A    | Potassium  | 20   | 500 |
| A    | Selenium   | 0.5  | 1   |
| A    | Silver     | 0.2  | 1   |
| A    | Sodium     | 4    | 100 |
| A    | Strontium  | 0.05 | 5   |
| A    | Thallium   | 1    | 2   |
| A    | Tin        | 1    | 5   |
| A    | Titanium   | 0.2  | 5   |
| A    | Vanadium   | 0.2  | 5   |
| A    | Zinc       | 0.4  | 2   |

**Test Code:** 6010W10

**Test Number:** SW6010B

**Test Name:** Total Metals by ICP

**Matrix:** Aqueous **Units:** mg/L

**METHOD DETECTION /  
REPORTING LIMITS**

Updated: 04-Jan-06

| Type | Analyte    | MDL    | PQL  |
|------|------------|--------|------|
| A    | Aluminum   | 0.04   | 0.1  |
| A    | Antimony   | 0.003  | 0.06 |
| A    | Arsenic    | 0.004  | 0.01 |
| A    | Barium     | 0.002  | 0.1  |
| A    | Beryllium  | 0.0002 | 0.01 |
| A    | Boron      | 0.005  | 0.05 |
| A    | Cadmium    | 0.001  | 0.01 |
| A    | Calcium    | 0.04   | 1    |
| A    | Chromium   | 0.004  | 0.01 |
| A    | Cobalt     | 0.004  | 0.05 |
| A    | Copper     | 0.004  | 0.01 |
| A    | Iron       | 0.01   | 0.05 |
| A    | Lead       | 0.004  | 0.01 |
| A    | Magnesium  | 0.04   | 1    |
| A    | Manganese  | 0.001  | 0.05 |
| A    | Molybdenum | 0.005  | 0.05 |
| A    | Nickel     | 0.002  | 0.05 |
| A    | Potassium  | 0.2    | 5    |
| A    | Selenium   | 0.005  | 0.01 |
| A    | Silver     | 0.002  | 0.01 |
| A    | Sodium     | 0.04   | 1    |
| A    | Strontium  | 0.0005 | 0.05 |
| A    | Thallium   | 0.01   | 0.02 |
| A    | Tin        | 0.01   | 0.05 |
| A    | Titanium   | 0.002  | 0.05 |
| A    | Vanadium   | 0.002  | 0.05 |
| A    | Zinc       | 0.004  | 0.02 |

**ATTACHMENT 2**

**FIELD FORMS**

**FIELD DATA RECORD - SEDIMENT SAMPLING**

PROJECT **OLD CHENANGO CANAL - UTICA, NY** JOB NUMBER **3613083073** DATE \_\_\_\_\_

FIELD SAMPLE ID \_\_\_\_\_ ACTIVITY TIME START \_\_\_\_\_ END \_\_\_\_\_ Sample Time \_\_\_\_\_

QC SAMPLES COLLECTED \_\_\_\_\_

**SEDIMENT DATA**

DEPTH OF SEDIMENT \_\_\_\_\_

TYPE OF SAMPLE  DISCRETE  COMPOSITE

TYPE OF SEDIMENT:  ORGANIC  SAND  GRAVEL  CLAY  TALCOSE  OTHER \_\_\_\_\_

EQUIPMENT FOR COLLECTION:  HAND CORER  S.S. SPOON  Shovel-Trowel  DREDGE  OTHER \_\_\_\_\_

DECON FLUIDS USED:  DI WATER  POTABLE WATER  LIQUINOX  OTHER \_\_\_\_\_

SAMPLE OBSERVATIONS  
 ODOR \_\_\_\_\_  
 COLOR \_\_\_\_\_

Associated field Dup \_\_\_\_\_ Equip BLK \_\_\_\_\_ MS/MSD: Yes

**ANALYTICAL PARAMETERS**

| SEDIMENT                            | METHOD NUMBER        | PRESERVATION METHOD | VOLUME REQUIRED            | Notes: |
|-------------------------------------|----------------------|---------------------|----------------------------|--------|
| <input type="checkbox"/> PCBS       | 8082 / 3540C         | 4° c                | 1 4 oz                     |        |
| <input type="checkbox"/> VOC        | 8260b / 5035         | DI and MEOH         | 2-low (DI) & 1-high (MEOH) |        |
| <input type="checkbox"/> SVOC       | 8270C / 3550B        | 4° c                | 1 8 oz                     |        |
| <input type="checkbox"/> TAL METALS | 6010B / 6020 / 7470A | 4° c                | 1 8 oz                     |        |
| <input type="checkbox"/> TOC        | 9060A                | 4° c                | 1 4 oz                     |        |
| <input type="checkbox"/> _____      | _____                | _____               | _____                      |        |
| <input type="checkbox"/> _____      | _____                | _____               | _____                      |        |
| <input type="checkbox"/> _____      | _____                | _____               | _____                      |        |

**NOTES** (characterize sediment and note % excluded [e.g. rocks], sketch bottom profile and sample location, water depth, other pertinent information)

SAMPLER SIGNATURE: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

**FIELD DATA RECORD - SURFACE SOIL SAMPLING**

PROJECT  JOB NUMBER  DATE

SAMPLE LOCATION  ACTIVITY TIME START  END  SAMPLE TIME

FIELD SAMPLE NUMBER  QC SAMPLES: duplicate \_\_\_\_\_ EQ BLK \_\_\_\_\_ MS/MSD: yes no

**SURFACE SOIL DATA**

TOP DEPTH: \_\_\_\_\_ BOTTOM \_\_\_\_\_ TYPE OF SOIL: \_\_\_\_\_ EQUIPMENT FOR COLLECTOR/DECON FLUIDS USED \_\_\_\_\_

TYPE  DISCRETE  ORGANIC  HAND CORER  DI WATER N2 PURGE  
 COMPOSITE  SAND  S.S. SPOON  POTABLE WATER

SAMPLE OBSERVATIONS  GRAVEL  ALUMINIUM PAN  LIQUINOX  
 ODOR \_\_\_\_\_  CLAY  SHOVEL-SPATULA  OTHER \_\_\_\_\_  
 COLOR \_\_\_\_\_  OTHER \_\_\_\_\_

**ANALYTICAL PARAMETERS**

| SOIL                                | METHOD NUMBER    | PRESERVATION METHOD | VOLUME         | Notes: |
|-------------------------------------|------------------|---------------------|----------------|--------|
| <input type="checkbox"/> VOC        | 8260B / 5030     | DI and MEOH         | 2-low & 1-high |        |
| <input type="checkbox"/> SVOC       | 8270C / 3520     | 4° C                |                |        |
| <input type="checkbox"/> PCBs       | 8082 / 3520      | 4° C                |                |        |
| <input type="checkbox"/> TAL METALS | 6010B/6020/7470A | 4° C                |                |        |
| <input type="checkbox"/> Cn, total  | 9012B            | 4° C                |                |        |
| <input type="checkbox"/>            |                  | 4° C                |                |        |
| <input type="checkbox"/>            |                  |                     |                |        |
| <input type="checkbox"/>            |                  |                     |                |        |
| <input type="checkbox"/>            |                  |                     |                |        |

**NOTES** (characterize soil, sketch location, part of transect?, measured distance from stream center, other pertinent information)

SAMPLED BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_





# FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT OLD CHENANGO CANAL - UTICA, NY      DATE        TIME  

CREW ID OR TASK ID        JOB NUMBER 3613083073

SAMPLER SIGNATURE \_\_\_\_\_ CHECKED BY \_\_\_\_\_

| EQUIPMENT CALIBRATION                       | INITIAL CALIBRATION |                | SECONDARY CALIBRATION (see note 3) |                |                                |
|---|---------------------|----------------|------------------------------------|----------------|--------------------------------|
| MANF & MODEL NO. _____<br>UNIT ID NO. _____ | STANDARD<br>VALUE   | METER<br>VALUE | STANDARD<br>VALUE                  | METER<br>VALUE | ACCEPTANCE<br>CRITERIA **      |
| pH      units                               | _____               | _____          | _____                              | _____          | +/- 10% of standard            |
| Redox      +/- mV                           | _____               | _____          | _____                              | _____          | see note 1                     |
| Conductivity      mS/cm                     | _____               | _____          | _____                              | _____          | +/- 10% of standard            |
| DO      mg/L *                              | _____               | _____          | _____                              | _____          | +/- 10% of standard            |
| Thermometer Temperature      deg. C         | _____               | _____          | _____                              | _____          | +/- 2.0 deg. C                 |
| <b>TURBIDITY</b>                            |                     |                |                                    |                |                                |
| METER TYPE _____      NTU (low)             | _____               | _____          | _____                              | _____          | within 0.5 NTU of the standard |
| MODEL NO. _____                             | _____               | _____          | _____                              | _____          |                                |
| UNIT ID NO. _____      NTU (high)           | _____               | _____          | _____                              | _____          | +/- 10% of standard            |
| <b>PHOTOIONIZATION</b>                      |                     |                |                                    |                |                                |
| METER TYPE _____      Background<br>ppmv    | _____               | _____          | _____                              | _____          | within 5 ppmv of Zero          |
| MODEL NO. _____                             | _____               | _____          | _____                              | _____          |                                |
| UNIT ID NO. _____      Span Gas<br>ppmv     | _____               | _____          | _____                              | _____          | +/- 10% of standard            |
| <b>OTHER METER TYPE _____</b>               |                     |                |                                    |                |                                |
| MODEL NO. _____                             | _____               | _____          | _____                              | _____          |                                |
| UNIT ID NO. _____                           | _____               | _____          | _____                              | _____          | see note 2                     |

**Check One**

- Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.
- Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above (see notes below).

**MATERIALS RECORD**

Source and Lot Number

|                               |                    |
|-------------------------------|--------------------|
| Deionized Water Source: _____ | pH _____           |
| PID SPAN Gas: Lot _____       | ORP _____          |
| PID Zero Gas: Lot _____       | Conductivity _____ |
| Other : _____                 | Turbidity _____    |
|                               | Other _____        |

**NOTES:**

\* = Indicate in notes section what was used as the DO standard (i.e., based on saturation at room temperature)

\*\* = If the meter reading is not within acceptance criteria, clean or replace probe and re-calibrate, or use a different meter if available. If project requirements necessitate use of the instrument, clearly document on all data sheets and log book entries that the parameter was not calibrated to the acceptance criteria.

1 = meter must read within specified range of the Zobell solution.

2 = specify acceptance criteria in the Notes section

3 = secondary calibration to be completed should instrument drift be suspected during field day

**APPENDIX B**

**NYSDOH COMMUNITY AIR MONITORING PLAN**

## APPENDIX 1A

### New York State Department of Health Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

#### Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

**Continuous monitoring** will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

**Periodic monitoring** for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

### **VOC Monitoring, Response Levels, and Actions**

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

### **Particulate Monitoring, Response Levels, and Actions**

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter ( $\text{mcg}/\text{m}^3$ ) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed  $150 \text{ mcg}/\text{m}^3$  above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than  $150 \text{ mcg}/\text{m}^3$  above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within  $150 \text{ mcg}/\text{m}^3$  of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.