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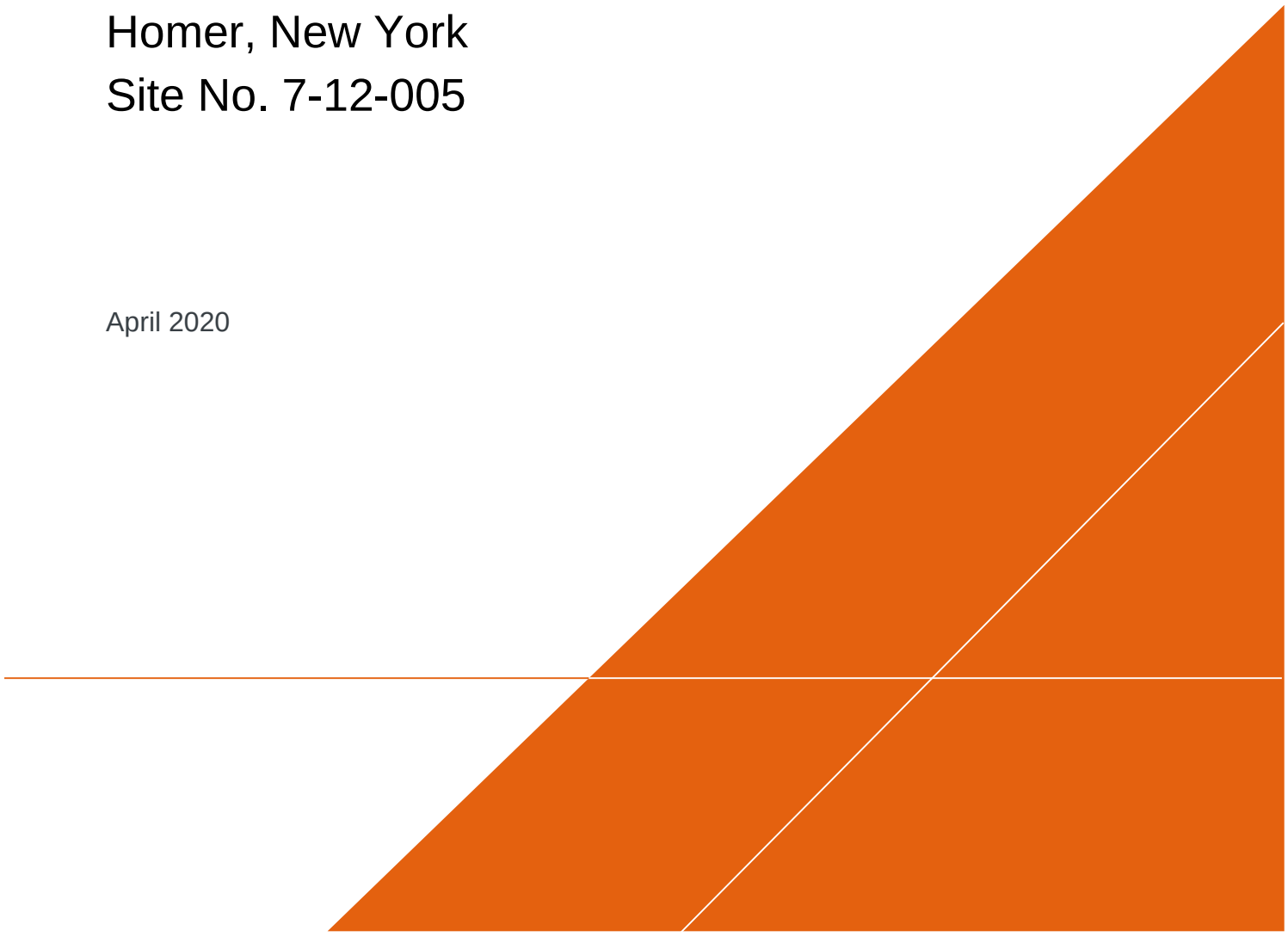
NYSEG

REMEDIAL DESIGN REPORT

Cortland-Homer Former MGP Site
Operable Unit No. 2
Homer, New York
Site No. 7-12-005

April 2020



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CERTIFICATION

I, Mark O. Gravelding, certify that I am currently a New York State registered Professional Engineer and that this *Remedial Design Report* was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER *Technical Guidance for Site Investigation and Remediation* (DER-10).

Mark O. Gravelding, P.E. Date

Senior Vice President

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Appendix B. Technical Specifications

Appendix C. Community Air Monitoring Plan

Appendix D. Community and Environmental Response Plan

Appendix E. Contingency Plan

Appendix F. Storm Water Pollution Prevention Plan

Appendix G. Preliminary Monitoring and Maintenance Plan

ATTACHMENTS

Attachment 1. Temporary Railroad Crossing Design

Attachment 2. 2016 Pre-Design Investigation Summary Report (Provided Electronically)

Attachment 3. 2019 Pre-Design Investigation Summary Report (Provided Electronically)

Attachment 4. 2019 Supplemental Pre-Design Investigation Summary

Attachment 5. Hydraulic Assessment Report

ACRONYMS AND ABBREVIATIONS

ARMSCO	Amended and Restated Multi-Site Order on Consent
BMP	best management practices
BOL	bill of lading
bgs	below ground surface
bss	below sediment surface
CAMP	Community Air Monitoring Plan
CERP	Community and Environmental Response Plan
CCR	Construction Completion Report
CFR	Code of Federal Regulations
cfs	cubic feet per second
CP	Contingency Plan
CPP	Citizen Participation Plan
cy	cubic yards
DBH	diameter at breast height
DEM	digital elevation model
DER	Division of Environmental Remediation
DNAPL	dense non-aqueous phase liquid
EC	engineering control
FDP	Floodplain Development Permit
FEMA	Federal Emergency Management Agency
FER	Final Engineering Report
HASP	Health and Safety Plan
HEC-RAS	Hydrologic Engineering Center's River Analysis System
IC	institutional control
ISS	in-situ soil solidification
JAP	Joint Application for Permit
LIDAR	light detection and ranging
LNAPL	light non-aqueous phase liquid
LTTD	low-temperature thermal desorption

mg/kg	milligram per kilogram
MGP	manufactured gas plant
MHWL	mean high-water line
MMP	Monitoring and Maintenance Plan
NAPL	non-aqueous phase liquid
NLEB	northern long-eared bat
NTU	nephelometric turbidity units
NWP #38	Nationwide Permit #38
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
NYSEG	New York State Electric & Gas Corporation
NYSW	New York, Susquehanna and Western Railway
OHWM	ordinary high-water mark
OU	Operable Unit
PAH	polycyclic aromatic hydrocarbon
PDI	Pre-Design Investigation
POP	Project Operation Plan
RAO	remedial action objective
RDWP	Remedial Design Work Plan
ROD	Record of Decision
RS	river station
SMP	Site Management Plan
SRI	Supplemental Remedial Investigation
SWPPP	Stormwater Pollution Prevention Plan
SPDES	State Pollutant Discharge Elimination System
TBD	to be determined
TWTS	temporary water treatment system
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

USGS	United States Geological Survey
WQC	Water Quality Certification

1 INTRODUCTION

This Remedial Design Report (Remedial Design) has been prepared to support the implementation of the New York State Department of Environmental Conservation- (NYSDEC-) selected remedy for Operable Unit No. 2 (OU-2) of the New York State Electric & Gas Corporation (NYSEG) Cortland-Homer Former Manufactured Gas Plant (MGP) Site (the Site) located in Homer, New York (NYSDEC Site No. 7-12-005). The NYSDEC-selected remedy is presented in the March 2005 Record of Decision for OU-2 (OU-2 ROD; NYSDEC 2005).

NYSEG has an Amended and Restated Multi-Site Order on Consent (ARMSCO) (#DO-0002-9309) with the NYSDEC (NYSDEC 2016b) to investigate and, where necessary, remediate 36 former MGP sites in New York State. The Cortland-Homer former MGP site (Site No. 7-12-005) is included on this list of 36 sites. Section VI of the ARMSCO requires NYSEG to submit a remedial design to the NYSDEC to facilitate implementation of the selected remedy. This Remedial Design has been prepared in accordance with the following documents:

- March 2005 ROD.
- December 2016 ARMSCO amended from the March 1994 Order on Consent (Index Number D0-0002-9309) between NYSEG and the NYSDEC.
- NYSDEC Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10; NYSDEC 2010b).
- Applicable provisions of the New York State Environmental Conservation Law and associated regulations, including Title 6 of the New York Code of Rules and Regulations (6 NYCRR), Part 375 (6 NYCRR Part 375; NYSDEC 2006).
- NYSDEC approval to the Pre-design Investigation (PDI) Summary Report & Sediment Cleanup Objective Memorandum letter, dated November 27, 2019.

Activities identified in this Remedial Design will be performed under the approval and oversight of the NYSDEC and the New York State Department of Health (NYSDOH).

1.1 Summary of Selected Remedy

As presented in the ROD, the primary elements of the NYSDEC-selected remedy for OU-2 consists of the following:

- A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.
- Excavation, on-site processing, and off-site disposal of significant deposits of sediments containing polycyclic aromatic hydrocarbons (PAHs) at concentrations greater that 6.2 milligrams per kilogram (mg/kg) from the West Branch of the Tioughnioga River.
- Completing remedial and restoration activities in accordance with Article 15 of the Environmental Conservation Law and 6 NYCRR, Part 608 (6 NYCRR Part 608, NYSDEC 2006).
- In-situ soil solidification (ISS) treatment of impacted subsurface soil in the “downgradient area” to a depth of 40 feet below grade.

- Providing 48 inches of soil backfill over the solidified soils.
- Construction of a temporary interceptor trench to collect non aqueous phase liquid (NAPL) migrating in the subsurface from the site into the OU-2 area. The final disposition of this barrier would be dependent on the remedy selection for Operable Unit No. 1 (OU-1), the former plant site.
- Development and implementation of a Site Management Plan (SMP), which include steps necessary to implement the institutional controls and engineering controls (ICs/ECs) identified for the site remedy, and the periodic evaluation of the effectiveness of the remedy on the banks, bed, and river water quality of the West Branch of the Tioughnioga River.
- Imposition of an institutional control in the form of an environmental easement.
- Providing an annual institutional control/engineering control (IC/EC) certification to the NYSDEC, as required in the SMP.

However, as described in Section 1.4.3, remedial construction activities have already addressed the upland portion of OU-2. Because previous remedial construction activities addressed OU-1 and OU-2 soils concurrently, an interceptor trench was not constructed and is not warranted.

1.2 Purpose

The purpose of this Remedial Design is to present the remedial approach and design to implement the selected remedy. As such, This Remedial Design provides the engineering design for each component of the selected remedy.

1.3 Report Organization and Structure

The organization of this Remedial Design is presented in Table 1.1.

Table 1.1 Remedial Design Report Organization

Section	Description
Section 1 – Introduction	Presents the purpose of the Remedial Design, summarizes the report organization, presents a description of the site characterization and nature and extent of impacts; the remedial objectives; and a summary of the selected remedy.
Section 2 – Basis of Design	Presents the process and tools used to identify and prepare design components.
Section 3 – Organizational Structure and Responsibilities	Presents the responsibilities of NYSEG, the Design Engineer, the Remediation Engineer, and the Remediation Contractor during the implementation of the selected remedy.
Section 4 – Pre-Remediation Activities	Describes the activities to be completed prior to the implementation of the selected remedy.
Section 5 – Remediation Activities	Summarizes the remedial tasks to be conducted as part of the selected remedy.

Section	Description
Section 6 – Post-Remediation Activities	Describes the reporting, monitoring, and administrative activities to be completed following remedial construction.
Section 7 – Schedule	Presents the anticipated schedule for the design and implementation of the selected remedy.
Section 8 – References	Lists select sources consulted as references.

This Remedial Design is supported by Design Drawings (included as Appendix A) and a list of Technical specifications (included as Appendix B). Additional supporting documents include the following:

- A Community Air Monitoring Plan (CAMP) (Appendix C) that describes the monitoring activities that will be conducted to detect potential airborne releases of constituents of concern during the implementation of remedial activities and provides a description of the engineering controls to be implemented to reduce odor-causing emissions.
- A Community and Environmental Response Plan (CERP) (Appendix D) that presents a summary of the site monitoring and work practices that will be completed to address potential short-term impacts to the surrounding community and/or environmental resources during the remedial activities, including required traffic control measures.
- A Contingency Plan (CP) (Appendix E) that describes response procedures to potential emergencies that may arise as a result of the remediation activities that will be completed at the Site.
- Stormwater Pollution Prevention Plan (SWPPP) (Appendix F) that describes the erosion, sediment, and turbidity control measures, as well as general site practices, to be implemented during the remedial activities. This SWPPP has been prepared in accordance with substantive requirements of the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharge from Construction Activities.

This Remedial Design, associated Design Drawings, Technical Specifications, and supporting plans provided herein are collectively referred to hereafter as the Contract Documents. With the exception of the temporary railroad crossing design (prepared by others, included as Attachment 1), supplemental information including attachments, exhibits, and tables are included for information only and are not part of the Contract Documents. Supplemental information is provided to present a comprehensive description of the site impacts, conditions, and completed activities.

1.4 Background Information

This section summarizes site background information including a description of the site location and physical setting, and a brief site history.

1.4.1 Location and Physical Setting

The Site which is located, in the Village of Homer, Cortland County, New York, just north of the City of Cortland (see Figure 1) and consists of two OUs.

- OU-1 encompasses the former MGP plant west of US Route 11.

- OU-2 includes a portion of the NYSEG property east of US Route 11 that is hydraulically downgradient from OU-1 (Figures 2 and 3). OU-2 also includes sediments in the West Branch of the Tioughnioga River containing MGP-related impacts, which is the focus of this Remedial Design.

The Site is located at 216 (northernmost portion of OU-1 consisting of a small portion of the former MGP), 218 (remaining footprint of OU-1), and 221 (OU-2) South Main Street (i.e., US Route 11). The majority of OU-1 is owned by NYSEG, with a small northern portion owned by a commercial company and the westernmost portion owned by the New York, Susquehanna and Western Railway (NYSW). NYSEG owns the upland portion of OU-2.

OU-1 is bordered by US Route 11 to the east, NYSW to the west and commercial properties to the north and south. The West Branch of the Tioughnioga River is approximately 150 feet east of the OU-1 site parcels. The upland portion of OU-2 parcel is bordered by US Route 11 to the west, commercial properties to the north and south, and the West Branch of the Tioughnioga River to the east. The West Branch of the Tioughnioga River flows south toward the City of Cortland with Interstate 81 to the east and various private, commercial, and County-owned properties west of the downstream portion of the river. The river bends to the southeast approximately 3,600 feet downstream of the upland portion of OU-2 to the confluence of Dry Creek with the West Branch of the Tioughnioga River known as the “sediment trap” which is considered the downstream extent of OU-2. NYSEG owns the wooded parcel of land, at this bend in the river, located at the end of Front Street, west of the NYSW and east of the West Branch of the Tioughnioga River.

Current land uses adjacent to the upland portion of OU-2 include automotive/equipment repair shops and vacant property (former gasoline service station and motel – both have been demolished). A museum is located south of the former motel property. A private residence and fields are located immediately east of the West Branch of the Tioughnioga River. Private residences are located west and south of the downstream portion of OU-2.

1.4.2 Site History and Operations

In 1858, the Cortland-Homer MGP plant was established and began supplying manufactured gas to the Village of Homer, New York under the name, “Homer and Cortland Gas Light Company”. Manufactured gas was produced at the Homer site using the coal gasification and carbureted water gas processes. Coal gas was manufactured on the site until 1921, and then carbureted water gas was produced from 1921 to 1932. A gas holder was used until early 1935 to store natural gas on the site.

Records for the Cortland-Homer MGP plant indicate that on-site coal tar production ranged from 19,528 gallons in 1907 to 51,347 gallons during 1913. Gas production in 1907 was 20,179,500 cubic feet of gas. By 1928, production had expanded to approximately 600,000 cubic feet of gas per day by the carbureted water gas process.

In the 1940s the plant was partially decommissioned by NYSEG. In 1944, the Brockway Motor Company purchased the MGP property and razed the remaining structures. A new building was constructed and modified by subsequent owners. The building extended over most of the site.

The portion of the building covering OU-1 was demolished in 2010, and all utilities to the building were disconnected. As part of the 2012/2013 remedial construction activities, the at-grade slab remaining from

building demolition of OU-1 was removed and a storage shed and concrete slab located on OU-2 were demolished.

1.4.3 Completed Remedial Actions

The environmental impacts identified at OU-2 have already been partially addressed through previously completed remedial construction activities. The original NYSDEC-selected remedy for OU-1, mainly excavation of impacted soils, was presented in the March 2007 ROD for OU-1 (NYSDEC 2007). NYSDEC issued a December 2010 Record of Decision Amendment (OU-1 ROD Amendment, NYSDEC 2010c), altering the selected remedy to ISS treatment of impacted soils in both OU-1 and OU-2.

A detailed account of the completed remedial construction activities is presented in the January 2015 Draft Construction Completion Report (Draft CCR, Arcadis 2015). Remedial activities were completed at OU-1 and OU-2 between July 2012 and February 2013 and generally included the following:

- Excavation and off-site disposal of existing former MGP structures, soil, debris, piping, major obstructions, including NAPL-saturated soils in the immediate vicinity of these structures, to allow ISS of soils containing greater than 500 mg/kg total PAHs to up to 46 feet below ground surface (bgs).
- ISS treatment of OU-1 and OU-2 soils, totaling approximately 54,530 cubic-yards (cy). ISS was preceded by the pre-ISS excavation of on-site soils to approximately 4 feet bgs. Soil was solidified using an auger mixing rig with eight-foot diameter augers in an overlapping sequence to create a monolithic solidified mass. Soil was solidified from the bottom of the pre-ISS cut to a silt/clay layer encountered at approximately 46 feet bgs. In general, ISS columns extended at least two feet into the top of the silt/clay layer.
- Installation of Vertical Barrier Walls. Two steel sheet pile vertical barrier walls were installed under US Route 11 to connect the OU-1 and OU-2 ISS monoliths and confine potential MGP residuals located between the monoliths/under US Route 11.
- Excavation of petroleum-impacted soil that remained after pre-ISS excavation was completed in OU-2. The excavation limits were based on observations of petroleum-impacted soil at the OU-2 pre-ISS cut boundaries and within test pits excavated during the OU-2 ISS treatment. Petroleum impacted soil was excavated to an average depth of 5 feet bgs. The petroleum impacted soil was transported off-site for disposal as a non-hazardous waste. Note that during the remedial construction activities, ISS treatment could not be completed any further west without jeopardizing the stability of the bank soils along the river. Documentation samples were collected from the bottom and sidewalls of the petroleum-impacted soil excavation areas. As indicated in the Draft CCR, total PAH concentrations in documentation samples were less than 32 mg/kg.
- Construction and maintenance of a soil cover system consisting of an approximate one-foot clean soil cover (crushed stone and bank run gravel) on-site, an approximate 4-foot clean soil cover over all restored subsurface utilities within the New York State Department of Transportation (NYSDOT) roadway right-of-way, or at least one foot of clean subbase plus asphalt pavement or concrete over a demarcation layer.

Remedial activities were substantially completed at the site in February 2013. Final site restoration was completed in June 2013. As noted in Section 1.1, the OU-2 ROD required installation of a temporary NAPL interception trench if OU-2 remedial constructions activities were completed prior to OU-1. As

impacted soils in OU-1 and OU-2 were addressed at the same time, the temporary interceptor trench was not constructed.

Following the completion of remedial construction activities, environmental easements were executed for NYSEG-owned upland portions of OU-1 and OU-2. Additionally, an SMP was prepared to provide monitoring and maintenance requirements for OU-1 and the upland area of OU-2. The NYSDEC-approved SMP was finalized in March 2016 (Arcadis 2016b).

1.5 Site Characterization

This section presents an overall site characterization and a summary of the nature and extent of impacted sediment based on the results obtained for the site investigation activities completed to date, which include the following:

- 1985-1989 Initial Remedial Investigation – NYSEG conducted initial remedial investigations between 1985 and 1989. Investigation results suggested that MGP-related impacts could migrate toward the West Branch of the Tioughnioga River.
- 1999/2001 Supplemental Remedial Investigation – NYSEG retained Stearns & Wheler to complete a Supplemental Remedial Investigation (SRI), which consisted of field efforts completed in 1999 and 2001. Investigation results were presented in the December 2003 Supplemental Remedial Investigation Final Report (SRI Report; Stearns & Wheler 2003) and generally indicated that MGP-related impacts were present in river sediment adjacent to and in isolated areas downstream of the site.
- 2013 Assessment – In January and February 2013, following two major flood events, Arcadis conducted a reconnaissance and sediment assessment to determine whether areas containing impacted sediment (as documented in the SRI Report) still existed. The assessment included probing sediments along the same stretch of the West Branch of the Tioughnioga River that was investigated during the SRI, extending from approximately 900 feet upstream of the site to the location of the "sediment trap" observed near the confluence with Dry Creek. The results of the 2013 assessment indicated that distribution of visual impacts observed in surficial sediments adjacent to and downstream from the site do not match with the distribution of visual impacts previously observed during the SRI and therefore, additional investigation was warranted.
- 2014/2015 Pre-Design Investigation – Based the 2013 assessment findings and the March 21, 2013 discussion between the NYSDEC and NYSEG, NYSEG determined that additional borings and analytical sampling were required to further verify the findings of the 2013 assessment. Subsequently, a Pre-Design Investigation (PDI) was completed in 2014 and 2015 to further delineate MGP-related impacts in river sediments upstream of, adjacent to, and downstream of the site. Sediment cores were drilled up to 10 feet below the sediment surface using various drilling equipment (i.e., tripod-mounted drill rig, barge-mounted drill rig, and all-terrain vehicle drill rig). Recovered sediment samples were visually characterized for color, composition, and presence/ absence of potential MGP-related impacts (i.e., NAPL, blebs, coating, sheens, staining, or odors) and headspace was screened for volatile organic compounds using a photoionization detector. A total of 146 samples were submitted for laboratory analysis during this investigation. Investigation results were presented in the February 2016 Pre-Design Investigation Letter Report (2016 PDI Letter; Arcadis 2016a).

- 2017/2018 Pre-Design Investigation – Arcadis conducted additional field survey, sediment probing, and upland soil borings. In addition, a habitat assessment was performed to identify vegetative and other habitat structures within the river and adjacent upland areas that could potentially be disturbed during OU-2 remediation activities. In 2017, Arcadis also obtained existing river flow data to support preparation of the remedial design. Investigation results were presented in the January 2019 Pre-Design Investigation Summary Report letter (2019 PDI Letter; Arcadis 2019a).
- 2018 Mussel Survey – Per NYSDEC's request based on observations of relic mussel shells at the site in 2017, Arcadis completed a mussel survey in July 2018. Mussel survey activities were completed in accordance with the NYSDEC-approved May 2018 Mussel Survey Work Plan (Arcadis 2018a). As presented in the September 2018 Qualitative Mussel Survey Report (Arcadis 2018b), only a small number of mussels were observed and therefore, a second quantitative survey was not completed.

The results of these investigations were collectively used to develop the current site characterization which consists of, as presented in the subsections below, a summary of site geology and hydrogeology and the nature and extent of impacts. A detailed site characterization is presented in the December 2003 SRI Report (Stearns & Wheler 2003). As discussed in Section 2, the site characterization information was refined based on the results of the investigation activities completed from 2014 to 2019.

While this section focuses on site characterization and the nature and extent of impacted sediments for the in-river portion of OU-2, characterization information for the upland portion of OU-2 is also provided, as appropriate.

1.5.1 Geology/Hydrogeology

The following description of site geologic conditions is based on the description provided in the OU-1 ROD (NYSDEC 2007).

The site is located in the Homer Preble Valley, within the Homer Preble Sole Source Aquifer. The regional geology is reported to consist of stratified drift and glacial outwash deposits that are underlain by bedrock composed primarily of shale. Collectively the drift and outwash deposits can be up to 240 feet thick.

In the Homer Preble Valley, the base of the aquifer is a lacustrine clay that is present at a depth of approximately 60 feet. Geological cross sections of the valley prepared by the United States Geological Survey (USGS) indicate that this deposit may be over 100 feet thick in this area. South of the site, in the City of Cortland, there is a confined outwash aquifer, as well as a surficial outwash aquifer.

The site is underlain (in descending order) by an anthropogenic fill layer, a glacial outwash sand, and a laminated gray silt and clay unit that constitutes a confining layer. The fill layer ranges from 6 inches to 10 feet on-site, and the outwash sand varies in thickness from 20 to 40 feet. The laminated gray silt was found to be continuous beneath the site.

Groundwater at the site is encountered at approximately 5 feet below grade, in the glacial outwash deposits. A seasonal fluctuation of 1 to 1.5 feet has been observed. The groundwater flows across the site in a west-to-east/southeast direction. The flow is primarily horizontal, consistent with the stratified nature of the aquifer. The groundwater then discharges into the West Branch of the Tioughnioga River.

1.5.2 Hydrology

The West Branch of the Tioughnioga River flows to the southeast, toward the northern edge of Cortland County. Dry Creek joins the river near the NYSEG-owned property in the downstream area and then joins the East Branch of the Tioughnioga River on the eastern edge of the City of Cortland. The West Branch of the Tioughnioga River generally consists of riffles, slack waters, and pools. River sediments primarily consist of coarse sands and gravel, with cobbles and boulders. Fine-grain sediments accumulate in depositional and backwater areas. Additional details regarding sediment types were presented in the 2016 PDI Letter (Arcadis 2016a).

The West Branch of the Tioughnioga River is approximately 50 feet wide with depths varying from 1 to 3 feet near the upland portion of the Site. In the downstream area, the river is generally wider and deeper. Historical USGS stream gauge station 01508803 (West Br Tioughnioga River at Homer, NY) was located approximately 1 mile upstream of the Site, near Water Street. The station recorded daily mean flow from 1966 to 1986 (with complete years of record from 1973 through 1985) and annual peak flow from 1967 to 1992. Gauging data indicates the river has an annual mean daily flow of approximately 127 cubic feet per second (cfs) with maximum flows of more than 1,900 cfs. Based on the historical gauge data, mean daily flows observed during the construction season (May to September) ranged from 150 cfs (May) to 25 cfs (September). There are currently no active gages on the West Branch of the Tioughnioga River.

The West Branch of the Tioughnioga River is classified as C(T) water body, which designates the river for fish propagation and survival (including trout), as well as primary and secondary contract recreation. NYSDEC has historically stocked this segment of the river with brown trout.

1.6 Nature and Extent of Impacts

The nature and extent of impacts observed in the upland portion of OU-2 and in the West Branch of the Tioughnioga River sediment is presented in the following subsections.

1.6.1 Upland Soil Quality

As discussed in Section 1.4.3, ISS treatment was completed at OU-1 and OU-2 to address soil containing MGP-related impacts and petroleum impacted soils were excavated from OU-2 upland areas. Soil samples collected from SRI soil borings and monitoring wells all contained total PAHs at concentrations less than 150 mg/kg (less than the 500 mg/kg total PAHs criteria for ISS treatment, as presented in the OU-1 ROD Amendment). Impacts typically consisted of petroleum- or tar-like odors with occasional sheens. One location, soil boring SB-16 (Figure 2) contained visual impacts and total PAHs at a concentration of 106 mg/kg at 22 to 24 feet below grade. As described in the soil boring log, the visual impacts included a “tar-like substance, sheen, and tar-like odor". PDI soil boring PDI-25 (Figure 2) was drilled immediately north of soil boring SB-16 (using rotosonic drilling methods) and soil samples from PDI soil boring PDI-25 were free of visual impacts. As indicated in the Draft CCR (Arcadis 2015), documentation samples collected from the bottom and sidewalls of the petroleum-impacted soil excavation areas contained total PAHs at concentrations less than 32 mg/kg.

As detailed in the 2019 PDI letter (Arcadis 2019a), three additional soil borings (PDI-2018-01 through PDI-2018-03) (Figure 2) were completed to further assess the presence/absence of residual MGP-related impacts between the completed ISS and excavation in the upland portion of OU-2 and the West Branch

of the Tioughnioga River. Visual impacts were limited to sheens at boring PDI-2018-02 (21 to 29 feet below grade). Analytical results for soil samples collected from the completed borings indicated PAH concentrations at less than 1 mg/kg.

1.6.2 Sediment Quality

The extent of sediment containing MGP-related impacts has been most-recently defined/refined based on the 2014/2015 Pre-Design Investigation. Although the 2016 PDI Letter focused on sediment containing visual impacts and sediment containing PAHs at concentration greater than 14.1 mg/kg, as discussed in Section 2, the extent of impacted sediment requiring remediation is based on the ROD-required sediment cleanup goal of 6.2 mg/kg.

In general, impacted sediment was observed in two main areas in the Tioughnioga River:

- Area 1 is generally located near the former MGP property, spanning from approximately 250 feet upstream of the NYSEG property to approximately 100 feet downstream of a closed bridge located near the museum property (see Figures 2 and 3).
- Area 2 is generally located adjacent to the NYSEG property at the end of Front Street, spanning from approximately 300 feet downstream of the railroad bridge to approximately 100 feet upstream of Dry Creek (i.e., a tributary to the West Branch of the Tioughnioga River) (see Figure 4).

At Area 1, impacted sediment is typically located at depths up to 2 feet bss, with isolated areas containing impacted sediment at depths up to 5 feet bss. The greatest PAH concentrations (more than 4,000 mg/kg) were observed in sediment located immediately adjacent to the Site. Impacted sediment with elevated PAH concentrations typically contains staining and sheens. Further downstream in Area 1, sediment typically contains PAHs at concentrations less than 100 mg/kg and minor visual impacts. NAPL blebs were observed in one location near the museum property. Additionally, during the 2013 sediment probing, trace sheens were observed when sediments were disturbed along the toe of the western bank of the West Branch of the Tioughnioga River from the edge of the Site and continuing approximately 900 feet downstream (to within 45 feet of the closed bridge). The presence of sheens along the toe of the western bank was confirmed during the 2017/2018 PDI.

At Area 2, impacted sediment is located at depths up to 7 feet bss. The greatest impacts are observed at the bend of the river, where sediment contains elevated PAH concentrations (i.e., from 1,000 mg/kg to more than 21,000 mg/kg). The greatest PAH concentrations and greatest degree of visual impacts (i.e., tar blebs and taffy-like tar) were observed in the vicinity of the sandbar located on the inner bend of the river. Elevated PAH concentrations were also observed immediately downstream of the sandbar.

A more detailed account of the vertical and horizontal extent of impacted sediment is presented in the 2016 PDI Letter (Arcadis 2016a).

2 BASIS OF DESIGN

As presented in the ROD, the major component of the selected remedy consists of removing MGP-impacted sediments within the West Branch of the Tioughnioga River. This section describes the remedial action objectives (RAOs) established for the site, the completed PDI activities, and the basis of design for remedial design components.

2.1 Remedial Action Objectives

Site-specific RAOs have been established through the remedy selection process stated in 6 NYCRR Part 375 (NYSDEC 2006). As presented in the ROD (NYSDEC 2005), the selected remedy must eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the Site through the proper application of scientific and engineering principles, the RAOs that have been established for the site consist of the following:

Eliminate or reduce to the extent practicable:

- Human and wildlife contact with sediments and bank deposits contaminated by site related constituents.
- Human and wildlife contact with subsurface soils contaminated by site related constituents and/or NAPL.
- Migration of tar, as both light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL), into the surface waters, bank deposits, and sediments of the West Branch of the Tioughnioga River.
- Human and wildlife exposure to NAPL in the surface waters, bank deposits, and sediments of the West Branch of the Tioughnioga River.

Attain to the extent practicable:

- NYSDEC ambient groundwater and surface water quality standards.

2.2 Pre-Design Investigation

PDI activities were performed by Arcadis on behalf of NYSEG from 2014 to 2019 to collect data to support the remedial design. Pre-design summary reports and their associated field tasks are listed below.

- 2016 Pre-Design Investigation Letter Report (Arcadis 2016a, included as Attachment 2) documenting the 2014/2015 sediment probing/sampling activities.
- 2019 Pre-Design Investigation Summary Report letter (Arcadis 2019a, included as Attachment 3) documenting the following 2017/2018 activities.
  - Topographic field survey
  - River flow data acquisition
  - Habitat assessment, tree survey, and wetland delineation
  - Sediment probing
  - OU-2 upland soil borings

- 2019 Supplemental Pre-Design Investigation Summary (2019 Supplemental PDI, Arcadis 2019d, included as Attachment 4) documenting the following 2019 activities:
  - Hydraulic model cross-section velocity/discharge survey
  - Additional wetland delineation and tree survey
  - Review of the mean high-water line (MHWL) with NYSDEC
  - Crane access road geotechnical investigation

The results of the PDI have been used as a basis for key design components.

2.3 Basis of Design for Remedial Activities

The following subsections present a basis for the key design components, including the following:

- Soil Removal – the rationale for not conducting additional soil remediation.
- Sediment Removal – how the limits of removal were established.
- Temporary River Bypass System – design assumptions used to develop the bypass system.
- Scour and Flood Contingency Measures – the evaluations completed to assess scour potential and develop scour contingency measures and flood contingency measures.
- Restoration – a brief summary of the existing conditions within the river and the associated upland support areas, which serve as the basis for the restoration design presented herein.

2.3.1 Soil Removal

Based on the completed investigation and remediation data (i.e., visual impacts limited to sheens and low concentrations of PAHs), residual soil impacts in the upland portion of OU-2 are isolated at depths greater than 20 feet below grade in the vicinity of SB-16 and PDI-2018-02. At this time, as presented in the 2019 PDI letter, additional upland remedial activities are not warranted based on the relative minor degree of remaining impacts.

2.3.2 Sediment Removal

Based on the results of the 2014/2015 sediment probing/sampling, the 2016 PDI letter (Arcadis 2016a) proposed a sediment cleanup goal of 14.1 mg/kg and corresponding proposed sediment removal limits. Although NYSDEC approved the 2016 PDI letter, NYSDEC subsequently rejected the May 2017 draft Remedial Design Work Plan (RDWP, Arcadis 2017), citing the ROD-required sediment cleanup goal of 6.2 mg/kg. As the ROD requires remediation to address “significant sediment deposits”, NYSDEC and NYSEG reviewed and discussed the applicability and interpretation of the ROD-required sediment cleanup goal during in-person meetings, conference calls, site visits, and written correspondences in 2017 and 2018.

Most recently, Arcadis submitted a January 29, 2019 Sediment Cleanup Objectives letter (Arcadis, 2019b) detailing proposed sediment excavation limits based on the presence of visual impacts and sediment containing PAHs at concentrations greater than 6.2 mg/kg, with a focus on addressing the upper 2 feet of sediment containing elevated PAH concentrations (in the absence of visual impacts), as well as focusing on “significant sediment deposits” within the river. NYSDEC provided recommendations for further revising the sediment excavation limits via an August 21, 2019 letter to NYSEG (NYSDEC

2019a). Arcadis provided additional modifications (based on NYSDEC comments) to the sediment excavation limits in a September 20, 2019 comment response letter (Arcadis 2019c), which was subsequently approved by NYSDEC via a November 27, 2019 letter to NYSEG (NYSDEC 2019b).

The sediment removal limits presented herein are consistent with those agreed to by NYSDEC and NYSEG, primarily based on the results from the 2014/2015 sediment probing/sampling while considering additional historic investigation results. As noted in the September 20, 2019 comment response letter (Arcadis 2019c), based on the agreed upon sediment removal limits, verification sampling during remedial construction is not warranted.

Note that sediment removal limits presented in previous project correspondence were based on a digitized (from aerial imagery) edge of water. For the purpose of this Remedial Design, the excavation limits have been extended to the vegetation/scour line (i.e., the MHWL elevation) delineated in 2017 and 2019.[1] Any potential modifications to the removal limits depicted herein will be provided to NYSDEC for review and approval. Details related to the removal approach and/or the potential reduction or expansion of the removal area are provided in Section 5.

2.3.3 Temporary River Bypass System

Target removal areas will generally be segregated from the flowing water of the West Branch of the Tioughnioga River using a river bypass system to temporarily divert river flow around active excavations. River hydraulics have been evaluated to establish appropriate design parameters for the river bypass system and ancillary hydraulic controls, and to satisfy permitting requirements of United States Army Corps of Engineers (USACE). River hydraulics and hydraulic control systems (e.g., river bypass system, scour protection measures) have been evaluated using multiple data sources including:

- Historical stream flow data from USGS station 01509000 for Tioughnioga River in Cortland.
- Federal Emergency Management Agency (FEMA) Flood Insurance Survey.
- Publicly available digital elevation model (DEM) and Light Detection and Ranging (LIDAR) data.
- A Hydrologic Engineering Centers River Analysis System (HEC-RAS) hydraulic model of the West Branch of the Tioughnioga River spanning the length of the river from approximately 300 feet upstream of the temporary river bypass system at Area 1 to 600 feet downstream of the temporary river bypass system at Area 2.
- A modified HEC-RAS hydraulic model, which includes detailed river bathymetry data within the project area and a detailed layout of proposed hydraulic controls that will be installed within the river during construction. The model output is included in the Hydraulic Assessment Report (Attachment 5).

[1] The Code of Federal Regulations (CFR) defines the ordinary high water mark (OHWM) as “the line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in characteristics of soil, destruction of terrestrial vegetation, the presence of litter and debris, and other appropriate means that consider the characteristics of the surrounding area” (CFR 2018). For a non-tidal waterbody, the definition of the OHWM is substantially equivalent to the NYSDEC’s definition of the MHWL, and both lines represent what is commonly known as the vegetation/scour line along the bank of a waterway. Specifically, the MHWL and OHWM for this Site would be established in an identical manner, using vegetative and physical characteristics or other appropriate means that consider the characteristics of the surrounding area. For reference, the MHWL elevation is defined by 6 NYCRR Part 608.1 (6 NYCRR 608.1).

Average flow rates, in cfs, for the months of May through October (i.e., encompassing the full in-water construction season) are summarized in the following table. Monthly averages are based on actual historical stream flow gauge data from the USGS Station 01508803 (West Br Tioughnioga River at Homer, NY) for the full years of record for the period 1973 through 1985.

Table 2.1 Average Monthly Flow Rates

Month	Monthly Average Flow (cfs) (1973-1985)
May	150
June	86
July	48
August	36
September	45
October	75

As discussed in Section 7, Remediation Contractor mobilization is anticipated to begin no later than March and in-river work will be initiated as early as reasonably practicable after May 15. At a minimum, each phase of the river bypass system is designed to convey the average monthly flow for the period in which the in-river work is tentatively scheduled to occur. Refer to Section 7 for a preliminary project schedule.

The approximate maximum average daily flows for specified recurrence intervals for the months of May through October for the years 1973 through 1985 were calculated using the USGS StreamStats web service and are provided in the following table.

Table 2.2 Maximum Average Daily Flow Recurrence Intervals

Recurrence Interval	Maximum Average Daily Flow (cfs) (May – October)
2-Year	1,340
5-Year	1,880
10-Year	2,230
100-Year	3,350

The median river flow (i.e., the flow equaled or exceeded approximately 50% of the time) from May through October, for the years 1973 through 1985, was approximately 85 cfs. Correlating to current-day conditions, using flow records from the Main Branch of the Tioughnioga river for the years 2001 through 2018, median river flow is expected to be approximately 105 cfs. Hydraulic modeling indicates that this median flow condition produces main channel velocities ranging from approximately 0.5 feet per second (fps) up to 4 fps, with maximum flow depths ranging from approximately 1 to 5 feet.

The estimated maximum bypass capacities provided by the river bypass system (based on the configuration presented in this Remedial Design) are:

- Area 1 – 200 cfs
- Area 2 – 350 cfs

2.3.4 Scour and Flood Contingency Measures

As part of the modeling to evaluate the temporary river bypass system (discussed in Section 2.3.3), the bypass channels were evaluated for flood potential during the 2-, 5-, 10-, 25-, 50, and 100-year storm events and scour potential under maximum bypass conditions. Additional details on the model output and details of the evaluation are included in the Hydraulic Assessment Report (Attachment 5).

2.3.4.1 Flood Contingency Measures

As indicated in the Hydraulic Assessment Report (Attachment 5), modeling was used to predict return-interval flow events that would overtop key features during both existing and bypass conditions. Modeling results identified one nearby structure at Area 1 (located at 216 South Main Street) that may be affected by a 10-year storm event during remedial construction. Flood contingency measures (e.g., sandbags, lined concrete barriers) to protect these features will be installed with a minimum of one foot of freeboard above the predicted flood elevation for each area/storm event, as indicated on Design Drawings G-103 (Appendix A). Modeling results for Area 2 indicated no increase in flooding impacts due to the installation and use of the temporary river bypass system.

2.3.4.2 Scour Protection Measures

Potential scour areas are indicated by locations at which the river velocities observed during use of the temporary river bypass system exceed those of the 1.5-year recurrence interval flow of 1,120 cfs, or "channel-forming discharge" velocity. For areas where modeling indicates the channel-forming discharge is exceeded during bypass conditions, the minimum median stone size (D_{50}) required to resist the anticipated channel-forming discharge velocities is calculated.

In Area 1, the discharge velocities predicted by the model during use of the temporary river bypass system are less than the existing channel-forming discharge velocity throughout the work area. As such, the existing river substrate size is anticipated to be sufficient to withstand the channel-forming discharge velocities predicted by the model. In Area 2, model predictions indicate the potential for discharge velocities exceeding the "channel-forming" velocity from river station (RS) 5+89 to 10+03 (i.e., just downstream of where the river bends to the southeast). Additional material with a minimum D_{50} stone size of 1 inch will be placed on the riverbed to improve flow characteristics. Additional scour evaluation details are provided in the Hydraulic Assessment Report (Attachment 5).

Additionally, the Remediation Contractor is required to monitor for scour at all areas during bypass conditions. Additional river protection stone will be temporarily added if scour conditions are observed.

2.3.5 Restoration

In general, following the completion of sediment excavation activities, disturbed areas will be restored consistent with current/pre-construction conditions.

In-river and bank restoration components are based on the completed habitat assessment, tree survey, and wetland delineation completed as part of the PDI activities from 2017 through 2019. Vegetative and other habitat structures within the river and bank areas were characterized to develop appropriate restoration design for each bank area. Additionally, the MHWL was determined along the banks of the remedial areas using visual indicators, consistent with the definition from 6 NYCRR Part 608.1 (NYSDEC 2006). Detailed results of the assessment are presented in the 2019 PDI Letter (Arcadis 2019a) and the 2019 Supplemental PDI (Arcadis 2019d).

Disturbed upland areas will be restored to match existing site conditions (as applicable) and restoration components include vegetated surfaces, gravel surfaces, and asphalt pavement. In Area 1, tree replacement will be approximately 1 for 1, based on the final number of trees removed (i.e., with a diameter at breast height [DBH] of 3 inches or greater). An estimated 232 trees (with DBH of 3 inches or greater) will be potentially removed to facilitate the remedial construction activities presented herein. Therefore, an estimated 232 trees will be planted as part of the site restoration.

As noted in Section 1, NYSEG owns the upland area adjacent to Area 2. A vast majority of the property will be cleared to facilitate sediment removal at Area 2, resulting in the removal of an estimated 463 trees (with DBH of 3 inches or greater). The restoration components for Area 2 presented herein consist of tree and shrub plantings up to 50 feet inland from the MHWL, which will include planting of an estimated 230 trees during site restoration. Based on the potential for future site use by NYSEG, the remainder of the upland area (i.e., area greater than 50 feet from MHWL) will be restored as vegetated topsoil using an upland seed mix.

3 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES

NYSEG, the NYSDEC, and NYSDOH will jointly participate in the implementation of the remediation activities described in this Remedial Design. NYSEG has the ultimate responsibility for implementing the remediation activities. NYSDEC (and potentially NYSDOH) personnel are anticipated to be on-site periodically to observe work activities. NYSEG will be responsible for all on-site operations during the project. The remediation activities will be observed by NYSEG's Remediation Engineer for general compliance with the Remedial Design. Communication with regulatory agencies and with members of the surrounding community will be managed by NYSEG. Key project personnel for NYSEG, NYSDEC, and the Design Engineer are identified below. The Remediation Engineer and Remediation Contractor are to be determined.

Table 3.1 Key Project Personnel

Name/Affiliation	Address	Contact Information
NYSEG		
Mr. Tracy L. Blazicek Project Manager	P.O. Box 5224 Binghamton, NY 13902-5224	T: 585.484.6839 tlblazicek@nyseg.com
NYSDEC		
Mr. Justin Starr Division of Environmental Remediation	625 Broadway Albany, NY 12233-7014	T: 518.402.9662 justin.starr@dec.ny.gov
NYSDOH		
Mr. Dan Tucholski Bureau of Environmental Exposure Investigation	Empire State Plaza Corning Tower, Room 1787 Albany, NY 12237	T: 518.402.7860 daniel.tucholski@health.ny.gov
Arcadis (Design Engineer)		
Mr. Jason Golubski, P.E. Project Manager Mr. Mark Gravelding, P.E. Engineer of Record	110 West Fayette Street Suite 300 Syracuse, NY 13202	T: 315.671.9437 jason.golubski@arcadis.com T: 315.671.9235 mark.gravelding@arcadis.com
Remediation Engineer		
To be determined (TBD)		
Remediation Contractor		
TBD		

Minimum responsibilities for NYSEG, the Design Engineer, the Remediation Engineer, and the Remediation Contractor for work to be conducted prior to, during, and following implementation of the remediation activities are presented in the following subsections.

3.1 NYSEG Responsibilities

NYSEG will be responsible for the following:

- Contracting with the selected Remediation Contractor.
- Contracting with a firm to serve as the Remediation Engineer.
- Coordinating with the Remediation Contractor, Design Engineer, and Remediation Engineer (as necessary) to implement the required work activities in conformance with the Remedial Design.
- Securing access agreements and coordinate with property owners (as needed) with respect to the implementation of the remediation activities.
- Issue contract addenda (if any) and modifications (if any) based on input from the Remediation Engineer and/or the NYSDEC.
- Acting as the “Generator” for material resulting from the remediation activities for off-site treatment and/or disposal of the waste.
- Contracting with a conditionally exempt waste disposal vendor (i.e., low-temperature thermal desorption [LTTD] treatment facility).
- Provide bills of lading/manifests for the off-site shipment of waste materials. These shipping documents may be provided to the Remediation Engineer to sign as an agent for NYSEG, under separate agreement with NYSEG.
- Coordinating with the NYSDEC and NYSDOH regarding environmental-related work activities.

3.2 Design Engineer Responsibilities

The Design Engineer will provide the following services prior to and during the implementation of the remediation activities:

- Assisting NYSEG with preparation of this remedial design.
- Assisting NYSDEC in preparing and sending a Notice and Fact Sheet consistent with NYSDEC Program Policy DER-23, Citizen Participation Handbook for Remedial Programs (NYSDEC 2010a).
- Assisting NYSEG with coordination and communication with the appropriate agency representatives to facilitate obtaining the associated federal, state, or local permits and approvals for work to be performed.
- Assisting NYSEG in preparing Remediation Contractor bid documents and evaluating bid proposals submitted by prospective Remediation Contractors.
- Assisting NYSEG with community relations and stakeholder communications prior to implementation of the remedial activities.
- Issuing formal design modifications (if necessary) signed and sealed by a New York State Licensed Professional Engineer.

3.3 Remediation Engineer Responsibilities

The Remediation Engineer will provide the following services during implementation of the remediation activities:

- Providing experienced and qualified project management and full-time on-site oversight to observe and monitor remediation activities. The Remediation Engineer will have stop-work authority to facilitate inspection of completed work and address health and safety concerns, as needed.
- Reviewing Remediation Contractor submittals and providing comments, if any, to the Remediation Contractor and NYSEG.
- Coordinating with the Design Engineer, as needed, for requests for interpretation and clarifications on this Remedial Design.
- Initiating field orders, work change directives, and proposal requests.
- Monitoring the Remediation Contractor's survey control for evaluating performance of the remedial action in compliance with this Remedial Design and payment quantities, as applicable.
- Reviewing the Remediation Contractor's daily geotechnical data and monitoring reports.
- Reviewing the Remediation Contractor's turbidity data and monitoring reports.
- Maintaining records of the work efforts associated with implementation of the remediation activities, including daily field reports and digital photographs of the work in progress and documentation of observations, problems, and deficiencies. Requirements for daily construction reports are presented in Specification Section 01 32 26, Construction Progress Reporting (Appendix B).
- Maintaining records of labor, materials, and equipment utilized for the remediation activities and any unusual circumstances, if any are encountered.
- Documenting that the remediation activities are conducted in general conformance with Remedial Design and notifying NYSEG of any deviations.
- Providing analytical results for imported fill materials to NYSDEC for review and approval prior to material being brought on-site.
- Coordinating with an independent testing laboratory to perform imported material and quality assurance testing, as required.
- Reviewing and signing (as an authorized agent for NYSEG) waste manifests/bills of lading for shipments of waste materials generated by the remediation activities.
- Maintaining an on-site project log in consultation with the Remediation Contractor that summarizes and tracks the type and quantity of waste streams generated by the remedial activities.
- Conducting community air monitoring in accordance with the CAMP (Appendix C)
- Conducting soil and water characterization sampling.
- Assisting NYSEG in the review of Remediation Contractor invoices/requests for payment.
- Coordinating, attending, and documenting on-site project meetings, as detailed in Section 5.1.1.
- Preparing (and certifying) a Final Engineering Report (FER) to document completion of the construction activities (as discussed in Section 6.1).
- Preparing an SMP to detail the post-remediation activities to be conducted at the project area (as discussed in Section 6.2).
- Revising the preliminary Monitoring and Maintenance Plan (MMP, as discussed in Section 6.3), if necessary, to detail the post-construction vegetation monitoring activities to be conducted at the Site.
- Providing NYSEG with support to resolve any issues during remedial construction.
- Issuing formal design modifications (if necessary, and not issued by the Design Engineer). Design modifications will be signed and sealed by a New York State Licensed Professional Engineer.

3.4 Remediation Contractor Responsibilities

In general, the Remediation Contractor is responsible for providing all supervision, labor, equipment, and materials needed (unless otherwise noted) to implement the activities described in the Contract documents which includes this Remedial Design text, the Design Drawings, Technical Specifications, and supporting documents. Additional Remediation Contractor responsibilities include:

- Thoroughly reviewing and understanding the Contract Documents and supplemental information provided herein. Nothing presented in one of the above documents or drawings should relieve the Remediation Contractor's obligation to satisfy the components specified in the other documents/ drawings.
- Verifying all existing site conditions.
- Notifying the Remediation Engineer and NYSEG immediately upon discovery of a conflict between the Contract Documents and actual site conditions. The Remediation Contractor will present in writing to NYSEG and the Design Engineer any noted discrepancies in the information contained herein.
- Reviewing and complying with AVANGRID's Contractor Safety Requirements (latest edition).
- Implementing the activities described in the Contract Documents in a safe manner and in accordance with applicable federal, state and local laws, rules and regulations.
- Perform surveys and survey control in accordance with the Contract Documents.
- Contracting with a third-party engineering firm to conduct geotechnical monitoring during construction activities and pre- and post-remediation structural surveys.
- Coordinating with potential disposal facilities to verify waste characterization analytical requirements prior to the collection of waste characterization samples.
- Preparing waste profiles for off-site treatment/disposal of solid and liquid wastes to be generated as part of the remediation activities.
- Contracting with waste haulers and waste disposal vendors for treatment/disposal of non-hazardous solid and liquid wastes to be generated as part of the remediation activities.
- Providing bills of lading/manifests for the off-site shipment of waste materials from the site. These shipping documents will be provided to the Remediation Engineer to complete and sign on behalf of NYSEG (under agreement with NYSEG).
- Attending on-site project meetings including, but not limited to, a pre-construction meeting, daily site safety (tailgate safety) meetings, weekly construction progress meetings, pre-final inspection (punch-list) meeting and final inspection/project close-out meeting.
- Submitting to NYSEG, daily construction reports detailing the work efforts associated with implementation of the remedial activities, including digital photographs of the work in progress and documentation of observations, problems, and deficiencies. Requirements for daily construction reports are presented in Specification Section 01 32 26, Construction Progress Reporting (Appendix B).
- Coordinating with NYSEG and the Remediation Engineer, as necessary, to complete required work activities.
- Providing the Remediation Engineer with bulk samples of aggregate and fill materials, as required.

4 PRE-REMEDIATION ACTIVITIES

The following pre-remediation activities will be completed by NYSEG (and/or its representatives) or Remediation Contractor prior to or at the start of remedial construction:

- Assisting NYSDEC in preparation of a citizen participation Notice and Fact Sheet
- Obtaining regulatory and local permits, access agreements, and other approvals
- Completing pre-construction structural surveys
- Preparing pre-mobilization submittals
- Conducting a pre-construction conference

The purpose of the pre-remediation activities is to coordinate with the local community and officials and to facilitate initiation of the remedial activities. Additional information regarding the pre-remediation activities is provided in the following subsections.

4.1 Citizen Participation Plan

Concurrent with the remedial design, Arcadis will prepare and submit a Citizen Participation Plan (CPP), under separate cover, describing the project-related citizen participation activities that have been and will be completed.

Consistent with NYSDEC Program Policy DER-23, Citizen Participation Handbook for Remedial Programs (NYSDEC 2010a), the NYSDEC is responsible for preparing and distributing a Notice and Fact Sheet describing the upcoming remediation work prior to the start of remedial construction. NYSEG (and the Remediation Engineer) will assist NYSDEC (as appropriate) in preparing the Notice and Fact Sheet. NYSDEC will distribute the Notice and Fact Sheet to parties on the site contact list (i.e., residents and business owners within a specified radius of the project area, as well as additional community and political personnel) and the document repository (i.e., the Cortland Free Library).

Additionally, a copy of the Remedial Design will be placed in the document repository.

4.2 Permitting and Access Agreements

Based on the scope of the remediation activities to be conducted at the Site and information currently available, the agreements/authorizations, permits, and/or notifications discussed below have been identified, at a minimum, as potentially applicable for the remediation activities.

4.2.1 Access Agreements

Access agreements and notifications are anticipated to be required to facilitate conducting sediment removal activities at Area 1 and Area 2. Non-owned properties anticipated to be affected during the OU-2 remedial constructions activities are listed below.

- Automotive shop property (207 North Main Street) located north of the NYSEG property (at Area 1) – for geotechnical monitoring
- Former automotive shop property (215 North Main Street) located north of the NYSEG property (at Area 1) – for geotechnical monitoring

- Private properties east of the Tioughnioga River (at Area 1) – for river access and staging
- The former motel property (4408 US Route 11) located south of the NYSEG property (at Area 1) – for river access and geotechnical monitoring
- Museum property (4386 US Route 11) located south of the NYSEG property (at Area 1) – for installation of security fencing, geotechnical monitors, and restoration, as necessary. Note that use of this property for river access or construction activities is prohibited.
- A private property located at the end of Front Street – for access to Area 2

Additionally, access to Area 2 will be via a new railroad crossing, over railroad tracks owned by the NYSW. NYSEG has coordinated with NYSW to develop a design for a railroad track crossing, included herein as Attachment 1. The Remediation Contractor will coordinate with the NYSW to install a railroad crossing in accordance with the Contract Documents.

4.2.2 Permits

Anticipated project related permits consist of the following:

- USACE Nationwide Permit #38 (NWP #38) – A permit must be applied for and granted prior to conducting sediment removal activities in the West Branch of the Tioughnioga River.
- NYSDEC Water Quality Certification (WQC) – A WQC must be applied for and granted, indicating that the proposed remediation activities will not violate water quality standards. Note that in-river work is prohibited from October 1 to May 15, unless project-specific approval is granted by the NYSDEC.
- SPDES Permit Equivalent – to be obtained by the Design Engineer, to facilitate discharge of treated water to the West Branch of the Tioughnioga River.
- City of Cortland, Floodplain Development Permit (FDP) – to be obtained by the Design Engineer for any work completed at Area 2. Note that based on information obtained to date, the Village of Homer/ Town of Cortlandville will not require an FDP for work to be completed at Area 1.

The NWP #38 and the WQC applications will be submitted to the USACE and NYSDEC under the joint application for permit (JAP). In support of the JAP the following agencies will be consulted, as applicable.

- United States Fish and Wildlife Service (USFWS) to confirm that the remediation activities will not affect protected species or their habitats.
- New York State Historic Preservation Office to identify any cultural or historic resources that may be present in the area of the Site.
- New York State Office of General Services to confirm ownership of lands under water.

The Remediation Contractor will be responsible for obtaining any other pertinent and applicable local, state, or federal permits or agreements specific to their work (e.g., coordinate with local agencies for any temporary traffic control within the adjacent roadways, Federal Aviation Administration permits for operation of a crane near an airport, etc.) and complete any required notifications.

4.3 Pre-Construction Structural Surveys

Prior to the Remediation Contractor's mobilization, the Remediation Contractor will contract with a third-party engineering firm to conduct pre- and post-remediation structural surveys at the locations defined in the Contract Documents. The pre-remediation survey will serve as the baseline for the post-construction

survey. The pre-construction survey will be conducted by a Professional Engineer licensed in the State of New York and will include, but not be limited to, visual inspection and photographic documentation of the existing conditions of the surface structures located at the following:

- 207 South Main Street (automotive shop)
- 215 South Main Street (former automotive shop)
- 4386 US Route 11 (museum)
- The private bridge (crossing the West Branch of the Tioughnioga River) located immediately upstream of 215 South Main Street
- The private bridge (crossing the West Branch of the Tioughnioga River) located immediately downstream of 4386 US Route 11
- The NYSW railroad bridge located immediately upstream of Area 2

The inspections will document the condition of the existing structures interior/exterior, as well as exterior features on the subject properties including, but not limited to; retaining walls; roads; utilities; poles; posts; signs; markers; curbs; sidewalks, and other facilities visible at or above the ground surface, as indicated in Specification Section 02 21 19, Structural Surveys (Appendix B).

A pre-construction structural survey report will be submitted to NYSEG and the Remediation Engineer prior to mobilization by the Remediation Contractor. The report will include written text, detailed photographs, and any relevant measurements or descriptions to document pre-remediation conditions of the aforementioned structures.

4.4 Remediation Contractor Pre-Mobilization Submittals

The selected Remediation Contractor will be required to prepare pre-mobilization submittals for review by NYSEG and the Remediation Engineer. Select submittals may be provided to the NYSDEC and/or NYSDOH for review and comment (as necessary). The Remediation Contractor will not be allowed to mobilize prior to review and approval of all required pre-mobilization submittals. These submittals will include, but not necessarily be limited to, the following:

- Insurance Certificate – The Remediation Contractor will provide an insurance certificate identifying NYSEG as primary insured (certificate holder). Policy limits required for the remedial activities are identified in NYSEG's standard terms and conditions for environmental remediation work included in the Contract Documents. The Remediation Contractor will not begin work prior to NYSEG approval of the insurance certificate. The insurance policy will be primary and non-contributory.
- Project Operations Plan (POP) – The Remediation Contractor will prepare and submit a POP presenting their detailed approach for implementing the pertinent work activities (incorporating, as necessary, plans, specifications, site maps, details, flow diagrams, charts, site geologic/geotechnical information, and schedules).
- Health and Safety Plan (HASP) – The Remediation Contractor will prepare and submit a site-specific HASP (for use by on-site personnel during the remedial activities) to provide a mechanism for establishing safe working conditions. The HASP will be prepared in accordance with all applicable rules and regulations, including 29 Code of Federal Regulations (CFR) 1910 and 29 CFR 1926, and will be prepared and/or approved by a Certified Industrial Hygienist. The Remediation Contractor is required to take all necessary precautions for the health and safety of on-site personnel in compliance

with all applicable provisions of federal, state, and local health/safety laws and the provisions associated with the HASP. The Remediation Contractor will assume sole responsibility for the accuracy and content of its HASP.

- Preliminary Progress Schedule – The Remediation Contractor will be required to prepare a preliminary schedule that identifies major work items and work sequences.

Additional requirements regarding the content of these pre-mobilization submittals and the overall submittal process are presented in the following Specification Sections (Appendix B):

- 01 15 00, Contractor's Project Operations Plan
- 01 32 16, Construction Progress Schedule
- 01 33 00, Submittal Procedures
- 01 35 23, Safety Requirements
- 01 35 29, Remediation Contractor's Health and Safety Plan

4.5 Pre-Construction Conference

A pre-construction conference will be held at the beginning of each construction season to designate responsible personnel, establish working relationships, discuss the preliminary schedule submitted by the Remediation Contractor, and review administrative and procedural requirements for the remedial construction activities. The Remediation Engineer will be responsible for coordinating the pre-construction conferences. Prior to the conferences, the Remediation Contractor will provide the required submittals as presented in Specification Section 01 31 19.13, Pre-Construction Conference (Appendix B).

5 REMEDIATION ACTIVITIES

This section presents a summary of the remedial activities to be conducted by the Remediation Contractor (except as identified otherwise herein). Refer to the Design Drawings (Appendix A), Technical Specifications (Appendix B), CERP (Appendix D), CP (Appendix F), and SWPPP (Appendix F) for additional details.

Additionally, the Remediation Contractor will complete construction activities in accordance with the Remediation Contractor's HASP and will be responsible for conducting worker health and safety and work zone air monitoring, for Remediation Contractor's employees, in accordance with Specification Section 01 35 29, Remediation Contractor's HASP (Appendix B).

As detailed in Table 5.1, remedial construction activities are anticipated to be completed in 2021 and 2022. Implementation of this work is highly weather-dependent and can only be performed when river flow conditions allow for remedial construction activities to be completed in a safe manner. Additionally, work may be limited due to time restrictions based on the required permits (e.g., the NYSDEC WQC prohibits in-river work between October 1 and May 15). Under certain conditions an extension of the in-river construction season may be requested (see Section 7 for additional details regarding in-river construction season extensions and the overall project schedule). As such, remedial construction activities described herein may extend into 2023 (or beyond).

The Remediation Contractor will make best efforts to complete the work identified within two construction seasons. As time allows (i.e., based on the in-river work window and regional weather), remediation activities will be conducted following the general sequence described in the table below.

Table 5.1 General Construction Sequence

Year	Activity
2021 – Area 1	• Mobilization and site preparation for Area 1 • Installation of temporary bypass culvert crossing and river bypass system • Excavation and restoration of Area 1 removal areas • Removal of temporary bypass culvert crossing and river bypass system • Restoration of Area 1 support areas • Installation of the railroad crossing at Area 2 (Fall 2021) • Clearing of NYSEG-owned property at Area 2 (Winter 2021/2022) • Demobilization from Area 1/winter shut down
2022 – Area 2	• Mobilization and site preparation for Area 2 • Installation of temporary bypass culvert crossing and river bypass system • Excavation and restoration of Area 2 removal areas • Removal of temporary bypass culvert crossing and river bypass system • Restoration of Area 2 support areas • Removal of railroad crossing and final Demobilization

A description of remediation activities, including references to supporting information to be included elsewhere in the Contract Documents, is presented in the following subsections. Note that the information

presented below does not provide a detailed description of the remedial construction activities to be completed each year, rather the text generally includes the overall approach/requirements for various remedial construction activities.

5.1 Project Support

This section presents the project support activities to be completed by the Remediation Contractor and/or the Remediation Engineer. Project support activities will be completed in accordance with the technical specifications and plans as presented in the following subsections.

5.1.1 Project Meetings

Project meetings to be attended by the Remediation Contractor are described below. Additional details for the meetings are presented in Specification Sections 01 31 19.13, Pre-Construction Conference and 01 31 19.23, Progress Meetings (Appendix B). Anticipated on-site project meetings will include, but not be limited to:

- Pre-Construction Conferences (as discussed in Section 4.5)
- Daily Safety (Tailgate Safety) and Coordination Meetings
- Weekly Construction Progress Meetings
- Pre-Final Inspections (Punch List)
- Final Inspection and Close-out Meetings

5.1.2 Survey Control

The Remediation Contractor will retain a New York State licensed surveyor to conduct survey control during the remediation activities. The Remediation Contractor will supply the survey information (including an as-built survey, signed and sealed by the Remediation Contractor's New York State licensed surveyor) to the Remediation Engineer for inclusion in the FER (see Section 6.1). Survey work associated with the remediation activities will be performed in accordance with Specification Sections 01 71 26, Construction Surveying and Layout and 01 78 39, Project Record Documents (Appendix B).

The Remediation Contractor will conduct the following topographic surveys in accordance with Section 01 71 26, Construction Surveying and Layout (Appendix B):

- Pre-construction survey of the upland support areas (e.g., OU-1 support area, OU-2 temporary support/access areas for Area 1 and Area 2, etc.) to be conducted prior to initiation of the remedial action.
- Pre-construction survey of the dewatered cell for each remedial area to be conducted after the area has been dewatered but prior to initiation of removal activities. During the pre-construction survey, the location of "monument boulders" (i.e., those measuring 2 feet in diameter or greater) will be documented, if any.
- Post-removal survey(s) of the excavation bottom of Area 1 and Area 2, prior to backfilling, to confirm horizontal and vertical limits of removal have been met.
- Interim survey(s) of the components such as, but not limited to, installation of support components (e.g., bypass culvert crossing, temporary river bypass system, quantity verification, etc.).

- Post-restoration survey of the restored areas, including the in-river areas (post-backfill) and upland support areas surveyed during the pre-construction survey. The post-construction survey of the removal areas will be completed at the same x,y coordinates as the pre-construction survey and will be performed prior to removal of the temporary river bypass system to confirm the areas have been restored to pre-removal grades.
- Post-construction survey of the upland restored areas will be conducted after completion of all site restoration activities to verify compliance with the Remedial Design prior to demobilization.

Requirements for vertical and horizontal surveys are presented in Section 01 71 26, Construction Survey and Layout (Appendix B) and the vertical tolerance for the comparison of pre-construction and post-restoration surveys is presented in Specification Section 31 23 00, Excavation and Fill (Appendix B).

5.1.2.1 Photographic Survey

The Remediation Contractor will conduct photographic surveys of all temporary support/access areas or affected properties, to be used during construction activities in accordance with Specification Section 01 71 26, Construction Surveying and Layout (Appendix B). Photographic surveys will be conducted as part of pre-construction (prior to start of work) and post-construction activities (following restoration/ demobilization) for each area. The pre-construction survey for each area will serve as the baseline for the post-construction survey of that area. If work at either area requires more than one construction season, a photographic survey to document interim conditions of all temporary support/access areas or affected properties (i.e., prior to winter shut down and prior to restarting work) will be completed.

5.1.2.2 Tree and Vegetation Survey

Prior to the removal of any trees or vegetation, the Remediation Engineer will conduct a pre-construction tree and vegetation survey of all areas that will be affected by the remedial construction activities. A tree survey will identify all live species of tree greater than 3 inches DBH and/or trees that may be considered a preferred habitat for threatened and/or endangered species. A vegetation survey will be completed to identify the dominant species by canopy, understory, and herbaceous layer. Observations made during the tree and vegetation survey (if significantly different from the surveys completed in 2017 and 2019) will be used to revise the final tree and shrub species types and numbers to be used for restoration (if necessary), as discussed in Section 5.9. Revisions to the restoration plan will be provided to the NYSDEC for review prior to the start of restoration activities.

5.1.3 Site Security, Control, and Access

Access to the project area will be restricted by installing temporary perimeter fencing and gates, as shown on Design Drawings G-103, G-104, and G-503 (Appendix A). Additional measures will be taken by the Remediation Contractor to further limit support and construction area access and security during the remedial activities, as described below. Security around active work areas, staging, handling, decontamination, and storage areas will be maintained during both work and non-work hours. The level of security will be dependent on the activities being performed and location of activities. Security measures to be implemented include:

- temporary perimeter fencing and/or barriers, warning tape, and signs

- maintenance of sign-in/sign-out sheets
- implementation of safe work practices
- use of private security (as necessary)

Temporary fencing/barriers will be installed and relocated, as needed, during the remedial activities to limit access to the active work area. Site security, control, access, and warning sign requirements are presented in Specification Sections 01 57 33, Security and 01 58 13, Temporary Project Signage (Appendix B). Specific methods to be used by the Remediation Contractor for site security, control, and access will be specified in the Remediation Contractor's Project Operations Plan.

Work activities will be coordinated with third-party property owners, as necessary, to maintain uninterrupted safe access 24 hours per day, 7 days per week for residents, visitors, and/or emergency response personnel in accordance with Specification Section 01 21 13, Project Coordination (Appendix B).

On-site traffic will be controlled during remedial activities. Prior to intrusive subsurface activities (e.g., installation of the temporary river bypass system), the Remediation Contractor will implement traffic control measures to preserve the safety of workers during performance of remedial activities. When construction vehicles travel over public roads, the Remediation Contractor will clean such paved surfaces a minimum of once per day when construction vehicles are traveling over roads (or more frequently as directed by Remediation Engineer).

Additional details regarding traffic controls are presented in Section 01 55 13, Temporary Access Roads and Parking Areas (Appendix B) and the CERP (Appendix D).

5.2 Mobilization

Mobilization will be initiated by the Remediation Contractor after notification from NYSEG to proceed. In general, mobilization activities include bringing personnel, equipment, and materials to the Site to support the remedial construction activities. Mobilization activities to be conducted by the Remediation Contractor each year (as necessary) include, but are not limited to, the following:

- Mobilizing and establishing three field office trailers: one to be utilized by the Remediation Contractor, and one to be utilized by the Remediation Engineer, and one to be utilized by the NYSDEC during implementation of the remediation activities. The trailers (and supporting telephone and internet services) will conform to the requirements presented in Specification Section 01 52 13, Temporary Field Offices (Appendix B).
- Coordinating with appropriate utilities to obtain electrical service and all necessary utilities for use during the remedial construction at Area 1 and Area 2, in accordance with Specification Section 01 51 05, Temporary Utilities.
    - At Area 1, utility connections are assumed to be completed from the utility poles located along US Route 11 (to be relocated to US Route 11 by others, prior to remedial construction). The Remediation Contractor will coordinate with National Grid (i.e., in early 2021) to facilitate the installation of new poles, transformers, and any other supporting appurtenances needed to provide the necessary electrical service to Area 1.
    - Based on preliminary discussions with National Grid, electrical service to Area 2 will be established from existing electrical lines/poles located along Morris Avenue. The Remediation

Contractor will coordinate with National Grid (i.e., in mid- to late-2021) to facilitate the installation of new poles, transformers, and any other support appurtenances needed to provide the necessary electrical service to Area 2, following the clearing of existing trees at Area 2 (i.e., in late 2021/early 2022).

- Providing and maintaining first-aid facilities and portable sanitary services for use by on-site personnel engaged in the remediation activities. First-aid and portable sanitary services will conform to the requirements presented in Specification Section 01 52 16, First-Aid Facilities and 01 52 19, Sanitary Facilities (Appendix B).
- Preparing and providing submittals (in addition to the pre-mobilization submittals) in accordance with Specification Section 01 33 00, Submittal Procedures (Appendix B) to Remediation Engineer and/or NYSEG for review as required by the Contract Documents (e.g., Design Drawings, Technical Specifications, etc.). Select submittals may be provided to the NYSDEC for review and comment.
- Obtaining any additional permits not identified in Section 4.2. The Remediation Contractor will be responsible for obtaining local permits (e.g., city building and/or construction permits) necessary to facilitate the remediation activities.

5.3 Site Preparation

During mobilization activities, the Remediation Contractor will also perform site preparation activities. The Remediation Contractor will inspect and confirm the condition of installed facilities prior to the start of construction.

Site preparation activities for all areas will generally consist of the following:

- Verifying site conditions and identifying, marking, and verifying the locations of aboveground and underground utilities, equipment, and existing structures and site features (e.g., manholes, outfalls, buildings), as necessary, to implement the remediation activities and in accordance with Section 01 71 33, Protection of Work and Property (Appendix B). Current site conditions (i.e., a site plan and approximate locations of known existing utilities) are shown on the Design Drawings (Appendix A).
- Coordinating with utility owners, subcontracting with a private utility locator, and contacting Dig Safely New York (Dig Safely) to initiate a subsurface utility clearance request, a minimum of three business days before the start of the remedial activities, to identify and mark the locations of underground utilities (e.g., electricity, telecommunications, water, natural gas, and storm and sanitary sewer) and associated structures at and near the work areas, as presented in Specification Section 01 71 33, Protection of Work and Property (Appendix B). If the Remediation Contractor damages existing utilities, equipment, or structures, the Remediation Contractor will be responsible for notifying the utility company/municipality and fully repairing all damages at no additional cost to NYSEG. Repairs (if necessary) will be completed in accordance with all requirements of the utility company/ municipality.
- Establishing temporary access roads and parking in accordance with Specification Section 01 55 13, Temporary Access Roads and Parking Areas (Appendix B). For work at Area 2, the Remediation Contractor will coordinate with the NYSW for construction of a temporary railroad crossing. Based on information provided by NYSW, the Remediation Contractor will be required to hire a NYSW-selected contractor to construct the temporary railroad crossing (consistent with the railroad crossing design included as Attachment 1, which was prepared by NYSW's design engineer). Additionally, the

Remediation Contractor will be required to hire NYSW's design engineer to provide oversight during construction of the temporary crossing.

- Completing pre-construction surveys and establishing survey control and work limits as noted in Section 5.1.2.
- Installing structural monitoring points as discussed in Section 5.4.3.
- Erecting project signs in accordance with Specification Section 01 58 13, Temporary Project Signage (Appendix B).
- Installing temporary erosion, sediment, and turbidity controls in accordance with the Design Drawings (Appendix A) and Specification Sections 01 57 05, Temporary Controls and 01 41 26, SWPPP and Permit (Appendix B).
- Installing temporary flood contingency measures, if needed based on weather and river conditions while river bypass system is in place, as shown on Design Drawings G-103 (Appendix A).
- Tree removal and grubbing activities in accordance with Section 31 11 00, Clearing and Grubbing (Appendix B). Tree removal and grubbing beyond that required to support site preparation for sediment removal activities are prohibited. Trees and shrubs will be removed only as necessary to complete the remedial construction activities and will be performed in accordance with permit requirements. The Remediation Contractor will not complete clearing and grubbing until a tree and vegetation survey is performed by the Remediation Engineer, in accordance with Section 5.1.2.2.[2]
- Installing work zone air monitoring equipment (to be relocated, as appropriate, based on wind direction) as required by the Remediation Contractor's HASP.
- Installing site control and safety measures, including temporary site security fencing and gates and project/warning signs in accordance with Section 5.1.3.
- Performing general site preparation to support staging of office trailers and the temporary water treatment system (TWTS) and constructing/improving the foundation pads (e.g., for the TWTS).
- Constructing temporary remediation support areas including, but not limited to; impacted material staging areas; on-site storage areas (for clean materials); and equipment, material, and personnel decontamination areas. The locations available for Remediation Contractor staging/support are shown on Design Drawings G-103 and G-104 (Appendix A). Remediation support area construction requirements are detailed in the following Specification Sections (Appendix B):
  - 02 61 15, Handling and Disposal of Impacted Materials
  - 02 51 00, Decontamination
  - 31 05 05, Aggregates for Earthwork
  - 31 05 19.13, Geotextiles for Earthwork
  - 31 05 19.16, Geomembranes for Earthwork

  The Remediation Contractor will be responsible for maintaining the remediation support areas (including the integrity of the liner systems) as necessary during implementation of the remedial activities.
- Constructing and testing the TWTS as shown on Design Drawing C-601 and C-602 (Appendix A) and in accordance with Section 01 53 53, Temporary Water Treatment and Management (Appendix B).

[2] To the extent possible, trees will be removed during the hibernation period (November 1 to March 31) for the northern long-eared bat (NLEB), a federally listed threatened species under the Endangered Species Act. Limited tree clearing in the summer is anticipated to be approved under the 4(d) rule guidance as the tree clearing activity will not have a significant effect on the NLEB.

Refer to Design Drawings (Appendix A) and Technical Specifications (Appendix B) for additional information regarding site preparation.

5.4 Temporary Controls and Monitoring

The Remediation Engineer and Remediation Contractor will share responsibilities for monitoring for impacts to workers and the surrounding community throughout the remedial construction.

The Remediation Engineer will be responsible for implementing the following:

- Vapor and dust perimeter air monitoring

The Remediation Contractor will be responsible for implementing the following:

- Worker breathing zone air monitoring (for the Remediation Contractor's employees)
- Turbidity and surface water quality monitoring
- Structural monitoring
- Weather/surface water elevation monitoring
- Noise Monitoring, as necessary

The Remediation Contractor will also be responsible for implementing corrective actions in consultation with the Remediation Engineer and NYSEG in the event of an exceedance. Monitoring requirements, action levels and corrective actions are detailed in attached technical specifications and plans as presented in the following subsections.

5.4.1 Vapor, Dust, and Odor Monitoring

The Remediation Engineer will perform vapor, dust, and odor perimeter air monitoring and submit a daily CAMP report to NYSEG, the Remediation Contractor NYSDEC, and NYSDOH. Vapor and dust monitoring action levels, appropriate corrective actions, and reporting requirements are presented in Specification Sections 01 35 49, CAMP; 01 57 05, Temporary Controls (Appendix B) and the CAMP (Appendix C).

In the event of an exceedance of an air monitoring action level for either vapors or dust, the Remediation Engineer will notify NYSEG as soon as the exceedance is identified. The Remediation Engineer will send a follow-up e-mail to NYSDEC, NYSDOH, NYSEG, and the Remediation Contractor within 24 hours of an exceedance that summarizes the data, the cause of the exceedance, and corrective measures implemented (or to be implemented) in response to the exceedance. Work will not continue until exceedances are addressed in consultation with NYSEG and the Remediation Contractor. Real time exceedances will be addressed immediately in consultation with the Remediation Contractor.

The Remediation Contractor will perform worker breathing zone air monitoring. Information regarding worker breathing zone monitoring will be included in the Remediation Contractor's HASP, submitted in accordance with Specification Section 01 35 29, Remediation Contractor's HASP (Appendix B).

5.4.2 Turbidity Control and Surface Water Quality Monitoring

Best management practices (BMPs) will be used to minimize turbidity caused by construction-related activities. BMPs will include, but are not limited to, the following:

- A sequenced/phased construction approach
- Minimizing water infiltration into the active work area, to the extent practicable
- On-site water management and treatment
- Landside erosion and sedimentation controls

In addition to those BMPs, a turbidity (silt) curtain will be used during in-river construction work and potential disturbance activities to limit the migration of re-suspended sediment downstream of the work area. Prior to installing the sheet pile, the turbidity curtain system will be installed within the West Branch of the Tioughnioga River downstream of the area in which the temporary river bypass system is being installed, as indicated on Design Drawings C-101 and C-104 (Appendix A). The turbidity curtain system will be constructed in accordance with Design Drawing G-501 (Appendix A). The Remediation Contractor will maintain the turbidity curtains downstream of each of the sediment removal areas throughout sediment removal operations and until removal of the temporary river bypass system is complete.

In accordance with Specification Section 01 57 05, Temporary Controls (Appendix B), the Remediation Contractor will perform both qualitative and quantitative turbidity monitoring at two locations (for each remediation Area) in the West Branch of the Tioughnioga River, including one location upstream of the active work area and one location downstream of the active work area. Preliminary turbidity monitoring locations are detailed on Design Drawing C-101 and C-104 (Appendix A). Final locations will be determined based on field conditions/accessibility and the need to maintain a safe distance from the active work area. During work hours, turbidity monitoring will consist of real-time turbidity monitoring stations at the locations upstream and downstream of the active work area and periodic qualitative visual monitoring. The Remediation Contractor will provide the Remediation Engineer and NYSEG with access to the real-time turbidity data.

The upstream location will represent the background turbidity level for comparison to the downstream location. Turbidity levels will be logged and transmitted a minimum of every 15 minutes. Based on a quantitative differential between the upstream and downstream monitoring locations and/or qualitative observation of contrast between the water quality upstream and downstream of the site, exceedance criteria and appropriate response actions have been established, as specified in Section 01 57 05, Temporary Controls (Appendix B). The early warning level is based on a quantitative differential of more than 25 but less than 50 nephelometric turbidity units (NTU), while the action level is based on a differential of more than 50 but less than 100 NTU. If a differential of more than 100 NTU is observed, work activities will be temporarily ceased.

5.4.3 Structural Monitoring

The Remediation Contractor will be responsible for installing vibration (seismographs) and optical monitoring points and conducting associated monitoring throughout the remedial construction. Structural monitoring will consist of vibration and optical survey monitoring of structures immediately adjacent to excavation areas. Optical survey points and vibration monitoring equipment will be installed at the locations shown on Design Drawings C-101 and C-104 (Appendix A). Details for geotechnical instrumentation, installation, and monitoring (including notification and action levels) are presented in Specification Section 31 09 13, Geotechnical Instrumentation and Monitoring (Appendix B).

5.4.4 Weather/River Level Monitoring

The Remediation Contractor will install staff gauges (or equivalent) upstream of the temporary river bypass system, along the sheet pile center line, and downstream of temporary river bypass system to facilitate monitoring of river elevations during bypass operations. The Remediation Contractor will conduct weather and river level monitoring, and implement response actions (e.g., evacuation of personnel and equipment from the river) as necessary and as indicated in the CP (Appendix E).

5.4.5 Noise

The Remediation Contractor will be responsible for minimizing noise emissions caused by construction operations, to the extent practical, and complying with all applicable laws and local ordinances.

5.4.6 Spills

All spills and unexpected subsurface petroleum impacts will be reported to the NYSDEC spills hotline (1-800-457-7362). The Remediation Engineer will be responsible for reporting issues related to unanticipated environmental impacts and the Remediation Contractor will be responsible for reporting spills (e.g., due to equipment leaks). Spills which do not require emergency response may be assigned to NYSDEC's project manager. Spill response actions to be implemented by the Remediation Contractor are detailed in the CP (Appendix E).

5.5 Temporary River Bypass System and River Crossing

The Remediation Contractor will install a temporary river bypass system around the sediment removal areas in a phased approach (as detailed on Design Drawings C-101 and C-104, Appendix A) to divert the river flow around the active work area such that removal can be performed in the dry, to the extent feasible, and to control turbidity generated as a result of performing the remediation activities.

The temporary river bypass system will primarily consist of sheet piles driven into the riverbed, installed in accordance with Section 31 50 00, Excavation Protection (Bypass System) (Appendix B). Sealed joints will be used between sheets to reduce water infiltration into the active work area. The approximate locations of the temporary river bypass system are illustrated on Design Drawings C-102 and C-103 (for Area 1) and Design Drawings C-105 and C-106 (for Area 2). To simplify the construction of cells on opposite sides of the river (i.e., Areas 1B and 1C and Areas 2B and 2C) the centerline steel sheet pile will remain in place and be common for removal on the left and right sides of the river, wherever possible. Profiles for the centerline sheet pile are shown on Design Drawings S-201 through S-204 (Appendix A). Once survey results confirm that remediation and restoration have been completed in accordance with the Remedial Design the temporary river bypass system will be removed.

In areas where use of sheet pile is prohibited (i.e., due to overhead obstructions), an alternate river bypass system comprised of concrete blocks and liner will be required (see Design Drawing C-501, Appendix A). The alternative river bypass system may be modified as necessary based on field conditions; additional alterations will be presented to NYSDEC for review/approval prior to installation.

A temporary river crossing will be installed to facilitate construction vehicles to access the east riverbank of Area 1 and facilitate access to the western sediment removal areas in Area 2. The approximate

locations of the temporary river crossings for the various phases of work are illustrated on Design Drawings C-102 and C-103 (for Area 1) and Design Drawings C-105 and C-106 (for Area 2). River crossing details are shown on Design Drawing C-501 (Appendix A). The temporary river crossing generally consists of steel caissons overlain stone fill, and rip rap. As designed, the estimated weight capacity for the temporary river crossing system is a maximum live load of 32 tons for wheeled equipment and 90 tons for tracked equipment.

As noted in Section 2, the Remediation Contractor will temporarily place larger backfill material in the active portions of the Area 2 to mitigate the potential for erosion of existing river material. Locations requiring placement of additional material are shown on Design Drawing C-104 (Appendix A). Additionally, the Remediation Contractor is required to monitor for scour at all areas during bypass operations and place additional material, as necessary to mitigate observed erosion.

5.6 Water Management and Treatment

Prior to initiating excavation operations, a TWTS will be constructed at the areas available for contractor support/laydown shown on Design Drawings G-103 (Area 1) and G-104 (Area 2) (Appendix A). Water generated from dewatering the excavation area and from the gravity dewatering of the excavated material will be collected and conveyed to the TWTS for treatment.

The TWTS is designed to remove suspended solids, oil and grease, insoluble metals, volatile organic compounds, and semi-volatile organic compounds from the water. The Remediation Contractor will be responsible for the setup and operation of the temporary TWTS and achieving the discharge criteria specified in the SPDES Permit Equivalent (to be obtained by the Design Engineer prior to commencing remedial construction activities). The Remediation Contractor will be required to conduct system start-up testing in accordance with Section 01 53 53, Temporary Water Treatment and Management (Appendix B) and for conducting water quality sampling required under the SPDES Permit Equivalent. Requirements for temporary TWTS components are provided on Design Drawings C-601 and C-602 (Appendix A) and in Section 01 53 53, Temporary Water Treatment and Management (Appendix B). Treated water will be discharged to the West Branch of the Tioughnioga River under the SPDES Permit Equivalent. Residuals from the TWTS (i.e., settled solids, expended filter bags, granular activated carbon media, and organoclay) will be handled and disposed of with the excavated material.

Surface water within the work area more than one foot above the original (i.e., pre-excavation) riverbed elevation may be pumped over the temporary river bypass system and back into the West Branch of the Tioughnioga River (assuming no sheens are observed on the water column). Surface water within one foot of the original riverbed elevation will be pumped from within the work area to the on-site TWTS for treatment prior to discharge. Dewatering pumps (and associated conveyance piping) will be installed within each removal area in sufficient quantity and capacity to depress the surface water level within the removal area to expose the riverbed and will be determined by the Remediation Contractor based on infiltration rates encountered in the field and in accordance with Section 01 51 41, Temporary Pumping (Appendix B). Once the area is dewatered, to the extent practicable, targeted sediment will be excavated and clean fill will be backfilled, as described in the following subsections.

5.7 Material Excavation

As indicated above, detailed excavation sequences are presented on Design Drawings C-101 and C-104 (for Areas 1 and 2, respectively). The Remediation Contractor will remove sediment to the limits shown on Design Drawings C-102 and C-103 (Area 1) and Design Drawings C-105 and C-106 (Area 2). An estimated 9,950 cubic yards (neat-line, in-situ) of material will be removed over two construction seasons. In general, excavations will be sequenced such that upstream areas are remediated and backfilled first followed by the downstream areas.

Prior to conducting sediment removal activities in each respective removal area, the Remediation Contractor will divert the outfalls that currently discharge into the area to flow outside of the temporary river bypass system, as indicated on Design Drawing G-002 (Appendix A). Diversion options will be evaluated by the Remediation Contractor and included in the Contractor's POP.

Sediment removal activities will be conducted "in the dry" within the temporary river bypass system in accordance with Section 31 23 00, Excavation and Fill (Appendix B). Sediment will be removed using conventional equipment working from upstream to downstream, minimizing the potential for cross-contamination of the remediated areas. Excavation equipment may be positioned on the access roads constructed at the top of the riverbank or positioned within the dewatered riverbed, if feasible, and based on the Remediation Contractor's discretion.

As indicated in Section 2, excavation limits have been extended to the vegetation/scour line (i.e., the MHWL). Sediment removal areas based on presence of visual impacts or total PAH concentrations greater that 6.2 mg/kg are shown on Figures 2 through 4. Sediment removal will be completed as follows:

- At locations where sediment removal is being conducted solely due to elevated PAH concentrations (i.e., total PAHs > 6.2 mg/kg), sediment removal will be completed to the limits presented on the Design Drawings.
- Where sediment removal is being conducted due to the presence of visual impacts, as the excavation progresses, if visual impacts are not observed, sediment removal may be terminated prior to reaching the design removal limits. Any potential reductions to the sediment removal limits will be presented to NYSDEC for review and approval prior to terminating sediment removal activities.
- If visual impacts are observed beyond the design removal limits, visually impacted sediment will be removed. Any potential expansion to the sediment removal limits will be presented to NYSDEC for review and approval prior to conducting additional sediment removal activities.

As indicated Arcadis' September 20, 2019 comment response letter (Arcadis 2019c), NYSEG may elect to conduct additional sampling (prior to remedial construction) to further delineate the extent of elevated PAH concentrations at select locations. As indicated above, any potential reductions to the sediment removal limits will be reviewed and approved by NYSDEC.

If, based on surrounding site conditions/geotechnical stability, the removal limits cannot expand enough to remove observed coal tar impacts, the area will be filled with minimum 1-foot layer of low-permeability clay prior to placing backfill/restoration materials, unless an alternate approach is approved by the NYSDEC. Any observed impacts within the riverbank that cannot be removed will be evaluated in consultation with the NYSDEC. It is anticipated that such impacts, if any, will likely by addressed by a

subsurface containment or barrier system (e.g., clay backfill). Means to address these impacts will be evaluated and discussed with NYSDEC prior to implementation.

5.8 Excavated Material Handling and Management

In general, sediment, debris, and miscellaneous wastes generated during the remedial activities will be handled and disposed of/treated off-site in accordance with applicable federal, state, and local regulations, as well as Section 02 61 15, Handling and Disposal of Impacted Sediments and Debris (Appendix B).

Removed sediment and debris (if present) will be loaded from the dewatered removal areas and transported to the upland support areas for further handling and management. Excavated material is anticipated to be hauled to the upland support areas via the temporary access roads. If transportation is required on public roadways, trucks will be lined and equipped with sealed tailgates. If the tires of the truck to be used for transport come into contact with the removal area, the tires will be cleaned in accordance with Section 02 51 00, Decontamination (Appendix B) prior to transport outside of the removal area.

Excavated material transported to the impacted material staging areas will be dewatered via gravity Boulders greater than 2 feet in diameter will be separated and stockpiled for cleaning via pressure washer, as necessary, and staged for reuse as river backfill (e.g., monument boulders, riffles) during backfilling/restoration activities. The impacted material staging area includes provisions for wash water collection (to support conveyance to the TWTS).

The remaining excavated material will be stockpiled within the impacted material staging area for additional dewatering with a drying agent (e.g., Portland cement, cement kiln dust), as necessary, to meet the required moisture content for over-the-road transport (i.e., achievement of the United States Environmental Protection Agency's "Paint Filter Test") and/or the requirements of the off-site treatment/disposal facility.

Attempts will be made to reduce the need for drying agents, such as blending drier material with other material that is more saturated. It is anticipated that solidification agents, if any, will be mixed at less than 10% by volume with the removed sediment to make it suitable for transport for off-site disposal. The Remediation Contractor may elect to perform a treatability test to support selection of the optimal drying agent and dosage rate prior to construction and/or modifying the drying agent and dosage rate during construction based on Paint Filter Tests.

Following chemical dewatering, the stockpiled material will be covered with polyethylene sheeting. Prior to load out, the stockpiled material will be sampled by the Remediation Contractor for waste characterization in accordance with the requirements of the selected thermal desorption facility. Following receipt of waste characterization analytical results, stockpiled material will be loaded out in dump trailers for transportation to selected thermal desorption facility. All trucks transporting material off-site will be lined and be equipped with a sealed tailgate.

Anticipated waste characterization parameters are provided in Section 02 61 15, Handling and Disposal of Impacted Sediments and Debris (Appendix B). The treatment and/or disposal facilities will be selected and/or approved by NYSEG. Sediment impacted with visible NAPL, if any, will be considered conditionally exempt and will be treated by LTTD. Removed debris free of visible impacts (e.g., brick and concrete) will

be disposed of at an appropriate facility selected by NYSEG and handled in accordance with Section 02 61 15, Handling and Disposal of Impacted Sediments and Debris (Appendix B). Non-visually impacted sediment and miscellaneous non-hazardous solid waste (if any), will be transported to Seneca Meadows Landfill for disposal.

5.9 Riverbed, Bank, and Upland Restoration

In general, following the completion of excavation activities, the removal areas will be backfilled and restored to match pre-construction elevations. The Remediation Contractor will propose backfill materials from sources meeting the requirements specified in Section 31 05 05, Aggregates for Earthwork (Appendix B). The Remediation Engineer will be responsible for conducting analytical and geotechnical testing to verify that the proposed materials meet project specifications. The Remediation Engineer will provide NYSDEC with testing results and NYSDEC's "Request to Import/Reuse Fill or Soil," form. Sediment removal areas will be backfilled in accordance with the requirements presented in Section 31 23 00, Excavation and Fill (Appendix B).

The restoration components described below are illustrated on Design Drawings C-107 through C-114, and the associated cross sections, details, and planting schemes are provided on Design Drawings C-503 through C-506 (Appendix A). Additional restoration requirements are presented in Specification Sections (Appendix B):

- 31 23 00, Excavation and Fill
- 32 12 00, Flexible Paving
- 32 90 00, Plantings and Restoration

Final placement of plantings may be varied in the field based on site conditions and under the direction of the Remediation Engineer's ecologist.

In addition, removal areas beyond the design removal limits that require excavation, based on visual impacts, will be backfilled and restored to match pre-construction elevations. Restoration plans for all additional removal/staging areas will be submitted to the NYSDEC for review/approval prior to implementation.

5.9.1 Riverbed Restoration

The riverbed (i.e., the area below the MHWL) will be restored to pre-construction elevations, lines, and grades using imported materials meeting the Class A Sediment Guidance Values (SGVs) as presented in Screening and Assessment of Contaminated Sediment (NYSDEC 2014). Emergent vegetation plugs will be installed within the river where existing wetlands have been delineated. Any "monument boulders" surveyed during the pre-construction survey will be replaced at the approximate pre-construction locations. Riffles and runs observed and documented as part of pre-removal surveys will be restored to match pre-construction conditions. Excavated material that is segregated and suitable for reuse (i.e., boulders greater than 2 feet in diameter) will be used as part of the riverbed restoration, with NYSDEC approval.

5.9.2 Bank Area Restoration

The Remediation Contractor will generally restore the bank areas (i.e., above the top of slope, below the top of bank) disturbed as a result of remedial activities (i.e., sediment/bank excavation). At Area 1 and Area 2, the full lengths of the eastern banks are assumed to be disturbed to facilitate construction of the crane access road and ultimately facilitate excavation/backfilling activities. As a conservative measure, this Remedial Design assumes that the entire western bank of Area 1 and select portions of the western bank at Area 2 will be disturbed (i.e., based on potential excavation of sediment removal areas). However, the Remediation Contractor will only disturb those areas necessary to complete the required sediment removal activities presented herein. Bank restoration will generally consist of the following:

- Emergent Vegetation Planting Area – located below the typical mean baseflow where wetlands have been previously delineated. Based on as-built conditions (i.e., post-construction topography, which should match pre-construction topography), the target areas of emergent vegetation plugs will be determined by water elevations corresponding to typical mean baseflow conditions, which corresponds to water depths of up to 4 inches along the restored shorelines (where baseline wetlands currently exist). For the purpose of this design, this planting area is assumed to be located 5 feet below the MHWL.
- Inundated Shoreline Planting Area – located above the Emergent Vegetation Planting Area (or the MHWL where the Emergent Plug Planting Area is not present) to the 1.25-year storm interval elevation (for steep sloped banks) or the approximate top of bank (for shallow sloped banks). This area will generally consist of live stake or shrub species (as appropriate based on bank slope) and vegetated topsoil (i.e., using the emergent wetland seed mix). Additionally, for shallow slope banks, trees will also be planted within the upper portion of this restoration area.
- Bank Planting Area – located above the 1.25-year storm interval elevation to the approximate top of bank. This area will consist of shrubs, trees (where bank slopes are shallow), and vegetated topsoil (i.e., using the bank seed mix).

Additionally, the western bank in the downstream portion of Area 1 has been disturbed by others and is largely covered with rubble/debris. Given the existing bank slopes and modeled river velocities, additional armoring is required (if this bank area is further disturbed during remedial construction). The riprap stability areas will consist of soil-choked riprap covered with vegetated topsoil (i.e., using the bank seed mix) and covered with a biodegradable erosion control blanket to protect the soil and seed from erosion until vegetation develops.

5.9.3 Upland Restoration

The Remediation Contractor will generally restore the upland areas (i.e., above the top of bank) disturbed as a result of remedial activities (i.e., temporary support areas and other ancillary areas) consistent with pre-construction conditions and elevations, or will be restored as agreed upon in the forthcoming property access agreement(s).

Area 1 upland restoration will consist of floodplain planting, grass planting, gravel restoration, and asphalt pavement restoration areas. Consistent with existing site conditions, the floodplain planting areas east of the river will include trees and shrubs. The remainder of the floodplain planting area (and wetland meadow planting area) will be restored with vegetated topsoil (i.e., using the wet meadow and floodplain

seed mixes). Note that the crane access road area will be restored with soil that is excavated and staged immediately adjacent to the access road.

Area 2 upland restoration will consist of floodplain and upland planting areas. The floodplain planting area will extent 50 feet inland from the MHWL and consist of trees/shrubs and vegetated topsoil (i.e., using the floodplain planting seed mix). The remaining upland portion of Area 2 will be restored as the upland planting area, consisting of vegetated topsoil only (i.e., using the upland seed mix).

The Remediation Contractor will be responsible for removing all ancillary components of the temporary railroad crossing (e.g., ramps, signage, gates, etc.). Per NYSW's request, the NYSW-selected contractor that constructed the temporary railroad crossing will remove the temporary crossing and restore the railroad to pre-construction conditions.

5.9.4 Sequencing and Schedule

Bank and upland restoration activities will be implemented in a phased approach as construction progresses. The anticipated sequence and schedule for implementation of restoration is as follows:

- Following completion of the Area 1 remedial construction activities, the restoration plan specified herein will be implemented for all areas disturbed during remedial activities. Assuming construction activities within Area 1 are completed in 2021, the "Year 1" monitoring and maintenance activities for this area will begin in 2022.
- Following completion of the Area 2 remedial construction activities, the restoration plan specified herein will be implemented for all areas disturbed during remedial activities. Assuming construction activities within Area 2 are completed in 2022, the "Year 1" monitoring and maintenance activities for this area will begin in 2023.

If the schedule for remedial construction activities is modified (see Section 7), the restoration sequence presented above will be updated accordingly.

To promote the greatest potential for vegetation survival and health, live stakes will be installed when dormant (i.e., before budding out) in early spring (no later than mid-May), if possible. If live stakes cannot be planted in the spring (due to high-flow conditions), NYSEG will consider planting in early fall or deferring to the following spring. Emerging vegetation will be planted in early summer (i.e., May to June) when water depths are approximately 1 to 4 inches. Trees and shrubs will be planted in the spring or fall and will not be planted in the summer months (i.e., not between mid-June and mid-September). Vegetation will not be planted if the given restoration area is inundated by water. Additional sequencing and scheduling requirements are presented Section 32 90 00, Plantings and Restorations (Appendix B).

5.10 Project Closeout

This section presents the project close-out activities to be completed by the Remediation Contactor.

5.10.1 Decontamination

The Remediation Contractor will decontaminate (as necessary), within the constructed decontamination area, all personnel and equipment, and vehicles that come into contact with excavated materials. All construction vehicles leaving the Site (including vehicles that had been transporting clean fill) will be

cleaned and/or decontaminated by the Remediation Contractor (as necessary) to prevent the tracking of soil off-site.

At a minimum, the Remediation Contractor will decontaminate the Remediation Contractor's project equipment that comes in contact with removed sediment materials (including, but not limited to, sediment removal, transport, and blending equipment, trucks, liquid handling equipment, pumps, and hand tools) prior to demobilizing and prior to handling clean material in accordance with Specification Section 02 51 00, Decontamination (Appendix B). The Remediation Contractor will perform decontamination activities until no visible soil, sediment, debris, or stains are present on the equipment surfaces (to the satisfaction of NYSEG and/or the Remediation Engineer). Equipment, such as pumps, will be flushed using clean water and appropriate cleaning agents (as necessary) to the satisfaction of NYSEG and/or the Remediation Engineer.

Unless otherwise directed by NYSEG and/or the Remediation Engineer, any equipment to be removed from the Site by the Remediation Contractor will be subject to a final visual inspection by NYSEG, the Remediation Engineer, and/or NYSDEC following cleaning. Precautions will be taken to limit contact between the equipment, personnel performing the cleaning activities, and any cleaning liquids that may accumulate in the decontamination area. The decontamination/wash area includes provisions for wash water collection (to support conveyance to the TWTS), and any water generated during decontamination activities will be treated in accordance with Specification Section 01 53 53, Temporary Water Treatment and Management (Appendix B).

5.10.2 Post-Construction Structural Survey

The post-construction structural surveys will be conducted by the same third-party engineering firm that conducted the pre-construction structural surveys. The post-remediation structural survey will be conducted consistent with the pre-construction structural surveys and include, but not be limited to, visual inspection and photographic documentation of the subject structures, in accordance with Specification Section 02 21 19, Structural Surveys (Appendix B). A post-construction structural survey report will be submitted to NYSEG and the Remediation Engineer within two weeks following the inspection.

Any damage to existing structures (caused by negligent activities by the Remediation Contractor), will be repaired by the Remediation Contractor, at no additional cost to NYSEG.

5.10.3 Post-Construction Photographic Survey

The Remediation Contractor will conduct photographic surveys of all temporary support/access areas or affected properties, used during construction activities in accordance with Specification Section 01 71 26, Construction Surveying and Layout (Appendix B). Photographic surveys will be conducted as part of post-construction activities (following restoration/demobilization) and compared to the pre-construction photographic survey.

5.10.4 Demobilization

As this project is anticipated to be performed over two construction seasons, the Remediation Contractor will temporarily demobilize from the Site following completion of work at Area 1 (i.e., 2021) and fully demobilize from the Site following completion of work at Area 2 (i.e., 2022). Following completion of

remedial construction activities at the end of each season, the Remediation Contractor will conduct the following demobilization activities in accordance with Specification Sections 01 74 05, Cleaning, 01 77 19, Closeout Requirements, and 01 78 39, Project Record Documents (Appendix B) for either temporary or final demobilization:

- Completion of “punch list” items, to be identified by the Remediation Engineer and NYSEG.
- Removal of the temporary river bypass system, turbidity control system, and any other work area(s), support area(s), staging area(s), decontamination area, equipment, or material installed or staged outside of the contractor support/laydown area.
- Removal and disposal of all impacted materials from the material stockpile areas including the decontamination/wash area.
- For each contractor support/laydown area, dismantle the work area(s), temporary import or impacted material staging area(s), and decontamination area specific to that phase of work, if not to be used in a subsequent season. If work area(s), staging area(s), and other support areas are to be used in subsequent seasons, the Remediation Contractor will ensure they are left in a clean, neat, stable, and orderly condition.
- Remove specified erosion and sediment control measures, as presented under Section 5.4, when the remedial activities are completed, and vegetation is established with a minimum 80 percent density.
- Transport residual wastes (e.g., disposable equipment; personal protective equipment; sampling equipment; cleaning residuals; sacrificial soil and liners from the material staging, and equipment decontamination areas) remaining at the completion of the remedial activities for off-site disposal in accordance with applicable rules and regulations.
- Remove/dispose of project-related material, equipment, and support structures from the project area, as appropriate based on the work remaining to be completed the following season.
- Prepare and provide required final field records and submittals to the Remediation Engineer.

Upon completion of all remedial actions at the Site, the Remediation Contractor will also appropriately remove/dispose all equipment and support structures from the Site, unless owned by NYSEG. For those materials and support structures owned by NYSEG, the Remediation Contractor will ensure they are left in a clean, neat, stable, and orderly condition, unless otherwise requested by NYSEG.

6 POST-REMEDIATION ACTIVITIES

Activities to be conducted following the completion of remediation activities at the Site include the following:

- Preparing a FER
- Updating the existing SMP to include post-construction monitoring and maintenance activities required for OU-2
- Updating the preliminary MMP to detail the post-construction vegetation monitoring activities, if necessary

General requirements for the content of the FER, SMP, and MMP are described below.

6.1 Final Engineering Report

The Remediation Engineer will prepare and submit a FER to the NYSDEC at the conclusion of OU-2 construction to document the remedial construction activities completed for both OU-1 and OU-2. As indicated in Section 1, previously completed remedial activities were documented in the January 2015 Draft CCR (Arcadis 2015). The FER will present a combination of the previously prepared construction documentation for OU-1 and the upland portion of OU-2, along with the documentation generated for OU-2 in-river remedial construction.

The FER will be prepared in accordance with DER-10 (NYSDEC 2010b) and the NYSDEC Generic Template for Final Engineering Reports (available on the NYSDEC website). At minimum the FER will present, the following information:

- Description of the remediation activities, including variations, if any, from the NYSDEC-approved Remedial Design.
- Record (“as-built”) drawings, tables, and figures detailing the remediation activities completed and indicating that acceptance criteria were met.
- Information and documentation regarding the final quantities and disposition of materials disposed of/treated off-site during implementation of the remediation activities, including executed manifests and BOLs.
- Summaries of field observations, test performed, laboratory samples collected, and monitoring results obtained during construction (e.g., turbidity and CAMP monitoring).
- Summaries of problems and deficiencies encountered during construction, including recurring problems and/or deficiencies discovered.
- Representative photographs taken during implementation of the remediation activities.
- Copies of regulatory permits and other key regulatory agency correspondence related to the permits and permit compliance.
- Certification statement signed and sealed by a professional engineer licensed in New York State.

A draft FER will be submitted to NYSDEC for review. Following receipt of NYSDEC comments, the FER will be revised accordingly and a stamped/signed final version of the FER will be submitted to NYSDEC.

6.2 Site Management Plan

As indicated in Section 1, a NYSDEC-approved SMP for the upland portions OU-1 and OU-2 was issued in March 2016. The Remediation Engineer will prepare a revised SMP that encompasses any post-construction monitoring activities associated with the in-river portion of OU-2 (if necessary). The revised SMP will be submitted to NYSDEC for review. Following receipt of NYSDEC comments, the SMP will be revised accordingly and a stamped/signed final version of the SMP will be submitted to NYSDEC.

Following receipt of the NYSDEC-approval of the revised SMP, OU-1 and OU-2 monitoring and maintenance activities will continue/commence.

6.3 Preliminary Maintenance and Monitoring Plan

A preliminary MMP (included as Appendix G) has been developed to outline the post-construction vegetation monitoring and maintenance requirements for areas restored as part of the remedial construction activities detailed herein. The preliminary MMP presents the methods and protocols to be followed when conducting post-construction monitoring, and includes the recommended scope, frequency, and duration requirements for post-construction monitoring at OU-2.

Following completion of the remedial construction and installation of the various restoration components, the Remediation Engineer will revise the MMP, as necessary, based on the as-built conditions for the restoration areas and base on any comments provided by NYSDEC.

7 SCHEDULE

Preliminary schedule for the remediation activities is presented in the table below.

Table 7.1 Anticipated Project Schedule

Schedule Component	Date
Submit Final Remedial Design to the NYSDEC	April 2020
Receive Approval Letter from the NYSDEC	April 2020
Regulatory Notifications and Permitting	Q2 2020 – Q1 2021
Remedial Contractor Procurement	Q2 2020 – Q1 2021
Phase 1 OU-2 Remedial Construction Activities	March – November 2021 (in-river May – September 2021)
Phase 2 OU-2 Remedial Construction Activities	March – November 2022 (in-river May – September 2022)

Note: Based on weather delays, elevated river flow, and/or time restrictions based on the fish protection window, remediation activities may extend beyond 2022.

Schedule considerations include, but are not limited to, weather, river flows rates, and fish protection windows.

Initiation of remedial construction is contingent on meeting the schedule components defined above and receipt of all required permits, access agreements, and approvals. Further details regarding the schedule for the remedial construction and sequencing of the work will be presented to the NYSDEC once the permits for the project have been received and the Remediation Contractor has been selected.

The final sequencing of remedial construction activities will be developed in conjunction with the selected Remediation Contractor, and in consideration of weather/climatic conditions and any permit requirements (e.g., construction window) or other regulatory conditions. During each phase/year remedial construction activities, the Remediation Contractor is anticipated to will mobilize to the Site by March 1 to initiate upland site-preparatory work. Upland project support activities associated with Phase 2 (e.g., constructing the railroad crossing, clearing trees, establishing utility connections, mobilizing equipment/materials from Area 1 to Area 2, etc.) are anticipated to be completed during the winter of 2021/2022.

The in-river work is expected to commence on May 16. Based on the targeted removal limits of Area 1 and Area 2 and the anticipated removal volume, an extension of the in-river construction season beyond September 30 (i.e., typical required end date per the WQC) may be required. NYSEG, in consultation with NYSDEC, will evaluate construction progress in mid-August each year. A decision to extend the in-river construction season beyond September 30 and apply for a permit extension, if necessary, will be made following the mid-August meeting, but prior to September 1 of each respective construction season.

8 REFERENCES

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NYSDEC. 2014. Screening and Assessment of Contaminated Sediment. June.

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FIGURES

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LEGEND:

APPROXIMATE BOUNDARY OF NYSEG–OWNED PROPERTY

FLOW DIRECTION

NOTE:

1. ALL LOCATIONS APPROXIMATE.

0 350' 700'

GRAPHIC SCALE

NEW YORK

NYSEG
CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK
REMEDIAL DESIGN REPORT

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

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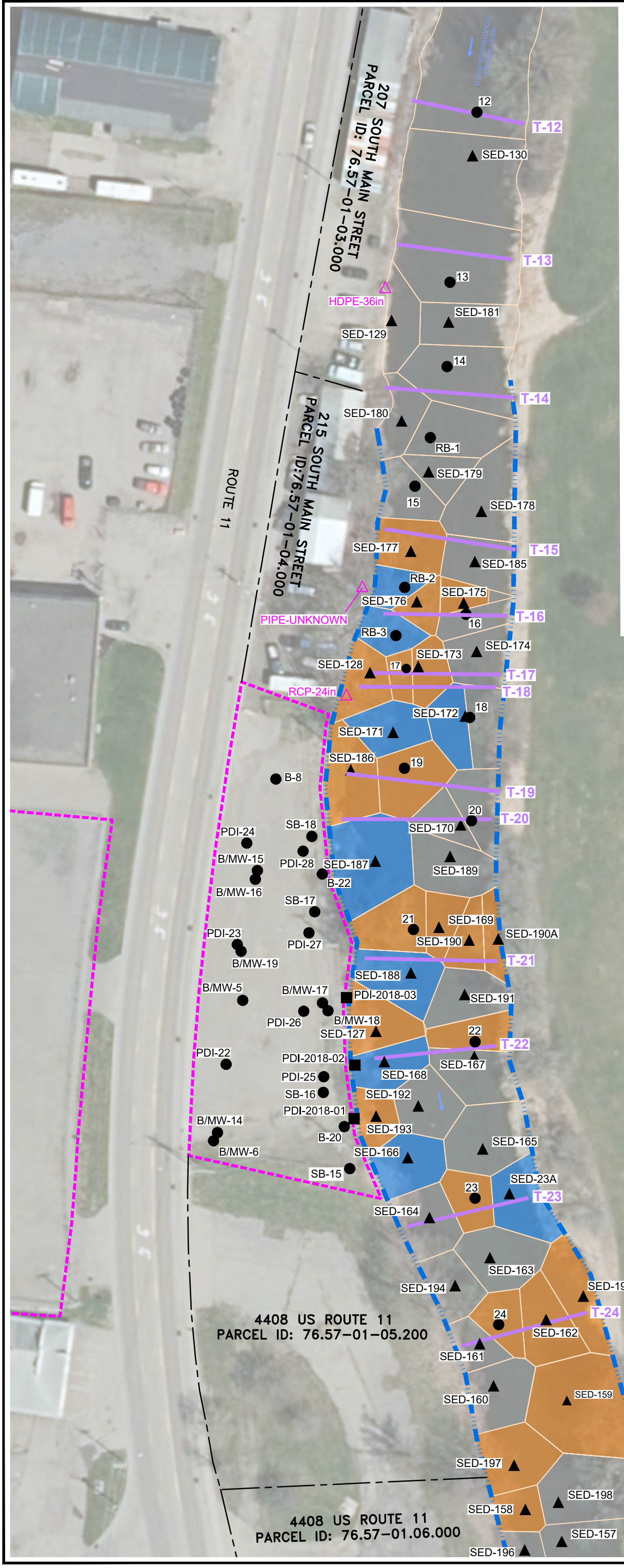

LEGEND:

- MEAN HIGH WATER LINE
- HISTORICAL SEDIMENT/SOIL BORING LOCATION
- 2018 PDI SOIL BORING LOCATION
- OUTFALL/GROUNDWATER SEEP
- PHASE I AND II SEDIMENT BORING LOCATION
- APPROXIMATE BOUNDARY OF NYSEG-OWNED PROPERTY
- 2013 PROBING TRANSECTS
- THIESSEN POLYGONS
- REMOVAL BASED ON PRESENCE OF VISUAL IMPACTS
- REMOVAL BASED ON PRESENCE OF TOTAL PAH > 6.2 MG/KG

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. HISTORICAL SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5-16 THROUGH 5-19 AND DESCRIPTIONS ON TABLE 5-19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 60' 120'

GRAPHIC SCALE

NYSEG
CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK
REMEDIAL DESIGN REPORT

AREA 1 - REMOVAL AREAS 1A AND 1B

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

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LEGEND:

- MEAN HIGH WATER LINE
- HISTORICAL SEDIMENT/SOIL BORING LOCATION
- OUTFALL/GROUNDWATER SEEP
- PHASE I AND II SEDIMENT BORING LOCATION
- 2013 PROBING TRANSECTS
- THIESSEN POLYGONS
- REMOVAL BASED ON PRESENCE OF VISUAL IMPACTS
- REMOVAL BASED ON PRESENCE OF TOTAL PAH > 6.2 MG/KG

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. HISTORICAL SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5-16 THROUGH 5-19 AND DESCRIPTIONS ON TABLE 5-19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 60' 120'

GRAPHIC SCALE

NYSEG
CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK
REMEDIAL DESIGN REPORT

AREA 1 - REMOVAL AREAS 1C AND 1D

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3

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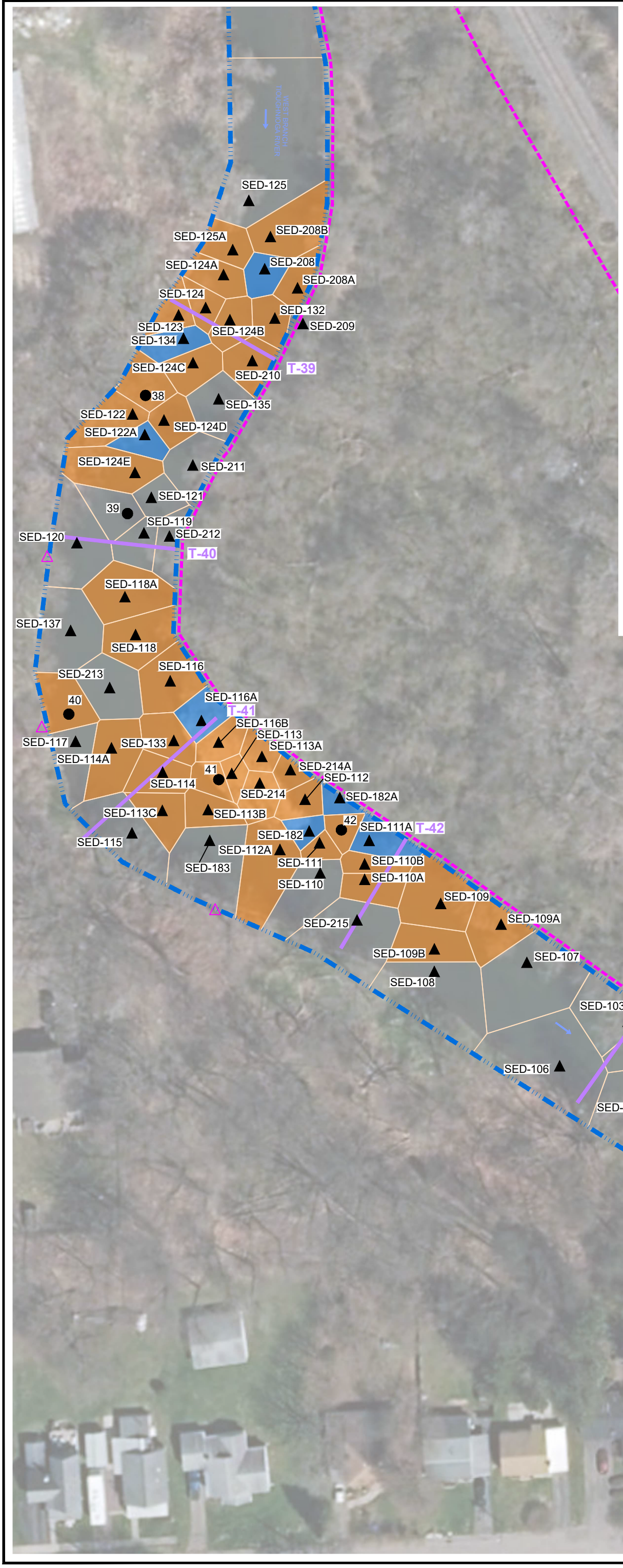

LEGEND:

- MEAN HIGH WATER LINE
- HISTORICAL SEDIMENT/SOIL BORING LOCATION
- OUTFALL/GROUNDWATER SEEP
- PHASE I AND II SEDIMENT BORING LOCATION
- APPROXIMATE BOUNDARY OF NYSEG–OWNED PROPERTY
- 2013 PROBING TRANSECTS
- THIESSEN POLYGONS
- REMOVAL BASED ON PRESENCE OF VISUAL IMPACTS
- REMOVAL BASED ON PRESENCE OF TOTAL PAH > 6.2 MG/KG

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. HISTORICAL SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5–16 THROUGH 5–19 AND DESCRIPTIONS ON TABLE 5–19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 60' 120'

GRAPHIC SCALE

NYSEG
CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK
REMEDIAL DESIGN REPORT

AREA 1 - REMOVAL AREAS 2A, 2B, 2C, AND 2D

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4

APPENDIX A

Design Drawings

DESIGN DRAWINGS

CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2 REMEDIAL DESIGN REPORT

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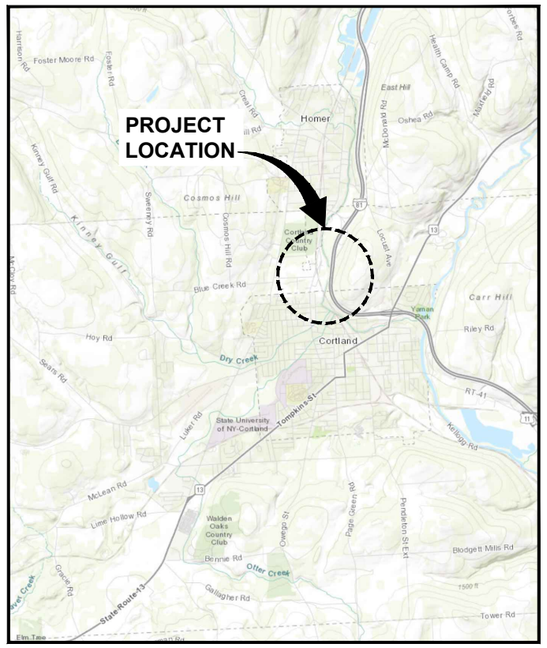

LOCATION MAP
0 5000' 10000'
GRAPHIC SCALE

DATE ISSUED
APRIL 2020

NYSEG
HOMER, NEW YORK

NYSDEC SITE NUMBER 7-12-005

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XREFS: IMAGES:
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Site Location.tif

GENERAL NOTES AND SPECIFICATIONS

GENERAL NOTES:

1. BASE MAP FOR OU-2 AREAS 1 AND 2 PROVIDED BY PJO SURVEYING OF SKANEATELES, NY ON MARCH 11, 2019. CONTOURS ARE BASED ON BASE MAP SURVEY PROVIDED AND ADJUSTED BY ARCADIS AS NECESSARY FOR HYDRAULIC MODELING PURPOSES.
2. MEAN HIGH WATER LINE (I.E., THE ORDINARY HIGH WATER LINE) IS BASED ON FIELD DELINEATION BY ARCADIS AND NYSDEC PERSONNEL COMPLETED IN OCTOBER 2017 AND 2019 AND HEC-RAS MODELING AND REPRESENTS A BASE FLOW OF APPROXIMATELY 660 CFS.
3. ELEVATIONS ARE IN US FEET AND ARE REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1988 (NAVD88).
4. HORIZONTAL COORDINATES ARE IN US FEET AND ARE REFERENCED TO THE NEW YORK STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, TRANSVERSE MERCATOR PROJECTION, NORTH AMERICAN DATUM 1983 (NAD83).
5. LOCATION OF EXISTING STRUCTURES DIGITIZED FROM AERIAL PHOTOGRAPHS DATED 4/22/2018 AND OBTAINED FROM ESRI ONLINE IMAGERY.
6. PROPERTY LINES TAKEN FROM CORTLAND COUNTY TAX MAPS AND PROVIDED BY PJO SURVEYING AS PART OF 2017 PRE-DESIGN INVESTIGATION ACTIVITIES.
7. ALL LOCATIONS, INCLUDING PROPERTY LINES AND ABOVE- AND UNDERGROUND UTILITIES, ARE APPROXIMATE, REFLECT AVAILABLE INFORMATION, ARE PROVIDED FOR REFERENCE ONLY, AND ARE SUBJECT TO FIELD VERIFICATION BY THE REMEDIATION CONTRACTOR, EASEMENTS AND RIGHTS-OF-WAY ARE NOT SHOWN.
8. PROMPTLY NOTIFY THE OWNER AND THE REMEDIATION ENGINEER, UPON DISCOVERY, AND BEFORE CONDITIONS ARE FURTHER DISTURBED, OF PHYSICAL CONDITIONS AT THE SITE WHICH DIFFER MATERIALLY FROM THOSE INDICATED ON THE CONSTRUCTION DOCUMENTS AND REFERENCE DOCUMENTS.
9. PROMPTLY, AFTER DISCOVERING, GIVE WRITTEN AND ORAL NOTICE TO THE REMEDIATION ENGINEER OF DELAYS IN PROJECT SCHEDULE DUE TO EQUIPMENT MALFUNCTION, WEATHER, OR GENERAL FAILURE TO MEET PRODUCTION STANDARDS.
10. COMPLY WITH ALL REQUIREMENTS OF ANY ISSUED PERMITS AND ANY APPLICABLE STATE AND FEDERAL LAWS AND REGULATIONS. IN-WATER WORK IS ANTICIPATED TO BE ALLOWED ONLY BETWEEN MAY 16 AND SEPTEMBER 30 EACH YEAR. WORK HOURS AND/OR TIME OF YEAR RESTRICTIONS WILL BE DICTATED BY ANY APPLICABLE PERMITS.
11. THE REMEDIATION CONTRACTOR SHALL MAKE BEST EFFORTS TO COMPLETE THE WORK WITHIN TWO CONSTRUCTION SEASONS.
12. PROTECT WORK IN PROGRESS, NO ADDITIONAL PAYMENTS WILL BE MADE FOR REPAIR OR REPLACEMENT OF PARTIALLY COMPLETED WORK DUE TO REMEDIATION CONTRACTOR'S FAILURE TO ADEQUATELY PROTECT THE WORK.
13. REFER TO THE REMEDIAL DESIGN REPORT AND TECHNICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE NOTES AND DETAILS PRESENTED ON THESE DESIGN DRAWINGS.

SITE PREPARATION:

1. PRIMARY SITE ACCESS FOR AREA 1 SHALL BE FROM ROUTE 11. SITE ACCESS FOR AREA 2 SHALL BE FROM FRONT STREET.
2. ESTABLISH, MAINTAIN, AND PROTECT THE PROJECT LIMITS, INCLUDING SUPPORT ZONES, EXCLUSION ZONES, AND CONTAMINATION REDUCTION ZONES.
3. PROTECT ABOVE- AND UNDERGROUND UTILITIES DURING CONSTRUCTION. THE LOCATION OF ALL ABOVE- AND UNDERGROUND UTILITIES MUST BE VERIFIED IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. THE REMEDIATION CONTRACTOR SHALL CONTACT "DIG SAFELY NEW YORK" (1-800-962-7962), A PRIVATE UTILITY LOCATOR, AND ALL APPLICABLE UTILITY COMPANIES FOR LOCATION OF UNDERGROUND UTILITIES. THE REMEDIATION CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR THE TEMPORARY REMOVAL, RELOCATION, AND REPLACEMENT OF ANY UTILITY POLES, GUY WIRES, UNDERGROUND UTILITIES, AND/OR OVERHEAD WIRES THAT FALL WITHIN THE LIMITS OF CONSTRUCTION, OR THAT MAY INTERFERE WITH THE WORK.
4. PLACE TEMPORARY CONSTRUCTION FENCING AROUND ACCESSIBLE PORTIONS OF THE LIMITS OF WORK (WHETHER SHOWN ON DRAWINGS OR NOT).
5. CONSTRUCT SUPPORT FACILITIES (E.G., WATER TREATMENT FACILITY, ETC.) WITHIN THE AREA 1 OR AREA 2 UPLAND SUPPORT AREAS.
6. REMOVE AND PROPERLY DISPOSE OF ALL ABOVE-GROUND DEBRIS, BRUSH, LOGS, TREES, STUMPS, REFUSE, AND RUBBISH FROM WITHIN THE WORK LIMITS, AS REQUIRED TO PERFORM THE WORK.
7. PROTECT VEGETATION NOT IDENTIFIED FOR REMOVAL DURING CONSTRUCTION. PROTECTION SHALL CONSIST OF ORANGE CONSTRUCTION FENCING SURROUNDING THE AREA TO BE PROTECTED. FOR BROAD-CANOPIED TREES, CONSTRUCTION FENCING SHALL BE PLACED NO CLOSER THAN THE DRIPLINE OF THE TREE. FOR NARROW-CANOPIED TREES, CONSTRUCTION FENCING SHALL BE PLACED AT A DISTANCE EQUAL TO THE STEM DIAMETER IN INCHES, CONVERTED TO FEET, AND DOUBLED, SUCH THAT A 10-INCH DIAMETER TREE WOULD BE PROTECTED TO 20 FEET.

TEMPORARY EROSION, SEDIMENTATION, AND TURBIDITY CONTROL:

1. INSTALL AND MAINTAIN ALL NECESSARY UPLAND AND IN-RIVER TEMPORARY EROSION, SEDIMENTATION, AND TURBIDITY CONTROL (WHETHER SHOWN ON DRAWINGS OR NOT) THROUGHOUT CONSTRUCTION AND THE INSTALLATION AND ESTABLISHMENT OF ALL NECESSARY RESTORATION MEASURES UPON COMPLETION OF CONSTRUCTION ACTIVITIES.
2. IMPLEMENT APPROPRIATE DUST CONTROL MEASURES AT ALL TIMES TO MINIMIZE FUGITIVE DUST.
3. UTILIZE GOOD HOUSEKEEPING PRACTICES TO MAINTAIN A NEAT AND ORDERLY SITE AT ALL TIMES DURING CONSTRUCTION.
4. PREVENT TRACKING OF SOIL MATERIALS ONTO OFFSITE AREAS. CLEAN ANY SOIL MATERIALS ACCIDENTALLY TRACKED OR OTHERWISE SPILLED OR DROPPED ONTO OFFSITE AREAS IMMEDIATELY AT NO ADDITIONAL COST TO THE OWNER.
5. SURROUND ANY IMPORTED SOIL MATERIALS AND/OR EXCAVATED SOILS/SEDIMENTS REQUIRING TEMPORARY STOCKPILING ONSITE WITH APPROPRIATE TEMPORARY EROSION AND SEDIMENTATION CONTROLS (E.G., SILT FENCE, STRAW/HAY/STRAW BALES) TO CONTAIN ANY SEDIMENT-LADEN RUNOFF THAT COULD BE GENERATED FROM SUCH STOCKPILES.

SEDIMENT REMOVAL:

1. FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, ACCESSORIES, AND APPURTENANCES NECESSARY TO COMPLETE REMOVAL OF SEDIMENTS AND RELATED WORK SHOWN ON THE DESIGN DRAWINGS.
2. TAKE APPROPRIATE STEPS TO PROTECT THE STABILITY OF STRUCTURES WITHIN AND AROUND THE REMOVAL AREAS. REPAIR ANY FEATURE DAMAGED AS A RESULT OF REMOVAL OPERATIONS, TRANSPORT OF EXCAVATED MATERIAL, OR OTHER CONSTRUCTION ACTIVITIES TO ITS ORIGINAL CONDITION (I.E., CONDITIONS THAT EXISTED PRIOR TO THE DAMAGE) AT NO ADDITIONAL COST TO THE OWNER.
3. TO REDUCE THE POTENTIAL FOR MIGRATION OF IMPACTS BEYOND THE LIMITS OF SEDIMENT REMOVAL AND POTENTIAL RECONTAMINATION OF RIVER SEDIMENTS DURING AN OVERTOPPING EVENT, COVER ALL IMPACTED SEDIMENT REMOVAL SURFACES WITH CLEAN MATERIAL OR POLY SHEETING. CONSIDERATION SHALL BE GIVEN TO THE TYPE OF COVER MATERIAL USED AND THE POTENTIAL FOR EROSION AND/OR LOSS OF THE COVER MATERIAL DURING AN OVERTOPPING EVENT. ALL COVER MATERIALS IN CONTACT WITH IMPACTED SEDIMENTS SHALL BE CONSIDERED IMPACTED AND DISPOSED IN ACCORDANCE WITH SPECIFICATION SECTION 02 61 15, HANDLING AND DISPOSAL OF IMPACTED MATERIALS.
4. IMPLEMENT APPROPRIATE MEASURES TO REDUCE THE POTENTIAL FOR GENERATION OF OIL SHEENS AND TO CATCH ANY SUCH OIL SHEENS THAT MAY OCCUR (E.G., VIA THE USE OF OIL ABSORBENT BOOMS AND/OR SIMILAR MEASURES).

WATER MANAGEMENT:

1. KNOWN OUTFALL STRUCTURES ARE PRESENT ADJACENT TO SEDIMENT REMOVAL AREAS. IMPLEMENT MEASURES (E.G., PUMP AND ASSOCIATED PIPING, FLUME, OR OTHER TECHNIQUES), AS NECESSARY, TO MANAGE FLOWS FROM EXISTING SURFACE WATER DISCHARGE POINTS ALONG THE RIVERBANK AROUND ACTIVE SEDIMENT REMOVAL AREAS, AND INTO THE BYPASS CHANNEL AND/OR THE RIVER DOWNSTREAM OF THE BACKWATER DAM, IN ACCORDANCE WITH SPECIFICATION SECTION 01 51 41, TEMPORARY PUMPING. COORDINATE WITH RESPECTIVE SURFACE WATER DISCHARGE POINT OWNERS TO DETERMINE ANTICIPATED DISCHARGE RATES AND NOTIFY SUCH OWNERS OF ANY POTENTIAL REDUCTIONS TO OUTFALL CAPACITIES RESULTING FROM REROUTING/DIVERSION ACTIVITIES.
2. COLLECT WATER COMING INTO CONTACT WITH IMPACTED SEDIMENTS DURING REMOVAL ACTIVITIES, INCLUDING BUT NOT NECESSARILY LIMITED TO, DEWATERING OF SEDIMENTS AND DECONTAMINATION FLUIDS, AND TREAT AT THE ONSITE TEMPORARY WATER TREATMENT SYSTEM PRIOR TO DISCHARGE. IF NO SHEENS ARE OBSERVED ON THE WATER COLUMN, SURFACE WATER WITHIN THE WORK AREA THAT IS GREATER THAN ONE FOOT ABOVE THE RIVERBED MAY BE PUMPED INTO THE RIVER. SURFACE WATER WITHIN ONE FOOT OF THE RIVERBED WITHIN THE ACTIVE WORK AREA (I.E., THE DEWATERED REMOVAL AREA) SHALL BE PUMPED FROM WITHIN THE WORK AREA TO THE ONSITE TEMPORARY WATER TREATMENT SYSTEM FOR TREATMENT PRIOR TO DISCHARGE.

RESTORATION AND DEMOBILIZATION:

1. RESTORE TO PRE-CONSTRUCTION CONDITIONS ALL SUPPORT AREAS THAT ARE IMPACTED BY CONSTRUCTION ACTIVITIES, INCLUDING BUT NOT LIMITED TO, EQUIPMENT AND MATERIALS STORAGE AREAS, MATERIAL LOADING AND STAGING AREAS, RIVER ACCESS AREAS, PARKING AREAS, AND LOCATIONS OF OFFICE TRAILERS, EXCEPT AS NOTED OTHERWISE.
2. UPON COMPLETION OF CONSTRUCTION EACH SEASON, LEAVE THE PROJECT AREA IN A CLEAN, NEAT, AND ORDERLY CONDITION.
3. COMMENCE DEMOBILIZATION OF ALL MATERIALS, EQUIPMENT, AND PERSONNEL BROUGHT TO THE SITE DURING MOBILIZATION AND CONSTRUCTION ACTIVITIES ONCE THE PROJECT IS COMPLETED AND ACCEPTED BY THE REMEDIATION ENGINEER. DECONTAMINATE ALL MATERIALS, EQUIPMENT, AND PERSONNEL AS SPECIFIED WITHIN THE REMEDIATION CONTRACTOR'S HASP. REMOVE ALL TEMPORARY FACILITIES.
4. BEAR ALL COSTS AND RESPONSIBILITY FOR REPAIRS TO ANY ONSITE AND/OR OFFSITE FEATURES (UTILITIES, SIDEWALKS, ROADS, ETC.) AND/OR SURFACES DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES.

SAFETY NOTES:

1. PROVIDE EVIDENCE OF ALL ONSITE PERSONNEL COMPLETING OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) 40-HOUR TRAINING AND 8-HOUR REFRESHER TRAINING PRIOR TO INITIATING REMEDIAL CONSTRUCTION ACTIVITIES.
2. THE REMEDIATION CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR IMPLEMENTING, MAINTAINING, AND SUPERVISING ALL SAFETY MEASURES AND PROGRAMS FOR THEIR EMPLOYEES, SUBCONTRACTORS, AND ANY OTHER PERSONS WHO MAY BE AFFECTED THEREBY, TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF, AND SHALL PROVIDE THE NECESSARY PRECAUTIONS TO PROTECT, SITE WORKERS, REMEDIATION ENGINEER PERSONNEL, AND SITE VISITORS, AND PREPARE A SITE-SPECIFIC HASP IN ACCORDANCE WITH SPECIFICATION SECTION 01 35 29, REMEDIATION CONTRACTOR'S HEALTH AND SAFETY PLAN (HASP), THAT SHALL BE REVIEWED BY THE REMEDIATION ENGINEER AND THE OWNER PRIOR TO THE START OF ANY WORK.
3. FURNISH AND PLACE, AS REQUIRED BY THE CONDITIONS AND PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR THE SAFETY AND PROTECTION OF PERSONS AND PROPERTY, INCLUDING PROPER GUARDS FOR PREVENTION OF ACCIDENTS, AND PROVIDE ALL DUST/VAPOR/ODOR PROTECTION, MECHANICAL/ELECTRICAL PROTECTION, SPECIAL GROUNDING, SAFETY RAILINGS, BARRIERS, PROPER WORKING EQUIPMENT WITH FUNCTIONING SAFETY MECHANISMS (E.G., LIFT GATE WARNING SIGNALS), ALL SITE SAFETY SIGNAGE, OR OTHER SAFETY FEATURES REQUIRED. AS NEEDED, THE REMEDIATION CONTRACTOR SHALL PROVIDE AND MAINTAIN SUFFICIENT LIGHT DURING NIGHT HOURS, IF NEEDED, TO SECURE SUCH PROTECTION.
4. COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS FOR PUBLIC BODIES HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY OR TO PROTECT THEM FROM DAMAGE, INJURY, OR LOSS, INCLUDING WITHOUT LIMITATION, THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER OSHA OF 1970 (PL 91-596) AND UNDER SECTION 107 OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (PL-91-54) AND AMENDMENTS THERETO. COMPLY WITH REQUIREMENTS SET FORTH UNDER 29 CODE OF FEDERAL REGULATIONS (CFR) 1910 AND 29 CFR 1926. ERECT AND MAINTAIN, AS REQURED BY THE CONDITIONS AND PROGRESS OF THE WORK, ALL NECESSARY SAFEGAURDS FOR THE SAFETY AND PROTECTION OF PERSON AND PROPERTY AND COMPLY WITH ALL APPLICABLE RECOMMENDATIONS OF THE MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION OF THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA.
5. THE MATERIALS SUBJECT TO HANDLING AS PART OF THE PROJECT MAY CONTAIN HAZARDOUS CONSTITUENTS OR CHEMICALS AND SHOULD BE HANDLED IN ACCORDANCE WITH APPLICABLE REGULATIONS. THE REMEDIATION CONTRACTOR SHALL DEVELOP AND IMPLEMENT APPROPRIATE HEALTH AND SAFETY MEASURES FOR ITS EMPLOYEES, SUBCONTRACTORS, AND SITE VISITORS, AND FOR THE PROTECTION OF THE ENVIRONMENT AND SURROUNDING COMMUNITY.
6. THE REMEDIATION CONTRACTOR'S HASP SHALL RECOGNIZE THE TYPES OF ACTIVITIES TO BE PERFORMED, THE UNIQUE HAZARDS SPECIFIC TO THESE ACTIVITIES, AND SPECIAL PRECAUTIONS AND CONTROLS THAT ARE TO BE IMPLEMENTED. THE REMEDIATION CONTRACTOR SHALL CLEARLY IDENTIFY AND EVALUATE SPECIFIC INGRESS/EGRESS ROUTES AND PROVISIONS, PERSONNEL AND WORK AREA MONITORING, PERSONAL PROTECTIVE EQUIPMENT, COMMUNICATIONS, ETC.
7. SEVERAL REMEDIATION ACTIVITIES WILL BE PERFORMED ADJACENT TO, OR IN THE VICINITY OF, UTILITY POLES, OVERHEAD, UNDERGROUND ELECTRICAL LINES AND TRANSFORMERS OR ON WATER. THE REMEDIATION CONTRACTOR'S HASP SHALL RECOGNIZE THESE HAZARDS AND INCORPORATE SPECIAL PRECAUTIONS AND CONTROLS SPECIFIC TO WORKING NEAR SUCH HAZARDS OR ON THE WATER. PERSONNEL SHALL WEAR U.S. COAST GUARD-APPROVED (TYPE I OR II) PFD (E.G., LIFE JACKET) WHEN WORKING IN CLOSE PROXIMITY TO FAST-FLOWING WATER DEEPER THAN 4 FEET. ADDITIONALLY, USE OF LIFELINES MAY BE REQUIRED.
8. PROVIDE A LIST OF ALL CHEMICAL PRODUCTS AND AN SDS FOR ALL CHEMICAL PRODUCTS TO BE USED ONSITE. THE LIST MUST BE APPROVED BY THE OWNER PRIOR TO BEING BROUGHT ONSITE.

SURVEY REQUIREMENTS:

1. PROVIDE ALL SURVEY INFORMATION TO THE REMEDIATION ENGINEER IN ACCORDANCE WITH SPECIFICATION SECTION 01 71 26, CONSTRUCTION SURVEYING AND LAYOUT.
2. ALL SURVEYS WILL BE PREFORMED BY A NEW YORK STATE LICENSED LAND SURVEYOR, UNLESS OTHERWISE NOTED. HARD COPY OF FINAL RECORD SURVEY SHALL BE STAMPED AND SIGNED BY THE SAME.

GENERAL REMEDIAL CONSTRUCTION SEQUENCE:

1. SPRING 2021 – MOBILIZATION AND SITE PREPARATION AT AREA 1.
2. SUMMER 2021 – AREA 1 RIVER DIVERSION INSTALLATION; SEDIMENT EXCAVATION AND BACKFILLING; RIVER DIVERSION REMOVAL; AND RESTORATION AND DEMOBILIZATION.
3. FALL 2021 / WINTER 2022 – AREA 1 RESTORATION AND DEMOBILIZATION, AREA 2 RAILROAD CROSSING CONSTRUCTION; INITIAL TREE CLEARING (AFTER OCTOBER 31); RELOCATION OF PROJECT SUPPORT OPERATIONS TO AREA 2; UTILITY INSTALLATION.
4. SPRING 2022 – RE-MOBILIZATION AND SITE PREPARATION AT AREA 2; FINAL TREE CLEARING (BEFORE APRIL 1).
5. SUMMER 2022 – AREA 2 RIVER DIVERSION INSTALLATION; SEDIMENT EXCAVATION AND BACKFILLING; RIVER DIVERSION REMOVAL; AND RESTORATION.
6. FALL 2022 – AREA 2 RESTORATION AND DEMOBILIZATION.

GENERAL LEGEND

- PROPERTY LINE
- MEAN HIGH WATER LINE (SEE GENERAL NOTE 2)
- WATER FLOW DIRECTION
- EXISTING WETLAND
- 96 EXISTING CONTOURS (SEE GENERAL NOTE 1)
- x x EXISTING CHAIN LINK FENCE
- EXISTING RAILROAD
- ST STORM SEWER LINE
- OH OVERHEAD LINE
- OUTFALL
- UTILITY POLE
- CATCH BASIN
- TREE GREATER THAN 3-INCHES DIAMETER AT BREAST HEIGHT AS IDENTIFIED DURING 2017 AND 2019 HABITAT ASSESSMENTS
- 1+00 REFERENCE STATIONING

ABBREVIATIONS

AOS	APPARENT OPENING SIZE
BGS	BELOW GROUND SURFACE
CL	CENTERLINE
CFR	CODE OF FEDERAL REGULATIONS
CFS	CUBIC FOOT PER SECOND
CMP	CORRUGATED METAL PIPE
ø/DIA.	DIAMETER
DNAPL	DENSE NON-AQUEOUS PHASE LIQUID
EL.	ELEVATION
EPS	EXPANDED POLYSTYRENE
ESRI	ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE
FT	FEET/FOOT
FT^2	SQUARE FEET
GA.	GAUGE
GAC	GRANULAR ACTIVATED CARBON
GPM	GALLONS PER MINUTE
GPS	GLOBAL POSITIONING SYSTEM
HASP	HEALTH AND SAFELY PLAN
HDPE	HIGH DENSITY POLYETHYLENE
HEC-RAS	HYDROLOGIC ENGINEERING CENTER RIVER ANALYSIS SYSTEM
H:V	HORIZONTAL:VERTICAL
INV.	INVERT
MAX	MAXIMUM
MGP	MANUFACTURED GAS PLANT
MH	MANHOLE
MHWL	MEAN HIGH WATER LINE
MIL	MIL(ONE-THOUSANDTHS OF AN INCH)
MIN	MINIMUM
NAD83	NORTH AMERICAN DATUM OF 1983
NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
NO.	NUMBER
NYSEG	NEW YORK STATE ELECTRIC & GAS CORPORATION
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NYSDOT	NEW YORK STATE DEPARTMENT OF TRANSPORTATION
OH	OVERHEAD
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OU	OPERABLE UNIT
OZ.	OUNCE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
RS	RIVER STATION
SAN	SANITARY
SCH.	SCHEDULE
SDS	SAFETY DATA SHEET
STA.	STATION
TYP.	TYPICAL
WTS	WATER TREATMENT SYSTEM

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1
State: NY | Date Signed: 4/8/2020 | Project Mgr.: JRG
Designed by: JJB | Drawn by: BKD | Checked by: LJP

STATE OF NEW YORK MARK OWEN GRAVELDING NO. 069985-1 LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

GENERAL NOTES, LEGEND, AND ABBREVIATIONS

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

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G-002

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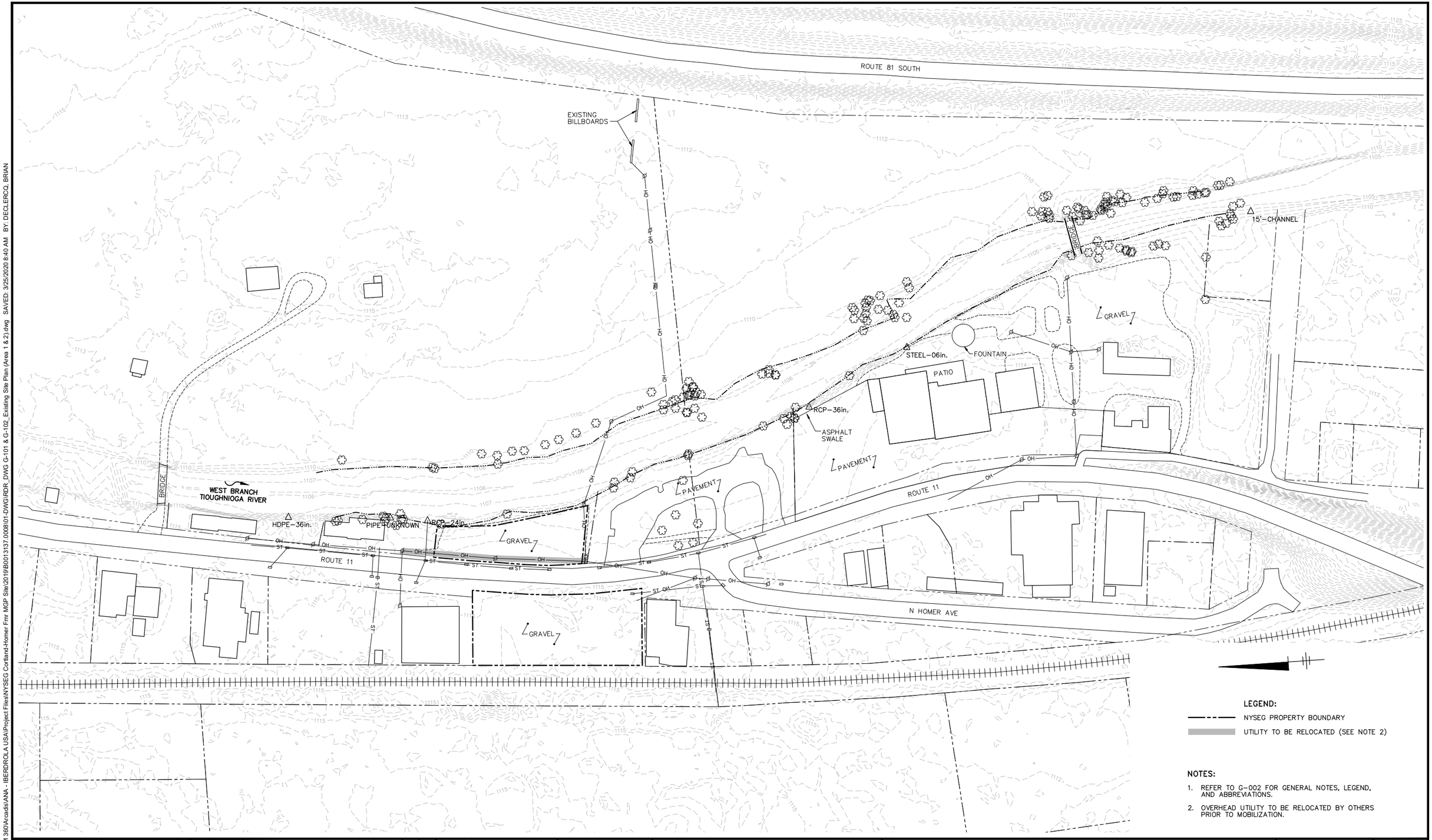

NOTES:

1. REFER TO G-002 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. OVERHEAD UTILITY TO BE RELOCATED BY OTHERS PRIOR TO MOBILIZATION.

C:\Users\bdeclercq\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2019\B0013137.0008\01-DWG\RDR_DWG G-101 & G-102_Existing Site Plan (Area 1 & 2).dwg SAVED: 3/25/2020 8:40 AM BY: DECLERCQ, BRIAN

80' 0 80' 160'
1"=80'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXISTING SITE PLAN (AREA 1)

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-101

ROUTE 81 NORTH

ROUTE 81 SOUTH

FRONT ST.

WILLOW AVE

SAMSON ST

DRY CREEK

EUCLID AVE

FAY WOOD AVE

WEST BRANCH TOUGHNIOGA RIVER

RCP - 48in.

OH

LEGEND:

NYSEG PROPERTY BOUNDARY

UTILITY TO BE RELOCATED (SEE NOTE 2)

NOTES:

1. REFER TO G-002 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. OVERHEAD UTILITY TO BE RELOCATED BY OTHERS PRIOR TO MOBILIZATION.

50' 0 50' 100'
1"=50'

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STATE OF NEW YORK MARK OWEN GRAVELDING LICENSED PROFESSIONAL ENGINEER NO. 069985-1

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NYSEG • CORTLAND-HOMER, NEW YORK

CORTLAND-HOMER FORMER MGP SITE

OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXISTING SITE PLAN (AREA 2)

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-102

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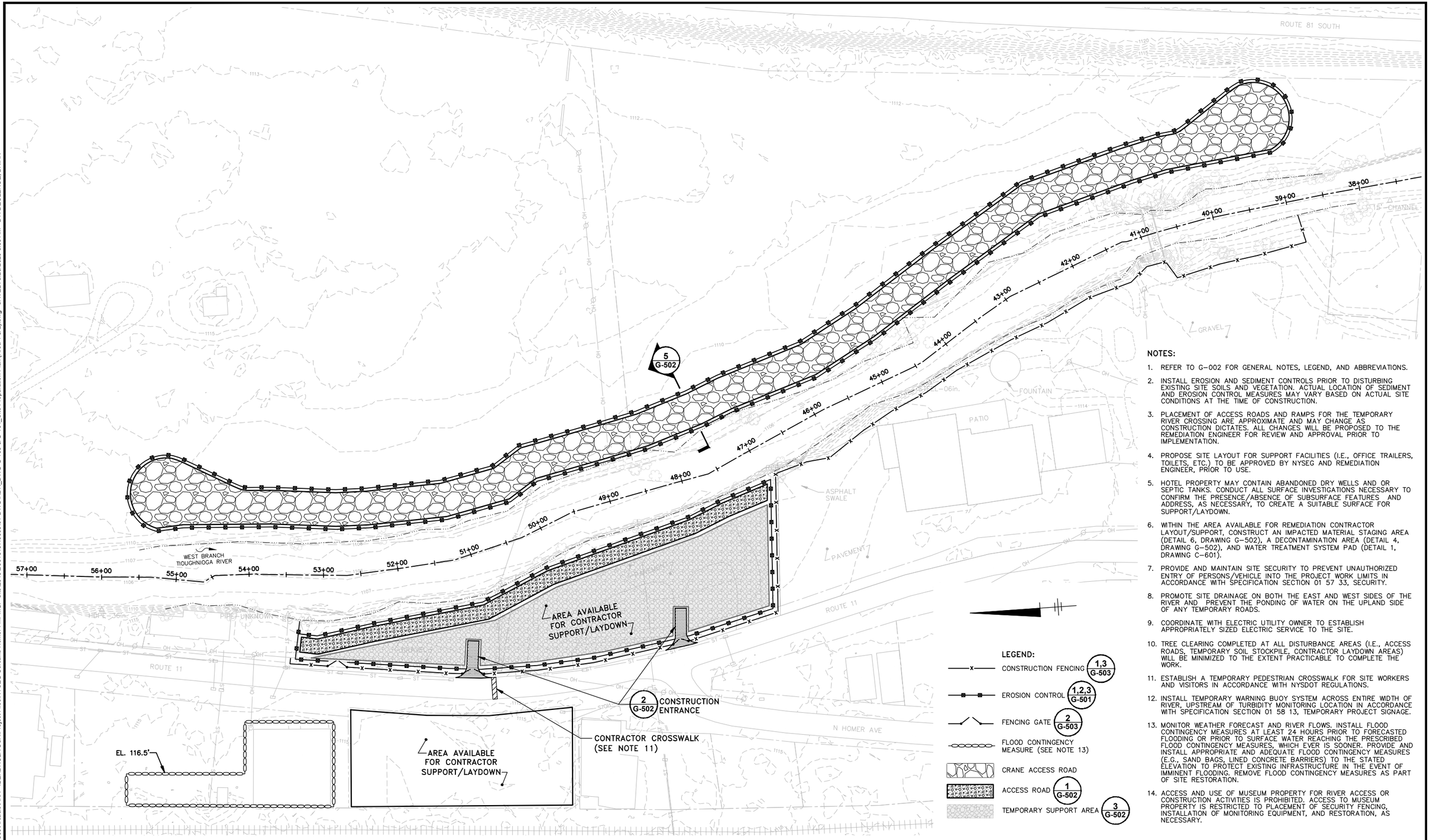

NOTES:

1. REFER TO G–002 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. INSTALL EROSION AND SEDIMENT CONTROLS PRIOR TO DISTURBING EXISTING SITE SOILS AND VEGETATION. ACTUAL LOCATION OF SEDIMENT AND EROSION CONTROL MEASURES MAY VARY BASED ON ACTUAL SITE CONDITIONS AT THE TIME OF CONSTRUCTION.
3. PLACEMENT OF ACCESS ROADS AND RAMPS FOR THE TEMPORARY RIVER CROSSING ARE APPROXIMATE AND MAY CHANGE AS CONSTRUCTION DICTATES. ALL CHANGES WILL BE PROPOSED TO THE REMEDIATION ENGINEER FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
4. PROPOSE SITE LAYOUT FOR SUPPORT FACILITIES (I.E., OFFICE TRAILERS, TOILETS, ETC.) TO BE APPROVED BY NYSEG AND REMEDIATION ENGINEER, PRIOR TO USE.
5. HOTEL PROPERTY MAY CONTAIN ABANDONED DRY WELLS AND OR SEPTIC TANKS. CONDUCT ALL SURFACE INVESTIGATIONS NECESSARY TO CONFIRM THE PRESENCE/ABSENCE OF SUBSURFACE FEATURES AND ADDRESS, AS NECESSARY, TO CREATE A SUITABLE SURFACE FOR SUPPORT/LAYDOWN.
6. WITHIN THE AREA AVAILABLE FOR REMEDIATION CONTRACTOR LAYOUT/SUPPORT, CONSTRUCT AN IMPACTED MATERIAL STAGING AREA (DETAIL 6, DRAWING G–502), A DECONTAMINATION AREA (DETAIL 4, DRAWING G–502), AND WATER TREATMENT SYSTEM PAD (DETAIL 1, DRAWING C–601).
7. PROVIDE AND MAINTAIN SITE SECURITY TO PREVENT UNAUTHORIZED ENTRY OF PERSONS/VEHICLE INTO THE PROJECT WORK LIMITS IN ACCORDANCE WITH SPECIFICATION SECTION 01 57 33, SECURITY.
8. PROMOTE SITE DRAINAGE ON BOTH THE EAST AND WEST SIDES OF THE RIVER AND PREVENT THE PONDING OF WATER ON THE UPLAND SIDE OF ANY TEMPORARY ROADS.
9. COORDINATE WITH ELECTRIC UTILITY OWNER TO ESTABLISH APPROPRIATELY SIZED ELECTRIC SERVICE TO THE SITE.
10. TREE CLEARING COMPLETED AT ALL DISTURBANCE AREAS (I.E., ACCESS ROADS, TEMPORARY SOIL STOCKPILE, CONTRACTOR LAYDOWN AREAS) WILL BE MINIMIZED TO THE EXTENT PRACTICABLE TO COMPLETE THE WORK.
11. ESTABLISH A TEMPORARY PEDESTRIAN CROSSWALK FOR SITE WORKERS AND VISITORS IN ACCORDANCE WITH NYSDOT REGULATIONS.
12. INSTALL TEMPORARY WARNING BUOY SYSTEM ACROSS ENTIRE WIDTH OF RIVER, UPSTREAM OF TURBIDITY MONITORING LOCATION IN ACCORDANCE WITH SPECIFICATION SECTION 01 58 13, TEMPORARY PROJECT SIGNAGE.
13. MONITOR WEATHER FORECAST AND RIVER FLOWS. INSTALL FLOOD CONTINGENCY MEASURES AT LEAST 24 HOURS PRIOR TO FORECASTED FLOODING OR PRIOR TO SURFACE WATER REACHING THE PRESCRIBED FLOOD CONTINGENCY MEASURES, WHICH EVER IS SOONER. PROVIDE AND INSTALL APPROPRIATE AND ADEQUATE FLOOD CONTINGENCY MEASURES (E.G., SAND BAGS, LINED CONCRETE BARRIERS) TO THE STATED ELEVATION TO PROTECT EXISTING INFRASTRUCTURE IN THE EVENT OF IMMINENT FLOODING. REMOVE FLOOD CONTINGENCY MEASURES AS PART OF SITE RESTORATION.
14. ACCESS AND USE OF MUSEUM PROPERTY FOR RIVER ACCESS OR CONSTRUCTION ACTIVITIES IS PROHIBITED. ACCESS TO MUSEUM PROPERTY IS RESTRICTED TO PLACEMENT OF SECURITY FENCING, INSTALLATION OF MONITORING EQUIPMENT, AND RESTORATION, AS NECESSARY.

LEGEND:

- CONSTRUCTION FENCING (1,3 / G-503)
- EROSION CONTROL (1,2,3 / G-501)
- FENCING GATE (2 / G-503)
- FLOOD CONTINGENCY MEASURE (SEE NOTE 13)
- CRANE ACCESS ROAD
- ACCESS ROAD (1 / G-502)
- TEMPORARY SUPPORT AREA (3 / G-502)

60' 0 60' 120'
1"=60'

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USE TO VERIFY FIGURE REPRODUCTION SCALE

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Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 4/8/2020	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

SITE PREPARATION PLAN (AREA 1)

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-103

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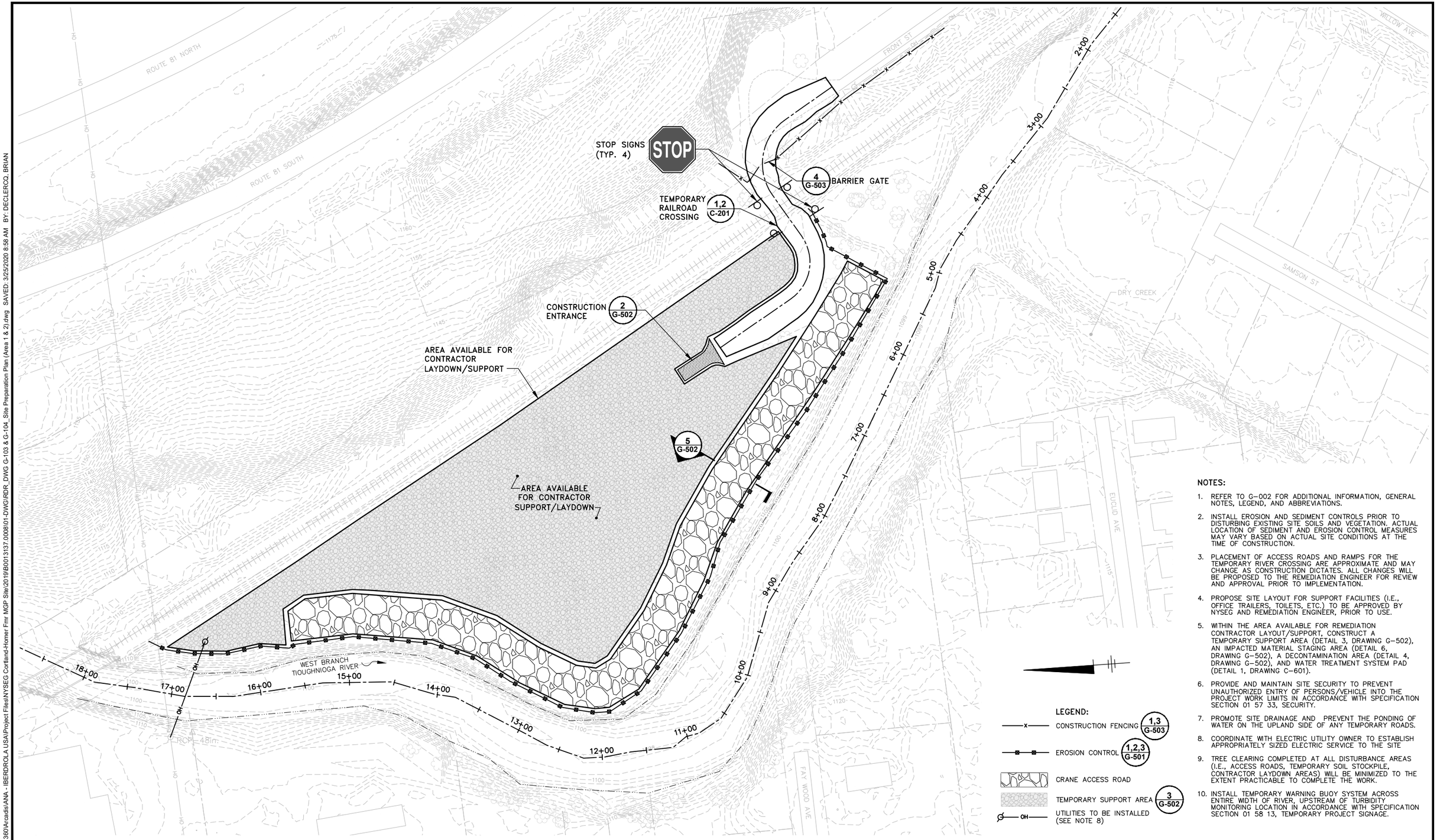

NOTES:

1. REFER TO G–002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. INSTALL EROSION AND SEDIMENT CONTROLS PRIOR TO DISTURBING EXISTING SITE SOILS AND VEGETATION. ACTUAL LOCATION OF SEDIMENT AND EROSION CONTROL MEASURES MAY VARY BASED ON ACTUAL SITE CONDITIONS AT THE TIME OF CONSTRUCTION.
3. PLACEMENT OF ACCESS ROADS AND RAMPS FOR THE TEMPORARY RIVER CROSSING ARE APPROXIMATE AND MAY CHANGE AS CONSTRUCTION DICTATES. ALL CHANGES WILL BE PROPOSED TO THE REMEDIATION ENGINEER FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
4. PROPOSE SITE LAYOUT FOR SUPPORT FACILITIES (I.E., OFFICE TRAILERS, TOILETS, ETC.) TO BE APPROVED BY NYSEG AND REMEDIATION ENGINEER, PRIOR TO USE.
5. WITHIN THE AREA AVAILABLE FOR REMEDIATION CONTRACTOR LAYOUT/SUPPORT, CONSTRUCT A TEMPORARY SUPPORT AREA (DETAIL 3, DRAWING G–502), AN IMPACTED MATERIAL STAGING AREA (DETAIL 6, DRAWING G–502), A DECONTAMINATION AREA (DETAIL 4, DRAWING G–502), AND WATER TREATMENT SYSTEM PAD (DETAIL 1, DRAWING C–601).
6. PROVIDE AND MAINTAIN SITE SECURITY TO PREVENT UNAUTHORIZED ENTRY OF PERSONS/VEHICLE INTO THE PROJECT WORK LIMITS IN ACCORDANCE WITH SPECIFICATION SECTION 01 57 33, SECURITY.
7. PROMOTE SITE DRAINAGE AND PREVENT THE PONDING OF WATER ON THE UPLAND SIDE OF ANY TEMPORARY ROADS.
8. COORDINATE WITH ELECTRIC UTILITY OWNER TO ESTABLISH APPROPRIATELY SIZED ELECTRIC SERVICE TO THE SITE
9. TREE CLEARING COMPLETED AT ALL DISTURBANCE AREAS (I.E., ACCESS ROADS, TEMPORARY SOIL STOCKPILE, CONTRACTOR LAYDOWN AREAS) WILL BE MINIMIZED TO THE EXTENT PRACTICABLE TO COMPLETE THE WORK.
10. INSTALL TEMPORARY WARNING BUOY SYSTEM ACROSS ENTIRE WIDTH OF RIVER, UPSTREAM OF TURBIDITY MONITORING LOCATION IN ACCORDANCE WITH SPECIFICATION SECTION 01 58 13, TEMPORARY PROJECT SIGNAGE.

LEGEND:

- CONSTRUCTION FENCING — 1,3 G-503
- EROSION CONTROL — 1,2,3 G-501
- CRANE ACCESS ROAD
- TEMPORARY SUPPORT AREA — 3 G-502
- UTILITIES TO BE INSTALLED (SEE NOTE 8) — OH

50' 0 50' 100'
1"=50'

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Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by	Drawn by	Checked by
JJB	BKD	LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · DATE · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

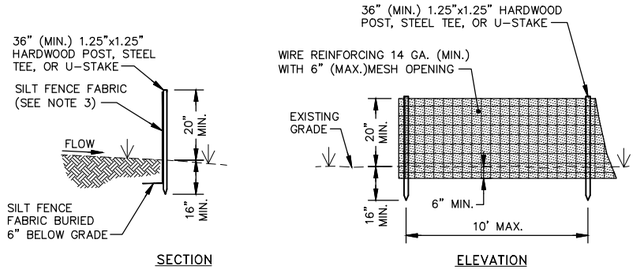
SITE PREPARATION PLAN (AREA 2)

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-104



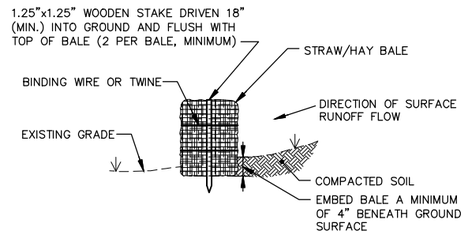
SECTION ELEVATION

NOTES:

1. ACCUMULATIONS OF SEDIMENT/SILT ADJACENT TO SILT FENCES WILL BE PERIODICALLY REMOVED THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE SILT FENCE.
2. THE INTEGRITY OF SILT FENCING WILL BE MAINTAINED FOR THE PROJECT DURATION AND UNTIL ADEQUATE VEGETATIVE GROWTH IS ESTABLISHED.
3. SILT FENCE MATERIALS WILL MEET THE REQUIREMENTS OF THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR SEDIMENT AND EROSION CONTROL.

SILT FENCE 1

NOT TO SCALE

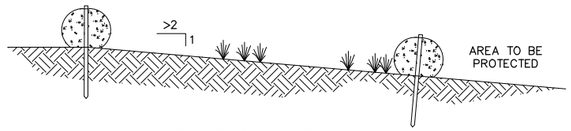


NOTES:

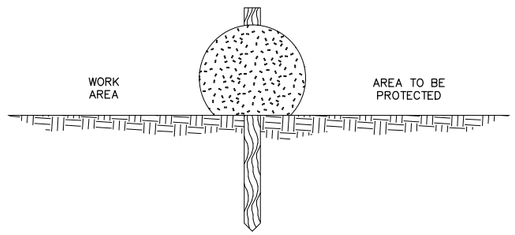
1. USE OF STRAW/HAY BALES WILL BE MINIMIZED.
2. BALES WILL BE PLACED TIGHTLY TOGETHER, END TO END, TO FORM A CONTINUOUS BARRIER IN SELECTED AREAS.
3. THE INTEGRITY OF THE STRAW/HAY BALES WILL BE MAINTAINED FOR THE PROJECT DURATION AND UNTIL ADEQUATE VEGETATIVE GROWTH IS ESTABLISHED.
4. STOCKPILE ANY EXCAVATED MATERIAL ONSITE FOR USE AS BACKFILL UPON COMPLETION.

STRAW/HAY BALE 2

NOT TO SCALE



INSTALLED ON SLOPE >2:1



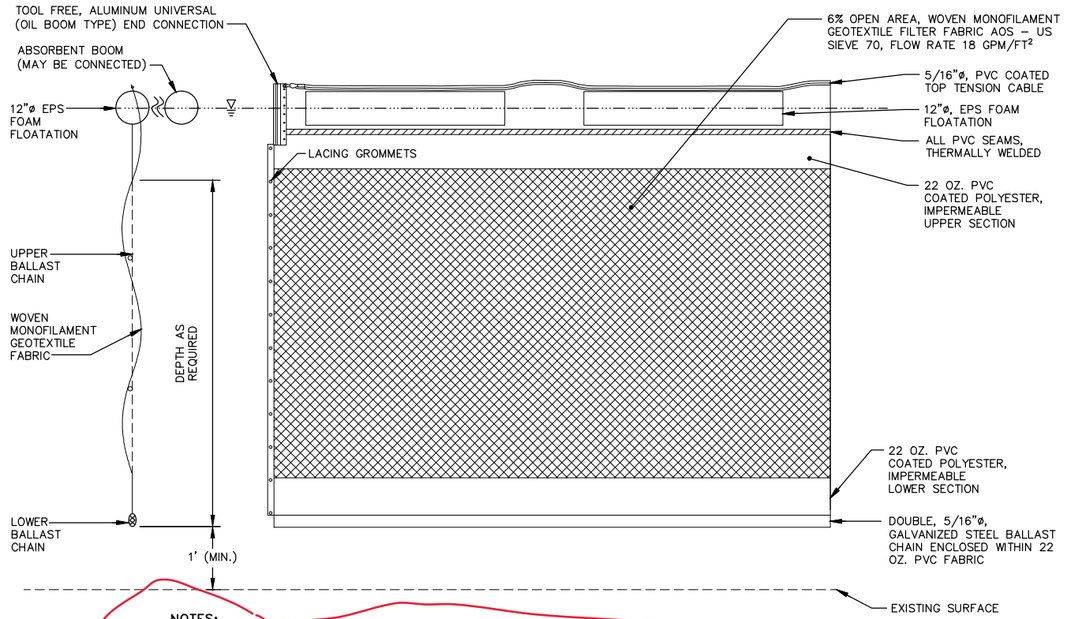
INSTALLED ON SOIL

NOTES:

1. OVERLAP FIBER ROLL SECTIONS BY 18 INCHES (MIN.) TO FORM A CONTINUOUS BARRIER.
2. FIBER ROLL WILL BE SECURED WITH 2-INCH X 2-INCH HARDWOOD STAKES INSTALLED THROUGH THE MIDDLE OF THE FIBER ROLL ON 10 FOOT CENTERS. IN THE EVENT STAKING IS NOT POSSIBLE, (i.e., WHEN FIBER ROLL IS USED ON PAVEMENT), CONCRETE BLOCKS OR SAND BAGS SHALL BE USED BEHIND THE FIBER ROLL TO STABILIZE.
3. IF SLOPE IS GREATER THAN 2:1 INSTALL SECOND FIBER ROLL BARRIER AT TOP OF SLOPE.
4. FIBER ROLL WILL MEET MINIMUM STANDARDS OF NORTH AMERICAN GREEN SEDIMAX-SWB9 (MINIMUM 9" DIAMETER) OR EQUIVALENT.
5. FIBER ROLL WILL BE 100% BIODEGRADABLE, INCLUDING WOVEN NETTING.

FIBER ROLL 3

NOT TO SCALE

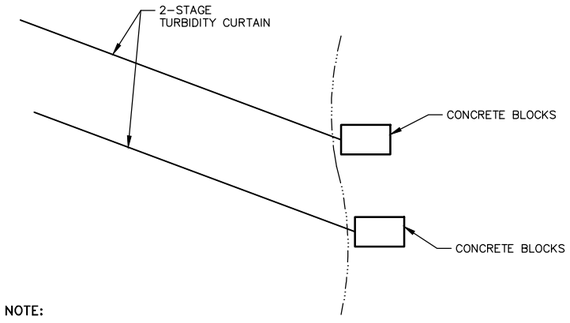


NOTES:

1. THE TURBIDITY CURTAIN DETAIL PROVIDED HEREON IS CONCEPTUAL. THE REMEDIATION CONTRACTOR MAY PROPOSE AN ALTERNATE TURBIDITY CURTAIN OR OTHER APPROPRIATE TURBIDITY CONTROL SYSTEM AT THE REVIEW AND APPROVAL OF THE DESIGN ENGINEER. THE REMEDIATION CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MEETING THE PERFORMANCE CRITERIA FOR A TURBIDITY CONTROL SYSTEM AS SPECIFIED IN THE TECHNICAL SPECIFICATIONS.
2. INSTALL TURBIDITY CURTAIN PRIOR TO INITIATION OF IN-WATER CONSTRUCTION ACTIVITIES.
3. INSTALL ABSORBENT BOOMS ALONG THE INTERIOR PERIMETER OF THE TURBIDITY CURTAIN IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.
4. ANCHOR CURTAIN SYSTEM TO SHORE USING THE LACING GROMMETS IN ACCORDANCE WITH METHODS SUGGESTED BY THE MANUFACTURER. POTENTIAL ATTACHMENT METHODS COULD INCLUDE CABLE CLAMPS, ATTACHED RINGS AND CABLE ETHERS OR FLOATING CABLE RING CONNECTORS. FINAL ANCHOR/CONNECTION DETAILS TO BE DETERMINED BY THE REMEDIATION CONTRACTOR.

TURBIDITY CURTAIN 4

NOT TO SCALE



NOTE:

1. ANCHORING DETAIL IS CONCEPTUAL. FINAL ANCHOR/CONNECTION DETAILS TO BE DETERMINED BY REMEDIATION CONTRACTOR.

TURBIDITY CURTAIN ANCHOR SYSTEM 5

NOT TO SCALE

NOT TO SCALE

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No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 4/8/2020	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EROSION, SEDIMENT, AND TURBIDITY CONTROL DETAILS

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-501

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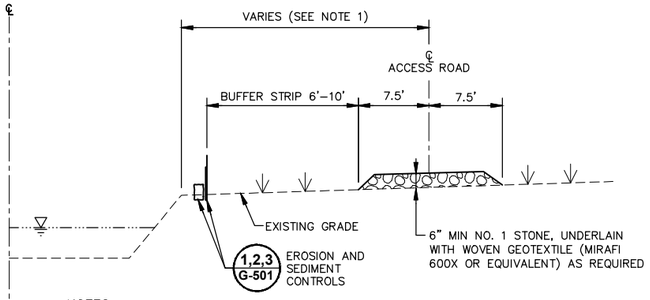
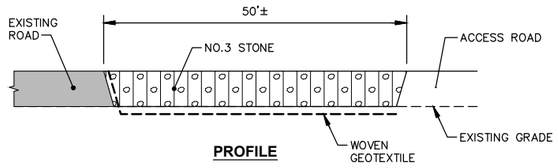


NOTES:

1. DIMENSION VARIES TO ACCOMMODATE EXISTING FEATURES AND TOPOGRAPHY.
2. PLACEMENT OF FILL FOR ACCESS ROADS WILL BE AS REQUIRED TO SUPPORT CONSTRUCTION EQUIPMENT.
3. THE EXISTING GRADE SURFACE WILL BE UNIFORM AND FREE OF DELETERIOUS MATERIALS (E.G. WOOD/METAL DEBRIS, ETC.) THAT COULD AFFECT THE STABILITY OF THE ACCESS ROAD.
4. COMPACTION OF NO. 1 STONE WILL BE SUFFICIENT DENSITY TO PROVIDE A FIRM AND UNIFORM SURFACE USING APPROPRIATE EQUIPMENT.

TEMPORARY ACCESS ROAD 1

NOT TO SCALE



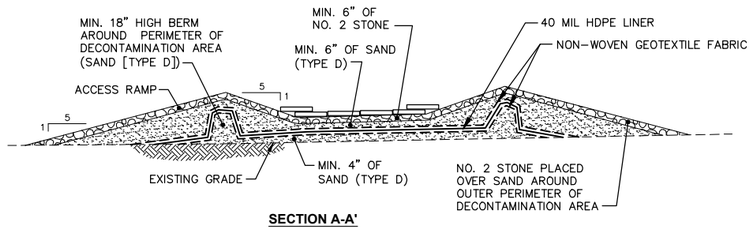
PROFILE

NOTES:

1. CONSTRUCTION ENTRANCE/EXIT PAD WILL BE APPROXIMATELY 50' LONG, 15' WIDE, AND 6" THICK.
2. INSTALL CONSTRUCTION ENTRANCE/EXIT PAD AT ALL ACCESS POINTS TO PAVED ROADS.

CONSTRUCTION ENTRANCE PAD 2

NOT TO SCALE



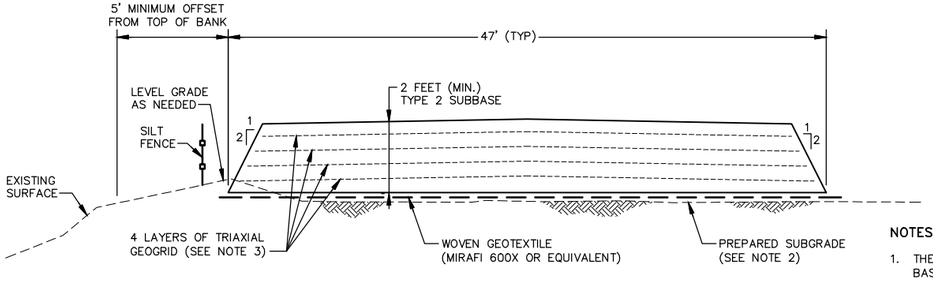
SECTION A-A'

NOTES:

1. DECONTAMINATION AREA WILL HAVE A GENERAL SLOPE TOWARD A COLLECTION SUMP TO FACILITATE THE COLLECTION OF WASH FLUIDS. FLUIDS WILL BE PUMPED FROM COLLECTION SUMP INTO 55 GALLON DRUMS OR A TEMPORARY STORAGE TANK (IF NECESSARY).
2. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, REMOVE THE DECONTAMINATION AREA, INCLUDING HDPE LINER, FOR DISPOSAL.
3. ALTERNATE DESIGN FOR TEMPORARY IMPACTED MATERIAL STAGING AREA MAY BE USED IN PLACE OF THIS DETAIL, WITH APPROVAL FROM THE REMEDIATION ENGINEER.
4. CONSTRUCT DECONTAMINATION AREA WITH MINIMUM DIMENSIONS OF 40 FEET BY 20 FEET.

DECONTAMINATION AREA 4

NOT TO SCALE

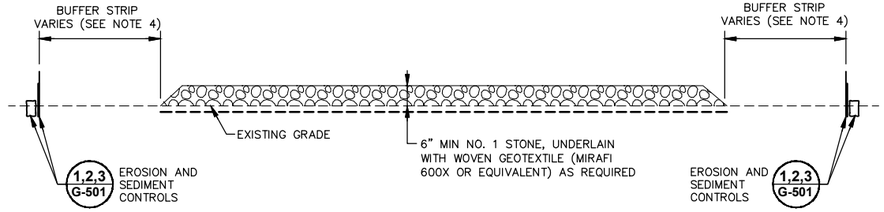


NOTES:

1. THE CRANE ACCESS ROAD DESIGN PRESENTED IS CONCEPTUAL AND BASED ON MAXIMUM LOADING OF 5,300 POUNDS PER SQUARE FOOT (PSF) AT AREA 1 AND 4,100 PSF AT AREA 2 . FINAL CRANE ROAD DESIGN TO BE DETERMINED BY REMEDIATION CONTRACTOR IN COORDINATION WITH THE DESIGN ENGINEER, INCLUDING MEANS OF DRAINGE TO PREVENT PONDING.
2. LEVEL EXISTING GRADE AS NEEDED.
3. GEOGRID WILL BE TENSAR UX1700 OR APPROVED EQUAL. INSTALL 4 LAYERS OF GEOGRID WITH 6–INCHES OF STONE BACKFILL BETWEEN LAYERS. PLACE GEOGRID LAYERS IN ALTERNATING DIRECTIONS ACROSS THE FULL WIDTH AND LENGTH OF THE PLATFORM.
4. PLACE STONE BACKFILL FOR CRANE ACCESS ROAD ON MAXIMUM 6–INCH LIFTS AND COMPACTED TO 95% STANDARD PROCTOR.
5. COMPACT SUBGRADE TO THE EXTENT POSSIBLE WITH NO FEWER THAN 5 PASSES WITH HEAVY EQUIPMENT PRIOR TO PLACEMENT OF GEOTEXTILE.

TYPICAL CRANE ACCESS ROAD CONFIGURATION 5

NOT TO SCALE

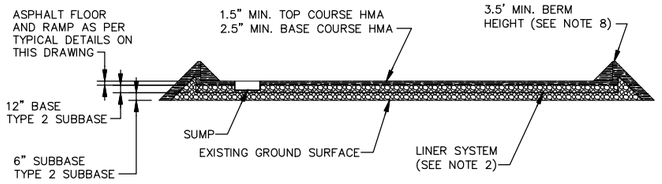


NOTES:

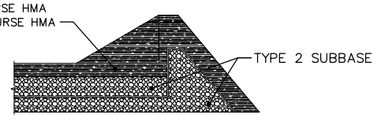
1. THE EXISTING GRADE SURFACE WILL BE UNIFORM AND FREE OF DELETERIOUS MATERIALS (E.G. WOOD/METAL DEBRIS, ETC.) THAT COULD AFFECT THE STABILITY OF THE PAD.
2. COMPACTION OF NO. 1 STONE WILL BE SUFFICIENT DENSITY TO PROVIDE A FIRM AND UNIFORM SURFACE USING APPROPRIATE EQUIPMENT.
3. DIMENSIONS OF TEMPORARY SUPPORT AREA FOR AREAS 1 AND 2 WILL VARY TO ACCOMMODATE REMEDIATION CONTRACTOR'S NEEDS AND EXISTING FEATURES AND TOPOGRAPHY. TEMPORARY SUPPORT AREA FOR AREAS 1 AND 2 SHALL BE WITHIN THE LIMITS ILLUSTRATED ON DRAWINGS G–103 THROUGH G–104.
4. PLACE STRAW/HAY BALE OR SILT FENCE ALONG THE OUTSIDE EDGE OF THE CONSTRUCTED TEMPORARY SUPPORT AREA. DIMENSION OF BUFFER STRIP VARIES TO ACCOMMODATE EXISTING FEATURES AND TOPOGRAPHY.

TEMPORARY SUPPORT AREA 3

NOT TO SCALE



SECTION A-A'



TYPICAL ASPHALT RAMP DETAIL

NOTES:

1. PROOF ROLL LOCATION OF IMPACTED MATERIAL STAGING AREA PRIOR TO CONSTRUCTION. ROLLER TO HAVE MINIMUM LOADED WEIGHT OF 25 TONS.
2. PLACE LINER SYSTEM (CONSISTING OF 16 OZ. NON–WOVEN GEOTEXTILE FABRIC, 40 MIL HDPE LINER, AND 16 OZ. NON–WOVEN GEOTEXTILE FABRIC) OVER THE SUBBASE.
3. CONSTRUCT IMPACTED MATERIAL STAGING AREA SUCH THAT AREA HAS A GENERAL SLOPE TOWARDS A COLLECTION SUMP TO FACILITATE COLLECTION OF FLUIDS FOR TREATMENT.
4. CONCRETE BIN BLOCKS MAY BE USED TO SEPARATE STOCKPILES. PROVIDE PROPOSED METHODS TO SEGREGATE AND STABILIZE MATERIAL.
5. SUBBASE MATERIAL BETWEEN EXISTING GRADE AND BOTTOM OF NON–WOVEN GEOTEXTILE FABRIC MAY NOT BE REQUIRED IF CONSTRUCTED ON ASPHALT.
6. IMPACTED MATERIAL STAGING AREA WILL BE 100 FEET BY 70 FEET MINIMUM.
7. INSTALL ASPHALT PAVEMENT IN ACCORDANCE WITH SPECIFICATION SECTION 32 12 00, FLEXIBLE PAVING.
8. MINIMUM BERM HEIGHT CORRESPONDS TO AN APPROXIMATE FLOOD ELEVATION FOR A 5–YEAR STORM, PLUS 6 INCHES OF FREE–BOARD. IF LARGER STORM IS IMMINENT, INCREASE BERM HEIGHT TO 6 FEET (FOR 100–YEAR STORM) OR REMOVE ALL STAGED IMPACTED MATERIAL FROM THE SITE PRIOR TO FLOODING.

IMPACTED MATERIAL STAGING AREA 6

NOT TO SCALE

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by JJB	Drawn by BKD	Checked by LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

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OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

MISCELLANEOUS DETAILS

ARCADIS Project No.
B0013137.0008.00016

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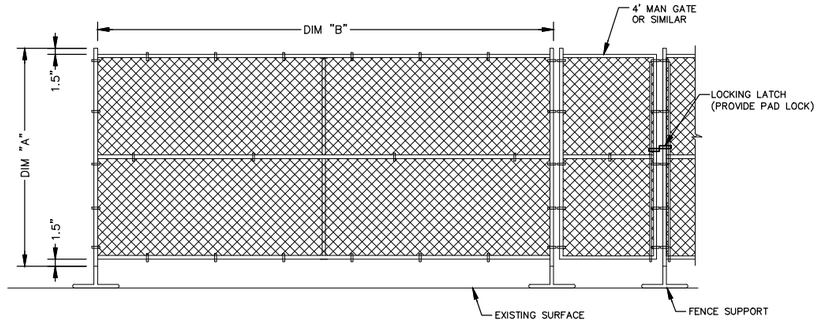
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-502

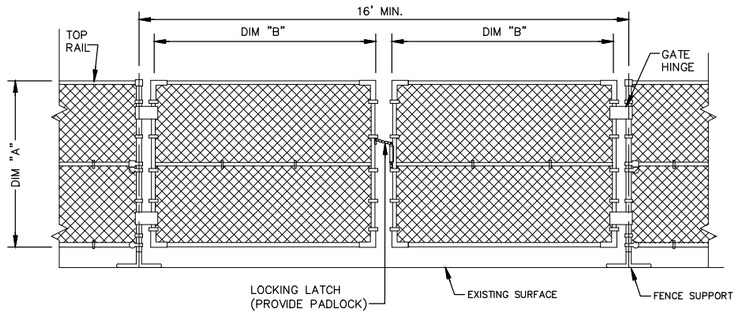


NOTES:

1. INSTALL MAN GATES, AS NECESSARY, TO PROVIDE ACCESS AND EGRESS TO SUBCONTRACTORS, SUPPLIERS, AND SITE WORKERS.
2. INSTALL A WOVEN GEOTEXTILE VISUAL BARRIER MEETING THE SPECIFICATIONS OF US FABRIC INC. FENCE SCREEN 130 SERIES PRIVACY AIR OR EQUIVALENT.
3. WIRE TIES OR CLIPS WILL BE A MINIMUM OF 6 GAUGE. HOG RINGS MAY BE USED TO TIE FABRIC TO FENCE SUPPORTS.
4. UNLESS STATED OTHERWISE, DIMENSIONS AND WEIGHTS SHALL BE AS LISTED IN TABLE G–503–A.

TEMPORARY SECURITY FENCE AND MAN GATE DETAIL 1

NOT TO SCALE

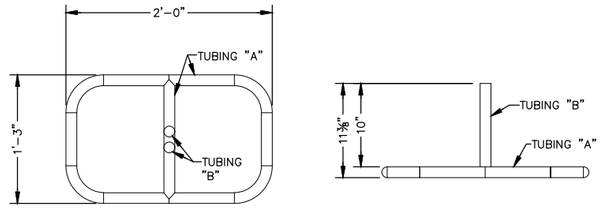


NOTES:

1. INSTALL VEHICLE GATES, AS NECESSARY, TO PROVIDE VEHICLE ACCESS AND EGRESS TO SUBCONTRACTORS, SUPPLIERS, AND SITE WORKERS.
2. INSTALL A WOVEN GEOTEXTILE VISUAL BARRIER MEETING THE SPECIFICATIONS OF FENCE SCREEN 130 SERIES PRIVACY AIR OR EQUIVALENT.
3. WIRE TIES OR CLIPS WILL BE A MINIMUM OF 6 GAUGE. HOG RINGS MAY BE USED TO TIE FABRIC TO FENCE SUPPORTS.
4. UNLESS STATED OTHERWISE, DIMENSIONS AND WEIGHTS SHALL BE AS LISTED IN TABLE G–503–A.

TEMPORARY SECURITY FENCE AND VEHICLE ACCESS GATE DETAIL 2

NOT TO SCALE



TUBING "A"	TUBING "B"
1–⅜"x16 GAUGE	1"x16 GAUGE

NOTES:

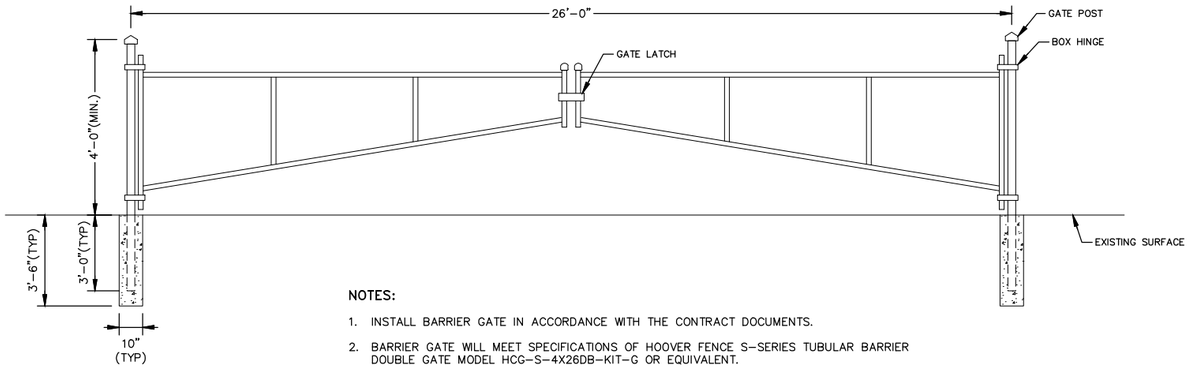
1. ALTERNATE SECURITY FENCE SUPPORTS MAY BE USED WITH NYSEG/REMEDIATION ENGINEER APPROVAL.
2. SECURITY FENCE SUPPORTS SHALL BE WEIGHED DOWN WITH SAND BAGS AS NECESSARY.

SECURITY FENCE SUPPORT DETAIL 3

NOT TO SCALE

TABLE G-503-A – MINIMUM FENCING CONSTRUCTION MATERIALS

OUTSIDE DIAMETER (INCHES)		WEIGHT/FOOT (POUNDS)		
DIM "A"	DIM "B"	TUBING MATERIAL	CHAIN LINK WIRE	
			GAUGE	DIAMOND SIZE
6'	10'	1 3/8" x 16 GAUGE	11.5	2 3/8"
6'	12'	1 5/8" x 16 GAUGE	11.5	2 3/8"



NOTES:

1. INSTALL BARRIER GATE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
2. BARRIER GATE WILL MEET SPECIFICATIONS OF HOOVER FENCE S–SERIES TUBULAR BARRIER DOUBLE GATE MODEL HCG–S–4X26DB–KIT–G OR EQUIVALENT.
3. CONCRETE MIX FOR FOOTINGS WILL BE MINIMUM 3,000 POUNDS PER SQUARE INCH (AT 28 DAYS).

BARRIER GATE 4

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Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

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B0013137.0008.00016

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APRIL 2020

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G-503

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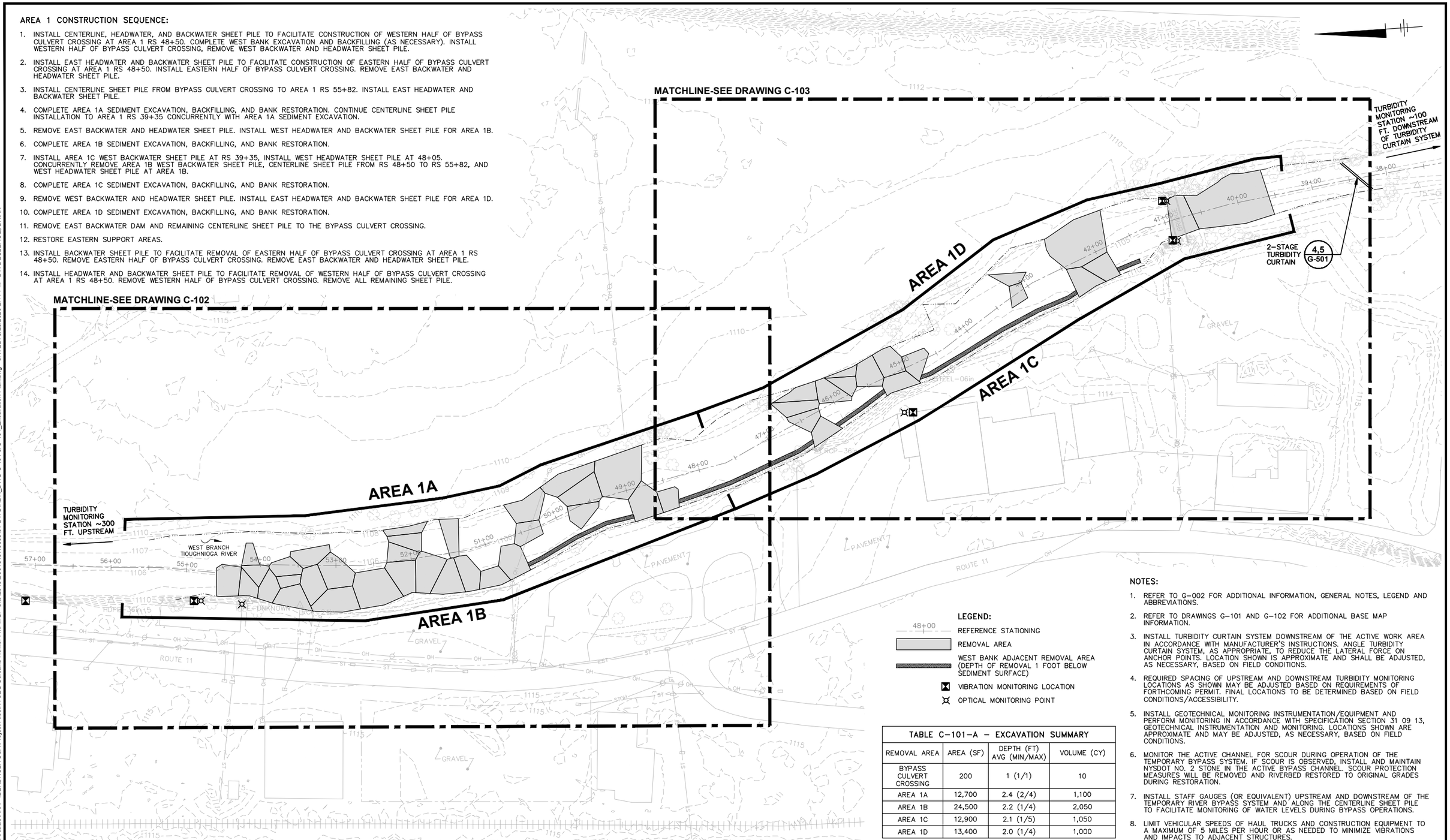
AREA 1 CONSTRUCTION SEQUENCE:

1. INSTALL CENTERLINE, HEADWATER, AND BACKWATER SHEET PILE TO FACILITATE CONSTRUCTION OF WESTERN HALF OF BYPASS CULVERT CROSSING AT AREA 1 RS 48+50. COMPLETE WEST BANK EXCAVATION AND BACKFILLING (AS NECESSARY). INSTALL WESTERN HALF OF BYPASS CULVERT CROSSING, REMOVE WEST BACKWATER AND HEADWATER SHEET PILE.
2. INSTALL EAST HEADWATER AND BACKWATER SHEET PILE TO FACILITATE CONSTRUCTION OF EASTERN HALF OF BYPASS CULVERT CROSSING AT AREA 1 RS 48+50. INSTALL EASTERN HALF OF BYPASS CULVERT CROSSING. REMOVE EAST BACKWATER AND HEADWATER SHEET PILE.
3. INSTALL CENTERLINE SHEET PILE FROM BYPASS CULVERT CROSSING TO AREA 1 RS 55+82. INSTALL EAST HEADWATER AND BACKWATER SHEET PILE.
4. COMPLETE AREA 1A SEDIMENT EXCAVATION, BACKFILLING, AND BANK RESTORATION. CONTINUE CENTERLINE SHEET PILE INSTALLATION TO AREA 1 RS 39+35 CONCURRENTLY WITH AREA 1A SEDIMENT EXCAVATION.
5. REMOVE EAST BACKWATER AND HEADWATER SHEET PILE. INSTALL WEST HEADWATER AND BACKWATER SHEET PILE FOR AREA 1B.
6. COMPLETE AREA 1B SEDIMENT EXCAVATION, BACKFILLING, AND BANK RESTORATION.
7. INSTALL AREA 1C WEST BACKWATER SHEET PILE AT RS 39+35, INSTALL WEST HEADWATER SHEET PILE AT 48+05. CONCURRENTLY REMOVE AREA 1B WEST BACKWATER SHEET PILE, CENTERLINE SHEET PILE FROM RS 48+50 TO RS 55+82, AND WEST HEADWATER SHEET PILE AT AREA 1B.
8. COMPLETE AREA 1C SEDIMENT EXCAVATION, BACKFILLING, AND BANK RESTORATION.
9. REMOVE WEST BACKWATER AND HEADWATER SHEET PILE. INSTALL EAST HEADWATER AND BACKWATER SHEET PILE FOR AREA 1D.
10. COMPLETE AREA 1D SEDIMENT EXCAVATION, BACKFILLING, AND BANK RESTORATION.
11. REMOVE EAST BACKWATER DAM AND REMAINING CENTERLINE SHEET PILE TO THE BYPASS CULVERT CROSSING.
12. RESTORE EASTERN SUPPORT AREAS.
13. INSTALL BACKWATER SHEET PILE TO FACILITATE REMOVAL OF EASTERN HALF OF BYPASS CULVERT CROSSING AT AREA 1 RS 48+50. REMOVE EASTERN HALF OF BYPASS CULVERT CROSSING. REMOVE EAST BACKWATER AND HEADWATER SHEET PILE.
14. INSTALL HEADWATER AND BACKWATER SHEET PILE TO FACILITATE REMOVAL OF WESTERN HALF OF BYPASS CULVERT CROSSING AT AREA 1 RS 48+50. REMOVE WESTERN HALF OF BYPASS CULVERT CROSSING. REMOVE ALL REMAINING SHEET PILE.



LEGEND:

TABLE C-101-A – EXCAVATION SUMMARY			
REMOVAL AREA	AREA (SF)	DEPTH (FT) AVG (MIN/MAX)	VOLUME (CY)
BYPASS CULVERT CROSSING	200	1 (1/1)	10
AREA 1A	12,700	2.4 (2/4)	1,100
AREA 1B	24,500	2.2 (1/4)	2,050
AREA 1C	12,900	2.1 (1/5)	1,050
AREA 1D	13,400	2.0 (1/4)	1,000

NOTES:

1. REFER TO G-002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G-101 AND G-102 FOR ADDITIONAL BASE MAP INFORMATION.
3. INSTALL TURBIDITY CURTAIN SYSTEM DOWNSTREAM OF THE ACTIVE WORK AREA IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. ANGLE TURBIDITY CURTAIN SYSTEM, AS APPROPRIATE, TO REDUCE THE LATERAL FORCE ON ANCHOR POINTS. LOCATION SHOWN IS APPROXIMATE AND SHALL BE ADJUSTED, AS NECESSARY, BASED ON FIELD CONDITIONS.
4. REQUIRED SPACING OF UPSTREAM AND DOWNSTREAM TURBIDITY MONITORING LOCATIONS AS SHOWN MAY BE ADJUSTED BASED ON REQUIREMENTS OF FORTHCOMING PERMIT. FINAL LOCATIONS TO BE DETERMINED BASED ON FIELD CONDITIONS/ACCESSIBILITY.
5. INSTALL GEOTECHNICAL MONITORING INSTRUMENTATION/EQUIPMENT AND PERFORM MONITORING IN ACCORDANCE WITH SPECIFICATION SECTION 31 09 13, GEOTECHNICAL INSTRUMENTATION AND MONITORING. LOCATIONS SHOWN ARE APPROXIMATE AND MAY BE ADJUSTED, AS NECESSARY, BASED ON FIELD CONDITIONS.
6. MONITOR THE ACTIVE CHANNEL FOR SCOUR DURING OPERATION OF THE TEMPORARY BYPASS SYSTEM. IF SCOUR IS OBSERVED, INSTALL AND MAINTAIN NYSDOT NO. 2 STONE IN THE ACTIVE BYPASS CHANNEL. SCOUR PROTECTION MEASURES WILL BE REMOVED AND RIVERBED RESTORED TO ORIGINAL GRADES DURING RESTORATION.
7. INSTALL STAFF GAUGES (OR EQUIVALENT) UPSTREAM AND DOWNSTREAM OF THE TEMPORARY RIVER BYPASS SYSTEM AND ALONG THE CENTERLINE SHEET PILE TO FACILITATE MONITORING OF WATER LEVELS DURING BYPASS OPERATIONS.
8. LIMIT VEHICULAR SPEEDS OF HAUL TRUCKS AND CONSTRUCTION EQUIPMENT TO A MAXIMUM OF 5 MILES PER HOUR OR AS NEEDED TO MINIMIZE VIBRATIONS AND IMPACTS TO ADJACENT STRUCTURES.

60' 0 60' 120'
1"=60'

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Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by JJB	Drawn by BKD	Checked by LJP

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OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXCAVATION PLAN (AREA 1)

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-101

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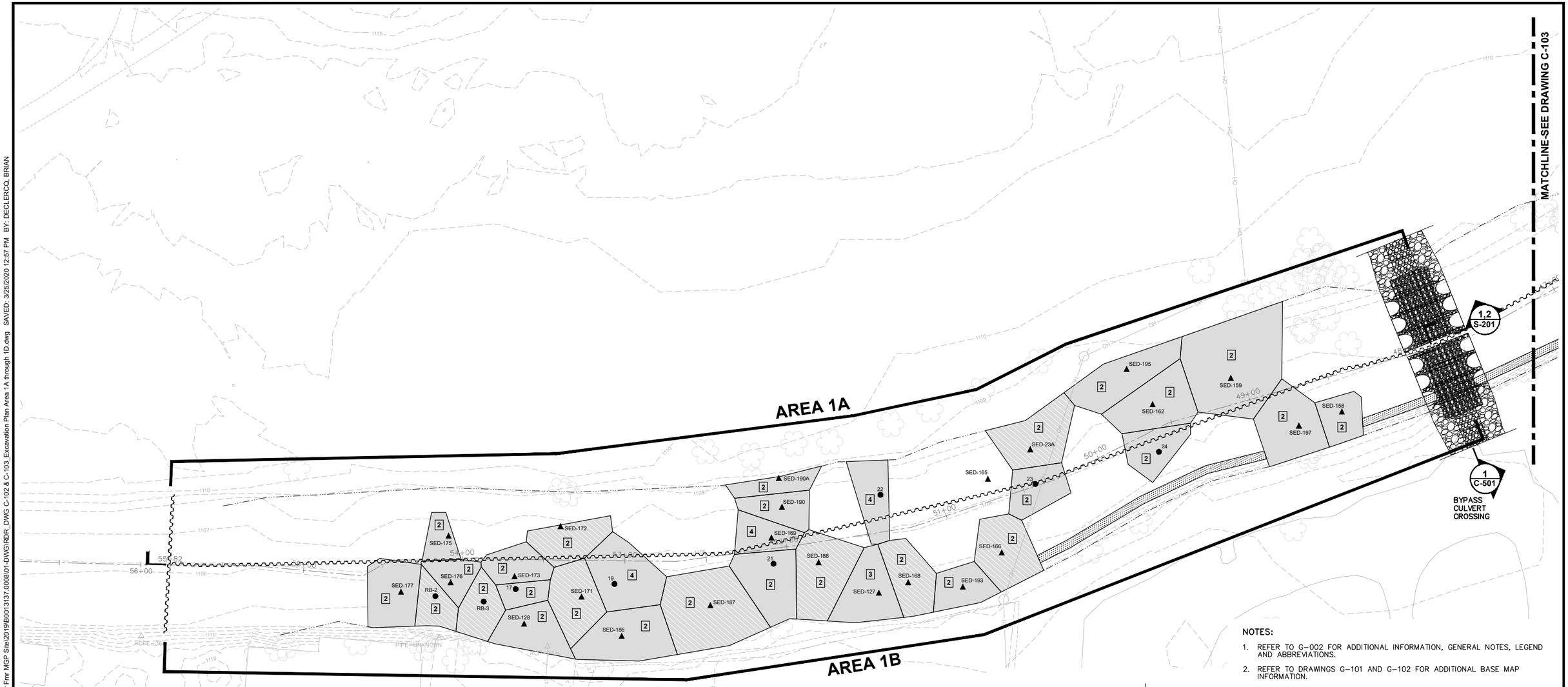

NOTES:

1. REFER TO G–002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G–101 AND G–102 FOR ADDITIONAL BASE MAP INFORMATION.
3. THE ALIGNMENT OF THE RIVER BYPASS SYSTEM MAY BE ADJUSTED IN THE FIELD BY THE REMEDIATION CONTRACTOR BASED ON FIELD CONDITIONS ENCOUNTERED. PRIOR TO ADJUSTMENT, THE REMEDIATION CONTRACTOR SHALL PROPOSE THE NEW ALIGNMENT TO THE REMEDIATION ENGINEER AND DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
4. EXCAVATION ACTIVITIES FOR AREA 1A AND 1B WILL PROCEED FROM UPSTREAM TO DOWNSTREAM AND FROM THE BYPASS BARRIER WALL OUT TOWARD THE RIVERBANK, AS APPROPRIATE.
5. SHEET PILE WILL NOT BE DRIVEN BELOW SEDIMENT SURFACE ADJACENT TO EXISTING STRUCTURES WITHOUT FIRST INVESTIGATING SUBSURFACE (E.G., EXTENT OF FOOTER). SHEET PILE WILL NOT BE INSTALLED WITHIN 5 FEET (HORIZONTAL) OF STRUCTURES, INCLUDING FOOTER (IF PRESENT). MATERIAL REMOVAL WILL BE OFFSET FROM EXISTING STRUCTURES (INCLUDING FOOTERS, IF PRESENT) BY 5 FEET (HORIZONTAL) FROM STRUCTURE. EDGE OF OFFSET WILL SLOPE AWAY FROM THE STRUCTURE AT NO STEEPER THAN 1H:1V INTO EXCAVATION.
6. SURVEY IN–RIVER REMEDIATION AREAS IN ACCORDANCE WITH SPECIFICATION SECTION 01 71 26, CONSTRUCTION SURVEYING AND LAYOUT.
7. WEST BANK ADJACENT REMOVAL AREA IS APPROXIMATE AND IS ASSUMED TO BE LOCATED FROM TOE OF BANK EXTENDING 5 FEET INTO THE RIVER. LIMITS OF REMOVAL TO BE MODIFIED IN THE FIELD BASED ON THE PRESENCE/ABSENCE OF SEDIMENT THAT GENERATES SHEEN.
8. REMOVAL LIMITS SHOWN ARE NEAT LINE AND DO NOT ACCOUNT FOR CONSTRUCTABILITY OR SLOUGHING OF MATERIALS.

LEGEND:

- 51+00 — REFERENCE STATIONING
- STEEL SHEET PILE
- TOTAL PAH > 6.2 mg/kg
- VISUAL IMPACTS
- [2] DEPTH OF REMOVAL (FEET BELOW SEDIMENT SURFACE)
- WEST BANK ADJACENT REMOVAL AREA (DEPTH OF REMOVAL 1 FOOT BELOW SEDIMENT SURFACE) (SEE NOTE 7)
- ● HISTORICAL SEDIMENT/SOIL BORING LOCATION
- ▲ PHASE I AND II SEDIMENT BORING LOCATION

30' 0 30' 60'
1" = 30'

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EXCAVATION PLAN (AREA 1A &1B)

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
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TELEPHONE: 315-432-1529

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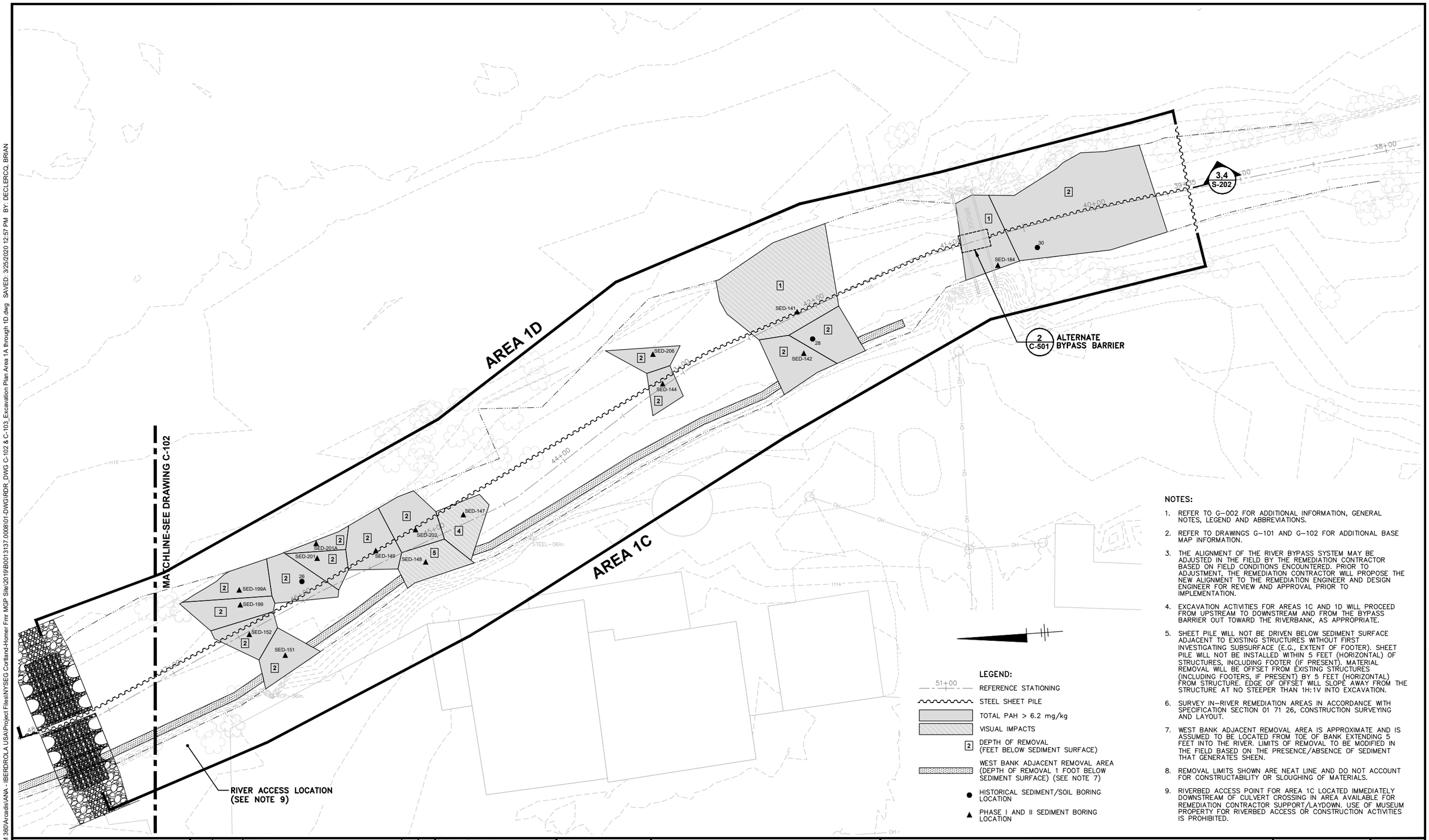

LEGEND:

- 51+00 — REFERENCE STATIONING
- STEEL SHEET PILE
- TOTAL PAH > 6.2 mg/kg
- VISUAL IMPACTS
- [2] DEPTH OF REMOVAL (FEET BELOW SEDIMENT SURFACE)
- WEST BANK ADJACENT REMOVAL AREA (DEPTH OF REMOVAL 1 FOOT BELOW SEDIMENT SURFACE) (SEE NOTE 7)
- ● HISTORICAL SEDIMENT/SOIL BORING LOCATION
- ▲ PHASE I AND II SEDIMENT BORING LOCATION

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3. THE ALIGNMENT OF THE RIVER BYPASS SYSTEM MAY BE ADJUSTED IN THE FIELD BY THE REMEDIATION CONTRACTOR BASED ON FIELD CONDITIONS ENCOUNTERED. PRIOR TO ADJUSTMENT, THE REMEDIATION CONTRACTOR WILL PROPOSE THE NEW ALIGNMENT TO THE REMEDIATION ENGINEER AND DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
4. EXCAVATION ACTIVITIES FOR AREAS 1C AND 1D WILL PROCEED FROM UPSTREAM TO DOWNSTREAM AND FROM THE BYPASS BARRIER OUT TOWARD THE RIVERBANK, AS APPROPRIATE.
5. SHEET PILE WILL NOT BE DRIVEN BELOW SEDIMENT SURFACE ADJACENT TO EXISTING STRUCTURES WITHOUT FIRST INVESTIGATING SUBSURFACE (E.G., EXTENT OF FOOTER). SHEET PILE WILL NOT BE INSTALLED WITHIN 5 FEET (HORIZONTAL) OF STRUCTURES, INCLUDING FOOTER (IF PRESENT). MATERIAL REMOVAL WILL BE OFFSET FROM EXISTING STRUCTURES (INCLUDING FOOTERS, IF PRESENT) BY 5 FEET (HORIZONTAL) FROM STRUCTURE. EDGE OF OFFSET WILL SLOPE AWAY FROM THE STRUCTURE AT NO STEEPER THAN 1H:1V INTO EXCAVATION.
6. SURVEY IN–RIVER REMEDIATION AREAS IN ACCORDANCE WITH SPECIFICATION SECTION 01 71 26, CONSTRUCTION SURVEYING AND LAYOUT.
7. WEST BANK ADJACENT REMOVAL AREA IS APPROXIMATE AND IS ASSUMED TO BE LOCATED FROM TOE OF BANK EXTENDING 5 FEET INTO THE RIVER. LIMITS OF REMOVAL TO BE MODIFIED IN THE FIELD BASED ON THE PRESENCE/ABSENCE OF SEDIMENT THAT GENERATES SHEEN.
8. REMOVAL LIMITS SHOWN ARE NEAT LINE AND DO NOT ACCOUNT FOR CONSTRUCTABILITY OR SLOUGHING OF MATERIALS.
9. RIVERBED ACCESS POINT FOR AREA 1C LOCATED IMMEDIATELY DOWNSTREAM OF CULVERT CROSSING IN AREA AVAILABLE FOR REMEDIATION CONTRACTOR SUPPORT/LAYDOWN. USE OF MUSEUM PROPERTY FOR RIVERBED ACCESS OR CONSTRUCTION ACTIVITIES IS PROHIBITED.

30' 0 30' 60'
1"=30'

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No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 4/8/2020	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXCAVATION PLAN (AREA 1C & 1D)

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-103

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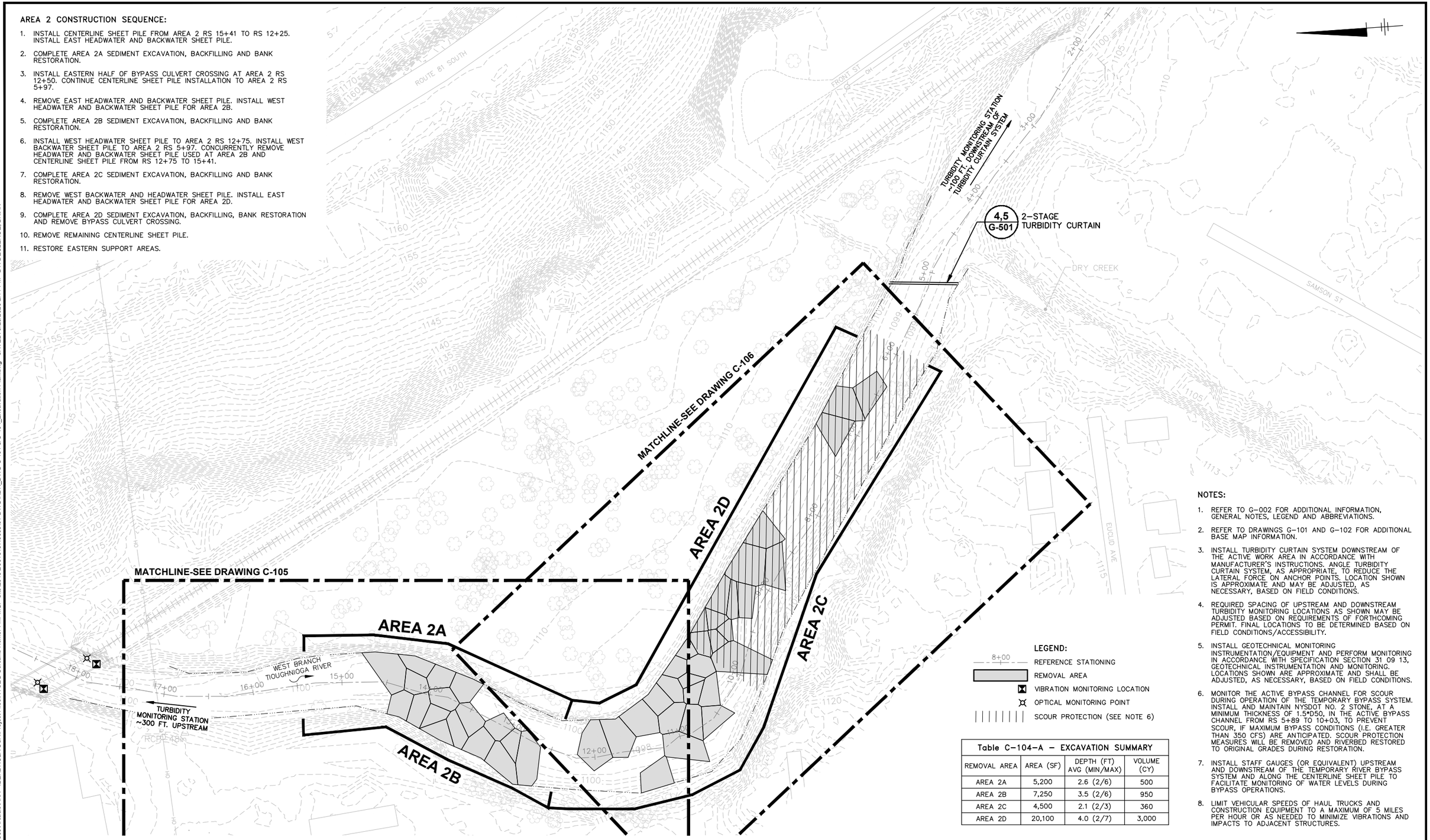
AREA 2 CONSTRUCTION SEQUENCE:

1. INSTALL CENTERLINE SHEET PILE FROM AREA 2 RS 15+41 TO RS 12+25. INSTALL EAST HEADWATER AND BACKWATER SHEET PILE.
2. COMPLETE AREA 2A SEDIMENT EXCAVATION, BACKFILLING AND BANK RESTORATION.
3. INSTALL EASTERN HALF OF BYPASS CULVERT CROSSING AT AREA 2 RS 12+50. CONTINUE CENTERLINE SHEET PILE INSTALLATION TO AREA 2 RS 5+97.
4. REMOVE EAST HEADWATER AND BACKWATER SHEET PILE. INSTALL WEST HEADWATER AND BACKWATER SHEET PILE FOR AREA 2B.
5. COMPLETE AREA 2B SEDIMENT EXCAVATION, BACKFILLING AND BANK RESTORATION.
6. INSTALL WEST HEADWATER SHEET PILE TO AREA 2 RS 12+75. INSTALL WEST BACKWATER SHEET PILE TO AREA 2 RS 5+97. CONCURRENTLY REMOVE HEADWATER AND BACKWATER SHEET PILE USED AT AREA 2B AND CENTERLINE SHEET PILE FROM RS 12+75 TO 15+41.
7. COMPLETE AREA 2C SEDIMENT EXCAVATION, BACKFILLING AND BANK RESTORATION.
8. REMOVE WEST BACKWATER AND HEADWATER SHEET PILE. INSTALL EAST HEADWATER AND BACKWATER SHEET PILE FOR AREA 2D.
9. COMPLETE AREA 2D SEDIMENT EXCAVATION, BACKFILLING, BANK RESTORATION AND REMOVE BYPASS CULVERT CROSSING.
10. REMOVE REMAINING CENTERLINE SHEET PILE.
11. RESTORE EASTERN SUPPORT AREAS.



LEGEND:

- 8+00 — REFERENCE STATIONING
- REMOVAL AREA
- VIBRATION MONITORING LOCATION
- OPTICAL MONITORING POINT
- SCOUR PROTECTION (SEE NOTE 6)

Table C-104-A – EXCAVATION SUMMARY

REMOVAL AREA	AREA (SF)	DEPTH (FT) AVG (MIN/MAX)	VOLUME (CY)
AREA 2A	5,200	2.6 (2/6)	500
AREA 2B	7,250	3.5 (2/6)	950
AREA 2C	4,500	2.1 (2/3)	360
AREA 2D	20,100	4.0 (2/7)	3,000

NOTES:

1. REFER TO G-002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G-101 AND G-102 FOR ADDITIONAL BASE MAP INFORMATION.
3. INSTALL TURBIDITY CURTAIN SYSTEM DOWNSTREAM OF THE ACTIVE WORK AREA IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. ANGLE TURBIDITY CURTAIN SYSTEM, AS APPROPRIATE, TO REDUCE THE LATERAL FORCE ON ANCHOR POINTS. LOCATION SHOWN IS APPROXIMATE AND MAY BE ADJUSTED, AS NECESSARY, BASED ON FIELD CONDITIONS.
4. REQUIRED SPACING OF UPSTREAM AND DOWNSTREAM TURBIDITY MONITORING LOCATIONS AS SHOWN MAY BE ADJUSTED BASED ON REQUIREMENTS OF FORTHCOMING PERMIT. FINAL LOCATIONS TO BE DETERMINED BASED ON FIELD CONDITIONS/ACCESSIBILITY.
5. INSTALL GEOTECHNICAL MONITORING INSTRUMENTATION/EQUIPMENT AND PERFORM MONITORING IN ACCORDANCE WITH SPECIFICATION SECTION 31 09 13, GEOTECHNICAL INSTRUMENTATION AND MONITORING. LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE ADJUSTED, AS NECESSARY, BASED ON FIELD CONDITIONS.
6. MONITOR THE ACTIVE BYPASS CHANNEL FOR SCOUR DURING OPERATION OF THE TEMPORARY BYPASS SYSTEM. INSTALL AND MAINTAIN NYSDOT NO. 2 STONE, AT A MINIMUM THICKNESS OF 1.5*D50, IN THE ACTIVE BYPASS CHANNEL FROM RS 5+89 TO 10+03, TO PREVENT SCOUR, IF MAXIMUM BYPASS CONDITIONS (I.E. GREATER THAN 350 CFS) ARE ANTICIPATED. SCOUR PROTECTION MEASURES WILL BE REMOVED AND RIVERBED RESTORED TO ORIGINAL GRADES DURING RESTORATION.
7. INSTALL STAFF GAUGES (OR EQUIVALENT) UPSTREAM AND DOWNSTREAM OF THE TEMPORARY RIVER BYPASS SYSTEM AND ALONG THE CENTERLINE SHEET PILE TO FACILITATE MONITORING OF WATER LEVELS DURING BYPASS OPERATIONS.
8. LIMIT VEHICULAR SPEEDS OF HAUL TRUCKS AND CONSTRUCTION EQUIPMENT TO A MAXIMUM OF 5 MILES PER HOUR OR AS NEEDED TO MINIMIZE VIBRATIONS AND IMPACTS TO ADJACENT STRUCTURES.

50' 0 50' 100'
1"=50'

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Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by JJB	Drawn by BKD	Checked by LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · DATE · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

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CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXCAVATION PLAN (AREA 2)

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-104

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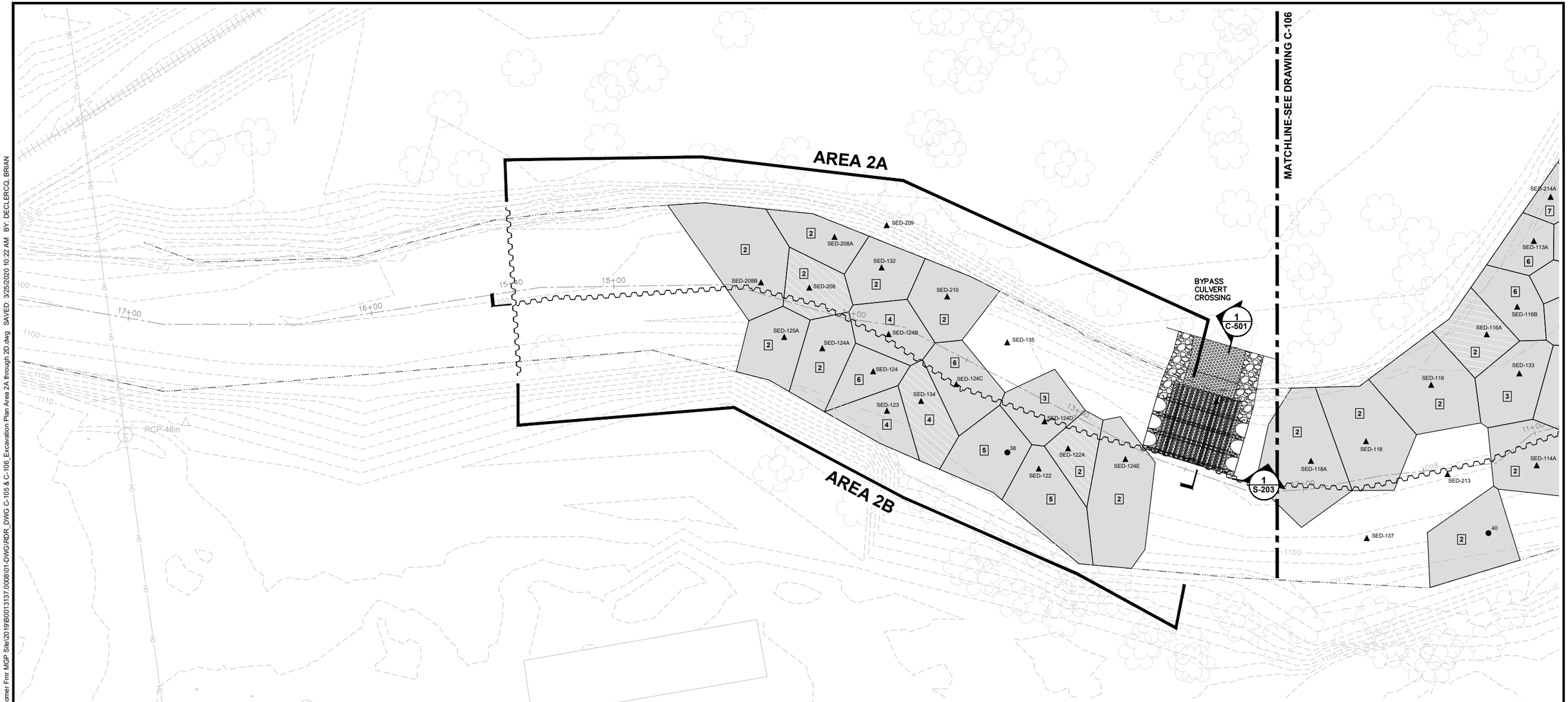

LEGEND:

- 1+00 — REFERENCE STATIONING
- STEEL SHEET PILE
- TOTAL PAH > 6.2 mg/kg
- VISUAL IMPACTS
- [2] DEPTH OF REMOVAL (FEET BELOW SEDIMENT SURFACE)
- ● HISTORICAL SEDIMENT/SOIL BORING LOCATION
- ▲ PHASE I AND II SEDIMENT BORING LOCATION

NOTES:

1. REFER TO G–002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G–101 AND G–102 FOR ADDITIONAL BASE MAP INFORMATION.
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4. EXCAVATION ACTIVITIES FOR AREA 2A AND 2B WILL PROCEED FROM UPSTREAM TO DOWNSTREAM AND FROM THE BYPASS BARRIER WALL OUT TOWARD THE RIVERBANK, AS APPROPRIATE.
5. SHEET PILE WILL NOT BE DRIVEN BELOW SEDIMENT SURFACE ADJACENT TO EXISTING STRUCTURES WITHOUT FIRST INVESTIGATING SUBSURFACE (E.G., EXTENT OF FOOTER). SHEET PILE WILL NOT BE INSTALLED WITHIN 5 FEET (HORIZONTAL) OF STRUCTURES, INCLUDING FOOTER (IF PRESENT). MATERIAL REMOVAL WILL BE OFFSET FROM EXISTING STRUCTURES (INCLUDING FOOTERS, IF PRESENT) BY 5 FEET (HORIZONTAL) FROM STRUCTURE. EDGE OF OFFSET WILL SLOPE AWAY FROM THE STRUCTURE AT NO STEEPER THAN 1H:1V INTO EXCAVATION.
6. SURVEY IN–RIVER REMEDIATION AREAS IN ACCORDANCE WITH SPECIFICATION SECTION 01 71 26, CONSTRUCTION SURVEYING AND LAYOUT.
7. REMOVAL LIMITS SHOWN ARE NEAT LINE AND DO NOT ACCOUNT FOR CONSTRUCTABILITY OR SLOUGHING OF MATERIALS.

20' 0 20' 40'
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Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 4/8/2020	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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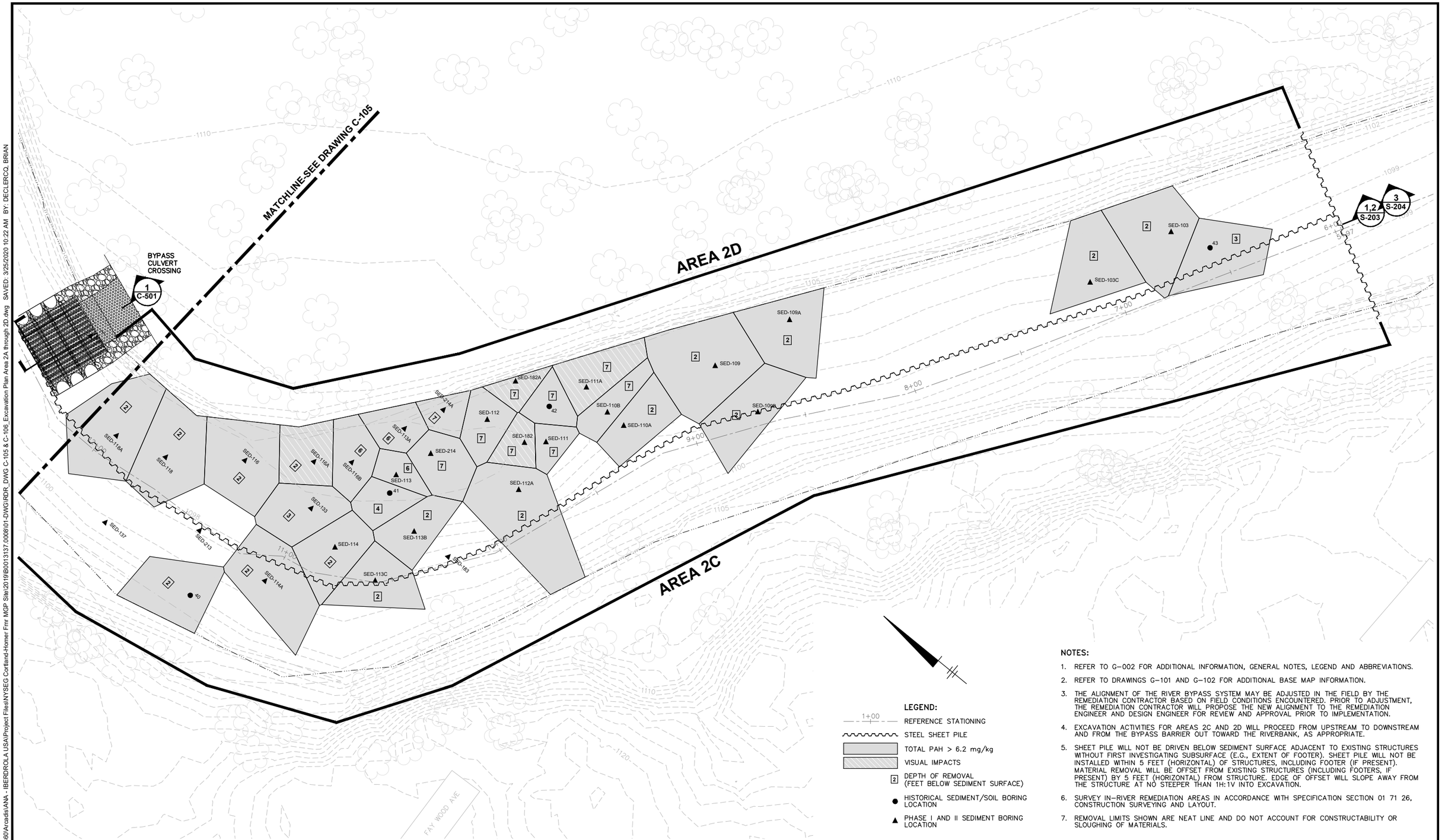
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXCAVATION PLAN (AREA 2A & 2B)

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-105



LEGEND:

- 1+00 — REFERENCE STATIONING
- STEEL SHEET PILE
- TOTAL PAH > 6.2 mg/kg
- VISUAL IMPACTS
- [2] DEPTH OF REMOVAL (FEET BELOW SEDIMENT SURFACE)
- ● HISTORICAL SEDIMENT/SOIL BORING LOCATION
- ▲ PHASE I AND II SEDIMENT BORING LOCATION

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4. EXCAVATION ACTIVITIES FOR AREAS 2C AND 2D WILL PROCEED FROM UPSTREAM TO DOWNSTREAM AND FROM THE BYPASS BARRIER OUT TOWARD THE RIVERBANK, AS APPROPRIATE.
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7. REMOVAL LIMITS SHOWN ARE NEAT LINE AND DO NOT ACCOUNT FOR CONSTRUCTABILITY OR SLOUGHING OF MATERIALS.

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Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 4/8/2020	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · DATE · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

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OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXCAVATION PLAN (AREA 2C & 2D)

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

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ONE LINCOLN CENTER
110 W FAYETTE STREET #300
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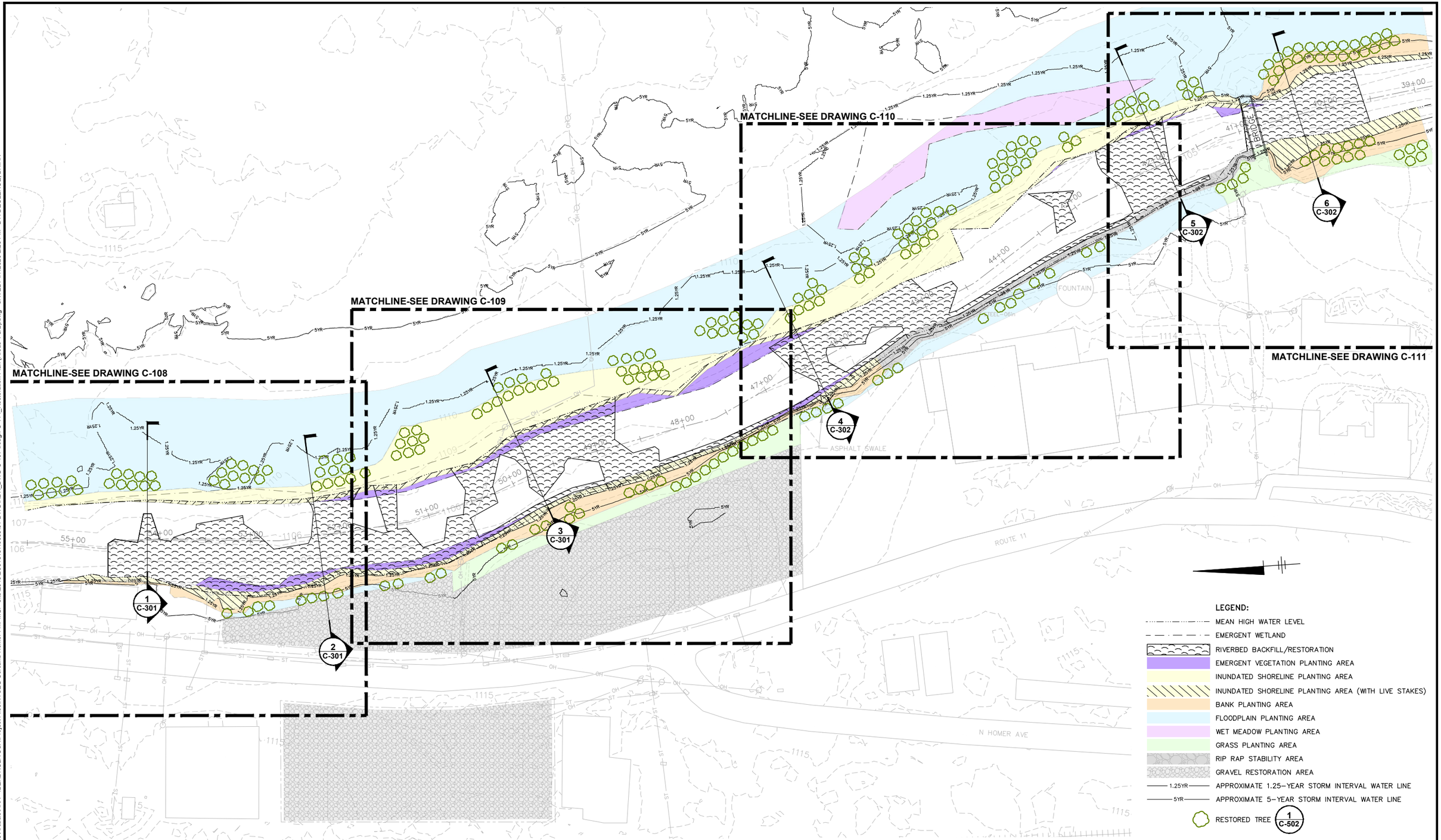

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1"=50'

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Professional Engineer's No.: 069985-1

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NY	4/8/2020	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985 · LICENSED PROFESSIONAL ENGINEER

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OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 1 GENERAL RESTORATION PLAN

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
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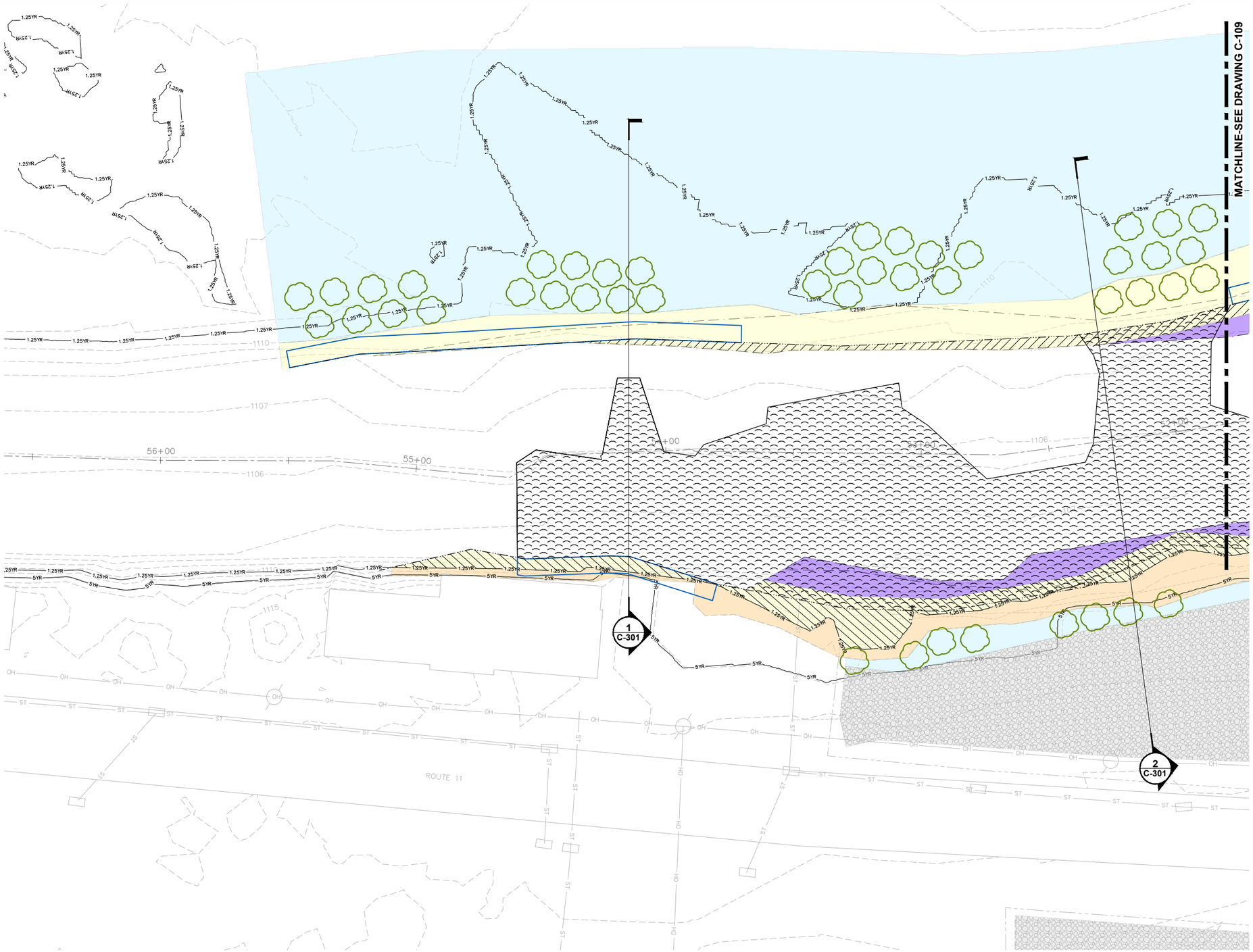

LEGEND:

- MEAN HIGH WATER LEVEL
- EMERGENT WETLAND
- RIVERBED BACKFILL/RESTORATION
- EMERGENT VEGETATION PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA (WITH LIVE STAKES)
- BANK PLANTING AREA
- FLOODPLAIN PLANTING AREA
- WET MEADOW PLANTING AREA
- GRASS PLANTING AREA
- GRAVEL RESTORATION AREA
- 1.25YR — APPROXIMATE 1.25-YEAR STORM INTERVAL WATER LINE
- 5YR — APPROXIMATE 5-YEAR STORM INTERVAL WATER LINE
- EROSION CONTROL BLANKET (SEE NOTE 6)
- RESTORED TREE (1 / C-502)

NOTES:

1. REFER TO DRAWING G-002 FOR GENERAL NOTES AND SPECIFICATIONS, GENERAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWIGNS G-101 AND G-102 FOR ADDITIONAL BASEMAP INFORMATION.
3. FLOOD RECURRANCE INTERVAL WATER LINES ARE MODELED AND APPROXIMATE.
4. REPLACE "MONUMENT" BOULDERS TO APPROXIMATE LOCATIONS IDENTIFIED DURING PRE-CONSTRUCTION SURVEY.
5. LIMITS OF EMERGENT VEGETATION PLANTING AREA WILL BE DETERMINED BY THE BASE FLOW ELEVATION AS DELINEATED IN THE FIELD FOLLOWING RIVERBED BACKFILL RESTORATION.
6. INSTALL EROSION CONTROL BLANKET IN AREAS WITH SLOPES GREATER THAN 3H:1V. INSTALL EROSION CONTROL MESH IN ALL OTHER RESTORATION AREAS.

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STATE OF NEW YORK · MARK OWEN GRAVELDING · 069985-1 · LICENSED PROFESSIONAL ENGINEER

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CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

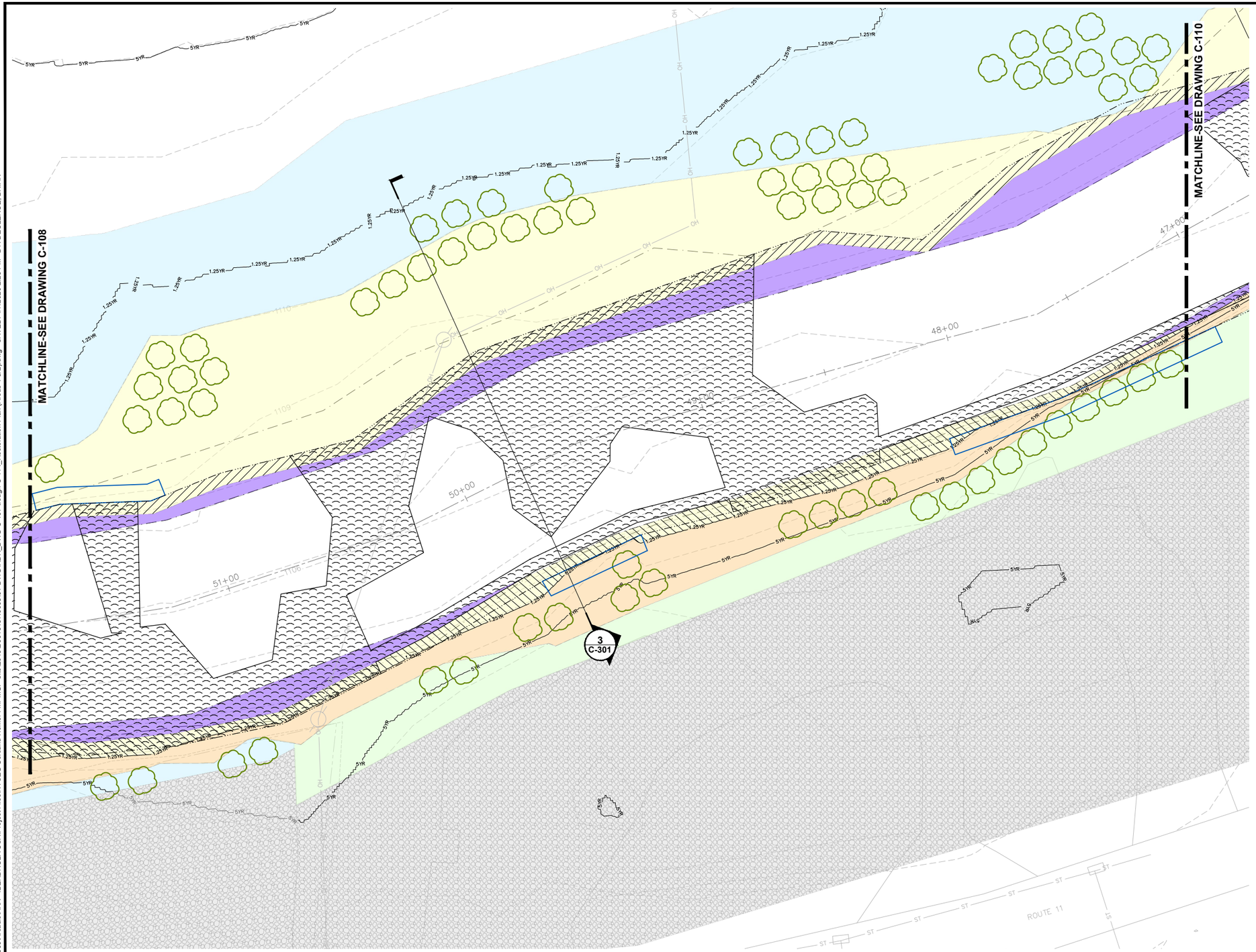
AREA 1 RESTORATION PLAN (STA.0+00 - STA.4+00)

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-108



LEGEND:

- MEAN HIGH WATER LEVEL
- EMERGENT WETLAND
- RIVERBED BACKFILL/RESTORATION
- EMERGENT VEGETATION PLANTING AREA
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State: NY	Date Signed: 4/8/2020	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

NYSEG • CORTLAND-HOMER, NEW YORK

CORTLAND-HOMER FORMER MGP SITE

OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 1 RESTORATION PLAN (STA.4+00 - STA.8+73)

ARCADIS Project No.: B0013137.0008.00016

Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-109

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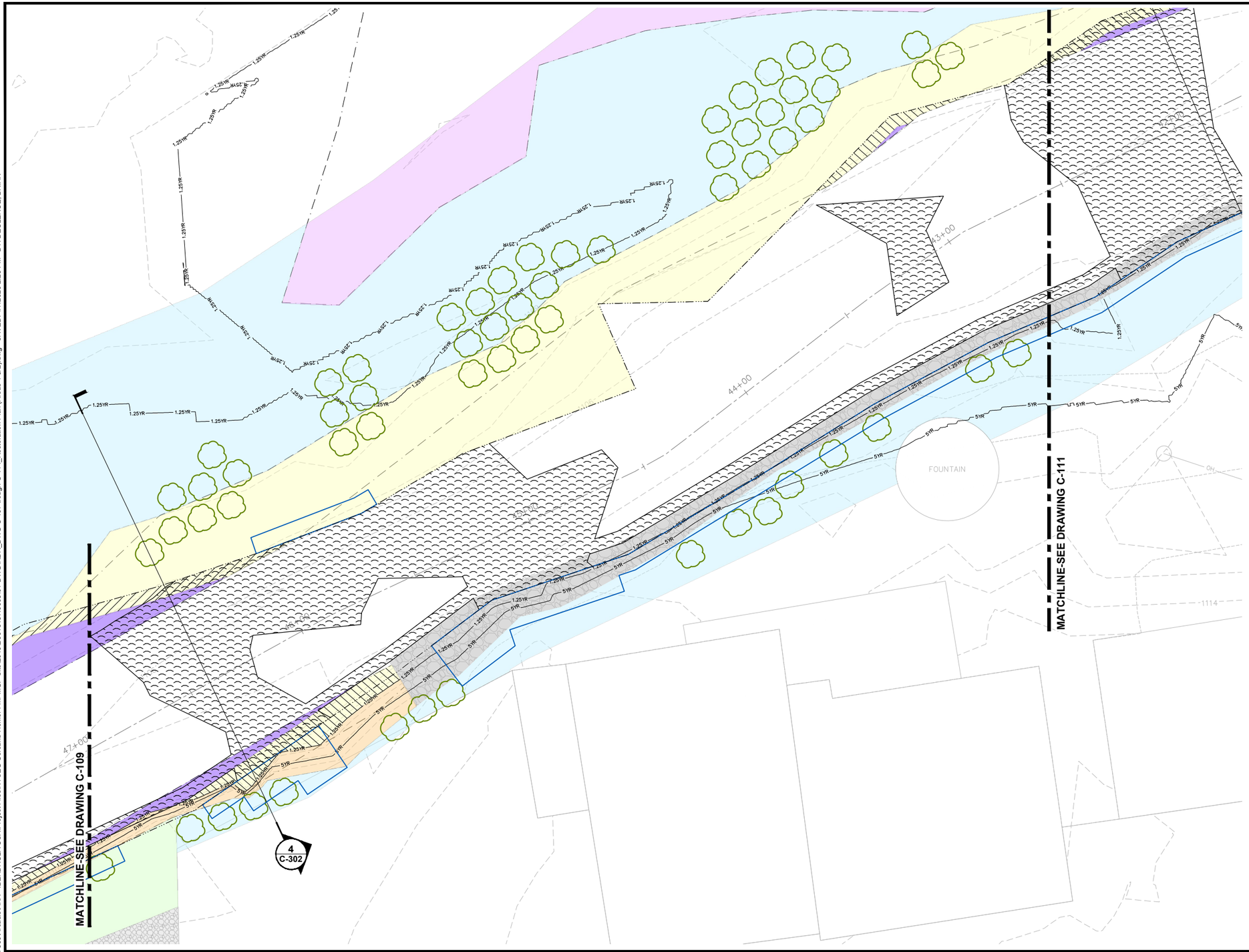

LEGEND:

- MEAN HIGH WATER LEVEL
- EMERGENT WETLAND
- RIVERBED BACKFILL/RESTORATION
- EMERGENT VEGETATION PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA (WITH LIVE STAKES)
- BANK PLANTING AREA
- FLOODPLAIN PLANTING AREA
- WET MEADOW PLANTING AREA
- GRASS PLANTING AREA
- RIP RAP STABILITY AREA
- GRAVEL RESTORATION AREA
- 1.25YR — APPROXIMATE 1.25-YEAR STORM INTERVAL WATER LINE
- 5YR — APPROXIMATE 5-YEAR STORM INTERVAL WATER LINE
- EROSION CONTROL BLANKET (SEE NOTE 6)
- RESTORED TREE (1 / C-502)

NOTES:

1. REFER TO DRAWING G-002 FOR GENERAL NOTES AND SPECIFICATIONS, GENERAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G-101 AND G-102 FOR ADDITIONAL BASEMAP INFORMATION.
3. FLOOD RECURRENCE INTERVAL WATER LINES ARE MODELED AND APPROXIMATE.
4. REPLACE "MONUMENT" BOULDERS TO APPROXIMATE LOCATIONS IDENTIFIED DURING PRE-CONSTRUCTION SURVEY.
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6. INSTALL EROSION CONTROL BLANKET IN AREAS WITH SLOPES GREATER THAN 3H:1V. INSTALL EROSION CONTROL MESH IN ALL OTHER RESTORATION AREAS.

1"=20' 20' 0 20' 40'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

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CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 1 RESTORATION PLAN (STA.8+73 - STA.13+65)

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

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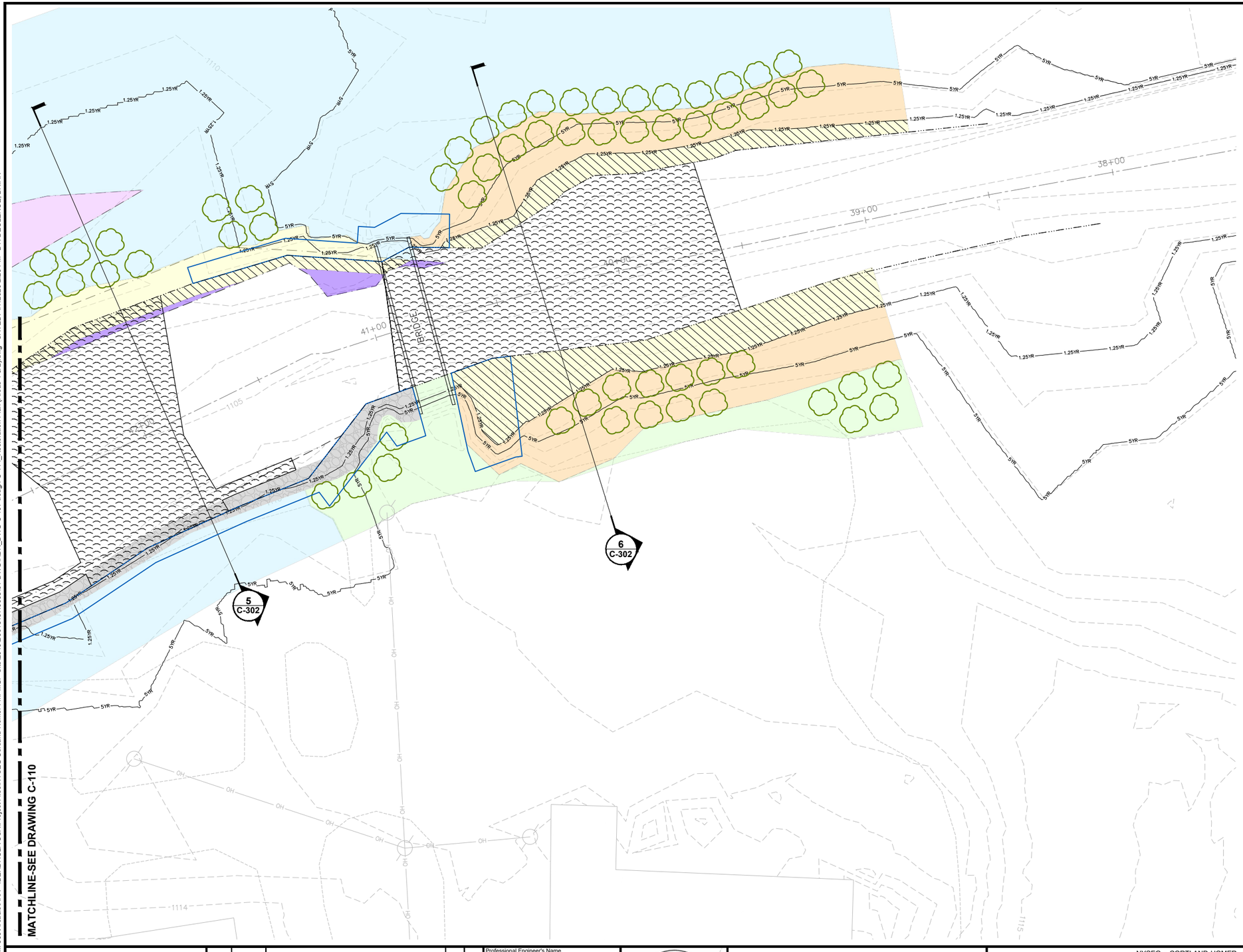

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1"=20' (20' 0 20' 40')

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State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
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STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

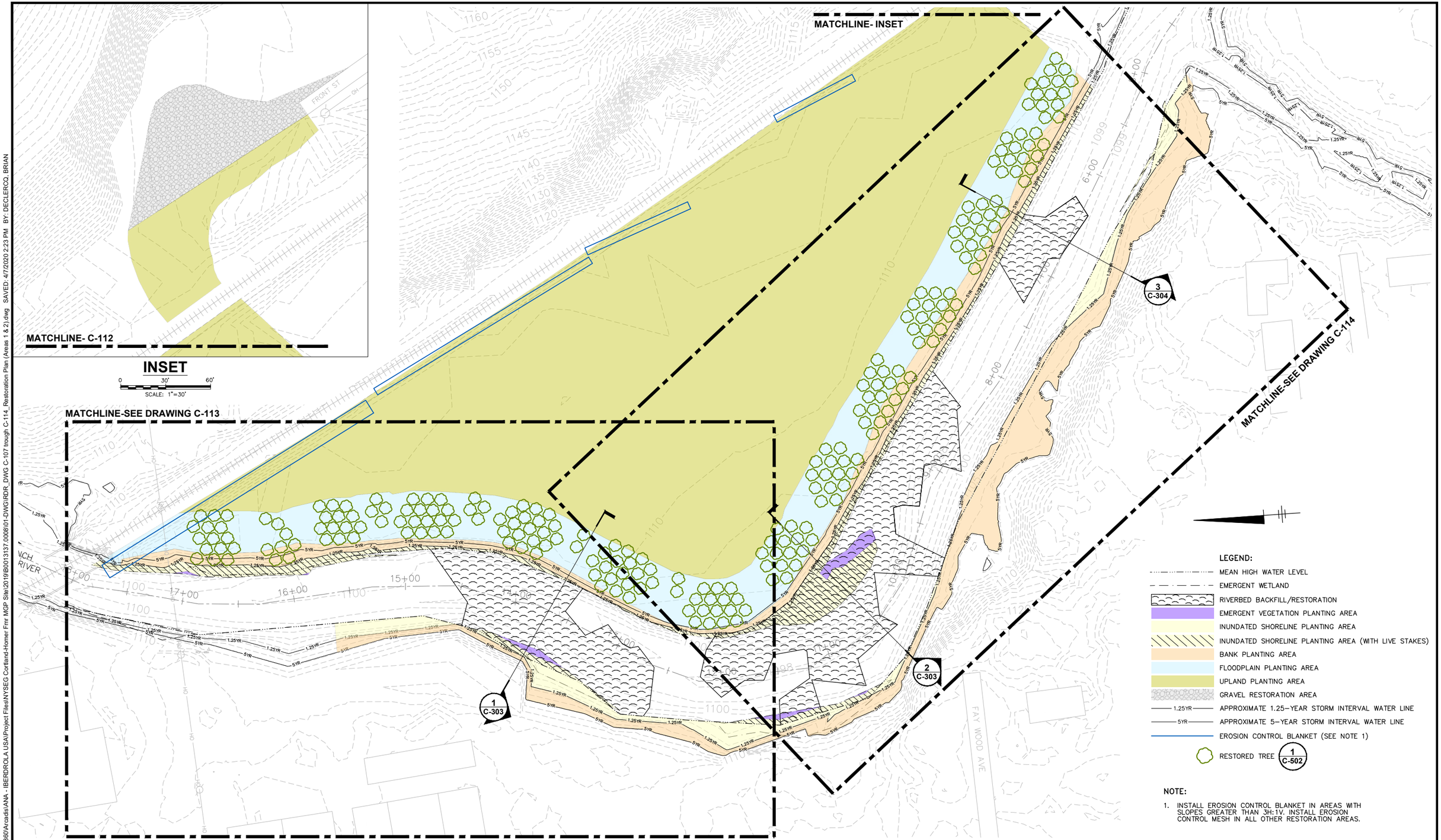
AREA 1 RESTORATION PLAN (STA.13+65 - STA.16+39)

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-111



NOTE:

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1" = 40' 40' 0 40' 80'

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Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 4/8/2020	Project Mgr.: JRG
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STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

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NYSEG • CORTLAND-HOMER, NEW YORK

CORTLAND-HOMER FORMER MGP SITE

OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 2 GENERAL RESTORATION PLAN

ARCADIS Project No.: B0013137.0008.00016

Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

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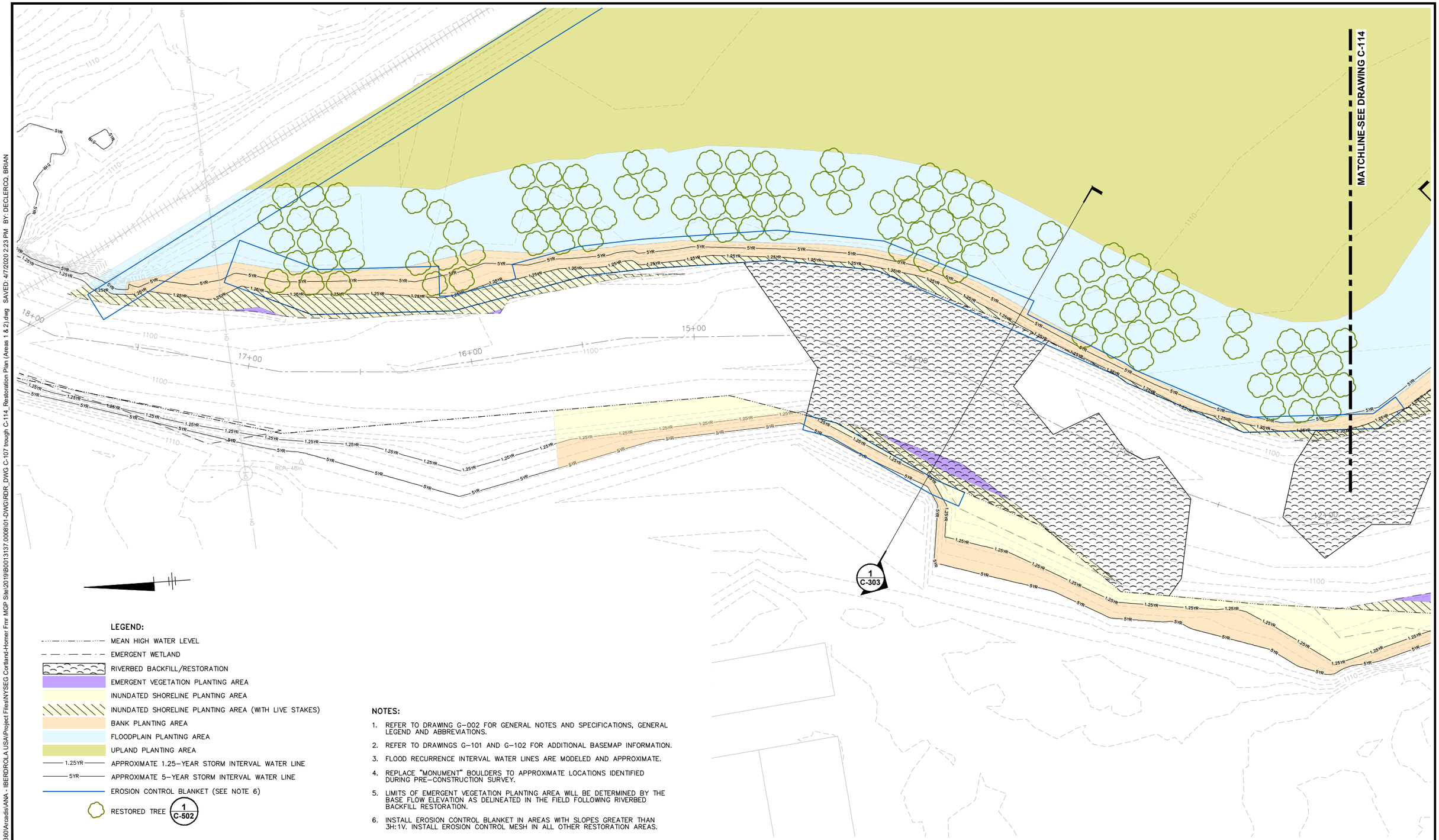

LEGEND:

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- RESTORED TREE (1 / C-502)

NOTES:

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20' 0 20' 40'
1"=20'

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Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

MARK OWEN GRAVELDING — NO. 069985-1 — LICENSED PROFESSIONAL ENGINEER — STATE OF NEW YORK

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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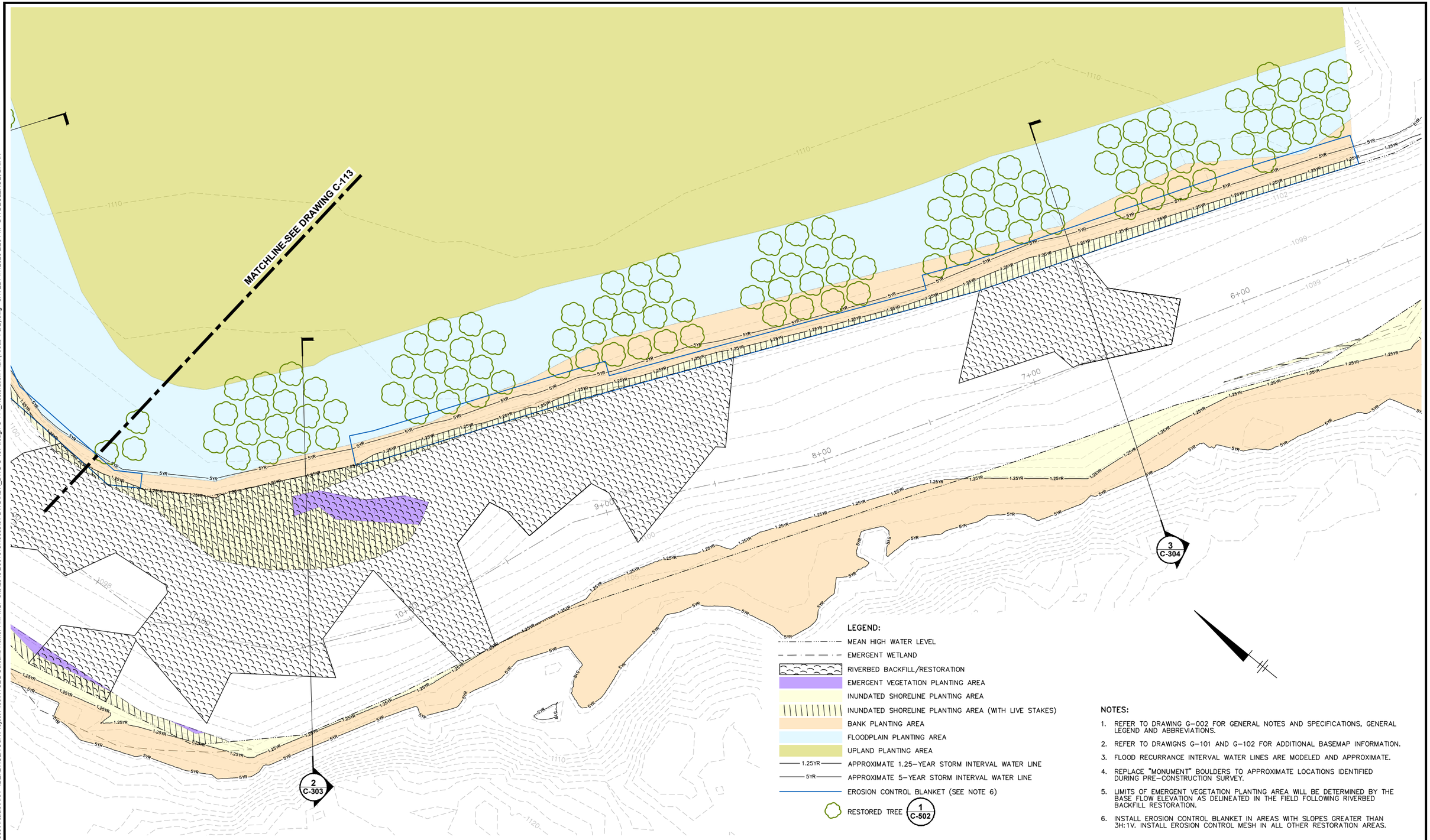
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 2 RESTORATION PLAN (STA.0+00 - STA.3+50)

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-113



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1"=20' — 20' 0 20' 40'

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NY	4/8/2020	JRG
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STATE OF NEW YORK — MARK OWEN GRAVELDING — NO. 069985 — LICENSED PROFESSIONAL ENGINEER

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NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 2 RESTORATION PLAN (STA.3+50 - STA.7+34)

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-114

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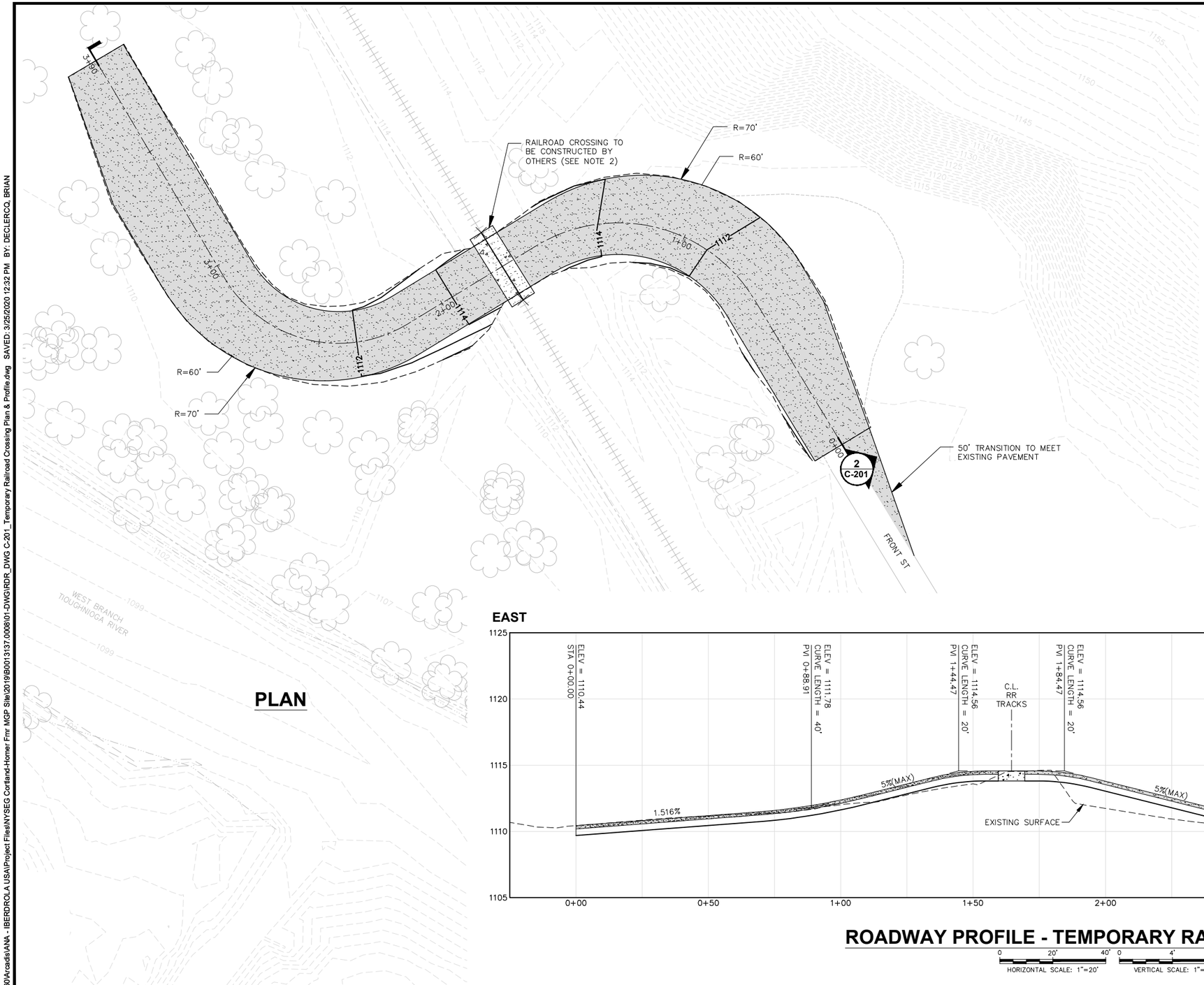


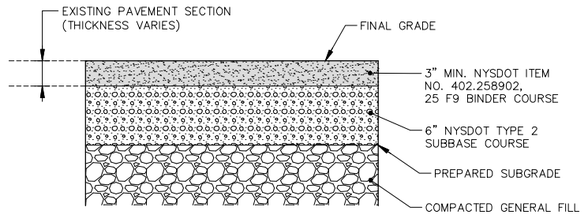
PLAN

LEGEND:

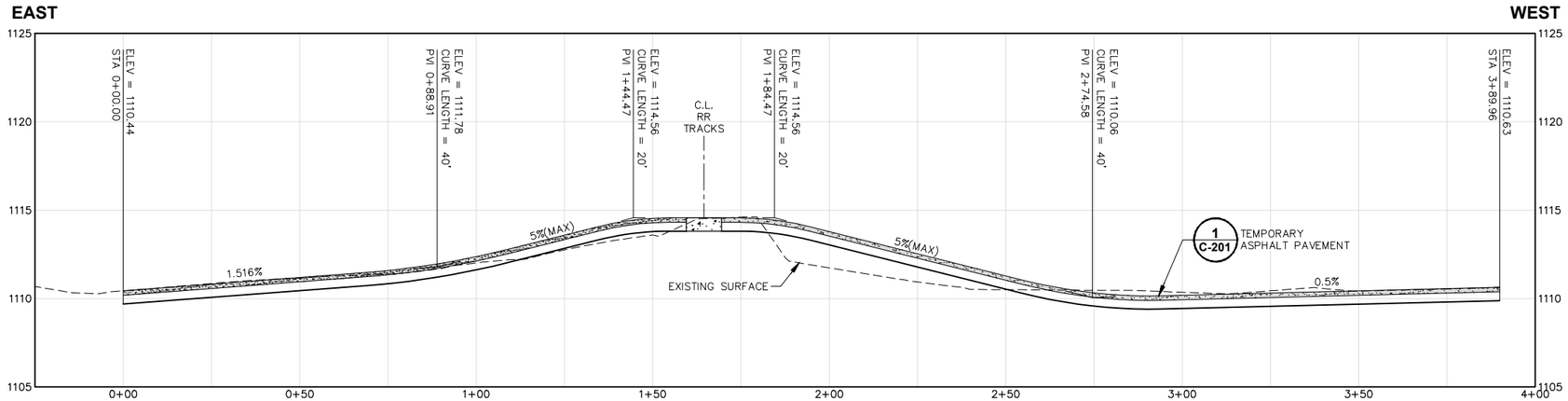
- 1110 — EXISTING CONTOURS
- EXISTING RAILROAD
- 1114 — PROPOSED CONTOURS
- PROPOSED GRADING LIMITS
- PROPOSED RAILROAD CROSSING
- PROPOSED ASPHALT PAVEMENT

NOTES:

1. SEE RAILROAD CROSSING DESIGN PREPARED BY OTHERS FOR CROSSING DETAILS.
2. NYSW TO COMPLETE GRADE CROSSING (I.E., RAIL AND TIE REPLACEMENT, CONCRETE INSTALLATION).
3. COMPLETE ALL OTHER EARTHWORK, PAVING, ETC. NECESSARY TO CONSTRUCT CROSSING.



TEMPORARY ASPHALT PAVEMENT (1)
NOT TO SCALE



ROADWAY PROFILE - TEMPORARY RAILROAD CROSSING (2)

HORIZONTAL SCALE: 1"=20' (0, 20', 40')
VERTICAL SCALE: 1"=4' (0, 4', 8')

20' 0 20' 40'
1"=20'

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NYSEG • CORTLAND-HOMER, NEW YORK
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OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 2 TEMPORARY RAILROAD CROSSING PLAN AND PROFILE

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

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ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
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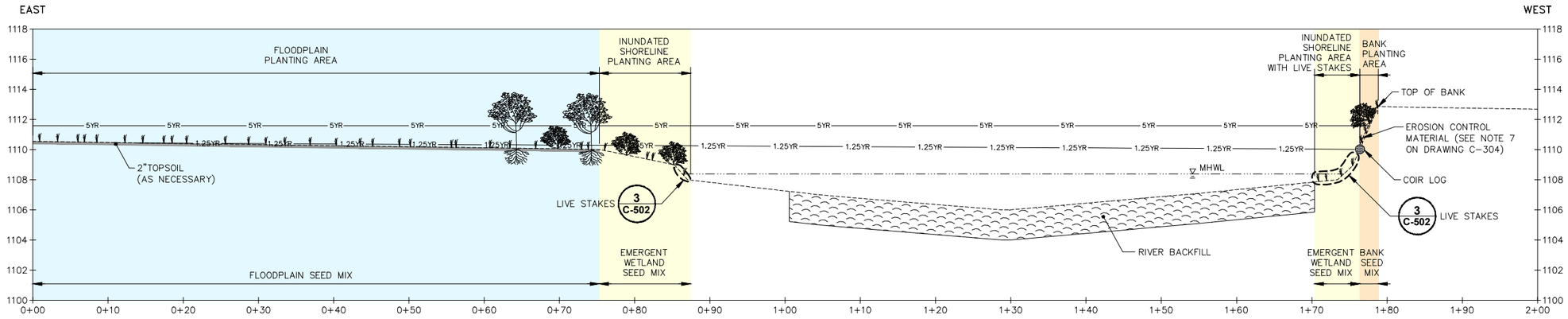
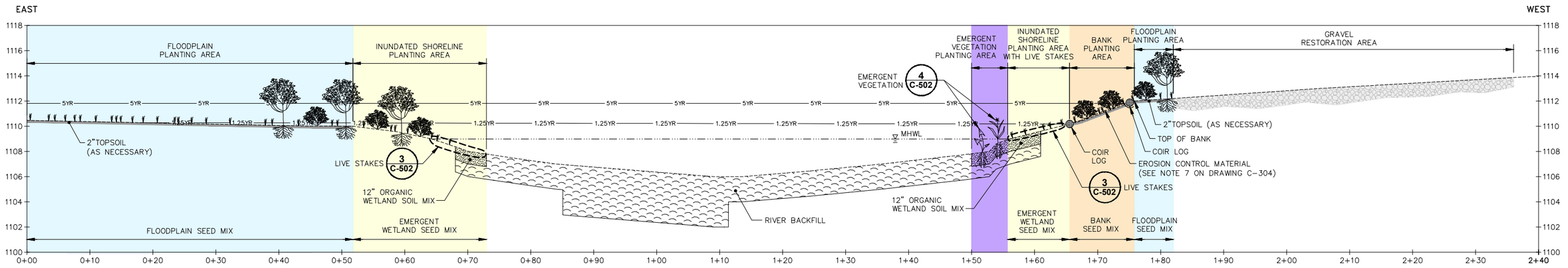


SECTION 1



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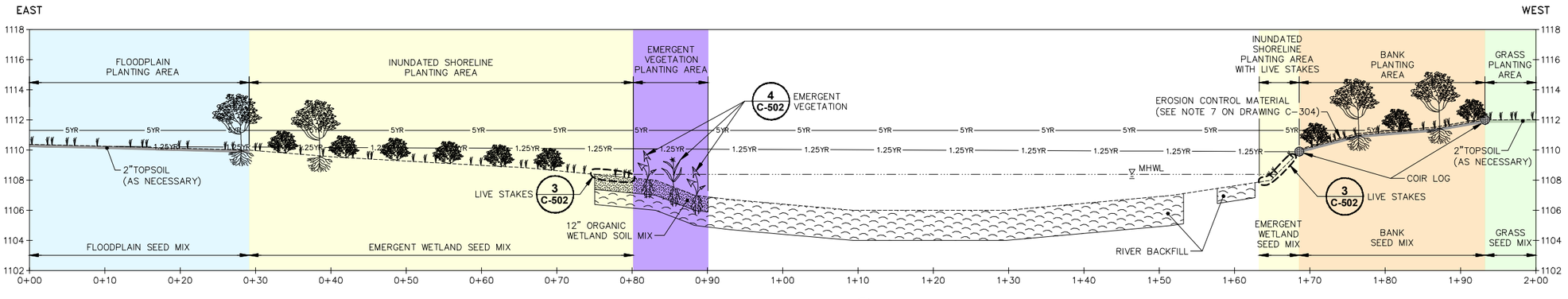

SECTION 3

NOTE:

1. SEE C-304 FOR NOTES AND LEGEND ITEMS APPLICABLE TO RIVERBED AND BANK RESTORATION DETAILS.

HORIZONTAL SCALE: 1"=8'
VERTICAL SCALE (2x): 1"=4'

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NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RIVERBED AND BANK RESTORATION DETAILS

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-301

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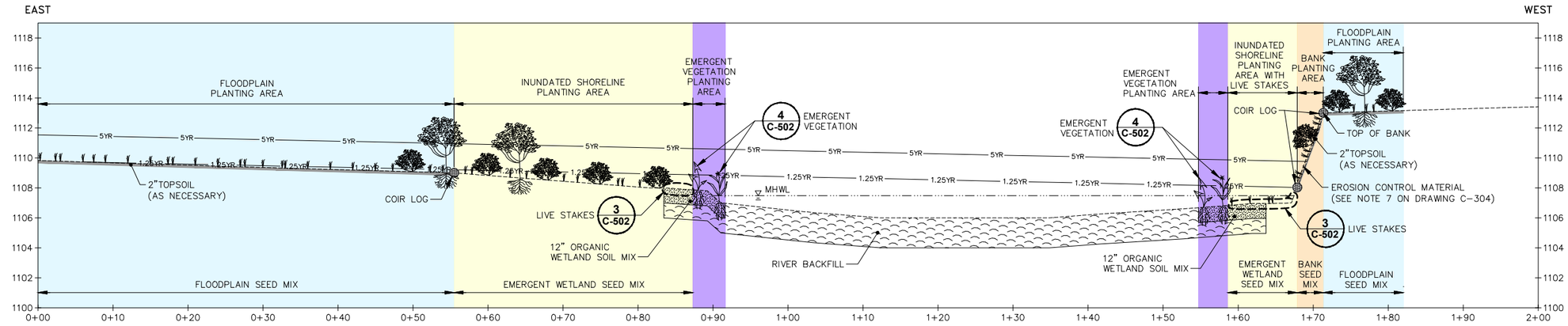
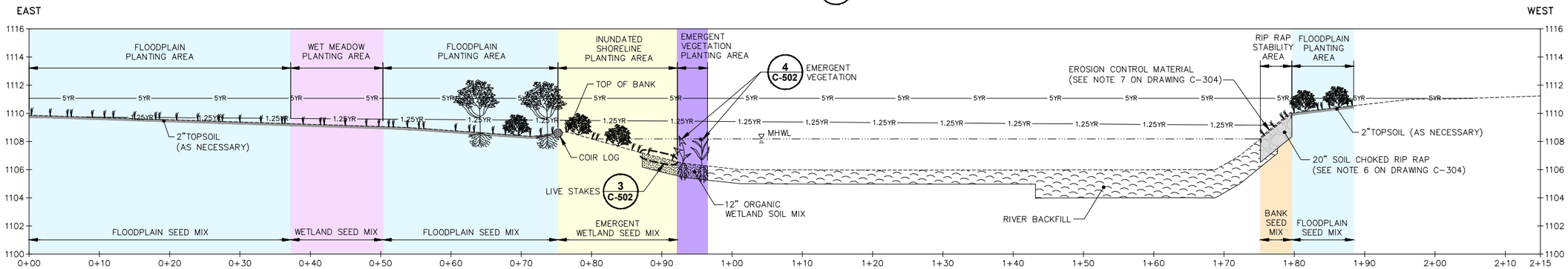


SECTION 4



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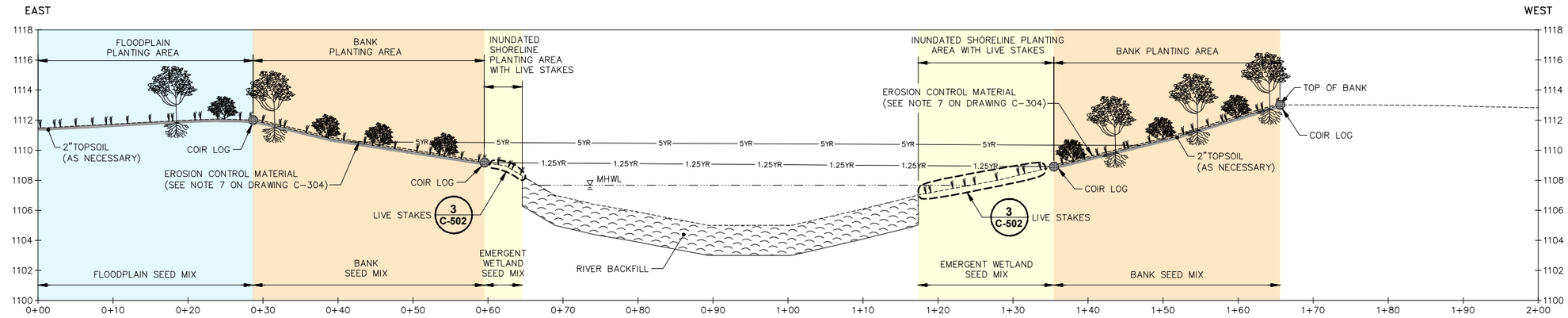

SECTION 6

NOTE:

1. SEE C-304 FOR NOTES AND LEGEND ITEMS APPLICABLE TO RIVERBED AND BANK RESTORATION DETAILS.

8' 0 8' 16'
HORIZONTAL SCALE: 1"=8'
4' 0 4' 8'
VERTICAL SCALE (2x): 1"=4'

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK MARK OWEN GRAVELDING LICENSED PROFESSIONAL ENGINEER NO. 069985-1

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RIVERBED AND BANK RESTORATION DETAILS

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-302

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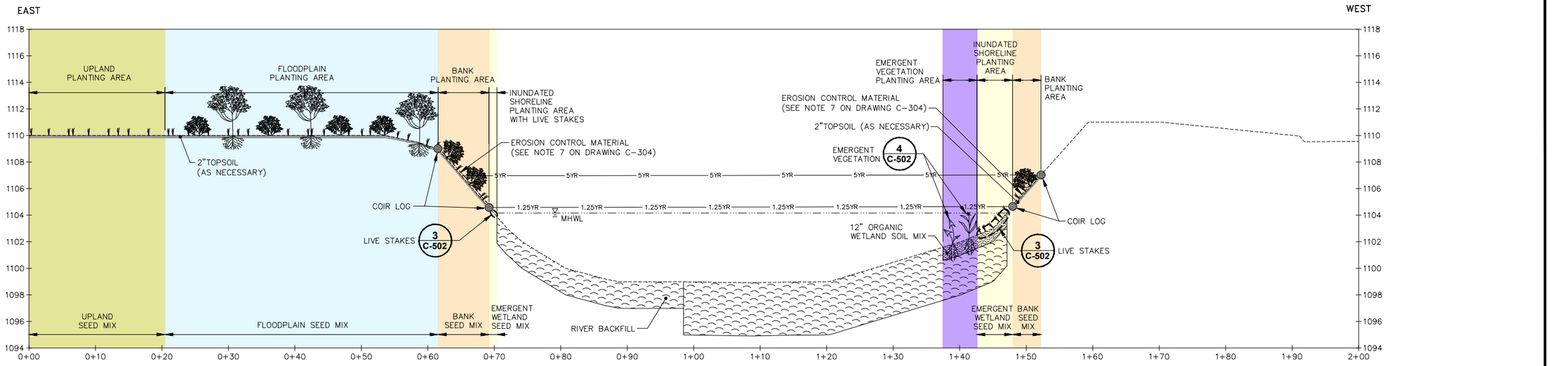

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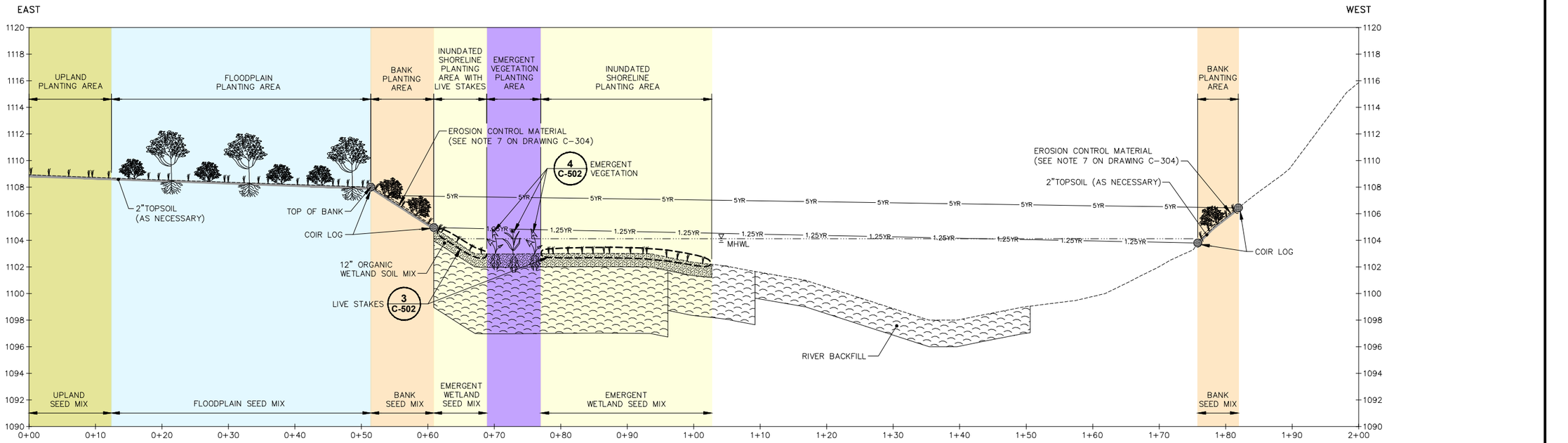

SECTION 2

NOTE:

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Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by	Drawn by	Checked by
JJB	BKD	LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · LICENSED PROFESSIONAL ENGINEER · NO. 069985-1

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OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RIVERBED AND BANK RESTORATION DETAILS

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-303

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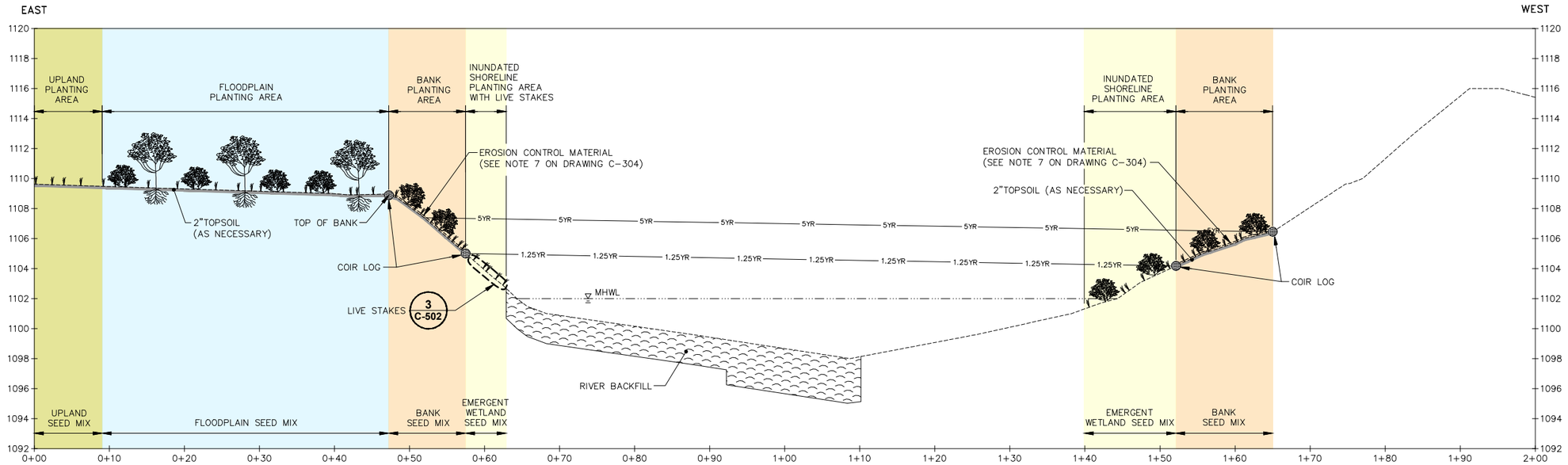

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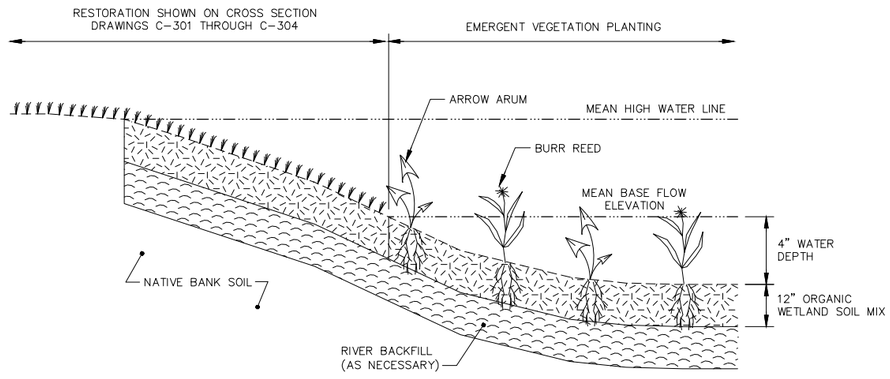

NOTE:

1. INSTALL EMERGENT VEGETATION AT 2.5 FEET ON CENTER SPACING AT A MEAN BASE FLOW ELEVATION THAT CORRESPONDS TO A MAXIMUM WATER DEPTH OF 4 INCHES. PLACE EMERGENT WETLAND SEED MIX FROM MEAN BASE FLOW ELEVATION TO THE EXTENT OF INUNDATED SHORELINE PLANTING AREA.

AREA 1 EMERGENT VEGETATION PLANTING AREA TYPICAL DETAIL 1

NOT TO SCALE

LEGEND:

- TREE 1 C-502
- SHRUB 2 C-502
- BIODEGRADABLE EROSION CONTROL BLANKET (SEE NOTE 7) 2 C-503
- COIR LOG 1 C-503
- 1.25YR — APPROXIMATE 1.25-YEAR STORM INTERVAL WATER LINE
- 5YR — APPROXIMATE 5-YEAR STORM INTERVAL WATER LINE

NOTES FOR C-301 TO C-304:

1. RESTORATION DETAIL(S) SHALL BE IMPLEMENTED ONLY IN AREAS DISTURBED BY REMEDIATION.
2. THICKNESSES NOTED ARE MINIMUM THICKNESSES.
3. RESTORE IN KIND, OUTLET PROTECTION DISTURBED DURING REMEDIAL CONSTRUCTION.
4. REPLACEMENT TREE OR SHRUBS WILL BE PLANTED IN ACCORDANCE WITH SPACING AND PLANTING RECOMMENDATIONS PROVIDED ON DESIGN DRAWINGS C-504A, C-504B, AND C-505.
5. TREES AND SHRUBS INSTALLED IN THE BANK AND FLOODPLAIN PLANTING AREA OF AREA 2 (I.E., EAST BANK) WILL BE PLANTED WITHIN 50 FEET OF THE MHWL.
6. RIP RAP STABILITY AREA WILL INCLUDE RIP RAP CHOKED WITH CLAYEY SOIL MIX. CLAYEY SOIL MIX AND RIP RAP WILL BE BLENDED PRIOR TO PLACEMENT. BANK SEED MIX WILL BE APPLIED AND A BIODEGRADABLE EROSION CONTROL MATERIAL WILL BE PLACED TO TO PROTECT BANK SEED.
7. INSTALL BIODEGRADABLE EROSION CONTROL MATERIALS OVER SEED MIX ABOVE THE 1.25-YEAR FLOOD ELEVATION IN RESTORATION AREAS. INSTALL BIODEGRADABLE EROSION CONTROL BLANKET (ECB) ON SLOPES GREATER THAN 3H:1V. INSTALL BIODEGRADABLE EROSION CONTROL MESH ON SLOPES LESS THAN 3H:1V. INSTALL COIR LOG AT TOP OF BANK TO ANCHOR EROSION CONTROL MATERIALS. EXTEND EROSION CONTROL MATERIALS FROM TOP OF BANK TO MWHL IF LIVE STAKES ARE NOT INSTALLED.
8. A POST-CONSTRUCTION SURVEY WILL BE COMPLETED BY THE REMEDIATION ENGINEER TO DETERMINE BASE FLOW WATER ELEVATION. EMERGENT VEGETATION PLANTINGS WILL BE INSTALLED FROM BASE FLOW ELEVATION TO A WATER DEPTH OF APPROXIMATELY 4-INCHES.
9. MHWL ELEVATIONS SHOWN ON CROSS SECTION DRAWINGS ARE APPROXIMATED TO EQUALIZE DIFFERENCES IN SURVEYED MHWL ELEVATIONS FROM SHORELINE TO SHORELINE.

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MARK O. GRAVELDING		
Professional Engineer's No.		
069985-1		
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Designed by	Drawn by	Checked by
JJB	BKD	LJP

STATE OF NEW YORK MARK OWEN GRAVELDING NO. 069985-1 LICENSED PROFESSIONAL ENGINEER

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CORTLAND-HOMER FORMER MGP SITE
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RIVERBED AND BANK RESTORATION DETAILS

ARCADIS Project No. B0013137.0008.00016

Date APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-304

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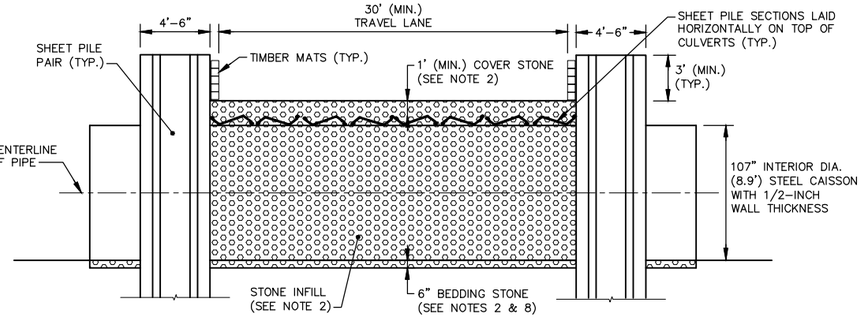
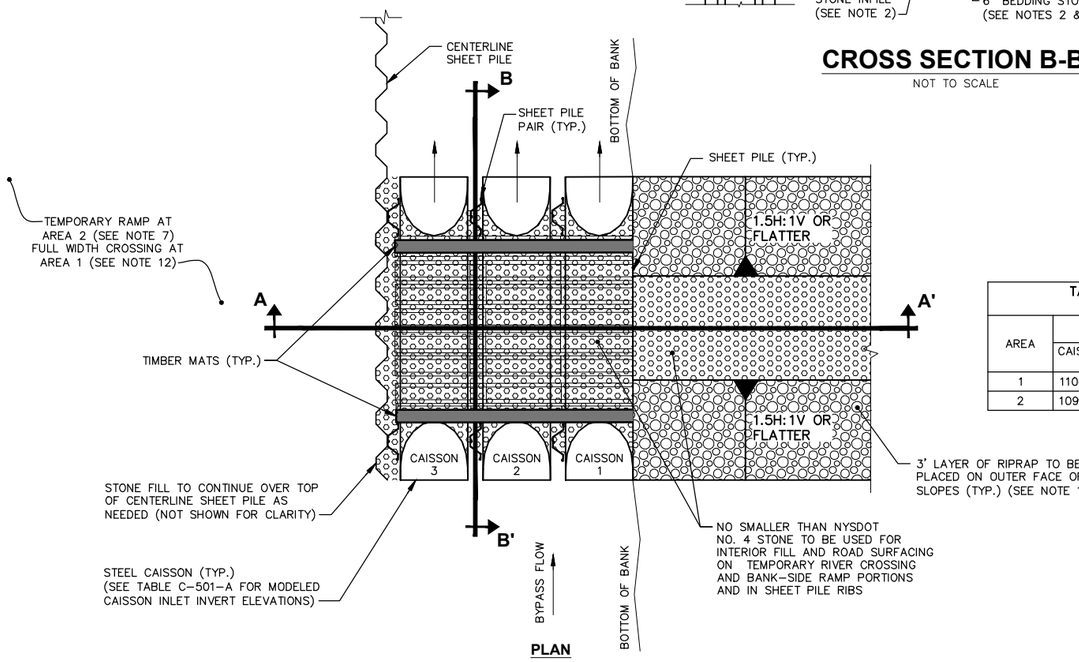
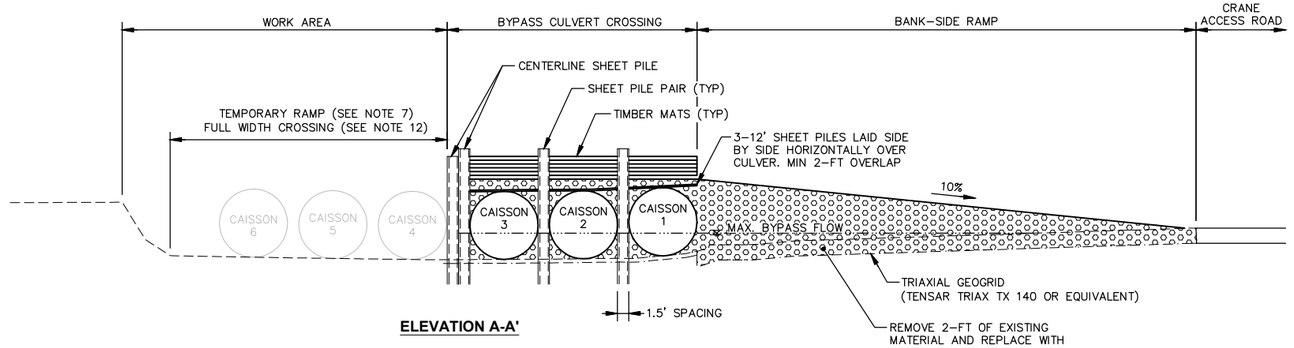


CROSS SECTION B-B'

NOT TO SCALE



PLAN



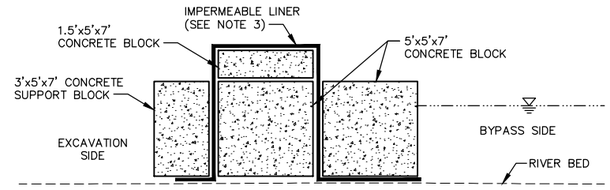
ELEVATION A-A'

BYPASS CULVERT CROSSING (1)

NOT TO SCALE

TABLE C-501-A – MODELED CAISSON INLET INVERT ELEVATIONS

AREA	INVERT ELEVATIONS (FT NAVD88)					
	CAISSON 1	CAISSON 2	CAISSON 3	CAISSON 4	CAISSON 5	CAISSON 6
1	1106.20	1106.20	1106.20	1106.20	1106.20	1106.20
2	1098.65	1098.65	1098.65			



NOTES:

1. ALTERNATIVE BYPASS SYSTEM TO BE USED IN THE EVENT THAT, DUE TO OVERHEAD STRUCTURE(S) OR BEDROCK AT SEDIMENT SURFACE, THE REMEDIATION CONTRACTOR IS UNABLE TO DRIVE STEEL SHEETING. REMEDIATION CONTRACTOR MAY PROPOSE ADDITIONAL ALTERNATIVE BYPASS BARRIER(S). ADDITIONAL ALTERNATIVE BYPASS BARRIERS WILL BE APPROVED BY THE REMEDIATION ENGINEER PRIOR TO INSTALLATION.
2. PRIOR TO BACKFILLING EXCAVATION, WATER ENTERING OR WITHIN THE EXCAVATION AREA WILL BE PUMPED TO THE ONSITE WATER TREATMENT SYSTEM FOR TREATMENT AND DISCHARGE IN ACCORDANCE WITH SPECIFICATION 01 53 53, TEMPORARY WATER TREATMENT AND MANAGEMENT.
3. IMPERMEABLE LINER WILL BE OVERLAPPED IN THE DIRECTION OF FLOW AS NECESSARY TO MITIGATE WATER INFILTRATION.
4. PRIOR TO PLACEMENT OF CONCRETE BLOCKS THE EXISTING GRADE SURFACE WILL BE SMOOTHED, TO THE EXTENT FEASIBLE, TO BE FREE OF MATERIAL THAT COULD AFFECT THE STABILITY OF BLOCKS AND UNIFORM CONTACT WITH THE EXISTING GRADE. FILL OR LEVELING MATERIAL, WHERE NEEDED TO CREATE A BETTER SEAL WITH THE RIVER BED AND LIMIT WATER INFILTRATION TO THE WORK AREA, WILL BE WASHED SAND OR PEA GRAVEL MATERIAL WITH LESS THAN 5% FINES. IF FILL MATERIAL IS NOT USED, LINER WILL BE ANCHORED UNDERNEATH AN EXCAVATION-SIDE CONCRETE BLOCK.
5. REMEDIATION CONTRACTOR WILL PROPOSE METHODS OR PROCEDURES TO INTEGRATE THE ALTERNATE BYPASS BARRIER INTO THE SHEET PILE BYPASS BARRIER SYSTEM TO MAINTAIN A CONTINUOUS AND WATER TIGHT RIVER BYPASS SYSTEM, TO THE EXTENT PRACTICABLE.

ALTERNATIVE BYPASS BARRIER DETAIL (OVERHEAD STRUCTURE) (2)

NOT TO SCALE

NOTES:

1. RIPRAP WILL BE AS SPECIFIED IN SECTION 31 05 05, AGGREGATES FOR EARTHWORK.
2. BEDDING STONE, COVER STONE, AND STONE INFILL WILL BE NO. 4 STONE AS SPECIFIED IN SECTION 31 05 05, AGGREGATES FOR EARTHWORK OR SIMILAR WASHED GRAVEL.
3. ESTABLISH A MINIMUM OF THREE SURVEY CONTROL POINTS AT THE UPSTREAM AND DOWNSTREAM SIDES OF TEMPORARY CROSSINGS. SURVEY CONTROL POINTS AT A MINIMUM FREQUENCY OF ONCE PER DAY DURING USE OF TEMPORARY RIVER CROSSING AND ACCESS FOR EVIDENCE OF EXCESSIVE MOVEMENT IN ANY COMPONENT OF THE CROSSING THAT COULD INDICATE IMMINENT FAILURE (E.G., LEANING OF SHEET PILE SECTIONS BETWEEN PIPE AND/OR PIPE DEFLECTION).
4. SUPPLY, FABRICATE, INSTALL, MAINTAIN AND REMOVE TEMPORARY RIVER CROSSING, AS NECESSARY TO COMPLETE THE WORK. TEMPORARY RIVER CROSSING WILL BE INSTALLED, INSPECTED, MAINTAINED, AND REMOVED IN ACCORDANCE WITH THE REQUIREMENTS FOR A TEMPORARY ACCESS WATERWAY CROSSING IN THE LATEST EDITION OF THE NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL.
5. MAXIMUM CAPACITY OF THE BYPASS CULVERT CROSSING, AS DESIGNED, IS 32 TONS FOR WHEELED EQUIPMENT AND 90 TONS FOR TRACKED EQUIPMENT.
6. MAINTAIN TEMPORARY RIVER CROSSING BY REPAIRING OR REPLACING ANY PORTION OR COMPONENT OF THE RIVER CROSSING THAT HAS BECOME WORN OR DAMAGED.
7. CONSTRUCT TEMPORARY RAMP WITH A MINIMUM CLEAR WIDTH OF 35 FEET AND A MAXIMUM SLOPE OF 10% (OR AS REQUIRED FOR SPECIFIC CONSTRUCTION EQUIPMENT) USING RIPRAP.
8. INSTALL STEEL CAISSONS BEGINNING AS CLOSE AS REASONABLY PRACTICAL TO TOE OF BANK OF NEAR SHORE, LEAVING NO LESS THAN 6 FEET CLEAR BETWEEN LAST CAISSON AND EDGE OF STEEL SHEET PILE.
9. COVER EXISTING STREAMBED WITH AT LEAST 6 INCHES OF NO. 4 STONE TO CREATE A RELATIVELY SMOOTH UNIFORM SURFACE ON WHICH TO BED THE STEEL CAISSONS. CAISSONS WILL NOT BE BEDDED DIRECTLY ON STREAMBED/COBBLE.
10. PERFORM PERIODIC INSPECTION TO ENSURE THAT THE CULVERTS, STREAMBED, AND STREAMBANKS ARE NOT DAMAGED, AND THAT SEDIMENT IS NOT ENTERING THE STREAM OR BLOCKING FISH PASSAGE OR MIGRATION. MAINTENANCE WILL BE PERFORMED, AS NEEDED IN A TIMELY MANNER TO ENSURE THAT STRUCTURES ARE IN COMPLIANCE WITH THIS DRAWING. THIS WILL INCLUDE REMOVAL AND DISPOSAL OF ANY TRAPPED SEDIMENT OR DEBRIS. SEDIMENT WILL BE DISPOSED OF AND STABILIZED OUTSIDE THE WATERWAY FLOOD PLAIN.
11. WHEN THE CROSSING HAS SERVED ITS PURPOSE, ALL STRUCTURES, INCLUDING CULVERTS, BEDDING, AND FILTER CLOTH MATERIALS WILL BE REMOVED WITHIN 7 CALENDAR DAYS. IN ALL CASES, THE CULVERT MATERIALS WILL BE REMOVED WITHIN ONE YEAR OF INSTALLATION. FINAL CLEAN-UP WILL CONSIST OF REMOVAL OF THE TEMPORARY STRUCTURE FROM THE WATERWAY, REMOVAL OF ALL CONSTRUCTION MATERIALS, RESTORATION OF ORIGINAL STREAM CHANNEL CROSS SECTION, AND PROTECTION OF THE STREAMBANKS FROM EROSION. REMOVAL MATERIAL WILL BE STORED OUTSIDE OF THE WATERWAY FLOODPLAIN. ALL AREAS DISTURBED DURING CULVERT REMOVAL WILL BE STABILIZED WITHIN 14 CALENDAR DAYS OF THE DISTURBANCE.
12. FOR FULL RIVER-WIDTH CROSSING AT AREA 1, CROSSING CONSTRUCTION WILL MIRROR THAT SHOWN (I.E., SIX CULVERTS ACROSS INSTEAD OF JUST THREE, AND SIMILAR SIDE PROTECTION AND BANK-SIDE RAMP).
13. INSTALLATION OF INTERIM DAMS (NOT SHOWN), TO FACILITATE CONSTRUCTION OF THE BYPASS CULVERT CROSSING, WILL BE CONSISTENT WITH CORRESPONDING CENTERLINE SHEET PILE ELEVATIONS AS SHOWN IN TABLE S-201-A ON DRAWING S-201.
14. REMEDIATION CONTRACTOR MAY PROPOSE ALTERNATE RIVER CROSSINGS, WHICH MUST BE APPROVED BY THE DESIGN ENGINEER AND REMEDIATION ENGINEER PRIOR TO CONSTRUCTION. ALTERNATE RIVER CROSSINGS ARE SUBJECT TO HYDRAULIC MODELING BY THE DESIGN ENGINEER AND MAY NOT BE ANY MORE RESTRICTIVE TO RIVER FLOWS THAT THE CROSSING SHOWN HEREIN.

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Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OREN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

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OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

TEMPORARY RIVER CROSSING AND ALTERNATIVE BYPASS DETAILS

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-501

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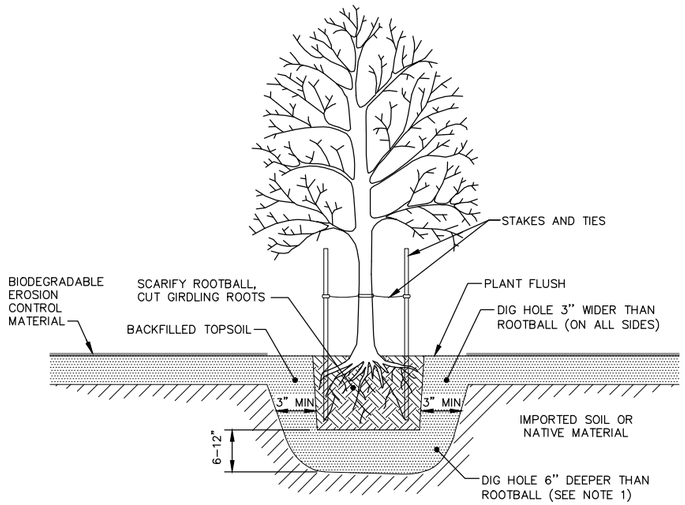
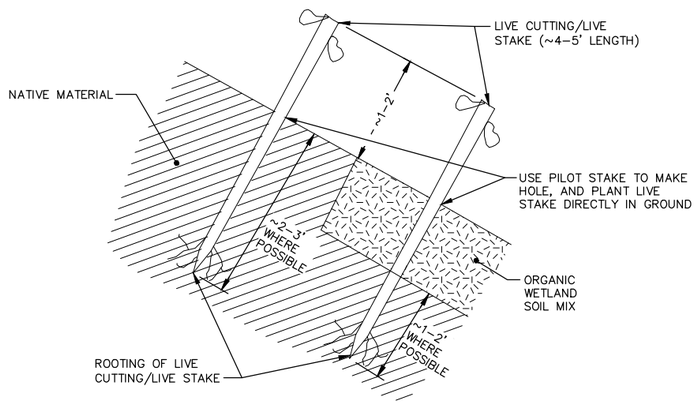


NOTE:

1. IF AT LEAST 6 INCHES OF SOIL IS PRESENT BELOW THE BOTTOM OF THE HOLE 6 INCHES MIN. OF TOPSOIL WILL BE PLACED BELOW THE ROOTBALL. IF LESS THAN 6 INCHES OF NATIVE SOIL IS PRESENT BELOW THE BOTTOM OF THE HOLE, THE HOLE WILL BE DUG DEEPER SUCH THAT UP TO 12 INCHES OF TOPSOIL CAN BE PLACED BELOW THE ROOTBALL.

TYPICAL TREE PLANTING DETAIL 1

NOT TO SCALE

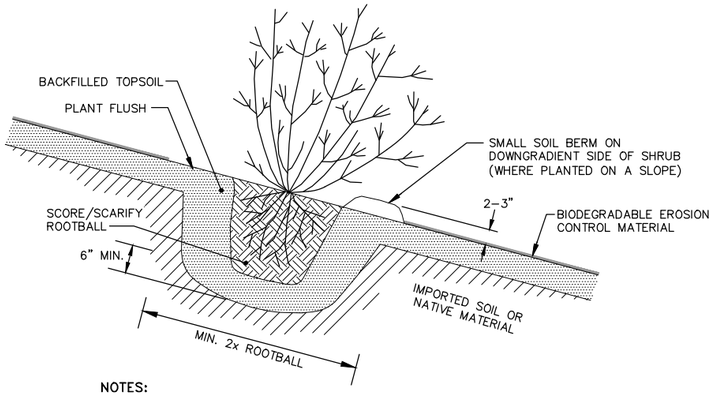


NOTES:

1. INSTALL LIVE STAKES SUCH THAT A MINIMUM OF 1' (2' WHERE POSSIBLE) OF STAKE IS EXPOSED ABOVE SURFACE AND ROOTING IS INSTALLED APPROXIMATELY ~1-3' IN TO SOIL, WHERE POSSIBLE.
2. LIVE CUTTING / LIVE STAKE LENGTH WILL BE BASED ON AVAILABILITY FROM LOCAL OR REGIONAL SUPPLIERS. TARGET WILL BE A MINIMUM OF 4-FOOT LENGTHS.

TYPICAL LIVE STAKE PLANTING DETAIL 3

NOT TO SCALE

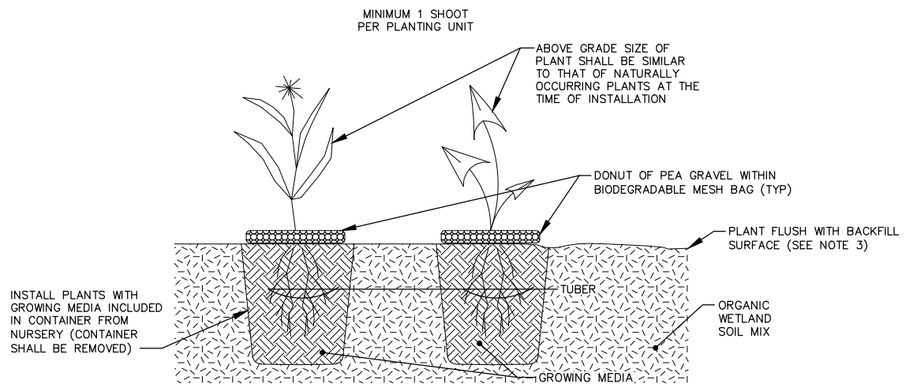


NOTES:

1. IN AREAS WHERE SOIL EROSION CONTROL MATERIAL HAS BEEN PLACED, A SMALL HOLE OR SLIT WILL BE MADE IN THE BLANKET TO ALLOW ACCESS TO THE SOIL. DISTURBANCE TO THE EROSION CONTROL MATERIAL WILL BE THE MINIMAL NECESSARY TO FACILITATE PLANTING.
2. DIG HOLE 3" BIGGER THAN ROOTBALL (ON ALL SIDES) AND REFILL WITH TOPSOIL (FERTILIZE AS NEEDED).

TYPICAL SHRUB PLANTING DETAIL 2

NOT TO SCALE



BURR REED **ARROW ARUM**

NOTES:

1. GROWING MEDIA SHALL CONSIST OF PEAT AND SAND.
2. PEA GRAVEL (OR SIMILAR) IN BIODEGRADABLE MESH BAG SHALL BE ADDED TO THE TOP OF RESTORED SURFACE AROUND PLANT.
3. TOP OF PLUG (I.E., GROWING MEDIA FROM CONTAINER) SHALL BE PLANTED FLUSH WITH OR NO MORE THAN 1 INCH BELOW THE BACKFILL SURFACE.
4. AQUATIC BED SPECIES SHALL BE PLANTED APPROXIMATELY 2.5-FEET ON CENTER.

EMERGENT VEGETATION SPECIES PLANTING DETAIL 4

NOT TO SCALE

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State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OREN GRAVELDING · 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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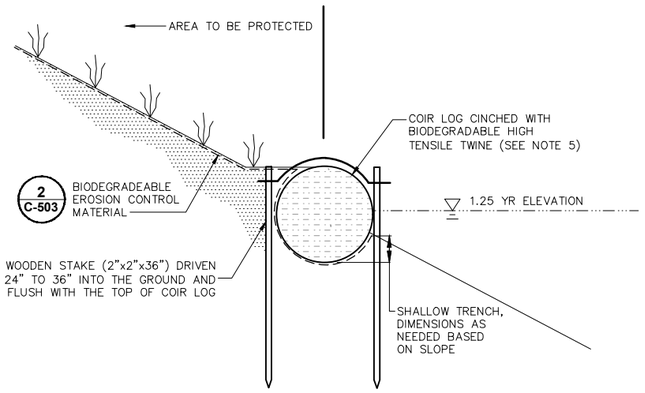
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RESTORATION DETAILS

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-502



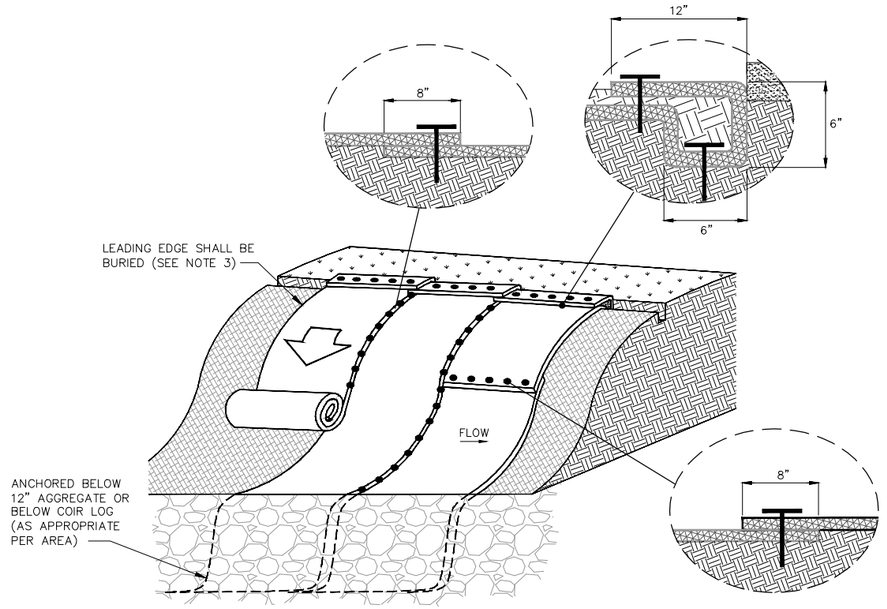
SECTION VIEW

NOTES:

1. COIR LOG WILL BE PLACED ON OR NEAR THE MHWL ELEVATION, AND END OF COIR LOG SHALL BE TURNED UP-GRADIENT AT UPSTREAM END OF INSTALLATION. USE OF COIR LOGS IS INTENDED TO PROTECT AGAINST EXCESSIVE FLOWS OR SEDIMENT TRANSPORT INTO THE RESTORED AREA ABOVE THE MHWL ELEVATION.
2. COIR LOGS WILL BE A MINIMUM 12" DIAMETER AND WILL BE COMPRISED OF BIODEGRADABLE MATERIALS.
3. EXCAVATE A SHALLOW TRENCH SLIGHTLY BELOW MHWL ELEVATION AND PLACE COIR LOG IN TRENCH WITH POSTS PLACED ON BOTH SIDES OF THE ROLL AND SPACED LATERALLY ON 2-4' INTERVALS OR AS RECOMMENDED BY THE MANUFACTURER.
4. PLACE SOIL EXCAVATED FROM TRENCH UPGRADIENT OF THE COIR LOG AND HAND TAMPED. VEGETATION WILL BE PLACED IMMEDIATELY ADJACENT TO THE COIR LOG TO PROMOTE ROOT GROWTH INTO THE FIBER. HERBACEOUS VEGETATION WILL BE PLANTED INTO THE FIBER ROLL, WHERE APPLICABLE.
5. NOTCH WOODEN STAKES AND TIE TOGETHER, ACROSS THE COIR LOG, WITH HIGH TENSILE TWINE.
6. BIODEGRADABLE COIR LOGS WILL BE 9 LBS/FT^3 DENSITY OR EQUIVALENT FROM EAST COAST EROSION, ROLANKA, OR GEI WORKS (OR APPROVED EQUAL).

BIODEGRADABLE COIR LOG 1

NOT TO SCALE

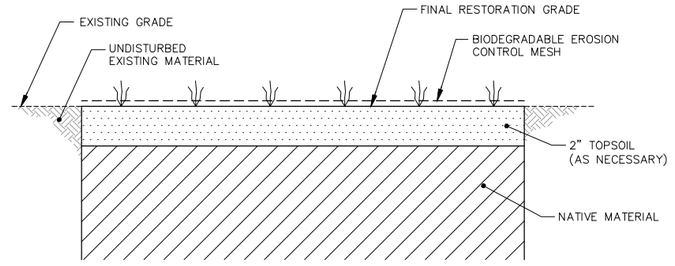


NOTES:

1. INSTALL BIODEGRADABLE EROSION CONTROL BLANKET (ON SLOPES GREATER THAN 3H:1V) OR BIODEGRADABLE EROSION CONTROL MESH (ON SLOPES LESS THAN 3H:1V), AS NECESSARY.
2. INSTALL ALL EROSION CONTROL MATERIALS AND ASSOCIATED PRODUCTS IN ACCORDANCE WITH MANUFACTURER INSTALLATION RECOMMENDATIONS AND GUIDELINES FOR HIGH FLOW CHANNELS.
3. INSTALL EROSION CONTROL MATERIAL PARALLEL TO THE DIRECTION OF THE SLOPE. INSTALL ANCHOR TRENCH AT THE UP-GRADIENT AND UPSTREAM EDGE OF THE INSTALLATION. OVERLAP EROSION CONTROL MATTING IN ACCORDANCE WITH MANUFACTURE RECOMMENDATIONS.
4. INSTALL BIODEGRADABLE ANCHORS (AS APPROVED BY NYSDEC) ON EROSION CONTROL MATERIAL OVERLAPS, AT THE TOE OF THE EROSION CONTROL MATERIAL ROLL AND THROUGHOUT THE EROSION CONTROL MATERIAL INSTALLATION PER MANUFACTURER INSTALLATION RECOMMENDATIONS AND GUIDELINES TO ENSURE THE EROSION CONTROL PRODUCT IS PROPERLY IN CONTACT WITH THE UNDERLYING GRADE.

BIODEGRADABLE EROSION CONTROL MATERIAL 2

NOT TO SCALE

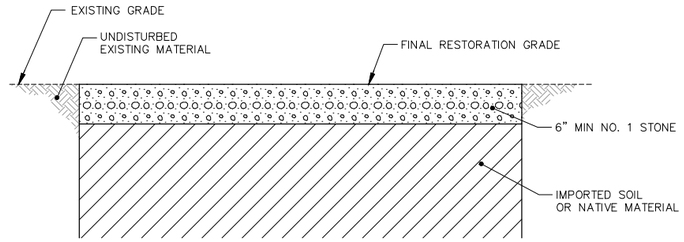


NOTES:

1. TOPSOIL AND SEEDING TO BE INSTALLED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 00, TOPSOIL AND SEEDING.

TYPICAL UPLAND RESTORATION DETAIL 3

NOT TO SCALE



TYPICAL GRAVEL COVER DETAIL 4

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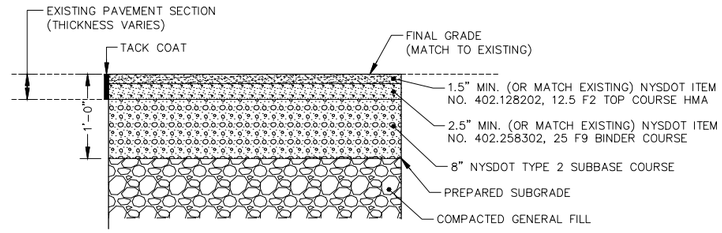

ASPHALT PARKING LOT 5

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No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

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ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-503

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Table C-504 - Planting Scheme for Drawing C-108 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	100	0.002	5576	13	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	3	
Western Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	1,300	0.030	5576	166	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	42	
					Total	**6,970**	**224**	

Inundated Shoreline Planting Area - Eastern Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	4,950	0.114	300	34	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	23	
Salix sericea	Silky willow	Shrub	OBL			200	23	
					Total	**700**	**80**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	2	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer saccharinum	Silver maple	Tree	FACW				2	
					Total		**4**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	830	0.019	500	10	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	8	
Salix nigra	Black willow	Shrub	FACW			300	6	
					Total	**1,200**	**24**	

Inundated Shoreline Planting Area (With Live Stakes) - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	2,400	0.055	500	28	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	22	
Salix nigra	Black willow	Shrub	FACW			300	17	
					Total	**1,200**	**67**	

Bank Planting Area - Western Shoreline [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	2,300	0.053	200	11	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	11	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	8	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	8	
Cornus amomum	Silky dogwood	Shrub	FACW			200	11	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	8	
Salix nigra	Black willow	Shrub	FACW			150	8	
					Total	**1,200**	**65**	

Floodplain Planting Area - Western Shoreline and Eastern Access Road

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	39,100	0.898	76	68	See Detail 2 on Drawing C-502. Plant 1-gallon container on 12 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			75	67	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			75	67	
Amerlanchier arborea	Serviceberry	Shrub	FAC			76	68	
					Total	**302**	**270**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	10	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				10	
Acer saccharinum	Silver maple	Tree	FACW				12	
Quercus palustris	Pin oak	Tree	FACW				9	
					Total		**41**	

Table C-504 - Planting Scheme for Drawing C-109 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	4,300	0.099	5576	550	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	138	
Western Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	1,400	0.032	5576	179	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	45	
					Total	**6,970**	**912**	

Inundated Shoreline Planting Area - Eastern Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	17,000	0.390	300	117	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	78	
Salix sericea	Silky willow	Shrub	OBL			200	78	
					Total	**700**	**273**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	13	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer saccharinum	Silver maple	Tree	FACW				12	
					Total		**25**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	2,500	0.057	500	29	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	23	
Salix nigra	Black willow	Shrub	FACW			300	17	
					Total	**1,200**	**69**	

Inundated Shoreline Planting Area (With Live Stakes) - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	2,900	0.067	500	33	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	27	
Salix nigra	Black willow	Shrub	FACW			300	20	
					Total	**1,200**	**80**	

Bank Planting Area - Western Shoreline [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	5,900	0.135	200	27	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	27	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	20	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	20	
Cornus amomum	Silky dogwood	Shrub	FACW			200	27	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	20	
Salix nigra	Black willow	Shrub	FACW			150	20	
					Total	**1,200**	**161**	
Juglans nigra	Black walnut	Tree	FACU	NA	NA	See Notes 5 and 6	2	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				2	
Acer saccharinum	Silver maple	Tree	FACW				2	
Betula nigra	River birch	Tree	FACW				3	
					Total		**9**	

Floodplain Planting Area - Western Shoreline and Eastern Access Road

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	32,600	0.748	76	57	See Detail 2 on Drawing C-502. Plant 1-gallon container on 12 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			75	56	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			75	56	
Amerlanchier arborea	Serviceberry	Shrub	FAC			76	57	
					Total	**302**	**226**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	2	See Detail 1 on Drawing C-504. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				11	
Acer saccharinum	Silver maple	Tree	FACW				1	
Quercus palustris	Pin oak	Tree	FACW				9	
					Total		**23**	

Grass Planting Area - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Vaccinium angustifolium	Lowbush blueberry	Shrub	FAC	6,400	0.147	80	12	See Detail 2 on Sheet C-502. Plant in clumps of 2 to 3 along top of bank. Minimum 16 foot on-center spacing.
Corylus americana	American hazlenut	Shrub	FACU			80	12	
Comptonia peregrina	Sweet fern	Shrub	NL			80	12	
Viburnum acerifolium	Maple leaf viburnum	Shrub	UPL			80	12	
					Total	**320**	**48**	
Acer saccharum	Sugar maple	Tree	FACU	NA	NA	See Notes 5 and 6	4	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Carya ovata	Shagbark hickory	Tree	FACU				3	
Acer rubrum	Red maple	Tree	FAC				2	
Prunus serotina	Black cherry	Tree	FACU				3	
					Total		**12**	

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Professional Engineer's Name: **MARK O. GRAVELDING**

Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by	**Drawn by**	**Checked by**
JJB	BKD	LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

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NYSEG ● CORTLAND-HOMER, NEW YORK

CORTLAND-HOMER FORMER MGP SITE

OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RESTORATION PLANTING SCHEME - AREA 1

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-504 A

Table C-504 - Planting Scheme for Drawing C-110 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	400	0.009	5576	51	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	13	
Western Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	400	0.009	5576	51	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	13	
					Total	**6,970**	**128**	

Inundated Shoreline Planting Area - Eastern Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	12,300	0.282	300	85	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	56	
Salix sericea	Silky willow	Shrub	OBL			200	56	
					Total	**700**	**197**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	6	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer saccharinum	Silver maple	Tree	FACW				6	
					Total		**12**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	600	0.014	500	7	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	6	
Salix nigra	Black willow	Shrub	FACW			300	4	
					Total	**1,200**	**17**	

Inundated Shoreline Planting Area (With Live Stakes) - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	700	0.016	500	8	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	6	
Salix nigra	Black willow	Shrub	FACW			300	5	
					Total	**1,200**	**19**	

Bank Planting Area - Western Shoreline [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	1,100	0.025	200	5	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	5	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	4	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	4	
Cornus amomum	Silky dogwood	Shrub	FACW			200	5	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	4	
Salix nigra	Black willow	Shrub	FACW			150	4	
					Total	**1,200**	**31**	

Floodplain Planting Area - Western Shoreline and Eastern Access Road

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	35,400	0.813	76	62	See Detail 2 on Drawing C-502. Plant 1-gallon container on 12 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			75	61	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			75	61	
Amerlanchier arborea	Serviceberry	Shrub	FAC			76	62	
					Total	**302**	**246**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	13	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				11	
Acer saccharinum	Silver maple	Tree	FACW				15	
Quercus palustris	Pin oak	Tree	FACW				9	
					Total		**48**	

Grass Planting Area - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Vaccinium angustifolium	Lowbush blueberry	Shrub	FAC	1,600	0.037	80	3	See Detail 2 on Sheet C-502. Plant in clumps of 2 to 3 along top of bank. Minimum 16 foot on-center spacing.
Corylus americana	American hazlenut	Shrub	FACU			80	3	
Comptonia peregrina	Sweet fern	Shrub	NL			80	3	
Viburnum acerifolium	Maple leaf viburnum	Shrub	UPL			80	3	
					Total	**320**	**12**	
Acer saccharum	Sugar maple	Tree	FACU	NA	NA	See Notes 5 and 6	1	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
					Total		**1**	

Table C-504 - Planting Scheme for Drawing C-111 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	400	0.009	5576	51	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	13	
					Total	**6,970**	**64**	

Inundated Shoreline Planting Area - Eastern Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	1,600	0.037	300	11	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	7	
Salix sericea	Silky willow	Shrub	OBL			200	7	
					Total	**700**	**25**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	2,100	0.048	500	24	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	19	
Salix nigra	Black willow	Shrub	FACW			300	14	
Western Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	2,900	0.067	500	33	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	27	
Salix nigra	Black willow	Shrub	FACW			300	20	
					Total	**1,200**	**137**	

Bank Planting Area - Eastern and Western Shorelines [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	8,100	0.186	200	37	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	37	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	28	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	28	
Cornus amomum	Silky dogwood	Shrub	FACW			200	37	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	28	
Salix nigra	Black willow	Shrub	FACW			150	28	
					Total	**1,200**	**223**	
Juglans nigra	Black walnut	Tree	FACU	NA	NA	See Notes 5 and 6	6	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				6	
Acer saccharinum	Silver maple	Tree	FACW				6	
Betula nigra	River birch	Tree	FACW				6	
					Total		**24**	

Floodplain Planting Area - Western Shoreline and Eastern Access Road

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	42,000	0.964	76	73	See Detail 2 on Drawing C-502. Plant 1-gallon container on 12 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			75	72	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			75	72	
Amerlanchier arborea	Serviceberry	Shrub	FAC			76	73	
					Total	**302**	**290**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	5	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				5	
Acer saccharinum	Silver maple	Tree	FACW				10	
Quercus palustris	Pin oak	Tree	FACW				4	
					Total		**24**	

Grass Planting Area - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Vaccinium angustifolium	Lowbush blueberry	Shrub	FAC	4,100	0.094	80	8	See Detail 2 on Sheet C-502. Plant in clumps of 2 to 3 along top of bank. Minimum 16 foot on-center spacing.
Corylus americana	American hazlenut	Shrub	FACU			80	8	
Comptonia peregrina	Sweet fern	Shrub	NL			80	8	
Viburnum acerifolium	Maple leaf viburnum	Shrub	UPL			80	8	
					Total	**320**	**32**	
Acer saccharum	Sugar maple	Tree	FACU	NA	NA	See Notes 5 and 6	2	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FACU				2	
Carya cordiformis	Bitternut hickory	Tree	FACU				3	
Juglans nigra	Black walnut	Tree	FACU				2	
					Total		**9**	

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Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by	**Drawn by**	**Checked by**
JJB	BKD	LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · 069985-1 · LICENSED PROFESSIONAL ENGINEER

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CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RESTORATION PLANTING SCHEME - AREA 1

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
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C-504 B

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Table C-505 - Planting Scheme for Drawing C-113 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Peltandra virginica	Arrow arum	Herbaceous	OBL	30	0.001	6970	5	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Western Shoreline								
Peltandra virginica	Arrow arum	Herbaceous	OBL	200	0.005	6970	32	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
					Total	**6,970**	**37**	

Inundated Shoreline Planting Area - Western Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	3,600	0.083	300	25	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	17	
Salix sericea	Silky willow	Shrub	OBL			200	17	
					Total	**700**	**59**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	2,800	0.064	500	32	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	26	
Salix nigra	Black willow	Shrub	FACW			300	19	
Western Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	500	0.012	500	6	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	5	
Salix nigra	Black willow	Shrub	FACW			300	3	
					Total	**1,200**	**91**	

Bank Planting Area - Eastern and Western Shorelines [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	7,600	0.175	200	35	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	35	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	26	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	26	
Cornus amomum	Silky dogwood	Shrub	FACW			200	35	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	26	
Salix nigra	Black willow	Shrub	FACW			150	26	
					Total	**1,200**	**209**	
Juglans nigra	Black walnut	Tree	FACU	NA	NA	See Notes 5 and 6	3	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				2	
Acer saccharinum	Silver maple	Tree	FACW				1	
Betula nigra	River birch	Tree	FACW				2	
					Total		**8**	

Floodplain Planting Area - Eastern Access Road within Buffer Area

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	21,900	0.503	300	151	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			300	151	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			300	151	
Amerlanchier arborea	Serviceberry	Shrub	FAC			300	151	
					Total	**1,200**	**604**	
Juglans nigra	Black walnut	Tree	FACU	NA	NA	See Notes 5 and 6	24	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer saccharum	Sugar maple	Tree	FACU				20	
Prunus serotina	Black cherry	Tree	FACU				24	
Quercus rubra	Red oak	Tree	FACU				24	
Carya cordiformis	Bitternut hickory	Tree	FACU				15	
					Total		**107**	

Table C-505 - Planting Scheme for Drawing C-114 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Peltandra virginica	Arrow arum	Herbaceous	OBL	600	0.014	6970	96	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Western Shoreline								
Peltandra virginica	Arrow arum	Herbaceous	OBL	200	0.005	6970	32	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
					Total	**6,970**	**128**	

Inundated Shoreline Planting Area - Western Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	3,300	0.076	300	23	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	15	
Salix sericea	Silky willow	Shrub	OBL			200	15	
					Total	**700**	**120**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	4,900	0.113	500	56	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	45	
Salix nigra	Black willow	Shrub	FACW			300	34	
Western Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	700	0.016	500	8	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	6	
Salix nigra	Black willow	Shrub	FACW			300	5	
					Total	**1,200**	**154**	

Bank Planting Area - Eastern and Western Shorelines [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	21,300	0.49	200	98	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	98	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	73	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	73	
Cornus amomum	Silky dogwood	Shrub	FACW			200	98	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	73	
Salix nigra	Black willow	Shrub	FACW			150	73	
					Total	**1,200**	**586**	
Juglans nigra	Black walnut	Tree	FACU	NA	NA	See Notes 5 and 6	4	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				4	
Carya cordiformis	Bitternut hickory	Tree	FACU				4	
Quercus rubra	Red oak	Tree	FACU				4	
					Total		**16**	

Floodplain Planting Area - Eastern Access Road within Buffer Area

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	20,100	0.46	300	138	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			300	138	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			300	138	
Amerlanchier arborea	Serviceberry	Shrub	FAC			300	138	
					Total	**1,200**	**552**	
Juglans nigra	Black walnut	Tree	FACU	NA	NA	See Notes 5 and 6	22	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer saccharum	Sugar maple	Tree	FACU				20	
Prunus serotina	Black cherry	Tree	FACU				22	
Quercus rubra	Red oak	Tree	FACU				20	
Carya cordiformis	Bitternut hickory	Tree	FACU				15	
					Total		**99**	

NOTES:

1. SEE SECTION 32 90 00, PLANTINGS AND RESTORATION FOR ADDITIONAL DETAILS.
2. WETLAND INDICATOR DESIGNATION SIGNIFIES ITS FREQUENCY OF OCCURRENCE IN A WETLAND: FACULTATIVE (FAC), FACULTATIVE UPLAND (FACU), FACULTATIVE WETLAND (FACW), NOT LISTED (NL), OBLIGATE (OBL), AND OBLIGATE UPLAND (UPL).
3. SHRUB PLANTING DENSITY ON EASTERN SHORELINE IS BASED ON EXISTING SITE CONDITIONS FOUND DURING PDI ACTIVITIES.
4. TREE AND SHRUB SPECIES WILL BE PLANTED IN BANK AREAS AS DIRECTED BY THE REMEDIATION ENGINEER. TO ACCOUNT FOR SPECIES TOLERANCE TO WET OR DRY CONDITIONS.
5. PLANTING PLAN ASSUMES ALL TREES WILL BE REMOVED WITHIN THE LIMITS OF DISTURBANCE. ESTIMATED QUANTITIES PROVIDE A CONSERVATIVE MAXIMUM NUMBER OF TREES TO BE REPLACED PER PLANTING AREA..
6. EXISTING TREES WITH DBH >3–INCHES LOCATED WITHIN THE ACTIVE CHANNEL (i.e., BELOW THE MHWL) THAT ARE REMOVED, WILL BE REPLACED IN KIND, ON A ONE FOR ONE TRUNK BASIS, WITH TREES PLANTED ABOVE THE MHWL (i.e., WITHIN THE ADJACENT BANK AND/OR FLOODPLAIN PLANTING AREAS).

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Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 4/8/2020	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

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CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RESTORATION PLANTING SCHEME - AREA 2

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

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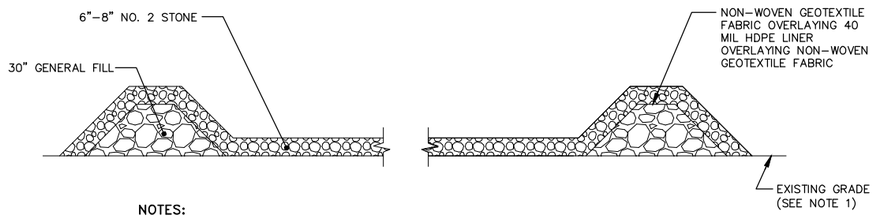
ABBREVIATIONS:

GAC	GRANULAR ACTIVATED CARBON
PVC	POLYVINYL CHLORIDE
SCH	SCHEDULE
TYP	TYPICAL
TDH	TOTAL DYNAMIC HEAD
GPM	GALLONS PER MINUTE
PSI	POUNDS PER SQUARE INCH

LEGEND:

- MAIN PROCESS PIPING
- SAMPLE TAP
- PRESSURE GAUGE
- FLANGE CONNECTION
- FLOW METER
- BALL VALVES
- CENTRIFUGAL PUMP
- 3" FLEXIBLE HOSE
- CAM LOCK CONNECTION



NOTES:

1. THE EXISTING GRADE SURFACE WILL BE UNIFORM AND FREE OF DELETERIOUS MATERIALS (E.G. WOODY DEBRIS, ETC.) THAT COULD EFFECT THE STABILITY OF THE PAD.
2. COMPACTION OF CRUSHED GRAVEL WILL BE SUFFICIENT DENSITY TO PROVIDE A FIRM AND UNIFORM SURFACE USING APPROPRIATE EQUIPMENT.
3. COMPACTION ABOVE GEOSYNTHETICS WILL BE PERFORMED IN A MANNER AND USING APPROPRIATE EQUIPMENT THAT AVOIDS DAMAGING THE GEOSYNTHETICS.
4. PAD SURFACE WILL BE 120 FEET BY 60 FEET MINIMUM.
5. ANY DAMAGE TO THE TEMPORARY WATER TREATMENT SYSTEM FOUNDATION PAD OR SECONDARY CONTAINMENT WILL BE ADDRESSED IMMEDIATELY BY THE REMEDIATION CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
6. REMEDIATION CONTRACTOR MAY PROPOSE USE OF A PREFABRICATED SPILL PREVENTION/SECONDARY CONTAINMENT SYSTEM IN LIEU OF THE TEMPORARY WATER TREATMENT SYSTEM FOUNDATION/CONTAINMENT SHOWN.
7. BERM HEIGHT CORRESPONDS TO AN APPROXIMATE FLOOD ELEVATION FOR A 5–YEAR STORM, PLUS 6 INCHES OF FREE–BOARD. IF LARGER STORM IS IMMINENT, INCREASE BERM HEIGHT TO 6 FEET (FOR 100–YEAR STORM) OR OTHERWISE PROTECT TEMPORARY WATER TREATMENT SYSTEM, AS NECESSARY.

WASTE WATER TREATMENT SYSTEM PAD DETAIL 1

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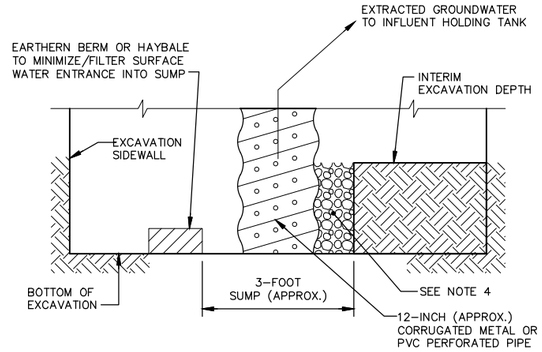

NOTES:

1. THE INFORMATION SHOWN ON THIS DETAIL IS CONCEPTUAL AND PROVIDED FOR INFORMATIONAL PURPOSES.
2. TO THE EXTENT PRACTICABLE, TAKE MEASURES TO MINIMIZE THE PRESENCE OF SOLIDS IN THE EXTRACTED GROUNDWATER.
3. SUBMIT PROPOSED DEWATERING TECHNIQUE, LOCATIONS, DIMENSIONS, AND OTHER RELEVANT INFORMATION AS PART OF THE EXCAVATION AND MATERIAL DEWATERING PLAN.
4. WHERE THE PERFORATED PIPE EXTENDS INTO THE EXISTING SOIL FORMATION, A SUMP WILL BE CREATED, THE PIPE INSTALLED, AND NO. 2 STONE PLACED IN THE REMAINING SUMP AREA. IN THE ABSENCE OF GRAVEL, THE PIPE WILL BE WRAPPED IN A NON–WOVEN GEOTEXTILE FABRIC.

EXCAVATION DEWATERING SUMP DETAIL 2

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Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

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OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

TEMPORARY WATER TREATMENT SYSTEM ABBREVIATIONS, LEGEND, AND DETAILS

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

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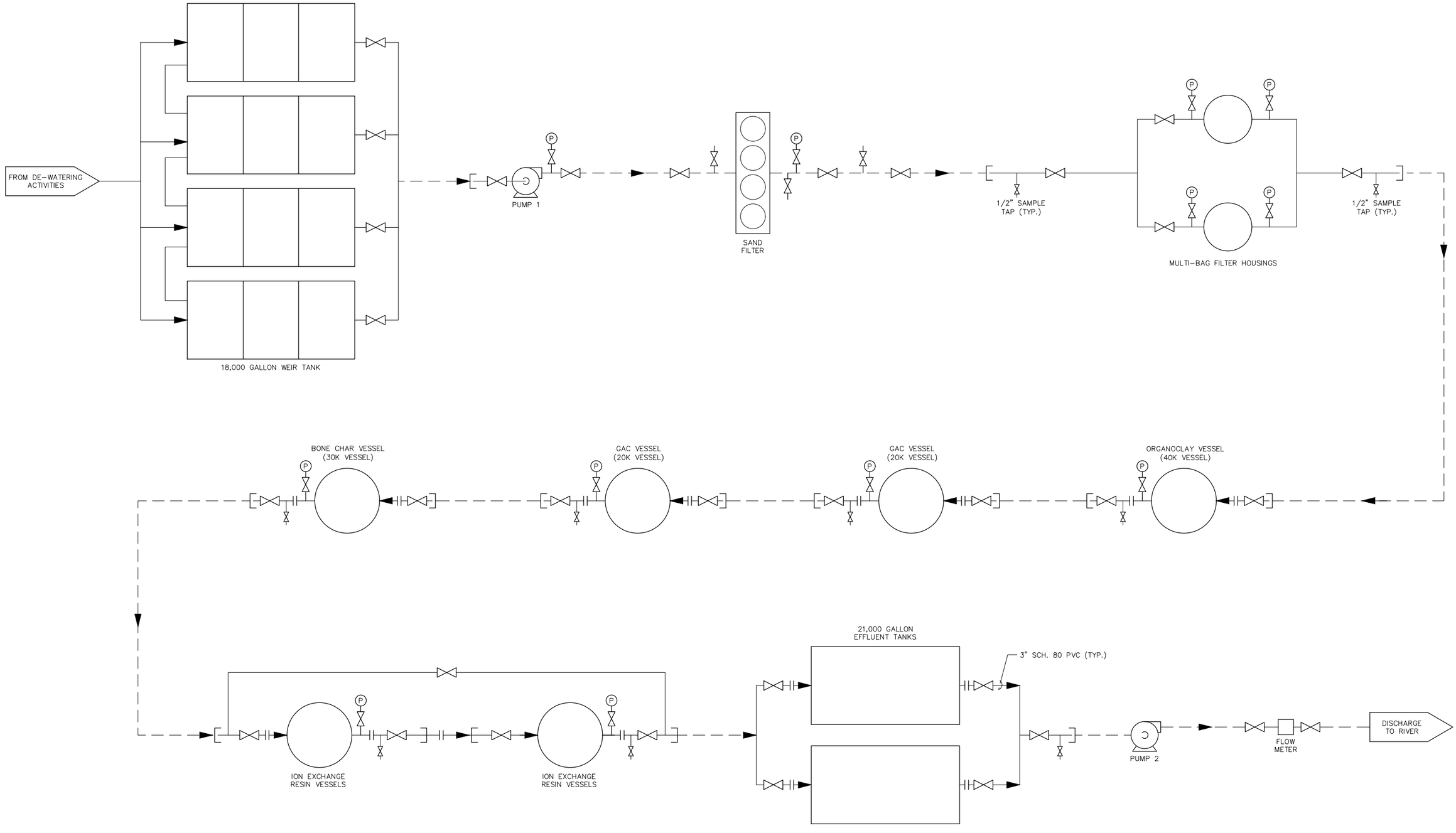

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Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	4/8/2020	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · No. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

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NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

TEMPORARY WATER TREATMENT SYSTEM PIPING AND INSTRUMENTATION DIAGRAM

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
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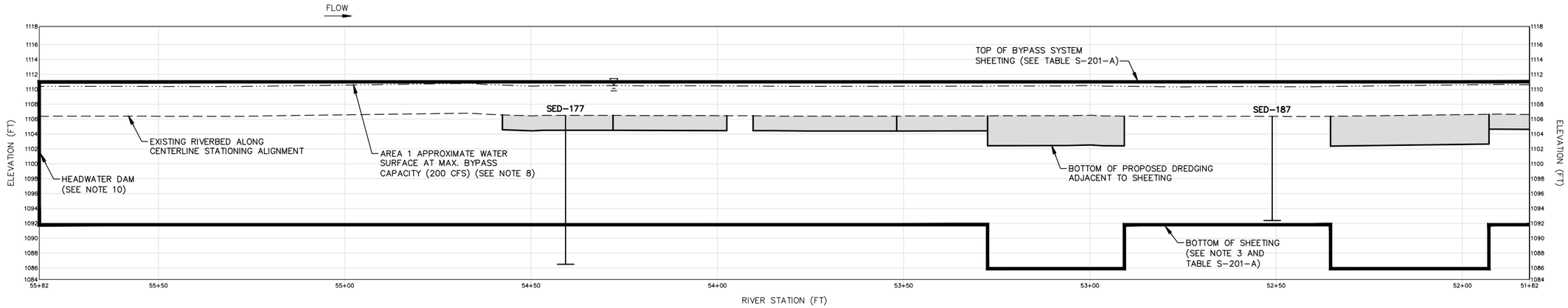
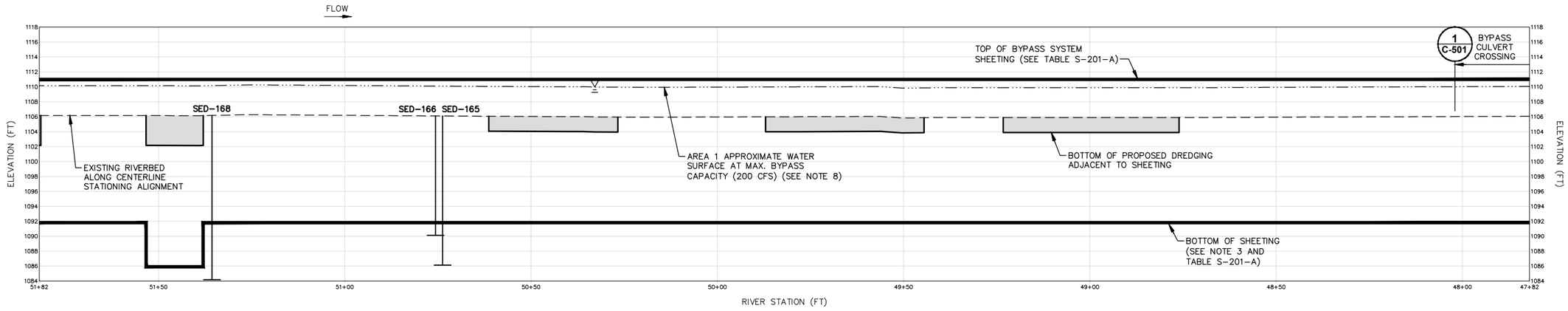


AREA 1 CENTERLINE BYPASS SYSTEM PROFILE (1)

SCALE AS INDICATED



AREA 1 CENTERLINE BYPASS SYSTEM PROFILE (2)

SCALE AS INDICATED

TABLE S-201-A – AREA 1 BYPASS STRUCTURE ELEVATIONS TABLE			
APPROXIMATE RIVER STATION LOCATION	MAXIMUM CENTERLINE TOP ELEVATION (FT NAVD88)	CENTERLINE BOTTOM ELEVATION (FT NAVD88)	MINIMUM LENGTH OF SHEET (FT)
55+82 TO 53+28	1111.0	1091.8	19.2
53+28 TO 52+90	1111.0	1085.9	25.1
52+90 TO 52+36	1111.0	1091.8	19.2
52+36 TO 51+92	1111.0	1085.9	25.1
51+92 TO 51+54	1111.0	1091.8	19.2
51+54 TO 51+36	1111.0	1085.9	25.1
51+36 TO 45+00	1111.0	1091.8	19.2
45+00 TO 44+68	1111.0	1085.9	25.1
44+68 TO 40+94	1111.0	1091.8	19.2
40+94 TO 40+74[1]	1111.0	NA	NA
40+74 TO 39+35	1111.0	1091.8	19.2

TABLE NOTE:

1. LOCATION OF ALTERNATIVE BYPASS BARRIER.

LEGEND:

- SEDIMENT SURFACE
- WATER SURFACE ELEVATION
- SHEET PILE
- REMOVAL AREA
- SEDIMENT BORING

RIVER BYPASS SYSTEM NOTES:

1. A BYPASS SYSTEM CONSISTING OF SHEET PILE WILL BE USED TO THE FULL EXTENT POSSIBLE CONSISTENT WITH THE DESIGN PROVIDED.
2. MINIMUM REQUIRED STEEL SHEET PILE SECTION MODULUS IS 16.0 CU.IN/FT FOR ALL REMOVAL AREAS. IT IS ASSUMED THAT EXISTING AZ-48 NYSEG-OWNED STEEL SHEET PILES ARE TO BE USED.
3. INSTALL ALL STEEL SHEET PILES THROUGH THE RIVERBED MATERIAL PER THE RIVER BYPASS SYSTEM DESIGN. BOTTOM OF SHEETING IS SHOWN ON TABLE S-201-A AND IN THE CROSS SECTIONS.
4. NOTIFY DESIGN ENGINEER OF ANY AND ALL LOCATIONS WHERE EMBEDMENT CANNOT BE REACHED DURING INSTALLATION. ADDITIONAL CONTINGENCY MEASURES MAY BE REQUIRED TO PROVIDE ADEQUATE SHEET PILING SUPPORT UNDER SUCH CONDITIONS.
5. INSTALL DENEEF®SWELLSEAL®WA 90R EQUIVALENT HYDROPHILIC WATERSTOP) IN ALL SHEET PILE INTERLOCKS.
6. SEDIMENT REMOVAL REQUIRED TO SPECIFIED APPROXIMATE REMOVAL ELEVATION, AS SHOWN, AT A MINIMUM.
7. MONITOR THE BYPASS CHANNEL FOR EVIDENCE OF POTENTIAL SCOUR DURING IN-RIVER CONSTRUCTION. IF EVIDENCE OF POTENTIAL SCOUR IS OBSERVED, COORDINATE WITH THE REMEDIATION ENGINEER TO DETERMINE THE NEED FOR ADDITIONAL SCOUR PROTECTION MEASURES.
8. RIVERBED ELEVATIONS, WATER SURFACE ELEVATIONS, AND MAXIMUM BYPASS CAPACITIES ARE APPROXIMATE. THE MAXIMUM CAPACITY OF THE RIVER BYPASS SYSTEM WILL VARY BASED ON PHYSICAL CONSTRUCTION LIMITATIONS AND/OR UNKNOWN VARIATIONS IN ACTUAL FIELD CONDITIONS (E.G. RIVERBED BATHYMETRY, RIVERBED COMPOSITION).
9. CONSTRUCTION SEQUENCE INCLUDING SHEET PILE INSTALLATION SEQUENCE SHOWN ON DRAWING C-101 (AREA 1) AND C-104 (AREA 2). INSTALL SHEET PILE IN ACCORDANCE WITH TECHNICAL SPECIFICATION 31 50 00, EXCAVATION PROTECTION (BYPASS SYSTEM).
10. INSTALLATION OF HEADWATER, BACKWATER, AND INTERIM DAMS (NOT SHOWN) WILL BE CONSISTENT WITH CORRESPONDING CENTERLINE SHEET PILE ELEVATIONS AS SHOWN IN TABLE S-201-A.
11. ANY PROPOSED DEVIATIONS FROM THE RIVER BYPASS SYSTEM CONFIGURATION SHOWN HEREIN MUST BE REVIEWED AND APPROVED BY THE DESIGN ENGINEER PRIOR TO IMPLEMENTATION. IF THE RIVER BYPASS SYSTEM IS INSTALLED AT ELEVATIONS HIGHER THAN STATED HEREIN, THE REMEDIATION CONTRACTOR IS LIABLE FOR ANY IMPACTS ASSOCIATED WITH INCREASED FLOOD POTENTIAL AND/OR THE REMEDIATION CONTRACTOR MAY BE REQUIRED TO PULL SELECT SHEET PILES TO MINIMIZE THE POTENTIAL FOR FLOODING DURING AN IMPENDING STORM/FLOOD EVENT.

15' 0 15' 30'
HORIZONTAL SCALE: 1"=15'
7.5' 0 7.5' 15'
VERTICAL SCALE: 1"=7.5'

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Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 4/8/2020	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK MARK O. GRAVELDING LICENSED PROFESSIONAL ENGINEER NO. 069985-1

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 1 SHEET PILE PROFILE (STA. 55+82 TO STA. 47+82)

ARCADIS Project No.: B0013137.0008.00016

Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

S-201

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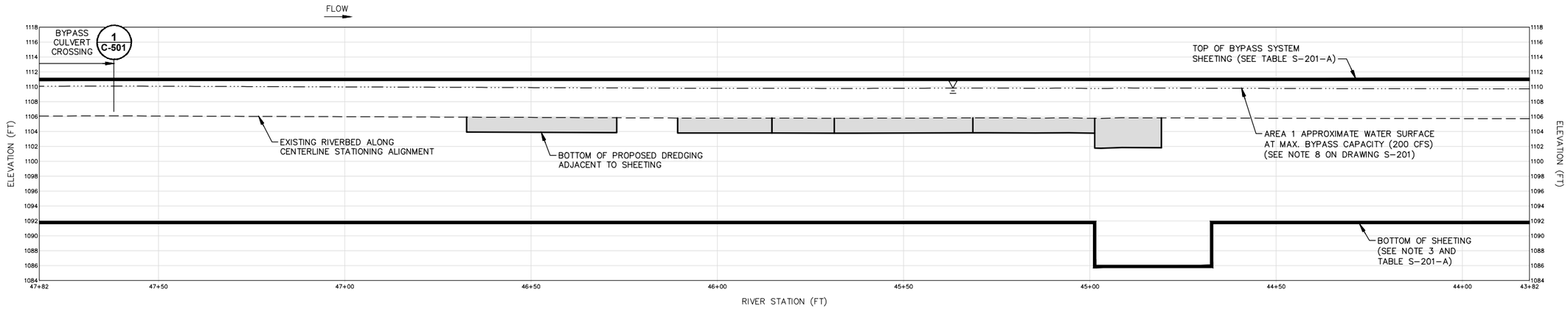
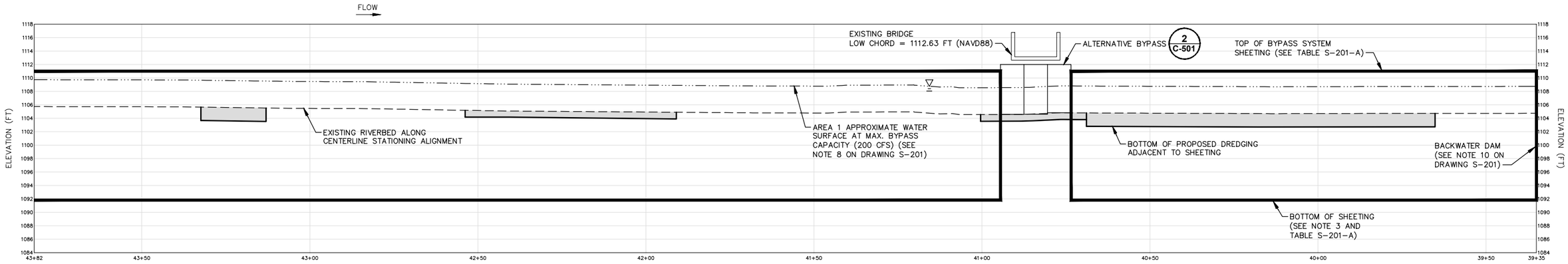


AREA 1 CENTERLINE BYPASS SYSTEM PROFILE 3

SCALE AS INDICATED



AREA 1 CENTERLINE BYPASS SYSTEM PROFILE 4

SCALE AS INDICATED

LEGEND:

- SEDIMENT SURFACE
- WATER SURFACE ELEVATION
- SHEET PILE
- REMOVAL AREA

RIVER BYPASS SYSTEM NOTES:

1. INSTALL ALL STEEL SHEET PILES THROUGH THE RIVERBED MATERIAL PER THE RIVER BYPASS SYSTEM DESIGN. BOTTOM OF SHEETING IS SHOWN ON TABLE S-201-A AND IN THE CROSS SECTIONS.
2. INSTALLATION OF HEADWATER, BACKWATER, AND INTERIM DAMS (NOT SHOWN) WILL BE CONSISTENT WITH CORRESPONDING CENTERLINE SHEET PILE ELEVATIONS AS SHOWN IN TABLE S-201-A.
3. REFER TO DRAWING S-201 FOR ADDITIONAL NOTES.

15' 0 15' 30'
HORIZONTAL SCALE: 1"=15'
7.5' 0 7.5' 15'
VERTICAL SCALE: 1"=7.5'

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1
State: NY
Date Signed: 4/8/2020
Project Mgr.: JRG
Designed by: JJB
Drawn by: BKD
Checked by: LJP

STATE OF NEW YORK MARK OWEN GRAVELDING NO. 069985-1 LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets
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CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 1 SHEET PILE PROFILE (STA. 47+82 TO STA. 39+35)

ARCADIS Project No.: B0013137.0008.00016
Date: APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

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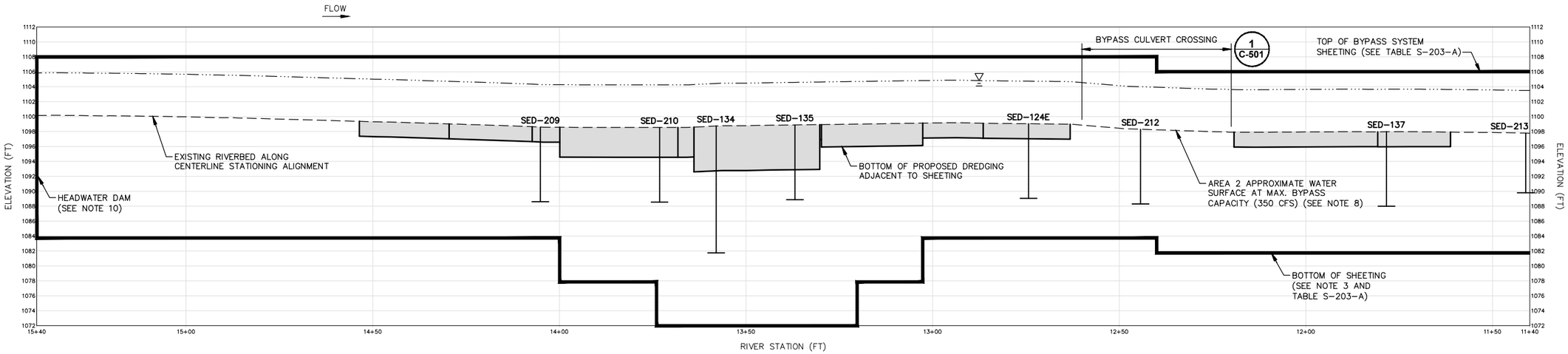
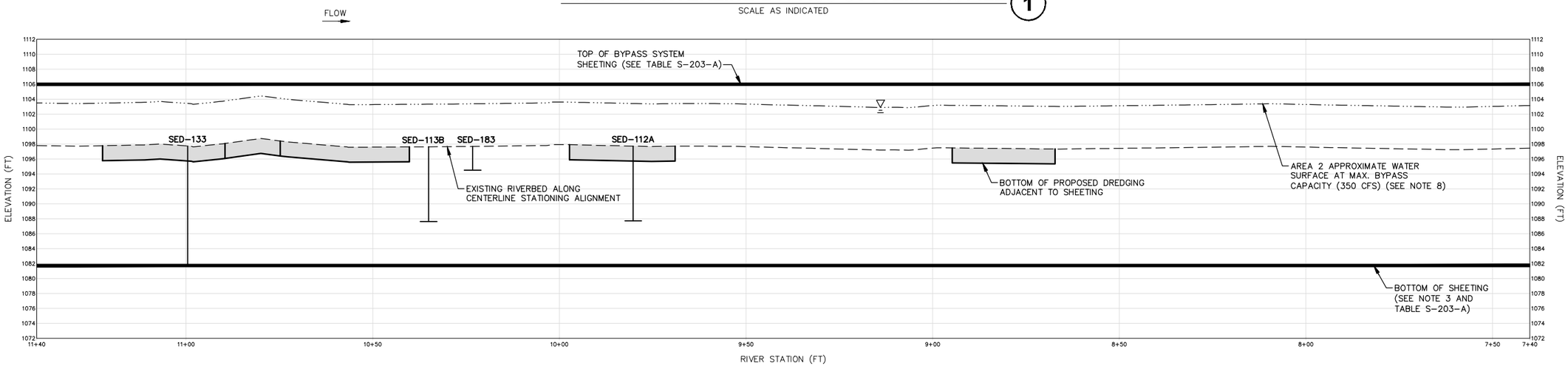


AREA 2 CENTERLINE BYPASS SYSTEM PROFILE 1

SCALE AS INDICATED



AREA 2 CENTERLINE BYPASS SYSTEM PROFILE 2

SCALE AS INDICATED

TABLE S-203-A – AREA 2 BYPASS STRUCTURE ELEVATIONS TABLE			
APPROXIMATE RIVER STATION LOCATION	MAXIMUM CENTERLINE TOP ELEVATION (FT NAVD88)	CENTERLINE BOTTOM ELEVATION (FT NAVD88)	MINIMUM LENGTH OF SHEET (FT)
15+40 TO 14+00	1108.0	1083.7	24.3
14+00 TO 13+74	1108.0	1077.8	30.2
13+74 TO 13+20	1108.0	1072.0	36.0
13+20 TO 13+02	1108.0	1077.8	30.2
13+02 TO 12+42	1108.0	1083.7	24.3
12+42 TO 6+82	1106.0	1081.7	24.3
6+82 TO 6+32	1106.0	1075.8	30.2
6+32 TO 5+97	1106.0	1081.7	24.3

LEGEND:

- SEDIMENT SURFACE
- WATER SURFACE ELEVATION
- SHEET PILE
- REMOVAL AREA
- SEDIMENT BORING

RIVER BYPASS SYSTEM NOTES:

1. INSTALL ALL STEEL SHEET PILES THROUGH THE RIVERBED MATERIAL PER THE RIVER BYPASS SYSTEM DESIGN. BOTTOM OF SHEETING IS SHOWN ON TABLE S-203-A AND IN THE CROSS SECTIONS.
2. INSTALLATION OF HEADWATER, BACKWATER, AND INTERIM DAMS (NOT SHOWN) WILL BE CONSISTENT WITH CORRESPONDING CENTERLINE SHEET PILE ELEVATIONS AS SHOWN IN TABLE S-203-A.
3. REFER TO DRAWING S-201 FOR ADDITIONAL NOTES.

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VERTICAL SCALE: 1"=7.5'

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AREA 2 SHEET PILE PROFILE (STA. 15+40 TO STA. 7+40)

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
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SYRACUSE, NY 13202
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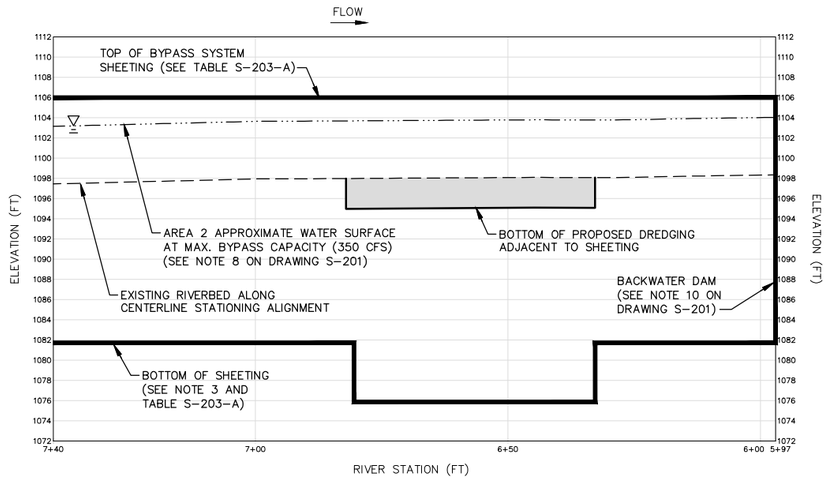

AREA 2 CENTERLINE BYPASS SYSTEM PROFILE

SCALE AS INDICATED

3

LEGEND:

- SEDIMENT SURFACE
- WATER SURFACE ELEVATION
- SHEET PILE
- REMOVAL AREA

RIVER BYPASS SYSTEM NOTES:

1. INSTALL ALL STEEL SHEET PILES THROUGH THE RIVERBED MATERIAL PER THE RIVER BYPASS SYSTEM DESIGN. BOTTOM OF SHEETING IS SHOWN ON TABLE S-203-A AND IN THE CROSS SECTIONS.
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OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 2 SHEET PILE PROFILE (STA. 7+40 TO STA. 5+97)

ARCADIS Project No.
B0013137.0008.00016

Date
APRIL 2020

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
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APPENDIX B

Technical Specifications

SECTION 00 01 10

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01 29 76	Progress Payment Procedures	01 29 76 – 1
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01 31 19.13	Pre-Construction Conference	01 31 19.13 – 1
01 31 19.23	Progress Meetings	01 31 19.23 – 1
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Note:

1. Specification included in Contractor Bid Package only.

END OF TABLE OF CONTENTS

SECTION 01 11 00

SUMMARY OF WORK

PART 1 – GENERAL

1.01 LOCATION AND DESCRIPTION OF WORK

A. The Work is located at the site of a former manufactured gas plant (MGP) at 218 South Main Street (NYS Route 11) in the Village of Homer, Cortland County, New York and at the north end of Front Street in the City of Cortland, Cortland County, New York.

B. The Work to be performed under this Contract includes, but is not limited to, the following:
   1. Pre-remediation activities.
   2. Mobilization and site preparation.
   3. Installation (and removal) of a temporary bypass system.
   4. Sediment removal and backfilling in the Tioughnioga River.
   5. Waste and water handling and management.
   6. Site restoration and demobilization.

C. Contracting Method: Work shall be performed under one prime contract.

D. Contaminants: Work related to MGP Waste and other site-related Contaminants, is included.

1.02 REMEDIATION CONTRACTOR'S USE OF SITE

A. Use of Premises:
   1. Confine construction operations to the work areas shown or indicated on the Design Drawings. Do not disturb portions of the Site beyond areas of the Work.
   2. Confine storage of materials and equipment, and locations of temporary facilities to the areas shown. Move stored products that interfere with operations of Owner, other contractors, and others performing work for Owner.
   3. Authorities having jurisdiction at the Site and others performing work for Owner shall, for all purposes that may be required by their contracts, have access to the Site and the premises used by Remediation Contractor, and Remediation Contractor shall provide safe and proper access.

B. Promptly repair damage to premises caused by construction operations. Upon completion of the Work, restore premises to specified condition. If condition is not specified, restore to pre-construction condition.

C. Work hours are anticipated to be between 7 a.m. and 6 p.m. Monday through Saturday, with the exception of Memorial Day and Labor Day weekends and July 4. Final work hours and/or time of year restrictions will be dictated by any applicable permits.

1.03 EASEMENTS AND RIGHTS-OF-WAY

A. Confine construction operations within Owner's property, easements obtained by Owner, and the limits shown. Use care in placing construction tools, equipment, excavated materials, and materials and equipment to be incorporated into the Work to avoid damaging property and interfering with traffic. Do not enter private property outside the construction limits without permission from the owner of the property.

B. On Private Property: Limits of Remediation Contractor's operations are shown on the Design Drawings.

1.04 NOTICES TO OWNERS AND AUTHORITIES OF PROPERTIES ADJACENT TO THE WORK

A. Notify Owner when execution of the Work may affect adjacent properties or use of adjacent properties. Owner will notify adjacent property owners; do not contact adjacent property owners directly unless authorized by the Owner to do so.

B. When it is necessary to temporarily obstruct access to property, or when utility service connection will be interrupted, provide notices sufficiently in advance to enable affected persons to provide for their needs. Conform notices to Laws and Regulations and, whether delivered orally or in writing, include appropriate information concerning the interruption and instructions on how to limit inconvenience caused thereby.

C. Notify utility owners and other concerned entities at least two working days, but not more than 10 working days, prior to cutting or closing streets or other traffic areas or excavating near Underground Facilities or exposed utilities.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 15 00

CONTRACTOR'S PROJECT OPERATIONS PLAN

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall prepare and submit to the Owner, Remediation Engineer, and New York State Department of Environmental Conservation Project Manager a Project Operations Plan (POP) in accordance with this Section.
   2. POP shall clearly describe Remediation Contractor's proposed means, methods, and sequence of construction operations, and shall demonstrate compliance with the Contract Documents.

1.02 SUBMITTALS

A. Informational Submittals:
   1. Remediation Contractor's POP: Submit in accordance with Article 1.03 of this Section.

1.03 POP SUBMITTAL

A. Remediation Contractor's POP shall address and include the following:
   1. Remediation Contractor's Organizational Structure: Specific chain of command and overall responsibilities of Remediation Contractor personnel. Include the following:
      a. Name and general functions and responsibilities of the following:
         1) Project Manager.
         2) Field Superintendent.
         3) Site Health and Safety Officer.
         4) Project Emergency Coordinator.
         5) Field Engineer.
         6) Foreman.
         7) Equipment operators and laborers.
         8) Others as appropriate.
      b. Designation of Remediation Contractor personnel that will reside at the Site for the duration of the Project.
   2. Work Schedule: Proposed work days and work hours. Include copy of Remediation Contractor's initial Progress Schedule, prepared in accordance with Section 01 32 16, Construction Progress Schedule.
   3. List of major construction equipment.
   4. List of major Subcontractors and Suppliers. Include name, role, and contact information for the following:
      a. Surveyor.
      b. Suppliers and sources of offsite fill and aggregates.
      c. Treatment, disposal, and recycling facilities.
      d. Others as appropriate.
   5. Comprehensive Work Plan: Written description of the general sequence and scope of the following:
      a. Mobilization and site preparation.
      b. Site access controls and security.
      c. Surveying.

d. Utility clearance, mark-out, and verification.
e. Erosion and sediment control.
f. Temporary outfall bypass.
g. Odor, vapor, and dust control.
h. Clearing and grubbing.
i. Turbidity and sheen control.
j. Temporary bypass system.
k. Work area dewatering and conveyance of water to the temporary water treatment system.
l. Sediment removal, including material handling, transportation, and staging approach.
m. Backfilling and grading.
n. Material dewatering.
o. Water treatment.
p. Waste management.
q. Site restoration.
r. Demobilization.

6. Access and Site Preparation Plan (may be included in the Comprehensive Work Plan): Prepare plan describing means and methods for accessing the Work Area and supporting the Work. At a minimum, include the following:
   a. Proposed access strategy.
   b. Proposed support area strategy, including office and sanitary facilities.
7. Sediment Removal and Backfilling Plan (may be included in the Comprehensive Work Plan): Prepare plan describing means and methods for sediment removal and backfilling. At a minimum, include the following:
   a. Proposed survey procedures.
   b. Proposed sediment removal and backfilling procedures.
   c. List of proposed equipment for sediment removal and backfilling Work. Where different procedures or equipment will be used for different types of material or at different locations at the Work Area, indicate where each procedure and equipment item will be used.
   d. Planned sequence of sediment removal and backfilling operations.
   e. Detailed schedule of sediment removal and backfilling Work in accordance with the accepted Progress Schedule.
8. Waste Management Plan (may be included in the Comprehensive Work Plan): In accordance with Section 02 61 15, Handling and Disposal of Impacted Materials.
9. Special Instrumentation Installation Plan (may be included in the Comprehensive Work Plan): In accordance with Section 31 09 13, Geotechnical Instrumentation and Monitoring.
10. Bypass System Installation Plan (may be included in the Comprehensive Work Plan): In accordance with Section 31 50 00, Excavation Protection (Bypass System).
11. Site Utilization Plan (may be included in the Comprehensive Work Plan): Site plan showing the proposed location and layout of the following:
    a. Temporary facilities (i.e., sanitary, first-aid, parking/storage, water treatment, containment systems, etc.).
    b. Temporary access roads and parking areas.
    c. River access/staging area.
    d. Equipment storage and fueling area(s).
    e. Temporary decontamination area(s). Clearly identify location and size of each.
    f. Temporary containment area(s). Clearly identify location and size of each.

B. Submit POP the sooner of seven days prior to pre-construction conference, or 30 days prior to Remediation Contractor's scheduled mobilization to the Site.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. This Section includes administrative and procedural requirements for the following:
      a. Requests for interpretation.
      b. Clarification notices.
      c. Minor changes in the Work and Field Orders.
      d. Work Change Directives.
      e. Proposal requests.
      f. Change Order requests.
      g. Change Orders.

B. Submit Contract modification documents to Remediation Engineer.

C. Retain at Remediation Contractor's office and at the Site a complete copy of each Contract modification document and related documents, and Remediation Engineer's response.

1.02 REQUESTS FOR INTERPRETATION

A. General:
   1. Submit requests for interpretation to obtain clarification or interpretation of the Contract Documents. Report conflicts, errors, ambiguities, and discrepancies in the Contract Documents using requests for interpretation.
   2. Do not submit request for interpretation when other form of communication is appropriate, such as submittals, requests for substitutions or "or equals", notices, ordinary correspondence, or other form of communication. Improperly prepared or inappropriate requests for interpretation will be returned without response or action.
   3. Submit written requests for interpretation to Remediation Engineer. Remediation Contractor and Owner may submit requests for interpretation.

B. Procedure:
   1. Submit one original (may be electronic) of each request for interpretation. Submit each request for interpretation with separate letter of transmittal.
   2. Remediation Engineer will provide timely review of requests for interpretation. Allow sufficient time for review and response.
   3. Remediation Engineer will maintain a log of all requests for interpretation. A copy of the log will be provided upon request.
   4. Remediation Engineer will provide written response to each request for interpretation. One copy of Remediation Engineer's response will be distributed to:
      a. Remediation Contractor.
      b. Owner.
   5. If Remediation Engineer requests additional information to make an interpretation, provide information requested within ten days, unless Remediation Engineer allows additional time, via correspondence referring to request for interpretation number.
   6. If Remediation Contractor or Owner believes that a change in the Contract Price or Contract Times or other change to the Contract is required, notify Remediation Engineer in writing before proceeding with the Work associated with the request for interpretation.

C. Submit each request for interpretation on the request for interpretation form included with this Section, or other form acceptable to Remediation Engineer.
   1. Number each request for interpretation using a two-digit sequential number. First request for interpretation will be “01”.
   2. In space provided on form, describe the interpretation requested. Provide additional sheets as necessary. Include text and sketches as required in sufficient detail for Remediation Engineer’s response.
   3. When applicable, request for interpretation shall include Remediation Contractor’s recommended resolution.

1.03 CLARIFICATION NOTICES

A. General:
   1. Clarification notices provide clarification or interpretation of conflicts, errors, ambiguities, and discrepancies in the Contract Documents that are identified by the Remediation Engineer.
   2. Clarification notices do not change the Contract Price or Contract Times, and do not alter the Contract Documents.
   3. Clarification notices, when required, will be initiated and issued by the Remediation Engineer as correspondence with additional information as required.

B. Procedure:
   1. One copy of each written clarification notice (may be electronic) will be distributed to:
      a. Remediation Contractor.
      b. Owner.
   2. If Remediation Contractor or Owner believes that a change in the Contract Price or the Contract Times or other change to the Contract is required, notify Remediation Engineer in writing before proceeding with the Work associated with clarification notice.
   3. If clarification notice is unclear, submit request for interpretation.

1.04 MINOR CHANGES IN THE WORK AND FIELD ORDERS

A. General:
   1. Field Orders authorize minor variations in the Work, but do not change the Contract Price or Contract Times.
   2. Field Orders, when required, will be initiated and issued by Remediation Engineer on the Field Order form included with this Section, or other form acceptable to Remediation Engineer.
   3. Remediation Engineer will maintain a log of all Field Orders issued.

B. Procedure:
   1. One copy of each Field Order (may be electronic) will be distributed to:
      a. Remediation Contractor.
      b. Owner.
   2. If Remediation Contractor or Owner believes that a change in the Contract Price or the Contract Times or other change to the Contract is required, immediately notify Remediation Engineer in writing before proceeding with the Work associated with the Field Order.
   3. If Field Order is unclear, submit request for interpretation.

1.05 WORK CHANGE DIRECTIVES

A. General:
   1. Work Change Directives, when required, order additions, deletions, or revisions to the Work.
   2. Work Change Directives do not change the Contract Price or Contract Times, but is evidence that the parties to the Contract expect that the change ordered or documented by the Work Change Directive will be included in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.
   3. Work Change Directives, when required, will be initiated and issued by the Remediation Engineer on the Work Change Directive form included with this Section, or other form acceptable to the Owner and Remediation Engineer.

B. Procedure:
   1. Work Change Directive signed by the Owner and Remediation Engineer will be furnished to the Remediation Contractor (may be electronic), who shall promptly sign Work Change Directive and, within five days of receipt, return to the Remediation Engineer.
   2. Signed Work Change Directives will be distributed as follows:
      a. Remediation Contractor: One original.
      b. Owner: Two originals.
      c. Remediation Engineer: One original.
   3. When required by the Remediation Engineer, document the Work performed under each separate Work Change Directive. For each day, document the following in a format acceptable to Remediation Engineer:
      a. Number and type of workers employed, and hours worked.
      b. Equipment used, including manufacturer, model, and year of equipment, and number of hours for each.
      c. Materials used.
      d. Receipts for and descriptions of materials and equipment incorporated into the Work.
      e. Invoices and labor and equipment breakdowns for Subcontractors and Suppliers.
      f. Other information required by Owner or Remediation Engineer.
   4. Submit documentation to Remediation Engineer as a Change Order request.

1.06 PROPOSAL REQUESTS

A. General:
   1. Proposal requests are for requesting the effect on the Contract Price and the Contract Times and other information relative to contemplated changes in the Work.
   2. Proposal requests do not authorize changes or variations in the Work, and do not change the Contract Price or Contract Times, or terms of the Contract.
   3. Proposal requests may be initiated by Remediation Engineer or Owner.
   4. Proposal requests will be issued on the proposal request form included with this Section, or other form acceptable to Owner and Remediation Engineer.

B. Procedure:
   1. One copy of each signed proposal request will be furnished to Remediation Contractor, with one copy each distributed to:
      a. Owner.
      b. Remediation Engineer.
   2. Submit request for interpretation to clarify conflicts, errors, ambiguities, and discrepancies in proposal request.
   3. Upon receipt of proposal request, Remediation Contractor shall prepare and submit a Change Order request, in accordance with this Section, for the proposed Work described in the proposal request.

1.07 CHANGE ORDER REQUESTS

A. General:
   1. Submit written Change Order request to Remediation Engineer in response to each proposal request, and when Remediation Contractor believes a change in the Contract Price or Contract Times, or other change to the terms of the Contract is required.

B. Procedure:
   1. Submit to Remediation Engineer one original (may be electronic) of each Change Order request with accompanying documentation. Submit each Change Order request with separate letter of transmittal.
   2. Remediation Engineer will review Change Order request and either request additional information from Remediation Contractor or provide to Owner a recommendation regarding approval of the Change Order request.
   3. When Remediation Engineer requests additional information to render a decision, submit required information within five days of receipt of Remediation Engineer's request, unless Remediation Engineer allows more time. Submit the required information via correspondence that identifies the Change Order request number.
   4. Upon completing review, one copy of Remediation Engineer's written response, if any, will be distributed to:
      a. Remediation Contractor.
      b. Owner.
      c. Remediation Engineer.
   5. If Change Order request is recommended for approval by Remediation Engineer and approved by Owner, a Change Order will be issued.

C. Each Change Order request shall be submitted on the Change Order request form included with this Section, or other form acceptable to Owner and Remediation Engineer.
   1. Number each Change Order request using a two-digit sequential number. First Change Order request will be "01".
   2. In space provided on the form:
      a. Describe the scope of each proposed change. Include text and sketches on additional sheets as required to provide detail sufficient for Remediation Engineer's review and response. If the proposed change is submitted in response to a proposal request, write in as scope, "In accordance with Proposal Request No." followed by the proposal request number. Provide written clarifications, if any, to scope of change.
      b. Provide justification for each proposed change. If the proposed change is submitted in response to a proposal request, write in as justification, "In accordance with Proposal Request No." followed by the proposal request number.
      c. List the total change in the Contract Price and Contract Times for each proposed change.
   3. Unless otherwise directed by Remediation Engineer, attach to the Change Order request detailed breakdowns of pricing (Cost of the Work and Remediation Contractor's fee), including:
      a. List of Work tasks to accomplish the change.
      b. For each task, labor cost breakdown including labor classification, total hours per labor classification, and hourly cost rate for each labor classification.
      c. Construction equipment and machinery to be used, including manufacturer, model, and year of manufacture, and number of hours for each.
      d. Detailed breakdown of materials and equipment to be incorporated into the Work, including quantities, unit costs, and total cost, with Supplier's written quotations.
      e. Breakdowns of the Cost of the Work and fee for Subcontractors, including labor, construction equipment and machinery, and materials and equipment incorporated into the Work, other costs, and Subcontractor fees.

f. Breakdown of other costs eligible, in accordance with the General Conditions.
g. Other information required by Remediation Engineer.
h. Remediation Contractor's fees applied to eligible Remediation Contractor costs and eligible Subcontractor costs.

1.08 CHANGE ORDERS

A. General:
1. Change Orders will be recommended by Remediation Engineer, and signed by Owner and Remediation Contractor, to authorize additions, deletions, or revisions to the Work, or changes to the Contract Price or Contract Times.
2. Change Orders will be issued on the Change Order form included with this Section or other form acceptable to Owner and Remediation Engineer.

B. Procedure:
1. Change Order will be furnished to Remediation Contractor (may be electronic), who shall promptly sign Change Order and, within five days of receipt, return to Remediation Engineer.
2. Remediation Engineer will sign each original Change Order and forward them to Owner.
3. After approval and signature by Owner, signed Change Orders will be distributed as follows:
a. Remediation Contractor: One original.
b. Owner: Two originals.
c. Remediation Engineer: One original.

PART 2– PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 ATTACHMENTS

A. The attachments listed below, which follow after the "End of Section" designation, are part of this Section:
1. Attachment A: Request for interpretation form (one page).
2. Attachment B: Field Order form (one page).
3. Attachment C: Work Change Directive form (one page).
4. Attachment D: Proposal request form (one page).
5. Attachment E: Change Order request form (two pages).
6. Attachment F: Change Order form (two pages).

END OF SECTION

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NYSEG
CORTLAND-HOMER FORMER MANUFACTURED GAS PLANT SITE
OPERABLE UNIT NO. 2
HOMER, CORTLAND COUNTY, NEW YORK

REQUEST FOR INTERPRETATION NO. ___

Contractor: _____ Purchase Order No.: _____

Date Transmitted: _____ Date Received: _____

Date Response Requested: _____ Date Response Transmitted: _____

Subject: _____

Reference(s): _____ _____
Specification Section(s) Drawing(s) / Note(s) / Detail(s)

Interpretation Requested:

Signature: _____ Date: _____

Remediation Engineer's Response:

Signature: _____ Date: _____

END OF REQUEST FOR INTERPRETATION

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NYSEG
CORTLAND-HOMER FORMER MANUFACTURED GAS PLANT SITE
OPERABLE UNIT NO. 2
HOMER, CORTLAND COUNTY, NEW YORK

FIELD ORDER NO. ___

Contractor: _____ Purchase Order No.: _____

Date Issued: _____ Effective Date: _____

Subject: _____

Reference(s): _____ _____
Specification Section(s) Drawing(s) / Note(s) / Detail(s)

Attention:

Remediation Contractor is hereby directed to promptly execute this Field Order for minor changes in the Work without changes in Contract Price or Contract Times. If Remediation Contractor considers that a change in Contract Price or Contract Times is required, please notify Remediation Engineer immediately and before proceeding with this Work.

Description:

Attachments:

Issued by Remediation Engineer:

Signature: _____ Date: _____

Receipt Acknowledged by Remediation Contractor:

Signature: _____ Date: _____

END OF FIELD ORDER

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NYSEG
CORTLAND-HOMER FORMER MANUFACTURED GAS PLANT SITE
OPERABLE UNIT NO. 2
HOMER, CORTLAND COUNTY, NEW YORK

WORK CHANGE DIRECTIVE NO. ___

Remediation Contractor: _____ Purchase Order No.: _____

Date Issued: _____ Effective Date: _____

Remediation Contractor is directed to proceed promptly with the following change(s):

Item No.	Description

Scope of Work:

Attachments:

Purpose for Work Change Directive:

Authorization for the Work described herein to proceed on the basis of Cost of the Work due to:

☐ Non-agreement on pricing of proposed change.

☐ Necessity to expedite Work described herein prior to agreeing to changes in Contract Price and Contract Times.

Estimated Change in Contract Price and Contract Times:

Contract Price:

$_____ ☐ Increase ☐ Decrease ☐ No Change

Contract Times:

_____ Days ☐ Increase ☐ Decrease ☐ No Change

Recommended for Approval by Remediation Engineer:

Signature: _____ Date: _____

Authorized by Owner:

Signature: _____ Date: _____

Receipt Acknowledged by Remediation Contractor:

Signature: _____ Date: _____

END OF WORK CHANGE DIRECTIVE

NYSEG
CORTLAND-HOMER FORMER MANUFACTURED GAS PLANT SITE
OPERABLE UNIT NO. 2
HOMER, CORTLAND COUNTY, NEW YORK

PROPOSAL REQUEST NO. ___

Remediation Contractor: _____ Purchase Order No.: _____

Date: _____

Subject: _____

Please submit a complete Change Order request for the proposed modifications described below. If the associated Change Order request is approved, a Change Order will be issued to authorize adjustment to the scope of the Work. This proposal request is not a Change Order, Work Change Directive, or an authorization to proceed with the proposed Work described below.

Scope of Proposed Work:

Requested by Remediation Engineer:

Signature: _____ Date: _____

END OF PROPOSAL REQUEST

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NYSEG
CORTLAND-HOMER FORMER MANUFACTURED GAS PLANT SITE
OPERABLE UNIT NO. 2
HOMER, CORTLAND COUNTY, NEW YORK

CHANGE ORDER REQUEST NO. ___

Remediation Contractor: _____ Purchase Order No.: _____

Date: _____ Submitted in Response to Proposal Request No.: _____

Subject: _____

Scope of Work:

Attach and list supporting information as required.

Justification:

Changes in Contract Price and Contract Times:

For Contract Price, when requested by Remediation Engineer, attach detailed cost breakdowns for Remediation Contractor and Subcontractors, Supplier quotations, and other information required. For the Contract Times, state increase, decrease, or no change to Contract Times for Substantial Completion, readiness for final payment, and Milestones, if any. If increase or decrease, state specific number of days for changes to the Contract Times.

The following changes are proposed to the Contract Price and Contract Times:

Description	Contract Price (dollars)	Contract Times (days)	
		Substantial	Final
1.	$		
2.	$		
Total This Change Order Proposal:	**$**		

Changes to Milestones (if any): _____

The adjustment proposed is the entire adjustment to the Remediation Contract to which Remediation Contractor believes it is entitled as a result of the proposed change.

Requested by Remediation Contractor:

Signature: _____ Date: _____

END OF CHANGE ORDER REQUEST

NYSEG
CORTLAND-HOMER FORMER MANUFACTURED GAS PLANT SITE
OPERABLE UNIT NO. 2
HOMER, CORTLAND COUNTY, NEW YORK

CHANGE ORDER NO. ___

Remediation Contractor: _____ Purchase Order No.: _____

Date Issued: _____ Effective Date: _____

The Contract Documents are modified as follows upon execution of this Change Order:

Description:

Attachments:

Change in Contract Price:

A. Original Contract Price: $_____

B. ☐ Increase ☐ Decrease ☐ No Change
from previously approved Change Order Nos. ___ to ___: $_____

C. Contract Price prior to this Change Order (Lines A+B): $_____

D. ☐ Increase ☐ Decrease ☐ No Change
of this Change Order: $_____

E. Contract Price incorporating this Change Order (Lines C+D): $_____

Change in Contract Times:

A. Original Contract Times ☐ Working days ☐ Calendar days:

Substantial Completion (days or date): _____
Ready for Final Payment (days or date): _____

B. ☐ Increase ☐ Decrease ☐ No Change
from previously approved Change Order Nos. ___ to ___:

Substantial Completion (days or date): _____
Ready for Final Payment (days or date): _____

C. Contract Times prior to this Change Order (Lines A+B):

Substantial Completion (days or date): _____
Ready for Final Payment (days or date): _____

D. ☐ Increase ☐ Decrease ☐ No Change
of this Change Order:

Substantial Completion (days or date): _____
Ready for Final Payment (days or date): _____

E. Contract Times incorporating this Change Order (Lines C+D):

Substantial Completion (days or date): _____
Ready for Final Payment (days or date): _____

Recommended for Approval by Remediation Engineer:

Signature: _____ Date: _____

Accepted by Owner:

Signature: _____ Date: _____

Accepted by Remediation Contractor:

Signature: _____ Date: _____

END OF CHANGE ORDER

SECTION 01 29 76

PROGRESS PAYMENT PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. This Section includes administrative and procedural requirements for the Remediation Contractor's requests for progress payments.

1.02 PROGRESS PAYMENTS

A. General:
   1. Applications for Payment shall be submitted on a form acceptable to the Owner and the Remediation Engineer.

B. Procedure:
   1. Review with the Remediation Engineer the proposed quantities and Work to be included in each progress payment. Application for Payment shall cover only the quantities and Work recommended by the Remediation Engineer.
   2. Submit to the Owner and the Remediation Engineer complete Application for Payment and other documents to accompany the Application for Payment.

C. Each request for progress payment shall include:
   1. Completed Application for Payment form, including summary/signature page, progress estimate sheets, and stored materials summary. Progress estimate sheets shall have the same level of detail as the Schedule of Values.
      a. Documentation of work completed in accordance with the Contract Documents measurements and payments. Costs for which progress payment is requested and for which documentation acceptable to the Remediation Engineer is not submitted, will not be eligible for payment.
   2. Listing of Subcontractors and Suppliers:
      a. Submit not less than monthly updated listing of all Subcontractors and Suppliers known to the Remediation Contractor, whether or not such entities have a contract directly with the Remediation Contractor. Include name, contact person, contact information, brief description of work/services supplied, and approximate date(s) of work/services supplied.
   3. Partial Release or Reduction of Retainage:
      a. For each Application for Payment where the Remediation Contractor requests partial release or reduction of retainage in any amount (other than request for final payment), submit with associated progress payment request consent of surety to partial release or reduction of retainage, duly completed by the Remediation Contractor and surety.
      b. For payment requests that include reduction in or payment of retainage in an amount greater than that required by the Contract Documents, obtain The Owner's concurrence for partial release or reduction in retainage prior to submitting such Application for Payment.

D. Requirements for request for final payment are specified in the Section 01 77 19, Closeout Procedures.

1.03 SUBMITTALS

A. Informational Submittals: Submit the following:
   1. An example invoice for review by the Owner, to ensure that the invoice conforms with the Owner's standards.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 13

PROJECT COORDINATION

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. This Section includes general requirements for coordinating construction operations on the Project.

1.02 COORDINATION

A. Coordinate the Work, including testing agencies, whether hired by the Remediation Contractor, Owner, or others, Subcontractors, Suppliers, and others with whom coordination is necessary, in accordance with this Section, to complete the Work in accordance with the Contract Documents.

B. Cooperate with and coordinate the Work with other contractors, utility service companies, Owner's employees working at the Site, and other entities working at the Site, in accordance with Section 01 11 00, Summary of Work.

C. Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.

D. Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Remediation Contractor's Progress Schedule.
   2. Installation and removal of temporary utilities, facilities, and controls.
   3. Delivery and processing of submittals.
   4. Progress meetings.
   5. Startup and adjustment of systems.
   6. Project closeout activities.

E. Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

F. Maintain sufficient competent personnel, drafting and CADD equipment (as necessary), and supplies at the Site for preparing layout drawings, coordination drawings, and record documents. With the Contract Documents and Shop Drawings, use such coordination drawings as tools for coordinating the Work of various trades. Where such coordination drawings are to be prepared by Subcontractors, ensure that each Subcontractor maintains required personnel and facilities at the Site.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 19.13

PRE-CONSTRUCTION CONFERENCE

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. A pre-construction conference will be held for the Project. Remediation Contractor shall attend the conference and be prepared to discuss all items on the agenda.
   2. Remediation Engineer will distribute an agenda, preside at conference, and prepare and distribute minutes to all conference participants and others as requested.

B. Purpose of conference is to designate responsible personnel, establish working relationships, discuss preliminary schedules submitted by the Remediation Contractor, and review administrative and procedural requirements for the Project. Matters requiring coordination will be discussed and procedures for handling such matters will be established.

C. Date, Time, and Location: Conference will be held within 20 days after the Contract Times start to run and before Work starts at the Site, unless otherwise specified by the Owner and agreed to by the Remediation Contractor. Owner will establish the date, time, and location of conference and will notify the interested and involved parties.

D. Prior to the conference, the Remediation Contractor shall submit the following preliminary schedules:
   1. Preliminary Progress Schedule.
   2. Preliminary Schedule of Submittals.

E. Remediation Contractor shall provide information required and contribute appropriate items for discussion. Remediation Contractor shall bring to the conference the following, with sufficient number of copies for each attendee:
   1. Preliminary Progress Schedule.
   2. Preliminary Schedule of Submittals.
   3. List of emergency contact information for Remediation Contractor's project manager, field superintendent, site health and safety officer, field engineer, and foreman.

1.02 ATTENDANCE

A. Representatives present for each entity shall be qualified and authorized to act on that entity's behalf.

B. Attendance:
   1. Remediation Contractor:
      a. Project manager.
      b. Field superintendent.
      c. Site health and Safety officer.
      d. Field engineer.
      e. Forman.
      f. Representatives of other Subcontractors and Suppliers if needed for the discussion of a particular agenda item.
   2. Owner.

3. Remediation Engineer.
4. New York State Department of Environmental Conservation and New York State Department of Health, if available.
5. Village of Homer, City of Cortland, if available.
6. Others as appropriate or as requested by Owner, Remediation Contractor, or Remediation Engineer.

1.03 PRELIMINARY AGENDA

A. Safety Moment

B. Procedural and Administrative:
   1. Personnel and Teams:
      a. Designation of roles and responsible personnel.
      b. Limitations of authority of personnel, including personnel who will sign Contract modifications and make binding decisions.
      c. List of proposed Subcontractors and Suppliers.
      d. Authorities having jurisdiction.
   2. Procedures for communication and correspondence.
   3. Copies of Contract Documents and availability.
   4. The Work and Scheduling:
      a. Scope of Work.
      b. Contract Times, including Milestones (if any).
      c. Phasing and sequencing.
      d. Preliminary Progress Schedule.
      e. Critical path activities.
      f. Working hours.
   5. Safety:
      a. Responsibility for safety.
      b. Designation of Remediation Contractor's safety representative.
      c. Identify Project Emergency Coordinator (responsibilities are as outlined in the Contingency Plan).
      d. Emergency procedures and accident reporting.
      e. Emergency contact information.
      f. Impact of Project on public safety.
   6. Permits.
   7. Coordination:
      a. Project coordination.
      b. Progress meetings.
   8. Products and Submittals:
      a. Preliminary Schedule of Submittals.
      b. Shop Drawings, Samples, and other submittals.
      c. Product options, "or equals", and substitutions.
   9. Contract Modification Procedures:
      a. Requests for interpretation.
      b. Clarification notices.
      c. Field Orders.
      d. Proposal requests.
      e. Change Order proposals.
      f. Work Change Directives.
      g. Change Orders.

10. Payment:
    a. Progress payment procedures.
    b. Taxes.
    c. Retainage.
11. Testing and inspections.
12. Record documents.
13. Preliminary Discussion of Contract Closeout:
    a. Procedures for Substantial Completion.
    b. Contract closeout requirements.
    c. Correction period.
    d. Duration of bonds and insurance.

C. Site Mobilization:
1. Field offices and staging areas.
2. Temporary facilities and utilities.
3. Access to staging/processing area, access roads, and parking.
4. Access to sediment removal areas, secondary staging area, access roads, and parking.
5. Maintenance and protection of traffic.
6. Use of premises.
7. Protection of existing property.
8. Security.
9. Temporary Controls:
    a. Erosion and sediment control.
    b. Storm water control.
    c. Odor, vapor, and dust control.
    d. Noise control.
    e. Temporary bypass system.
    f. Turbidity controls.
    g. Pollution control.
10. Temporary fencing.
11. Storage of materials and equipment.
12. Reference points and benchmarks; surveys and layouts.
13. Site maintenance and housekeeping during the Project, including cleaning and removal of trash and debris.
14. Sediment removal and handling.
15. Restoration.

D. General discussion and questions.

E. Next meeting.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

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SECTION 01 31 19.23

PROGRESS MEETINGS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Progress meetings will be held on a regular basis throughout the Project. Remediation Contractor shall attend each progress meeting and be prepared to discuss in detail all items on the agenda.
   2. Remediation Engineer will preside at progress meetings and will prepare and distribute agenda and minutes of progress meetings to all meeting participants and others as requested.

B. Date and Time:
   1. Progress Meetings: Every week on a day and time agreeable to the Owner, the Remediation Engineer, and the Remediation Contractor.
   2. Daily Safety and Coordination meetings: Daily meetings will be attended by the Remediation Contractor's representative(s), the Remediation Engineer, the Owner (as necessary), and other parties to be on Site during the day to discuss day-to-day operations, daily schedule, health and safety issues, Remediation Contractor coordination issues, and general project status.
   3. Pre-Final Inspection: A pre-final inspection (punch list) meeting will be held at the substantial completion of the remedial construction activities. Participants in the meeting will include the Remediation Contractor, the Owner, the Remediation Engineer, and NYSDEC. The meeting will be scheduled by the Remediation Engineer. As part of the meeting, a pre-final site inspection will be conducted by the Owner, the Remediation Engineer, and NYSDEC.
   4. Project Closeout Meeting: A project close-out meeting will be held at the end of the remedial construction activities. Participants in the meeting will include the Remediation Contractor, the Owner, the Remediation Engineer, and NYSDEC. The meeting will be scheduled by the Remediation Engineer. As part of the meeting, a final site inspection will be conducted by the Owner, the Remediation Engineer, and NYSDEC.
   5. Other Meetings: As required.

C. Location: Remediation Contractor's field office at the Site or other location mutually agreed upon by the Owner, the Remediation Engineer, and the Remediation Contractor.

D. Handouts: Remediation Contractor shall bring to each progress meeting a minimum of 5 copies of each of the following:
   1. List of Work accomplished since the previous progress meeting.
   2. Up-to-date Progress Schedule.
   3. Up-to-date Schedule of Submittals.
   4. Detailed "look-ahead" schedule of Work planned for the next two weeks, with specific starting and ending dates for each activity, including shutdowns, deliveries of important materials and equipment, Milestones (if any), and important activities affecting Owner, the Project, and the Site.

1.02 ATTENDANCE

A. Representatives present for each entity shall be qualified and authorized to act on that entity's behalf.

B. Attendance:
   1. Remediation Contractor:
      a. Project manager.
      b. Site superintendent.
      c. Site health and safety officer.
      d. Field engineer.
      e. Forman.
      f. Representatives of other Subcontractors and Suppliers when needed for the discussion of a particular agenda item.
   2. Owner.
   3. Remediation Engineer.
      a. Project Manager
      b. Construction Manager
      c. Air Monitoring Technician
   4. New York State Department of Environmental Conservation and New York State Department of Health, if available.
   5. Village of Homer, City of Cortland, if available.
   6. Others as appropriate or as requested by Owner, Remediation Contractor, or Remediation Engineer.

1.03 PRELIMINARY AGENDA

A. Review, comment, and amendment (if required) of minutes of previous progress meeting.

B. Safety and safe work practices.

C. Status of permits, as applicable.

D. Results of community air monitoring and turbidity monitoring performed since previous progress meeting.

E. Review of progress since previous progress meeting.

F. Planned progress through next progress meeting.

G. Review of Progress Schedule:
   1. Contract Times, including Milestones (if any).
   2. Critical path.
   3. Schedules for fabrication and delivery of materials and equipment.
   4. Issues potentially affecting the Contract Times, including Milestones (if any).
   5. Corrective measures, if required, to achieve Contract Times, including Milestones (if any).

H. Submittals:
   1. Status of critical submittals.
   2. Review of Schedule of Submittals and the Remediation Engineer's submittal log.

I. Field observations, problems, and conflicts.

J. Quality standards, testing, and inspections.

K. Coordination between parties.

L. Site management issues, including access, security, temporary controls, maintenance and protection of traffic, and housekeeping.

M. Punch list status, as applicable.

N. Other business.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULE

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. The Remediation Contractor shall prepare, submit, maintain, and update Progress Schedules in accordance with this Section, unless otherwise accepted by the Owner.
   2. The Owner's acceptance of the Progress Schedule, and comments or opinions concerning the activities in the Progress Schedule shall not control the Remediation Contractor's independent judgment relative to the means, methods, techniques, sequences, and procedures of construction. The Remediation Contractor is solely responsible for complying with the Contract Times.
   3. If the Progress Schedule reflects completion date(s) different than the Contract Times, the Contract Times are not thereby voided, nullified, or affected. The Contract Times govern. Where the Progress Schedule reflects completion date(s) that are earlier than the Contract Times, Owner may accept such Progress Schedule with Remediation Contractor to specifically understand that no Claim for additional Contract Times or additions to the Contract Price shall be brought against Owner resulting from Remediation Contractor's failure to complete the work by the earlier date(s) indicated on the accepted Progress Schedule.

B. Factors Affecting the Progress Schedule:
   1. In preparing the Progress Schedule, take into consideration submittal requirements and submittal review times, time for fabricating and delivering materials and equipment, work by subcontractors, availability and abilities of workers, availability of construction equipment, weather conditions, restrictions in operations at the Site and coordination with the Owner's operations, if any, and other factors that have the potential to affect completion of the work within the Contract Times.
   2. Comply with sequencing requirements, if any, indicated in the Contract Documents.

1.02 SUBMITTALS

A. Informational Submittals:
   1. Preliminary Progress Schedule: Submit preliminary Progress Schedule in accordance with this Section.
   2. Initial Progress Schedule: After making revisions in accordance with Owner's and/or Remediation Engineer's comments on the preliminary Progress Schedule, submit Initial Progress Schedule in accordance this Section.
   3. Progress Schedule Updates:
      a. Submit updated Progress Schedule at each progress meeting. Bring to meeting the minimum number of copies specified in Section 01 31 19.23, Progress Meetings.
      b. Submit each updated Progress Schedule with letter of transmittal complying with requirements of Section 01 33 00, Submittal Procedures and specifically indicating the following:
         1) Listing of activities and dates that have changed since the previous Progress Schedule submittal.
         2) Discussion of problems causing delays, anticipated duration of delays, and proposed countermeasures.
         3) Completed activities, if any, and the anticipated and actual durations of each.

c. If the Progress Schedule remains unchanged from one progress meeting to the next, submit a written statement to that effect.

4. Look-Ahead Schedules: Submit two-week look-ahead schedule at each progress meeting.
5. Recovery Schedules: Submit in accordance with this Section.

1.03 PROGRESS SCHEDULES

A. Format:
1. Type: Gantt chart prepared using Microsoft Project 2013 or later edition, Primavera P6, or similar scheduling software.
2. Sheet Size: 22 inches by 34 inches, unless otherwise accepted by Owner.
3. Time Scale: Indicate first date of each work week.
4. Organization:
a. Group deliveries of materials and equipment into a separate sub-schedule that is part of the Progress Schedule.
b. Group construction into a separate sub-schedule (that is part of the Progress Schedule) by activity.
c. Group Work by Subcontractors into a separate sub-schedule (that is part of the Progress Schedule) by activity.
d. Group critical activities that dictate the rate of progress (the “critical path”) into a separate sub-schedule that is part of the Progress Schedule. Clearly indicate the critical path on the Progress Schedule.
e. Organize each sub-schedule by Specification Section or payment item number.
5. Activity Designations: Indicate title and related Specification Section or payment item number.

B. Content:
1. At a minimum, the following major work items should be included, with appropriate subtasks included as necessary, in the general sequence listed below:
a. Mobilization.
b. Site Preparation.
c. River Bypass System Installation (for each removal area).
d. Sediment Removal and Backfilling (for each removal area).
e. River Bypass System Removal (for each removal area).
f. Site Restoration.
g. Demobilization.
2. Progress Schedules shall also indicate the following:
a. Dates for shop-testing.
b. Delivery dates for materials and equipment to be incorporated into the Work.
c. Dates for beginning and completing each phase of the Work by activity and by trade.
d. Dates for start-up, check-out, and field-testing.
e. Dates corresponding to the Contract Times, and planned completion date associated with each Milestone (if any), Substantial Completion, and readiness for final payment.

C. Progress Schedule Updates: Update Progress Schedule on a bi-weekly basis (i.e., every two weeks) and to reflect changes to the Contract Times, if any.

1.04 RECOVERY SCHEDULES

A. General:
1. When updated Progress Schedule indicates that the ability to comply with the Contract Times falls two or more weeks behind schedule, and there is no excusable delay (e.g., severe weather), Change Order, or Work Change Directive to support an extension of the

Contract Times, Remediation Contractor shall prepare and submit a Progress Schedule demonstrating Contractor's plan to accelerate the work to achieve compliance with the Contract Times ("recovery schedule") for Owner's acceptance.

2. Submit recovery schedule within three days after submittal of updated Progress Schedule where need for recovery schedule is indicated.

B. Implementation of Recovery Schedule:
   1. At no additional cost to the Owner, do one or more of the following: furnish additional labor, provide additional construction equipment, provide suitable materials, employ additional work shifts, expedite procurement of materials and equipment to be incorporated into the Work, and other measures necessary to complete the Work within the Contract Times.
   2. Upon acceptance of recovery schedule by the Owner, incorporate recovery schedule into the next Progress Schedule update.

C. Lack of Action: Remediation Contractor's refusal, failure, or neglect to take appropriate recovery action, or to submit a recovery schedule, shall constitute reasonable evidence that Remediation Contractor is not prosecuting the work or separable part thereof with the diligence that will ensure completion within the Contract Times.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

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SECTION 01 32 26

CONSTRUCTION PROGRESS REPORTING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall prepare and submit construction progress reports (i.e., daily construction reports, field condition reports) in accordance with this Section.
   2. Remediation Engineer shall prepare and submit daily construction reports in accordance with this Section.

1.02 SUBMITTALS

A. Informational Submittals:
   1. Daily Construction Reports: Submit in accordance with Article 1.03 of this Section.
   2. Field Condition Reports: Submit in accordance with Article 1.04 of this Section.

1.03 DAILY CONSTRUCTION REPORTS

A. Prepare daily construction reports throughout the Project. Include in each report, at a minimum, the following:
   1. Remediation Contractor's name.
   2. Owner's name.
   3. Project name.
   4. Site name and location.
   5. Date and day of the week.
   6. High and low temperatures and general weather conditions.
   7. Representative photographs of work performed (a minimum of four per day, including date, time, location and description of photograph).
   8. River conditions/elevation.
   9. Extent of bypass system installed that day.
   10. Total extent of bypass system installed to date.
   11. Volume of material removed/placed that day.
   12. Total volume removed/placed to date.
   13. Daily production rate (sediment removed and backfill placed).
   14. Overall production rate to date (sediment removed and backfill placed).
   15. Unusual conditions encountered during sediment removal, including large debris encountered.
   16. Results of progress surveys.
   17. Major equipment and materials installed as part of the Work.
   18. Waste shipments.
   19. Meter readings and similar recordings.
   20. Work performed, including field quality control measures and testing.
   21. Number of Remediation Contractor employees at the Site.
   22. Number of employees at the Site for each Subcontractor.
   23. Breakdown of employees by trades.
   24. Major construction equipment used.
   25. Material and equipment deliveries.
   26. Services connected and disconnected.
   27. Equipment or system tests and startups.

28. Stoppages, delays, shortages, and losses.
29. Accidents. Comply with accident reporting requirements of Section 01 35 29, Contractor's Health and Safety Plan.
30. Emergency procedures.
31. Meetings and significant decisions.
32. Orders and requests of authorities having jurisdiction.
33. Change Orders received and implemented.
34. Work Change Directives received and implemented.
35. Field Orders received and implemented.
36. Request for Interpretation and clarifications submitted.
37. Other instructions received from Owner or Remediation Engineer.

B. Submit daily construction reports to the Remediation Engineer by 10:00 a.m. the next working day after the day covered in the associated report. Daily report shall be signed by responsible member of the Remediation Contractor's staff, such as the Remediation Contractor's project manager, field superintendent, field engineer, or foreman designated by the Remediation Contractor as having authority to sign daily reports.

1.04 FIELD CONDITION REPORTS

A. Immediately upon discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

B. Submit field condition reports to the Remediation Engineer with request for interpretation, prepared in accordance with Section 01 26 00, Contract Modification Procedures.

1.05 REMEDIATION ENGINEER'S DAILY CONSTRUCTION REPORTS

A. Remediation Engineer shall prepare daily construction reports throughout the Project. Include in each report, at a minimum, the following:
   1. Date.
   2. Project name.
   3. Site name and location.
   4. Data on weather conditions, including temperature, cloud cover, and precipitation.
   5. Work start and end times.
   6. Work stoppages (including reason for stoppage, i.e., weather, equipment malfunction)
   7. Remediation Contractor's:
      a. Manpower (i.e., number of workers).
      b. Equipment
      c. Materials delivered or removed from site.
   8. Chronological description of work in progress.
   9. Health and safety issues
   10. Testing preformed onsite and results, if collected on Site.
   11. Record of pertinent communications with onsite parties, outside companies, regulatory agencies, or consultants regarding construction activities.
   12. Documentation of problems or deficiencies noted during construction and corrective action employed by the Remediation Contractor.
   13. Representative photographs of work performed including date, time, location and description of photograph.

B. Remediation Engineer shall submit daily construction reports to Owner by 5:00 p.m. the next working day after the day covered in the associated report or at on an alternate reduced schedule, if requested by the Owner.

PART 2– PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

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SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. This Section specifies the general methods and requirements of submissions applicable to Remediation Contractor submittals, including plans, shop drawings, product data, samples, mock-ups, and schedules. Detailed and specific submittal requirements are provided elsewhere in the Specifications and are summarized in the submittal log form included with this Section.
   2. Provide submittals well in advance (as indicated in this Section) of the need for the material, equipment, or procedure (as applicable) in the Work and with ample time required for delivery of material or equipment and to implement procedures following Remediation Engineer's review or acceptance of the associated submittal. Work covered by a submittal will not be included in progress payments until review or acceptance of related submittals has been obtained in accordance with the Contract Documents.
   3. Remediation Contractor is responsible for dimensions to be confirmed and corrected at the Site, for information pertaining solely to the fabrication processes and to techniques of construction, and for coordinating the work of all trades. Remediation Contractor's signature of submittal's stamp and letter of transmittal shall be the Remediation Contractor's representation that the Remediation Contractor has met its obligations under the Contract Documents relative to that submittal.

B. Samples:
   1. Conform submittal of Samples to the Specification Section in which the Sample is specified.
   2. Furnish at the same time Samples and submittals that are related to the same unit of Work or Specification Section. The Remediation Engineer will not review submittals without associated Samples and will not review Samples without associated submittals.
   3. Samples shall clearly illustrate functional characteristics of product, all related parts and attachments, and full range of color, texture, pattern, and material.

C. Each submittal shall be prepared and transmitted to the Remediation Engineer a minimum of 10 working days in advance of the Remediation Contractor's intended performance of the related Work or other applicable activities, or within the time specified in the individual Work of other related Sections, so that Work will not be delayed by processing times (including rejections and resubmittals, if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. The Owner and/or Remediation Engineer will not be liable for any expense and/or delay resulting from the Remediation Contractor's failure to provide submittals in a timely manner.

D. The Remediation Engineer shall forward select submittals to New York State Department of Environmental Conservation (NYSDEC) for review, as requested by NYSDEC.

1.02 TYPES OF SUBMITTALS

A. Submittals are classified as Action Submittals, Informational Submittals, Closeout Submittals, and Maintenance Material Submittals. The type of each required submittal is designated in

the respective Specification Sections. When type of submittal is not specified in the associated Specification Section, submittal will be classified as follows:

1. Action Submittals include:
    a. Shop Drawings.
    b. Product data.
    c. Delegated design submittals, which include documents prepared, sealed, and signed by a design professional retained by Remediation Contractor, Subcontractor, or Supplier for materials and equipment to be incorporated into the completed Work. Delegated design submittals do not include submittals related to temporary construction unless specified otherwise in the related Specification Section. Delegated design submittals include design drawings, design data including calculations, specifications, certifications, and other submittals prepared by such design professional.
    d. Samples.
    e. Testing plans, procedures, and testing limitations.
2. Informational Submittals include:
    a. Certificates.
    b. Design data not sealed and signed by a design professional retained by Remediation Contractor, Subcontractor, or Supplier.
    c. Pre-construction test and evaluation reports, such as reports on pilot testing, subsurface investigations and similar reports.
    d. Supplier instructions, including installation data, and instructions for handling, starting-up, and troubleshooting.
    e. Source quality control submittals (other than testing plans, procedures, and testing limitations), including results of shop testing.
    f. Field quality control submittals (other than testing plans, procedures, and testing limitations), including results of operating and acceptability tests at the Site.
    g. Supplier reports.
    h. Sustainable design submittals (other than sustainable design closeout documentation).
    i. Special procedure submittals, including health and safety plans and other procedural submittals.
    j. Qualifications statements.
3. Closeout Submittals include:
    a. Maintenance contracts.
    b. Operations and maintenance data.
    c. Bonds, such as maintenance bonds and bonds for a specific product or system.
    d. Warranty documentation.
    e. Record documentation.
    f. Sustainable design closeout documentation.
    g. Software.
4. Maintenance Material Submittals include:
    a. Spare parts.
    b. Extra stock materials.
    c. Tools.
5. When type of submittal is not specified and is not included in the list above, Remediation Engineer will determine the type of submittal.

B. Not Included in this Section: Administrative and procedural requirements for the following are covered elsewhere in the Contract Documents:
    1. Requests for interpretations and clarifications of the Contract Documents.
    2. Field Orders, Work Change Directives, and Change Orders.
    3. Applications for Payment.
    4. Progress Schedules.

5. Progress reports.
6. Photographic documentation.
7. Reports and documentation required in accordance with applicable permits.
8. Site survey data.

1.03 SUBMITTALS REQUIRED IN THIS SECTION

A. Informational Submittals:
   1. Schedule of Submittals:
      a. Timing:
         1) Provide submittal within time frames specified in Attachment A – Submittal Log.
         2) Provide updated Schedule of Submittals with each submittal of the updated Progress Schedule.
      b. Content: Requirements for content of preliminary Schedule of Submittals and subsequent submittals of the Schedule of Submittals are identical. Identify on Schedule of Submittals all submittals required in the Contract Documents. Updates of Schedule of Submittals shall show scheduled dates and actual dates for completed tasks. Indicate submittals that are on the Project's critical path. Indicate the following for each submittal:
         1) Date by which submittal will be provided to Remediation Engineer.
         2) Whether submittal will be for a substitution or "equal".
         3) Date by which Remediation Engineer's response is required. At least 10 working days shall be allowed from Remediation Engineer's receipt of each submittal. Allow increased time, up to 20 working days, for large or complex submittals.
         4) For submittals for materials or equipment, date by which material or equipment must be at the Site to avoid delaying the Work and to avoid delaying the work of other contractors.
      c. Prepare Schedule of Submittals using same software, and in same format, specified in Section 01 32 16, Construction Progress Schedule.
      d. Coordinate Schedule of Submittals, as specified in Section 01 32 16, Construction Progress Schedule.
      e. Schedule of Submittals that is not compatible with the Progress Schedule, or that does not indicate submittals on the Project's critical path, or that that places extraordinary demands on Remediation Engineer for time and resources, is unacceptable. Do not include submittals not required by the Contract Documents.
      f. In preparing Schedule of Submittals:
         1) Considering the nature and complexity of each submittal, allow sufficient time for review and revision.
         2) Reasonable time (i.e., minimum three business days) shall be allowed for Remediation Engineer's review and processing of submittals, for submittals to be revised and resubmitted, and for returning submittals to Remediation Contractor.
         3) Identify and accordingly schedule submittals that are expected to have long anticipated review times and submittals that may be subject to review by NYSDEC or other authorities having jurisdiction.

1.04 PROCEDURE FOR SUBMITTALS

A. Submittal Identification System: Use the following submittal identification system, consisting of submittal number and review cycle number.
   1. Submittal number shall be separate and unique number correlating to each individual submittal required. Remediation Contractor shall assign submittal number as follows:
      a. First part of submittal number shall be the applicable Specification Section number, followed by a hyphen.

b. Second part of submittal number shall be a three-digit number (sequentially numbered from 001 through 999) assigned to each separate and unique submittal provided under the associated Specification Section.
c. Typical submittal number for the third submittal provided for Section 31 05 05, Aggregates for Earthwork would be “31 23 00-003”.

2. Review cycle number shall be a letter designation indicating the initial submittal or re-submittal associated with each submittal number:
   a. “A” = Initial (first) submittal.
   b. “B” = Second submittal (i.e., first re-submittal).
   c. “C” = Third submittal (i.e., second re-submittal).
3. Typical submittal identification for the second submission (first re-submission) of the third submittal provided for Section 31 05 05, Aggregates for Earthwork would be “31 23 00-003-B”.

B. Letter of Transmittal for Submittals:
   1. Provide separate letter of transmittal with each submittal. Each submittal shall be for one Specification Section.
   2. Each letter of transmittal shall contain the following:
      a. Remediation Contractor’s name.
      b. Owner’s name.
      c. Project name.
      d. Contract or Purchase Order number.
      e. Transmittal number.
      f. Submittal number and review cycle.
      g. Submittal date and dates of any previous submissions.
      h. Reference to appropriate Specification Section number, page, and paragraph(s).
      i. Reference to appropriate Drawing sheet(s) and detail(s).
      j. Clear space at least three inches by three inches in size for affixing Remediation Engineer’s review stamp.
      k. Clear space suitably sized for affixing Remediation Contractor’s stamp.
   3. For submittals with proposed deviations from requirements of the Contract Documents, letter of transmittal shall specifically describe each proposed variation.

C. Remediation Contractor’s Review and Stamp:
   1. Remediation Contractor’s Review: Before transmitting submittals to the Remediation Engineer, review submittals to:
      a. Ensure proper coordination of the Work.
      b. Determine that each submittal is in accordance with the Remediation Contractor’s desires.
      c. Verify that submittal contains sufficient information for the Remediation Engineer to determine compliance with the Contract Documents.
   2. Incomplete or inadequate submittals will be returned without review.
   3. Remediation Contractor’s Stamp and Signature:
      a. Each submittal provided shall bear the Remediation Contractor’s stamp of approval and signature, as evidence that submittal has been reviewed by the Remediation Contractor and verified as complete and in accordance with the Contract Documents.
      b. Submittals without the Remediation Contractor’s stamp and signature will be returned without review.
      c. Remediation Contractor’s stamp shall contain the following certification statement:

         “By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data, and I have checked and coordinated each item with other applicable Shop Drawings and all Project requirements.”

D. Submittal Marking and Organization:
   1. Mark each page of submittal, and each individual component submitted, with submittal number and applicable Specification paragraph.
   2. Arrange submittal information in same order as requirements are written in the associated Specification Section.
   3. Each Shop Drawing sheet shall have title block with complete identifying information satisfactory to Remediation Engineer.
   4. Package together submittals for the same Specification Section. Do not provide required information piecemeal.

E. Format of Submittal and Recipients:
   1. Action Submittals and Informational Submittals: Provide Action Submittals and Informational Submittals as electronic files in PDF format, except that submittals of Samples shall be as specified in Paragraph 1.04.E.2 of this Section.
   2. Samples:
      a. Securely label or tag Samples with submittal identification number. Label or tag shall include clear space at least three inches by three inches in size for affixing Remediation Engineer's review stamp. Label or tag shall not cover, conceal, or alter appearance or features of Sample. Label or tag shall not be separated from the Sample.
      b. Submit number of Samples required in Specifications. If number of Samples is not specified in the associated Specification Section, provide at least three identical Samples of each item required for the Remediation Engineer's review. Samples will not be returned to the Remediation Contractor. If Remediation Contractor requires Sample(s) for the Remediation Contractor's use, notify the Remediation Engineer in writing and provide additional Sample(s). Remediation Contractor is responsible for furnishing, shipping, and transporting additional Samples.
      c. Deliver one Sample to the Remediation Engineer's field office at the Site. Deliver balance of Samples to the Remediation Engineer's office, unless otherwise directed by Remediation Engineer.
   3. Closeout Submittals:
      a. Provide the following Closeout Submittals as electronic files in PDF format:
         1) Maintenance contracts.
         2) Operations and maintenance data.
         3) Bonds for specific products or systems.
         4) Warranty documentation.
         5) Sustainable design closeout documentation.
      b. Record Documentation: Submit in accordance with Section 01 78 39, Project Record Documents.
      c. Software: Submit number of copies required in Specification Section where the software is specified. If number of copies is not specified, provide two copies electronically in addition to software loaded on to Owner's computer(s), as necessary.
   4. Maintenance Material Submittals: For spare parts, extra stock materials, and tools, submit quantity of items specified in associated Specification Section.

F. Distribution:
   1. Remediation Engineer will distribute each reviewed submittal requiring Remediation Engineer's written response as electronic file in PDF format.
   2. Remediation Contractor shall distribute hardcopy reproductions of reviewed submittals, where required, to the job site file and elsewhere, as directed by the Remediation Engineer. Number of hardcopies shall be as directed by the Remediation Engineer but will not exceed four.

G. Resubmittals: Resubmittal requirements are provided in Article 1.05 of this Section.

H. Remediation Engineer's Submittal Log:
   1. Remediation Engineer will maintain a log of required submittals using the form included with this Section. Updated submittal log will be provided to the Remediation Contractor upon request.
   2. Review submittal log and status of each submittal with the Remediation Engineer on a weekly or more frequent basis.
   3. Coordinate updates to Schedule of Submittals with Remediation Engineer's updates to submittal log.

1.05 REMEDIATION ENGINEER'S REVIEW

A. Timing: Remediation Engineer's review will conform to timing accepted by Remediation Contractor in the accepted Schedule of Submittals.

B. Submittals not required in the Contract Documents will not be reviewed by the Remediation Engineer and will not be recorded in the Remediation Engineer's submittal log. Hardcopies, if any, of such submittals will be returned to Remediation Contractor.

C. Results of Remediation Engineer's Review:
   1. Action Submittals: Each submittal will be given one of the following dispositions:
      a. Reviewed: Upon return of submittal marked "Reviewed", order, ship, or fabricate materials and equipment included in the submittal (pending Remediation Engineer's review or acceptance, as applicable, of source quality control submittals) or otherwise proceed with the Work in accordance with the submittal and the Contract Documents.
      b. Reviewed and Noted: Upon return of submittal marked "Reviewed and Noted", order, ship, or fabricate materials and equipment included in the submittal (pending Remediation Engineer's review or acceptance, as applicable, of source quality control submittals) or otherwise proceed with the Work in accordance with the submittal and the Contract Documents, provided it is in accordance with corrections indicated.
      c. Revise and Resubmit: Upon return of submittal marked "Revise and Resubmit", make the corrections indicated and re-submit to Remediation Engineer for review.
      d. Rejected: This disposition indicates material or equipment that cannot be reviewed. Upon return of submittal marked "Rejected", repeat initial submittal procedure utilizing reviewable material or equipment.
   2. Informational Submittals:
      a. Each submittal will be given one of the following dispositions:
         1) Accepted: Information included in submittal conforms to the applicable requirements of the Contract Documents and is acceptable. No further action by Remediation Contractor is required relative to this submittal, and the Work covered by the submittal may proceed, and products with submittals with this disposition may be shipped or operated, as applicable.
         2) Not Accepted: Submittal does not conform to applicable requirements of the Contract Documents and is not acceptable. Revise submittal and re-submit to indicate acceptability and conformance with the Contract Documents.
      b. The following types of Informational Submittals, when acceptable to the Remediation Engineer, will not receive a written response from the Remediation Engineer. Disposition as "Accepted" will be recorded in the Remediation Engineer's submittal log. When submittals of the following are not acceptable, the Remediation Engineer will provide written response to the Remediation Contractor:
         1) Safety data sheets.
         2) Manifests and other shipping documents.

3) Delivery tickets.
4) Compaction testing reports.
5) Concrete testing reports.
6) Manufacturer's instructions.

3. Closeout Submittals: Dispositions and meanings are the same as specified for Informational Submittals. When acceptable, Closeout Submittals will not receive a written response from the Remediation Engineer. Disposition as "Accepted" will be recorded in Remediation Engineer's submittal log. When Closeout Submittal is not acceptable, Remediation Engineer will provide written response to the Remediation Contractor.
4. Maintenance Material Submittals: Dispositions and meanings are the same as specified for Informational Submittals. When acceptable, Maintenance Material Submittals will not receive a written response from the Remediation Engineer. Disposition as "Accepted" will be recorded in the Remediation Engineer's submittal log. When Maintenance Material Submittal is not acceptable, the Remediation Engineer will provide written response to the Remediation Contractor, and the Remediation Contractor is responsible for costs associated with transporting and handling of maintenance materials until compliance with the Contract Documents is achieved.

PART 2– PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 ATTACHMENTS

A. The form listed below, which follows after the "End of Section" designation, is part of this Specification Section:
   1. Attachment A: Remediation Engineer's Submittal Log (example) (2 pages).

END OF SECTION

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Attachment A
Remediation Engineer's Submittal Log (Example)

NYSEG
Cortland-Homer Former MGP Site, Operable Unit No. 2
Homer, Cortland County, New York

Specification / Document Reference	Submittal Description	Submittal Type (see Note 1)	Submittal Schedule	Submittal Reference No.	Date Received	Interim Status/Date (see Note 2)	Final Status/Date (see Note 2)	Notes
Section 01 15 00 Contractor's POP	Remediation Contractor's POP (see specification for requirements)	I	Submit the sooner of 7 days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the site					
Section 01 29 76 Progress Payment Procedures	Example Invoice	I	Submit 7 days prior to first invoice					
Section 01 31 19.13 Pre-Construction Conference	Preliminary Progress Schedule	I	Submit 3 days prior to pre-construction conference					
	Preliminary Schedule of Submittals	I						
	Emergency Contact List	I						
Section 01 32 16 Construction Progress Schedule	Preliminary Progress Schedule (same as for Section 01 31 19.13)	I	Submit 3 days prior to pre-construction conference					
	Initial Progress Schedule	I	Submit after addressing comments from Owner/Engineer on Preliminary Progress Schedule					
	Progress Schedule Updates (as necessary)	I	Submit at each progress meeting					
	Look-Ahead Schedules	I						
	Recovery Schedules (as necessary)	I	Submit as necessary					
Section 01 32 26 Construction Progress Reporting	Daily Construction Reports	I	Submit to Engineer by 10:00 AM the next working day after the day covered in the associated report					
	Field Condition Reports (as necessary)	I	Submit with request for interpretation, as necessary					
Section 01 35 23 Safety Requirements	Emergency Contact List (same as for Section 01 31 19.13)	I	Submit 3 days prior to Pre-Construction Conference					
	Citations (if any)	I	Submit as necessary					
	Work Permits (as needed)	I						
Section 01 35 29 Contractor's HASP	Remediation Contractor's Health and Safety Plan (HASP) (see specification for requirements)	I	Submit the sooner of 7 days prior to pre-construction conference or 30 days prior to Contractor's					
	Qualification Statements - HASP preparer and Site Health and Safety Officer	I						
	Incident Reports (as necessary)	I	Submit as necessary					
	Daily Health and Safety Field Report (may be included in Daily Construction Reports)	I	Submit to Engineer by 10:00 AM the next working day after the day covered in the associated report					
Section 01 35 43.13 Environmental Procedures for Haz Mat	Hazardous Materials Communication Plan	I	Submit within 3 days of Contractor's receipt of request					
	Emergency Spill Response Plan	I						
	Information for Hazardous materials proposed for use at the site (see specification requirements)	I	Submit at least 3 days prior to bringing Hazardous Material to the Site					
	Information for Hazardous Materials generated on-site (see specification requirements)	I	Submit Information not less than 3 days after Contractor's Receipt of Analytical Results					
	Hazardous Materials Management Plan Components (as necessary)	I	Submit at least 3 days prior to bringing Hazardous Material to the Site					
	Copies of permits for storing, handling, using, transporting, and disposing of hazardous materials	I	Submit within 3 days of Contractor's receipt of request					
Section 01 41 26 SWPPP and Permit	Storm Water Permit Certification Statement	I	Submit at least 2 weeks prior to performing any work					
	Qualifications Statement - Inspector	I	at the Site					
	Storm Water Inspection Reports	I	Submit within 3 days after each inspection					
Section 01 51 41 Temporary Pumping	Temporary Pumping System Plan (may be within POP - Section 01 15 00)	I	Provide prior to mobilization and update, as necessary					
	Schedule for Temporary Pumping (may be included within Progress Schedule - Section 01 32 16)	I	Provide to Engineer at least 15 days prior to delivery to Site					
Section 01 52 13 Temp Field Offices	Field Office submittal: site plan, utility providers, and product data (may be within POP - Section 01 15 00)	A	Submit to Engineer for approval prior to staging on Site					
Section 01 53 53 Temp Water Treatment System	Shop Drawings	A	Submit 30 days prior to Contractor's scheduled mobilization of TWTS to the site					
	Operation and Maintenance Manual	A						
	Start-up and operational sample results	A	Submit as soon as results available					
Section 01 57 05 Temp Controls	Erosion And Sediment Control Plan (may be within POP - Section 01 15 00)	A	Submit the sooner of 7 days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the site					
	Turbidity and Sheen Control Plan (may be within POP - Section 01 15 00)	A						
	Noise Control Plan (may be within POP - Section 01 15 00)	A						
	Odor, Dust, and Vapor Control Plan (may be within POP - Section 01 15 00)	A						
	Pollution Control Plan (may be within POP - Section 01 15 00)	A						
	Product data - Rolled Erosion Control Materials (silt fencing, straw bale dike, fiber roll)	A	Submit at least 2 weeks prior to installation at the Site					
	Product data - turbidity curtain system materials	A						
	Product data - oil absorbent boom materials	A						
	Product data - vapor mitigation agent (for each product)	A						
Section 01 58 13 Temp Project Signage	Shop drawing - each project sign, including proposed locations	A	Submit at least 2 weeks prior to installation at the Site					
Section 01 71 23 Field Engineering	Qualification Statements and Certifications (as necessary)	I	Submit at least 2 weeks prior to starting survey Work					
Section 01 71 26 Construction Surveying and Layout	Survey Plan (may be within POP - Section 01 15 00)	I	Submit at least 10 days prior to starting survey Work					
	Survey Field Books	I	Submit within 2 days after completing survey Work					
	Qualifications Statement	I	Submit at least 10 days prior to starting survey Work					
	Pre-Construction Survey - Upland support and staging areas	I	Submit a minimum of 7 days prior to initiating intrusive work					
	Pre-Construction Survey - Removal Areas	I	Provide to Engineer within 24 hours					
	Pre-Construction Survey - Photo Documentation	I						
	Interim Survey - Temporary Bypass System	I	Submit to Engineer within 24 hours					
	Interim Survey - Removal Areas Excavation/Backfill (as necessary)	I						
	Interim Survey - Winter shutdown conditions (as necessary)	I						
	Interim Survey - Photo Documentation	I	Submit as necessary					
	Post Removal Survey - Removal Areas	I	Submit to Engineer within 24 hours, must be approved prior to commencing backfilling					
	Post-Restoration Survey - Upland support and staging areas	I	Submit no more than 2 weeks after survey is complete					
	Post-Restoration Survey - Removal Areas	I						
	Post-Restoration Survey - Photo Documentation	I						
Section 01 74 19 Construction Waste Management and Disposal	Waste Management Plan (see specification for requirements)	I	Submit within 14 days before the date the Contract Times commence running, and before removing any waste					
	Disposal Records	I	Submit a monthly basis, and concurrent with each Application for Payment					
Section 01 77 19 Closeout Procedures	Removal Documentation	I	Submit prior to submitting an application for Final Certification Inspection					
	Truck Volume Counts and Measurement Summary	I						

Attachment A
Remediation Engineer's Submittal Log (Example)

NYSEG
Cortland-Homer Former MGP Site, Operable Unit No. 2
Homer, Cortland County, New York

Specification / Document Reference	Submittal Description	Submittal Type (see Note 1)	Submittal Schedule	Submittal Reference No.	Date Received	Interim Status/Date (see Note 2)	Final Status/Date (see Note 2)	Notes
	Request for Substantial Completion	C						
	Request for Final Acceptance	C						
Section 01 78 39 Project Record Documents	Record Documents (see Specification Section 01 71 26)	A	Submit to Engineer prior to readiness for final payment					
Section 02 21 19 Structural Surveys	Qualifications Statement	I	Submit at least 2 weeks prior to starting survey					
	Notification of intended survey start	I	Submit 2 weeks before performing each survey					
	Survey Reports	I	Submit reports within 14 days after each survey. Submit pre-construction surveys prior initiating deflection or vibration causing construction					
Section 02 51 00 Decontamination	Equipment Decontamination Documentation Report and Certification	A	Prior to the demobilization of any equipment that has contacted impacted materials					
	Safety Data Sheets for all cleaning/decontamination solutions (see Specification Section 01 35 43.13)	I	Submit at least 3 days prior to bringing Hazardous Material to the Site					
	Decontamination Status Report (to be included in Daily Construction Report)	I	Submit to Engineer by 10:00 AM the next working day after the day covered in the associated report					
Section 02 61 15 Handling and Disposal of Impacted Materials	Product Data	A	Submit as part of Contractor's POP or separately					
	Waste Management Plan (see specification for requirements, same as for Section 01 74 19)	A	Submit within 14 days before the date the Contract Times commence running, and before removing any waste					
	Transport Permits, Licenses and Approvals	I	Submit at least 10 days prior to material transport					
	Waste transporter permits	I						
	Disposal Records	I	Submit a monthly basis, and concurrent with each Application for Payment					
	Waste Characterization Sample results, Lab Reports	I	Submit prior to shipping material off-site					
Section 31 05 05 Aggregates for Earthwork	Borrow Source Characterization Report	A	Submit 4 weeks prior to proposed import of materials					
	Representative Sample(s)	A						
	Delivery Tickets	I	Submit a monthly basis, and concurrent with each Application for Payment					
Section 31 05 19.13 Geotextiles for Earthwork	Non-Woven Geotextile Product Data (manufacturer's data, specifications, installation instructions, dimensions, lot/roll numbers)	I	Submit to Engineer prior to shipment of any geotextile material					
	Woven Geotextile Product Data (manufacturer's data, specifications, installation instructions, dimensions, lot/roll numbers)	I						
	Geogrid Product Data (manufacturer's data, specifications, installation instructions, dimensions, lot/roll numbers)	I						
	Certificates	I						
Section 31 05 19.16 Geomembranes for Earthwork	Written certification of minimum test values	I	Submit to Engineer prior to shipment of any geomembrane material					
	Manufacturer's standard warranty	I						
	QC test results	I						
	Remediation Contractor's written certification of field-delivered material	I						
	Lot and roll numbers	I						
Section 31 09 13 Geotech Instrumentation and Monitoring	Qualifications Statement	I	Submit the sooner of 7 days prior to pre-construction conference or 30 days prior to Contractor's					
	Special Instrumentation Installation Plan (may be within POP - Section 01 15 00)	I						
	Geotechnical Monitoring Report (may be provided in Daily Construction Report)	I	Submit to Engineer by 10:00 AM the next working day after the day covered in the associated report					
	Product Data	A	Submit at least 2 weeks prior to installation at the Site					
Section 31 11 00 Clearing and Grubbing	Remediation Contractor's warranty	I	Submit at least 1 week prior to starting clearing					
	Pre-Construction Tree and Vegetation Survey	A						
	Tree Removal Plan	A						
Section 31 23 00 Excavation and Fill	Excavation and Backfill Plan (may be within POP - Section 01 15 00)	A	Submit the sooner of 7 days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the site					
	Modifications to Excavation and Backfill Plan (as needed)	A	Submit as necessary					
	Testing Laboratory Qualification	I	Submit 2 weeks before performing field testing					
	Field Quality Control Test Results	I	Submit 5 days after performing field testing					
Section 31 50 00 Excavation Protection (Bypass System)	Resumes for sheet pile enclosure installation crew	I	Submit the sooner of 7 days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the site					
	Bypass System Installation Plan (may be within POP - Section 01 15 00)	I						
	Bypass System Installation Alternative Approaches	I						
	Sheet pile installation records	I	Submit 5 days after installation					
Section 32 12 00 Flexible Paving	Shop drawings (see specification for requirements)	A	Submit 2 weeks before performing paving					
	Qualifications Statement - asphalt concrete production facility	I						
	Qualifications Statement - testing laboratory	I						
	Quality assurance test data - field test results (see specification for requirements)	I						
	Material delivery tickets	I	Submit a monthly basis, and concurrent with each Application for Payment					
	Field Quality Control Test Results	I	Submit 5 days after performing field testing					
Section 32 90 00 Plantings and Restoration	Restoration Schedule	I	Submit at least 2 weeks prior to commencing restoration					
	Manufacturer's Product Data (see specification for details)	A	Submit at least 4 weeks prior to commencing restoration					
	Suppliers Certifications - each seed mix (see specification for details)	A						
	Maintenance Data (see specification for details)	M	Submit at least 2 weeks prior to commencing restoration					
	Remediation Contractor's warranty	I						

Notes:

1. Submittal Type:
   - I - Informational
   - A - Action
   - C - Closeout
   - M - Maintenance

2. Review Status:
   - R - Reviewed
   - RN - Reviewed and Noted
   - S - Resubmit
   - J - Rejected
   - I - For your information
   - A - Accepted
   - NA - Not Accepted

SECTION 01 35 23

SAFETY REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope:
   1. This Section augments the requirements elsewhere in the Contract Documents regarding the Remediation Contractor's responsibilities for safety and protection and includes requirements for the Remediation Contractor's safety representative and other safety requirements applicable to the Project.
   2. Remediation Contractor shall provide labor, materials, tools, equipment, training, certifications, protective measures, and incidentals shown, specified, and required to comply with the Remediation Contractor's obligations under the Contract for safety and protection of personnel and property.
   3. Remediation Contractor shall comply with the requirements of the Iberdrola's Contractor Safety Requirements (latest edition). Iberdrola's Contractor Safety Requirements is a mandatory document that contains expectations and requirements applicable to all contractors, subcontractors, contracted services, and vendors. Iberdrola's Contractor Safety Requirements document is a binding and integral part of the Contract.

B. Coordination:
   1. When multiple contractors are working at the Site, the Remediation Contractor shall communicate to each other, subcontractors, the Owner, Remediation Engineer, and other entities working at the Site those elements of the Remediation Contractor's safety program with which such other entities are to comply.

1.02 TERMINOLOGY

A. The following words or terms are not defined but, when used in this Section, have the following meaning:
   1. "Confined spaces" are areas on or about the Site as defined in 29 CFR 1910.146(b), 29 CFR 1926.21(b)(6), and other Laws and Regulations. Confined spaces include, but are not limited to: storage tanks, process vessels, bins, boilers and similar spaces; ventilation or exhaust ducts and stacks; manholes, underground utility vaults and chambers, sewers, pipelines, tunnels; and open-topped spaces greater than four feet deep, such as pits, tubs, vaults, and vessels.
   2. "Entry permit" means the written or printed document provided by the employer of personnel entering permit-required confined space, to allow and control entry into permit-required confined space and that contains the information specified in 29 CFR 1926.146(f), and other Laws and Regulations.
   3. "Permit-required confined space" means confined space as defined in 29 CFR 1926.146(b) and other Laws and Regulations, and that has one or more of the following characteristics:
      a. Contains or has potential to contain a hazardous atmosphere.
      b. Contains material that has potential for engulfing an entrant.

c. Has internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or floors, or by floor that slopes downward and tapers to a smaller cross-section.
d. Contains other recognized serious safety or health hazard.

4. "Hot work permit" means the written authorization of employer of personnel entering a confined space to perform operations, such as riveting, welding, cutting, burning, and heating, capable of providing a source of ignition.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with Laws and Regulations related to protecting personnel working in or entering confined spaces, including:
1. Code of Federal Regulations (CFR), Title 29, Part 1910, Occupational Safety and Health Standards.
2. CFR, Title 29, Part 1926, Safety and Health Regulations for Construction.

B. Qualifications:
1. Remediation Contractor's Safety Representative shall meet the requirements in Section 01 35 29, Contractor's Health and Safety Plan.

1.04 SUBMITTALS

A. Informational Submittals: Submit the following:
1. Emergency contact information, in accordance with Article 1.07 of this Section.
2. Citations:
a. Copies of safety citations from authorities having jurisdiction and insurance companies, submitted within 24 hours of Remediation Contractor's receipt of such citations.
3. Work Permits, as needed:
a. Hot Work Permits
b. Digging/Excavation Permits
c. Confined Space Entry Permits

1.05 WORK REQUIREMENTS

A. Remediation Contractor shall implement a safe work policy on the Project and establish a goal of minimizing or eliminating hazards to personnel, process, equipment, environment, and the general public.

B. Confined space entry shall comply with 29 CFR 1910.146, 29 CFR Subpart AA.

1.06 SAFETY REPRESENTATIVE RESPONSIBILITIES

A. General:
1. Remediation Contractor's safety representative shall be at the Site full-time when Work is in progress. When Remediation Contractor employs multiple shifts, furnish more than one safety representative as necessary.
2. Remediation Contractor's safety representative shall have no other duties on the Project except those directly related to safety. Safety representative shall not be the Remediation

Contractor's project manager, field engineer, superintendent, or other supervisory personnel working on the Project.

3. Remediation Contractor's safety representative shall have appropriate space at the Site to maintain and keep available safety records, up-to-date copies of pertinent safety Laws and Regulations, Material Data Sheets, Remediation Contractor's site-specific health and safety plan (HASP), copies of the Owner's health and safety requirements with which Remediation Contractor shall comply, and the Site safety plan including information concerning foreseeable emergency conditions, and emergency contact information as required in Article 1.07 of this Section.

B. Remediation Contractor's safety representative's responsibilities include:
   1. Duties and responsibilities in accordance with the Contract Documents.
   2. Remediation Contractor's safety representative shall coordinate with Remediation Contractor's "competent person" required under Laws and Regulations.
   3. Remediation Contractor's safety representative shall attend pre-construction conference in accordance with Section 01 31 19.13, Pre-Construction Conference and progress meetings in accordance with Section 01 31 19.23, Progress Meetings.
   4. Schedule and conduct safety meetings and safety training programs as required by Laws and Regulations, Remediation Contractor's HASP, and good safety practices. Advise the Remediation Engineer prior to the time and place of such meetings. Invite the Owner's personnel to meetings. Instruct the Remediation Contractor's employees (and Subcontractors, Suppliers with personnel at the Site, and others for whom Remediation Contractor is responsible) on recognition of hazards; observance of precaution; contents of the Remediation Contractor's HASP and other safety programs with which employees shall comply; and use of personal protective equipment (PPE) and safety equipment.
   5. Determine that operators of specific construction equipment (and permanent equipment used for construction operations) are qualified by training and experience before such personnel are allowed to operate such equipment.
   6. Develop and implement emergency response procedures, including names, locations, and contact telephone numbers for emergency services and medical assistance as indicated in requirements for the emergency contact list in Article 1.07 of this Section.
   7. Post appropriate notices regarding health and safety Laws and Regulations at locations at the Site and Remediation Contractor's office that afford maximum exposure to personnel.
   8. Post appropriate instructions and warning signs in regard to all hazardous areas and hazardous conditions that cannot be eliminated. Identification of such areas shall be based on experience, site surveillance, and severity of the associated hazard. Signage shall not be used in place of appropriate workplace controls.
   9. Ascertain via personal inspection that safety Laws and Regulations and safety program requirements are enforced. Make inspections not less than once per work shift to ensure that machines, tools, and equipment are in a safe operating condition; and that all work areas are free of hazards to the extent practicable. Implement necessary and timely corrective actions to eliminate unsafe acts and unsafe conditions. Submit to Remediation Engineer daily copy of findings resulting from inspection using inspection checklist forms established in Remediation Contractor's HASP.
   10. Submit to the Remediation Engineer, copies of safety citations from authorities having jurisdiction and insurance companies within 24 hours of Remediation Contractor's receipt of such citations.
   11. Provide appropriate orientation to employees, visitors, Subcontractors, and Supplier personnel at the Site.

12. Perform all related tasks necessary to achieve the highest degree of safety that the nature of the Work allows.

1.07 EMERGENCY CONTACT INFORMATION

A. Remediation Contractor shall submit list of emergency contact information for 24-hour use throughout the Project. Emergency contact information shall be updated and kept current throughout the Project. If personnel or contact information change, furnish updated emergency contact information list at the next progress meeting.

B. Remediation Contractor's list of emergency contact information shall include:
   1. Remediation Contractor's project manager's office, field office, and cellular telephone numbers.
   2. Remediation Contractor's Site superintendent's office, field office, and cellular telephone numbers.
   3. Remediation Contractor's foreman's field office and cellular telephone numbers.
   4. Remediation Contractor's safety representative's office and cellular telephone numbers.
   5. Major Subcontractors' and Suppliers' office and cellular telephone numbers of project manager and foreman (when applicable).

C. Additional Emergency Contact Information:
   1. The Owner's project managers: office and cellular telephone numbers.
   2. Remediation Engineer's project manager's office and cellular telephone numbers.
   3. Remediation Engineer's project engineer's office and cellular telephone numbers.
   4. Remediation Engineer's onsite representative's field office and cellular telephone numbers.
   5. Utility companies' 24-hour contact telephone number(s), including gas, water, sewer, oil, telephone, cable television/telecommunications, and other companies or concerns having utilities in the vicinity of the Work.
   6. Highway and street owners' 24-hour telephone number(s).
   7. Emergency telephone numbers, including: "Emergency: Dial 911", and seven-digit telephone numbers for the hospital, ambulance, police, and fire department nearest to the Site. Furnish names of each of these institutions.
   8. Other involved entities as applicable.

D. Include with list of emergency contact information an 8.5-inch by 11-inch map showing route from the Site to the nearest hospital.

1.08 SAFETY EQUIPMENT

A. General:
   1. Remediation Contractor shall provide proper safety and rescue equipment, adequately maintained and readily available, for any foreseeable contingency.
   2. Such equipment shall include, at a minimum, items such as fire extinguishers and first-aid equipment in accordance with Section 01 52 16, First-Aid Facilities. If confined space or elevated work is anticipated, such equipment shall also include safety ropes and harnesses, fall-prevention devices, stretchers, water safety devices, oxygen breathing apparatus, resuscitators, gas detectors, oxygen deficiency indicators, combustible gas detectors, fire extinguishers and first-aid equipment, and similar equipment.

3. Keep safety equipment in protected areas. Check safety equipment at scheduled intervals.
4. Temporary First-Aid Facilities: Provide and maintain in accordance with Section 01 52 16, First-Aid Facilities.

B. Safety Equipment Log:
   1. Maintain a log indicating the person who checked the equipment, when equipment was checked, and that equipment was acceptable.
   2. Update equipment log not less-often than monthly.
   3. Include in safety representative's onsite records copies of equipment calibration records.

C. Provide replacement safety equipment when primary safety equipment is unavailable due to use or when undergoing maintenance.

D. PPE:
   1. All persons entering the work areas shall wear appropriate PPE required for that particular area.
   2. Remove from the Site any person failing to comply with this or any other safety requirement.
   3. At a minimum, Remediation Engineer will furnish for Remediation Engineer's employees and consultant's protective helmets (hard hats), safety eyewear, reflective clothing, appropriate footwear, and hearing protection.
   4. Remediation Contractor shall furnish other/specialty equipment required, if any.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

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SECTION 01 35 29

CONTRACTOR'S HEALTH AND SAFETY PLAN

PART 1 – GENERAL

1.01 DESCRIPTION

A. The Remediation Contractor shall comply with all applicable laws, ordinances, rules, regulations, and orders for public bodies having jurisdiction for the safety of persons or property or to protect or to protect them from damage, injury, or loss, including, without limitation, the Department of Labor Safety and Health Regulations for Construction promulgated under the Occupational Safety and Health Administration (OSHA) of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54) and amendments thereto. The Remediation Contractor shall comply with the requirements set forth under 29 CFR 1910 and 29 CFR 1926. The Remediation Contractor shall comply with all applicable recommendations of the Manual of Accident Prevention in Construction of the Associated General Contractors of America

B. Scope:
   1. Remediation Contractor shall prepare and maintain a written, site-specific Health and Safety Plan (HASP), and conduct all construction activities in a safe manner that avoids:
      a. Injuries to employees, Subcontractors, and other persons with an interest at or near the Site.
      b. Employee exposures to health hazards above occupational limits established respectively by OSHA, American Conference of Governmental Industrial Hygienists (ACGIH), and Nuclear Regulatory Commission (NRC), as applicable.
      c. Exposure of the public and Owner's employees to air contaminants above levels established for public exposure by United States Environmental Protection Agency (USEPA), NRC, New York State Department of Environmental Conservation (NYSDEC), New York State Department of Health (NYSDOH), and other authorities having jurisdiction at the Site.
      d. Significant increases in concentrations of contaminants in soil, water, or sediment near the Site.
      e. Violations of the Occupational Safety and Health Act, or other Laws or Regulations.

1.02 QUALITY ASSURANCE

A. Qualifications:
   1. HASP Preparer:
      a. Engage a certified industrial hygienist, accredited by the American Board of Industrial Hygiene, or safety professional certified by the Board of Certified Safety Professionals, to prepare or supervise preparation of the Remediation Contractor's HASP.
   2. Site Health and Safety Officer (SHSO):
      a. Engage a certified industrial hygienist, accredited by the American Board of Industrial Hygiene, or safety professional certified by the Board of Certified Safety Professionals, to manage, oversee, and enforce the Remediation Contractor's health and safety program at the Site, and ensure compliance with Remediation Contractor's HASP and applicable Laws and Regulations during the Project. Remediation Contractor's safety representative shall have a minimum of five years

direct construction safety experience and appropriate training to supervise Hazardous Waste operations and emergency response (HAZWOPER) activities.

b. Remediation Contractor's safety representative shall be present at the Site at all times when Work is being performed and shall be dedicated solely to the supervision of the Remediation Contractor's health and safety program.

c. Responsibilities include, but are not necessarily limited to, the following:
   1) Supervising the implementation of Remediation Contractor's HASP.
   2) Providing health and safety orientation training to the Remediation Contractor's employees, Subcontractors, and Site visitors.
   3) Attending pre-construction conference, progress meetings, and other Project meetings, as required.
   4) Preparing and maintaining health and safety records and statistics.
   5) Leading and documenting daily job safety briefings.
   6) Preparing and submitting incident reports in accordance with Article 1.05 of this Section.
   7) Leading incident investigations on the Remediation Contractor's behalf.
   8) Preparing and submitting daily health and safety field reports in accordance with Article 1.06 of this Section.

B. Regulatory Requirements:
   1. Laws and Regulations applying to the Work under this Section include, but are not limited to, the following:
      a. 29 CFR 1904, Recording and Reporting Occupational Injuries and Illnesses.
      b. 29 CFR 1910, Occupational Safety and Health Standards.
      c. 29 CFR 1926, Safety and Health Regulations for Construction.
      d. 40 CFR 261.3, 264, and 265, Resource Conservation and Recovery Act (RCRA).
      e. 49 CFR 171.8, Transportation, Definitions and Abbreviations.
      f. 6 NYCRR 371, Identification and Listing of Hazardous Wastes.
      g. 6 NYCRR 375, Environmental Remediation Programs.
      h. 12 NYCRR 23, Protection in Construction, Demolition, and Excavation Operations.
      i. 12 NYCRR 57, High Voltage Proximity.
      j. 12 NYCRR 59, Workplace Safety and Loss Prevention Program.
      k. 12 NYCRR 61, Occupational Licensing and Certification.
      l. 16 NYCRR 753, Protection of Underground Facilities.
      m. 17 NYCRR 32, Oil Spill Prevention and Control – Actions to be Taken in Case of Discharge.

1.03 SUBMITTALS

A. Informational Submittals:
   1. Remediation Contractor's HASP: Submit in accordance with Article 1.04 of this Section.
   2. Qualifications Statements:
      a. HASP Preparer: Submit name and qualifications of certified industrial hygienist or safety professional, including summary of experience and copy of valid certifications.
      b. SHSO: Submit name and qualifications of safety representative, including summary of experience, training received, and copy of valid certifications applicable to the Project.
   3. Reports:
      a. Incident Reports: Submit in accordance with Article 1.05 of this Section.
      b. Daily Health and Safety Field Reports: Submit in accordance with Article 1.06 of this Section.

4. Submit in accordance with Article 1.07 of this Section, the following valid training certificates:
    a. Initial 40-hour HAZWOPER training.
    b. Initial 24-hour HAZWOPER training.
    c. Eight-hour HAZWOPER supervisor training.
    d. Annual eight-hour HAZWOPER refresher training.

1.04 HASP SUBMITTAL

A. General:
1. Each employer working at the Site shall develop and implement a written HASP for its employees involved in Hazardous Waste operations. HASP shall include procedures that will be used to ensure the safe handling of Hazardous Waste during excavating, loading, and transporting activities.
2. Comply with 29 CFR 1904, 29 CFR 1910, 29 CFR 1926, 12 NYCRR 23, 12 NYCRR 56, 12 NYCRR 57, 12 NYCRR 59, 12 NYCRR 61, 17 NYCRR 32, and other Laws and Regulations.
3. Include in HASP requirements for complying with Owner's health and safety requirements and Site-specific hazard/emergency response plans, if any.
4. HASP shall be kept at the Site, shall address safety and health hazards of each phase of operations at the Site, and shall include requirements and procedures for employee protection.

B. HASP Contents: HASP shall address and include the following:
1. Organizational Structure:
    a. Specific chain of command and overall responsibilities of supervisors and employees. Include the following:
        1) Designation of general supervisor who has responsibility and authority to direct all Hazardous Waste operations.
        2) Name of Remediation Contractor's SHSO who has responsibility and authority to implement and modify the HASP and verify compliance.
        3) Other personnel required for Hazardous Waste operations at the Site and emergency response, and general functions and responsibilities of each.
        4) Lines of authority, responsibility, and communication.
    b. Review and update organizational structure as necessary to reflect current status of Site operations and personnel.
2. Site description, background, and scope of Work.
3. Safety and health risk or hazard analysis, and planned hazard controls, for each task and operation required to complete the Project, including tasks to be performed adjacent to or on the water.
4. Site control measures, including:
    a. Preventing trespassing.
    b. Preventing unqualified or unprotected workers from entering restricted areas.
    c. Preventing the "tracking" of contaminants out of the Site.
    d. Maintaining a log of employees at the Site and visitors to the Site.
    e. Delineating exclusion, contamination reduction, and support zones.
    f. Locating personnel and equipment decontamination zones.
    g. Communicating routes of escape and gathering points.
5. Training Program:
    a. Initial training requirements for Site workers and supervisors.
    b. Exceptions to initial training requirements.
    c. Site briefings for visitors and workers.
    d. Refresher training requirements.

e. Certification of training for all Remediation Contractor and Subcontractor employees assigned to the Project.

6. Medical Surveillance Program:
   a. Provisions of the Site medical surveillance program.
   b. Communication protocols between the Site, physicians, and workers.
   c. Medical recordkeeping procedures.
   d. Certification of medical clearance for all Contractor and Subcontractor employees assigned to the Project.
7. Personal Protective Equipment (PPE):
   a. PPE selection criteria.
   b. Site- and task-specific PPE ensembles, including U.S. Coast Guard-approved (Type I or II) personal floatation device for when working in close proximity to fast-flowing water deeper than four feet.
   c. Training in the use of PPE.
   d. Respiratory protection.
   e. Hearing conservation.
   f. PPE maintenance and storage.
8. Exposure Monitoring Program:
   a. Monitoring procedures to detect the presence of hazardous substances.
   b. Monitoring procedures to determine worker exposures to hazardous substances and physical hazards.
   c. Action levels and required responses for known and expected hazardous substances and physical hazards.
   d. Calibration and maintenance procedures for monitoring equipment.
9. Heat stress prevention program.
10. Spill containment program. Comply with Section 01 35 43.13, Environmental Procedures for Hazardous Materials.
11. Decontamination Program:
    a. Location and type of temporary decontamination facilities.
    b. General and specific decontamination procedures for personnel and PPE.
    c. General and specific decontamination procedures for equipment and vehicles.
    d. Disposal of residual waste from decontamination.
    e. Decontamination equipment and materials.
    f. Monitoring procedures used to evaluate the effectiveness of decontamination.
12. Emergency Response Plan:
    a. Potential emergencies that may occur at the Site.
    b. Pre-emergency planning.
    c. On-site emergency response equipment, materials, and PPE.
    d. Emergency Maps: Evacuation routes, gathering points, and route to nearest hospital.
    e. Emergency roles and responsibilities.
    f. Emergency alerting and evacuation procedures for Site personnel.
    g. Procedures for notifying, and list of emergency contact information for:
       1) Emergency responders, including fire officials, ambulance service, poison control, police, and local hospitals.
       2) Authorities having jurisdiction.
       3) Owner and Remediation Engineer.
       4) Remediation Contractor’s project manager, Site superintendent, SHSO, and foreman.
       5) Other entities, as required.
    h. Emergency response procedures.
    i. Emergency decontamination, medical treatment, and first-aid.
    j. Emergency response training.
13. Other standard operating procedures applicable to the Work.

C. Submittal Procedure:
   1. Submit HASP to the Remediation Engineer the sooner of seven days prior to pre-construction conference, or 30 days prior to the Remediation Contractor's scheduled mobilization to the Site.
   2. Remediation Engineer's review and acceptance of HASP will be only to determine if the topics covered in HASP comply with the Contract Documents. Remediation Engineer's review and acceptance will not extend to safety measures, means, methods, techniques, procedures of construction, or whether representations made in the HASP comply with Laws and Regulations, or standards of good practice.
   3. Do not perform Work at the Site until written HASP has been accepted by the Remediation Engineer.
   4. Notwithstanding other provisions of the Contract Documents, changes in the Contract Price or Contract Times will not be authorized due to delay by the Remediation Contractor in developing, submitting, or revising the HASP.

1.05 INCIDENT REPORTING AND INVESTIGATION

A. Immediately notify Owner and Remediation Engineer of all incidents that:
   1. Result in bodily injury, illness, or property damage.
   2. Affect the environment.
   3. Involve the public.

B. Submit NYSEG's Incident and Accident Report to the Owner and the Remediation Engineer in accordance with Iberdrola's Contractor Safety Requirements (latest edition).

C. Submit incident report to the Owner and the Remediation Engineer within 24 hours after incident occurs. Include in each report the following:
   1. Date, time, and location of incident.
   2. Names of all Site personnel involved in or affected by incident.
   3. Description of incident and activities being performed when incident occurred.
   4. Medical treatment administered, if any.
   5. Nature and seriousness of injury or damage.

D. Comply with 29 CFR 1904.29, including using OSHA 300, 300-A, and 301 forms (or equivalent) to document all incidents that result in bodily injury.

E. Based upon results of incident investigation, modify HASP as required by changing tasks or procedures to prevent reoccurrence of accident.

F. Post current copy of Remediation Contractor's OSHA 300-A report at conspicuous place at the Site from February 1 through April 30 of each year.

1.06 DAILY HEALTH AND SAFETY FIELD REPORTS

A. Prepare daily health and safety field reports throughout the Project. Include in each report, at a minimum, the following:
   1. Remediation Contractor's name.
   2. Owner's name.
   3. Project name.
   4. Site name and location.
   5. Date and day of the week.
   6. Weather conditions.
   7. Delays encountered in construction.

8. Acknowledgment of deficiencies noted along with corrective actions taken on current and previous deficiencies.
9. Daily health and safety exposure monitoring results, documentation of instrument calibration, new hazards encountered, and PPE utilized.
10. Problems, real or anticipated, encountered during the Work that should be brought to the attention of the Owner, the Remediation Contractor's SHSO, and the Remediation Engineer.
11. Deviations from planned Work described in previously submitted daily health and safety field report(s).

B. Submit daily health and safety field reports to the Remediation Engineer by 10:00 a.m. the next working day after the day covered in the associated report. Daily reports shall be signed by the Remediation Contractor's safety representative.

1.07 RECORDS

A. Retain at the Site complete and accurate health and safety records for all Remediation Contractor and Subcontractor employees assigned to the Project. Records shall include, at a minimum, the following:
   1. Valid Training Certificates:
      a. Initial 40-hour HAZWOPER training.
      b. Initial 24-hour HAZWOPER training.
      c. Eight-hour HAZWOPER supervisor training.
      d. Annual eight-hour HAZWOPER refresher training.
      e. 10-hour construction safety training.
      f. First-aid/cardiopulmonary resuscitation training.
      g. Other training required by Remediation Contractor's HASP.
   2. Valid medical clearance certificates.
   3. Valid respirator fit test certificates.
   4. Incident reports prepared in accordance with Article 1.05 of this Section.
   5. Daily health and safety field reports prepared in accordance with Article 1.06 of this Section.
   6. Other records required by Laws and Regulations.

B. Keep records up to date throughout the Project.

C. Remediation Contractor's SHSO shall meet at least monthly with the Owner and the Remediation Engineer to review the Remediation Contractor's health and safety records and verify compliance with this Section.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 35 43.13

ENVIRONMENTAL PROCEDURES FOR HAZARDOUS MATERIALS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall develop, implement, and maintain a Hazardous Materials Management Program (HMMP) throughout the Project, in accordance with Laws and Regulations.
      a. Hazardous Materials Brought to Site by the Remediation Contractor: Transport, handle, store, label, use, and dispose of in accordance with this Section, and Laws and Regulations.
      b. Hazardous Material Generated by the Remediation Contractor:
         1) Hazardous Material shall be properly handled, stored, labeled, transported, and disposed of by Remediation Contractor in accordance with Laws and Regulations, and this Section.
         2) If Remediation Contractor will generate or has generated Hazardous Material at the Site, obtain Owner's United States Environmental Protection Agency (USEPA) identification number listing Owner's name and address of the Site as generator of the Hazardous Material.
         3) Remediation Contractor shall be responsible for identifying, characterizing, profiling, transporting, and disposing of Hazardous Material generated by Remediation Contractor.
      c. Fines or civil penalties levied against Owner for violations committed at the Site by Remediation Contractor, and costs to Owner (if any) associated with cleanup of Hazardous Materials shall be paid by Remediation Contractor.

B. Enforcement of Laws and Regulations:
   1. Interests of Owner are that accidental spills and emissions, Site contamination, and injury of personnel at the Site are avoided.
   2. When Owner is aware of suspected violations, Owner will notify Remediation Contractor, and authorities having jurisdiction if Owner reasonably concludes that doing so is required by Laws or Regulations.

1.02 DEFINITIONS

A. The following terms are defined for this Section and supplement the terms defined in the General Conditions:
   1. Hazardous Material: Material, whether solid, semi-solid, liquid, or gas, that, if not stored or used properly, may cause harm or injury to persons through inhalation, ingestion, absorption or injection, or that may negatively impact the environment through use or discharge of the material on the ground, in water (including groundwater), or to the air. Hazardous Material includes, but is not limited to, chemicals, Asbestos, Hazardous Waste, polychlorinated biphenyls (PCBs), Petroleum, Radioactive Material, and which is or becomes listed, regulated, or addressed pursuant to the following:
      a. Comprehensive Environmental Response, Compensation, and Liability Act, 42 United States Code (USC) §§9601 et seq. ("CERCLA").
      b. Hazardous Materials Transportation Act, 49 USC §§1801 et seq.
      c. Resource Conservation and Recovery Act, 42 USC §§6901 et seq. ("RCRA").

d. Toxic Substances Control Act, 15 USC §§2601 et seq.
e. Clean Water Act, 33 USC §§1251 et seq.
f. Clean Air Act, 42 USC §§7401 et seq.
g. Any other Law or Regulation regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Laws and Regulations applying to the Work under this Section include, but are not limited to, the following:
a. 29 CFR 1910, Occupational Safety and Health Standards.
b. 29 CFR 1926, Safety and Health Regulations for Construction.
c. 40 CFR 261.3, 264, and 265, Resource Conservation and Recovery Act (RCRA).
d. 49 CFR 171.8, Transportation, Definitions and Abbreviations.
e. 6 NYCRR 364, Waste Transporter Permits.
f. 6 NYCRR 371, Identification and Listing of Hazardous Wastes.
g. 6 NYCRR 372, Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities.
h. 6 NYCRR 375, Environmental Remediation Programs.
i. 17 NYCRR 32, Oil Spill Prevention and Control – Actions to be Taken in Case of Discharge.

1.04 SUBMITTALS

A. Informational Submittals:
1. Hazardous Materials (including Chemicals) Proposed for Use at the Site: Submit current (dated within the past two years) safety data sheets (SDSs) in accordance with 29 CFR 1910.1200 (OSHA Hazard Communication Standard), manufacturer, Supplier (if different than manufacturer), container size(s) and number of containers proposed to be at the Site, minimum and maximum volume of material intended to be stored at the Site, and description of process or procedures in which Hazardous Material will be used. Furnish information in sufficient time to obtain Remediation Engineer's acceptance no later than at least three days before bringing Hazardous Material to the Site.
2. Hazardous Material Generated at the Site: Submit for each Hazardous Material generated at the Site identification number, analysis results, and number and size of storage containers at the Site. Furnish information not less than three days after Remediation Contractor's receipt of analytical results.
3. Permits: Submit copies of permits for storing, handling, using, transporting, and disposing of Hazardous Materials, obtained from authorities having jurisdiction.
4. Other Documents required for the HMMP: Submit requested documents within three days of Remediation Contractor's receipt of request. HMMP documents may include communication plan, emergency/spill response plan, and other documents.

1.05 HAZARDOUS MATERIALS MANAGEMENT

A. Obtain Owner's acceptance before bringing each Hazardous Material to the Site.

B. Communication Plan: Remediation Contractor shall develop a Hazardous Materials communication plan. At a minimum, maintain at the Site two notebooks containing the following:
1. Inventory of Hazardous Materials, including all chemicals.

2. Current (dated within the past two years) SDSs for all materials being used to accomplish the Work, whether or not defined as Hazardous Material in this Section. Keep one notebook in Remediation Contractor's field office at the Site; keep second notebook at location acceptable to Owner and Remediation Engineer. Keep notebooks up to date as materials are brought to and removed from the Site.

C. Emergency/Spill Response Plan: Develop, implement, and maintain an emergency/spill response plan, for each Hazardous Material or each class/group of Hazardous Materials as applicable. Response plan shall include, at a minimum, the following:
   1. Description of equipment and materials available at the Site to contain a spill of, or respond to an emergency related to, the material.
   2. Procedures for notifying, and list of emergency contact information for:
      a. Authorities having jurisdiction.
      b. Emergency responders.
      c. Remediation Contractor's project manager, Site superintendent, site health and safety officer (SHSO), and foreman.
      d. Owner and Remediation Engineer.
      e. Other entities as required.
   3. Response coordination procedures between Remediation Contractor, Owner, Remediation Engineer, and others as appropriate.
   4. Site plan showing proposed location of Hazardous Materials storage area, location of spill containment/response equipment and materials, and location of storm water drainage inlets and drainage routes.
   5. Description of Hazardous Material handling and spill response training provided to Remediation Contractor's and Subcontractors' employees, in accordance with 29 CFR 1926.21(b) and other Laws and Regulations.

D. Storage of Hazardous Materials and Non-Hazardous Materials:
   1. Hazardous Materials containers shall bear applicable hazard diamond(s).
   2. Container Labeling:
      a. Properly label each container of consumable materials, whether or not classified as Hazardous Materials under this Section.
      b. Stencil Remediation Contractor's name and, as applicable, Subcontractor's name, on each vessel containing Hazardous Material and, for non-Hazardous Materials, on each container over five-gallon capacity. Containers shall bear securely attached label clearly identifying contents. Label containers that are filled from larger containers.
      c. If Owner or Remediation Engineer becomes aware of unlabeled containers at the Site, Owner will notify Remediation Contractor. Properly label container(s) within one hour of receipt of notification or remove container from the Site.
   3. To greatest extent possible, store Hazardous Materials off-site until required for use in the Work.

E. Hazardous Materials Storage Area:
   1. Maintain designated storage area for Hazardous Materials that includes secondary containment. Storage area shall include barriers to prevent vehicles from colliding with storage containers and shall include protection from environmental factors such as weather.
   2. Provide signage in accordance with Laws and Regulations, clearly identifying the Hazardous Materials storage area.

F. Remediation Contractor's SHSO shall meet at least monthly with Owner, Remediation Contractor's project manager, and Remediation Engineer to review Remediation Contractor's HMMP documents and procedures, and inspect storage areas and the Site in general, to verify compliance with this Section.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 35 49

COMMUNITY AIR MONITORING PLAN

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Engineer shall provide all labor, materials, equipment, services, and incidentals as specified and required to perform community air monitoring on a continuous basis during all ground-intrusive Work or dust-generating Work, as required by the Project's Community Air Monitoring Plan (CAMP). The CAMP is part of the Contract Documents. Community air monitoring includes:
      a. Real-time air monitoring for total volatile organic compounds (TVOCs) and particulate matter less than 10 micrometers in diameter (PM_{10}).
      b. Periodic monitoring for manufactured gas plant (MGP)-related odors.
   2. Remediation Contractor shall provide all labor, materials, equipment, services, and incidentals as specified and required to implement any required response actions to air monitoring exceedance(s), if necessary, in accordance with the Project's CAMP.

B. Coordination:
   1. Coordinate requirements of this Section with requirements for odor, vapor, and dust control in the Contract Documents.

1.02 TERMINOLOGY

A. The following words or terms are not defined but, when used in this Section, have the following meaning:
   1. "Dust-generating Work" means any Work with the potential to generate dust. Examples of dust-generating Work include, but are not limited to, the following:
      a. Handling removed material and fill material.
      b. Intrusive Work.
   2. "Intrusive Work" means any Work performed below the existing level of the ground or sediment surface, or that involves the disturbance of existing earth, regardless of quantity. Examples of ground-intrusive Work include, but are not limited to, the following:
      a. Installation of erosion and sediment controls and other site preparation activities.
      b. Installation of river bypass system.
      c. Material removal and handling.
      d. Backfilling and grading.
      e. Site restoration.
   3. "Perimeter of work area" means the limits of exclusion zone.
   4. "Work area" means any area where ground-intrusive Work or dust-generating Work is being performed.

1.03 QUALITY ASSURANCE

A. Qualifications:
   1. Air Monitoring Technician:
      a. Remediation Engineer's air monitoring technician shall have a minimum of three years direct construction safety or environmental monitoring experience, and appropriate health and safety training in accordance with Laws and Regulations.

b. Remediation Engineer's air monitoring technician shall be present at the Site at all times when dust-generating or intrusive Work is being performed and shall be dedicated solely to the implementation of the CAMP.
c. Responsibilities include, but are not necessarily limited to, the following:
    1) Installing the meteorological monitoring system.
    2) Selecting upwind and downwind monitoring locations and setting up air monitoring stations on a daily basis.
    3) Calibrating air monitoring equipment on a daily basis, or other frequency recommended by the manufacturer.
    4) Coordinating equipment maintenance and repairs.
    5) Monitoring meteorological conditions throughout the workday and relocating air monitoring stations as necessary and appropriate.
    6) Performing routine inspections of air monitoring stations to verify proper function.
    7) Performing periodic perimeter checks of the work area to monitor for MGP-related odors.
    8) Removing air monitoring stations and downloading TVOC and PM_{10} data from monitoring equipment at the end of each workday.
    9) Managing a database of TVOC, PM_{10}, and meteorological data at the Site and documenting the general site activities ongoing each day during monitoring.
    10) Attending progress meetings and other Project meetings, as required.
    11) Preparing and submitting daily air monitoring reports in accordance with Article 1.05 of this Section.
    12) Preparing and submitting exceedance reports in accordance with Article 1.06 of this Section.
    13) Preparing and submitting daily odor monitoring logs in accordance with Article 1.07 of this Section.
    14) Notifying the Owner and Remediation Contractor personnel when alert or action levels are exceeded at downwind monitoring locations, and when MGP-related odors are noted at the perimeter of the work area.

B. Regulatory Requirements:
    1. Comply with applicable provisions and recommendations of the New York State Department of Environmental Conservation (NYSDEC) Technical Guidance for Site Investigation and Remediation (DER-10).

1.04 SUBMITTALS

A. Informational Submittals:
    1. Reports:
        a. Daily Air Monitoring Reports: Remediation Engineer shall submit in accordance with Article 1.05 of this Section, or at a reduced frequency if requested by the Owner.
        b. Exceedance Reports: Remediation Engineer shall submit in accordance with Article 1.06 of this Section.
    2. Submit community air monitoring and weather data in accordance with Article 1.08 of this Section.

1.05 DAILY AIR MONITORING REPORTS

A. Prepare daily air monitoring reports throughout the Project. Include in each report, at a minimum, the following:
    1. Remediation Contractor's name.
    2. Owner's name.
    3. Remediation Engineer's name.
    4. Project name.

5. Site name and location.
6. The following for each day that community air monitoring is performed:
   a. Date and day of the week.
   b. General location and brief description of work performed at the Site.
   c. Daily average concentration of TVOCs and PM_{10} for each air monitoring station.
   d. Daily maximum 15-minute time-weighted average (TWA) concentration of TVOCs and PM_{10} for each air monitoring station.
   e. Exceedances (if any) of the alert or action levels specified in Paragraph 3.01.B and 3.01.C of this Section. Provide the following:
      1) Time, location, and 15-minute TWA concentration (above background) of exceedance.
      2) Copy of action level exceedance report (if any), prepared in accordance with Article 1.06 of this Section.
   f. Site plan showing approximate locations of upwind and downwind air monitoring stations at the Site and predominant wind direction for the day. Note if air monitoring stations were relocated during the day.
   g. Copy of daily odor monitoring log, prepared in accordance with Article 1.07 of this Section.

B. Remediation Engineer will distribute daily air monitoring reports within three business days after the day covered in the associated report to:
   1. Owner.
   2. Remediation Contractor.
   3. NYSDEC.
   4. New York State Department of Health (NYSDOH).
   5. Others as appropriate.

1.06 ACTION LEVEL EXCEEDANCE REPORTS

A. Prepare an exceedance report whenever the action levels specified in Paragraph 3.01.C of this Section are exceeded. Include in each report the following:
   1. Remediation Contractor's name.
   2. Owner's name.
   3. Remediation Engineer's name.
   4. Project name.
   5. Site name and location.
   6. Date, day of the week, and time of exceedance.
   7. General location and brief description of work being performed at time of exceedance.
   8. Weather conditions at time of exceedance.
   9. For each air monitoring station, 15-minute TWA concentration of TVOCs and PM_{10} at time of exceedance.
   10. Source or cause of exceedance, if known.
   11. Corrective actions taken or to be taken in response to exceedance.
   12. Date and time verbal and/or written notification was provided to NYSDEC.

B. Submit exceedance reports. Remediation Engineer will distribute exceedance reports within 24 hours after exceedance to:
   1. Owner.
   2. Remediation Contractor.
   3. NYSDEC.
   4. NYSDOH.
   5. Others as appropriate.

1.07 DAILY ODOR MONITORING LOG

A. Prepare daily odor monitoring logs throughout the Project. Include in each daily log, at a minimum, the following:
   1. Remediation Contractor's name.
   2. Owner's name.
   3. Project name.
   4. Site name and location.
   5. Date and day of the week.
   6. Weather conditions.
   7. Time and outcome of each perimeter check.
      a. Note the presence or absence of MGP-related odors at the perimeter of the work area.
      b. Identify the general location(s) along the work area perimeter where MGP-related odors are noticed.
   8. Time and outcome of any odor complaints from the public.

B. Submit daily odor monitoring logs in daily air monitoring report submittal in accordance with Article 1.05 of this Section.

1.08 DATA MANAGEMENT

A. Maintain a database of TVOC, PM_{10}, and meteorological data files at the Site.
   1. Index TVOC and PM_{10} data files by date, station number, station location (upwind or downwind), and data type (TVOC or PM_{10}).
   2. Index meteorological data files by date.

B. Back up data files to disc or portable hard drive on a weekly or more frequent basis.

C. Submit TVOC, PM_{10}, and meteorological data files on a monthly basis throughout the Project. Label each disc with the following information:
   a. Dates covered.
   b. Owner's name.
   c. Project name.
   d. Site name and location.

PART 2 – PRODUCTS

2.01 PERIMETER AIR MONITORING SYSTEM

A. System Description:
   1. Provide complete, integrated perimeter air monitoring system consisting of the following:
      a. A minimum of Four portable air monitoring stations, each capable of measuring real-time ambient air concentrations of TVOCs and PM_{10}, logging air monitoring data, and alerting Site personnel if alert levels or action levels are exceeded. Additional air monitoring stations may be required as construction progresses.
      b. One portable meteorological monitoring system capable of measuring wind speed, wind direction, relative humidity, dry bulb temperature, and barometric pressure, and displaying and logging weather data.

B. Air Monitoring Stations:
   1. Photoionization Detectors: Direct-reading, data-logging photoionization detector with 10.6 eV lamp. Provide one of the following for each air monitoring station:

a. MiniRAE 3000 by RAE Systems.
b. Or equal.

2. Aerosol Photometers: Direct-reading, data-logging aerosol monitor. Provide one of the following for each air monitoring station:
   a. DustTrak II Aerosol Monitor Model 8530 by TSI, Inc.
   b. Or equal.
3. Telemetry Package: Netronix Thiamis Telemetry Modem (or equivalent) and appurtenances.
4. Spare Equipment: Provide and retain at the Site, or make available within 24 hours, the following:
   a. Spare photoionization detectors and aerosol photometers to allow for uninterrupted monitoring in the event of equipment damage or malfunction.
   b. Spare batteries for each photoionization detector and aerosol photometer to allow for continuous real-time monitoring and data-logging for a period of not less than 12 hours.
5. Environmental Enclosures and Mounting Tripods: Provide portable, weather-tight enclosure and compatible mounting (survey) tripod for each air monitoring station. Environmental enclosures shall provide proper operating conditions for photoionization detectors and aerosol photometers.
6. Alarms and Wireless Alert System: Provide for each air monitoring station audible and visible alarms and wireless alert system capable of alerting air monitoring technician in real-time (via handheld radio, cell phone, etc.) if alert or action levels are exceeded.
7. Accessories: Provide equipment calibration kits, sampling inlets, data management software, and other accessories recommended by the equipment manufacturers for the intended application.

C. Meteorological Monitoring System:
1. Product and Manufacturer: Provide one of the following:
   a. Wireless Vantage Pro2 by Davis Instruments.
   b. Or equal.
2. Telemetry Package: Netronix Thiamis Telemetry Modem (or equivalent) and appurtenances
3. Accessories: Provide the following:
   a. WeatherLink data logger and software suite by Davis Instruments.
   b. Mounting Pole Kit by Davis Instruments.
   c. Other accessories recommended by equipment manufacturer for the intended application.

PART 3 – EXECUTION

3.01 REAL-TIME AIR MONITORING FOR TVOCS AND PM10

A. Air Monitoring Stations:
1. Installation:
   a. Deploy air monitoring stations at the start of each workday before any ground-intrusive Work or dust-generating Work is initiated.
      1) Position one air monitoring station at the upwind perimeter of the work area and three air monitoring stations at the downwind perimeter of the work area. Determine and designate upwind and downwind air monitoring stations based on predominant wind direction, and nature and location of Work to be performed.
      2) Set alarm levels on real-time TVOC and PM_{10} monitoring equipment to respond to 15-minute TWA concentrations at or below the action levels specified in Paragraph 3.01.C of this Section.

3) Ensure that community air monitoring is being performed before initiating ground-intrusive Work or dust-generating Work.

b. Monitor wind direction throughout the day per Article 3.02 and adjust locations of air monitoring stations if wind direction shifts more than 60 degrees from original upwind direction. Document original upwind and downwind air monitoring stations, and any changes made to monitoring locations during the day.

2. Protection:
   a. Protect air monitoring stations from damage due to construction operations, weather, and vandalism.
   b. Immediately remove from service, and replace at Remediation Engineer's expense, damaged equipment.
3. Removal:
   a. Remove air monitoring stations at the end of each workday, and only after all ground-intrusive Work or dust-generating Work has been completed for the day.
   b. Download TVOC and PM_{10} data from air monitoring stations at the end of each day.

B. Alert Levels and Response:
1. Alert Levels:
   a. TVOCs: 15-minute TWA concentration at downwind air monitoring station of 2.5 parts per million (ppm) above background (upwind) 15-minute TWA concentration.
   b. PM_{10}: 15-minute TWA concentration at any one (or more) downwind air monitoring station of 100 micrograms per cubic meter ($\mu g/m^3$) above average background (upwind) 15-minute TWA concentration, or visible dust observed leaving the work area.
2. Response: Implement the following if alert levels are exceeded:
   a. Notify Remediation Contractor.
   b. Identify potential source(s) of the exceedance.
   c. Remediation Contractor shall continue Work and employ additional odor, vapor, and/or dust controls (depending on the reason for the alert) to abate emissions in accordance with Section 01 57 05, Temporary Controls.
   d. Evaluate and, if necessary and appropriate, modify construction techniques.

C. Action Levels and Response:
1. Action Levels:
   a. TVOCs: 15-minute TWA concentration at downwind air monitoring station of 5 ppm above background (upwind) 15-minute TWA concentration.
   b. PM_{10}: 15-minute TWA concentration at downwind air monitoring station of 150 $\mu g/m^3$ above background (upwind) 15-minute TWA concentration, or visible dust observed leaving the work area.
2. Response: Implement the following if action levels are exceeded:
   a. Remediation Contractor shall stop all Work and Remediation Engineer shall immediately notify Owner. Owner or Remediation Engineer will notify the NYSDEC project manager by telephone or e-mail within two hours after the exceedance.
   b. Remediation Engineer shall continue monitoring and Remediation Contractor shall employ additional odor, vapor, and dust controls to abate emissions in accordance with Section 01 57 05, Temporary Controls.
   c. Identify the source or cause of the exceedance.
   d. Remediation Contractor shall evaluate and, if necessary and appropriate, modify construction techniques.
   e. Remediation Engineer shall prepare exceedance report in accordance with Article 1.06 of this Section.

f. Work shall not resume until 15-minute TWA concentrations are below the action levels. If the 15-minute TWA concentration of TVOCs exceeds 25 ppm above the background (upwind) 15-minute TWA concentration, work shall not resume until authorized by Owner.

3.02 METEOROLOGICAL MONITORING

A. During work hours, monitoring meteorological conditions throughout the day and relocate air monitoring stations as necessary and appropriate per Article 3.01-A of this Section.

3.03 PERIODIC MONITORING FOR MGP-RELATED ODORS

A. Perimeter Checks:
   1. During work hours, perform periodic walks around the entire perimeter of the work area to monitor for MGP-related odors.
   2. Document the time and outcome of each perimeter check in daily odor monitoring log in accordance with Article 1.07 of this Section.
   3. Implement the following if MGP-related odors are noticed at the perimeter of the work area:
      a. Notify Remediation Contractor personnel.
      b. Identify the source or cause of the MGP-related odors.
      c. Remediation Contractor shall continue Work and employ additional odor, vapor, and dust controls to abate emissions in accordance with Section 01 57 05, Temporary Controls.
      d. Remediation Contractor shall evaluate and, if necessary and appropriate, modify construction techniques.
      e. Remediation Engineer shall perform more frequent perimeter checks.
      f. If MGP-related odors persist at the perimeter of the work area, Remediation Contractor shall stop work and Remediation Engineer shall notify the Owner.
      g. Identify the source or cause of MGP-related odors.
      h. Remediation Contractor shall evaluate and, if necessary and appropriate, further modify construction techniques and employ additional odor, vapor, and dust controls to abate emissions in accordance with Section 01 57 05, Temporary Controls.
      i. Work shall not resume until authorized by Owner.

B. Odor Complaints:
   1. Immediately notify Owner of any odor complaints from the public.
   2. Implement the following in response to an odor complaint:
      a. As appropriate, Remediation Engineer shall verify the legitimacy of the complaint based on the Work being performed at the Site, the predominant wind direction, and other climatological factors.
      b. Remediation Engineer shall continue monitoring and Remediation Contractor shall employ additional odor, vapor, and dust controls to abate emissions in accordance with Section 01 57 05, Temporary Controls.
      c. Remediation Contractor shall evaluate and, if necessary and appropriate, modify construction techniques.
   3. Remediation Engineer shall document the time and outcome of any odor complaints in daily odor monitoring log in accordance with Article 1.07 of this Section.

3.04 FIELD QUALITY CONTROL

A. Remediation Engineer shall calibrate air monitoring equipment on a daily basis, or other frequency recommended by the manufacturer, in accordance with manufacturer's calibration and quality assurance requirements. Document all instrument readings, field reference checks, and calibrations in a dedicated log.

B. During the workday, Remediation Engineer shall perform periodic field checks of monitoring equipment to verify proper function. Document the date, day, time, and outcome of each field check in a dedicated log.

C. Remediation Engineer shall immediately remove from service, and replace, in coordination with Owner, damaged or malfunctioning equipment.

D. Preventative maintenance and repair of monitoring equipment, if required, shall only be performed by qualified personnel, or authorized representatives of the manufacturer.

E. Remediation Engineer shall prepare and retain at the Site electronic or written records of all equipment calibrations, field checks, maintenance, and repairs.

END OF SECTION

SECTION 01 41 26

STORM WATER POLLUTION PREVENTION PLAN AND PERMIT

PART 1 – GENERAL

1.01 DESCRIPTION

A. Remediation Contractor shall comply with the Project's Storm Water Pollution Prevention Plan (SWPPP) and the substantive requirements of the most current version of New York State Department of Environmental Conservation (NYSDECs) State Pollutant Discharge Elimination System General Permit for Storm Water Discharges from Construction Activity (hereinafter, the "SPDES General Permit"). Remediation Contractor is responsible for providing necessary materials and taking appropriate measures to comply with requirements of the SPDES General Permit and minimize pollutants in storm water run-off from the Site.

B. Documents: The following are part of the Work included under this Section:
   1. SWPPP: Prepared by Design Engineer, on behalf of the Owner, and filed with NYSDEC. The SWPPP is included with this Section, and as Appendix G to the Design Report, as part of the Contract Documents.
   2. SWPPP Revisions: Prepared by the Remediation Engineer, on behalf of the Owner, in accordance with Article 1.04 of this Section. Copy of each SWPPP Revision will be furnished to the Remediation Contractor. SWPPP Revisions, if any, will become part of the Contract Documents.
   3. Storm Water Permit Certification Statement: To be submitted by the Remediation Contractor to the Remediation Engineer on the form included with this Section. Do not perform Work at the Site until the storm water permit certification statement has been submitted to the Remediation Engineer.
   4. Storm Water Inspection Reports: Prepared by Remediation Contractor's qualified inspector and submitted to the Remediation Engineer in accordance with Article 1.05 of this Section. A storm water inspection report shall be prepared for each Site inspection and assessment required by the SPDES General Permit and this Section.

C. Prevent discharge of sediment to and erosion from the Site to surface waters, drainage routes, public streets and rights-of-way, and private property, including dewatering operations. Prevent trash and construction and demolition debris from leaving the Site via storm water run-off. Provide berms, dikes, and other acceptable methods of directing storm water around work areas to drainage routes.

D. Do not cause or contribute to a violation of water quality standards, Laws, or Regulations. Provide and implement measures to control pollutants in storm water run-off from the Site to prevent:
   1. Turbidity increases that will cause a substantial visible contrast to natural conditions.
   2. Increase in suspended, colloidal, and settle-able solids that would cause sediment deposition, or impair receiving water quality and use.
   3. Presence of residue from oil and floating substances, visible oil, and globules of grease.

E. Remediation Contractor shall pay civil penalties and other costs incurred by Owner, including additional engineering, construction management, and inspection services, associated with non-compliance with the SPDES General Permit and erosion, sediment, and turbidity controls associated with the Work.

F. Contract Price includes all material, labor, and other permits and incidental costs related to:
   1. Installing and maintaining structural and non-structural items used in complying with the SWPPP and its revisions, if any.
   2. Clean-up, disposal, and repairs following wet weather events or spills caused by Remediation Contractor.
   3. Implementing and maintaining “best management practices”, as defined in applicable permits and Laws or Regulations, to comply with requirements that govern storm water discharges at the Site.
   4. Inspecting erosion, sediment, turbidity, and storm water controls as specified.

G. Coordinate requirements of this Section with requirements for earthwork, erosion control, and landscaping in the Contract Documents, applicable permit requirements, and Laws and Regulations.

H. Implement SWPPP controls and practices prior to starting other Work at the Site.

1.02 QUALITY ASSURANCE

A. Qualifications:
   1. Qualified Inspector:
      a. Remediation Contractor’s qualified inspector shall be knowledgeable in the principles and practices of erosion, sediment, and turbidity control, and shall be responsible for performing Site inspections and assessments, and preparing and certifying storm water inspection reports, in accordance with this Section.
      b. Remediation Contractor’s qualified inspector shall be one of the following:
         1) Professional engineer licensed and registered in the State of New York.
         2) Landscape architect licensed and registered in the State of New York.
         3) Certified Professional in Erosion and Sediment Control.
         4) NYSDEC-endorsed individual.
         5) An individual working under the direct supervision of, and employed by the same company as, a professional engineer or landscape architect licensed and registered in New York State, provided that said individual has received four hours of NYSDEC-endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC-endorsed entity. Following the initial training, the individual shall have completed four hours of training every three years.

B. Regulatory Requirements:
   1. Comply with Laws and Regulations related to environmental protection and restoration, including:
      a. SPDES General Permit.
      b. New York State Standards and Specifications for Erosion and Sediment Control.

1.03 SUBMITTALS

A. Informational Submittals:
   1. Storm Water Permit Certification Statement: Submit in accordance with Paragraph 1.01.B.3 of this Section.
   2. Qualifications Statements: Submit name and qualifications of qualified inspector, including summary of experience, training received, and copy of valid certifications applicable to the Project.
   3. Storm Water Inspection Reports: Submit in accordance with Article 1.05 of this Section.

1.04 SWPPP REVISIONS

A. Remediation Engineer will prepare a SWPPP Revision in accordance with the SPDES General Permit:
   1. When the provisions of the SWPPP prove to be ineffective in minimizing pollutants in storm water discharges from the Site.
   2. When there is a significant change in design, construction, operation, or maintenance of the Project that has or could have an effect on the discharge of pollutants from the Site.
   3. To address issues or deficiencies identified during an inspection by Remediation Contractor's qualified inspector, NYSDEC, or other regulatory authority having jurisdiction.

1.05 STORM WATER INSPECTION REPORTS

A. Prepare a storm water inspection report for each Site inspection and assessment required by the SPDES General Permit and this Section. Each report shall be prepared using the form included with this Section.

B. Include in each storm water inspection report, at a minimum, the following:
   1. Date and time of inspection.
   2. Name, title, and affiliation of Remediation Contractor's qualified inspector.
   3. Weather and soil conditions (e.g., dry, wet, saturated, etc.) at the time of the inspection.
   4. Description of and site plan showing areas that are disturbed at the time of the inspection and any areas that have been stabilized (either temporary or final) since the previous inspection.
   5. Repairs, maintenance, or corrective actions implemented since the previous inspection. Include digital photographs, with date stamp, that clearly show the areas or items installed, repaired, or replaced.
   6. Condition of storm water run-off at all points of discharge from the Site.
   7. Identification of any erosion, sediment, turbidity, and storm water controls that require repair or maintenance.
   8. Identification of any erosion, sediment, turbidity, and storm water controls that were not installed properly or are not functioning as designed.
   9. Repairs, maintenance, or corrective actions required to correct any deficiencies observed during the inspection. Include digital photographs, with date stamp, that clearly show the deficient areas or items.

C. Submit storm water inspection reports to Remediation Engineer within three days after each inspection. Inspection reports shall be signed by Remediation Contractor's qualified inspector.

D. Retain copies of storm water inspection reports at the Site. Keep with the SWPPP and any SWPPP revisions.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 INSPECTIONS AND REPAIRS

A. Perform Site inspections and assessments as required by the SPDES General Permit and this Section to ensure the continued effectiveness and integrity of all SWPPP controls and practices, including erosion, sediment, and turbidity controls. Inspections and assessments shall be done by Remediation Contractor's qualified inspector.

B. Inspections:
   1. Site inspections shall be performed:
      a. After installation of SWPPP controls, including erosion, sediment, and turbidity controls, and temporary field offices and other temporary facilities, prior to starting other Work at the Site.
      b. Every seven days during the Work, and within 24 hours after wet weather events, until all disturbed areas have achieved final stabilization in accordance with the SPDES General Permit and the SWPPP. For temporary Work stoppages and seasonal shut-downs greater than two weeks in duration, inspection frequency may be reduced to once every 30 days if temporary stabilization measures have been applied to all disturbed surfaces, and if approved by Remediation Engineer, the Owner, and NYSDEC.
   2. During each inspection, verify sediment control practices and record approximate degree of sediment accumulation as percentage of acceptable sediment storage volume. Inspect erosion, sediment, and turbidity, control practices and record repairs and maintenance performed, if any. Observe and record deficiencies relative to implementation of the SWPPP.
   3. Prepare storm water inspection report for each inspection in accordance with Article 1.05 of this Section.

C. Notify Remediation Engineer within one day after each inspection of any deficiencies observed, and any repairs, maintenance, or corrective actions required to correct such deficiencies.

D. Complete repairs or maintenance to SWPPP controls in accordance with applicable requirements and to satisfaction of Remediation Engineer within two days after each inspection. If site conditions prevent repairs or maintenance from being completed, document such conditions in the subsequent storm water inspection report and complete repairs or maintenance as soon as site conditions permit.

E. Cooperate with representatives of authorities having jurisdiction during periodic visits to Site, and promptly provide information requested by authorities having jurisdiction.

3.02 ATTACHMENTS

A. The attachments listed below, which follow after the "End of Section" designation, are part of this Section:
   1. Attachment A: Storm water permit certification statement form (one page).
   2. Attachment B: Storm water inspection report form (four pages).

END OF SECTION

NYSEG
CORTLAND-HOMER FORMER MANUFACTURED GAS PLANT SITE
OPERABLE UNIT NO. 2
HOMER, CORTLAND COUNTY, NEW YORK

STORM WATER PERMIT CERTIFICATION STATEMENT

Each Remediation Contractor and Subcontractor identified in the Storm Water Pollution Prevention Plan (SWPPP) shall certify that they understand the permit conditions and their responsibilities. Every Remediation Contractor and Subcontractor performing an activity that involves soil disturbance shall sign and submit this certification statement to Remediation Engineer prior to performing the Work. This certification statement shall be signed by an owner, principal, president, secretary, or treasurer of the firm.

I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that Owner must comply with the terms and conditions of the most current version of NYSDEC's SPDES General Permit for Storm Water Discharges from Construction Activity (SPDES General Permit), and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect, or inaccurate information is a violation of the referenced permit and the laws of the State of New York, and could subject me to criminal, civil, and/or administrative proceedings.

Firm: _____

Address: _____

_____

Name (Print): _____ Title: _____

Signature: _____ Date: _____

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NYSEG
CORTLAND-HOMER FORMER MANUFACTURED GAS PLANT SITE
OPERABLE UNIT NO. 2
HOMER, CORTLAND COUNTY, NEW YORK

STORM WATER INSPECTION REPORT

Date and Time of Inspection: _____

Qualified Inspector (Name, Title, and Affiliation): _____

Weather Conditions: _____

Soil Conditions: _____

Describe disturbed areas at time of inspection: _____

Describe areas stabilized (temporary or final) since previous inspection: _____

ATTACH SITE PLAN SHOWING APPROXIMATE LIMITS OF DISTURBED AND NEWLY-STABILIZED AREAS

Describe repairs, maintenance, or corrective actions implemented since previous inspection: _____

ATTACH PHOTOGRAPHS OF AREAS OR ITEMS INSTALLED, REPAIRED, OR REPLACED

Maintaining Water Quality (Turbidity Control)

Yes	No	NA	
☐	☐	☐	Is there an increase in turbidity causing a substantial visible contrast to natural conditions?
☐	☐	☐	Is there residue from oil and floating substances, visible oil film, or globules or grease?
☐	☐	☐	All disturbance is within the limits of the approved plans?
☐	☐	☐	Have receiving lake/bay and/or wetland been impacted by silt from project?

Housekeeping

Yes	No	NA	
1. General Site Conditions:			
☐	☐	☐	Is construction site litter and debris appropriately managed?
☐	☐	☐	Are facilities and equipment necessary for implementation of erosion, sediment, and turbidity control in working order and/or properly maintained?
☐	☐	☐	Is construction impacting the adjacent property?
☐	☐	☐	Is dust adequately controlled?

Run-Off Control Practices (if necessary)

Yes	No	NA	
1. Interceptor Dikes and Swales (if applicable):			
☐	☐	☐	Installed per plan with minimum side slopes of 2H:1V or flatter?
☐	☐	☐	Stabilized by geotextile fabric, seed, or mulch with no erosion occurring?
☐	☐	☐	Sediment-laden run-off directed to sediment trapping structure?
2. Stone Check Dam (if applicable):			
☐	☐	☐	Is channel stable (flow is not eroding soil underneath or around the structure)?
☐	☐	☐	Check dam is in good condition (rocks in place and no permanent pools behind the structure)?
☐	☐	☐	Has accumulated sediment been removed?

Soil Stabilization

Yes	No	NA	
1. Topsoil and Spoil Stockpiles:			
☐	☐	☐	Stockpiles are stabilized with vegetation and/or mulch?
☐	☐	☐	Sediment control is installed at the toe of the slope?
2. Revegetation:			
☐	☐	☐	Temporary seed and mulch have been applied to idle areas?
☐	☐	☐	Six inches minimum of topsoil has been applied under permanent seeding?

Sediment Control Practices

Yes	No	NA	
1. Stabilized Construction Entrance:			
☐	☐	☐	Stone is clean enough to effectively remove mud from vehicles?
☐	☐	☐	Installed per standards and specifications?
☐	☐	☐	Does all traffic use the stabilized entrance to enter and leave construction site?
☐	☐	☐	Is adequate drainage provided to prevent ponding at entrance?
2. Silt Fence:			
Sediment accumulation is ___% of design capacity.			
☐	☐	☐	Installed per plan?
☐	☐	☐	Joints constructed by wrapping the two ends together for continuous support?
☐	☐	☐	Fabric buried six inches minimum below grade?
☐	☐	☐	Posts are stable, fabric is tight and without rips or frayed areas?

Sediment Control Practices (continued)

Yes	No	NA	
			3. Storm Drain Inlet Protection (Use for Stone and Block; Filter Fabric; Curb; or Excavated Practices)
			Sediment accumulation ___% of design capacity.
☐	☐	☐	Installed concrete blocks lengthwise so open ends face outward, not upward?
☐	☐	☐	Placed wire screen between No. 3 crushed stone and concrete blocks?
☐	☐	☐	Drainage area is one acre or less?
☐	☐	☐	Excavated area is 900 cubic feet?
☐	☐	☐	Excavated side slopes are 2H:1V?
☐	☐	☐	2"x4" frame is constructed and structurally sound?
☐	☐	☐	Three-foot maximum spacing between posts?
☐	☐	☐	Fabric is embedded one to 1.5 feet below ground and secured to frame/posts with staples at maximum eight-inch spacing?
☐	☐	☐	Posts are stable, fabric is tight and without rips or frayed areas?
			4. Temporary Sediment Trap:
			Sediment accumulation is ___% of design capacity.
☐	☐	☐	Outlet structure is constructed per the approved plan or drawing?
☐	☐	☐	Geotextile fabric has been placed beneath rock fill?
			5. Temporary Sediment Basin:
			Sediment accumulation is ___% of design capacity.
☐	☐	☐	Basin and outlet structure constructed per the approved plan?
☐	☐	☐	Basin side slopes are stabilized with seed and mulch?
☐	☐	☐	Drainage structure flushed and basin surface restored upon removal of sediment basin facility?

Describe any repairs, maintenance, or corrective actions required to correct observed deficiencies: _____

ATTACH PHOTOGRAPHS OF DEFICIENT AREAS OR ITEMS OBSERVED DURING THE INSPECTION

Qualified Inspector's Certification:

I certify under penalty of Law that this document and all attachments were prepared under my direction or supervision in accordance with a system to ensure that qualified personnel property gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein may be punishable by Law.

Signature: _____ Date: _____

SECTION 01 51 00

TEMPORARY UTILITIES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall provide all temporary utilities required for the Project.
      a. Make all arrangements with utility service companies for temporary services and obtain required permits and approvals for temporary utilities.
      b. Pay all utility service costs, including cost of electricity, water, fuel, and other utility services required for the Work.
      c. Continuously maintain adequate utilities for all purposes during the Project, until removal of temporary utilities and temporary facilities. At a minimum, provide and maintain temporary utilities through Substantial Completion and removal of temporary field offices and sheds.
      d. Should Owner occupy part of the Project prior to Substantial Completion of the entire Work, cost of utilities consumed via temporary utilities serving the portion occupied by Owner will be shared proportionately between Owner and Remediation Contractor as mutually agreed to by the parties.
      e. Maintain, including cleaning, temporary utilities and continuously provide consumables as required.
      f. Temporary utilities shall be adequate for personnel using the Site and requirements of the Project.
      g. Provide temporary utilities in compliance with Laws and Regulations and, when applicable, requirements of utility owners.

B. Provide the following temporary utilities:
   1. Electricity.
   2. Lighting.
   3. Telephone and Internet.
   4. Heating, ventilating, and temporary enclosures.
   5. Water.

1.02 FIRE PROTECTION REFERENCE STANDARDS

A. The following standards are referenced in this Section:
   1. NFPA 10, Standard for Portable Fire Extinguishers.
   2. NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.03 REQUIREMENTS FOR TEMPORARY UTILITIES

A. Electrical:
   1. Provide temporary electrical service required for the Work, including continuous power for temporary field offices and sheds. Provide temporary outlets with circuit breaker protection and ground fault protection.
   2. If a generator is used to provide the temporary electrical service, provide sound enclosures, as necessary to mitigate noise produced by generators. Follow local noise ordinances to determine requirements and necessity for sound enclosures.

B. Lighting:
   1. Minimum lighting shall be five foot-candles for open areas and 10 foot-candles for stairs and shops.
   2. Provide minimum requirement specified in Section 01 52 13, Temporary Field Offices and Structures for indoor Work areas.

C. Telephone and Communications:
   1. Provide temporary telephone and internet required for Remediation Contractor's operations at the Site and for summoning emergency medical assistance and in accordance with Section 01 52 13, Temporary Field Offices and Structures.

D. Heating, Ventilating, and Enclosures:
   1. Provide sufficient temporary heating, ventilating, and enclosures to ensure safe working conditions and prevent damage to existing facilities and the Work, and in accordance with Section 01 52 13, Temporary Field offices and Structures.
   2. Except where otherwise specified, temporary heating shall maintain temperature of the area served between 50 degrees Fahrenheit (F) and maximum design temperature of building or facility and its contents.
   3. Maintain temperature of areas occupied by Owner's personnel or electronic equipment, including offices, lunchrooms, locker rooms, toilet rooms, and rooms containing computers, microprocessors, and control equipment, between 65 degrees F and 80 degrees F with relative humidity less than 75 percent.
   4. Required temperature range for storage areas and certain elements of the Work, including preparation of materials and surfaces, installation or application, and curing as applicable, shall be in accordance with the Contract Documents for the associated Work and the Supplier's recommended temperature range for storage, application, or installation, as appropriate.
   5. Provide temporary ventilation sufficient to prevent accumulation in construction areas and areas occupied by Owner of hazardous and nuisance levels or concentrations of dust and particulates, mist, fumes or vapors, odors, and gases associated with construction.
   6. Provide temporary enclosures and partitions required to maintain required temperature and humidity.

E. Water:
   1. Provide temporary water facilities including piping, valves, meters if not provided by owner of existing waterline, backflow preventers, pressure regulators, and other appurtenances. Provide freeze-protection as required.
   2. Provide water for temporary sanitary facilities, field offices, Site maintenance and cleaning and, when applicable, disinfecting and testing of systems.
   3. Continuously maintain adequate water flow and pressure for all purposes during the Project, until removal of temporary water system.

F. Fire Protection:
   1. Provide temporary fire protection, including portable fire extinguishers rated not less than 2A or 5B in accordance with NFPA 10 for each temporary building and for every 3,000 square feet of floor area under construction.
   2. Comply with NFPA 241 and requirements of fire marshals and authorities having jurisdiction at the Site.

PART 2 – PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for temporary systems may be new or used but shall be adequate for purposes intended and shall not create unsafe conditions and shall comply with Laws and Regulations.

B. Provide required materials, equipment, and facilities, including piping, wiring, and controls.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install temporary utilities in neat, orderly, manner, and make structurally, mechanically, and electrically sound throughout.

B. Location of Temporary Utilities:
   1. Locate temporary systems for proper function and service.
   2. Temporary systems shall not interfere with or provide hazards or nuisances to the Work under this and other contracts, movement of personnel, traffic areas, materials handling, hoisting systems, storage areas, finishes, and work of utility companies.
   3. Do not install temporary utilities on the ground, with the exception of temporary extension cords, hoses, and similar systems in place for short durations.

C. Modify and extend temporary systems as required by progress of the Work.

3.02 USE

A. Maintain temporary systems to provide safe, continuous service as required.

B. Properly supervise operation of temporary systems:
   1. Enforce compliance with Laws and Regulations.
   2. Enforce safe practices.
   3. Prevent abuse of services.
   4. Prevent nuisances and hazards caused by temporary systems and their use.
   5. Prevent damage to finishes.
   6. Ensure that temporary systems and equipment do not interrupt continuous progress of construction.

C. At end of each work day, check temporary systems and verify that sufficient consumables are available to maintain operation until work is resumed at the Site. Provide additional consumables if the supply on hand is insufficient.

3.03 REMOVAL

A. Completely remove temporary utilities, facilities, equipment, and materials when no longer required. Repair damage caused by temporary systems and their removal and restore the Site to condition required by the Contract Documents. If restoration of damaged areas is not specified, restore to pre-construction condition.

B. Where temporary utilities are disconnected from existing utility, provide suitable, water-tight or gas-tight (as applicable) cap or blind flange, as applicable, on service line, in accordance with requirements of utility owner.

END OF SECTION

SECTION 01 51 41

TEMPORARY PUMPING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall provide all labor, materials, tools, equipment, and incidentals shown, specified, and required for temporary pumping and handling of fluids during the Project.
   2. Design and provide temporary pumping system; pumps; piping, supports, and valves; temporary instrumentation and control systems; fuel and electricity as required; personnel; and appurtenances. Comply with Laws and Regulations and requirements of authorities having jurisdiction. System shall be suitable for its service and operating environment.
   3. Capacity – General:
      a. Provide temporary pumping system of sufficient capacity with not less than one of the largest pumps out of service.
      b. Pay costs associated with repairing damage to property, including cleaning, caused by undersized or inadequate temporary pumping systems.
      c. Remediation Engineer's acceptance of temporary pumping submittals does not relieve or mitigate Remediation Contractor from responsibility for the temporary pumping system in accordance with the Contract Documents.
   4. Temporary Pumping Capacity for Sewer Outfalls (where needed):
      a. Required capacity of each temporary pumping system for sewer outfalls shall be determined by Remediation Contractor.
      b. Each temporary pumping system shall be adequate to convey the discharge rate conveyed through the associated existing permanent conduits. Temporary pumping systems shall not result in: flow back-ups into buildings or structures; overflows to storm sewers or receiving waters; or adverse effects on system of Owner, utility owners, or owners of transportation systems (including streets and roads).
      c. Basis of capacity of each temporary pumping system shall consider flow metering data (if available), results of system hydraulic modeling (if available), sewer inspection video and associated data (if available), capacity of the pipe or conduit temporarily removed from service, whether system experiences surcharges during high-flow events, nature of drainage area tributary to the pipe or conduit temporary removed from service, weather, and other factors.
   5. Temporary Pumping Capacity for Dewatering Work Areas:
      a. Dewatering pumps shall be sufficient in quantity and capacity to depress the surface water level within the removal area to expose the riverbed. Pumps shall be selected with a total dynamic head capacity of at least twice the static head due to elevation difference from the pump inlet to the maximum elevation of the dewatering pipeline.
      b. Temporary pumping systems shall not result in: flow back-ups into buildings or structures; overflows to storm sewers or receiving waters; or adverse effects on system of Owner, utility owners, or owners of transportation systems (including streets and roads).
   6. Location of temporary pumping systems shall not affect utility owners, public access to streets and drives, or access to private property, unless approved by authorities having jurisdiction.

7. Obtain Remediation Engineer's acceptance of each temporary pumping system submittal. Temporary pumping systems for which Remediation Engineer's acceptance is not obtained in advance will not be eligible for payment.

B. Coordination:
   1. Coordinate the Work to be performed under other Sections that must be performed with or before the Work specified in this Section

1.02 QUALITY ASSURANCE

A. Component Supply and Compatibility:
   1. Obtain each temporary pumping system from a single Supplier who shall be responsible for providing a complete system.

B. Regulatory Requirements:
   1. Secondary containment for fuel tanks, where applicable, shall be in accordance with Laws and Regulations.
   2. Leakage from temporary pumping system or improper discharge is not allowed.
   3. Quality of exhaust emissions from internal-combustion engines associated with temporary pumping systems shall comply with Laws and Regulations, including applicable air permits. Before furnishing temporary pumping system, verify compliance with air quality standards and provide temporary emissions controls to comply with such standards when required.

1.03 SUBMITTALS

A. Timing: Furnish to Remediation Engineer submittals for temporary pumping system not less than 30 days prior to delivery of temporary pumping system to the Site.

B. Informational Submittals: Submit the following:
   1. Schedule for Temporary Pumping in Collection System:
      a. Schedule for temporary pumping for each work area. Include dates of mobilizing each temporary pumping system, testing, starting and ending dates of temporary pumping, and demobilizing each temporary pumping system in each work area.
      b. At Remediation Contractor's option, such information may be included on the Progress Schedule prepared and maintained in accordance with Section 01 32 16, Progress Schedule. When such option is exercised, however, upon request of Remediation Engineer break out as separate sub-schedule the schedule of temporary pumping and furnish to Remediation Engineer.
      c. Maintain and update schedule for temporary pumping for collection system and submit updated schedules in accordance with requirements for updating the Progress Schedule as indicated in Section 01 32 16, Progress Schedule.
   2. Temporary Pumping System Plan, to include the following for each temporary pumping system:
      a. Basis for capacity of the system proposed.
      b. System curve of flow plotted against total dynamic head, and calculations that substantiate the proposed temporary pumping system, including comparison of net positive suction head required and net positive suction head available.
      c. Manufacturer's data and specifications on each type and size of pump proposed and its capacity, including pump curves.
      d. Manufacturer's data and specifications for engines and other equipment required for temporary pumping system, including expected exhaust emissions data.

e. Technical information and specifications on noise controls for noise-emitting equipment.
f. Technical data on temporary piping, pipe joints, valves, pipe supports, controls, flow meter, secondary containment for fuel tanks, emissions controls when required, and other information pertinent to the temporary pumping system.
g. Narrative describing proposed operation of temporary pumping system, including who will operate system, staffing, planned frequency of fueling, contingency plan in event of pump failure, and statement of existing systems that may be affected during operation of temporary pumping system.

PART 2 – PRODUCTS

2.01 TEMPORARY PUMPING SYSTEM

A. General:
1. System components shall be suitable for continuous operation with the fluid pumped.
2. Noise controls: Provide noise controls for temporary pumping system. Noise emitted from temporary pumping system shall comply with Laws and Regulations and shall not exceed 70 db at a distance of 30 feet from noise source.
3. Fuel-consuming temporary pumping system components intended for use when Remediation Contractor is not present shall include fuel tanks sized for not less than 24 hours of uninterrupted operation at system's operating capacity and means to automatically notify Remediation Contractor upon high and low suction water level and low fuel level.

B. Temporary Pumps for Dewatering Work Areas:
1. Sufficient in quantity and size to convey water to the temporary water treatment system specified in Section 01 53 53, Temporary Water Treatment and Management.

C. Temporary Piping System:
1. Piping shall be high density polyethylene or other durable material accepted by Remediation Engineer and suitable for system operating pressures. Durable hoses can be used only for short sections upon acceptance by Remediation Engineer.
2. Piping system shall have watertight joints of the following types: fused joints, restrained couplings, flanged coupling adapters, quick-connects by Camlok or equal, flanged joints, grooved and shouldered end-type couplings, and other watertight joints accepted by Remediation Engineer.
3. Size piping for flow velocity of not greater than 10 feet per second.
4. Provide check valves or pump control valves as required.
5. Provide thrust restraints as required.
6. Provide air valves on piping as required. Air valves shall expel air upon pipe filling and admit air upon pipe dewatering and release small quantities of entrained air during operation. Air valves shall be suitable for service with the pumped fluid.
7. Discharge from temporary pumping system shall not adversely affect collection system structures, pipe or conduits, private property, and shall not result in flow backups, flooding, or damage. Provide energy-dissipating measures at discharge point as necessary for temporary pumping capacity for sewer outfalls.

PART 3 – EXECUTION

3.01 PREPARATION

A. General:
   1. Temporary piping shall be located off of roads, driveways, and sidewalks.
   2. Temporary piping for dewatering work areas shall be temporarily anchored to the bank of the Tioughnioga River, above the water line.
   3. Where shown or indicated on the Design Drawings, bury temporary piping that would otherwise inhibit access to buildings, structures, streets, and driveways.
   4. Hydrostatic Testing of Temporary Piping System:
      a. For temporary pumping capacity for sewer outfalls perform successful hydrostatic testing of temporary piping system using clean water at pressure equal to 1.2 times highest expected system operating pressure, for 15 minutes while maintaining test pressure within 3.0 psi of required test pressure.
      b. For temporary pumping capacity for dewatering work areas perform successful hydrostatic testing of temporary piping system using clean water at pressure equal to 1.2 times highest expected system operating pressure, for one hour while maintaining test pressure within 3.0 psi of required test pressure.
      c. Remediation Engineer will witness hydrostatic test.
      d. Hydrostatic test criteria for acceptance: No leakage.
   5. Verify that entire temporary pumping system is ready for operation before commencing temporary pumping. Verify that controls and flow meter are properly connected and functional, where appropriate.

3.02 TEMPORARY PUMPING

A. During Operation of the Temporary Pumping System temporary pumping, system shall operate continuously as needed to dewater the work area and/or divert sewer outfalls. In the event of equipment failure, immediately make repairs or replace equipment. Provide spare parts and redundant units as necessary for continuous operation.

3.03 REMOVAL

A. Upon Conclusion of Temporary Pumping to Bypass Sewer Outfalls:
   1. Remove equipment in manner that allows flow to slowly return to normal, without surging, surcharging, and adverse effects on existing system.
   2. Flush out temporary pumping system with clean water discharged to an appropriate location.
   3. Remove temporary pumping system and appurtenances from the Site.
   4. Repair damage caused by temporary systems and their removal and restore the Site to condition required by the Contract Documents. If restoration of damaged areas is not specified, restore to pre-construction condition.

B. Upon Conclusion of Temporary Pumping to Dewater Work Areas:
   1. Flush out temporary pumping system with clean water discharged to an appropriate location.
   2. Remove temporary pumping system and appurtenances from the Site.
   3. Repair damage caused by temporary systems and their removal and restore the Site to condition required by the Contract Documents. If restoration of damaged areas is not specified, restore to pre-construction condition.

END OF SECTION

SECTION 01 52 13

TEMPORARY FIELD OFFICES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Field Offices shall be located at the Owner's property located at:
      a. 218 South Main Street, Homer, New York (i.e., Area 1).
      b. North end of Front Street, Cortland, New York (i.e., Area 2).
   2. Remediation Contractor shall maintain field offices at the Site for Owner, Remediation Engineer, New York State Department of Environmental Conservation (NYSDEC), and Remediation Contractor.
   3. Provide required storage and work sheds.
   4. Field offices shall be complete, fully functional, and ready for occupancy within 14 days after Remediation Engineer's approval of the submittal required by this Section.

1.02 SUBMITTALS

A. Action Submittals:
   1. Field Office Submittal: Submit, as a single submittal, the following:
      a. Site plan indicating proposed location of field offices, parking for field offices, and facilities related to the field offices for each area (i.e., Area 1 and Area 2).
      b. Listing of utility providers (if applicable).
      c. Product data and technical information for multifunction printer and telephone system.

PART 2 – PRODUCTS

2.01 FIELD OFFICES (THREE TRAILERS)

A. Two field office trailers (i.e., one for the Remediation Contractor and one for the Remediation Engineer) shall consist of a Mobile Office manufactured by ModSpace (or equivalent) and provide a minimum of 460 square feet of floor space (with a 10-foot minimum width) and shall be partitioned to provide three separate spaces (at least one of which will serve as a shared common area). A minimum of two outside doors will be required. A sign reading "All Site Visitors Must Sign-In Here" shall be affixed to the trailer exterior of the Remediation Contractor's trailer.
   1. Trailers shall be completely weather-tight and insulated.
   2. Windows shall each have insect screen and operable sash. Provide each window with lock and exterior security bars approved by the Remediation Engineer.
   3. Each trailer shall have two doors for ingress and egress, each with landing, stairs, and railing conforming to building codes in effect at the Site.
      a. Landing and stairs shall be metal, pressure-treated wood, fiberglass, or concrete, and have slip-resistant walking surfaces.
      b. Railing shall be metal, wood, or fiberglass.
      c. Doors shall be secure and lockable, and each furnished with suitable, lockable security bar by Master Lock or equal.

4. Furnish to Remediation Engineer two identical sets each of keys suitable for operating all keyed locks, including ingress/egress door locks, security bars for doors, window locks, closets, and office furnishings.

B. One field office trailer (for NYSDEC) shall consist of a Mobile Office manufactured by ModSpace (or equivalent) and provide a minimum of 160 square feet of floor space (with an 8-foot minimum width).
   1. Trailers shall be completely weather-tight and insulated.
   2. Window(s) shall each have insect screen and operable sash. Provide each window with lock and exterior security bars approved by the Remediation Engineer.
   3. Trailer shall have at least one door for ingress and egress, each with landing, stairs, and railing conforming to building codes in effect at the Site.
      a. Landing and stairs shall be metal, pressure-treated wood, fiberglass, or concrete, and have slip-resistant walking surfaces.
      b. Railing shall be metal, wood, or fiberglass.
      c. Door(s) shall be secure and lockable, and each furnished with suitable, lockable security bar by MasterLock or equal.
   4. Furnish to Remediation Engineer and NYSDEC two identical sets each of keys suitable for operating all keyed locks, including ingress/egress door locks, security bars for doors, window locks, closets, and office furnishings.

C. The Remediation Contractor shall provide and maintain, in accordance with all applicable codes and regulations, the fire protection system (e.g., fire extinguishers, sprinklers, etc.) and electric, heating, and cooling services for the office trailers.

2.02 FIELD OFFICE UTILITIES

A. Comply with Section 01 51 00, Temporary Utilities.

B. Provide the following for each field office:
   1. Electrical System and Lighting:
      a. Electric service as required, including paying all costs.
      b. Interior lighting of 50 foot-candles at desktop height or one fluorescent light every 15 feet overhead.
      c. Minimum of eight 120-volt, wall-mounted, duplex convenience electrical receptacles.
      d. Exterior, wall-mounted, 250-watt lighting at each entrance.
   2. Heating, Ventilating, and Air Conditioning:
      a. Automatic heating and automatic cooling to maintain indoor temperature as specified in Section 01 51 00, Temporary Utilities.
      b. Furnish all fuel and pay all utility costs.
   3. Telephone Service:
      a. Private telephone service, including payment of installation, monthly, and service costs.
      b. Provide one telephone line per trailer (three lines total), each with separate telephone number assigned by the telephone company.
      c. Pay for unlimited local and long-distance service for duration of the Project.
   4. Internet Service:
      a. Obtain and pay for Internet service, with unlimited (untimed) Internet access, until removal of field office trailers.
      b. Provide fiber-optic or cable connection with appropriate modem and appurtenances, and dual-band Wireless-N router.
      c. Minimum Speed: Up to 15 megabits per second download, up to 1 megabit per second upload.

d. Provide Wireless-G router capable of supporting a minimum of four users simultaneously for each field office trailer occupied by Remediation Contractor, Owner, and Remediation Engineer.
e. Set up system and appurtenances required and verify functionality in each field office space.

C. Should actions of utility companies delay the complete set up of field offices, Remediation Contractor shall provide temporary electricity, heat, telephone, and internet service as required at no additional cost to Owner.

2.03 FIELD OFFICE FURNISHINGS AND EQUIPMENT

A. Provide the following furnishings and equipment for each of the two minimum 460-square foot field office trailers (specified in Pat 2.01.A):
1. Desks: Four five-drawer desks, each five feet long by 2.5 feet wide with at least one file drawer per desk suitable for storing 8.5-inch by 11-inch documents.
2. Desk Chairs: Four new or used (in good condition) five-point, high backed, cushioned swivel chairs.
3. Other Chairs: Ten metal folding chairs without arm rests.
4. Tables:
a. Two new or used (in good condition) portable folding tables, each 8 feet long by 2.5 feet wide.
b. Two new or used (in good condition) portable folding tables, each 6 feet long by 2.5 feet wide.
5. Plan rack(s) to hold a minimum of eight sets of the Drawings.
6. Two four-drawer, legal size, fire-proof file cabinets with locks.
7. Four polyethylene waste baskets, each with minimum capacity of seven gallons.
8. Suitable doormat at each exterior ingress/egress door.
9. One tack board, approximately three feet long by 2.5 feet wide, with thumbtacks.
10. One white board for use with dry markers, approximately six feet long by four feet wide, with marker holding tray, installed by Remediation Contractor at location selected by Remediation Engineer in the field. Furnish supply of colored markers and eraser for the white board.
11. Fire extinguisher with associated signage, and smoke detector, in accordance with Laws and Regulations. At a minimum, provide two wall-mounted fire extinguishers and one battery-operated, ceiling-mounted smoke detector. Comply with fire protection requirements of Section 01 51 00, Temporary Utilities.
12. One first-aid station. Comply with Section 01 52 16, First Aid Facilities.
13. Two electric clocks.
14. One electric coffee maker with ten-cup capacity or larger.
15. One microwave oven with minimum capacity of 0.9 cubic foot.
16. Two refrigerators, each with minimum capacity of 2.5 cubic feet.
17. Bottled water with electric cooler dispenser for five-gallon bottles, with cup dispenser.
18. Multifunction Printer:
a. One new or used (in good condition) machines with the following functions:
1) Photocopying.
2) Network printing.
3) Scanning to produce PDF and JPG files.
4) E-mail.
5) Fax via telephone line.
b. Products and Manufacturers: Provide one of the following:
1) Brother MFC-j690dw printer.
2) Approved equal.

c. Provide necessary cables and appurtenances to enable all functions specified in this Section, including scan-and-email and printing from field office computers.

19. Telephone System:
    a. Telephone System Features:
        1) Provide two cordless telephones, each with hands-free speaker, speed dialing with minimum of 16 programmable numbers, volume control, LCD display, and buttons for hold and mute.
        2) Set up and verify operation of each telephone set.
    b. Provide two digital telephone answering machines.

B. Provide the following furnishings and equipment the minimum 160-square foot field office trailer (specified in Pat 2.01.B):
1. Desks: One five-drawer desk, five feet long by 2.5 feet wide with at least one file drawer suitable for storing 8.5-inch by 11-inch documents.
2. Desk Chairs: One new or used (in good condition) five-point, high backed, cushioned swivel chairs.
3. Other Chairs: Three metal folding chairs without arm rests.
4. Tables: One new or used (in good condition) portable folding tables, six feet long by 2.5 feet wide.
5. Plan rack(s) to hold a minimum of eight sets of the Drawings.
6. One four-drawer, legal size, fire-proof file cabinets with locks.
7. Two polyethylene waste baskets, each with minimum capacity of seven gallons.
8. Suitable doormat at each exterior ingress/egress door.
9. One tack board, approximately three feet long by 2.5 feet wide, with thumbtacks.
10. One white board for use with dry markers, approximately six feet long by four feet wide, with marker holding tray, installed by Remediation Contractor at location selected by Remediation Engineer (in consultation with NYSDEC) in the field. Furnish supply of colored markers and eraser for the white board.
11. Fire extinguisher with associated signage, and smoke detector, in accordance with Laws and Regulations. At a minimum, provide two wall-mounted fire extinguishers and one battery-operated, ceiling-mounted smoke detector. Comply with fire protection requirements of Section 01 51 00, Temporary Utilities.
12. One first-aid station. Comply with Section 01 52 16, First Aid Facilities.
13. One electric clock.
14. One electric coffee maker with ten-cup capacity or larger.
15. One microwave oven with minimum capacity of 0.9 cubic foot.
16. One refrigerator, with minimum capacity of 2.5 cubic feet.
17. Bottled water with electric cooler dispenser for five-gallon bottles, with cup dispenser.
18. Multifunction Printer:
    a. One new or used (in good condition) machines with the following functions:
        1) Photocopying.
        2) Network printing.
        3) Scanning to produce PDF and JPG files.
        4) E-mail.
        5) Fax via telephone line.
    b. Products and Manufacturers: Provide one of the following:
        1) Brother MFC-j690dw printer.
        2) Approved equal.
    c. Provide necessary cables and appurtenances to enable all functions specified in this Section, including scan-and-email and printing from field office computers.
19. Telephone System:
    a. Telephone System Features:

1) Provide cordless telephone with hands-free speaker, speed dialing with minimum of 16 programmable numbers, volume control, LCD display, and buttons for hold and mute.
2) Set up and verify operation of telephone set.

b. Provide digital telephone answering machine.

C. Provide two-way portable radios and charging units for Remediation Engineer, and key Remediation Contractor personnel (e.g., superintendent, foreman, etc.).

2.04 STORAGE AND WORK SHEDS

A. Provide storage and work sheds sized, furnished, and equipped to accommodate personnel, materials, and equipment involved in the Work, including temporary utility services and facilities required for environmental controls sufficient for personnel, materials, and equipment.

PART 3– EXECUTION

3.01 INSTALLATION

A. Install field offices and related facilities in accordance with Laws and Regulations.

B. Install materials and equipment in accordance with manufacturer's instructions.

3.02 CLEANING, MAINTENANCE, AND SUPPLIES

A. Provide the following maintenance services:
1. Immediately repair malfunctioning, damaged, leaking, or defective field offices, sheds, site improvements, systems, and equipment.
2. Promptly provide snow removal for field offices, including parking areas, walkways, and stairs and landings.
3. Provide continuous maintenance and janitorial service of field offices and sanitary facilities. Clean field offices at least once per week.
4. Properly dispose of trash as needed, at least twice per week. Dispose of other waste, if any, as required, to avoid creation of nuisances.

B. Provide the following consumables as needed:
1. Light bulbs for interior and exterior lights.
2. Toner or ink cartridges for multifunction printers, as required.
3. Paper supplies for multifunction printers.
4. Dry markers in six colors and white board eraser set.
5. Bottled water suitable for water dispensers and disposable cups.
6. Coffee supplies, including disposable cups, filters, coffee, sugar, creamer, and stir-sticks.
7. Soap, paper towels, cleansers, sanitary supplies, and janitorial implements, including broom.
8. Batteries for smoke detector and other battery-powered items furnished by Remediation Contractor.
9. Replace fire extinguishers upon expiration.
10. Replenish contents of first-aid kits as required.

3.03 REMOVAL

A. Do not remove field offices and sheds until after Substantial Completion. Restore areas upon removal and prior to final inspection.

END OF SECTION

SECTION 01 52 16

FIRST-AID FACILITIES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall provide first-aid facilities during the Project.
      a. Pay all costs for first-aid facilities, including installation, maintenance, and removal.
      b. Maintain, including cleaning, first-aid facilities. Keep first-aid facilities continuously supplied with consumables.
      c. Facilities shall be adequate for personnel using the Site and requirements of the Project.
      d. Provide facilities in compliance with Laws and Regulations.

1.02 REFERENCE STANDARDS

A. The following standards are referenced in this Section:
   1. ANSI Z308.1, Minimum Requirements for Workplace First Aid Kits and Supplies.
   2. ANSI Z358.1, Emergency Eye Wash and Shower Equipment.

1.03 REQUIREMENTS FOR FIRST-AID FACILITIES

A. Provide temporary first-aid stations at or immediately adjacent to the Site's major work areas, and inside the temporary field office. Locations of first-aid stations shall be determined by Remediation Contractor's safety representative. At a minimum, first-aid stations provided shall include:
   1. One first-aid kit complying with ANSI Z308.1.
   2. One eyewash station complying with ANSI Z358.1.

B. Provide list of emergency telephone numbers at each hardwired telephone at the Site. List shall be in accordance with the list of emergency contact information required in Section 01 35 29, Contractor's Health and Safety Plan.

C. When Work is in progress, provide at the Site at least one person trained in first-aid and cardiopulmonary resuscitation (CPR). First-aid- and CPR-trained personnel shall possess valid certificate indicating that they have successfully completed a first-aid and CPR training course by the American Red Cross or similar entity.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 INSTALLATION

A. Location of temporary first-aid facilities shall be as specified in Article 1.03 of this Section.

3.02 USE

A. Properly supervise temporary first-aid facilities.

B. Properly dispose of wastes.

C. Check temporary first-aid stations not less than weekly and verify that sufficient consumables are available. Provide additional consumables if the supply on hand is insufficient.

3.03 REMOVAL

A. Completely remove temporary first-aid facilities and materials when no longer required. Repair damage caused by temporary first-aid facilities and their removal and restore the Site to condition required by the Contract Documents. If restoration of damaged areas is not specified, restore to pre-construction condition.

END OF SECTION

SECTION 01 52 19

SANITARY FACILITIES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Remediation Contractor shall provide all temporary sanitary facilities required for the Project.
   1. Make all arrangements with temporary sanitary facility companies for temporary sanitary services and obtain required permits and approvals for temporary sanitary services.
   2. Pay all temporary sanitary facility service costs, including cost of electricity, water, fuel, and other utility services required for the Work.
   3. Continuously maintain, including cleaning, adequate temporary sanitary facilities for all purposes during the Project, until removal of temporary sanitary facilities. At minimum, provide and maintain temporary sanitary facilities through Substantial Completion and removal of temporary field offices and sheds. Provide consumables as required.
   4. Provide temporary sanitary facilities in compliance with Laws and Regulations and, when applicable, requirements of utility owners.

1.02 REQUIREMENTS FOR TEMPORARY SANITARY FACILITIES

A. Sanitary Facilities.
   1. Provide and maintain a minimum of two suitably enclosed chemical or self-contained toilets and suitable temporary washing facilities for employees and visitors to the Site at each temporary support area (i.e., Area 1 and Area 2), as necessary. Location of temporary toilets shall be acceptable to Owner.
   2. Provide supply of potable drinking water and related facilities and consumables for all personnel using the Site.

PART 2 – PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for temporary sanitary facilities may be new or used but shall be adequate for purposes intended and shall not create unsafe conditions and shall comply with Laws and Regulations including 29 CFR Parts 1910 and 1926.

B. Provide required materials, equipment, and facilities, including piping, wiring, and controls.

PART 3– EXECUTION

3.01 INSTALLATION

A. Install temporary sanitary facilities in neat, orderly, manner, and make structurally, mechanically, and electrically sound throughout.

B. Location of Temporary Sanitary Facilities:
   1. Locate temporary sanitary facilities for proper function and service at main staging area and any remote access/staging sites, as necessary.

2. Temporary sanitary facilities shall not interfere with or provide hazards or nuisances to: The Work under this and other contracts, movement of personnel, traffic areas, materials handling, hoisting systems, storage areas, finishes, and work of utility companies.

C. Modify and extend temporary sanitary facilities as required by progress of the Work.

3.02 USE

A. Maintain sanitary facilities to provide safe, continuous service as required.

B. Properly supervise operation of sanitary facilities:
1. Enforce compliance with Laws and Regulations.
2. Enforce safe practices.
3. Prevent abuse of services.
4. Prevent nuisances and hazards caused by temporary sanitary facilities and their use.
5. Prevent damage to finishes.
6. Ensure that temporary sanitary facilities do not interrupt continuous progress of construction.

C. At the end of each workday, check sanitary facilities and verify that sufficient consumables are available to maintain operation until work is resumed at the Site. Provide additional consumables if the supply on hand is insufficient.

3.03 REMOVAL

A. Following completion of the remedial construction activities, the Remediation Contractor shall remove the temporary sanitary facilities.

END OF SECTION

SECTION 01 53 53

TEMPORARY WATER TREATMENT AND MANAGEMENT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope:

1. Remediation Contractor shall provide all labor, materials, equipment, and incidentals required to furnish, install, test, and place into satisfactory operation, a temporary water treatment system at the location shown on the Design Drawings and as specified herein. The temporary water treatment system shall include the material, equipment and incidentals required to: collect, store, convey, treat, and discharge all liquids generated during performance of the Work. Liquids that shall be handled, treated, and discharged include, but may not be limited to, the following:
   a. Rainfall runoff which accumulates in excavation or containment areas.
   b. Direct precipitation in excavation or containment areas.
   c. Water generated from dewatering activities.
   d. Water generated from decontamination activities.
   e. Groundwater/surface water encountered during remedial activities.
   f. Other water generated as a result of remedial activities.

2. Remediation Contractor shall provide all labor, materials, equipment, and incidentals required to provide power, and to operate and maintain the temporary water treatment system. The temporary water treatment system specified herein is a typical temporary water treatment system that was designed based on sound, industry-accepted design principles and consists of proven treatment technologies and configurations. Remediation Contractor shall have the opportunity to propose an alternate temporary water treatment system design, that at a minimum, shall meet the performance standards, design, construction, and operational intent established herein. The temporary water treatment system shall include the following major components:
   a. Berms, containment, and collection sump
   b. Influent equalization weir tanks
   c. Centrifugal pumps
   d. Sand filter
   e. Bag filters
   f. Organoclay vessel
   g. Liquid-phase granular activated carbon (GAC) vessels
   h. Bone char vessel
   i. ion exchange vessels
   j. Effluent storage/backwash tanks
   k. Conveyance pipe, hose, valves, and appurtenances
   l. Flow meter and totalizer
   m. Spare parts

B. Coordination: Review installation procedures under this and other Sections and coordinate the installation of items that must be installed with, or before the temporary water treatment system.

1.02 REFERENCES

A. Standards referenced in this Section are listed below:
   1. American Society of Mechanical Engineers, (ASME).
   2. American Society for Testing and Materials, (ASTM).
   3. U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA).
      a. Safety and Health Standards 29 CFR 1910/1926.

1.03 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Equipment manufacturers shall have a minimum of five years' experience producing substantially similar equipment and shall be able to show evidence of at least five installations in satisfactory operation for at least five years.

B. Component Compatibility: All components shall be specifically constructed for the specified service conditions and shall be integrated into the overall assembly by the Remediation Contractor.

C. Remediation Contractor's Testing Laboratory:
   a. The Remediation Contractor shall retain the services of an independent testing laboratory authorized to operate in the New York State to perform quality assurance testing required in this Section.
   b. Testing laboratory shall have current National Environmental Laboratory Accreditation Program (NELAP) and New York State Environmental Laboratory Approval Program (ELAP) certification for specific methods (including Perfluorooctane Sulfonate [PFOA] and Perfluorooctanoic Acid [PFOS]) they are performing from a recognized state or federal laboratory accreditation program.
   c. The laboratory shall be capable of providing detection limits at or below New York State Department of Environmental Conservation (NYSDEC) SPDES Permit Equivalent, to allow for comparison of the analytical results to those objectives.

1.04 SUBMITTALS

A. Action Submittals:
   1. Shop Drawings: Complete layout and installation drawings for the equipment showing mounting details, dimensions, fitting locations, materials of construction, containment details, and updated system piping and instrumentation diagram (P&ID). Submit manufacturer's literature, catalog cuts, and specifications for major equipment, and for all appurtenances (piping, valves, instrumentation, etc.) showing performance data, electrical wiring and control diagrams, installation and operation instructions, and applicable certifications.

   2. Operation and Maintenance Manual: Complete Operation and Maintenance Manual, including, but not limited to the following (as applicable): description of operation, start-up and testing procedures; normal (daily) operational procedures; normal and emergency shut down procedures; alarm responses; maintenance data and schedules; daily log sheet; equipment manufacturer's manuals; sampling plan and schedule to maintain consistent system operations and effluent control; manufacturer's recommended spare parts inventory; and calibration and alignment information.

B. Informational Submittals:
   1. Start-up testing analytical results.

1.05 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading: Deliver materials to the Site to ensure uninterrupted progress of the Work.

B. Storage and Protection: Store materials to permit easy access for inspection and identification. Keep all material off the ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.

C. Acceptance at Site: All boxes, crates and packages shall be inspected by the Remediation Contractor upon delivery to the Site. Remediation Contractor shall notify the Remediation Engineer, in writing, if any loss or damage exists to equipment or components. Replace loss and repair damage to new condition in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 EQUIPMENT PERFORMANCE

A. General:
1. Construct and operate the temporary water treatment system to treat collected liquids at a maximum instantaneous flow rate of 1,000 gallons per minute (gpm).
2. Construct the temporary water treatment system with any instrumentation, controls, alarms, or telemetry necessary to operate the system unattended.
3. Winterize the system as needed to protect equipment, pipes, and other components from damage during periods of freezing weather while the system is not in operation.

2.02 EQUIPMENT

A. Berms, Containment, and Collection Sump
1. Construct a containment area for the temporary water treatment system in accordance with indicated on the Design Drawings.
2. Periodically inspect containment area(s) and immediately repair any noted deficiencies.

B. Influent Equalization Weir Tanks
1. Weir tanks shall be 18,000-gallon open-top weir tanks by Adler or approved equal. Minimum total storage capacity shall be 72,000 gallons (equivalent to 4 tanks).
2. Weir tanks shall be of steel construction and shall be equipped with inlet and outlet pipe connections, over and under weirs to promote settling of solids and capture of floatables, access stairs and guardrails meeting OSHA requirements, and liquid level gauge.

C. Centrifugal Pumps
1. Centrifugal Pump 1 shall be Rain-for-Rent DV150IE pump, or equal, with 6” suction and 6” discharge, equipped with a variable speed drive dual voltage 230/460V motor, capable of 2,100 gpm at 135-feet of head.
2. Centrifugal Pump 2 shall be Rain-for-Rent DV100CE pump, or equal, with 6” suction and 4” discharge, equipped with a variable speed drive dual voltage 230/460V motor, capable of 1,150 gpm at 104-feet of head.
3. Pump curves and anticipated duty points for each pumping application shall be submitted for approval.
4. Each centrifugal pump shall have an available spare.

D. Sand Filters

1. Sand filter shall be Yardney Management Systems model IL 4824-4A, or equal, capable of 756 gpm max per vessel. Each vessel shall be filled with 7 cubic feet ½"x3/4" crushed rock and 21 cubic feet 0.47mm crushed silica sand for removal of gross suspended solids.

E. Bag Filters
   1. Bag filters shall be skid-mounted, CSD, Inc. eight-bag vessels, or equal, rated for 1,760 gpm each with 100-micron filter
   2. Each bag filter system shall be equipped with bag filter housings, bag support baskets, legs, interconnecting piping, shutoff valves, sample taps (at inlet and outlet of each housing) and pressure gauges (at inlet and outlet of each housing).
   3. Piping and valves shall be configured to allow each bag filter system to operate in parallel or vessel flow isolation mode. Valves shall isolate individual housing from the filter process, allowing continuous service of the remaining housings during filter bag removal and replacement.
   4. Bag filter housings shall be carbon steel construction built to ASME pressure vessel standards and shall be rated for a maximum working pressure of 150 psi.
   5. Bag filter housings shall be capable of utilizing 0.5-micron high efficiency bag filters.

F. Organoclay Vessel
   1. Organoclay vessel shall be TetraSOLV model DL4-120 or approved equal.
   2. Organoclay vessel shall be designed for a nominal flow rate of at least 1,000 gpm.
   3. System backflush shall be accomplished using the effluent pumps and manually actuated valves. Backflush shall be initiated manually based on pressure differential or elapsed time. System backflush shall be performed using treated water stored in the effluent holding tanks.
   4. Organoclay vessel shall be filled with an appropriate quantity of oil-absorbing clay media. Media shall be 40,000 pounds of Hydrosil HS-200.

G. Liquid Phase GAC Vessels
   1. GAC vessels shall be TetraSOLV model DL4-120 or approved equal. Each unit shall be filled with 20,000 lbs. of COL-GL 60 carbon media or approved equal.
   2. GAC vessels shall be skid-mounted and each vessel shall have a minimum loaded hydraulic capacity of 1,000 gpm. A total of 2 of the specified GAC vessels shall be installed.
   3. GAC vessels shall be designed for a down flow application and a carbon dry fill opening in the top. All vessel fittings shall be installed by the GAC vessel manufacturer at the time and place of manufacture.
   4. System backflush shall be accomplished using the effluent pumps and manually actuated valves. Backflush shall be initiated manually based on pressure differential or elapsed time. System backflush shall be performed using treated water stored in the effluent holding tanks.

H. Bone Char Vessel
   1. Bone char vessel shall be TetraSOLV model DL4-120, or approval equal. Each unit shall be filled with 30,000 pounds of OXOS 824N (8X24) granular bone char media, or approved equal, for removal of Chromium (III) and other metals.
   2. Vessel shall have a minimum loaded hydraulic capacity of 1,000 gpm.

I. Ion Exchange Vessels
   1. Ion exchange vessels shall be TetraSOLV model AF-10,000 filter 96" O.D. x 7'-6" seam to seam height or approved equal. Each unit shall be filled with an anion resin capable of treating 1,000 gpm of groundwater containing up to 3,000 ug/L cyanide.

2. Each vessel shall have a minimum loaded hydraulic capacity of 1,000 gpm.

J. Effluent Storage Tanks
   1. Effluent storage tanks shall be 21,000-gallon tanks by Adler or approved equal. Minimum total effluent storage capacity shall be 42,000 gallons (equivalent to two tanks). Additional effluent storage shall be provided as necessary to meet the minimum startup testing requirements specified in Article 3.02 of this Section.
   2. Effluent storage tanks shall be of steel construction and shall be equipped with inlet and outlet pipe connections and removable hatches which can be opened by personnel for visual inspection and water level measurements, access stairs and guardrails meeting OSHA requirements, and liquid level gauge.

K. Conveyance Pipe, Hose, Valves, and Appurtenances
   1. Provide all necessary piping, hose, valves, and appurtenances required for installation and operation of the temporary water treatment system.
   2. Piping located inside the temporary water treatment system containment area shall be Schedule 80 PVC. Hoses shall be Versiflo 150 by Goodyear Tire and Rubber Co., Inc., or approved equal. Piping located outside the temporary water treatment system containment area shall be single wall, HDPE SDR 11 with butt fused connections. HDPE Pipe shall be Driscoplex® by Performance Pipe, CP Chemical Co.
   3. Piping, hose, valves, and appurtenances shall conform to applicable ASTM standards.
   4. Piping shall be secured to prevent displacement, supported in accordance with manufacturer's instructions, and protected from vehicular traffic when placed on ground surface.

L. Flow Meter/Totalizer
   1. Flow meter shall be 4-inch Recordall® Turbo model 2000 by BadgerMeter, Inc., or approved equal.
   2. Flow meter shall be capable of displaying instantaneous and totalized flow locally. Flow meter shall be equipped with totalizer model ER-10 by BadgerMeter, Inc., or approved equal.

M. Spare Parts
   1. Remediation Contractor shall furnish spare parts and accessories necessary to operate and maintain the temporary water treatment system for the duration of the Work.
   2. Stock equipment manufacturer's recommended spare parts at the Site. Spare parts shall be identical and interchangeable with original equipment parts.
   3. Stock spare schedule 80 PVC pipe, fittings, valves, transfer hose, and pressure gauges, necessary to make timely repairs to the temporary water treatment system conveyance piping.
   4. Store spare parts in secure location in accordance with manufacturer's instructions.

PART 3 - EXECUTION

3.01 GENERAL

A. Install, operate, and maintain temporary water treatment system in accordance with the Contract Documents, approved submittals, and manufacturer's instructions and requirements; and so as to not exceed the substantive requirements for water discharge limitations identified in the State Pollutant Discharge Elimination System (SPDES) Equivalency Permit to be obtained prior to remedial construction.

3.02 TESTING AND STARTUP ACTIVITIES

A. Perform temporary water treatment system startup, testing, and troubleshooting activities prior to initiating full-scale (normal) operations. Startup and testing activities shall be in accordance with equipment manufacturer's recommendations and as indicated in Remediation Contractor prepared O&M Manual which has been reviewed by the Remediation Engineer.

B. General startup and testing of the temporary water treatment system shall consist of treating a minimum of 40,000 gallons of water collected from the first proposed excavation area (i.e., water that has been in contact with soil to be disturbed). During the startup test, the temporary water treatment system shall be operated at the 1,000 gpm peak flow rate until the entire 40,000-gallon batch is treated. The Remediation Contractor shall continuously monitor and record readings (every 15 minutes minimum) from all pressure gauges, flow meters, and other installed instrumentation necessary to demonstrate that the system is operating as designed, including backwash, by-pass, and recycle functions, to the satisfaction of the Remediation Engineer.

C. Remediation Contractor shall collect start-up testing water samples following treatment of approximately 20,000 gallons and 40,000 gallons of water. The entire 40,000 gallons of treated water shall be retained in the effluent storage tanks until analytical results indicate that water may be discharged. Samples collected during start-up shall be submitted for laboratory testing in accordance with the SPDES Permit Equivalent, to be obtained by the Design Engineer, which is assumed to consist of the following parameter list:
   1. Volatile Organic Compounds via USEPA Method No. 624 or 8260
   2. Semi-Volatile Organic Compounds (SVOCs) via USEPA Method No. 625 or 8270
   3. Metals via USEPA Method No. 200.7 or 6010
   4. Total Cyanide via USEPA Method No. 335.4 or 9010
   5. Oil and Grease via USEPA Method No. 1664A
   6. pH via USEPA Method No. 9040B
   7. Total Suspended Solids via USEPA Method No. 2540D-11

3.03 COLLECTION OF LIQUIDS

A. Liquid that requires handling, treatment, and disposal shall be collected and transferred to the temporary water treatment system. The method(s) by which water is collected shall be area-specific and shall be conducted in a manner that prohibits the spillage, leakage, or other release of liquid as collected.

B. Maintain timely and accurate records concerning the volumes and areas from which accumulated liquids are removed and transported to the temporary water treatment system.

C. Equipment utilized to collect/handle accumulated liquids, including pumps, tanks, and tanker trucks, as appropriate, shall be decontaminated prior to removal from the Site.

3.04 HANDLING AND STORAGE OF LIQUIDS

A. Store liquids in containers acceptable to the Remediation Engineer and Owner. Storage containers may be reused by the Remediation Contractor, unless otherwise directed by the Remediation Engineer.

B. Storage containers shall be clearly marked to indicate the known or suspected contents, source area(s), and date(s) of generation.

3.05 WATER QUALITY TESTING

A. Temporary water treatment system water quality testing will be conducted by the Remediation Contractor during normal operations. During the first month of operation, testing is assumed to be conducted once per week. During and after the second month of operation, extending until system shutdown, testing is assumed to be conducted once per week. Note, water quality testing may have to be conducted more frequently, dependent on the SPDES Equivalency Permit requirements. Operational sampling will be collected by the Remediation Contractor and submitted for laboratory testing in accordance with the SPDES Equivalency Permit.

B. Notify Remediation Engineer and Owner regarding any operational, sampling, or effluent discharge issues that exceed permit limitations.

3.06 ROUTINE MONITORING

A. The temporary water treatment system shall initially be manually operated and controlled through a series of valves, visual reading gauges, and pump controls as necessary to accommodate system operation. Remediation Contractor shall provide an experienced operator to be on site during temporary water treatment system operation. While the system is operating, the operator shall have no other duties that interfere with the manual operation of the temporary water treatment system. As operating experience is gained, the Remediation Contractor may add additional controls and alarms approved by Remediation Engineer to eliminate the need for a dedicated on-site system operator.

B. The Remediation Contractor prepared O&M manual shall describe the routine activities to be conducted at least once per shift by the temporary water treatment system operator. Activities should be in accordance with equipment manufacturer's requirements and recommendations. Those activities shall include, but not be limited, to the following:
   1. Verify that valves are positioned properly, to fill and drain the tanks as applicable.
   2. Visual inspection of piping, hoses, and valves noting damage, leakage, or other defects.
   3. Visual inspection of storage tanks noting water levels, damage, leakage, corrosion, or other defects. When tanks are emptied, the sediment thickness in the bottom of the tank shall be gauged and recorded. If sediment is observed to be 4 inches deep, or if directed by the Remediation Engineer, the tank shall be cleaned. Liquids resulting from cleaning activities shall be treated using the temporary water treatment system, and solids shall be collected for subsequent disposal in accordance with Section 02 61 15, Handling and Disposal of Impacted Materials.
   4. Visual inspection of pumps and equipment noting excessive noise or vibration, damage, leakage, corrosion, or other defects.
   5. Obtain readings from temporary water treatment system pressure gauges associated with the different treatment processes within the treatment train(s). Pressure gauge readings shall be utilized to determine when a backwash event or filter replacement is required, or a particular treatment unit is not functioning properly.
   6. Obtain readings from the system flow meter totalizer to monitor system flow rate, totalized flow to date, and daily flow total.
   7. Visual inspection of containment liner noting damage, standing water, or other
   8. Remediation Contractor shall collect, at a minimum once per day, water quality field data consisting of turbidity and pH measurements to provide indications of system performance. As operating experience is gained and following approval of the Remediation Engineer, the Remediation Contractor may reduce the frequency of the monitoring. Samples shall be collected in the individual treatment trains at the following locations:

a. Influent equalization weir tanks
b. Upstream of bag filter units
c. Downstream of organoclay vessels
d. Downstream of liquid-phase GAC units

3.07 CORRECTIVE ACTIONS

A. At the direction of the Owner or the Remediation Engineer, the Remediation Contractor shall take corrective actions necessary to maintain specified treatment system performance in the event of an upset condition and/or operating conditions that result in non-compliant effluent water quality. During corrective actions, the Remediation Contractor may be required by the Owner or the Remediation Engineer to mobilize additional effluent storage tanks, improved equipment, and/or repeat start-up and testing procedures as specified herein. If the Remediation Contractor fails to make these corrections, or if the improved equipment fails to meet specified requirements, Owner, notwithstanding having made partial payment for work and materials which have entered into the manufacture of said equipment, may reject said equipment and order the Remediation Contractor to remove it from the premises at the Remediation Contractor's expense.

3.08 DOCUMENTATION

A. Remediation Contractor shall maintain a daily operations log (i.e., tabulated results) to record, at a minimum; flow rate, volume treated, volume discharged, sampling completed, media changeouts and any issues identified/corrected. In addition, all activities related to O&M of the temporary water treatment system shall be documented in the daily log. The daily log shall be kept onsite and shall be made available to the Remediation Engineer on demand.

END OF SECTION

SECTION 01 55 13

TEMPORARY ACCESS ROADS AND PARKING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Provide temporary construction roads, walks, parking areas, and appurtenances required during the Project for use by the Remediation Contractor, subcontractors, the Owner, the Owner's employees (e.g., the Remediation Engineer), and emergency vehicles.
   2. Temporary roads and parking areas shall be designed and maintained by Remediation Contractor and shall be fully passable to vehicles in all weather conditions.

B. Use of Existing Roads:
   1. Remediation Contractor is allowed to use existing roads upon the Effective Date of the Agreement.
   2. Prevent interference with traffic on existing roads and parking areas. At all times, keep access roads and entrances serving the Site clear and available to the Owner, the Owner's employees (e.g., the Remediation Engineer), emergency vehicles, and other contractors. Do not use access roads or Site entrances for parking or storage of materials or equipment.
   3. Prior to use, Remediation Contractor shall document the existing condition of any existing roads intended to be used during the Project, in accordance with Section 01 71 26, Construction Surveying and Layout.
   4. Remediation Contractor shall indemnify and hold harmless the Owner and the Remediation Engineer from expenses caused by the Remediation Contractor's operations over existing roads and parking areas.
   5. After use and restoration (as necessary), the Remediation Contractor shall document the final condition of pre-existing roads used during the Project, in accordance with Section 01 71 26, Construction Surveying and Layout.
   6. Schedule deliveries to minimize use of driveways and Site entrances.

1.02 SITE ACCESS

A. Site Access:
   1. Remediation Contractor access to the upland support area for Area 1 will be via the site entrance located at 218 South Main Street, Homer, New York.
   2. Remediation Contractor access to the upland support area for Area 2 will be via the temporary construction access road/railroad crossing located at the north end of Front Street, Cortland, New York.
   3. Remediation Contractor shall comply with public roadway requirements for weight and height.

1.03 REMEDIATION CONTRACTOR PARKING

A. Remediation Contractor employee vehicles shall park in designated area(s) at the upland support areas for the Site.

B. Park construction vehicles and equipment in work areas off permanent roads and parking areas, in areas of the Site designated (and approved by the Remediation Engineer) for Remediation Contractor staging.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Materials for temporary roads and parking areas shall comply with the Contract Documents.

B. Traffic controls shall comply with requirements of authorities having jurisdiction.

PART 3 – EXECUTION

3.01 TEMPORARY ROADS AND PARKING AREAS

A. Temporary Roads and Parking in Areas Different from Permanent Pavement:
   1. Provide temporary roads and parking areas adequate to support and withstand traffic loads during the Project. Locate temporary roads and parking areas as shown on the Design Drawings and in areas conducive to facilitate the Project (as approved by the Remediation Engineer).
   2. Provide reasonably level, graded, well-drained subgrade of satisfactory soil material, compacted to at least 95 percent of maximum dry density in the upper six inches.
   3. Where required to support loads and provide separation between subgrade and subbase materials, provide geotextile, as required.
   4. Provide required material (Section 31 05 05, Aggregates for Earthwork) to minimum thickness indicated on the Design Drawings, roller-compacted to level, smooth, dense surface. Subbase for temporary roads and areas traveled by construction vehicles shall be adequate for loads and traffic served.
   5. Install Construction Entrance Pads at all access points from temporary roads to permanent pavement as detailed in the Design Drawings.

B. Crane Access Roads
   1. Provide temporary crane access roads adequate to support crane loads during the project. Locate temporary crane access roads as shown on the Design Drawings.
   2. Strip and stockpile existing material adjacent to the crane access road locations in accordance with the Design Drawings. Provide reasonably level, graded, subgrade.
   3. Where required to support loads provide triaxial geogrid, as required in Specification Section 31 05 19.13, Geotextiles for Earthwork.
   4. Provide required materials as required in Specification Section 31 05 05, Aggregates for Earthwork, to minimum thickness indicated on the Design Drawings, roller-compacted to level, smooth, dense surface. Subbase for crane access roads will be adequate for loads and traffic served.

C. Railroad Crossing
   1. Coordinate with New York Susquehanna, and Western Railway (NYSW) to construct rail crossing at the location indicated on the Design Drawings.
   2. Rail crossing will be constructed by the NYSW in accordance with the Rail Crossing Design included as Attachment 1 to the Remedial Design.

3.02 TRAFFIC CONTROLS

A. Traffic Controls:
   1. Provide temporary traffic controls at intersections of temporary roads, including intersections with other temporary roads, intersections with public roads, intersections with permanent access roads at the Site, and at pedestrian crossings, as necessary.
   2. Provide traffic control signs on roads and drives, as shown on the Design Drawings.
      a. Provide warning signs on permanent roads and drives and provide “STOP” signs for traffic on temporary roads where required and at entrances to permanent pavement.
   3. Provide a temporary pedestrian crossing at Area 1, as necessary, and in accordance with NYSDOT requirements.
   4. Comply with requirements of authorities having jurisdiction.
      a. Comply with Contract Specifications and Section 619 of the NYSDOT Standard Construction Details and Specifications.

3.03 MAINTENANCE OF ROADS

A. General:
   1. Maintain temporary roads and parking to continuously provide access for construction vehicles and trucks, emergency vehicles, and Remediation Engineer.
   2. Public roads shall be passable at all times unless a road closure is allowed in writing by authority having jurisdiction.
   3. When granular material of temporary roads and parking without hard surfacing become intermixed with soil or when temporary roads otherwise create a nuisance, remove intermixed granular-and-soil material and replace with clean aggregate as required.

B. Cleaning and Dust Control:
   1. Cleaning: Clean paved surfaces over which construction vehicles travel. Perform cleaning by mechanical sweeping a minimum of once per day when construction vehicles are traveling over roads (or more frequently as directed by Remediation Engineer). Clean the following surfaces:
      a. Roads within limits of the Project.
      b. Permanent roads at the Site, between the site entrance and the work areas, between the site entrance and construction parking and staging areas.
      c. Public roads that require sweeping and cleaning due to construction operations.
   2. Dust Control:
      a. Control dust resulting from construction activities to prevent nuisances at the Site and in nearby areas.
      b. Apply water or use other methods subject to the Remediation Engineer’s acceptance that will minimize airborne dust. Do not use water when water will cause hazardous or objectionable conditions such as mud, ponds, and pollution.
      c. Provide dust control that is non-polluting and does not contribute to tracking-out of dirt and dust onto pavement. Re-apply dust control treatment as required.
      d. Comply with Section 01 57 05, Temporary Controls.

C. Protection of Underground Facilities: Provide temporary, heavy-duty steel roadway plates as needed to protect existing, manholes, handholes, valve boxes, vaults, and other Underground Facilities near to or visible at the ground surface.

3.04 REMOVALS AND RESTORATION

A. Removals:
   1. Remove temporary roads, walks, and parking areas unless otherwise indicated in the Contract Documents or requested by the Owner. Return areas of temporary roads, walks, and parking to pre-construction condition unless otherwise indicated in the Contract Documents or requested by the Owner. Remove temporary gates, fencing, and traffic controls associated with temporary roads and parking areas unless otherwise indicated in the Contract Documents or requested by the Owner.

B. Restoration:
   1. Repair or replace paving, curbs, gutters, and sidewalks affected by temporary roads and parking, and restore to required conditions in accordance with authorities having jurisdiction.
   2. Restore to pre-construction conditions existing roads, walks, and parking areas damaged by Remediation Contractor, subject to approval of the owner of affected roads, walks, and parking areas.

END OF SECTION

SECTION 01 57 05

TEMPORARY CONTROLS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall provide and maintain methods, equipment, materials, and temporary construction as required to control environmental conditions at the Site and adjacent areas.
   2. Maintain temporary controls until no longer required.
   3. Temporary controls include, but are not limited to, the following:
      a. Erosion, sediment, and turbidity controls.
      b. Control of surface water, including storm water run-on and run-off.
      c. Sheen controls.
      d. Odor, vapor, and dust controls.
      e. Pollution controls.
      f. Noise controls.

1.02 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with applicable provisions and recommendations of the following reference standards:
      a. New York State Department of Environmental Control (NYSDEC) New York State Standards and Specifications for Erosion and Sediment Control (latest edition).

1.03 SUBMITTALS

A. Informational Submittals:
   1. The Remediation Engineer shall submit daily turbidity monitoring report in accordance with Article 1.04 of this Section, or at a reduced frequency if requested by the Owner.
   2. The Remediation Engineer shall submit air monitoring report and exceedance report (as necessary) in accordance with Section 01 35 49, Community Air Monitoring Plan.

B. Action Submittals:
   1. The Remediation Contractor shall submit the following plans (separate or as part of the Remediation Contractor's Project Operation Plan):
      a. Erosion and Sediment Control Plan.
      b. Turbidity and Sheen Control Plan.
      c. Noise Control Plan.
      d. Odor, Dust, and Vapor Control Plan.
      e. Pollution Control Plan.
   2. Product Data: Submit manufacturer's product data, specifications, and installation instructions for the following:
      a. Fiber Roll, Silt fencing.
      b. Turbidity curtain system materials.
      c. Oil absorbent boom materials.
      d. Vapor mitigation agents and proposed application and storage equipment for each.
   3. Turbidity monitoring data, in accordance with Article 3.02 of this Section.

1.04 DAILY TURBIDITY MONITORING REPORTS

A. Remediation Engineer shall prepare turbidity monitoring reports throughout the Project. Include in each report, at a minimum, the following:
   1. Remediation Contractor's name.
   2. Owner's name.
   3. Remediation Engineer's name.
   4. Project name.
   5. Site name and location.
   6. The following for each day that turbidity monitoring is performed:
      a. Date and day of the week.
      b. General location and brief description of work performed at the Site.
      c. Turbidity results for each monitoring station and the differential between the upstream and downstream monitoring stations.
      d. Daily maximum differential between the upstream and downstream monitoring stations.
      e. Exceedances (if any) of the action levels specified in Article 3.02.F of this Section. Provide the following:
         1) Time, location, and reading (above background) of exceedance.
         2) General location and brief description of work being performed at time of exceedance.
         3) Source or cause of exceedance, if determined.
         4) Corrective actions taken or to be taken in response to exceedance.
         5) Date and time verbal or written notification was provided to NYSDEC of the exceedance.
      f. Notation of visual observation of turbidity, if any.

B. Remediation Engineer will distribute daily turbidity monitoring reports within three business days after the day covered in the associated report:
   1. Owner.
   2. Remediation Contractor.
   3. NYSDEC.
   4. New York State Department of Health.
   5. Others as appropriate.

PART 2 – PRODUCTS

2.01 EROSION, SEDIMENT, AND TURBIDITY CONTROLS

A. General:
   1. Materials used for erosion, sediment, and turbidity controls will be in accordance with the applicable regulatory requirements indicated in Article 1.02 of this Section, unless otherwise shown or indicated in the Contract Documents.

B. Silt Fencing:
   1. Filter Fabric:
      a. Material: Geotextile will comply with the New York State Standards and Specifications for Erosion and Sediment Control standard and specifications for reinforced silt fence.
      b. Height: Three feet, minimum.
   2. Fence Support Posts:
      a. Material: Hardwood or steel posts may be used.
         1) Hardwood posts will be at least 1.25 inches by 1.25 inches in cross section.

2) Steel posts will be "T" or "U" shape in cross section with a minimum weight of 1.0 pound per linear foot.

b. Length: Three feet, minimum.

3. Wire Reinforcing: Wire fencing will be a minimum 14 gauge with a maximum 6 in. mesh opening or as approved.
4. Fabric fasteners will be heavy-duty staples, wire ties, or other fastener compatible with support post material.

C. Straw Bale Dike:
1. Bales will be firmly packed, unrotted straw bound firmly with intact baling wire. Cross-sectional area on the small end of each bale will be approximately 12 inches by 12 inches or larger.
2. Posts will comply with requirements for silt fencing support posts or may be suitable reinforcing steel.

D. Fiber Roll:
1. Fiber Roll will be a minimum of 9 inches in diameter and follow selected manufacturer material recommendations.
2. Fiber Roll Support:
a. Hardwood posts will be at least 2 inches by 2 inches in cross section and installed in the middle of the Fiber Roll.
b. In the event staking is not possible, concrete blocks or sandbags will be used to stabilize the Fiber Roll.

E. Temporary Construction Entrance:
1. Stone used will be in accordance with the Design Drawings and Section 31 05 05, Aggregates for Earthwork.

F. Turbidity Curtain System:
1. Turbidity curtain system will isolate the active Work Area as indicated on the Design Drawings or as directed by the Remediation Engineer, from the Tioughnioga River to prevent migration of suspended sediments outside the Work Area.
2. Turbidity curtains will be a pre-assembled system, as specified on the Design Drawings.

2.02 TURBIDITY MONITOR

A. Turbidity monitor will consist of the following main components, or equivalent:
1. Data station (NexSens MB-300) with batteries, solar panels, and LED beacon, turbidity sensor (YSI 6136).
2. Submersible data-logging system (NexSens SDL500C) with cellular modem telemetry.
3. Computer software (iCharts).

2.03 SHEEN CONTROLS

A. Oil Absorbent Boom:
1. Provide oil absorbent pads, rolls, and booms as required to contain sheens, should they occur, and prevent the potential migration of pollutants in accordance with all applicable laws and regulations.
2. Oil absorbent booms will be five to eight inches in diameter.
3. Remediation Contractor shall maintain and replace oil absorbent booms as necessary to prevent migration of oils/sheens beyond the boom.

2.04 ODOR, VAPOR, AND DUST CONTROLS

A. Vapor Mitigation Agents:
   1. BioSolve® Pinkwater®, by The BioSolve Company.
   2. AC-645 Long-Duration Foam, by Rusmar, Inc.

B. Water: Clean, potable.

C. Provide pressure washers, pneumatic foam unit, portable tanks, hoses, and other equipment required for the storage and application of vapor mitigation agents and water.

D. Provide a water truck, as necessary to control dust on site and on river access roads. Provide a sweeper truck to clean any materials tracked off site onto public roadways, as necessary.

PART 3 – EXECUTION

3.01 EROSION, SEDIMENT, AND TURBIDITY (INCLUDING SHEEN) CONTROL

A. Installation and Maintenance:
   1. General:
      a. Provide erosion and sediment controls as shown and indicated on the Design Drawings and elsewhere in the Contract Documents. Provide erosion and sediment controls as the Work progresses into previously undisturbed areas.
      b. Installation of erosion and sediment controls will be in accordance with the applicable regulatory requirements indicated in Article 1.02 of this Section, unless otherwise shown or indicated in the Contract Documents.
      c. Use necessary methods to successfully control erosion and sedimentation, including ecology-oriented construction practices, vegetative measures, and mechanical controls. Use best management practices in accordance with Laws and Regulations, and regulatory requirements indicated in Article 1.02 of this Section, to control erosion and sedimentation during the Project.
      d. Plan and execute construction, disturbances of soils and soil cover, and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation. Provide temporary measures for controlling erosion and sedimentation, as indicated in the Contract Documents and as required for the Project.
      e. Where areas must be cleared for storage of materials or equipment, or for temporary facilities, provisions will be made for regulating drainage and controlling erosion and sedimentation, subject to the Remediation Engineer’s approval.
      f. Provide erosion and sediment controls, including stabilization of soils, at the end of each workday.
   2. Coordination:
      a. Coordinate erosion and sediment controls with this Section's requirements on water control and with Section 01 41 26, Storm Water Pollution Prevention Plan (SWPPP) and Permit.
      b. Coordinate temporary erosion and sediment controls with construction of permanent drainage facilities and other Work to the extent necessary for economical, effective, and continuous erosion and sediment control.
   3. Before commencing activities that will disturb soil or soil cover at the Site, provide all erosion and sediment control measures required by the Contract Documents for the areas where soil or soil cover will be disturbed.
   4. In general, implement construction procedures associated with, or that may affect, erosion and sediment control to ensure minimum damage to the environment during

construction. Remediation Contractor shall implement any and all additional measures required to comply with Laws and Regulations, and Section 01 41 26, SWPPP and Permit.

5. Vegetation Removal:
   a. Perform clearing, grubbing, and related operations in accordance with Section 31 11 00, Clearing and Grubbing.
   b. Remove only those shrubs, grasses, and other vegetation that must be removed for construction. Protect remaining vegetation.
6. Access Roads and Parking Areas: When possible, access roads and temporary roads will be located and constructed to avoid adverse effects on the environment. Provisions will be made to regulate drainage, avoid erosion and sedimentation, and minimize damage to vegetation.
7. Sediment Removal and Temporary Controls:
   a. Perform sediment removal, fill, and related operations in accordance with Section 31 05 05, Aggregates for Earthwork and Section 31 23 00, Excavation and Fill.
   b. Control erosion to minimize transport of soil from staging areas into existing waterways and surface waters. Such measures will include, but are not limited to, using berms, silt fencing, straw bale dikes, gravel or crushed stone, slope drains, and other methods. Apply such temporary measures to erodible materials exposed by activities associated with the construction of the Project.
   c. Remediation Contractor shall provide special care in areas with steep slopes, where disturbance of vegetation will be minimized to maintain soil stability.
8. Inspection and Maintenance:
   a. Periodically inspect areas of earthwork and areas where soil or soil cover are disturbed to detect evidence of the start of erosion and sedimentation; apply corrective measures as required to control erosion and sedimentation. Continue inspections and corrective measures until soils are permanently stabilized and permanent vegetation has been established.
   b. Inspect and report not less often than the frequency specified in Section 01 41 26, SWPPP and Permit.
   c. Repair or replace damaged erosion and sediment controls within one day of Remediation Contractor becoming aware of such damage.
   d. Periodically remove silt and sediment that has accumulated in or behind sediment and erosion controls. Properly dispose of silt and sediment in accordance with Section 01 74 19, Construction Waste Management and Disposal or Section 02 61 15, Handling and Disposal of Impacted Materials, as appropriate.
9. Duration of Erosion and Sediment Controls:
   a. Maintain erosion and sediment controls in effective working condition until the associated drainage area has been permanently stabilized.
   b. Maintain erosion and sediment controls until the Site is restored and site improvements including landscaping, if any, are complete with underlying soils permanently stabilized.
10. Work Stoppage: If the Work is temporarily stopped or suspended for any reason, Remediation Contractor shall provide additional temporary controls necessary to prevent environmental damage to the Site and adjacent areas while the Work is stopped or suspended.
11. Failure to Provide Adequate Controls: In the event Remediation Contractor repeatedly fails to satisfactorily control erosion and siltation, the Owner reserves the right to employ outside assistance or to use Owner's own forces for erosion and sediment control. Cost of such work, plus engineering and inspection costs, will be deducted from monies due to Remediation Contractor.

B. Silt Fencing:
   1. Install and maintain silt fencing in a vertical plane, at the location(s) shown or indicated on the Design Drawings.
   2. Locations of Silt Fencing:
      a. Where possible, install silt fencing along contour lines so that each given run of fencing is at the same elevation.
      b. On slopes, install silt fencing at intervals that do not exceed the maximum lengths indicated in Table 01 57 05-A.

TABLE 01 57 05-A
MAXIMUM LENGTH OF SLOPE BETWEEN RUNS

Slope	Slope Length (feet)
1:2 (50%)	25
1:3 (33%)	50
1:4 (25%)	75
1:5 (20%) and Less	100

      c. Provide silt fencing around the perimeter of each stockpile of topsoil, general fill material, and excavated material. Install silt fencing before expected precipitation and maintain until stockpile is removed.
      d. Do not install silt fencing at the following types of locations:
         1) Area of concentrated storm water flows such as ditches, swales, or channels.
         2) Where rock or rocky soils prevent full and uniform anchoring of silt fencing.
         3) Across upstream or discharge ends of storm water piping or culverts.

   3. Installation:
      a. Securely fasten filter fabric to each support post in no less than four locations. Spacing between support posts will not exceed 10 feet (center to center).
      b. When two sections of filter fabric abut each other, fold over edges and overlap by minimum of six inches and securely fasten to wire mesh.
      c. Embed posts in the ground to the depth necessary for proper controls, but not less than 16 inches below ground surface.
      d. Filter fabric will extend a minimum of six inches below ground and a minimum of 20 inches above ground.
      e. Filter fabric at bottom of silt fence will be buried in a trench, in a “J” configuration, to a depth of six inches.
   4. Maintenance:
      a. Conduct routine inspection in accordance with Section 01 41 26, SWPPP and Permit.
      b. Remove accumulated sediment when depth reaches one-half the effective height of the sediment control.
      c. Repair and reinstall silt fencing as required.
      d. Do not allow formation of concentrated storm water flows on slopes above silt fencing unless so shown or indicated in the Contract Documents. If unauthorized concentrated storm water flows occur, stabilize the slope via earthmoving and other stabilization measures as required to prevent flow of concentrated storm water flows toward silt fencing.

C. Fiber Roll:
   1. Install and maintain Fiber Roll at the location(s) downgradient of Work Area and/or as shown on the Construction Drawings or modified by the Remediation Engineer in the field, or as otherwise deemed necessary by the Remediation Contractor. Fiber Roll will be installed in accordance with the manufacturer’s recommendations.

a. Where possible, install Fiber Roll along contour lines so that each given run is at the same elevation.
b. On slopes greater than 2:1 (H:V) install a second run of Fiber Roll at the top of slope. Install Fiber Roll at intervals that do not exceed the maximum intervals indicated in Table 01 57 05-B of this Section.

TABLE 01 57 05-B
MAXIMUM LENGTH OF SLOPE ABOVE EACH FIBER ROLL RUN

Slope (percent)	Slope Length (feet)
2 and less	600
2.1 to 5	400
5.1 to 10	200
10.1 to 15	140
15.1 to 20	100
20.1 to 25	80
25.1 to 40	60
40.1 to 50	40

c. Provide erosion and sediment control measures around the perimeter of each stockpile of topsoil, general fill material, and excavated material. Install erosion and sediment control before expected precipitation and maintain until stockpile is removed.

2. Installation:
   a. Securely stake Fiber Roll using 2-inch x 2-inch x 3 feet hard wood stakes through the middle of the Fiber Roll on 10 feet centers or other methods in accordance with manufacturer's instructions and approved by the Remediation Engineer.
   b. When two sections of Fiber Roll abut each other, overlap sections 18 inches and securely stake.
   c. Embed posts in the ground to the depth necessary for proper controls in accordance with manufacturer's specifications.
3. Maintenance:
   a. Conduct routine inspection in accordance with Section 01 41 26, SWPPP and Permit.
   b. Remove accumulated sediment when depth reaches one-half the effective height of the sediment control.
   c. Repair and reinstall Fiber Roll as required.
   d. Do not allow formation of concentrated storm water flows on slopes above Fiber Roll unless so shown or indicated in the Contract Documents. If unauthorized concentrated storm water flows occur, stabilize the slope via earthmoving and other stabilization measures as required to prevent flow of concentrated storm water flows toward Fiber Roll.

D. Straw Bale Dike:
1. Install straw bale dikes where shown or indicated, including in swales, along contours, and along toe of slopes. On slopes, install straw bale dikes at intervals that do not exceed the maximum lengths indicated in Table 01 57 05-A of this Section.
2. Install bales in shallow excavation as wide as the bale and approximately four to six inches below surrounding grade.
3. Ends of bale will tightly abut ends of adjacent bales.
4. Securely install straw bales using two support posts per bale, driven into the ground a minimum of 1.5 to 2 feet below bottom of bale. Top of post will be flush with top of bale. Angle first post for each bale toward the previously installed bale.
5. Frequently inspect bales and repair or replace as required. Remove accumulated silt and debris from behind straw bales.

E. Protection of Storm Water Drainage Inlets and Catch Basins:
   1. Protect each drainage inlet and catch basin that has the potential to receive storm water run-off from exposed soils.
   2. Install inlet filter bags inside of drainage inlet or catch basin in accordance with manufacturer's instructions. Secure inlet filter bag with the structure's grate or by other acceptable means. Alternate protection methods may be used with Remediation Engineer's approval.
   3. Inlet filter bags will not pose any obstruction above the elevation of the drainage inlet or catch basin grate requiring barricades or flashers.
   4. When removing silt and sediment from inlet filter bag, do not dump filter bag's contents into the drainage inlet or catch basin.
   5. Remove silt and sediment from inlet filter bag, or replace inlet filter bag, when inlet filter bag is not more than half full.

F. Temporary Construction Entrance:
   1. Where shown on the Design Drawings, and where construction vehicles will regularly transit to paved surfaces from unstabilized surfaces, provide a temporary construction entrance. Remediation Contractor vehicles shall use temporary construction entrances.
   2. Provide temporary construction entrances of the width, length, and thickness shown or indicated on the Drawings. When not shown or indicated on the Drawings, temporary construction entrance will be not less than 50 feet long, by 15 feet wide, by 6 inches thick. Slope of entrance will not exceed 12 percent.
   3. Installation:
      a. Ensure that subgrade under temporary construction entrance is suitably dense for the intended purpose. Suitably prepare subgrade as required for temporary construction entrance.
      b. Provide on subgrade a layer of geotextile fabric, installed in accordance with geotextile manufacturer's recommendations and in accordance with Section 31 05 19.13, Geotextiles for Earthwork.
      c. Provide crushed stone on installed geotextile in accordance with Design Drawings and Section 31 05 05, Aggregates for Earthwork. Grade crushed stone for passage of vehicles.
   4. Maintenance:
      a. Maintain temporary construction entrance at not less than the minimum required thickness. Add crushed stone as required to maintain thickness.
      b. When upper layer of temporary construction entrance becomes contaminated with soil, remove the contaminated material and replace with clean crushed stone.
      c. Using water to wash down temporary construction entrance or paved areas onto which soil material has been tracked is prohibited.

G. Turbidity Curtain System (Including Oil Absorbent Booms and Pads)
   1. General:
      a. Provide two-stage turbidity curtain and sheen controls as shown and indicated on the Design Drawings.
      b. Install two-stage turbidity curtain system downstream of the Work Area.
      c. Use best management practices (BMP) to control turbidity and sheen, including mechanical controls.
      d. Anchor the turbidity curtain at the shoreline in a manner that controls suspended particulates near the shoreline.
      e. If installation of the two-stage curtain is not practicable due to river conditions (e.g., water depth or velocity), more localized measures for turbidity and sheen control measures will be used.
      f. Oil Absorbent Booms and Pads will be on hand for immediate deployment if sheens are observed on the water column.

2. Before commencing activities that will disturb sediment at the Work Area, provide all turbidity and sheen control measures required for the areas where material will be disturbed.
3. Implement construction procedures associated with, or that may affect, turbidity and sheen control to ensure minimum damage to the environment during construction. Remediation Contractor shall implement any and all additional measures required to comply with Laws and Regulations.
4. Control turbidity and sheen to minimize transport of material to or from the Site and adjacent surface waters. Apply such temporary measures to areas disturbed by activities associated with the construction of the Project.
5. Inspection and Maintenance
    a. Periodically inspect areas where sediments are disturbed to detect evidence of the start of turbidity and sheen; apply corrective measures as required to control turbidity and sheen.
    b. Repair or replace damaged turbidity and sheen controls within 1 hour of Remediation Contractor becoming aware of such damage.
6. Maintain turbidity and sheen controls in effective working condition until the associated Work Area has been returned to pre-construction conditions.

3.02 TURBIDITY MONITORING

A. Turbidity monitoring will be performed by the Remediation Contractor to monitor the effectiveness of the turbidity barriers. Monitoring will be conducted by the Remediation Contractor prior to the start of dredging activities to establish a baseline and subsequently during the dredging operations to assess the effectiveness of the turbidity barriers.
B. During the intrusive operations, turbidity monitoring will consist of real-time turbidity monitoring stations at a minimum of two locations in the Tioughnioga River:
    1. One location approximately 300 feet upstream of the active work area (upstream location).
    2. One location approximately 100 feet downstream of the turbidity curtain system (downstream location).
    3. Final locations to be determined based on field conditions/accessibility and/or permit requirements.
C. At each monitoring location, turbidity will be monitored in real time using a turbidity monitoring system, consisting of the following main components: data station, turbidity sensor, submersible data-logging system with cellular modem telemetry, and computer software. Turbidity levels will be measured using International Organization for Standardization 7027 method and reported in nephelometric turbidity units (NTUs).
D. Turbidity levels will be logged and transmitted a minimum of every 15 minutes. The Remediation Contractor will provide the Remediation Engineer with access to the real-time turbidity data.
E. Turbidity exceedance levels are as follows:
    1. Early Warning Level: More than 25, but less than 50 NTUs greater than background (i.e., upstream) or if minor contrast between the upstream and downstream location or oily sheens immediately downstream of the backwater dam are visually observed. Requires visual inspection of current work activities, turbidity control system, and engineering controls to assess the need to make any minor operational changes.
    2. Action Level: Two consecutive measurements more than 50, but less than 100 NTUs greater than background, or if significant visible contrast between the upstream and downstream location is visually observed. A number of site assessment activities will be initiated, including, but not limited to, the following:
        a. Temporarily cease remedial activities to perform a visual inspection of the existing erosion and sedimentation controls, temporary river bypass system, and turbidity

curtain system. Remediation Contractor shall perform maintenance/repairs, implement BMPs and/or operational changes, as appropriate.

b. Continued monitoring to determine if prior results greater than 50 NTUs was anomaly or short duration event.
c. If these assessment activities indicate that the elevated downstream turbidity reading reflects a water quality impact that could persist or recur and that it is related to specific construction activities or site controls, the Remediation Contractor will make recommendations to modify the pertinent activities to the extent feasible, or additional controls will be implemented.
d. If oily sheen emanating from the project is observed downstream of the turbidity curtain system, the Remediation Contractor shall facilitate the Remediation Engineer promptly collecting a surface water sample from the downstream turbidity monitoring station. The Remediation Engineer shall submit the sample for analysis of benzene, toluene, ethylbenzene, and xylene (BTEX) using test method 8021/BTEX at Practical Quantitation Limit (PQL) and polycyclic aromatic hydrocarbons (PAHs) using test method 8270/PAH at PQL. Results will be requested on a 2- to 3-day rush turn-around-time to facilitate reporting of results within 72 hours.

3. Stop Work Level: More than 100 NTUs greater than background. Temporarily cease sediment removal activities until the turbidity level is less than 100 NTU. Perform response for greater than 50 but less than 100 NTU. Work will not commence until approval is received from the Owner or the Remediation Engineer.
4. If the Work is temporarily stopped or suspended for any reason, Remediation Contractor shall provide additional temporary controls necessary to prevent environmental damage to the Work Area and adjacent areas while the Work is stopped or suspended.
5. In the event Remediation Contractor repeatedly fails to satisfactorily control turbidity and sheen, the Owner reserves the right to employ outside assistance or to use Owner's own forces for turbidity and sheen control. Cost of such work, plus engineering and inspection costs, will be deducted from monies due to the Remediation Contractor.

3.03 SURFACE WATER CONTROL

A. General:
1. Provide methods to control surface water to prevent damage to the Work, the Site (including temporary support areas), and adjoining properties.
2. Control fill, grading, and ditching to direct surface water away from disturbed areas, excavations, pits, tunnels, and other construction areas, and to direct drainage to proper run-off courses to prevent erosion, damage, or nuisance.

B. Equipment and Facilities for Surface Water Control:
1. Provide, operate, and maintain equipment and facilities of adequate size to control surface water.

C. Discharge and Disposal:
1. Dispose of surface water in a manner to prevent flooding, erosion, and other damage to any and all parts of the Site (including temporary support areas), and adjoining areas, and that complies with Laws and Regulations.

3.04 ODOR, VAPOR, AND DUST CONTROL

A. General:
1. Provide means, methods, and facilities required to control MGP-related odors, vapors, and dust generated during the Work.

2. Proactively employ odor, vapor, and dust controls during the Work, and evaluate and modify construction techniques and site management practices, as necessary and appropriate, to:
    a. Mitigate MGP-related odor emissions to the extent practicable, and to the satisfaction of the Owner, the Remediation Engineer, and the NYSDEC.
    b. Prevent exceedances of the community air monitoring action levels specified in Section 01 35 49, Community Air Monitoring Plan.
3. If Remediation Contractor's means, methods, and facilities are unsuccessful in controlling MGP-related odors, vapors, and dust as specified in this Section, based on visual observations or the results of community air monitoring, Work will be suspended until appropriate corrective actions are taken by the Remediation Contractor to remedy the situation to the Remediation Engineer's satisfaction. Owner will not be liable for any expense or delay resulting from the Remediation Contractor's failure to control MGP-related odors, vapors, and dust in accordance with this Section.

B. Vapor Mitigation Agents:
1. Mobilize vapor mitigation agents and means of storage and dispersion at the Site before initiating any ground-intrusive Work or dust-generating Work.
2. Application of vapor mitigation agents will be as follows:
    a. BioSolve Pinkwater:
        1) Prepare a solution of BioSolve® Pinkwater® concentrate and water in accordance with manufacturer's recommendations.
        2) Apply when actively handling excavated materials and as required by Owner or Remediation Engineer.
        3) Application of BioSolve® Pinkwater® to the water surface or below the mean high-water line (MHWL) is prohibited.
    b. AC-645 Long-Duration Foam:
        1) Prepare a solution of AC-645 Long-Duration Foam concentrate and water in accordance with manufacturer's recommendations. Apply to uniformly cover excavated materials with minimum three inches of foam.
        2) Apply before each work break, at the end of each workday, and as required by Owner or Remediation Engineer.
        3) AC-645 Long-Duration Foam applied to removal areas below the MHWL will be completely excavated/removed prior to backfilling/flooding removal cell.

C. Construction Techniques and Site Management Practices:
1. Excavate and backfill, and load, handle, and unload excavated materials and clean fill materials, in manner that minimizes the generation of airborne dust.
2. Haul excavated materials and clean fill materials in properly covered vehicles.
3. Restrict vehicle speeds on temporary access roads and active haul routes.
4. Cover shallow excavations and stockpiles of clean fill materials with polyethylene liners before extended work breaks and at the end of each workday. Anchor liners to resist wind forces; slope to prevent accumulation of water.
5. Hold to a minimum the areas of bare soil exposed at one time.
6. Comply with progress cleaning requirements of Section 01 74 05, Cleaning.

3.05 POLLUTION CONTROL

A. General:
1. Provide means, methods, and facilities required to prevent contamination of soil, water, and atmosphere caused by discharge of noxious substances from construction operations.
2. Equipment used during construction will comply with Laws and Regulations.
3. Comply with Section 01 35 43.13, Environmental Procedures for Hazardous Materials.

B. Spills and Contamination:
   1. Provide equipment, materials, and personnel to perform emergency measures required to contain and clean up spills, and to remove soils and liquids contaminated by spills.
   2. Provide spill kits, including oil-absorbent pads, socks, and booms, at or immediately adjacent to the Site's major work areas and equipment storage and fueling areas.
   3. Immediately notify the Owner or the Remediation Engineer of all spills, regardless of material, volume, or circumstances involved.
   4. Excavate contaminated material and properly dispose of off-site and replace with suitable compacted fill and topsoil.

C. Protection of Surface Waters:
   1. Implement special measures to prevent harmful substances from entering surface waters. Prevent disposal of wastes, effluents, chemicals, and other such substances in or adjacent to surface waters and open drainage routes, in sanitary sewers, or in storm sewers.

D. Atmospheric Pollutants:
   1. Provide systems for controlling atmospheric pollutants related to the Work.
   2. Prevent toxic concentrations of chemicals and vapors.
   3. Prevent harmful dispersal of pollutants into atmosphere.

E. Solid Waste:
   1. Provide systems for controlling and managing solid waste related to the Work.
   2. Prevent solid waste from becoming airborne, and from discharging to surface waters and drainage routes.
   3. Properly handle and dispose of solid waste.

3.06 NOISE CONTROL

A. Remediation Contractor's vehicles, equipment, and operations will minimize noise emissions to the greatest degree practicable. Provide mufflers, silencers, and sound barriers when necessary, or as directed by Owner or Remediation Engineer.

B. Noise levels will comply with all applicable Laws and Regulations, including OSHA requirements and local ordinances.

C. Noise emissions will not interfere with the Work of the Owner or others.

D. Additional noise monitoring may be conducted by the Remediation Engineer to evaluate noise emissions if requested by neighboring private property owners.

3.07 PROHIBITED CONSTRUCTION PROCEDURES

A. Prohibited construction procedures include, but are not limited to, the following:
   1. Dumping or disposing of spoil material, cleared vegetation, debris, or other waste material in any surface waters, drainage ways, or other unauthorized locations.
   2. Indiscriminate, arbitrary, or capricious operation of equipment in any surface waters, drainage ways, or other unauthorized locations.
   3. Pumping of silt-laden water from trenches or other excavations to any surface waters, drainage ways, sewers, or other unauthorized locations.
   4. Damaging vegetation beyond the extent necessary for construction.

3.08 REMOVAL OF TEMPORARY CONTROLS

A. Remove temporary controls only when directed by the Owner or the Remediation Engineer.

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SECTION 01 57 33

SECURITY

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Safely guarding all Work, the Project, products, materials, equipment, and property from loss, theft, damage, and vandalism until Substantial Completion, or as otherwise directed by the Owner. Safely guard property in the vicinity of the Work and Project, the site, and other private property in the vicinity of the Project from injury and loss in connection with the performance of the Project.
   2. Employ a security guard to provide required security and prevent unauthorized entry during non-working hours, seven days a week, from the date of initial mobilization until Substantial Completion, or as otherwise directed by Owner.
   3. Making no claim against the Owner for damage resulting from trespass.
   4. Paying full compensation for, or repairing and replacing, damage to properties located adjacent to the remedial construction activities, and other properties arising from failure to furnish adequate security.
   5. Providing temporary fencing, temporary gates, and privacy screens in accordance with the Contract Documents and this Section.

B. Related Sections:
   1. Section 01 32 26, Construction Progress Reporting

1.02 SUBMITTALS

A. Action Submittals:
   1. Shop Drawings: Submit drawings showing proposed locations and extent of temporary fencing and gates at the site.
   2. Product Data: Submit manufacturer's data, specifications, and installation instructions for temporary fencing, temporary gates, and privacy screens.

B. Informational Submittals:
   1. Daily Security Logs: Submit in accordance with Paragraph 1.03.C of this Section.

1.03 SITE ACCESS AND SECURITY PROCEDURES

A. Comply with the Owner's security procedures and access restrictions at the Site throughout the Project.

B. Maintain a daily security log of all site workers and visitors throughout the Project. Include the date, name, affiliation, purpose of visit, time in, and time out for each site worker and visitor. Submit copy of daily security log to the Remediation Engineer with daily construction report in accordance with Section 01 32 26, Construction Progress Reporting.

PART 2 – PRODUCTS

2.01 TEMPORARY FENCING AND GATES

A. Temporary Fencing:
   1. Temporary fencing details are shown on the Design Drawings.
   2. Provide portable chain-link fence panels or driven-post chain-link fencing with minimum height of six feet. Fence fabric and framework shall be galvanized steel.

B. Temporary Gates:
   1. Temporary gate details shown on the Design Drawings.
   2. Provide chain-link vehicle swing gates with minimum height of six feet and minimum width of 16 feet. Gate fabric and framework shall be galvanized steel.
   3. Provide chain-link man gates with minimum height of six feet and minimum width of 4 feet.
   4. Provide suitable locking mechanism for each temporary gate.

2.02 RELATED MATERIALS

A. Privacy Screens: Provide privacy screens for all temporary fencing and gates used for site.

B. Privacy screen details are shown on the Design Drawings.
   1. Size: Match to height of fence fabric.
   2. Color: Green or black.
   3. Opacity: 85 percent, minimum.

PART 3 – EXECUTION

3.01 TEMPORARY FENCING AND GATES

A. Installation:
   1. Install temporary fencing and gates used for site security in accordance with the Contract Documents and manufacturer's instructions.
   2. Install privacy screens in accordance with manufacturer's instructions on all temporary fencing and gates used for site security.

B. Maintenance:
   1. Maintain temporary fencing and gates throughout the Project. Repair damage to temporary fencing and gates and replace fencing and gates when required to maintain site security.
   2. Adjust or relocate temporary fencing and gates at the site as needed to accommodate the Work and construction sequencing.
   3. Maintain privacy screens throughout the Project. Promptly repair or replace damaged privacy screens.

C. Removal:
   1. Remove temporary fencing and gates upon Substantial Completion, or when otherwise directed by NYSEG.
   2. Repair damage caused by temporary fencing and gates and their removal and restore the site to condition required by the Contract Documents. If restoration of damaged areas is not specified, restore to pre-construction condition.

3.02 SECURITY GUARD

A. Provide security guard for Area 2 during non-working hours.

B. Security personnel is not required if Remediation Contractor personnel are on-site during non-working hours (e.g., for temporary water treatment system operation).

3.03 FIELD QUALITY CONTROL

A. Site Inspections:
   1. Perform hourly or more frequent inspections of the Site during non-working hours.
   2. Document the time and outcome of each inspection in a dedicated log. Log shall be made available to Owner and Remediation Engineer upon request.

END OF SECTION

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SECTION 01 58 13

TEMPORARY PROJECT SIGNAGE

PART 1 – GENERAL

1.01 SUMMARY

A. Scope:
   1. Remediation Contractor shall furnish and install temporary signage as specified in this Section for construction site information.
   2. Temporary signs include:
      a. Project identification signs.
      b. Project hotline signs.
      c. Danger signs.
      d. Security signs.
      e. Warning buoys/signs (Temporary Boater Controls).
   3. Do not display any other temporary signs, other than those specified, without prior approval of Owner.
   4. Maintain temporary signs until Substantial Completion, or as otherwise directed by Owner.

1.02 SUBMITTALS

A. Action Submittals:
   1. Shop Drawings: Submit Shop Drawings showing layout, text, font, character size, colors, graphics or logos (if any), materials of construction, and dimensions of each temporary sign, and the proposed locations and orientations of temporary signs at the Site.

PART 2 – PRODUCTS

2.01 MATERIALS AND CONSTRUCTION

A. Project Identification Signs:
   1. Project identification signs, including layout, fonts, logos, and colors, shall be as specified in the NYSDEC guidance document included with this Section.
   2. Location:
      a. Area 1: Mounted on fencing at the construction entrance.
      b. Area 2: Mounted on posts at the north end of Front Street.
   3. Text Inserts: Text inserts shall be centered horizontally on sign board in the specified locations.
      a. Program Name: “State Superfund Program”.
      b. Site Name: “Cortland-Homer Former MGP Site”.
      c. Site Number: “7-12-005”.
      d. Name of Party Performing Remedial Activities: “NYSEG”.
      e. Governor: “Andrew M. Cuomo, Governor”. *(or current)*
      f. Commissioner: “Basil Seggos, Commissioner”. *(or current)*
      g. Municipal Executive: “Hal McCabe, Mayor”. *(or current)*
   4. Background Color: White.
   5. Text Height: 1.5 inches, minimum.
   6. Printing: Digital or screen printing with ultraviolet-resistant inks.
   7. Sign Board:

a. Material: Aluminum composite, minimum thickness of three millimeters.
b. Minimum Dimensions: 96 inches wide by 48 inches high.

8. Supports and Bracing: Provide supports and bracing as required to adequately support and brace signs for the duration of the Project.
9. Obtain Remediation Engineer approval before releasing for manufacture.

B. Project Hotline Signs:
1. Location: Mounted on fencing at site entrance.
2. Text: Text shall be centered vertically and horizontally on sign board, and shall read as follows:

"SITE HOTLINE: [*Insert telephone number assigned to the Site Hotline*]"

3. Background Color: White.
4. Text Color: Black.
5. Text Height: 1.5 inches, minimum.
6. Printing: Digital or screen printing with ultraviolet-resistant inks.
7. Sign Board:
a. Material: Aluminum composite, minimum thickness of three millimeters.
b. Minimum Dimensions: 96 inches wide by 48 inches high.
8. Supports and Bracing: Provide supports and bracing as required to adequately support and brace signs for the duration of the Project.
9. Obtain Remediation Engineer approval before releasing for manufacture

C. Danger Signs:
1. Location: Mounted on fencing at intervals of 100 linear feet and on either side of temporary Site security gates at 218 South Main Street and at the north end of Front Street (two signs per gate).
2. Text: "DANGER" in upper panel and "CONSTRUCTION AREA AUTHORIZED PERSONNEL ONLY" in lower panel.
3. Background Color: Red upper panel, black outline along border, and white lower panel.
4. Text Color: White in upper panel and black in lower panel.
5. Printing: Digital or screen printing with ultraviolet-resistant inks.
6. Sign Board:
a. Material: Treated polyethylene, thickness of 0.055 inch.
b. Minimum Dimensions: 14 inches wide by 10 inches high.
7. Supports and Bracing: Provide supports and bracing as required to adequately support and brace signs for the duration of the Project.

D. Security Signs:
1. Location: Mounted on fencing on each side of Site security gate entrance at 218 South main Street and at the north end of Front Street (two signs per Site entrance), and at entrances of each field office trailer (one sign per trailer entrance).
2. Text: "SECURITY NOTICE" in upper panel and "ALL VISITORS MUST SIGN-IN AT THE FIELD OFFICE" in lower panel.
3. Background Color: Yellow upper panel, black outline along border, and white lower panel.
4. Text Color: Black for upper and lower panels.
5. Printing: Digital or screen printing with ultraviolet-resistant inks.
6. Sign Board:
a. Material: Treated polyethylene, thickness of 0.055 inch.
b. Minimum Dimensions: 20 inches wide by 14 inches high.
7. Supports and Bracing: Provide supports and bracing as required to adequately support and brace signs for the duration of the Project.

E. Warning Buoy/Sign:
   1. Location: A minimum of three (3) buoys/signs anchored across the West Branch of the Tioughnioga River upstream of the temporary turbidity controls any bypass system.
   2. Text: “KEEP OUT” with high visibility markings on all sides.
   3. Background color: White.
   4. Text Color: Black.
   5. Markings: Exclusion area markings in high visibility colors.
   6. Each Buoy:
      a. Material: UV protected polyethylene
      b. Minimum Dimensions: 49 inches tall by 10 inches wide.
   7. Supports and Bracing: Provide anchoring and bracing as required to maintain location of buoys for the duration of the project.

PART 3 – EXECUTION

3.01 INSTALLATION, MAINTENANCE, AND REMOVAL

A. Hotline:
   1. Procure an answering service to manage calls to the Site Hotline.
   2. Establish a phone tree immediate notification to project team of receipt of call(s) to the Site Hotline. Phone tree is expected to include:
      a. New York State Department of Environmental Conservation’s (NYSDEC’s) Construction Manager (if applicable).
      b. Remediation Engineer.
      c. Owner.
      d. NYSDEC Project Manager.

B. Installation:
   1. Install temporary signs within 14 days of Remediation Engineer’s approval of the submittal required by this Section.
   2. Install temporary signs prior to initiating installation of the temporary bypass system or other substantially intrusive activities, unless otherwise allowed by the Remediation Engineer.
   3. Obtain Owner and Remediation Engineer approval of installation locations before installing temporary signs.

C. Maintenance:
   1. Maintain temporary signage so that signs are clean, legible, and upright. Cut grass, weeds, and other plants so that temporary signs are not covered or obscured. Maintain warning buoys/signs at the water’s surface during fluctuations of water levels.

   2. Repair or replace damaged temporary signs. Relocate signs as required by progress of the Project.

D. Remove temporary signs upon Substantial Completion, or as otherwise directed by the Remediation Engineer.

3.02 ATTACHMENTS

A. The attachment listed below, which follows after the “End of Section” designation, is part of this Specification Section:
   1. Attachment A: Signs for Remedial Programs (three pages).

END OF SECTION

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SECTION 01045

PROJECT IDENTIFICATION AND SIGNS

PART 1 GENERAL

The sign shall be 4-ft high × 8-ft wide, and constructed of 3/4- to 1-in. medium density overlay plywood, with a resin coating on both sides. The edges shall be framed with a snap trim edge cap consisting of an aluminum channel with a polyvinyl coating. An aluminum sign of equal size may also be used. The sign's background shall be painted with white exterior oil base sign enamel. The second, third, fourth, and eighth lines will have green letters. The first, fifth, sixth, and seventh lines will have blue letters. The DEPARTMENT logo will be painted as noted. All adhesives are solvent resistant.

1.1 REFERENCES

1.1.1 Lumber Standard: American Softwood Lumber Standard; U.S. Department of Commerce Product Standard PS20.

1.1.2 Softwood Plywood Standard: Construction and Industrial; U.S. Department of Commercial Product Standard PS1.

1.2 QUALITY ASSURANCE

1.2.1 Painter's Qualifications: All paint shall be applied by a professional sign painter.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Aluminum blanks will be covered with vinyl sheeting to achieve background color, logo will be silk screened on vinyl surface.

2.1.2 Framing: Snap trim edge cao of polyvinyl coated aluminum channel.

2.1.3 Paint

2.1.3.1 Background Enamel: Exterior, alkyd, glass enamel with primer as recommended by finish coat manufacturer.

2.1.3.2 Lettering and Striping Enamel: Exterior, long oil, alkyd; high gloss enamel manufactured for lettering signs.

FOR INFORMATIONAL PURPOSES ONLY

2.1.4 Colors

2.1.4.1 DEPARTMENT logo: Pantone® Matching System (PMS) Color Chart 301 Blue
PMS 355 Green

2.1.4.2 Text: PMS 301 Blue
PMS 355 Green

2.1.5 Type: Caslon 540. Center each line with small caps and initial caps. See Figure 01580-1 (Project Sign)

2.2 FABRICATION

2.2.1 Paint both sides and all edges of signs with two coats of primer and one coat of background enamel.

2.2.2 Paint lettering and striping with two coats of lettering enamel.

2.2.3 Do not apply succeeding coat until previous coat has completely dried.

2.2.4 Apply even coats of uniform thickness without brush marks, runs, or lap marks.

2.2.5 Lettering and striping shall be uniform with sharp, neat profiles.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Install signs within two weeks of Notice to Proceed.

3.1.2 Install signs where directed by ENGINEER.

3.1.3 Fasten sign, in a level position, securely to security wall. The center of the sign should be located approximately 6-7 ft from ground level.

3.2 MAINTENANCE AND REMOVAL

3.2.1 Maintain the signs plumb and level for the duration of the work.

3.2.2 When directed, at the completion of the project, remove the signs.

END OF SECTION

FOR INFORMATIONAL PURPOSES ONLY

8'

4'

2"	
6"	NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation
2"	
4"	STATE SUPERFUND PROGRAM
2"	
4"	COURT STREET FORMER MGP SITE
2"	
2"	SITE NO. 7-04-031
2"	
2"	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
2"	
2"	GOVERNOR: ANDREW M. CUOMO
2"	
2"	COMMISSIONER: BASIL SEGGOS
2"	
2"	BROOME COUNTY EXECUTIVE: DEBRA PRESTON
2"	
4"	TRANSFORM THE PAST…. BUILD FOR THE FUTURE
2"	

FOR INFORMATIONAL PURPOSES ONLY

FIGURE 01045-1

PROJECT SIGN

SECTION 01 62 00

PRODUCT OPTIONS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. This Section includes:
      a. Remediation Contractor's options for selecting products.
      b. Requirements for consideration of "or-equal" products.

1.02 TERMINOLOGY

A. The following words or terms are not defined but, when used in this Section, have the following meaning:
   1. "Products" includes materials, equipment, machinery, components, fixtures, systems, and other goods incorporated in the Work. Products do not include machinery and equipment used for preparing, fabricating, conveying, erecting, or installing the Work. Products include Owner-furnished goods incorporated in the Work where use of such goods is specifically required in the Contract Documents.

1.03 PRODUCT OPTIONS

A. For products specified only by reference standard or description, without reference to Supplier, provide products meeting that standard, by a Supplier or from a source that complies with the Contract Documents.

B. For products specified by naming one or more products or Suppliers, provide the named products that comply with the Contract Documents, unless an "or-equal" or substitute product is approved by Remediation Engineer.

C. For products specified by naming one or more products or Suppliers and the term, "or equal", when Remediation Contractor proposes a product or Supplier as an "or equal", submit to Remediation Engineer a request for approval of an "or-equal" product or Supplier.

D. For products specified by naming only one product or manufacturer and followed by words indicating that no substitution is allowed, there is no option and no substitution will be allowed.

1.04 "OR-EQUAL" PRODUCTS

A. For proposed products not named in the Contract Documents and considered as an "or equal", Remediation Contractor shall request in writing Remediation Engineer's approval of the "or equal". Request for approval of an "or-equal" product shall accompany the Shop Drawing or product data submittal for the proposed product and shall include:
   1. Remediation Contractor's request that the proposed product be considered as an "or equal", accompanied by Remediation Contractor's certifications.

2. Documentation adequate to show that proposed product:
   a. Does not require extensive revisions to the Contract Documents.
   b. Is consistent with the Contract Documents.
   c. Will produce results and performance required in the Contract Documents.
   d. Is compatible with other portions of the Work.
3. Detailed comparison of significant qualities of proposed product with the products and manufacturers named in the Contract Documents. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements shown or indicated.
4. Evidence that proposed product manufacturer will furnish warranty equal to or better than specified, if any.
5. List of similar installations for completed projects with project names and addresses, and names and address of design professionals and owners, if requested.
6. Samples, if requested.
7. Other information requested by Remediation Engineer.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 65 00

PRODUCT DELIVERY REQUIREMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. This Section includes general requirements for preparing for shipping, delivering, and handling materials and equipment.
   2. Remediation Contractor shall make all arrangements for transporting, delivering, and handling of materials and equipment required for prosecution and completion of the Work.
   3. When required, move stored materials and equipment without additional compensation and without changes to the Contract Times.

1.02 SUBMITTALS

A. Refer to individual Specification Sections for submittal requirements relative to delivering and handling materials and equipment.

1.03 PREPARING FOR SHIPMENT

A. When practical, factory-assemble materials and equipment. Match mark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with strippable, protective coating.

B. Package materials and equipment to facilitate handling, and protect materials and equipment from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate the associated purchase order number, bill of lading number, contents by name, Owner's contract name and number, Remediation Contractor name, equipment number, and approximate weight. Include complete packing lists and bills of materials with each shipment.

C. Protect materials and equipment from exposure to the elements and keep thoroughly dry and dust-free at all times. Protect painted surfaces against impact, abrasion, discoloration, and other damage. Lubricate bearings and other items requiring lubrication in accordance with manufacturer's instructions.

D. Keep Remediation Engineer informed of delivery of all materials and equipment to be incorporated in the Work.

E. Do not ship materials and equipment until:
   1. Related Shop Drawings, Samples, and other submittals have been reviewed or accepted (as applicable) by Remediation Engineer, including, but not necessarily limited to, all Action Submittals associated with the materials and equipment being delivered.
   2. Manufacturer's instructions for handling, storing, and installing the associated materials and equipment have been submitted to and accepted by Remediation Engineer in accordance with the Specifications.

3. Results of source quality control testing (factory testing), when required by the Contract Documents for the associated materials or equipment, have been reviewed and accepted by Remediation Engineer.
4. Facilities required for handling materials and equipment in accordance with manufacturer's instructions are in place and available.
5. Required storage facilities have been provided.

1.04 DELIVERY

A. Scheduling and Timing of Deliveries:
   1. Arrange deliveries of materials and equipment in accordance with the accepted Progress Schedule and in ample time to facilitate inspection prior to installation.
   2. Schedule deliveries to minimize space required for and duration of storage of materials and equipment at the Site or delivery location, as applicable.
   3. Coordinate deliveries to avoid conflicting with the Work and conditions at the Site, and to accommodate the following:
      a. Work of other contractors and Owner.
      b. Storage space limitations.
      c. Availability of equipment and personnel for handling materials and equipment.
      d. Owner's use of premises.
   4. Deliver materials and equipment to the Site during regular working hours.
   5. Deliver materials and equipment to avoid delaying the Work and the Project, including work of other contractors, as applicable. Deliver anchor system materials, including anchor bolts to be embedded in concrete or masonry, in ample time to avoid delaying the Work.

B. Deliveries:
   1. Shipments shall be delivered with Remediation Contractor's name, Subcontractor's name (if applicable), Site name, Project name, and contract designation clearly marked.
   2. Site may be listed as the "ship to" or "delivery" address; but Owner shall not be listed as recipient of shipment unless otherwise directed in writing by Remediation Engineer.
   3. Provide Remediation Contractor's telephone number to shipper; do not provide Owner's telephone number.
   4. Arrange for deliveries while Remediation Contractor's personnel are at the Site. Remediation Contractor shall receive and coordinate shipments upon delivery. Shipments delivered to the Site when Remediation Contractor is not present will be refused by Owner, and Remediation Contractor shall be responsible for the associated delays and additional costs, if incurred.
   5. Comply with Section 01 35 43.13, Environmental Procedures for Hazardous Materials.

C. Containers and Marking:
   1. Have materials and equipment delivered in manufacturer's original, unopened, labeled containers.
   2. Clearly mark partial deliveries of component parts of materials and equipment to identify materials and equipment, to allow easy accumulation of parts, and to facilitate assembly.

D. Inspection of Deliveries:
   1. Immediately upon delivery, inspect shipment to verify that:
      a. Materials and equipment comply with the Contract Documents and reviewed or accepted (as applicable) submittals.
      b. Quantities are correct.
      c. Materials and equipment are undamaged.

d. Containers and packages are intact, and labels are legible.
e. Materials and equipment are properly protected.

2. Promptly remove damaged materials and equipment from the Site and expedite delivery of new, undamaged materials and equipment, and remedy incomplete or lost materials and equipment to furnish materials and equipment in accordance with the Contract Documents, to avoid delaying progress of the Work.
3. Advise Remediation Engineer in writing when damaged, incomplete, or defective materials and equipment are delivered, and advise the Remediation Engineer of the associated impact on the Progress Schedule.

1.05 HANDLING OF MATERIALS AND EQUIPMENT

A. Provide equipment and personnel necessary to handle materials and equipment, including those furnished by Owner, by methods that prevent soiling or damaging materials, equipment, and packaging.

B. Provide additional protection during handling as necessary to prevent scraping, marring, and otherwise damaging materials, equipment, and surrounding surfaces.

C. Handle materials and equipment by methods that prevent bending and overstressing.

D. Lift heavy components only at designated lifting points.

E. Handle materials and equipment in safe manner and as recommended by the manufacturer to prevent damage. Do not drop, roll, or skid materials and equipment off delivery vehicles or at other times during handling. Hand-carry or use suitable handling equipment.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 66 00

PRODUCT STORAGE AND HANDLING REQUIREMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. This Section includes general requirements for storing and protecting materials and equipment.

1.02 STORAGE

A. Store and protect materials and equipment in accordance with manufacturer's recommendations and the Contract Documents.

B. Remediation Contractor shall make all arrangements and provisions necessary for, and pay all costs for, storing materials and equipment. Excavated materials, construction equipment, and materials and equipment to be incorporated into the Work shall be placed to avoid injuring the Work and existing facilities and property, and so that free access is maintained at all times to all parts of the Work and to public utility installations in vicinity of the Work. Store materials and equipment neatly and compactly in locations that cause minimum inconvenience to the Owner, other contractors, public travel, and owners, tenants, and occupants of adjoining property. Arrange storage in manner to allow easy access for inspection.

C. Areas available at the Site for storing materials and equipment are shown or indicated in the Contract Documents, or as approved by the Owner or the Remediation Engineer.

D. Store materials and equipment to become Owner's property to facilitate their inspection and ensure preservation of quality and fitness of the Work, including proper protection against damage by freezing, moisture, and high temperatures with ambient temperatures as high as 90 degrees F. Store in indoor, climate-controlled storage areas all materials and equipment subject to damage by moisture, humidity, heat, cold, and other elements, unless otherwise acceptable to the Owner. When placing orders to Suppliers for equipment and controls containing computer chips, electronics, and solid-state devices, Remediation Contractor shall obtain, coordinate, and comply with specific temperature and humidity limitations on materials and equipment, because temperature inside cabinets and components stored in warm temperatures can approach 200 degrees F.

E. Remediation Contractor shall be fully responsible for loss or damage (including theft) to stored materials and equipment.

F. Do not open manufacturer's containers until time of installation, unless recommended by the manufacturer or otherwise specified in the Contract Documents.

G. Do not store materials or equipment in structures being constructed unless approved by Remediation Engineer in writing.

H. Do not use lawns or other private property for storage without written permission of the owner or other person in possession or control of such premises.

1.03 PROTECTION

A. Equipment to be incorporated into the Work shall be boxed, crated, or otherwise completely enclosed and protected during shipping, handling, and storage, in accordance with Section 01 65 00, Product Delivery Requirements.

B. Store all materials and equipment off the ground (or floor) on raised supports such as skids or pallets.

C. Protect painted surfaces against impact, abrasion, discoloration, and other damage. Painted equipment surfaces that are damaged or marred shall be repainted in their entirety in accordance with equipment manufacturer and paint manufacturer requirements, to the satisfaction of the Remediation Engineer.

D. Protect electrical equipment, controls, and instrumentation against moisture, water damage, heat, cold, and dust. Space heaters provided in equipment shall be connected and operating at all times until equipment is placed in operation and permanently connected.

1.04 UNCOVERED STORAGE

A. The following types of materials may be stored outdoors without cover on supports so there is no contact with the ground:
   1. Reinforcing steel.
   2. Pre-cast concrete materials.
   3. Structural steel.
   4. Metal stairs.
   5. Handrails and railings.
   6. Grating.
   7. Checker plate.
   8. Metal access hatches.
   9. Castings.
   10. Fiberglass products.
   11. Rigid electrical conduit.
   12. Piping, except polyvinyl chloride (PVC) or chlorinated PVC (CPVC) pipe.

1.05 COVERED STORAGE

A. The following materials and equipment may be stored outdoors on supports and completely covered with covering impervious to water:
   1. Grout and mortar materials.
   2. Masonry units.
   3. Rough lumber.
   4. Soil materials and granular materials such as aggregate.
   5. PVC and CPVC pipe.
   6. Filter media.

B. Tie down covers with rope or anchor with sandbags, and slope covering to prevent accumulation of water.

C. Store loose soil materials and granular materials, with covering impervious to water, in well-drained area or on solid surfaces to prevent mixing with foreign matter. Place, grade, and shape stockpiles for proper drainage.

1.06 FULLY-PROTECTED STORAGE

A. Store all material and equipment not named in Articles 1.04 and 1.05 of this Section on supports in buildings or trailers that have concrete or wooden flooring, roof, and fully-closed walls on all sides. Covering with visquine plastic sheeting or similar material in space without floor, roof, and walls is not acceptable. Comply with the following:
   1. Provide heated storage for materials and equipment that could be damaged by low temperatures or freezing.
   2. Provide air-conditioned storage for materials and equipment that could be damaged by high temperatures.
   3. Protect mechanical and electrical equipment from being contaminated by dust, dirt, and moisture.
   4. Maintain humidity at levels recommended by manufacturers for electrical and electronic equipment.

1.07 HAZARDOUS PRODUCTS

A. Prevent contamination of personnel, storage area, and the Site. Comply with Laws and Regulations, manufacturer's instructions, and Section 01 35 43.13, Environmental Procedures for Hazardous Materials.

1.08 MAINTENANCE OF STORAGE

A. On a scheduled basis, periodically inspect stored materials and equipment to ensure that:
   1. Condition and status of storage facilities is adequate to provide required storage conditions.
   2. Required environmental conditions are maintained on a continuing basis.
   3. Materials and equipment exposed to elements are not adversely affected.

1.09 RECORDS

A. Keep up-to-date account of materials and equipment in storage to facilitate preparation of Applications for Payment, if the Contract Documents provide for payment for materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 71 23

FIELD ENGINEERING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Provide field engineering services and professional services of the types indicated for the Project, including furnishing civil, structural, and other engineering services specified or required to execute the Remediation Contractor's construction methods.

B. Related Sections:
   1. Section 01 71 26, Construction Surveying and Layout

1.02 QUALITY ASSURANCE

A. Qualifications:
   1. Remediation Contractor Field Engineer:
      a. Employ and retain at the Site, a field engineer with experience and capability of performing all field engineering tasks required of the Remediation Contractor.
      b. Responsibilities include, but are not necessarily limited to, the following:
         1) Checking all formwork, reinforcing, inserts, structural steel, bolts, sleeves, piping, other materials, and equipment for compliance with the Contract Documents.
         2) Maintaining field office files, drawings, and record documents, and coordinating field engineering services with Subcontractors and Suppliers as appropriate. Preparing layout and coordination drawings for construction operations.
         3) Checking and coordinating the Work for conflicts and interferences, and immediately advising the Remediation Engineer of all discrepancies of which the Remediation Contractor is aware.
         4) Cooperating as required with the Remediation Engineer in observing the Work and performing field inspections.
         5) Reviewing and coordinating the Work with Shop Drawings and the Remediation Contractor's other submittals.

1.03 SUBMITTALS

A. Informational Submittals:
   1. Qualifications Statements:
      a. Remediation Contractor Field Engineer: Submit name and address of field engineer. When requested by the Remediation Engineer, submit qualifications.
   2. Certificates:
      a. Field Engineering: When requested by the Remediation Engineer, submit documentation verifying accuracy of field engineering.

PART 2 – PRODUCTS (NOT USED)

PART 3– EXECUTION (NOT USED)

END OF SECTION

SECTION 01 71 26

CONSTRUCTION SURVEYING AND LAYOUT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Furnishing surveying services specified or required for construction and documentation purposes to execute the Remediation Contractor's construction methods, including all supervision, labor, tools, materials, equipment, services and appurtenances necessary for, or incidental to, completing all work necessary for performing the surveying activities described herein and preparing required as-built survey drawings of pre-construction, interim, post-removal, and post-restoration grades.
   2. Developing and making all detail surveys and measurements required for construction, including slope stakes, batter boards, and all other working lines, elevations, and cut sheets.
   3. Providing materials required for benchmarks, control points, batter boards, grade stakes, and other items.
   4. Safeguard all survey points and benchmarks.
   5. Keeping a transit, theodolite, or total station (theodolite with electronic distance measurement device), leveling instrument, and related implements such as survey rods and other measurement devices, at the Site at all times, and having a skilled instrument person available when necessary for laying out the Work.
   6. Being solely responsible for all locations, dimensions, and levels. No data other than Change Order, Work Change Directive, or Field Order will justify departure from dimensions and levels required by the Contract Documents.
   7. Rectifying all Work improperly installed because of not maintaining, not protecting, or removing without authorization established reference points, stakes, marks, and monuments.
   8. Providing such facilities and assistance necessary for the Remediation Engineer to check lines and grade points placed by the Remediation Contractor. Do not perform excavation or backfilling Work until all cross-sectioning necessary for determining payment quantities for Unit Price Work have been completed and accepted by Remediation Engineer.

B. Related Sections:
   1. Section 01 78 39, Project Record Documents
   2. Section 31 50 00, Excavation Protection (Bypass System)

1.02 QUALITY ASSURANCE

A. Qualifications:
   1. Surveyor:
      a. Employ or retain the services of a surveyor with experience and capability of performing surveying and layout tasks required in the Contract Documents and as required for the Work. Surveyor shall be a professional land surveyor licensed and registered in the State of New York.
      b. Responsibilities include, but are not necessarily limited to, the following:
         1) Providing required surveying equipment, including transit or theodolite, level, stakes, and surveying accessories.

2) Establishing required lines and grades for performing all excavating, filling, compacting, and grading, and for constructing all facilities, structures, pipelines, and site improvements.
3) Preparing and maintaining professional-quality, accurate, well organized, legible notes of all measurements and calculations made while surveying and laying out the Work.
4) Performing such surveys and computations necessary to determine quantities of Work performed, placed, or installed.
5) Performing such surveys necessary to record actual construction, including demolition, excavation, backfilling, and restoration operations.
6) Prior to backfilling operations, surveying, locating, and recording on a copy of the Contract Documents accurate representation of buried Work and Underground Facilities encountered.
7) Preparing certified survey drawings in accordance with Section 01 78 39, Project Record Documents.
8) Complying with requirements of the Contract Documents relative to surveying and related Work.

B. When applicable, regularly resurvey benchmarks for comparison with original elevations and positions. Where the Remediation Contractor uses a laser for control, periodically check the grade and alignment during each day's operation. The Remediation Contractor shall promptly notify the Remediation Engineer if changes in elevations or positions occur to be reviewed for consistency with Design Drawings.

1.03 SUBMITTALS

A. Informational Submittals:
1. Survey Plan: Submit surveying plan for conducting all survey Work not less than 10 days prior to starting survey Work.
2. Survey Field Books:
a. Submit example of proposed survey field books to be maintained by the Remediation Contractor's surveyor. Example will have sufficient information and detail, including example calculations and notes, to demonstrate that field books will be organized and maintained in a professional manner, complying with the Contract Documents.
b. Submit original field books within two days after completing survey Work.
3. Qualifications Statements:
a. Surveyor: Submit name and address of firm and resumes of each professional land surveyor and crew chief conducting the survey Work. Submit at least 10 days prior to beginning survey Work. During the Project, submit resume for each new registered land surveyor and crew chief employed or retained by the Remediation Contractor at least 10 days prior to starting on the survey Work.
4. Certificates:
a. Surveying: When requested by the Remediation Engineer, submit certificate signed by professional surveyor certifying that elevations and locations of the Work comply with the Contract Documents. Explain all deviations, if any.

5. Survey Results:
    a. Provide electronic copy of results in PDF and AutoCAD release 2016, or newer, .dwg file with 3D points (in x, y, z [easting, northing, elevation] format), point labels (including point descriptions and elevations, at a minimum), topographic break lines, and triangulated irregular network (TIN) (i.e., 3D faces representing ground surface), or other format acceptable to Remediation Engineer. Each data file must include a descriptive header including, but not limited to, software and equipment information, project name and client, horizontal and vertical datum, units, survey type, alignment, and stations surveyed. Provide results of surveys required in Article 3.02, including:
        1) Pre-Construction.
        2) Interim.
        3) Post-Removal.
        4) Post-Restoration.
    b. Drawings will include elevation contours at 1-foot resolution.
    c. Drawings showing survey data will be shown on a scale not to exceed 1-inch equals 20 feet.
    d. Provide photographic documentation as required in Article 3.02.

1.04 RECORDS

A. Maintain at the Site, a complete and accurate log of control and survey Work as it progresses.
    1. Survey data will be in accordance with recognized professional surveying standards, Laws and Regulations, and prevailing standards of practice in the locality where the Site is located. Original field notes, computations, and other surveying data will be recorded by the Remediation Contractor's surveyor in Remediation Contractor-furnished hard-bound field books and will be signed and sealed by Remediation Contractor's surveyor.
    2. Completeness and accuracy of survey Work, and completeness and accuracy of survey records, including field books, will be responsibility of Remediation Contractor. Failure to organize and maintain survey records in an appropriate manner that allows reasonable and independent verification of calculations, and to allow identification of elevations, dimensions, and grades of the Work, will be cause for rejecting the survey records, including field books.
    3. The accuracy of the Remediation Contractor's survey and other furnishing of data to the Remediation Engineer do not constitute a transfer of responsibility for verifying accuracy.
    4. Illegible notes or data, and erasures on any page of field books, are unacceptable. Do not submit copied notes or data. Corrections by ruling or lining out errors will be unacceptable unless initialed by the surveyor. Violation of these requirements may require re-surveying the data questioned by Remediation Engineer.

PART 2 - PRODUCTS

2.01 QUALITY OF MATERIALS AND EQUIPMENT

A. Survey instruments will be calibrated as specified by the manufacturer.

PART 3 - EXECUTION

3.01 SURVEYING

A. Verification of Conditions: Verify Site conditions before starting Work. Promptly notify the Remediation Engineer of any discrepancies with the potential to affect the Work.

B. Exercise care during the execution of the work activities specified herein to minimize any disturbance to existing property and to the landscape and waters in the areas surrounding the work areas. Survey crews shall not traverse into controlled areas or private property without first obtaining approval by the Owner or the Remediation Engineer.

C. Contingency survey of the removal areas will be performed at the sole expense of the Remediation Contractor if post-removal and/or post-restoration surveys indicates that final removal elevation/extent and/or backfill elevation/extent, as specified within the Contract Documents, has not been met.

D. Reference Points:
   1. The Owner's established reference points damaged or destroyed by Remediation Contractor will be re-established by the Owner at Remediation Contractor's expense.
   2. From Owner-established reference points, establish lines, grades, and elevations necessary to control the Work. Obtain measurements required for executing the Work to tolerances specified in the Contract Documents.
   3. Establish, place, and replace as required, such additional stakes, markers, and other reference points necessary for control, intermediate checks, and guidance of construction operations.

E. Coordinate System and Reference Datums: For all surveys, use and report data in using the following:
   1. Coordinate System: New York State Plane Coordinate System, New York Central Zone, FIPSZONE 3102.
   2. Reference Datums:
      a. Horizontal datum: North American Datum of 1983 (NAD83), U.S. Survey Feet
      b. Vertical Datum: North American Vertical Datum of 1988., U.S. Survey Feet.

F. Surveys to Determine Quantities for Payment:
   1. For each Application for Payment, perform such surveys and computations necessary to determine quantities of Work performed, placed, or installed. Perform surveys necessary for the Remediation Engineer to determine final quantities of Work performed or in place. Surveys for payment will be based on topographic survey performed by a licensed surveyor in accordance with this Section.
   2. Notify the Remediation Engineer at least 24 hours before performing survey services for determining quantities. Unless waived in writing by the Remediation Engineer, perform quantity surveys in presence of the Remediation Engineer.

G. Surveys to Record Actual Construction: Perform such surveys necessary to record actual construction including, but not limited to, the following:
   1. Horizontal and vertical limits of excavation.
   2. Horizontal and vertical location of existing Underground Facilities and surface structures demolished, realigned, or abandoned in-place.
   3. Horizontal and vertical limits of fill for each material classification.
   4. Subgrade and final grade topography.

5. Horizontal and vertical location of buildings, foundations, and walls.
6. Horizontal location of exposed piping and utilities, poles, exposed wires, posts, signs, markers, curbs, fencing, gates, guard rails, guard cables, and other facilities visible at or above ground surface.
7. Horizontal limits of lawns, pavements, roads, walks, drives, and other surface improvements.

H. Construction Surveying: Comply with the following:
1. Topography: Collect elevation data on maximum 20-foot grid and at significant grade breaks (elevation changes of 1 foot or more).
2. Alignment Staking: Provide alignment stakes at 50-foot intervals on tangent, and at 25-foot intervals on curves.
3. Slope Staking: Provide slope staking at 50-foot intervals on tangent, and at 25-foot intervals on curves. Re-stake at every 10-foot difference in elevation.
4. Structures: Stake out structures, including elevations, and check prior to and during construction.
5. Pipelines: Stake out pipelines including elevations, and check prior to and during construction.
6. Road: Stake out roadway elevations at 50-foot intervals on tangent, and at 25-foot intervals on curves.
7. Cross-Sections: Provide original, intermediate, and final staking as required for site work, and other locations as necessary for quantity surveys.
8. Easement Staking: Provide easement staking at 50-foot intervals on tangent, and at 25-foot intervals on curves. Also provide wooden laths with flagging at 100-foot maximum intervals.
9. Record Staking: Provide permanent stake at each blind flange and each utility cap is provided for future connections. Stakes for record staking will be material acceptable to Remediation Engineer.

I. Accuracy:
1. Establish the Remediation Contractor's temporary survey reference points for Remediation Contractor’s use to at least second-order accuracy (i.e., 1:10,000). Construction staking used as a guide for the Work will be set at least third-order accuracy (i.e., 1:5000). Basis on which such orders are established will provide the absolute margin for error specified below.
2. Horizontal accuracy of easement staking will be plus or minus 0.1-foot, accuracy of other staking (e.g., structures, pipeline, road) will be plus or minus 0.04 foot horizontally and plus or minus 0.02 foot vertically, unless otherwise specified or approved by the Owner and the Remediation Engineer.
3. Vertical accuracy will be plus or minus 0.1 feet for general site grading and 0.02 feet for structural features (e.g. pipes, manholes) unless otherwise specified or approved by the Owner and the Remediation Engineer.
4. Horizontal and vertical accuracy for general topographic surveys of the upland support and staging areas and removal areas will be plus or minus 0.1 foot, unless otherwise specified or approved by the Owner and the Remediation Engineer.
5. Survey calculations will include an error analysis sufficient to demonstrate required accuracy.

3.02 REQUIRED SURVEYS

A. Pre-Construction Surveys
1. Perform Pre-Construction Survey of intended upland support and staging areas and any area that will be disturbed (e.g., crane access road, temporary stockpile area) to document existing area conditions. The survey will be completed prior to disturbance of existing conditions. Support areas will include any areas to be used by the Remediation

Contractor for staging and access to support the Work, including the areas utilized for the temporary river crossing(s) and placement of the water treatment system, if outside of the other areas surveyed pre-construction in accordance with the other subsections in Article 3.02.A.

2. Perform Pre-Construction Survey of the dewatered area bound within the temporary river bypass system for each removal area. Survey will extend a minimum of 10 linear feet on to land from the land side edge of the remedial area boundaries or to adjacent upland support, staging, or disturbed areas, whichever is encountered first.
   a. Within the dewatered area, document prominent features/structures within the sediment removal areas (e.g., “monument” boulders [those measuring 2 feet in diameter or greater]).
3. Provide documentation of pre-construction conditions prior to start of work. Documentation will consist of digital photographs. Photographs will be numbered. A key plan will be provided to show the location and general direction of each photograph. At a minimum, perform photographic documentation survey of all affected properties including but not limited to the following:
   a. Automotive shop property (207 South Main Street) located north of the NYSEG property (at Area 1).
   a. Former automotive shop property (215 South Main Street) located north of the NYSEG property (at Area 1).
   b. Private properties east of the Tioughnioga River (at Area 1).
   c. The former motel property (4408 US Route 11) and museum property (4386 US Route 11) located south of the NYSEG property (at Area 1).
   d. US Route 11 from 215 South Main Street to 4386 US Route 11 (at Area 1).
   e. Front Street (Area 2).
   f. A private property located at the north end of Front Street (Area 2).
   g. Location of Railroad crossing (Area 2).

   Pre-construction photo documentation will be submitted to the Owner and the Remediation Engineer at least one week prior to the start of intrusive activities (i.e., staging area development, sheet pile installation, etc.) in Area 1 or Area 2.
4. Pre-Construction Surveys must be accepted by the Remediation Engineer before commencing intrusive activities in the area.

B. Interim Survey and Monitoring
   1. Perform interim conventional survey of the installation of support components (i.e., the temporary river bypass system) and provide to the Owner and the Remediation Engineer for review prior to initiation of sediment removal. Survey of sheet pile installation will be in accordance with Section 31 50 00, Excavation Protection (Bypass System).
   2. Collect interim removal surface data during excavation. Interim monitoring results (i.e., approximate extent, approximate depth) will be included in the Remediation Contractor’s daily progress reports and will be made available to the Owner and/or the Remediation Engineer upon request.
   3. Collect interim backfill surface data during backfill. Interim backfill monitoring will be performed similar to the interim removal surface monitoring described in Article 3.02.B(2) above. Interim monitoring results (i.e., approximate extent, approximate depth) will be included in the Remediation Contractor’s daily progress reports and will be made available to the Owner and/or the Remediation Engineer upon request.

4. If work at Area 1 or Area 2 requires more than one construction season, provide digital photograph documentation of interim conditions prior to winter shutdown and prior to reinitiating work at Area 1 or Area 2. Photographs will be numbered. A key plan will be provided to show the location and general direction of each photograph. At a minimum, perform photographic documentation survey of the truck route used to transport material. Each interim-construction photo documentation of the truck route will be submitted to the Owner and Remediation Engineer not more than 2 weeks after completion of the survey performed prior to winter shutdown and at least one week prior to reinitiating work in Area 1 or Area 2.

C. Post-Removal Surveys
   1. Perform Post-Removal Surveys in each removal area within 5 working days following completion of excavation. Remediation Contractor shall submit this survey comparison to the Remediation Engineer for review and approval.
   2. Complete the Post-Removal Surveys at the same locations and along the same lines as used in the pre-construction survey (Article 3.02.A(2)).
   3. Post-Removal Surveys must be accepted by the Remediation Engineer before commencing backfill placement in each area.

D. Post-Restoration Surveys
   1. Perform Post-Restoration Survey of the remediated areas to confirm that the required restoration elevations have been met and the required terms of Contract completed. The post-restoration survey will be completed at the same locations and along the same lines as used in the pre-construction survey (Article 3.02.A(2)).
   2. Perform Post-Restoration Survey of upland support and staging areas within 5 working days following completion of restoration activities of those areas. Post-Restoration Surveys will cover the full extent of the areas disturbed by the work including support areas and restoration areas (including all replaced/restored site features). Post-Restoration Surveys will include location of all installed products including underground facilities (e.g., replacement pipes).
   3. Provide documentation of post-restoration conditions following site restoration. Documentation will consist of digital photographs. The post-restoration conditions documentation will consist of the same elements as the pre-construction conditions documentation described in Article 3.02.A(2) and will also note any discrepancies from the pre-construction conditions.
   4. Post-Restoration Surveys of the removal areas will be submitted to the Owner and Remediation Engineer for approval prior to removal of the temporary river bypass system and not more than 2 weeks after completion of the survey. The post-restoration survey drawings of upland support and staging areas and photographs of the truck route will be submitted to the Owner and Remediation Engineer for approval prior to demobilization and not more than 2 weeks after completion of the survey.

E. Remediation Contractor's surveyor shall calculate the actual thickness and quantities (to the nearest cubic yard) of soil excavated and backfill material placed for each removal area. The quantity calculations will be submitted to the Remediation Engineer for approval.

F. Remediation Engineer will verify the soil excavation and backfill placement elevations achieve the specified requirements. If required excavation or backfill placement has not been achieved as determined by the Remediation Engineer, Remediation Contractor shall implement corrective action and re-survey the area at no additional expenses to the Owner.

END OF SECTION

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SECTION 01 71 33

PROTECTION OF WORK AND PROPERTY

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in this Section.
   2. To prevent damage, injury, or loss, the Remediation Contractor's actions shall include the following:
      a. Storing materials, supplies, and equipment in an orderly, safe manner that does not unduly interfere with the progress of the Work or work of other contractors or utility companies.
      b. Providing suitable storage facilities for materials and equipment subject to damage or degradation by exposure to weather, theft, breakage, or other cause.
      c. Placing upon the Work or any part thereof only loads consistent with the safety and integrity of that portion of the Work and existing construction.
      d. Frequently removing and disposing of refuse, rubbish, scrap materials, and debris caused by Remediation Contractor's operations so that, at all times, the Site is safe, orderly, and workmanlike in appearance.
      e. Providing temporary barricades and guard rails around openings, scaffolding, temporary stairs and ramps, excavations, elevated walkways, and other hazardous areas.
   3. Do not, except after written consent from proper parties, enter or occupy privately-owned land with personnel, tools, materials, or equipment, except on lands and easements provided by Owner. Remediation Contractor shall not seek out such written consent unless specifically authorized by Owner to do so.
   4. Remediation Contractor has full responsibility for preserving public and private property and facilities on and adjacent to the Site. Direct or indirect damage done by, or on account of, any act, omission, neglect, or misconduct by the Remediation Contractor in executing the Work, shall be restored by the Remediation Contractor, at its expense to condition equal to that existing before damage was done.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 BARRICADES AND WARNING SIGNALS

A. General:
   1. Where the Work is performed on or adjacent to roadway, access road, right-of-way, or public place:
      a. Provide barricades, fences, lights, warning signs, danger signals, watchmen, and take other precautionary measures for protecting persons, property, and the Work.
      b. Paint barricades to be visible at night.
      c. From sunset to sunrise, furnish and maintain at least one light at each barricade.

d. Erect sufficient barricades to keep vehicles from being driven on or into Work under construction.
e. Furnish watchmen in sufficient numbers to protect the Work.

2. Provide temporary barricades to protect personnel and property for Work not in or adjacent to vehicular travel areas, including indoor work, in accordance with Laws and Regulations.
3. Remediation Contractor's responsibility for maintaining temporary barricades, signs, lights, and for providing watchmen shall continue until the Work is accepted in accordance with the Contract Documents.

3.02 TREE AND PLANT PROTECTION

A. General:
1. Protect existing trees, shrubs, and plants on or adjacent to the Site, shown or designated to remain in place, against unnecessary cutting, breaking, or skinning of trunk, branches, bark, and roots.
2. Do not store materials or equipment, or park construction equipment and vehicles, within the foliage drip line.
3. In areas subject to traffic, provide temporary fencing or barricades to protect trees and plants.
4. Cover exposed roots with burlap, which shall be kept continuously wet. Cover exposed roots with earth as soon as possible. Protect root systems from mechanical damage and damage by erosion, flooding, run-off, and noxious materials in solution.
5. If branches or trunks are damaged, prune branches immediately and protect cut or damaged areas with emulsified asphalt compounded specifically for horticultural use, in manner acceptable to Remediation Engineer.
6. When directed by the Remediation Engineer, remove and dispose of damaged trees and plants that die or suffer permanent injury, and replace at the Remediation Contractor's expense damaged trees or plants with specimens of equal or better quality.

B. Coordinate Work in this Article 3.02 with Section 31 11 00, Clearing and Grubbing.

3.03 PROTECTION OF EXISTING STRUCTURES

A. Underground/Subsurface Facilities:
1. Underground/Subsurface Facilities known to Owner and Design Engineer, except water, gas, sewer, electric, and communications services to individual buildings and properties, are shown on the Design Drawings. Information shown for Underground/Subsurface Facilities is the best available to Owner and Design Engineer but is not guaranteed to be correct or complete.
2. Utility Mark-Out and Utility Clearance.
a. Clearly delineate areas of subsurface intrusive work and subaquatic work at the Site.
b. Provide required notification to local one-call notification system (Dig Safely New York) at least three working days, but not more than 10 working days, before planned start of intrusive work.
c. Subcontract with a private utility locator to conduct utility markout.
d. Perform and document a desktop review of available drawings, site plans, or other reference material.
e. Walk the Site and review utility markings before proceeding with intrusive work. Document any visible evidence of utilities.
f. Contact potential utility or industrial companies identified in previous steps, located near worksite.
g. Perform a marine survey for subsurface utilities.

h. Protect and preserve staking, markings, or other designations until no longer required for proper and safe Work at or near Underground/Subsurface Facilities.
i. Any differences identified by the Remediation Contractor between the utilities shown on the Design Drawings and those encountered in the field will be brought to the immediate attention of the Owner and the Remediation Engineer prior to implementation of any intrusive activities.

3. Remediation Contractor shall explore ahead of intrusive work, and shall uncover obstructing Underground/Subsurface Facilities sufficiently to determine their location, to prevent damage to Underground/Subsurface Facilities, and to prevent service interruption to building or parcels served by Underground/Subsurface Facilities. If Remediation Contractor damages an Underground/Subsurface Facility, or the material surrounding or supporting the same, Remediation Contractor shall immediately notify Owner, Remediation Engineer, and the owner of the damaged facility and restore it to original condition, in accordance with requirements of the owner of the damaged facility. Such repair or restoration Work shall be performed at no additional cost to Owner.
   a. Undertake such emergency response actions as may be required.
   b. Collect, containerize, characterize, and properly dispose of any oils or pollutants released from the damaged facility.
   c. Provide provisions for alternate or temporary service until damaged facility is repaired.
   d. Provide assistance to the owner of the damaged facility during repairs unless authorized by the facility's owner to undertake such repairs directly.
4. Necessary changes in the location of the Work may be directed by the Remediation Engineer to avoid Underground Facilities not shown or indicated on the Contract Documents.
5. If permanent relocation of an existing Underground Facilities is required and is not otherwise shown or indicated in the Contract Documents, the Remediation Contractor will be directed in writing to perform the Work. When the relocation Work results in a change in the Contract Price, Contract Times, contract modification procedures and payment for such Work shall be in accordance with the Contract Documents.

B. Surface Structures:
1. Surface structures are existing buildings, retaining walls, other structures, and other facilities at or above ground surface, including their foundations or any extension below ground surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, piers, roads, dams, spillways, channels, open drainage, exposed piping and utilities, poles, exposed wires, posts, signs, markers, curbs, walks, fencing, and other facilities visible at or above ground surface.
2. Existing surface facilities, including but not limited to guard rails, posts, guard cables, signs, poles, markers, curbs, and fencing, that are damaged or temporarily removed to facilitate the Work shall be replaced and restored to their original condition at the Remediation Contractor's expense.

C. Protection of Underground Facilities and Surface Structures:
1. Remediation Contractor shall sustain in their places and protect from direct or indirect injury all Underground Facilities and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such facility or structure. Before proceeding with the Work of sustaining and supporting such facility or structure, Remediation Contractor shall satisfy the Remediation Engineer that methods and procedures to be used have been approved by party owning same.
2. Remediation Engineer will document that the Remediation Contractor has completed the following:

a. Dig safely New York is contacted and the utility clearance is completed.
b. A private utility mark-out is completed.
c. Utility locations/alignments are marked out on the ground or with buoys in the river.

3. Remediation Contractor shall bear all risks attending the presence or proximity of all Underground Facilities and surface structures within or adjacent to the limits of the Work, in accordance with the Contract Documents. Remediation Contractor shall be responsible for damage and expense for direct or indirect injury caused by its Work to facilities and structures. Remediation Contractor shall repair immediately and completely damage caused by its Work, to the satisfaction of the owner of damaged facility or structure.
4. Comply with 16 NYCRR 753 (Protection of Underground Facilities) and other Laws and Regulations regarding the protection of Underground Facilities.

D. Coordinate Work in this Article 3.03 with 31 05 05 Aggregates for Earthwork.

3.04 PROTECTION OF EXISTING MONITORING WELLS

A. Remediation Contractor shall clearly mark, maintain, and protect existing monitoring wells shown or indicated to remain.

B. Repair or decommission and replace, at the Remediation Contractor's expense, existing monitoring wells damaged during the Work.
1. Decommissioning shall be in accordance with the NYSDEC Groundwater Monitoring Well Decommissioning Policy (CP-43).
2. Replace decommissioned monitoring well with new well of equal construction. Install at location selected by Remediation Engineer.

3.05 PROTECTION OF INSTALLED MATERIALS, EQUIPMENT, AND LANDSCAPING

A. Protect installed materials and equipment to prevent damage from subsequent operations. Remove protection facilities when no longer needed prior to completion of the Work.

B. Control traffic to prevent damage to equipment, materials, and surfaces.

C. Provide coverings to protect materials and equipment from damage.

END OF SECTION

SECTION 01 74 05

CLEANING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall execute cleaning during the Project, at completion of the Work, and as required by this Section.
   2. Maintain in a clean manner the Site, the Work, and areas adjacent to or affected by the Work.

1.02 REFERENCE STANDARDS

A. The following standards are referenced in this Section:
   1. NFPA 241, Safeguarding Construction, Alteration, and Demolition Operations.

1.03 PROGRESS CLEANING

A. General: Clean the Site, work areas, and other areas occupied by the Remediation Contractor at least weekly. Dispose of materials in accordance with the following:
   1. Comply with NFPA 241 for removing combustible waste materials and debris.
   2. Do not hold non-combustible materials at the Site more than three days if the temperature is expected to rise above 80 degrees F. When temperature is less than 80 degrees F, dispose of non-combustible materials within seven days of their generation.
   3. Provide suitable containers for storage of waste materials and debris.
   4. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately.

B. Site:
   1. Keep outdoor, dust-generating areas wetted down or otherwise control dust emissions in accordance with Section 01 57 05, Temporary Controls.
   2. At least weekly, brush-sweep roadways and paved areas at the Site that are used by construction vehicles or otherwise affected by construction activities.

C. Work Areas:
   1. Clean areas where the Work is in progress to level of cleanliness necessary for proper execution of the Work.
   2. Remove liquid spills promptly and immediately report spills to the Owner and the Remediation Engineer, and authorities having jurisdiction.
   3. Where dust would impair proper execution of the Work, broom-clean or vacuum entire work area, as appropriate.
   4. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

D. Installed Work: Keep installed Work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of material or equipment installed, using only cleaning agents and methods specifically recommended by material or equipment manufacturer. If manufacturer does not recommend specific cleaning agents or methods, use cleaning agents and methods that are not hazardous to health and property and that will not damage exposed surfaces.

E. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration until Substantial Completion.

F. Waste Disposal:
   1. Properly dispose of waste materials, surplus materials, debris, and rubbish off the Site.
   2. Do not burn or bury rubbish and waste materials at the Site.
   3. Do not discharge volatile or hazardous substances, such as mineral spirits, oil, or paint thinner, into storm sewers or sanitary sewers.
   4. Do not discharge wastes into surface waters or drainage routes.
   5. Remediation Contractor shall be solely responsible for complying with Laws and Regulations regarding storing, transporting, and disposing of waste.

G. During handling and installation of materials and equipment, clean and protect construction in progress and adjoining materials and equipment already in place. Apply protective covering where required for protection from damage or deterioration, until Substantial Completion.

H. Clean completed construction as frequently as necessary throughout the construction period.

1.04 CLOSEOUT CLEANING

A. Complete the following prior to requesting inspection for Substantial Completion:
   1. Clean and remove from the Site rubbish, waste material, debris, and other foreign substances.
   2. Sweep paved areas broom-clean. Remove petrochemical spills, stains, and other foreign deposits.
   3. Hose-clean sidewalks and loading areas.
   4. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
   5. Leave surface waterways, drainage routes, storm sewers, and gutters open and clean.
   6. Repair pavement, roads, sod, and other areas affected by construction operations and restore to specified condition. If condition is not specified, restore to pre-construction condition.
   7. Clean exposed exterior and interior hard-surfaced finishes to dirt-free condition, free of spatter, grease, stains, fingerprints, films, and similar foreign substances.
   8. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, and similar spaces.
   9. Remove non-permanent tags and labels.
   10. Leave the Site clean, and in neat, orderly condition, satisfactory to Owner and Remediation Engineer.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. This Section includes administrative and procedural requirements for:
      a. Recycling non-hazardous, uncontaminated construction waste.
      b. Disposing of non-hazardous, uncontaminated construction waste.

B. Coordination:
   1. The Remediation Contractor shall coordinate the transportation and off-site treatment/ disposal of materials (e.g., soil, water, debris) generated during construction activities.

C. Performance Requirements:
   1. Practice efficient waste management in using materials in the Work.
   2. Employ reasonable means to divert construction waste from landfills and incinerators. Facilitate recycling of materials, including the following:
      a. Construction Waste:
         1) Site-clearing waste.
         2) Packaging:
            a) Paper.
            b) Cardboard and boxes.
            c) Pallets and wood crates.
   3. Dispose of construction waste only at Owner-approved facilities.

1.02 TERMINOLOGY

A. The following words or terms are not defined but, when used in this Section, have the following meaning:
   1. “Construction waste” is building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
   2. “Disposal” is removal to an off-site location of construction waste and subsequent sale, recycling, reuse, or placement in an Owner-approved landfill or incinerator facility conforming to Laws and Regulations and acceptable to authorities having jurisdiction.
   3. “Recycle” is recovery of construction waste for subsequent processing in preparation for reuse.
   4. “Recycle and reuse” is recovery of construction waste and subsequent processing and reuse in the Work.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with hauling and disposal Laws and Regulations of authorities having jurisdiction.

1.04 SUBMITTALS

A. Informational Submittals:
   1. Waste Management Plan: Submit acceptable plan for managing construction waste within 14 days of the date the Contract Times commence running, and before removing any waste from the Site. Include the following:
      a. For materials that will be recycled and reused in the Work, procedures and equipment for preparing recycled materials before incorporating them into the Work.
      b. Procedures for separating each type of recyclable waste, including sizes of containers, container labeling, and designated location at the Site where materials will be separated and stored.
      c. List of local, Owner-approved disposal facilities that will be used for construction waste. Include name, address, and telephone number of each recycling or processing facility, landfill, and incinerator facility. Identify type of waste to be disposed of at each facility.
   2. Waste Profiles:
      a. Preliminary Waste Profiles: The Remediation Contractor is responsible for obtaining waste profile requirements from the proposed disposal facility. The Remediation Engineer shall prepare and submit waste profile, listing Owner's name and address of the Site as generator of waste, for each landfill and incinerator facility. Owner will sign and return each acceptable waste profile to the Remediation Contractor.
      b. Final Waste Profiles: Submit counter-signed waste profile and proof of acceptance of waste for each landfill and incinerator facility.
   3. Disposal Records:
      a. Recycling and Processing Facility Records: Submit counter-signed manifests, weight tickets, receipts, and invoices on a monthly basis throughout the Project, and concurrent with each Application for Payment.
      b. Landfill and Incinerator Facility Records: Submit counter-manifests, weight tickets, receipts, and invoices on a monthly basis throughout the Project, and concurrent with each Application for Payment.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Recyclable Waste: On a daily basis, remove all recyclable materials from the work area in acceptable containers.

B. Provide separate collection containers as required by recycling haulers and to prevent contamination of materials, including protection from the elements as applicable.

C. Replace loaded containers with empty containers as demand requires, at least weekly.

D. Handling: Deposit recyclable materials in containers in clean (no mud, adhesives, solvents, or petroleum or coal tar contamination), debris-free condition.

E. If contamination chemically combines with materials so that materials cannot be cleaned, do not deposit into recycle containers.

F. Environmental Requirements: Transport recyclable waste materials from the work area to recycling containers, and carefully deposit in containers in manner to minimize noise and dust. Close the covers of container immediately after materials are deposited. Do not place recyclable waste materials on the ground adjacent to container.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 WASTE MANAGEMENT

A. Provide handling, containers, storage, signage, transportation, and other items required to manage wastes during the Project.

B. Site Access and Temporary Controls:
   1. Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent facilities.
      a. Designate and label specific areas of the Site necessary for separating materials to be recycled or reused.
      b. Provide temporary controls in accordance with the Contract Documents.

C. Shipping Documents: The Remediation Engineer shall prepare a non-hazardous waste manifest for each shipment of construction waste. Owner or an authorized agent will review and sign each manifest as generator of waste.

3.02 RECYCLING WASTE

A. General:
   1. Recycle paper and beverage containers used by Remediation Contractor's personnel, Subcontractors, and Suppliers.
   2. Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at the Site to the maximum extent practical.
      a. Provide appropriately marked containers or bins for controlling recyclable waste until recyclable materials are removed from the Site. Post list of acceptable and unacceptable materials at each container and bin. Inspect containers and bins for contamination and remove contaminated materials if found.
      b. Before removing from the Site, prepare and process recyclable waste as required by recycling or processing facility.
      c. Stockpile processed materials at the Site without intermixing with other materials. Place, grade, and shape stockpiles to drain water. Cover to prevent dust and blowing debris.
      d. Stockpile materials away from the construction area. Do not store within drip line of trees.
      e. Remove recyclable waste from the Site and from Owner's property and transport to Owner-approved recycling or processing facility.

B. Recycling Construction Waste:
   1. Site-Clearing Wastes:
      a. Cut trees, branches, shrubs, brush, and logs into manageable lengths.
      b. If required by recycling or processing facility, chip trees, branches, shrubs, brush, and logs before removing from the Site.
      c. If approved by the Owner, some wood chips may be used onsite during restoration.
   2. Packaging:
      a. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store at dry location.

b. Pallets: Require that goods delivered on pallets have the pallets removed from Site, to the extent possible. For pallets that remain at the Site, break down pallets into component wood pieces. Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, and treated wood materials.
c. Crates: Break down crates into component wood pieces. Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, and treated wood materials.

3.03 DISPOSAL OF WASTE

A. General: Except for items or materials to be recycled or recycled and reused, remove from the Site and properly dispose of waste at Owner-approved facility such as permitted landfill or thermal treatment facility, or other method acceptable to Owner and authorities having jurisdiction.
   1. Except as otherwise specified, remove from the Site all waste and debris from the Work as it accumulates. Upon completion of the Work, remove materials, equipment, waste, and debris and leave the Site clean, neat, and orderly. Comply with the Contract Documents regarding cleaning and removal of trash, debris, and waste.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials at the Site.

END OF SECTION

SECTION 01 77 19

CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Provisions of this section apply to the procedural requirements for closeout of Work executed by the Remediation Contractor.

1.02 SUBMITTALS

A. Informational Submittals:
   1. Removal Documentation. Provide all documentation pertaining to all components of Work and requiring inspection prior to submitting an application for Final Certification Inspection including, but not limited to, tables showing actual excavated and backfilled volumes, Construction Drawings, certified survey data, executed warranties, bills of lading and/or waste manifests from the waste hauler, certified weigh slips from the disposal facility, maintenance agreements, inspection certificates and similar required documentation for specific units of Work.
   2. Truck volume counts and measurement summary. Following completion of construction and as a pre-requisite for Final Certification Inspection, the Remediation Contractor shall provide the Remediation Engineer with final truck volume counts and measurement summary tables. Provide supporting data that was used to develop the measurement summary tables.
   3. Request for Substantial Completion in accordance with Article 1.03-A of this Section.
   4. Request for Final Acceptance in accordance with Article 1.03-B of this Section.

B. The Remediation Contractor shall prepare and submit Closeout Documents in accordance with Section 01 78 39, Project Record Documents.

1.03 INSPECTION PROCEDURES

A. Substantial Completion:
   1. Preliminary Procedures: Prior to requesting an inspection for Substantial Completion, the Remediation Contractor shall complete the following:
      a. Prepare a list of items to be completed and corrected, including the value of the items on the list, and the reasons why the items are not completed. Submit the list to the Remediation Engineer.
      b. Advise the Remediation Engineer, in writing, of pending insurance changeover requirements, if applicable.
      c. Terminate and remove temporary facilities, including mockups, construction tools, and similar elements from the Site, as necessary.
      d. Complete grading, restoration, and final cleaning.

2. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of the request, the Remediation Engineer will proceed with the inspection or notify the Remediation Contractor of unfulfilled requirements. The Remediation Engineer will prepare the Certificate of Substantial Completion after inspection or will notify the Remediation Contractor of items, either on the Remediation Contractor's list or additional items identified by the Remediation Engineer, that must be completed or corrected before the Certificate of Substantial Completion will be issued. Any outstanding items required for Substantial Completion at this time will be documented as the formal punch-list for Substantial Completion:
    a. Re-inspection: Request re-inspection when the punch-list is completed or corrected.
    b. Results of completed inspection will form the basis of requirements for Final Completion.

B. Final Acceptance:
    1. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
        a. Submit a Request for Payment in accordance with the procedures specified in Section 01 29 76, Progress Payment Procedures.
        b. Submit a Certification for the Remediation Engineer stating that all items, actions, and requirements of the punch-list have been completed, corrected, satisfied, or otherwise resolved.
    2. Inspection: Submit a written request for final inspection for acceptance. The Remediation Engineer will prepare a Recommendation of Final Payment after inspection or will notify the Remediation Contractor of work that must be completed or corrected before the Certificate will be issued.

PART 2– PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 FINAL CLEANING

A. At the time of project closeout, clean and restore the Work area to its pre-construction condition. Complete the following operations before requesting the Remediation Engineer's inspection for certification of substantial completion:
    1. Dismantle the work area(s), equipment/personnel decontamination area(s), and other remedial support areas including the temporary field offices and restoring the area to pre-construction conditions (or better).
    2. Dispose of decontamination area construction materials in accordance with Section 02 61 15, Handling and Disposal of Impacted Materials.
    3. Remove from the Site all materials, equipment, and support structures, unless otherwise specified by the Owner.
    4. Remove non-permanent protection and labels.
    5. Remove debris.
    6. Inspect Project Work Limits.

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall maintain and submit to the Remediation Engineer record documents in accordance with this Section.

1.02 SUBMITTALS

A. Closeout Submittals:
   1. Record Documents: Submit in accordance with Article 1.04 of this Section.

1.03 MAINTENANCE OF RECORD DOCUMENTS

A. Maintain in Remediation Contractor's field office, in clean, dry, legible condition, complete sets of project record documents. Project record documents include but are not limited to, the following:
   1. Remedial Design Report, Drawings, Specifications, and Addenda.
   2. Shop Drawings, Samples, and other Remediation Contractor submittals, including records of test results, reviewed or accepted, as applicable, by the Remediation Engineer.
   3. Change Orders, Work Change Directives, Field Orders, photographic documentation, survey data, permits, and all other documents pertinent to the Work.
   4. Remediation Contractor's updated work schedule.
   5. As-built survey drawings.
   6. Meeting minutes.
   7. Permits.
   8. Shipping papers (e.g., waste manifest and bills of lading).
   9. Remediation Contractor's HASP, including appropriate training//medical monitoring certifications, site and emergency contact information, and emergency route(s) to hospital.

B. Provide files and racks for proper storage and easy access to record documents. File record documents in accordance with the edition of the Construction Specification Institute's "MasterFormat" used for organizing the Project Manual, unless otherwise accepted by Remediation Engineer.

C. Make record documents available for inspection upon request of the Owner or the Remediation Engineer.

D. Do not use record documents for purpose other than serving as Project record. Do not remove record documents from the Remediation Contractor's field office without the Remediation Engineer's approval.

1.04 SUBMITTAL OF RECORD DOCUMENTS

A. Prior to readiness for final payment, submit to the Remediation Engineer one copy of the following record documents:

1. Drawings.
2. Specifications and Addenda.

B. Submit record documents with transmittal letter on Remediation Contractor letterhead complying with letter of transmittal requirements in Section 01 33 00, Submittal Procedures.

C. Record documents submittal shall include certification, with original signature of an official authorized to execute legal agreements on behalf of the Remediation Contractor, reading as follows: "[*Insert Remediation Contractor's corporate name*] has maintained and submitted record documentation in accordance with Specification Section 01 78 39, Project Record Documents and other elements of Contract Documents, for the NYSEG, Cortland-Homer Former MGP Site, Operable Unit 2, Village of Homer, Cortland County, New York. We certify that each record document submitted is complete, accurate, and legible relative to the Work performed under our Contract, and that the record documents comply with the requirements of the Contract Documents.

[*Provide signature, print name, print signing party's corporate title, and date*]"

1.05 RECORDING CHANGES

A. General:
1. At the start of the Project, label each record document to be submitted as "PROJECT RECORD" using legible, printed letters. Letters on record copy of the Drawings shall be two inches high.
2. Keep record documents current. Make entries on record documents within two working days of receipt of information required to record the change.
3. Do not permanently conceal the Work until required information has been recorded.
4. Accuracy of record documents shall be such that future searches for items shown on the record documents may rely reasonably on information obtained from the Remediation Engineer-accepted record documents.
5. Marking of Entries:
   a. Use erasable, colored pencils (not ink or indelible pencil) for marking changes, revisions, additions, and deletions to record documents.
   b. Clearly describe the change by graphic line and make notations as required. Use straight-edge to mark straight lines. Writing shall be legible and sufficiently dark to allow scanning of record documents into legible electronic files.
   c. Date all entries on record documents.
   d. Call attention to changes by drawing a "cloud" around the change(s) indicated.
   e. Mark initial revisions in red. In the event of overlapping changes, use different colors for subsequent changes.

B. Drawings:
1. Record changes on a copy of the Drawings. Submittal of the Remediation Contractor-originated or -produced drawings as a substitute for recording changes on the Drawings is unacceptable.
2. Record changes on plans, sections, schematics, and details as required for clarity, making reference dimensions and elevations (to Project datum) for complete record documentation.
3. Record actual construction, including:
   a. Horizontal and vertical location of existing Underground Facilities and surface structures demolished, realigned, or abandoned in-place, referenced to permanent surface improvements. For each Underground Facility or surface structure, provide dimensions to at least two permanent, visible surface improvements.
   b. Horizontal and vertical limits of excavation.

c. Depths of various elements of foundation relative to Project datum.
d. Horizontal and vertical location of new Underground Facilities referenced to permanent surface improvements. For each Underground Facility, including pipe fittings, provide dimensions to at least two permanent, visible surface improvements.
e. Location of exposed utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
f. Changes in structural and architectural elements of the Work, including changes in reinforcing.
g. Field changes of dimensions, arrangements, and details.
h. Changes made in accordance with Change Orders, Work Change Directives, and Field Orders.
i. Changes in details on the Contract Drawings. Submit additional details prepared by Remediation Contractor when required to document changes.

4. Supplemental Drawings:
   a. In some cases, drawings produced during construction by the Remediation Engineer or the Remediation Contractor supplement the Design Drawings and shall be included with record documents submitted by the Remediation Contractor. Supplemental record drawings shall include the following:
      1) Drawings provided with Change Orders, Work Change Directives, and Field Orders.
      2) Drawings that cannot be incorporated into the Drawings due to space limitations.
      3) Certified survey drawings, in accordance with Article 1.06 of this Section.
   b. Supplemental drawings provided with record drawings shall be integrated with the Drawings and include necessary cross-references between drawings. Supplemental record drawings shall be on sheets the same size as the Drawings.
   c. When supplemental drawings developed by the Remediation Contractor using computer-aided drafting/design (CADD) software are to be included in record drawings, submit electronic files for such drawings in AutoCAD 2016, or newer, format as part of record drawing submittal. Submit electronic files electronically labeled, “Supplemental Record Drawings”, together with the Remediation Contractor name, Project name, and Contract name and number.

C. Specifications and Addenda:
   1. Mark each Section to record:
      a. Manufacturer, trade name, catalog number, and Supplier of each product and item of equipment actually provided.
      b. Changes made by Addendum, Change Orders, Work Change Directives, and Field Orders.

1.06 CERTIFIED SURVEY DRAWINGS

A. Prepare the following survey drawings:
   1. Pre-Construction survey, depicting the pre-construction horizontal and vertical limits of for each sediment removal area and for each support area in accordance with Section 01 71 26, Construction Surveying and Layout, including spot elevations and topographic contours.
   2. Interim survey, depicting the installation of support components (i.e., the temporary river bypass system), including alignment and spot elevations.
   3. Post-Removal survey, depicting the horizontal and vertical limits of material removal for each removal area in accordance with Section 01 71 26, Construction Surveying and Layout, including spot elevations and topographic contours.
   4. Post-Restoration survey, depicting the final horizontal and vertical limits of backfill/restoration for each removal area and each support area in accordance with

Section 01 71 26, Construction Surveying and Layout, including subgrade spot elevations and topographic contours.

5. Soil cover subgrade plan, depicting the horizontal limits of grading and subgrade topographic contours.
6. Final Site plan, depicting final (post-construction) Site conditions.

B. Drawing Requirements:
   1. General Content:
      a. Property lines, easements, and rights-of-way.
      b. Topographic contours at minimum one-foot intervals.
      c. Horizontal and vertical location of buildings, foundations, bridges, and walls.
      d. Horizontal location of exposed piping and utilities, poles, exposed wires, posts, signs, markers, curbs, fencing, gates, guard rails, guard cables, and other facilities visible at or above ground surface.
      e. Horizontal limits of lawns, pavements, roads, walks, drives, and other surface improvements.
      f. Horizontal and vertical location of monitoring wells, including ground surface elevation, outer casing elevation, and inner casing elevation.
      g. Horizontal location, size (diameter), and species of trees and other plantings.
   2. Scale: One inch equals 20 feet.
   3. Sheet Size: 34 inches wide by 22 inches high.

C. Certification:
   1. Each survey drawing shall be signed and sealed by a professional land surveyor licensed and registered in the State of New York.

1.07 ELECTRONIC FILES FURNISHED BY REMEDIATION ENGINEER

A. CADD files will be furnished by the Remediation Engineer upon the following conditions:
   1. Remediation Contractor shall submit to the Remediation Engineer a letter on Remediation Contractor letterhead requesting CADD files and providing specific definition(s) or description(s) of how files will be used, and specific description of benefits to Owner if the request is granted.
   2. Remediation Contractor shall execute the Remediation Engineer's standard agreement for release of electronic files and shall abide by all provisions of the agreement for release of electronic files.
   3. Layering system incorporated in CADD files shall be maintained as transmitted by Remediation Engineer. CADD files transmitted by the Remediation Engineer containing cross-referenced files shall not be bound by the Remediation Contractor. Drawing cross-references and paths shall be maintained. If Remediation Contractor alters layers or cross-reference files, Remediation Contractor shall restore all layers and cross-references prior to submitting record documents to the Remediation Engineer.
   4. Remediation Contractor shall submit record drawings to the Remediation Engineer in same CADD format that files were furnished to Contractor.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 02 21 19

STRUCTURAL SURVEYS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall provide all labor, materials, equipment, professional services, and incidentals as specified and required to perform structural surveys.
   2. The Work includes, but is not limited to, performing pre-construction and post-construction structural surveys of the following:
      a. Bridge abutments and piers:
         1) Private bridge (crossing the Tioughnioga River) located immediately upstream of 207 South Main Street
         2) Private bridge (crossing the Tioughnioga River) located immediately downstream of 4386 US Route 11
         3) New York Susquehanna, and Western Railway bridge located immediately upstream of Area 2
      b. Buildings immediately adjacent to the Work areas:
         1) Structure on Tax Parcel 76.57-01-03.000 (207 South Main Street)
         2) Structure on Tax parcel 76.57-01-04.000 (215 South Main Street)
         3) Structure complex nearest the Area 1 removal areas (i.e., Tioughnioga River) on Tax Parcel 76.15-01-30.000 (4386 US Route 11), including decorative fountain structure

1.02 TERMINOLOGY

A. The following words or terms are not defined but, when used in this Section, have the following meaning:
   1. “Surface structures” are existing buildings, retaining walls, other structures, and other facilities at or above ground surface, including their foundations or any extension below ground surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, exposed piping and utilities, poles, exposed wires, posts, signs, markers, curbs, walks, fencing, and other facilities visible at or above ground surface

1.03 QUALITY ASSURANCE

A. Qualifications:
   1. Professional Engineer:
      a. Remediation Contractor shall retain the services of a professional engineer licensed and registered in the State of New York and experienced in providing engineering services of the kind indicated.
      b. Responsibilities include, but are not necessarily limited to, performing structural surveys, and preparing and certifying structural survey reports.

1.04 SUBMITTALS

A. Informational Submittals:
   1. Qualifications Statements: Submit name, address of firm, and qualifications of professional engineer.

2. Notification of Intended Survey Start: Submit in accordance with Article 3.01.A of this Section.
3. Survey Reports: Submit in accordance with Article 1.05 of this Section.

1.05 SURVEY REPORTS

A. Remediation Contractor's professional engineer shall prepare separate reports for each property and survey. In each report, document the results of the survey and the conditions of visible surface structures located at the property. Include field notes, measurements, and photographs taken during the survey. Number each photograph and label with description and orientation. Provide recommendation/evaluation of structural stability of each surface structure as it relates to implementation of the Work and any proposed modifications to the monitoring required by Section 31 09 13, Geotechnical Instrumentation and Monitoring or protection of the work required by Section 01 71 33, Protection of Work and Property.

B. Submit reports within 14 days after each survey. Reports shall be certified by the professional engineer.

1.06 SCHEDULING AND SEQUENCING

A. Pre-Construction Surveys: Perform pre-construction surveys before initiating removal activities. Deflection or vibration causing construction operations may not begin until the pre-construction reports for each of the identified structures are reviewed by the Owner and the Remediation Engineer.

B. Post-Construction Surveys: Perform post-construction surveys after completion of all removal and backfilling operations and before Substantial Completion.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PREPARATION

A. Notification: Notify the Owner and the Remediation Engineer in writing not less than 14 days before performing each survey. Do not enter properties without permission of property owners.

3.02 STRUCTURAL SURVEYS

A. Structural surveys shall be performed in accordance with this specification and Section 31 09 13, Geotechnical Instrumentation and Monitoring.

B. The professional engineer shall review any available drawings to gain understanding of the structure framework and support system.

C. Perform structural surveys to assess and document the pre-construction and post-construction structural and cosmetic conditions of visible surface structures located at each property. Surveys shall be performed by the Remediation Contractor's retained professional engineer. The Remediation Engineer will accompany the Remediation Contractor's professional engineer for each survey.

D. For each survey, take comprehensive notes, measurements, and photographs of each structure as a whole and of potential areas of damage or deterioration including, but not limited to, the following:
   1. Photographic documentation should provide an overview of the entire structure or property, in addition to close-up pictures to record problematic areas (e.g. cracks, corrosion, etc.). Each photograph will be labeled with a picture number, description, and orientation.
   2. Notes and measurements should be taken on potential items of concern, including, but not limited to, the following:
      a. Spalling concrete.
      b. Cracks.
      c. Active leaking.
      d. Construction joints. Note if joint is opening (cracking) or tight.
      e. Cracking associated with transitions in geometry. Note changes in plan or section dimensions and any settlement or shrinkage cracking.
      f. Foundation settlement.
      g. Bearing seats of beam/column connections. Carefully examine for potential separation, spalling, and cracking that may be associated with thermodynamic changes or joint rotation.
      h. Bolts and connections.
      i. Areas of corrosion in structural members associated with cracking.
      j. Areas of delaminating concrete or voids in concrete in walls and slabs. Note method of observation (e.g., hammer sounding, chain drag, ultrasonic testing, etc.).

E. Prepare separate survey report for each feature in accordance with Article 1.05 of this Section.

END OF SECTION

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SECTION 02 51 00

DECONTAMINATION

PART 1 – GENERAL

1.01 DESCRIPTION

A. SCOPE
   1. Decontaminating all vehicles, equipment, and personnel that come into contact with excavated or impacted materials at the site.
   2. Construction and maintaining decontamination areas.
   3. Furnishing all materials, equipment, and labor necessary to construct and maintain decontamination areas and decontaminate vehicles, equipment, and personnel.

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (October 1985), as prepared by the National Institute of Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), United States Coast Guard (USCG), and United States Environmental Protection Agency (USEPA).

1.03 SUBMITTALS

A. Action Submittal:
   1. Equipment Decontamination Documentation Report and Certification. Submit an Equipment Decontamination Documentation Report and certification to the Remediation Engineer prior to the demobilization of any equipment that has contacted impacted materials. The Equipment Decontamination Documentation Report shall include a description of decontamination procedures and the results of inspection and testing.

B. Informational Submittals
   1. Safety Data Sheets for all cleaning/decontamination solutions shall be submitted in accordance with Section 01 35 43.13, Environmental Procedures for HazMat.
   2. Daily Activities Report. Include a Decontamination Status Report as part of the Daily Activities Reports prepared in Section 01 32 26, Construction Progress Reporting. The Decontamination Status Report shall document all equipment that have undergone decontamination procedures and include the following, at a minimum:
      a. Description of the decontamination status for each equipment, including whether it has come in contact with impacted materials.
      b. Whether the status of a piece of equipment has changed from handling impacted materials to non-impacted materials.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL REQUIREMENTS

A. All construction vehicles leaving the work area shall be decontaminated by the Remediation Contractor (as necessary) to prevent the tracking of soil offsite (including vehicles

transporting clean fill to the site). Vehicles and equipment that come into contact with excavated or impacted materials at the site shall be visually inspected and decontaminated by the Remediation Contractor (to the satisfaction of the Owner, Remediation Engineer, and/or New York State Department of Environmental Conservation) within the equipment decontamination area prior to handling backfill material or leaving the site. Any visible soils or other debris shall be promptly removed and disposed of in a manner consistent with the materials excavated.

B. Precautions shall be taken to limit contact between the vehicle/equipment, personnel performing the decontamination activities, and any decontamination liquids that may accumulate in the decontamination area. Personnel engaged in decontamination activities shall use personal protective equipment, including disposable clothing, as required by the Remediation Contractor's HASP.

C. Wash water, solids, and other materials generated during decontamination activities shall be collected by the Remediation Contractor and handled/managed in accordance with Section 02 61 15, Handling and Disposal of Impacted Materials. Accumulated liquids shall be removed by the Remediation Contractor on a periodic basis so as to not exceed the capacity of the decontamination area.

3.02 DECONTAMINATION AREAS

A. The Remediation Contractor is responsible for constructing and maintaining decontamination area(s) to accommodate all loads, vehicles, equipment, and migration scenarios.

B. The Remediation Contractor is responsible for constructing the decontamination area at the locations shown on the Design Drawings. Alternative locations within the Project Work Limits shall be approved by the Owner and/or Remediation Engineer prior to construction.

C. Vehicle/equipment decontamination areas shall be constructed as specified on the Design Drawings. Alternate decontamination area configuration/construction shall be approved by the Remediation Engineer prior to construction.

D. The Remediation Contractor shall construct and maintain appropriately sized decontamination areas for its personnel. Personnel decontamination areas shall be located within the contamination reduction zone and include those facilities necessary to decontaminate personnel upon exiting the work area (exclusion zone), in accordance with the Remediation Contractor's HASP, and in accordance with local, state, and federal laws and regulations. At a minimum, personnel decontamination areas shall include run-on/run-off controls.

END OF SECTION

SECTION 02 61 15

HANDLING AND DISPOSAL OF IMPACTED MATERIALS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Provide all labor, materials, equipment, and incidentals as shown, specified and required for removal and handling of impacted materials in the Work Area.
   2. The Work includes handling, segregating, dewatering, temporary storage as necessary, and loading of contaminated material for transport to appropriate Owner-selected or Owner-approved facilities in accordance with Laws and Regulations.
   3. Remediation Contractor shall be responsible for obtaining the appropriate permits and equipment necessary for the removal, transportation, and disposal of such materials and pay all fees (unless otherwise paid by the Owner) associated with transporting and disposing of contaminated material.

B. Coordination:
   1. Coordinate disposing of waste as specified under this and other Sections.

1.02 REFERENCES

A. Terminology:
   1. The following words or terms are not defined but, when used in this Section, have the following meaning:
      a. “Construction wastewater” is water used for working or processing or resulting from dewatering or decontamination operations.
      b. “Contaminated material” is material containing coal tar or Site-related contaminants of concern. Examples of potential contaminated material include, but are not limited to, the following:
         1) Construction wastewater.
         2) Removed material waste and mixing spoils.
         3) Free-phase non-aqueous phase liquid (NAPL).
      c. “Debris” is anticipated to include impacted vegetation, stumps/root balls, bricks, rebar, and/or large stone found within the removal area. Such materials will be segregated as appropriate from other excavated materials (i.e., soil and sediment) and handled separately, where practicable.
      d. “Disposal” is removal to an off-site location of contaminated material and subsequent recycling, reuse, or disposal in an Owner-approved or Owner-selected landfill or incinerator conforming to Laws and Regulations and acceptable to authorities having jurisdiction.

B. Reference Standards:
   1. The following standards are referenced in this Section:
      a. ASTM E329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Laws and Regulations applying to the Work under this Section include, but are not limited to, the following:
      a. 29 CFR 1910, Occupational Safety and Health Standards.
      b. 29 CFR 1926, Safety and Health Regulations for Construction.
      c. 40 CFR 261.3, 264, and 265, Resource Conservation and Recovery Act (RCRA).
      d. 49 CFR 171.8, Transportation, Definitions and Abbreviations.
      e. 46 CFR 46, Shipping
      f. 6 NYCRR 364, Waste Transporter Permits.
      g. 6 NYCRR 370, Hazardous Waste Management System – General.
      h. 6 NYCRR 371, Identification and Listing of Hazardous Wastes.
      i. 6 NYCRR 372, Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities.
      j. 6 NYCRR 373, Hazardous Waste Management Facilities.
      k. 6 NYCRR 375, Environmental Remediation Programs.
      l. NYSDEC Technical Guidance for Site Investigation and Evaluation (DER-10).
      m. United States Department of Transportation (USDOT) Regulations.
      n. New York State Department of Transportation (NYSDOT) Regulations.
   2. Comply with applicable provisions and recommendations of the following:
      a. New York State Department of Environmental Conservation (NYSDEC) Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants (MGPs) (DER-4).
      b. NYSDOT Standard Specifications and Standard Sheets.
   3. Obtain required permits and approvals for removal of material, including work permits from right-of-way owners.
   4. Comply with requirements of authorities having jurisdiction.

1.04 SUBMITTALS

A. Action Submittals:
   1. Product Data: Submit manufacturer's product data for proposed drying agent.
   2. Waste Management Plan: Prepare plan describing means and methods for managing material after removal and arranging for transportation of all generated waste as a result of remediation activities to the off-site processing and disposal facility(ies). At a minimum, include the following:
      a. Description, number, and type of trucks to be used for material transport, including debris, from the removal areas to the upland support areas (i.e., Area 1 or Area 2).
      b. Description of conveyance system piping and pumps (number and type) to be used for water transport from the removal areas to the temporary water treatment system (WTS) at Area 1 or Area 2.

B. Information Submittals:
   1. Copies of all local, state, and federal transport permits, licenses, and approvals
   2. Waste Transporter Permits: Submit copy of valid NYSDEC waste transporter permit for each transporter hauling contaminated material.
   3. Waste Characterization Records: Submit the following:
      a. Analytical results for waste characterization samples, as provided to the waste disposal/treatment facilities.
      b. Waste profiles submitted to the waste disposal/treatment facilities.
      c. Facility approval letters for waste treatment/disposal.

4. Disposal Records: Remediation Contractor to obtain and provide to the Remediation Engineer counter-signed manifests, bills of lading, weight tickets, receipts, and invoices for disposal facility(ies) other than Clean Earth's Fort Edward facility on a monthly basis throughout the Project, and concurrent with each Application for Payment.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store drying agent, if any, in closed water-proof super sacks not exceeding 1 ton in weight. Bulk deliveries and uncontained onsite storage of drying agent are prohibited.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Drying Agent: Provide cement kiln dust, lime kiln dust, or approved non-biodegradable sorbent containing no more than 50 percent reactive (free) calcium oxide (CaO) and magnesium oxide (MgO) by weight.

PART 3 – EXECUTION

3.01 GENERAL

A. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent facilities.
   1. Designate and label specific areas of the Site necessary for separating and storing wastes.
   2. Provide temporary controls and signage in accordance with the Contract Documents and Sections 01 57 05, Temporary Controls and 01 58 13, Temporary Project Signage.

3.02 MATERIAL SEGREGATION AND REUSE

A. Materials will be removed in accordance with Section 31 23 00, Excavation and Fill.

B. Site-grubbing wastes shall be handled in accordance with the waste stream for the surrounding excavated material.

C. Once at the upland staging area, removed material will be dewatered via gravity. Boulders larger than 2-feet in diameter will be separated and stockpiled for inspection and cleaning for possible reuse.

D. If boulders segregated for reuse contain visible impacts power wash the material in the decontamination area to the satisfaction of the Remediation Engineer, the Owner, and/or NYSDEC. Wash water shall be collected and treated onsite at the temporary WTS.

E. Excavated material not suitable for reuse (i.e., less than 2-feet in diameter and/or coated with un-washable visible impacts) will be stockpiled for additional dewatering (see Part 3.04 of this Section).

3.03 WASTE CHARACTERIZATION

A. General:
   1. Excavated material containing visual impacts or elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) will be disposed offsite at a low-temperature thermal desorption (LTTD) facility (i.e., Clean Earth's Fort Edward facility).
   2. Non-visually impacted material and non-hazardous waste material will be disposed of offsite at a non-hazardous solid waste landfill facility approved by the Owner (i.e., Seneca Meadows Landfill).
   3. Segregate waste streams as required by waste transporters and disposal facilities. Crush rock and debris, as necessary, to render material suitable for disposal.

B. Waste Characterization:
   1. Remediation Contractor will be responsible for the following:
      a. Obtaining a list of treatment/disposal facility characterization requirements for each waste stream.
      b. Collecting waste characterization samples and submit the samples for laboratory analysis (as required by the treatment/disposal facility[ies]), and coordinate and pay for laboratory testing.
      c. Submitting waste characterization sample results and completed profiles to the treatment/ disposal facility[ies]) for approval.

3.04 DEWATERING OF REMOVED MATERIAL

A. Stabilization and dewatering of removed material to meet the requirements of the selected offsite treatment/disposal facility (e.g., paint filter test, additional moisture content requirements), prior to the transportation of such materials to the offsite permitted treatment/disposal facility.

B. Dewater material as necessary to pass Paint Filter Liquids Test procedures (USEPA SW-846 Method 9095B) before leaving the Site, as well as comply with additional moisture requirements from treatment and disposal facilities.

C. Dewatering shall include the following:
   1. Gravity dewatering within the impacted materials staging area.
   2. Use of approved drying agent to amend removed materials. Unless otherwise directed by Owner, removed materials shall be amended with no more than ten percent drying agent by weight.

3.05 TEMPORARY STORAGE OF CONTAMINATED MATERIAL

A. General:
   1. Provide temporary containment areas adequate to support and withstand traffic loads during the Project.
   2. Waste materials shall be stored in locations approved by the Owner so as not to endanger the Work, and so that easy access may be had at all times to all parts of the Work area.
   3. Provide safe and adequate vehicle/equipment access to and egress from the removal area and the temporary support and upland staging areas.
   4. Special precautions shall be taken to permit access at all times to fire hydrants, fire alarm boxes, driveways, and other points where access may involve the safety and welfare of the general public. Site access for utility personnel shall be maintained at all times.

B. Removed Material:
   1. It may be necessary to store removed materials onsite on a temporary basis to accommodate one or more of the following:
      a. Construction sequencing.
      b. Disposal facility scheduling issues.
      c. Material dewatering requirements.
   2. Removed materials may be temporarily staged in the impacted material staging areas for up to 24 hours. Removed materials shall only be stockpiled (for longer than 24 hours) if covered by polyethylene sheeting or with the application of vapor mitigation agents in accordance with Specification Section 01 57 05, Temporary Controls.
      a. Based on Site conditions, the Owner may elect to limit the maximum allowable stockpile size. Limitations to stockpile size shall not result in any additional cost to the Owner.
      b. Inspect stockpiles daily (at a minimum) and any noted deficiencies shall be immediately corrected by the Remediation Contractor to the satisfaction of the Owner and/or Remediation Engineer.
   3. Mobilize debris crushing/downsizing equipment prior to initiating excavation activities to minimize potential work delays once/if materials requiring downsizing are encountered.
   4. Debris shall be stockpiled onsite within a fully lined roll-off container for characterization (by the Remediation Contractor) prior to offsite disposal. Following characterization by the Remediation Contractor, downsize debris (as required by the waste transportation and disposition vendors), and appropriately containerize (i.e., completely line and cover waste hauling vehicles) the debris to facilitate transportation to the offsite disposal facility based on the characterization results and in accordance with applicable rules and regulations (including local flow control regulations).

C. Construction Wastewater:
   1. All water generated during the Project shall be collected, extracted, and conveyed to the onsite temporary WTS per Section 01 51 41, Temporary Pumping.
   2. Project-related water shall be treated at the onsite temporary water treatment system and discharged in accordance with Section 01 53 53, Temporary Water Treatment and Management.

D. Free-phase NAPL:
   1. Free-phase NAPL, if encountered, may represent a hazardous waste (subject to characterization by Remediation Engineer) and will be managed in accordance with all applicable Laws and Regulations, including 6 NYCRR Parts 370-374 and 376, unless and until determined to be non-hazardous.
   2. NAPL-containing drums or containers shall be stored in a secure storage area equipped with secondary containment (generally consisting of an impermeable liner and run-on/run-off control). The storage area shall include appropriate signage to identify it as a hazardous waste storage area.
   3. A hazardous waste label, with generator information, accumulation start date, and other required information, shall be completed by the Remediation Contractor and affixed to each container.
   4. Containers shall be transported off-site for disposal at an appropriate Owner-approved facility within 90 days of the accumulation date.
   5. The total volume of NAPL in the satellite accumulation area shall not exceed 50 gallons at any time without prior notification to and approval by the Owner.
   6. Once full, containers will be marked with an accumulation end date by the Owner or Remediation Engineer and shall be re-located by the Remediation Contractor to a separate, demarcated storage area equipped with secondary containment. The storage area shall include appropriate signage to identify it as a hazardous waste storage area.

7. Coordinate and be responsible for the costs associated with the transportation of containers offsite for treatment/disposal at an Owner-selected facility within 90 days of the end accumulation date.

3.06 LOADING, TRANSPORTATION, AND DISPOSAL

A. Coordinate the scheduling with offsite transportation/disposal facilities, as well as with waste haulers contracted by the Owner.

B. Contaminated material shall be transported in vehicles with current New York State Waste Transporter Permits pursuant to 6 NYCRR Part 364. Waste Transporter Permits shall be submitted to the Remediation Engineer before Remediation Contractor mobilization, and current copies of those permits shall be maintained onsite by the Remediation Contractor for the duration of the Project.

C. All vehicles transporting contaminated material shall be fully-lined with minimum 6-mil polyethylene sheeting, an equivalent material, or otherwise water-tight, and shall be equipped with functioning tailgate locks and non-mesh (solid), waterproof tarpaulins.

D. Load contaminated material in a manner as to avoid contamination of their exteriors, including tires (e.g., loaded with 10-mil polyethylene sheeting draped over the side of the truck).

E. A manifest (hazardous or non-hazardous as appropriate) shall be prepared by the Remediation Engineer for each load of waste material to be transported offsite for treatment/disposal. Each manifest will be signed by the Owner (as the Generator) or an authorized agent. Counter-signed waste manifests and facility disposal receipts (indicating the actual quantity of waste received at the treatment/disposal facility) shall be maintained by the Remediation Engineer onsite in the project file.

F. The Remediation Engineer shall be responsible for the preparation of a log for each disposal facility that indicates, at a minimum, the following information regarding each truck load:
   1. Load number (sequential).
   2. Uniform Hazardous Waste Manifest Number or Bill of Lading Number.
   3. Transporters name.
   4. Truck ID number (tractor or trailer number).
   5. Estimated tare weight.
   6. Material type (nonhazardous, hazardous, debris).
   7. Destination.

G. Inspect vehicles before leaving the Site. Clean vehicles of visible soil or debris within temporary decontamination area in accordance with Section 02 51 00, Decontamination.

H. Keep all streets, sidewalks, and pavements clean and free from dirt, mud, stone, and other hauled materials. Comply with Section 01 74 05, Cleaning.

I. Vehicles transporting contaminated material shall follow approved haul routes as specified in Community and Environmental Response Plan, included as Appendix D to the Remedial Design Report.

END OF SECTION

SECTION 31 05 05

AGGREGATES FOR EARTHWORK

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work Specified
   1. Aggregates for Earthwork materials will be used as shown on the Design Drawings, as specified herein, or as directed by the Owner.

1.02 APPLICABLE CODES, STANDARDS, AND SPECS

A. The following standards are referenced in this Section:
   1. ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3 [600 kN-m/m^3]).
   2. ASTM D2974, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
   3. ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
   4. ASTM D4972, Standard Test Methods for pH of Soils.
   5. ASTM D6913, Standard Test Method for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.
   6. ASTM D5519-15, Standard Test Method for Particle Size Analysis of Natural and Man-Made Riprap Materials.
   7. ASTM D7928, Standard Test Method for Particle-Size Distribution (Gradation) of Fine0Grained Soils Using the Sedimentation (Hydrometer) Analysis.
   8. Nutrient Content in accordance with Agricultural Experiment Station recommendations for New York State (Hesse, P. R., A Textbook of Soil Chemical Analysis, Chemical Publishing Co., New York, NY, 1972).
   9. Total volatile organic compounds (VOCs) in accordance with USEPA SW-846 Method 8260C.
   10. Total semi-volatile organic compounds (SVOCs) in accordance with USEPA SW-846 Method 8270D.
   11. Total polychlorinated biphenyls (PCBs) in accordance with USEPA SW-846 Method 8082.
   12. Pesticides in accordance with USEPA SW-846 Method 8081B.
   13. Herbicides in accordance with USEPA SW-846 Method 8051A.
   14. Target Analyte List (TAL) Metals in accordance with USEPA SW-846 Method 6010C/6020A/7471B.
   15. Total mercury in accordance with USEPA SW-846 Method 7471.
   16. Total Cyanide in accordance with USEPA SW-846 Method 9012B.
   17. pH in accordance with USEPA SW-846 Method 9045C.
   18. Per- and Polyfluoroalkyl Substances (PFAS) in accordance with USEPA Modified Method 537.

B. Regulatory Requirements: Laws and Regulations applying to the Work under this Section include:
   1. NYSDEC, Technical Guidance for Site Investigations and Remediation (DER-10).
   2. NYSDEC, Title 6 of the Official Compilation of Codes, Rules, and Regulations (6 NYCRR) Part 375 (Environmental Remediation Programs).
   3. New York State Department of Transportation (NYSDOT), Standard Specifications.

1.03 QUALITY ASSURANCE

A. Qualifications:
   1. Remediation Contractor's Testing Laboratory:
      a. Retain the services of an independent agriculture testing laboratory (Cornell Cooperative Extension or equivalent) authorized to operate in New York State to perform organic content, nutrient content, and pH quality assurance testing.
   2. Remediation Engineer's Testing Laboratory:
      a. The Remediation Engineer shall retain the services of an independent testing laboratory authorized to operate in the New York State to perform quality assurance testing required in this Section (except for organic content, nutrient content, and pH quality assurance testing, which is to be performed by the Remediation Contractor).
      b. Testing laboratory shall have current National Environmental Laboratory Accreditation Program (NELAP) and New York State Environmental Laboratory Approval Program (ELAP) certification for specific methods (including Perfluorooctane Sulfonate [PFOA] and Perfluorooctanoic Acid [PFOS]) they are performing from a recognized state or federal laboratory accreditation program.
      c. The laboratory shall be capable of providing detection limits at or below New York State Department of Environmental Conservation (NYSDEC) Screening and Assessment of Contaminated Sediment or 6 NYCRR Part 375 Unrestricted Use soil cleanup objectives (other fill and stone) to allow for comparison of the analytical results to those objectives.
   3. Off-site Fill Sources:
      a. Source of off-site general fill will be from a NYSDEC-permitted mine, pit, or quarry, and will be approved by NYSDOT for furnishing aggregates for NYSDOT projects.

B. Quality Assurance Material Testing for Off-site Materials:
   1. Materials used in the Work may require testing and retesting, as directed by the Remediation Engineer, during the Project. In addition to providing a representative sample (see Article 1.04 of this Section) the Remediation Contractor shall provide the Remediation Engineer with free access to material stockpiles and facilities at all times. Costs for initial testing will be the Remediation Engineer's responsibility.
   2. Remediation Engineer reserves the right to visit each material source and conduct visual observation of the materials proposed for use. Remediation Contractor shall coordinate access with the material sources for the Remediation Engineer to perform visits.
   3. Quality assurance testing of the imported materials will be performed at the source location prior to shipment to the Project Site unless otherwise approved by the Remediation Engineer.
   4. The Remediation Engineer reserves the right to reject material based on the results of conformance tests. Rejected materials will be removed from the Project Site at no cost to the Owner (if delivered without Remediation Engineer approval).
   5. Remediation Engineer required Quality Assurance Material Testing: Perform the testing described below at the frequency indicated. Additional sampling may be required at the discretion of the Remediation Engineer if concerns arise that the characteristics of the fill materials have changed.
      a. Geotechnical Testing:
         1) Gradation in accordance with ASTM D6913 and D5519-15 (as appropriate). Perform one test for each type and source of material indicated in Part 2.
         2) Compaction characteristics in accordance with ASTM D698. Perform one test for each type and source of material requiring compaction.

3) Atterberg limits in accordance with ASTM D4318. Perform one test for each type and source of material requiring compaction.

b. Chemical Testing: For each material with greater than 10 percent by weight passing the No. 80 sieve, as determined by gradation testing performed in accordance with this section, perform chemical testing as follows:
   1) Frequency:
      a) For all imported materials requiring chemical testing, collect seven (7) discrete and two (2) composite samples for the initial 1,000 cubic yards of imported material at the frequency presented in DER-10 Table 5.4(e)10.
      b) Following analysis of the initial 1,000 cubic yards of imported material, chemical testing will be completed as specified in DER-10 Table 5.4(e)10 or may be modified in consultation with the NYSDEC project manager.
   2) Analysis: Collected samples will be submitted for the following:
      a) Discrete Grab Samples:
         i. VOCs by USEPA SW-846 Method 8260 (including 1,4-Dioxane).
      b) Composite Samples:
         i. SVOCs by USEPA SW-846 Method 8270D.
         ii. PCBs by USEPA SW-846 Method 8082.
         iii. Pesticides by USEPA SW-846 Method 8081B.
         iv. Herbicides by USEPA SW-846 Method 8151A.
         v. TAL metals by USEPA SW-846 Method 6010C/6020A/7471B.
         vi. Total mercury by USEPA SW-846 Method 7471
         vii. Total Cyanide by USEPA SW-846 Method 9012B.
         viii. pH by USEPA SW-846 Method 9045C.
         ix. PFAS by USEPA SW-846 Modified Method 537.
   3) Off-site materials used as backfill below the mean high-water line (MHWL) will meet the Class A sediment guidance values (SGVs) detailed in the Screening and Assessment of Contaminated Sediment, NYSDEC, June 2014.
   4) Off-site materials used as backfill above the MHWL will meet the Unrestricted Use soil cleanup objective (SCO) as presented in 6 NYCRR Table 375-6.8(a).
   5) Costs for retesting of rejected materials and installed Work will be the Remediation Contractor's responsibility.

6. Remediation Contractor Required Quality Assurance Material Testing: Perform the testing described below at the frequency indicated. Additional sampling may be required if concerns arise that the characteristics of the fill materials have changed.
   a. Physical Testing:
      1) For each imported topsoil, clay, or clayey soil mix source, perform the following analyses on one representative sample from each source.
         a) pH of soils in accordance with ASTM D4972 or USEPA SW-846 Method 9045C.
         b) Organic matter in accordance with ASTM D2974.
         c) Submit sample to a certified agricultural laboratory (Cornell Cooperative Extension or equivalent) for analysis of nutrient content of soils and recommendations for soil amendments, if applicable, in accordance with Agricultural Experiment Station recommendations for New York State.
   b. If testing results indicate that a proposed off-site fill material does not comply with the Contract Documents, Remediation Contractor shall identify and propose a new off-site source of the specified material in accordance with Article 1.04 of this Section.
   c. Do not ship off-site fill materials to the Site until proposed materials, sources, and Suppliers are accepted by Remediation Engineer

d. Costs for retesting of rejected materials and installed Work will be the Remediation Contractor's responsibility.

C. Required Quality Assurance Material Testing for On-site Materials (Reuse Materials): If Remediation Engineer approves reuse of excavated material (i.e., from potentially impacted material) based on visual observation (i.e., no coal tar impacts observed), Remediation Engineer shall collect samples and perform the testing described below at the frequency indicated to verify compliance with the requirements of this Section. Additional sampling may be required at the discretion of the Remediation Engineer if concerns arise that the characteristics of the fill materials have changed.
   a. Geotechnical Testing: Perform geotechnical testing as specified in Article 1.03.B(5)(a) of this Section.
   b. Chemical Testing; For each material with greater than 10 percent by weight passing the No. 80 sieve, as determined by gradation testing performed in accordance with this section, perform chemical testing as follows
      1) Frequency:
         a) For on-site materials designated for reuse, collect samples at the frequency as presented in DER-10 subdivision 5.4(e) and Appendix 5 or as agreed upon with the NYSDEC project manager.
      2) Analysis:
         a) Perform chemical analysis as specified in Article 1.03.B(5)(b) of this Section demonstrating that on-site materials meet the Unrestricted Use soil cleanup objectives outlined in 6 NYCRR Part 375 (Environmental Remediation Programs).
   2. If testing results indicate that an on-site material does not comply with the Contract Documents, Remediation Contractor shall remove, transport, and dispose of material, unless otherwise approved by Remediation Engineer.

1.04 SUBMITTALS

A. Action Submittals:
   1. Borrow Source Characterization Report: At least four weeks prior to import of materials to project site, submit a Borrow Source Characterization Reports for each source and each material type specified in Part 2. The Borrow Source Characterization Reports will include, at a minimum following:
      a. The material source, including name, address, and contact information.
      b. A certification letter from the borrow source owner or operator certifying that the source is not from an industrial site or suspected to have been modified by the addition of manufactured chemicals and that the material does not contain oil or hazardous material as supported by test data to be provided with certification letter and a copy of applicable current permits (e.g., NYSDEC mining permit) and approvals (e.g., NYSDOT quarry certification).
   2. Representative Sample: At least four weeks prior to proposed import of materials to the Project Site, submit a representative sample of each off-site fill material to the Remediation Engineer to perform the geotechnical and chemical testing, as appropriate, and as required by Article 1.03 of this Section.
   3. Material Testing Results:
      a. Submit to the Remediation Engineer, as necessary, analytical testing results for each material tested as specified in Article 1.03.B(6).

b. Remediation Engineer to submit to the Remediation Contractor, as necessary, geotechnical and chemical testing results for each material tested as specified in Article 1.03.B(5).

4. NYSDEC's Request to Import/Reuse Fill or Soil Form:
   a. For each proposed import or reuse material, Remediation Engineer shall submit to the NYSDEC all required laboratory data and a completed Request to Import/Reuse Fill or Soil form (Attachment A) for NYSDEC review and approval prior to importing fill material or using reuse material.

B. Informational Submittals:
   1. Delivery Tickets. Submit copy of delivery ticket for each load of off-site material delivered to the Site. Each delivery ticket will indicate Supplier name and source address, project name, contract number, date, material type, NYSDOT item number when applicable, and weight delivered as measured on certified scales at the source location.

PART 2– PRODUCTS

2.01 GENERAL

A. Any off-site materials brought on-site for use as fill must be from a NYSDOT-certified source and meet the requirements of this Section.

B. If quality assurance testing shows that the material does not meet the requirements of this Section, the Remediation Contractor must identify a new source for the material and provide the required data and materials for testing by the Remediation Engineer for the new source of material prior to the use of such material on-site.

2.02 MATERIALS

A. General Fill:
   1. Imported soil/general fill will consist of clean common earth fill, free from excessive moisture; organic material; coatings; sharp angular stones; unsatisfactory soils; nuisance seeds and other deleterious materials, and having the following gradation by weight as specified in Table 31 05 05-A:

TABLE 31 05 05-A
GRADATION REQUIREMENTS FOR IMPORTED SOIL/GENERAL FILL

U.S. Sieve Size	Percentage by Weight Passing Sieve
2-inch (50 mm)	100
¼-inch	30-60
No. 200 (0.075 mm)	10-30

B. River Backfill
   1. Material will be free of rock and gravel larger than 1.5 inches in any dimension, debris, waste, frozen material, organic material, and other deleterious matter (e.g., inorganic debris).
   2. Material will be rounded, and gradation will be as specified in Table 31 05 05-B.

TABLE 31 05 05-B
GRADATION REQUIREMENTS FOR RIVER BACKFILL

U.S. Sieve Size	Percentage by Weight Passing Sieve
1.5-inch (37.5 mm)	100
½-inch (12.7 mm)	65-100
No. 40 (0.425 mm)	25-50
No. 200 (0.075 mm)	5-15

C. Type "D" Sand:
   1. Material will be free of foreign chemical contaminants and will comply with the soil cleanup objectives for Restricted Residential Use, as set forth in 6 NYCRR 375-6.8(b).
   2. Gradation will be as specified in Table 31 05 05-C.

TABLE 31 05 05-C
GRADATION REQUIREMENTS FOR TYPE "D" SAND

U.S. Sieve Size	Percentage by Weight Passing Sieve
3/8 -inch (9.5 mm)	100
No. 4 (4.8 mm)	95-100
No. 8 (2.4 mm)	80-100
No. 16 (1.2 mm)	50-85
No. 30 (0.6 mm)	25-60
No. 50 (0.3 mm)	10-30
No. 100 (0.15 mm)	2-10

D. No. 1 Stone:
   1. Material will consist of clean, durable, sharp-angled fragments of gravel free from coatings, fines, or organic materials.
   2. Material will meet the NYSDOT Standard Specifications, Section 703-02 or similar.
   3. Material gradation will be in accordance with NYSDOT Size Designation 1 as specified in Table 31 05 05-D.

TABLE 31 05 05-D
GRADATION REQUIREMENTS FOR NO. 1 STONE

U.S. Sieve Size	Percentage by Weight Passing Sieve
1 -inch (25 mm)	100
½ -inch (12.7 mm)	90-100
¼ -inch (6.35 mm)	0-15
No. 200 (0.075 mm)	0-1

E. Type 2 Subbase:
   1. Material will meet the NYSDOT Standard Specifications for Construction and Materials Section 304-2.02 or will be functionally equivalent as reviewed and approved by the Remediation Engineer.
   2. Gradation will be as specified in Table 31 05 05-E.

TABLE 31 05 05-E
GRADATION REQUIREMENTS FOR TYPE 2 SUBBASE

U.S. Sieve Size	Percentage by Weight Passing Sieve
2-inch (50 mm)	100
¼-inch (6.3 mm)	25-60
No. 40 (0.425 mm)	35-70
No. 200 (0.075 mm)	0-15

   3. Plasticity index of material passing the No. 40 sieve will not exceed 5.0.

F. No. 2 Stone:

1. Material will consist of clean, durable, sharp-angled fragments of gravel free from coatings, fines, or organic materials.
2. Material will meet the NYSDOT Standard Specifications, Section 703-02 or similar. Material gradation will be in accordance with NYSDOT Size Designation 2 as specified in Table 31 05 05-F.

TABLE 31 05 05-F
GRADATION REQUIREMENTS FOR NO. 2 STONE

U.S. Sieve Size	Percentage by Weight Passing Sieve
1 ½ -inch (37.5 mm)	100
¾ -inch (19 mm)	0-25
½ -inch (12.7 mm)	0-5

G. No. 3 Stone:
1. Material will consist of clean, durable, sharp-angled fragments of gravel free from coatings, fines, or organic materials.
2. Material will meet the NYSDOT Standard Specifications, Section 703-02 or similar.
3. Material gradation will be in accordance with NYSDOT Size Designation 3 as specified in Table 31 05 05-G.

TABLE 31 05 05-G
GRADATION REQUIREMENTS FOR NO. 3 STONE

U.S. Sieve Size	Percentage by Weight Passing Sieve
2 ½ -inch (63.5 mm)	100
2 -inch (50 mm)	90-100
1 ½ -inch (37.5 mm)	35-70
1 -inch (25 mm)	0-15

H. No. 4 Stone:
1. Material will be natural or prepared mixtures consisting predominately of hard, durable particles of stone or gravel and free of organic material.
2. Material will meet the NYSDOT Standard Specification Section 703-02 or similar.
3. Material gradation will be in accordance with NYSDOT Size Designation 4 as specified in Table 31 05 05-H.

TABLE 31 05 05-H
GRADATION REQUIREMENTS FOR NO. 4 STONE

U.S. Sieve Size	Percentage by Weight Passing Sieve
4-inch (100 mm)	100
3-inch (75 mm)	90-100
2-inch (50 mm)	0-15

I. Rip Rap:
1. Rip rap will consist of hard, durable, river cobble and will be composed of a well graded mixture of rock size.
2. Material gradation will be as specified in Table 31 05 05-I.

TABLE 31 05 05-I
GRADATION REQUIREMENTS FOR RIP RAP

Stone size	Percentage Passing
20-inches	100
13-inches	50
7-inches	0

J. Clay
   1. Material gradation will be as specified in Table 31 05 05-J.

TABLE 31 05 05-J
GRADATION REQUIREMENTS FOR CLAY

Stone size	Percentage by Weight Passing Sieve
No. 4	100
No. 10	95 - 100
No. 30	95 - 100
No. 40	90 - 95
No. 60	95 - 90
No. 100	90 - 85
No. 200	80 - 85

K. Topsoil:
   1. All soil accepted as topsoil, whether obtained from on-site or off-site sources, will comply with requirements of this section.
   2. Topsoil Source: Amend existing in-place surface soil to produce topsoil, where possible. Verify suitability of surface soil to produce topsoil, as specified. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
      a. Supplement acceptable surface soil with manufactured topsoil from off-site sources, when quantities available on Site are insufficient to complete the Work.
   3. The topsoil will be natural, fertile, friable, granular soil characteristic of productive soils in the region.
   4. Topsoil must be uniform in composition and texture, clean and free from clay lumps, stones greater than 2 inches in diameter, weeds, stumps, roots, toxic substances, and debris or similar substances (e.g., inorganic waste) 2 inches or more in greatest dimension or that prevents proper placement of the material.
   5. Topsoil will meet criteria for pH and organic content as specified in Table 31 05 05-K:

TABLE 31 05 05-K
pH AND ORGANIC CONTENT REQUIREMENTS FOR TOPSOIL

Parameter	Criteria
pH	6.0 to 7.5
Organic Content	5% (minimum)

   6. Topsoil will meet the nutrient content guidance values specified in Table 31 05 05-L. Material that does not fall within the guidance ranges will require fertilization with the appropriate fertilizer to bring the topsoil within the guidance values.

TABLE 31 05 05-L
NUTRIENT CONTENT GUIDANCE FOR TOPSOIL

Parameter	Guidance Value
Total Nitrogen	0.1 - 0.3%
Total Phosphorus	0.1 - 0.3%
Total Potassium	0.1 - 0.3%
Total Calcium	0.1 - 0.3%

   7. Topsoil will have clay content of less than 15% (per ASTM D7928) and gradation will otherwise be as specified in Table 31 05 05-M:

TABLE 31 05 05-M
GRADATION REQUIREMENTS FOR TOPSOIL

Stone size	Percentage by Weight Passing Sieve
1.5-inch (38.1 mm)	100
No. 4 (4.76 mm)	90 - 100
No. 40 (0.42 mm)	50 - 95
No. 200 (0.074 mm)	< 20

8. Application of soil amendments/fertilizers to the topsoil will be dictated by results of specified soil testing and subject to the Remediation Engineer's approval prior to use. Additional details regarding allowable soil amendments and fertilizers is provided in Section 32 90 00, Plantings and Restoration.
9. Topsoil formulated on-site or brought to the site from off-site locations will not be stored for long periods of time (i.e., greater than one month) nor allowed to dry out. Preferable storage will be in a saturated condition until placement in the restored areas.
10. In concert with the above requirements, the topsoil will meet the substantive requirements of Section 4 of the most recent version of the New York State Standards and Specifications for Erosion and Sediment Control.

L. Clayey Soil Mix:
1. All soil accepted as clayey soil mix, will comply with requirements of this section.
2. Clayey Soil Mix Source: If no off-site source is available, blend imported topsoil and clay to produce material in compliance with requirements of this section. All component materials will comply with the requirements of this section.
3. Clayey Topsoil Mix materials must be uniform in composition and texture, clean and free from clay lumps, stones greater than 2 inches in diameter, weeds, stumps, roots, toxic substances, and debris or similar substances (e.g., inorganic waste) 2 inches or more in greatest dimension or that prevents proper placement of the material.
4. Topsoil and Clayey Soil Mix will meet criteria for pH and organic content as specified in Table 31 05 05-N:

TABLE 31 05 05-N
pH AND ORGANIC CONTENT REQUIREMENTS FOR CLAYEY SOIL MIX

Parameter	Criteria
pH	6.0 to 7.5
Organic Content	3% (minimum)

5. Clayey Soil Mix will meet the nutrient content guidance values specified in Table 31 05 05-O. Material that does not fall within the guidance ranges will require fertilization with the appropriate fertilizer to bring the material within the guidance values.

TABLE 31 05 05-O
NUTRIENT CONTENT GUIDANCE FOR CLAYEY SOIL MIX

Parameter	Guidance Value
Total Nitrogen	0.1 - 0.3%
Total Phosphorus	0.1 - 0.3%
Total Potassium	0.1 - 0.3%
Total Calcium	0.1 - 0.3%

6. Clayey Soil Mix gradation will be as specified in Table 31 05 05-P.

TABLE 31 05 05-P
GRADATION REQUIREMENTS FOR CLAYEY SOIL MIX

Stone size	Percentage by Weight Passing Sieve
1.5-inch (38.1 mm)	100
No. 4 (4.76 mm)	90 - 100
No. 40 (0.42 mm)	40 - 90
No. 200 (0.074 mm)	30 - 50

7. Clayey Soil Mix Atterberg limits will be as specified in Table 31 05 05-Q.

TABLE 31 05 05-Q
ATTERBERG LIMIT REQUIREMENTS FOR CLAYEY SOIL MIX

Property	Limit
Liquid Limit	>30
Plasticity Index	<10

8. Application of soil amendments/fertilizers to the topsoil will be dictated by results of specified soil testing and subject to the Remediation Engineer's approval prior to use. Additional details regarding allowable soil amendments and fertilizers is provided in Section 32 90 00, Plantings and Restoration.
9. Clayey Soil Mix will not be stored for long periods of time (i.e., greater than one month) nor allowed to dry out. Preferable storage will be in a saturated condition until placement in the restored areas.

M. Organic Wetland Soil Mix
1. Organic Wetland Soil Mix Source: uniformly blend a 50/50 mix of imported topsoil and river backfill. All topsoil and river backfill materials will comply with the requirements of this section.
2. Organic wetland soil mix materials must be uniform in composition and texture, clean and free from clay lumps, stones greater than 1.5 inches in diameter, weeds, stumps, roots, toxic substances, and debris or similar substances (e.g., inorganic waste) 1.5 inches or more in greatest dimension or that prevents proper placement of the material.

PART 3 – EXECUTION

3.01 GENERAL

A. Fill materials will be placed in accordance with the Design Drawings, Specifications (e.g., Section 31 23 00, Excavation and Fill), and/or Contract Documents.

B. Dispose of materials displaced through the use of the above materials in accordance with Section 02 61 15, Handling and Disposal of Impacted Materials.

C. Restore to design grade any settlements in the finished work at no additional cost to the Owner.

3.02 EROSION AND SEDIMENT CONTROLS

A. Provide temporary erosion and sediment controls in accordance with Specification Section 01 57 05, Temporary Controls and Design Drawings. When applicable, also comply with requirements of the erosion and sediment control plan approved by authorities having jurisdiction.

3.03 ATTACHMENT

A. The attachment listed below, which follows after the “End of Section” designation, is part of this section:
   1. Attachment A: NYSDEC’s Request to Import/Reuse Fill or Spoil Form (Three pages). Attachment may also be found electronically at: https://www.dec.ny.gov/docs/remediation_hudson_pdf/requesttoreusesoil.pdf

END OF SECTION

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NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Request to Import/Reuse Fill or Soil

This form is based on the information required by DER-10, Section 5.4(e). Use of this form is not a substitute for reading the applicable Technical Guidance document.

SECTION 1 – SITE BACKGROUND

The allowable site use is: Choose an item

Have Ecological Resources been identified? Choose an item

Is this soil originating from the site? Choose an item

How many cubic yards of soil will be imported/reused? Choose an item

If greater than 1000 cubic yards will be imported, enter volume to be imported:

SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone? Choose an item

Does it contain less than 10%, by weight, material that would pass a size 80 sieve? Choose an item

Is this virgin material from a permitted mine or quarry? Choose an item

Is this material recycled concrete or brick from a DEC registered processing facility? Choose an item

SECTION 3 - SAMPLING

Provide a brief description of the number and type of samples collected in the space below:

Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.

If the material meets requirements of DER-10 section 5.5 (other material), no chemical testing needed.

SECTION 3 CONT'D - SAMPLING

Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5):

Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.

If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.

SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Location where fill was obtained:

Identification of any state or local approvals as a fill source:

If no approvals are available, provide a brief history of the use of the property that is the fill source:

Provide a list of supporting documentation included with this request:

The information provided on this form is accurate and complete.

_____ _____

Signature Date

_____

Print Name

_____

Firm

Revised August 2014

SECTION 31 05 19.13

GEOTEXTILES FOR EARTHWORK

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Provide all labor, materials, tools, equipment, and services as shown, specified, and required to furnish and install geotextiles.

1.02 REFERENCE STANDARDS

A. The following standards are referenced in this Section:
   1. AASHTO M 288, Standard Specification for Geotextile Specification for Highway Applications.

1.03 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer:
      a. Geotextile manufacturer shall be a specialist in the manufacture of geotextile separation and stabilization fabrics and will have produced and successfully installed a minimum of five million square feet.
      b. Geogrid manufacturer shall be a specialist in the manufacture of geogrid reinforcement fabrics and will have produced and successfully installed a minimum of five million square feet.

1.04 SUBMITTALS

A. Informational Submittals:
   1. Product Data for each geotextile and geogrid material presented in Article 2.02 of this Section:
      a. Geotextile/geogrid manufacturer's data.
      b. Specifications.
      c. Installation instructions.
      d. Dimensions.
      e. Lot and roll numbers of the field-delivered materials.
   2. Certificates: Submit affidavit certifying that the geotextile/geogrid furnished complies with the requirements of this Section. Do not ship geotextile/geogrid to the Site until affidavit is submitted to the Remediation Engineer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Each roll of geotextile/geogrid delivered to the Site will be labeled by the manufacturer identifying the manufacturer's name, product identification, lot number, roll number, and roll dimensions.

B. Inspect all rolls and packages upon delivery to the Site. Notify Remediation Engineer if any loss or damage exists to geotextile/geogrid. Replace loss and repair damage to new condition, in accordance with manufacturer’s instructions.

C. Geotextile/geogrid will be protected from ultraviolet light exposure, precipitation or other inundation, mud, dirt, dust, puncture, cutting, or any other damaging or deleterious conditions. Geotextile/geogrid rolls will be shipped and stored in relatively opaque and watertight wrappings.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. SKAPS Industries

B. TenCate Mirafi

C. U.S. Fabrics

D. Hanes Geo Components

E. Tensar International Corporation

F. Approved equal.

2.02 MATERIALS

A. Non-Woven Geotextile
   1. Non-woven geotextile will be of needle-punched construction and consist of long-chain polymeric fibers or filaments composed of polypropylene. The non-woven geotextile will be chemically inert to naturally encountered chemicals, acids, and bases and resist biological degradation.
   2. Non-woven geotextile will be used as a cushioning layer above and below the high-density polyethylene (HDPE) geomembrane liner in material staging areas, containment areas, and decontamination areas.
   3. The non-woven geotextile will meet GRI GT12 specifications and have the following MARVs (i.e., Mirafi 1160N or approved equal):

TABLE 31 05 19.13-A
REQUIREMENTS FOR NON-WOVEN GEOTEXTILE

Property	ASTM Test Method	Units	MARV
Unit Weight	D5261	oz/yd^2 (g/m^2)	16.0 (379)
Grab Tensile Strength	D4632	lb (N)	380 (1691)
Grab Tensile Elongation	D4632	%	50
Trapezoidal Tear Strength	D4533	lb (N)	140 (623)
CBR Puncture Strength	D6241	lb (N)	1025 (4561)
Apparent Opening Size	D4751	U.S. Sieve (mm)	100 (0.15)
Permittivity	D4491	sec^{-1}	0.7
Flow Rate	D4491	gal/min/ft^2 (l/min/ft^2)	50 (2037)
UV Resistance (at 500 hours)	D4355	%strength retained	70

Note: If a newer ASTM Test method version is available other than noted, the latest version will be used.

B. Woven Geotextile
   1. Woven geotextile will be composed of high-tenacity polypropylene yarns woven into a stable network such that the yarns retain their relative position. The woven geotextile will

be chemically inert to naturally encountered chemicals, acids, and bases and resist biological degradation.

2. Woven geotextile will be used as a separation layer placed below temporary access roads, construction entrance pads, and temporary support areas.
3. The woven geotextile will meet the following specifications of Mirafi® 600X, or approved equal, and have the following MARVs:

TABLE 31 05 19.13-B
REQUIREMENTS FOR WOVEN GEOTEXTILE

Property	ASTM Test Method	Units	MARV
Unit Weight	D5261	oz/yd^2 (g/m^2)	6.0 (203)
Grab Tensile Strength	D4632	lb (N)	315 (1402)
Grab Tensile Elongation	D4632	%	15
Trapezoidal Tear Strength	D4533	lb (N)	120 (534)
CBR Puncture Strength	D6241	lb (N)	900 (4005)
Permittivity	D4491	sec^{-1}	0.05
Flow Rate	D4491	gal/min/ft^2 (l/min/m^2)	4.0 (163)
AOS	D4751	U.S. Sieve (mm)	40 (0.425)
UV Resistance (at 500 hours)	D4355	%strength retained	70

Note: If a newer ASTM Test method version is available other than noted, the latest version will be used.

C. Geogrid

1. Geogrid will be an integrally formed structural geogrid manufactured from high density polyethylene.
2. Geogrid will be used as a reinforcement layer to support construction of the crane access road.
3. Geogrid will meet the following specifications of Tensar UX1700 Geogrid or approved equal.

TABLE 31 05 19.13-C
REQUIREMENTS FOR GEOGRID

Property	Test Method	Units	MD Values[1]
Tensile Strength @ 5% Strain[2]	ASTM D6637-10	lb/ft (kN/m)	5,140 (75)
Ultimate Tensile Strength[2]	ASTM D6637-10	lb/ft (kN/m)	11,990 (175)
Junction Strength[3]	ASTM D7737-11	lb/ft (kN/m)	10,970 (160)
Flexural Stiffness[4]	ASTM D7748-12	mg-cm	9,075,000
Resistance to Long Term Degradation[5]	EPA 9090	%	100
Resistance to UV Degradation[6]	ASTM D4355-05	%	95
Maximum Allowable Strength for 120-year Design Life[7]	GRI-GG4-05	lb/ft (kN/m)	4,390 (64.1)
Minimum Reduction Factor for Installation Damage (RF_{ID})[8]	--	--	1.05
Reduction Factor for Creep for 120-year Design Life (RF_{CR})[9]	ASTM D5262-04	--	2.60
Minimum Reduction Factor for Durability (RF_D)	--	--	1.00

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759-02. Brief descriptions of test procedures are given in the following notes.
2. True resistance to elongation when initially subjected to a load measured via ASTM D6637-10 Method A without deforming test materials under load before measuring such resistant or employing “secant” or “offset” tangent methods of measurement so as to overstate tensile properties.
3. Load transfer capability determined in accordance with ASTM D7737-11.
4. Resistance to bending force determined in accordance with ASTM D7748-12, using one meter (minimum) long specimen.
5. Resistance to loss or load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.

6. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355-05.
7. Reduction factors are used to calculate the geogrid strength available for resisting force in the long-term load bearing applications. Allowable Strength (T_{allow}) is determined by reducing the ultimate tensile strength (T_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD}*RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID}*RF_{CR}*RF_D)$]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
8. Minimum value is based on Installation Damage Testing in Sand, Silt, and Clay soils. Coarser soils require increased RF_{ID} values.
9. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262-04. Actual design life of the completed structure may differ.

PART 3 – EXECUTION

3.01 INSPECTION

A. Examine the areas and conditions under which the Work will be performed and notify the Remediation Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected in a manner acceptable to the Remediation Engineer.

3.02 PREPARATION

A. Excavate or fill subgrade, as required, to bring subgrade to elevations shown or indicated. Maintain all angles of repose. Confirm that subgrade is at proper elevations and that no further earthwork is required to bring the subgrade to proper elevations. Provide subgrade elevations that slope parallel to finished grade and in the direction shown on the Design Drawings.

B. Remove all stones greater than two inches in any dimension, construction debris, trash, rubble, and all other extraneous materials from the subgrade.

C. Notify the Remediation Engineer that subgrade has been prepared and obtain the Remediation Engineer's approval before installing geotextile/geogrid.

3.03 INSTALLATION

A. Geotextiles will be placed (rolled out) in the direction of most frequent vehicular travel.

B. Adjoining edges of geotextiles will be overlapped a minimum of 12 inches.

C. Geotextiles will be weighted with sandbags or equivalent when required. Such sandbags will be installed during placement and will remain until replaced with cover materials.

D. During placement of geotextiles, care will be taken not to entrap in the geotextile stone, excessive dust, mud, or moisture that could damage or cause clogging of the geotextile or hamper subsequent seaming.

E. Use proper tools to cut and size geotextiles; exercise care while cutting geotextiles.

F. Geotextiles will not be exposed to precipitation prior to being installed and will not be exposed to direct sunlight for more than 15 days.

G. Geogrid will be placed (rolled out) in the direction of most frequent vehicular travel and installed in accordance with manufacturer recommendations.

3.04 GEOTEXTILE REPAIR

A. Any holes or tears in the fabric will be repaired as follows:
   1. On Slopes: A fabric patch will be sewn into place using a double sewn lock stitch (1/4 inch to 3/4 inch apart and no closer than one inch from any edge). Should any tear exceed 10 percent of the width of the roll, that roll will be removed from the slope and replaced.
   2. Non-Slopes: A fabric patch will be spot-seamed in place with a minimum of 24 inches of overlap in all directions.

3.05 PLACEMENT OF COVER MATERIALS

A. Place cover materials in such a manner as to ensure that geotextiles are not damaged or dislodged.

END OF SECTION

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SECTION 31 05 19.16

GEOMEMBRANES FOR EARTHWORK

PART 1 – GENERAL

1.01 DESCRIPTION

A. Furnish and install 40 mil textured high-density polyethylene (HDPE) geomembrane liner for alternative bypass system, material staging areas, and decontamination areas as specified in this section and in accordance with the manufacturer's recommendations/specifications.

B. Quality assurance (QA)/quality control (QC) testing of HDPE geomembrane liner as specified in this section and in accordance with the manufacturer's recommendations/ specifications.

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. ASTM International (ASTM). The following ASTM specifications are referenced in this section and are to be considered part of this section:
   1. D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
   2. D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique
   3. D1603 - Standard Test Method for Carbon Black Content in Olefin Plastics
   4. D3895 - Standard Test Method for Oxidative Induction Time of Polyolefins by Differential Scanning Calorimetry
   5. D4218 - Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
   6. D4833 - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
   7. D5199 - Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geosynthetics
   8. D5397 - Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
   9. D5596 - Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
   10. D6693 - Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

   Note, if a newer ASTM Test method version is available other than noted, the latest version shall be used.

B. Geosynthetics Research Institute (GRI). The following GRI test methods are referenced in this section and are to be considered part of this section:
   1. GM13 - Test Methods, Test Properties, and Testing Frequencies for High-Density Polyethylene (HDPE) Smooth and Textured Geomembranes

C. Where reference is made to one of the above codes, standards, specifications, or publications, the revisions in effect at the time of bid shall apply.

1.03 SUBMITTALS

A. Informational Submittals:
   1. Written certification that the minimum test values provided in Part 2.02 of this section are guaranteed by the manufacturer.
   2. Manufacturer's standard warranty for the geomembrane.
   3. Results of QC tests conducted by the manufacturer. QC test results shall include lot and roll identification numbers representative of the field-delivered material. At a minimum, results shall be submitted for:
      a. Thickness (ASTM D5199).
      b. Density (ASTM D1505).
      c. Tensile Properties (ASTM D6693).
      d. Tear Resistance (ASTM D1004).
      e. Puncture Resistance (ASTM D4833).
      f. Carbon Black Content (ASTM D1603/ASTM D4218).
      g. Carbon Black Dispersion (ASTM D5596).
      h. Notched Constant Tensile Load (ASTM D5397).
      i. Oxidative Induction Time (OIT) (ASTM D3895).
   4. Remediation Contractor's written certification (provided prior to the installation of the geomembrane) that the field-delivered material has not been damaged due to improper transportation, handling, or storage.
   5. HDPE lot and roll number of field-delivered material.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Solmax Geosynthetics.

B. GSE Lining Technology, Inc.

C. Poly-Flex, Inc.

D. Approved equal.

2.02 MATERIALS

A. HDPE Geomembrane
   1. HDPE geomembrane liner will meet the following minimum test values (i.e., GSE HD Smooth Geomembrane or approved equal):

TABLE 31 05 19.16-A
REQUIREMENTS FOR HDPE GEOMEMBRANE

Property	ASTM Test Method	Units	MARV
Thickness • Lowest individual for any of the 10 values	D5199	mil (mm)	40 (1.0) 36 (0.9)
Density	D1505	g/cm^2	0.940
Tensile Properties	D6693, Type IV Dumbbell, 2 ipm		
• Break Strength		lb/in-width (N/mm)	152 (27)
• Yield Strength		lb/in-width (N/mm)	84 (15)
• Break Elongation	G.L. 2.0 in (50 mm)	%	700
• Yield Elongation	G.L. 1.3 in (33 mm)	%	12
Tear Resistance	D1004	lb (N)	28 (125)
Puncture Resistance	D4833	lb (N)	72 (320)
Carbon Black Content (Range)	D1603*/4218	%	2.0 - 3.0
Carbon Black Dispersion	D5596	See Note 1	
Notched Constant Tensile Load	D5397	hrs.	300
Oxidation Induction Time	D3895, 200°C; O_2, 1 atm	mins.	>100

Notes:
1. Dispersion only applies to near spherical agglomerates. 9 of 10 views shall Category 1 or 2. No more than 1 view from Category 3.
2. * Modified

2. The geomembrane shall be free of defects, such as holes or blisters, or any contamination by foreign matter.
3. QC testing shall be performed by an independent laboratory at the Remediation Contractor's expense. QC test results shall be submitted to the Remediation Engineer for review a minimum of two weeks prior to mobilizing the material to the site.

B. Welding Material
1. The resin used in the welding material must be identical to the liner material.
2. All welding materials shall be of a type recommended and supplied by the manufacturer and shall be delivered in the original sealed containers, each with an indelible label bearing the brand name, Manufacturer's mark number, and complete directions as to proper storage.

2.03 DELIVERY, HANDLING, AND STORAGE

A. The Remediation Contractor shall be responsible for any damage incurred by the liner material prior to and during transportation to the site.

B. The handling, storage, and care of the liner material prior to and following installation at the site are the responsibility of the Remediation Contractor.

C. Any damage caused to the liner material during delivery, handling, and storage shall be repaired at the Remediation Contractor's expense.

2.04 WARRANTY

A. The Remediation Contractor shall provide a written warranty stating that the materials and workmanship provided are free from defects for the duration of the project.

B. The written warranty shall provide for the complete repair or replacement of the liner material, including all incidental costs associated with the defect, at no cost to the Owner.

C. All repairs or replacements shall be performed within a reasonable period of time, as determined by the Owner and/or Remediation Engineer.

PART 3 – EXECUTION

3.01 INSTALLATION

A. General Requirements
   1. Place, seam, and test liner in accordance with the manufacturer's recommendations/ specifications.
   2. Perform geomembrane installation on geotextile-covered surfaces free from stones or other protruding objects.
   3. No liner shall be placed onto an area that has become softened by precipitation. Appropriate methods of moisture control are the responsibility of the Remediation Contractor.
   4. The liner shall not be installed on frozen soil material. Such material shall be removed and replaced with acceptable material.
   5. All surfaces on which the liner is to be installed shall be acceptable to the Remediation Engineer at the time of installation.

B. Placement
   1. Place geomembrane panels following all instructions on the boxes or wrapping containing the material that describe the proper methods of unrolling the panels.
   2. Do not deploy liner if weather conditions will preclude material seaming following deployment.
   3. During placement, visually inspect geomembrane for uniformity, tears, punctures, blisters, or other damage or imperfections. Any such damage or imperfections shall be immediately repaired and re-inspected at the Remediation Contractor's expense.
   4. Do not use equipment that can damage the liner by handling, trafficking, leakage of hydrocarbons, or other means.
   5. Do not smoke, wear damaging shoes, or engage in other activities that could damage the liner.
   6. Do not allow the prepared surface underlying the liner to deteriorate after acceptance and shall remain acceptable up to the time of liner installation and until completion of the project.
   7. Place adequate temporary loading and/or anchoring (e.g., sandbags), not likely to damage the liner, to prevent uplift by wind (in case of high winds, continuous loading is recommended along edges of panels to minimize risk of wind flow under the panels).
   8. Minimize direct contact with the liner. In high-traffic areas, the liner shall be protected by geotextiles, extra geomembrane, or other suitable materials.
   9. Do not cause excessive scratches or crimps in the liner when unrolling or adjusting and do not damage the supporting soil or underlying geotextile (where applicable).
   10. Minimize the potential for wrinkles (especially differential wrinkles between adjacent panels).

11. Repair any damage to the geomembrane panels or portions of the panels as a result of placement at the Remediation Contractor's expense. The decision to replace or repair any panel or portions of panels shall be made by the Remediation Engineer.

3.02 SEAMING

A. All personnel performing seaming operations shall be qualified by experience or by successfully passing seaming tests.

B. Orient all seams, whether field or factory, parallel to the line of slope, not across slope. At liner penetrations and corners, the number of seams shall be minimized.

C. Clean and prepare the area of the liner to be seamed in accordance with the manufacturer's specified procedures. Any abrading of the liner shall not extend more than 0.5 inch on either side of the weld. Care shall be taken to eliminate or minimize the number of wrinkles and "fish-mouths" resulting from seam orientation.

D. Do not field seam when either the air or sheet temperature is below 32ºF, when the sheet temperature exceeds 122ºF, or when the air temperature is above 104ºF. At air or sheet temperatures between 32ºF and 40ºF, conduct seaming directly behind a preheating device. In addition, do not conduct seaming when the liner material is wet from precipitation, dew, fog, etc., or when winds are in excess of 20 miles per hour.

E. Do not perform seaming on frozen or excessively wet underlying surfaces.

F. Overlap seams beyond the weld large enough to perform destructive peel tests but shall not exceed 5 inches.

G. Perform trial seams on excess liner material. A 1-foot by 3-foot seamed liner sample shall be fabricated with the seam running down the 3-foot length in the center of the sample. Such trial seaming shall be conducted prior to the start of each seaming succession for each seaming crew, every 4 hours, after any significant change in weather conditions or liner temperature, or after any change in seaming equipment. From each trial seam, four field test specimens shall be taken. The test specimens shall be 1-inch by 12-inch strips cut perpendicular to the trial seam. Two of these specimens shall be shear tested and two shall be peel tested using a field tensiometer and recorded as pass (failure of liner material) or fail (failure of seam). Upon initial failure, a second trial seam shall be made; if both trial seams fail, then the seaming device and its operator shall not perform any seaming operations until the deficiencies are corrected, and two successive passing trial seams are produced. Completed trial seam samples cannot be used as portions of a second sample and must be discarded.

H. Where "fish-mouths" occur, cut, overlap, and apply an overlap weld. Where necessary, patching using the same liner material shall be welded to the geomembrane.

I. Acceptable seaming methods include:
   1. Extrusion welding using extrudate with identical physical, chemical, and environmental properties.
   2. Hot-wedge welding using a proven fusion welder and master seamer.

J. The seaming device shall not have any sharp edges that might damage the liner. Where self-propelled seaming devices are used, it shall be necessary to prevent "bulldozing" of the device into the underlying soil.

K. Perform non-destructive seam testing on all field seams.
   1. Conduct non-destructive seam testing under the direct observation of the Remediation Engineer.
   2. Air pressure testing may be used if double-track hot-wedge welding has been used to seam the liner. Using approved pressure testing equipment, the following procedures shall be followed:
      a. Seal both ends of the air channel separating the double-track hot-wedge welds.
      b. Insert pressure needle into air channel and pressurize the air channel to 27 psi.
      c. Monitor pressure gauge for 3 minutes and determine whether pressure is maintained without a loss of more than 2 psi.
      d. If the pressure test fails, then localize the leak and mark the area for repair.
   3. Vacuum testing shall be used on all seams not tested using air pressure testing. Using an approved vacuum box, the following procedures shall be followed:
      e. Apply a soapy water mixture over the seam.
      f. Place vacuum box over soapy seam and form a tight seal.
      g. Create a vacuum by reducing the vacuum box pressure to 5 psi for 10 seconds.
      h. Observe through the vacuum box window any bubbles.
      i. Where bubbles are observed, mark seam for repair.
      j. Move vacuum box further down seam, overlapping tested seam by 3 inches.
      k. Where hot-wedge seaming has been performed, the overlap shall be cut back to the weld.

3.03 LINER REPAIR

A. All imperfections, flaws, construction damage, and seam failures shall be repaired by the Remediation Contractor at no additional cost to the Owner.

B. Acceptable repair methods include:
   1. Patching, used to repair holes, tears, undispersed raw materials, and contamination by foreign matter.
   2. Grinding and re-welding to repair small sections of extruded seams.
   3. Spot Welding or Seaming to repair pinholes or other minor, localized flaws.
   4. Capping to repair large lengths of failed seams.
   5. Topping to repair areas of inadequate seams which have an exposed edge.
   6. Removing bad seams and replacing with a strip of new material welded into place.

END OF SECTION

SECTION 31 09 13

GEOTECHNICAL INSTRUMENTATION AND MONITORING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work Specified:
   1. Furnish and installation of geotechnical instrumentation in accordance with this Section and as shown on the Design Drawings, including:
      a. Deflection monitoring of steel sheet pile wall deflections using land surveying technology and wall integrity inspections during installation/removal of bypass system and removal and backfill activities.
   2. Provide and maintain safe means of access to all geotechnical instrumentation for the duration of the Project.

B. Related Sections
   1. 01 15 00, Remediation Contractor's Project Operations Plan.
   2. 01 32 26, Construction Progress Reporting
   3. 01 71 23, Field Engineering.
   4. 01 71 33, Protection of the Work and Property.
   5. 02 21 19, Structural Surveys.
   6. 31 50 00, Excavation Protection (Bypass System).

1.02 QUALITY ASSURANCE

A. Qualifications
   1. Instrumentation personnel to be hired by the Remediation Contractor must have at least 4 years of direct field experience in installation and monitoring of the types of instruments specified herein and interpreting instrumentation data. The instrumentation installer must be able to demonstrate that they have successfully completed a minimum of 5 projects where optical survey points or vibration monitoring instrumentation have been installed and operated.
   2. Responsibilities include, but are not necessarily limited to, the following:
      a. Installing and removing all geotechnical instrumentation.
      b. Calibrating geotechnical instrumentation at frequencies recommended by the manufacturer.
      c. Coordinating instrument maintenance and repairs.
      d. Collecting and recording instrument readings.
      e. Managing a database of geotechnical monitoring data at the Site.
      f. Preparing and submitting daily geotechnical monitoring reports in accordance with Article 1.03 of this Section.
      g. Responding to exceedances of alert or action levels during the Work.
      h. Notifying Remediation Engineer and appropriate Contractor personnel when alert or action levels are exceeded during the Work.

B. Instrument Calibration:
   1. A factory calibration will be conducted on all geotechnical instrumentation, as applicable, at the place of manufacture before shipment to the Site. Review calibration record for each instrument and match to serial number of the instrument. Submit factory calibration records to the Remediation Engineer upon request.

2. During the Work, calibrate geotechnical instrumentation at frequencies recommended by the manufacturer, in accordance with manufacturer's calibration and quality assurance requirements. Document all instrument readings, field reference checks, and calibrations in a dedicated log.
3. Preventative maintenance and repair of geotechnical instrumentation, if required, will only be performed by qualified personnel, or authorized representatives of the manufacturer.
4. Prepare and retain at the Site electronic or written records of all instrument calibrations, preventative maintenance, and repairs. Submit to the Remediation Engineer upon request.

C. Pre-Installation Testing
1. Examine geotechnical instrumentation and accessories upon delivery to the Site for damage due to shipment.
2. Verify instruments and accessories are in working order before installing.
3. Immediately remove from the Site, and replace at the Remediation Contractor's expense, damaged or malfunctioning instruments and accessories.

1.03 SUBMITTALS

A. Informational Submittals:
1. Qualifications: Submit qualifications of proposed instrumentation personnel.
2. Prior to the start of work, submit a Special Instrumentation Installation Plan as part of the Remediation Contractor's Project Operations Plan. This plan will include the following:
a. Shop Drawings that detail the proposed means, methods, and locations (plan and elevation) for installing the instruments on the steel sheet piles, existing buildings, and bridge abutments. Details will include manufacturer's specifications and installation/operating procedures. Shop Drawings will include proposed alignment of associated cables, benchmark location, robotic total station locations, and proposed data logging location, as appropriate.
b. Manufacturer's technical specifications indicating that the optical survey points meet the minimum requirements outlined in this Section.
c. Manufacturer's technical specifications indicating that the vibration monitoring equipment meet the minimum requirements outlined in this Section.
d. Instrumentation Installation Methods: Submit the following:
1) Relevant health and safety measures applicable to geotechnical installation and removal.
2) Detailed descriptions of the proposed installation procedures for the geotechnical instrumentation (i.e., optical survey, vibration monitoring).
3) Manufacturer's installation recommendations and requirements.
4) Methods for demarcating the location of geotechnical instruments.
5) Proposed methods for reinstalling the instruments if they are damaged, fail to operate properly, or otherwise require temporary removal and reinstallation.
6) Proposed means of protecting geotechnical instrumentation during completion of the work.
3. Geotechnical Monitoring Report (may be provided in Daily Construction Report, submitted in accordance with Section 01 32 26, Construction Progress Reporting): Submit data collected as required in Article 3.02 of this Section, in accordance with Article 1.06 of this Section. Provide survey data to the Remediation Engineer no later than 10:00 a.m., of the subsequent workday after the day covered in the associated report.
4. Submit electronic or written records of all field checks of seismograph equipment, performed in accordance with Article 3.02.B of this Section, to the Remediation Engineer upon request.

B. Action Submittals:
   1. Product Data: Submit manufacturer's data, specifications, and installation and operating instructions for all geotechnical instrumentation and accessories furnished under this Section.

1.04 DELIVERY, STORAGE AND HANDLING

A. Prior to installation, store all special sensors and accessory hardware in a dry location protected from direct sunlight, moisture, theft, extreme temperatures (>90 and <20 degrees Fahrenheit [ºF]), physical, and chemical hazards.

B. All instruments will be calibrated and in working order at the time of installation and will be verified on-site by the Remediation Engineer, immediately prior to installation.

C. All appropriate precautions for working with electricity, as indicated in the Remediation Contractor's Health and Safety Plan, will be followed at time of installation.

1.05 INSTRUMENTATION

A. All instruments will be installed in the presence of the Remediation Engineer. The Remediation Contractor shall allow access to the work area at all times for the purpose of observing instrumentation and obtaining data. The Remediation Contractor shall determine the elevation and location of all instrumentation a minimum of one week prior to excavation or sheet pile installation.

B. The Remediation Contractor shall be responsible for any and all damage incurred to utilities and structures during geotechnical instrumentation installation.

C. The Remediation Contractor shall protect and maintain instrumentation until the end of the Project. Any instrumentation damaged or otherwise rendered non-functional will be repaired or replaced with a new installation within five working days at no additional cost to the Owner. Repair or replacement work will conform to the requirements specified herein for the respective type of geotechnical instrumentation.

D. The Remediation Contractor shall provide installation plans for monitoring devices.

1.06 GEOTECHNICAL MONITORING REPORT

A. Prepare daily geotechnical monitoring reports throughout the project, or at a reduced frequency if requested by the Owner. Include in each report, at a minimum, the following:
   1. Remediation Contractor's name.
   2. Owner's name.
   3. Project name.
   4. Site name and location.
   5. Date and day of the week.
   6. High and low temperatures and general weather conditions.
   7. General location and brief description of Work performed at the Site.
   8. Optical Monitoring Records: Provide the following for each optical survey point:
      a. Location.
      b. Time and reading for each monitoring event.
      c. The coordinates (northing and easting) and elevation of each optical survey point.

9. Both raw and reduced data will be provided on summary tables and plots. Data plots will show absolute vertical deformation versus time and absolute horizontal deformation versus time.
10. Vibration Monitoring Records: Provide the following for each seismograph:
    a. Serial number.
    b. Location.
    c. Start time, stop time, and duration of monitoring.
    d. Maximum peak particle velocity for monitoring period.
    e. Histograms of longitudinal, transverse, and vertical readings in units of inches per second.
11. Exceedances (if any) of the alert levels and action levels specified in this Section. Provide the following:
    a. Time, location, and instrument reading of exceedance.
    b. Summary of Work being performed at time of exceedance.
    c. Corrective actions taken or to be taken in response to exceedance.
12. Site plan showing approximate locations of all geotechnical instrumentation at the Site. Label each instrument with its serial number.

PART 2 – PRODUCTS

2.01 GENERAL

A. Geotechnical instrumentation will be specifically designed, manufactured, and installed for the application intended and environmental conditions required.

B. Furnish power and batteries in sufficient supply to allow for continuous real-time monitoring and data-logging for a period of not less than 12 hours.

2.02 OPTICAL SURVEY POINTS

A. Optical survey equipment will meet a 0.05-inch tolerance in order to know that any variances in movements are not due to the equipment tolerance, but rather they are due to the actual movements due to removal and backfilling activities.

B. Optical Survey Points will be fixed prisms or an approved equivalent that will allow the points to be optically surveyed.

2.03 VIBRATION MONITORING (SEISMOGRAPHS)

A. Provide portable seismographs with triaxial geophones for the continuous monitoring of vibrations per Article 3.02 of this Section.
    1. Manufacturer: Provide products of one of the following:
        a. GeoSonics/Vibra-Tech, Inc.
        b. Instantel.
        c. Or equal.
    2. Range: 0.01 to 10 inches per second.
    3. Resolution: 0.005 inch per second.
    4. Accuracy: Plus-or-minus five percent.
    5. Frequency Response Range: Two to 250 Hertz.

6. Furnish seismographs as necessary based on Design Drawings, complete with readout displays, data loggers, protective housings, software, and other accessories recommended by manufacturer for the intended application. Seismographs will be suitable for installation on hard and/or soft surfaces (and vertical or horizontal), as appropriate for each area to be monitored.

2.04 SPARE EQUIPMENT

A. Furnish and retain at the Site spare instrumentation, readout indicators, data loggers, batteries, and accessories to allow for uninterrupted monitoring in the event of instrument damage or malfunction.

PART 3 – EXECUTION

3.01 INSTALLATION

A. General:
   1. Install geotechnical instrumentation in accordance with manufacturer's instructions.
   2. Lay out and stake or mark individual instrument locations for approval of Remediation Engineer. Adjust locations when requested and obtain Remediation Engineer's acceptance of layout before installing. Make minor adjustments as required.

B. Optical Survey Points
   1. Remediation Contractor shall have a qualified surveyor establish a benchmark and optical survey points.
   2. The Remediation Engineer shall be notified at least 24 hours prior to installing each instrument.
   3. Install optical survey points as shown on Design Drawings in locations approved by the Remediation Engineer (horizontal and vertical) and in accordance with the manufacturer's specifications.
      a. Optical survey points will be mounted at locations visible from the shoreline used for access.
      b. For bridges, install optical survey points on abutments.

C. Vibration Monitoring Equipment
   1. Mount vibration monitoring equipment in approved locations and in accordance with the manufacturer's specifications as shown on Design Drawings.
      a. Install vertically on structures to be monitored.
   2. Ensure the seismographs are installed properly and in accordance with manufacturer recommendations at the start of each workday during which monitoring is required (see Article 3.02 of this Section) and before intrusive activities are initiated for the day.
   3. Secure seismographs/seismograph equipment at the end of each workday and after all monitored site activities have been completed for the day.

3.02 MONITORING

A. Optical Survey
   1. Monitoring Schedule:
      a. Once installed, survey and document, by robotic total station, the baseline coordinates (northing and easting) and elevation of each optical survey points before any sheet pile installation or material removal activities begin.

b. Survey and document, by robotic total station, the coordinates (northing and easting) and elevation of each optical survey point once a day during sheet pile installation and removal activities and sediment removal and backfilling activities.

2. Notification Level: 1.5 inches of movement in any direction.
   a. Immediately notify Remediation Engineer.
      1) Remediation Engineer shall notify New York Susquehanna & Western Railway within 12 hours.
   b. Additional optical surveying will continue on a repeatable basis for the location where the movement occurred, and any other optical monitoring points deemed necessary by the Remediation Engineer, for at least two times per day for two consecutive days to determine if further movement occurs.
   c. Work can continue with optical surveying continuing daily.
3. Action Level: 2.0 inches of movement in any direction.
   a. Immediately notify the Remediation Engineer.
      1) Remediation Engineer shall notify New York Susquehanna & Western Railway within 1 hour.
   b. Stop all work.
   c. If additional movement is detected at or greater than 2.0 inches, work will stop and Remediation Contractor shall backfill removal area.
4. When the optical survey action level has been reached, Remediation Contractor must then propose a method to continue work activities to be reviewed by the Remediation Engineer and the Owner that prevents further movement of the steel sheet piles (e.g. sequential excavation and backfilling).

B. Vibration Monitoring
   1. Monitoring Schedule:
      a. Baseline Monitoring:
         1) Perform baseline vibration monitoring at required locations prior to initiating installation of bypass system.
         2) Baseline monitoring will be performed continuously between the hours of 7:00 a.m. and 5:00 p.m. over a period of not less than five working days prior to initiating installation of bypass system.
      b. Routine Monitoring:
         1) Continuously monitor vibrations at required locations during installation/removal of bypass system activities performed for the associated remediation area.
         2) During the workday, perform hourly or more frequent field checks of seismographs to verify proper function. Document the date, day of the week, time, and outcome of each field check in a dedicated log. Immediately remove from service, and replace at Remediation Contractor's expense, damaged or malfunctioning instruments. Prepare and retain at the Site, electronic or written records of all field checks.
         3) Download monitoring data from seismographs at the end of each day.
   2. Notification Level: peak particle velocity of 0.75 inches per second.
      a. Immediately notify Remediation Engineer.
         1) Remediation Engineer shall notify New York Susquehanna & Western Railway within 12 hours.
      b. Continue work and review ongoing construction activities and discuss potential modification to means and methods to reduce vibration.
   3. Action Level: 1.00 inches per second, or the maximum baseline level, whichever is lower.
      a. Immediately notify Remediation Engineer.
         1) Remediation Engineer shall notify New York Susquehanna & Western Railway within 1 hour.
      b. Stop all work.

c. Review ongoing construction activities and discuss potential modification to means and methods to reduce vibration.

4. When the vibration monitoring action level has been reached, Remediation Contractor must then propose a method to continue work activities to be reviewed by the Remediation Engineer and the Owner that prevents further vibration in exceedance of the action level (e.g., modifying sheet pile driving/removal techniques, sequencing, or equipment).

3.03 DAMAGE TO INSTRUMENTATION

A. Protect all instruments and appurtenant fixtures, leads, connections, and other components of instrumentation from damage due to construction operations, weather, and vandalism.

B. If an instrument is damaged or inoperative, repair or replace the damaged or inoperative instrument within 48 hours with no additional cost to the Owner. The Remediation Engineer will be the sole judge of whether repair or replacement is required.

3.04 REMOVAL

A. Remove instrumentation only when directed by the Owner and/or Remediation Engineer.

B. Repair any damaged or disturbed surfaces to original condition.

C. All instrumentation will become the property of the Remediation Contractor.

END OF SECTION

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SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall provide all labor, materials, equipment, and incidentals required to perform clearing and grubbing as shown and specified in the Contract Documents.
   2. The Work includes removing from the Site and disposing of trees, shrubs, stumps, roots, brush, logs, vegetation, topsoil, rubbish, and other objectionable material.
   3. Pay all fees associated with transporting and disposing of debris resulting from clearing and grubbing, unless otherwise paid by Owner.
   4. Limits of Clearing and Grubbing Work: Clear and grub only as necessary to facilitate installing temporary facilities as well as performing sediment removal and backfilling activities.

1.02 WARRANTY

A. Remediation Contractor shall warrant that Work performed under this Section will not permanently damage trees, shrubs, turf, and plants designated to remain, or other adjacent work, facilities, or property. If damage resulting from Remediation Contractor's operations becomes evident during the correction period, Remediation Contractor shall replace damaged items and property at no additional cost to Owner.

1.03 SUBMITTALS

A. Action Submittals:
   1. Remediation Engineer shall complete a Pre-Construction Tree and Vegetation Survey of all areas that will be affected by the remedial construction activities.
   2. Tree Removal Plan. The Tree Removal Plan will identify all trees with a diameter at breast height (DBH) of 3 inches or greater that the Remediation Contractor proposes to trim or remove. The Tree Removal Plan will include a table and drawings identifying the location, size, species, and condition of each tree that the Remediation Contractor proposes to trim or remove. The Tree Removal Plan will describe all equipment and procedures to be used to remove, transport, and dispose of trees and provide a schedule for operations. The plan will identify the procedures and locations for chipping and sizing of removed trees.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PREPARATION

A. Protection:
   1. Throughout the Project, protect existing site improvements, including streets, drives, and Underground Facilities to remain (if any), and adjacent property and structures. Repair damage caused by the Remediation Contractor to original condition or replace in kind, to satisfaction of the Remediation Engineer, and at no additional cost to the Owner.
   2. Do not remove trees or vegetation prior to completion of the Pre-Construction Tree and Vegetation Survey.
   3. Do not remove trees without the approval of the Owner or the Remediation Engineer, unless shown or indicated for removal on the Design Drawings.
   4. Do not locate construction equipment, stored materials, or stockpiles within the drip line of trees and vegetation to remain.

B. Site Preparation:
   1. Obtain, pay costs associated with, and comply with applicable permits, if any, required for clearing and grubbing Work.
   2. Clearing and Grubbing activities will not occur prior to completion of the Pre-Construction Tree and Vegetation survey performed by the Remediation Engineer.
   3. Delineation of Clearing and Grubbing Limits:
      a. Locate and clearly flag trees, vegetation, and other items to remain within the limits of clearing and grubbing as shown on the contract drawings.
      b. Provide flagging to delineate limits of areas to be cleared or grubbed. Review at Site with Remediation Engineer before initiating clearing and grubbing Work.
      c. Replace flagging that is lost, removed, or destroyed until clearing and grubbing Work is complete and Remediation Engineer allows removal of flagging.
   4. Erosion and Sediment Controls:
      a. Install applicable erosion and sediment controls before initiating clearing and grubbing Work.
      b. Comply with Section 01 41 26, Storm Water Pollution Prevention Plan and Permit and erosion and sediment control requirements of Section 01 57 05, Temporary Controls.
      c. Adjust, relocate, or install additional erosion and sediment controls as clearing and grubbing Work progresses to undisturbed areas of the Work areas.

3.02 CLEARING AND GRUBBING

A. Remove all trees, shrubs, stumps, roots, brush, logs, rubbish, and debris within the construction work limits as required to perform the work or as indicated in the Contract Documents. Blanket tree removal is prohibited.

B. Trees, shrubs, and other dense vegetation will be removed to ground surface.

C. Trees and shrubs to remain that have been damaged or require trimming will be treated and repaired under the direction of a qualified arborist, or other professional with qualifications acceptable to Remediation Engineer. Trees and shrubs intended to remain, that are damaged beyond repair or that are removed, will be replaced by Remediation Contractor at no additional cost to Owner.

3.03 DISPOSAL OF CLEARED AND GRUBBED MATERIALS

A. Shrubs will be chipped on site; wood chips may be used as mulch during site restoration activities.

B. Trees will be cut into manageable-sized pieces to support transport and disposition.

C. Properly transport and dispose of cleared and grubbed materials, as necessary at appropriate, Owner-approved facilities in accordance with Laws and Regulations.
   1. Site-Clearing Wastes: Comply with Section 01 74 19, Construction Waste Management and Disposal.
   2. Site-Grubbing Wastes: Comply with Section 02 61 15, Handling and Disposal of Impacted Materials.

END OF SECTION

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SECTION 31 23 00

EXCAVATION AND FILL

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall provide all labor, materials, equipment, and incidentals required to perform all excavating, filling, and grading as shown, specified, and required to complete the Work.
   2. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof, except rock requiring drilling, blasting, or special equipment for removal.

B. Coordination:
   1. Review procedures under this and other Sections and coordinate Work that must be performed with or before excavation and fill Work.

1.02 QUALITY ASSURANCE

A. Qualifications:
   1. Retain the services of an independent testing laboratory to perform quality assurance and field quality control testing required in this Section. Testing laboratory shall comply with ASTM D6938, and shall be experienced in the types of testing required.
   2. Off-site Fill Sources: Source of off-site general fill and subbase material shall be a in accordance with Section 31 05 05, Aggregates for Earthwork.

B. Regulatory Requirements:
   1. Laws and Regulations applying to the Work under this Section include, but are not limited to, the following:
      a. 29 CFR 1926.650 through 29 CFR 1926.652, Subpart P – Excavations.
      b. 6 NYCRR 360, Solid Waste Management Facilities.
      c. 6 NYCRR 375, Environmental Remediation Programs.
      d. 12 NYCRR 23-4.1 through 12 NYCRR 23-4.5, Subpart 23-4 – Excavation Operations.
      e. 16 NYCRR 753, Protection of Underground Utilities.
   2. Comply with applicable provisions and recommendations of the following:
      a. NYSDOT Standard Specifications and Standard Sheets.
   3. Obtain required permits and approvals for excavation and fill Work, including work permits from right-of-way owners.

1.03 SUBMITTALS

A. Action Submittals: Submit the following:
   1. Excavation and Backfilling Plan (may be within Project Operations Plan [POP], see Section 01 15 00, Remediation Contractor's POP): Submit acceptable plan for excavation, backfilling, and related Work not less than 10 days prior to starting excavation Work. Include the following:
      a. Plan for coordinating shut-offs, locating, capping, temporary services, and continuing utility services.

b. Plan for sequencing with survey procedures performed in accordance with Section 01 71 26, Construction Surveying and Layout.
c. Plan for sequencing of temporary river bypass system installed in accordance with Section 31 50 00, Excavation Protection (Bypass System).
d. Proposed excavation, dewatering, backfilling, and compaction (if necessary) procedures. Where different procedures or equipment will be used for different types of material or at different locations at the Site, indicate where each procedure and equipment item will be used.
e. List of proposed equipment for excavation, dewatering, backfilling, and compaction (if necessary) Work.
f. Planned sequence of excavation and backfilling operations.
g. Detailed schedule of excavation and backfilling Work in accordance with the accepted Progress Schedule.

2. During construction, submit any proposed significant changes to operating procedures or equipment, such as use of an entirely different material removal technology, to the Owner and the Remediation Engineer for review and approval prior to implementation.
3. During construction, submit updates to the Excavation and Backfilling Plan as requested by the Remediation Engineer or, as necessary, to account for different methods, procedures, or conditions to those presented in the approved Excavation and Backfilling Plan.

B. Informational Submittals: Submit the following:
1. Submit material removal status summary in daily progress reports in accordance with Section 01 32 26, Construction Progress Reporting.
2. Testing Laboratory Qualifications: Submit qualifications for the firm proposed for field nuclear density testing of granular materials.
3. Field Quality Control Submittals: Submit laboratory test reports for field quality control testing performed in accordance with Article 3.09 of this Section.

1.04 DEFINITIONS

A. Debris: Debris includes, but is not limited to, wood, vegetation, and manmade objects (e.g. brick, concrete, metal, ash, cinders, glass).

B. Earth: Earth means materials, such as sand, gravel, sediment, clay, loam, ashes, cinders, pavements, muck, roots, pieces of timber, soft or disintegrated rock, not requiring blasting, barring, or wedging from their original beds, and specifically excluding all or bedrock, masonry, or debris larger than 0.5 cubic yard in volume.

C. Backfill: Backfill means the refilling of excavated areas to the elevations indicated on the Design Drawings or as directed using specified materials for refilling of excavated areas; and the compacting of all materials used in filling or refilling by rolling, ramming, or as may be required and approved by the Owner.

D. Material Removal: Material Removal includes the removal of all soil and sediment material and debris necessary to achieve the horizontal limit shown on the Design Drawings and discussed herein and the vertical limit discussed herein.

E. Best Management Practices (BMPs): BMPs shall be implemented by the Remediation Contractor as directed by the Remediation Engineer. BMPs that shall be implemented by the Remediation Contractor at the direction of the Remediation Engineer include, but are not limited to, the following operational procedures:
1. Implement material removal in a manner that ensures stable slopes along the exposed face of uncut areas inside the material removal area boundary to minimize bank

sloughing or failure. This may involve a stairstep configuration of bucket bites in continuous areas where the thickness of the material removal cut to achieve the required removal depth is greater than two times the bite depth of the material removal bucket being used at that location.

2. Implement material removal of slopes in a stairstep fashion where the bucket bites proceed from the top of the slope to the bottom of the slope to minimize sloughing.

1.05 SITE CONDITIONS

A. Subsurface Information:

1. The Contract Documents indicate information available relative to subsurface conditions at the Site. Such information and data is not intended as a representation or warranty of continuity of conditions between soil borings or test pits, nor of surface water or groundwater levels at dates and times other than date and time when measured, nor that purpose of obtaining the information and data were appropriate for use by the Remediation Contractor. The Owner and the Remediation Engineer will not be responsible for interpretations or conclusions drawn therefrom by the Remediation Contractor.
2. Soil borings and other exploratory operations may be made by the Remediation Contractor, at no additional cost to the Owner. Coordinate the Remediation Contractor-performed test borings and other exploratory operations with Owner and utility owners as appropriate. Perform such explorations without disrupting or otherwise adversely affecting operations of the Owner or utility owners. Comply with Laws and Regulations relative to required notifications.

B. Existing Structures:

1. The Contract Documents show or indicate certain existing structures and Underground Facilities adjacent to or within the limits of the Work. Such information was obtained from existing records and is not guaranteed to be correct or complete. Remediation Contractor shall explore ahead of demolition, trenching, excavation, or other subsurface Work to determine the exact location of all existing structures and Underground Facilities. Existing structures and Underground Facilities shall be supported and protected from damage by the Remediation Contractor. Immediately repair and restore existing structures and Underground Facilities damaged by the Remediation Contractor without additional cost to Owner.
2. Movement or operation of construction equipment over Underground Facilities shall be at the Remediation Contractor's sole risk and only after the Remediation Contractor has prepared and submitted to the Remediation Engineer and utility owners (as applicable), and received acceptance therefrom, a plan describing the Remediation Contractor's analysis of the loads to be imparted and the Remediation Contractor's proposed measures to protect structures and Underground Facilities during the Project.
3. If needed, coordinate with utility owners for shut off of services in active piping and conduits, and for testing, shut off of services, and draining, purging, or de-energizing where specified or required of piping and conduits of unknown status. When required by utility owner, the Owner will assist the Remediation Contractor with utility owner notifications.
4. Do not interrupt existing utilities serving facilities occupied and used by the Owner or others, except when such interruption is allowed in writing by the Remediation Engineer after acceptable temporary utility services are provided by the Remediation Contractor for the affected structure or property.

PART 2 – PRODUCTS

2.01 EQUIPMENT

A. Excavators and buckets of various sizes, types, and configurations shall be provided as necessary to maximize effectiveness based on the cut thicknesses and different substrate conditions anticipated to be encountered.

B. In some areas, discrete removal methods (e.g., air conveyor system) shall be utilized to remove fine-grained material, minimizing stream disturbance.

2.02 RESTORATION MATERIALS

A. Fill material shall be a in accordance with Section 31 05 05, Aggregates for Earthwork.

PART 3 – EXECUTION

3.01 INSPECTION

A. Provide the Remediation Engineer with sufficient notice and with means to examine areas and conditions under which excavating, filling, and grading Work will be performed. Remediation Engineer will advise the Remediation Contractor in writing when the Remediation Engineer is aware of conditions that may be detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

B. If at any point during the Work, the turbidity monitoring data indicates turbidity levels above the turbidity action level or distinct turbidity plumes are visible the Contractor will implement response actions as required by Section 01 57 05, Temporary Controls.

3.02 SEQUENCING OF WORK

A. Prior to start of excavation, prepare area as specified in Article 3.03 of this Section.

B. Prior to the start of excavation, conduct pre-construction survey in accordance with Section 01 71 26, Construction Surveying and Layout.

C. Conduct investigations and/or excavation as specified in Article 3.04 through Article 3.06 of this Section.

D. Monitor material removal activities via conventional survey techniques, equipment positioning and visualization software. Include material removal progress in daily reports in accordance with Section 01 32 26, Construction Progress Reporting.

E. Conduct post-removal survey in accordance with Section 01 71 26, Construction Surveying and Layout following completion of material removal and prior to fill placement.

F. If material removal equipment is to be used for restoration, the conduct equipment decontamination prior to using for placement of fill, in accordance with Section 02 51 00, Decontamination.

G. Conduct fill placement as discussed in Article 3.06 of this Section.

H. Conduct post-restoration survey in accordance with Section 01 71 26, Construction Surveying and Layout following completion of restoration.

I. Conduct equipment decontamination prior to demobilization in accordance with Section 02 51 00, Decontamination.

3.03 PREPARATION

A. Erosion and Sediment Control: Provide temporary erosion and sediment controls in accordance with Section 01 57 05, Temporary Controls, and comply with Section 01 41 26, Storm Water Pollution Prevention and Permit.

B. Odor, Vapor, and Dust Control: Provide odor, vapor, and dust controls in accordance with Section 01 57 05, Temporary Controls, and comply with Section 01 35 49, Community Air Monitoring Plan.

C. Site Preparation:
   1. Comply with Section 01 71 33, Protection of Work and Property
   2. Comply with Section 31 11 00, Clearing and Grubbing.

D. Temporary River Bypass System:
   1. Prior to start of installation of temporary river bypass system, provide temporary barriers surrounding excavations and excavation work areas to provide temporary protection to persons and property. Barriers shall have openings only at vehicular, equipment, and worker access points.
   2. Install temporary river bypass system as indicated in the Contract Documents and in accordance with Section 31 50 00, Excavation Protection (Bypass System).

E. Dewatering:
   1. General:
      a. Provide and maintain adequate drainage and dewatering equipment to remove and dispose of all surface water and groundwater entering excavations, or other parts of the Work and work areas. Make best efforts to keep each excavation dry during excavation, subgrade preparation, and continually thereafter until backfilling operations are completed and acceptable to the Remediation Engineer.
      b. Make best efforts to keep all working areas at the Site free of surface water at all times. Provide temporary drainage ditches and temporary dikes, and provide required temporary pumping and other work necessary for diverting or removing rainfall and all other accumulations of surface water from excavation and fill areas. Perform diversion and removal of surface water in a manner that prevents accumulation of water behind permanent or temporary structures and at any other locations in the work area where such accumulations may be detrimental. See Section 01 51 41, Temporary Pumping for additional requirements.
      c. Remediation Contractor shall be responsible for the condition of piping, conduits, and channels used for drainage, and such piping, conduits, and channels shall be clean and free of sediment.
      d. Remove water from excavations as fast as water collects.
   2. Temporary Dewatering System:
      a. In accordance with Section 01 51 41, Temporary Pumping, design, provide, operate, and maintain dewatering system to include sufficient trenches, sumps, pumps, hose, piping, well points, and similar facilities, necessary to depress and maintain surface water and groundwater level below the base of each excavation until backfilling operations are completed and acceptable to the Remediation Engineer.

b. Design and operate dewatering system to avoid settlement and damage to existing structures and Underground Facilities, and to minimize the turbidity of the collected water.
c. Operate dewatering system continuously during active excavation and backfilling Work. Provide standby pumping facilities and personnel to maintain the continued effectiveness of the system. Do not discontinue dewatering operations without first obtaining the Remediation Engineer's acceptance for such discontinuation.
d. If, in the Remediation Engineer's opinion, surface water or groundwater levels are not being lowered or maintained as required, provide additional or alternate temporary dewatering devices, as necessary, at no additional cost to the Owner.
e. Locate elements of temporary dewatering system to allow continuous dewatering operation without interfering with the Work to the extent practicable.

3. Disposal of Water Removed by Dewatering System:
   a. If no sheens are observed on the water column, surface water within the work area that is greater than one foot above the riverbed may be pumped over the temporary river bypass system and back into the West Branch of the Tioughnioga River.
   b. For surface water within one foot of the riverbed within the dewatered work area, Remediation Contractor shall collect and convey water from excavations in closed conduits or piping to the upland staging area temporary water treatment system.
   c. Handling and disposal of wastewater shall be in accordance with Laws and Regulations and Section 01 53 53, Temporary Water Treatment and Management.

3.04 INVESTIGATIVE TEST PITS

A. General: In advance of the construction, excavate, make observations and measurements, and fill test pits to determine conditions or location of existing structures and Underground Facilities, as necessary. Perform all work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, and filling test pits. Remediation Contractor shall be responsible for the definite location of each existing structure and Underground Facility involved within the areas of excavation for the Work. Exercise care during such location work to avoid damaging and disrupting the affected structure or Underground Facility. Remediation Contractor shall be responsible for repairing, at its expense, damage caused during the Work to existing structures or Underground Facilities to remain.

B. Payment for Test Pits: There shall be no separate payment for test pits.

3.05 EXCAVATION

A. Maintain excavations in dry condition in accordance with Article 3.03 of this Section.

B. Remove and stockpile on-site (for future reuse) "monument boulders" surveyed during pre-construction survey (in accordance with Section 01 71 26, Construction Surveying and Layout).

C. Excavation of Sediment Materials: Excavate sediment materials to the depths indicated on the Design Drawings. Excavate sediment materials up to the sheet pile of the temporary river bypass system in accordance with the Design Drawings.

D. Concurrent Investigation/Excavation:
   1. Sequence excavations within each removal area as specified on the Design Drawings of the Contract Documents.

2. If coal tar impacts and sheen-generating sediment are not observed in the overburden material within the target removal areas specified on the Design Drawings of the Contract Documents:
    a. Complete test trench(es) in the step-out manner in non-excavated portions of the cell to assess the presence/absence of coal tar impacts.
    b. Excavate test trench(es) down to target depths.
    c. If impacts not are observed, the Remediation Engineer may terminate the excavation, even if the target removal limits illustrated on the Design Drawings of the Contract Documents have not been achieved, with NYSDEC approval.
3. If coal tar impacts are observed to extend outside of the target removal areas specified on the Design Drawings of the Contract Documents:
    a. Complete test trench(es) to delineate the observed impact.
    b. Excavate test trench(es) down to target depths of adjacent removal areas, until the impacts are no longer observed, or at the direction of the Remediation Engineer, whichever comes first.
    c. At the direction of the Remediation Engineer, the target removal limits may be expanded such that observed impacted material will be excavated until no further impacts are observed, if feasible given surrounding site conditions/geotechnical stability.
    d. If, based on surrounding site conditions/geotechnical stability, the removal limits cannot expand enough to remove observed coal tar impacts, fill the area with minimum 1-foot layer of low-permeability clay prior to placing backfill/restoration materials, unless an alternate approach is approved by the Remediation Engineer.

E. Disposal of Excavated Materials:
1. Handling and disposal of waste material shall be in accordance with Laws and Regulations and Section 02 61 15, Handling and Disposal of Impacted Material.
2. Material removed from excavations that does not comply with requirements for fill or is in excess of the quantity required for fill, shall be removed, transported, and disposed of away from the Site, unless otherwise approved by the Remediation Engineer.

F. Unauthorized Excavation:
1. Material that slides, falls, or caves into the established limits of removals due to any cause whatsoever will be evaluated by the Remediation Engineer. If the additional material is not in conformance to the restoration proposed for the area being evaluated, the material shall be removed and disposed of at the Remediation Contractor's expense and no extra compensation shall be paid to the Remediation Contractor for materials required to backfill void areas left by the slide, fall, or cave-in.
2. All excavations outside the lines and grades shown or indicated and that are not approved by the Remediation Engineer, together with removing and disposing of the excavated material and backfilling with suitable material, shall be at the Remediation Contractor's expense. Fill unauthorized excavations with appropriate fill material (depending on location of unauthorized excavation and in accordance with the Contract Documents) at the Remediation Contractor's expense.

G. Misplaced Material: Material that is deposited elsewhere than at the stockpile area is considered misplaced material. If materials are misplaced by the Remediation Contractor, the Remediation Contractor will be required to remove such misplaced material and deposit it where directed by the Owner at the Remediation Contractor's expense.

H. For areas with existing herbaceous cover and topsoil that require re-seeding, unless otherwise noted on the Design Drawings, scarify, harrow, rake, and broom the ground surface until the upper two inches of the soil surface is smooth and of uniform fine texture in preparation for seeding/planting per Section 32 90 00, Plantings and Restoration.

3.06 FILL

A. Fill materials shall not be placed until all material removal activities have been completed and post-removal survey has been completed and reviewed by the Remediation Engineer in accordance with Article 3.02 of this Section.

B. Provide all fill required for the finished grades as shown and as specified in this Section.

C. Place fill in excavations as promptly as progress of the Work allows, but not until completing the following:
   1. Surveying and recording of horizontal and vertical limits of excavation.
   2. Removal of trash and debris.
   3. Approval by the Remediation Engineer.

D. Fill that includes organic materials or other unacceptable material shall be removed and replaced with approved fill material in accordance with the Contract Documents.

E. Place fill to restore the pre-construction grades. Vertical tolerance shall be plus or minus 0.5 feet at each point and no more than 25% of all points shall exceed 0.0 feet, unless otherwise specified or approved by the Owner and the Remediation Engineer.

F. Place "monument boulders" (accepted for reuse in accordance with Section 02 61 15, Handling and Disposal of Impacted Materials) surveyed during pre-construction survey (in accordance with Section 01 71 26, Construction Surveying and Layout) at the approximate location(s) surveyed prior to excavation.

G. Compaction Density Requirements:
   1. Compaction shall not be performed on river backfill, "monument boulders" (i.e., reuse material), or topsoil fill materials.
   2. Compaction required for all other types of fills shall be in accordance with Table 31 23 00-A of this Section. Moisten material or aerate the material as necessary to provide the moisture content that will facilitate obtaining the required compaction.

TABLE 31 23 00-A
MINIMUM DENSITY REQUIREMENTS

Fill Material	Maximum Uncompacted Lift Thickness (inches)	Percent Compaction (ASTM D698)
Imported Soil		
More Than Five Feet Below Final Grade	18	90
Less Than Five Feet Below Final Grade	12	90
Subbase Material		
Below Pavements and Sidewalks	6	95
All Other Locations	12	95
Granular Fill, Gravel, and Sand	12	See Note 1

Notes:
1. Compact to a firm non-yielding condition using a minimum of three passes of suitable compaction equipment.

   3. Fill shall be wetted and thoroughly mixed to achieve optimum moisture content plus-or-minus two percent.
   4. Replace natural, undisturbed soils or compacted soil subsequently disturbed or removed by construction operations with materials compacted as indicated in Table 31 23 00-A of this Section.

5. Field quality control testing for density, to verify that specified density was obtained, shall be performed within the top five feet of the excavation.
6. When field quality control testing indicates unsatisfactory compaction, provide additional compaction necessary to obtain the specified compaction. Perform additional compaction Work at no additional cost to the Owner until specified compaction is obtained. Such work includes complete removal of unacceptable (as determined by the Remediation Engineer) fill areas and replacement and re-compaction until acceptable fill is provided in accordance with the Contract Documents.

3.07 RIP RAP MATERIALS

A. Rip rap materials shall be carefully placed to avoid damage and/or displacement of the underlying materials, particularly native river rock/river backfill. Placement of rip rap by dumping into chutes shall not be permitted.

B. Rip rap materials shall be placed in a single lift, to the full required thickness, to avoid segregation of stone sizes during placement.

C. Rip rap materials shall be placed such that the completed top surface of the rip rap meets the lines and grades shown on the Design Drawings, unless otherwise directed by the Owner and/or the Remediation Engineer.

D. Some hand placement or rearrangement of stones by mechanical equipment may be required to the extent necessary to achieve the results specified.

E. Rip rap materials do not require compaction.

3.08 GRADING

A. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.

B. Smooth subgrade surfaces within specified tolerances, with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

C. Grade areas adjacent to building/retaining wall lines to drain away from structures and to prevent ponding. Finish surfaces free of irregular surface changes, and comply with the following:
   1. Grassed Areas or Areas Covered with Gravel, Stone, Wood Chips, or Other Special Cover: Finish areas to receive topsoil or special cover to within not more than one inch above or below the required subgrade elevations.

3.09 FIELD QUALITY CONTROL

A. Compaction Testing:
   1. Remediation Contractor shall notify the Remediation Engineer at least 72 hours in advance of scheduled compaction testing. The Remediation Engineer may designate areas to be tested.
   2. Perform field moisture content and density tests in accordance with ASTM D6938 to verify that specified compaction of fill materials has been obtained. Comply with the following:
      a. Upland Fill Areas. At least one density and moisture content test shall be conducted for each 1,200 square feet of surface area for each lift of fill within compaction area or as directed by the Remediation Engineer.

b. Additional tests may be required as determined by the Remediation Engineer.

3. Submit test results, certified by testing laboratory, to the Remediation Engineer within 24 hours of completion of test.
4. If testing laboratory reports or inspections indicate subgrade or fill compaction below specified density, remove unacceptable materials as necessary and replace with specified materials, and provide additional compaction at the Remediation Contractor's expense until subgrades and fills are acceptable. Costs for retesting of subgrade or fill materials that did not originally comply with specified density shall be paid by the Remediation Contractor.

END OF SECTION

SECTION 31 50 00

EXCAVATION PROTECTION (BYPASS SYSTEM)

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work Specified
   1. Work under this Section includes, but is not limited to, the following items, including labor, materials, equipment, and services necessary for and incidental to the following:
      a. Transport sheet piles (herein referred to as “sheet piling”) to the Site from location specified by the Owner, to be determined and other necessary materials listed herein and shown on the Design Drawings. The steel piles will be provided by Owner. Owner, Remediation Contractor, and Remediation Engineer shall coordinate as needed to facilitate the delivery.
      b. Cut sheet piling to lengths needed, as necessary, according to the Design Drawings.
      c. Install sheet piling and other appurtenances related to the temporary river bypass system (herein referred to as “bypass system”) without damaging adjacent shoreline and existing structures (e.g., bridges, bridge abutment, buildings), overhead and subsurface utilities, and other improvements adjacent to the staging areas, installation and removal areas.
      d. Monitor adjacent existing structures in accordance with the requirements of Specification Section 31 09 13, Geotechnical Instrumentation and Monitoring.
      e. Monitor the Temporary Bypass Culvert Crossing in accordance with Design Drawings.
      f. Removal and decontamination/cleaning of temporary sheet piling and other appurtenances related to the bypass system.
      g. Stockpile sheet piling in the designated areas in Area 1 (west side of river near temporary bypass culvert crossing) and in Area 2 (bend on east side of river) as indicated in the Design Drawings, unless alternate location is specified by the Owner.
   2. All labor, materials, equipment, surveys, and services necessary for or incidental to the following:
      a. Driving of the temporary steel sheet pile.
      b. Cutting of sheet pile when required.
      c. Welding of sheet pile where required.
      d. Removing and cleaning temporary sheet piles and other appurtenances related to the bypass system.
   3. In addition to identifying the technical requirements related to this component of the project, this specification also establishes the Owner’s expectations regarding the sheet piling installation, including the level of effort to be put forth by the Remediation Contractor concerning the installation activities.
      a. It is the Remediation Contractor’s responsibility to thoroughly review the sheet pile bypass system configuration and the available information concerning subsurface conditions, including the presence of gravel, cobbles, boulders, or other potential obstructions or other conditions that may impede sheet pile installation. From this review, the Owner anticipates that the Remediation Contractor will review and understand the scope of the steel sheeting installation and the nature of the subsurface conditions that may be encountered during installation. The Owner also anticipates that the Remediation Contractor will provide the materials, equipment, and level and experience of labor necessary to install the steel sheeting consistent with the Design Drawings.

b. The Remediation Contractor shall notify the Remediation Engineer if the implemented measures do not result in design piling depth, in accordance with the Design Drawings.

4. Removal will not extend below the limits depicted on the Design Drawings, unless approved by the Remediation Engineer, and is determined that such work is necessary and can be conducted in a safe manner.

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. Driving and Erecting: Installer shall be regularly engaged in the driving and erection of sheet piling.

B. Qualifications of Welders: Qualify all welders, welding processes, and procedures in accordance with current American Welding Society (AWS) certification. Certifications will be current and valid throughout the work.

C. Codes and standards:
1. American Welding Society (AWS).
2. American Society for Testing and Materials (ASTM).
3. American Institute of Steel Construction (AISC).

D. Driving operators and foreman shall have a minimum of three years' experience installing steel sheet piles.

1.03 SUBMITTALS

A. Informational Submittals:
1. Resumes for key Remediation Contractor/subcontractor personnel, including project manager, on-site superintendent/foreman, on-site health and safety officer, and equipment operators. Also, number of years continuously engaged in sheet pile installation and summaries of representative Project experience.
2. Submit a Bypass System Installation Plan as part of Section 01 15 00, Contractor's Project Operations Plan. It will:
   a. Describe the anticipated approach for installing the sheet piling and other appurtenances related to the bypass system to the design configuration, assuming that no significant installation difficulties are encountered.
   b. Describe quality control measures and equipment that will be used to ensure tight interlocking joints are maintained in order to minimize water seepage through the sheet pile interlocks. Also include details of structural sheet pile interlock connectors.
   c. Include shop drawings for a sheet pile installation template (or demonstrate ability of equipment to maintain alignment during driving), showing all details and specifications of template components used to insure vertical and horizontal alignment is maintained during sheet piling installation.
   d. Include proposed welding procedures and certification of welders.
   e. Include number of years continuously engaged in sheet pile installation and summaries of representative Project experience.
   f. Include a list of equipment, including 'cut sheets', anticipated to be used for the installation of the sheet piling. For the sheet pile installation, the Remediation Contractor will include certification that each pile hammer delivered to the site is suitable for the anticipated conditions, including with regard to impact energy, static weight, and overhead clearance.
3. Bypass System Installation Alternate Approaches: To fully represent and consider "best efforts" regarding attempts to achieve the steel sheeting design configuration and limit vibrations induced by pile driving, the Remediation Contractor shall identify other potential alternate means and measures of steel sheeting installation for review by the

Owner in its Bypass System Installation Plan. To be considered as a potential alternate measure, any approach offered by the Remediation Contractor must be fully described, and include:

a. A detailed description of the alternate equipment including cut-sheets (where applicable)
b. An explanation of how the potential alternate approach would be implemented at the site
c. A summary of the alternate's successful application in similar environs (including references for independent confirmation)
d. A discussion of its specific applicability to the project (e.g., the circumstances under which it may be considered for use, as well as its limitations). To be considered for possible implementation, any potential alternate approach must be pre-approved by the Owner. No field trials will be permitted until the Owner is satisfied that a potential alternative is a viable option.

4. Provide accurate records of each sheet pile installed. Submitted records will include the following information:
   a. Pile identification number, along with location.
   b. Date and time of driving.
   c. Model of hammer and energy rating.
   d. Length of sheet pile in the ground when driving is complete.
   e. Rate of penetration in feet/minute, as well as changes in rate of penetration and depth at which change occurred.
   f. Detailed remarks concerning alignment, obstructions, etc.

1.04 COORDINATION

A. Provide piling and equipment at least 10 days prior to beginning sheet piling installation activities.

B. Notify the Remediation Engineer at least 10 days prior to beginning sheet piling installation operations at any location. Prior to notification, the Remediation Contractor shall ensure that all required submittals have been submitted to the Remediation Engineer and returned by the Remediation Engineer as "Reviewed" or "Reviewed and Noted."

1.05 SITE CONDITIONS

A. Subsurface Information:
   1. The Supplementary Conditions indicate information available relative to subsurface conditions at the Site. Such information and data are not intended as a representation or warranty of continuity of conditions between soil borings or test pits, nor of groundwater levels at dates and times other than date and time when measured, nor that purpose of obtaining the information and data were appropriate for use by Contractor. Owner and Engineer will not be responsible for interpretations or conclusions drawn therefrom by Contractor.
   2. Soil borings and other exploratory operations may be made by Contractor, at no additional cost to Owner. Coordinate Contractor-performed test borings and other exploratory operations with Owner, Third-Party Property Owner, utility owners, other contractors, and others performing work for Owner or Third-Party Property Owner as appropriate. Perform such explorations without disrupting or otherwise adversely affecting operations of Owner, Third-Party Property Owner, utility owners, other contractors, and others performing work for Owner or Third-Party Property Owner. Comply with Laws and Regulations relative to required notifications.

PART 2 – PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Sheet piling will be supplied by the Owner. All materials will be undamaged, and will conform to pertinent AISC, ANSI, ASTM or other industry standards.

B. DeNeef® Swellseal® WA (or equivalent hydrophilic waterstop) will be installed in all sheet pile interlocks.

C. Liner and other appurtenances required for the alternate bypass system design will be supplied by the Remediation Contractor. Liner will be a watertight system (e.g., 40 mil HDPE liner) to be proposed to and approved by the Remediation Engineer prior to use. If the material selected by the Remediation Contractor is not sufficient to maintain dewatered work conditions, Remediation Contractor shall propose additional liner material(s) and/or additional dewatering measures at no additional cost to the Owner.

D. Custom steel corner pieces will be supplied by Remediation Contractor. All materials will be undamaged, and will conform to pertinent AISC, ANSI, ASTM or other industry standards.

E. Splicing of sheet piling is not permitted.

F. Select the proposed pile driving equipment, including hammers and other required items, and submit complete descriptions of the proposed equipment is subject to the review by the Remediation Engineer. Changes in the selected pile driving equipment will not be allowed after the equipment has been approved except as specified and directed. No additional contract time will be allowed for Remediation Contractor proposed changes in the equipment.
   1. Pile Driving Hammers will be of the vibratory, or impact type.
      a. Remediation Contractor shall use vibratory pile driving to extent practical, and only use impact pile driving when approved by the Remediation Engineer.
      b. Vibratory pile driving hammers will be sized appropriately by the pile driving contractor based on available subsurface information and specifications of piling to be driven.
      c. For impact hammers, a pile cushion block will be required to protect the sheet piling integrity.
      d. Submit the following information for each impact hammer proposed:
         1) Make and model
         2) Ram mass weight (pounds)
         3) Anvil mass weight (pounds)
         4) Rated stroke (inches)
         5) Rated energy range (foot-pounds)
         6) Rated speed (blows per minute)
         7) Steam or air pressure, hammer, and boiler and/or compressor (pounds per square inch [psi])
         8) Rated bounce chamber pressure curves or charts, including pressure correction chart for type and length of hose used with pressure gauge (psi)
         9) Pile driving cap, make, and mass weight (pounds)
         10) Cushion block dimensions and material type
         11) Power pack description

G. Use biodegradable fluids for equipment and environmentally-acceptable lubricants for oil-water interfaces, to the extent practicable.

2.02 GENERAL REQUIREMENTS

A. General:
   1. Except as otherwise specifically noted in the Design Drawings, or specified herein, all materials and work for structural steel and miscellaneous metal work will be in conformance with applicable provisions of the latest edition of the AISC Steel Construction Manual.

B. Field Erection:
   1. Structural steel and miscellaneous metal will be stored on blocking so that no metal touches the ground and water cannot collect thereon. The material will be protected against bending under its own weight or superimposed loads.
   2. Before assembly, surfaces to be in contact with each other will be thoroughly cleaned.
   3. Handle sheet piling with care using only handling holes or lifting devices to prevent permanent deflection, distortion, or damage to interlocks.
   4. Do not drag sheet piles along the ground.

PART 3 – EXECUTION

3.01 GENERAL

A. The Remediation Contractor is expected to achieve the design configuration (including depths) through the use of conventional pile driving methods or through the use of "best efforts". If the steel sheeting cannot be installed to the design embedment (i.e., into sediment or till) using the means and methods identified in the Remediation Contractor's Bypass System Installation Plan (see Article 1.03.A(2) above), the Remediation Contractor shall notify the Owner and/or the Remediation Engineer. Subsequently, the Remediation Contractor may participate in discussions with onsite personnel representing the Owner and Remediation Engineer regarding the potential implementation of the alternative approach(es) identified in the Remediation Contractor-identified/Owner-approved alternate approaches (refer to Article 1.03.A(3) above). The alternate approaches to be implemented (if any) will consider the specific circumstances of the installation (e.g., depth of refusal, location of sheet pile relative to design depth, measures that have already been implemented, and experience gained elsewhere within the site), and will be at the direction of the Owner.

3.02 PREPARATION

A. Protect structures, utilities, sidewalks, utilities, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, dewatering, and other hazards that could develop during bypass system operations.

B. Provide adequate clearance of support and protection systems within work areas to allow for proper installation/construction of required site features.

C. Monitor sheet piling daily during removal activities and for as long as excavation remains open. Promptly correct bulges, breakage, or leaks, to ensure that removal areas remain stable.

D. Damages to or destabilizing adjacent facilities, structures and/or pavement caused by activities associated with the installation or removal of the sheet piling will be promptly be repaired or replaced in-kind at the Remediation Contractor's expense.

E. Establish necessary lengths as determined on the Design Drawings.

F. Locate and protect all underground utilities, existing structures.

G. Locate and protect all aboveground utilities, existing structures.

3.03 INSTALLATION OF BYPASS SYSTEM

A. Turbidity exceedances are not permitted during installation (or removal) of bypass system components or temporary bypass culvert crossings. Use of temporary diversions will be at the Remediation Contractor's discretion.

B. Install temporary river bypass system as indicated on the Design Drawings.

C. Any modifications to the construction sequence must be submitted to and approved by the Design Engineer, Remediation Engineer, and NYSEG prior to implementation.

D. Remove any material that stops driving prior to continuation of driving, or develop an alternative methodology, reviewed by the Remediation Engineer, for completing sheet piling installation.

E. Plumb steel sheet piling within four percent of pile length.

F. Sheet piling will be constructed to meet all safety requirements.

G. Sheet piling will be installed using a template to maintain vertical and horizontal alignment during installation.

H. Set Up Sheet piling
   1. Drive piles with equipment suitable for the conditions encountered. The method and equipment selected will deliver the necessary energy to drive the sheet piling to the design depths as shown on the Design Drawings and minimize damage to each end of sheet piling and adjacent interlocks. Suitable procedures must be employed to prevent damage to sheet pile tops and joints.
   2. Care should be maintained during sheet pile pick-up to prevent damage due to excessive bending or twisting while positioning sheet pile for driving. In the opinion of the Remediation Engineer, twisted or bent sheet pile sections may be rejected from use.
   3. Monitor, prevent, and correct any tendency of sheet piles to bend, twist or rotate, and to pull out of interlock. Care must be maintained throughout the installation process to ensure that sheet piles do not declutch. The integrity of each sheet pile and interlocked joint must be maintained during and after driving.
   4. Sheet piles damaged or driven outside the above tolerances will be replaced. Any sheet pile ruptured in the interlock or otherwise damaged during driving will be immediately pulled and replaced.
   5. The Remediation Contractor shall take necessary precautions to ensure adjacent sheet piles do not penetrate deeper during sheet pile installation.
   6. The Remediation Contractor shall pull any sheet pile that is known to have pulled out of interlock or is suspected of having tip or interlock damage and re-drive it.
   7. Splicing of sheet piling is not permitted.

3.04 MONITORING

A. Remediation Contractor will monitor for scour, by visual observation, the riverbed of the active bypass channel in all removal areas (i.e., Area 1 or Area 2) during installation and/or operation of the temporary bypass system. If maximum bypass flows are anticipated or scour is observed Remediation Contractor will place additional stone material at the location indicated on the design drawings or at the location of observed scouring.

3.05 RECORDS

A. Mark identification number clearly visible on each sheet pile with a waterproof marking device, within two feet of the top, before driving is initiated.

B. Spray paint all sheet piles rejected from the work for any reason, at the time of rejection, with the letter “X” within three feet of both ends.

3.06 REJECTION

A. If excavation system components are rejected from the work because of deviation from location, plumbness requirement, excessive bending, twisting, pulling out of interlock, or other reasons, the Remediation Contractor shall take suitable corrective action at no additional cost to the Owner and such corrective action will be reviewed by the Remediation Engineer. Suitable action includes extracting, furnishing, and driving of replacement sheet piles, so that all sheet piles installed meet the requirements of this Section and as indicated on the Design Drawings.

3.07 EXTRACTION AND REPAIRS

A. Temporarily remove sheet piling [for repair or replacement] when approved by the Remediation Engineer and when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures.

B. Once the removal area has been sufficiently restored and with approval from the Remediation Engineer, remove bypass system.

C. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities; repair the above items as needed.

D. Removal sequence will be in the reverse order as installation unless otherwise approved by the Design Engineer, Remediation Engineer, and NYSEG.

3.08 PROVISIONS FOR REUSE OF STEEL SHEET PILING

A. Following extraction, the Remediation Contractor shall clean steel sheet piling and inspect for any damage that may have occurred while driving and/or extracting the piling.

B. Upon extraction, the Remediation Contractor shall transport steel sheet piling to the designated decontamination pad for subsequent cleaning/decontamination in accordance with Section 02 51 00, Decontamination. Impacted material which falls from the piling during extraction and transport to the decontamination pad will be collected by the Remediation Contractor and appropriately disposed offsite.

C. All sheet piling must be inspected by the Remediation Engineer for reuse prior to redriving in subsequent excavation areas.

END OF SECTION

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SECTION 32 12 00

FLEXIBLE PAVING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install flexible, hot-mix, hot-laid, asphalt concrete pavement.
   2. The Work includes:
      a. Preparation such as saw-cutting, cleaning, compaction, and other preparation for installing asphalt concrete pavement.
      b. Providing asphalt concrete paving materials.
      c. Providing tack coat material.
      d. Providing quality controls and testing.

B. Coordination:
   1. Review installation procedures under this and other Sections and coordinate the installation of items that must be installed with or before paving.

1.02 REFERENCE STANDARDS

A. The following standards are referenced in this Section:
   1. ASTM D2950/D2950M, Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
   2. ASTM E329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
   3. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3[600 kN-m/m3]).
   4. ASTM D6938, Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.03 QUALITY ASSURANCE

A. Qualifications:
   1. Asphalt Concrete Production Facility: Production facility for asphalt concrete, tack coat materials, and other bitumastic materials will be approved by NYSDOT for furnishing such materials for NYSDOT highways.
   2. Remediation Contractor's Testing Laboratory: Retain the services of an independent testing laboratory to perform testing and determine compliance with the Contract Documents of the materials provided under this Section. Testing laboratory shall comply with ASTM E329, and will be experienced in the types of testing required.

B. Regulatory Requirements:
   1. Reference Specifications and Details: Comply with applicable requirements of the NYSDOT Standard Specifications (effective September 1, 2016) and Standard Sheets.

C. Quality Assurance Testing:
   1. Test bituminous materials and asphalt concrete mix design for each asphalt concrete material in accordance with reference specifications indicated in Part 1.03(B) of this Section.

2. In lieu of quality assurance testing submit evidence and certification of material compliance with reference specifications indicated in Part 1.03(B) of this Section. When evidence of conformance submitted is not acceptable to Remediation Engineer, perform quality assurance testing.
3. To facilitate testing laboratory, Remediation Contractor shall:
    a. Secure and deliver to testing laboratory representative Samples of materials that Contractor proposes to furnish and that are required to be tested.
    b. Furnish such labor as is necessary to obtain and handle Samples at the Site or at asphalt concrete production facility and other material sources.
    c. Advise testing laboratory and Remediation Engineer sufficiently in advance of operations to allow for completion of quality assurance tests and for the assignment of personnel.

1.04 SUBMITTALS

A. Action Submittals:
1. Shop Drawings:
    a. Submit the proposed asphalt concrete mix design for each asphalt concrete material, and other bituminous materials, required under this Section. Provide complete data on materials, including location in the Work, source, material content and percentages, temperatures, and all other pertinent data.
    b. Proposed gradation for each aggregate to be used for subbase and in asphalt paving material. Submit gradation test results for the same material furnished on a previous project. Indicate the proportion of reclaimed asphalt pavement.
    c. In lieu of the information required under Paragraphs 1.04(A)(1)(a) and 1.04(A)(1)(b), above, submit certificates of compliance with the reference specifications indicated in Part 1.03(B) of this Section, for each for the following:
        1) Each asphalt concrete mix design required.
        2) Bituminous materials required.
        3) Aggregates to be used in asphalt paving, from each material source and each required gradation.
        4) Density of uncompacted asphalt concrete material.
        5) Density of previously-compacted, previously-tested asphalt concrete material.
        6) Density and voids analysis for each asphalt concrete material test specimen.
        7) Evidence of asphalt concrete plant inspection and compliance with the reference specifications indicated in Part 1.03(B) of this Section.

B. Informational Submittals:
1. Qualifications Statements:
    a. Asphalt Concrete Production Facility: Submit name, address, and proof of NYSDOT approval for asphalt concrete production facility.
    b. Remediation Contractor’s Testing laboratory: Submit name and qualifications of testing laboratory to be employed, and qualifications of testing laboratory's personnel that will perform quality assurance and field quality control testing required in this Section. If more than one laboratory will be employed, submit qualifications statement for each laboratory.
2. Quality Assurance Test Data Submittals:
    a. Submit for quality assurance tests required.
3. Delivery Tickets:
    a. Submit copy of delivery ticket for each load of asphalt concrete, tack coat materials, and other materials obtained from asphalt concrete production facility, signed by Remediation Contractor.
4. Field Quality Control Submittals:
    a. Submit results of required field quality control testing.

1.05 SITE CONDITIONS

A. Environmental Requirements:
   1. Temperature:
      a. For binder course paving lifts equal to or greater than two inches thick, atmospheric temperature will be 40 degrees F and rising.
   2. Prohibitions:
      a. Do not place asphalt paving materials when weather is foggy or during precipitation.
      b. Do not place asphalt paving materials when the base on which the material will be placed contains moisture in excess of optimum.
   3. Place asphalt paving materials only when Remediation Engineer concurs that weather conditions are suitable.

PART 2– PRODUCTS

2.01 SYSTEM PERFORMANCE

A. System Description:
   1. Subbase Course: Provide NYSDOT Type 2 subbase course of the thickness shown or indicated, in accordance with reference specifications indicated in Part 1.03(B). of this Section.
   2. Asphalt Pavement Courses: Provide the following:
      a. Binder Course: 2.5- or 3.0-inches compacted thickness (min.).
      b. Top Course: 1.5 inches compacted thickness (min.).

2.02 ASPHALT CONCRETE MIXES

A. Asphalt Concrete Mixtures: Provide the following materials designed and manufactured in accordance with the reference specifications indicated in Part 1.03(B) of this Section:
   1. Binder Course: NYSDOT Item No. 402.258902, 25.0 F9 Binder Course HMA, 80 Series Compaction.
   2. Top Course: NYSDOT Item No. 402.128202, 12.5 F2 Top Course HMA, 80 Series Compaction.

2.03 BITUMINOUS MATERIALS

A. Bituminous Materials for Asphalt Concrete:
   1. Bituminous materials for asphalt concrete will comply with the reference specifications indicated in Part 1.03(B) of this Section, for the asphalt concrete mixes specified.

B. Tack Coat:
   1. Tack coat will be emulsified asphalt that conforms to the requirements of Section 702 (Table 702-7 and/or 702-8) of the reference specifications indicated in Part 1.03(B) of this Section.

PART 3 – EXECUTION

3.01 INSPECTION

A. Examine the subgrade, subbase, and base on which asphalt paving will be installed and notify the Remediation Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

B. Do not place materials on subgrades or subbase that is muddy or has water thereon.

3.02 PREPARATION

A. Preparation: Before starting installation of asphalt paving, perform the following:
   1. Grade Control: Establish and maintain throughout asphalt paving installation the required lines and grades, including crown and cross-slope for each asphalt concrete course during construction operations.
   2. Subgrade: The subgrade will be shaped to line and grade and compacted with self-propelled rollers. Compaction will be to 95 percent Standard Proctor Maximum Density (ASTM D698) throughout the sub-grade.
   3. Provide and compact subbase as required to achieve the finished grades as shown and as specified in this Section. Verify aggregate and asphalt paving can be installed at the required thicknesses and to the final grades indicated on the Contract Drawings without cutting into existing material except for area specifically indicated to be cut on the Contract Drawings. Subbase material will be compacted to 95 percent Standard Proctor Maximum Density (ASTM D698). Before installing asphalt pavement, obtain Remediation Engineer's concurrence that subgrade and subbase are suitable for installing asphalt pavement.

3.03 INSTALLATION OF ASPHALT PAVING

A. General:
   1. Provide final pavement surfaces of uniform texture, at required grades and cross-sections.
   2. Construct paved surfaces to the lines, grades, and typical sections shown or indicated. If grading is not provided, match existing lines and grades.

B. Installation of Asphalt Concrete:
   1. Asphalt concrete mixture will be transported to the area of paving and placed as soon as possible after mixing.
   2. Placement of each asphalt concrete course will be completed over the full width of the section under construction during each day's paving operations.
   3. Spread and finish asphalt concrete courses by means of self-propelled mechanical spreading and finishing equipment. Compacted thickness of layers placed will not exceed 150 percent of specified thickness unless approved in writing by Remediation Engineer.
   4. Compaction:
      a. Rollers:
         1) Use sufficient rolling equipment to satisfactorily compact and finish the quantity of asphalt concrete placed. There will be not less than two rollers on the Project at all times. When acceptable to the Remediation Engineer, one of the rollers may be a pneumatic-tire roller.
         2) During rolling operations, roller speed will not exceed three miles per hour. When sufficient number of rollers is not available, reduce the quantity of asphalt concrete placed to accommodate the available rollers' speed.

3) Required rollers will be in acceptable operating condition, prior to placing of asphalt concrete.
4) Use of vibratory rollers in lieu of steel-wheeled rollers is acceptable, however when thickness of asphalt concrete is one inch or less, rolling will be in the static mode.

b. Rolling of initially-placed asphalt concrete material, or breakdown rolling, will begin as soon as the asphalt concrete mixture will bear the roller without undue displacement.
c. Rolling will be longitudinal, overlapping on successive trips by not less than one-half roller rear wheel width, and not more than three-quarters of roller rear wheel width. Alternate trips of the roller will be of slightly different lengths.
d. At all times, roller motion will be slow enough to avoid displacing the asphalt concrete.
e. Operate rollers continuously from breakdown of laid asphalt concrete through finish rolling.
f. Perform finish rolling using a steel-wheeled roller or a vibratory steel-wheel roller operating in the static mode.
g. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.
h. At each location not accessible to roller, thoroughly compact asphalt concrete with tampers and finish, where necessary, with a hot smoothing iron to provide uniform, smooth layer over the entire area so compacted.

5. Each compacted asphalt concrete course will be within plus-or-minus 1/4 inch of the indicated thickness. Total thickness of asphalt pavement will be within plus-or-minus 1/2 inch of the indicated thickness.

C. Construction Joints:
1. Construction joints will be made in such a manner as to ensure a neat junction, thorough compaction, and bond throughout.
2. Provide a transverse joint extending over the full width of the strip being laid and at right angles to its centerline at the end of each work day and at other times when the placement of hot-mix asphalt concrete will be suspended for a period of time that will allow asphalt concrete mixture to chill.
3. Thoroughly compact by rolling the forward end of a freshly laid strip of asphalt concrete before the asphalt concrete mixture becomes chilled. When the Work is resumed, the end will be cut vertically for the full depth of the layer.

D. Joining of Pavements:
1. When pavement is to join previously laid pavement or concrete, the existing or previously laid pavement will be neatly and carefully edged to allow for overlapping and feathering of the subsequent course of asphalt concrete material.
2. Where new pavement is to meet existing pavement, the existing pavement will be saw-cut and notched.
3. Where new pavement will meet existing asphalt pavement, remove existing pavement 12 inches onto undisturbed existing pavement course at edges where new pavement will meet existing pavement.
4. Tack Coat:
a. Provide tack coat material at the following locations:
1) At edges where new pavement will connect to existing or previously-installed pavement.
2) On surface of existing or previously-installed pavement course over which new pavement will be installed, prior to placement of the subsequent pavement course. Tack coat may be deleted when a succeeding layer of asphalt pavement is being applied over a freshly-placed asphalt pavement course that has been subjected to very little or no traffic, with approval of Remediation Engineer.

3) Where new pavement will abut concrete railroad crossing, curbing, concrete gutters, drainage structures and frames, manhole cover frames, valve boxes, and similar items.

b. Tack Coat Installation: Install tack coat immediately prior to installing pavement. Place pavement while tack coat is wet. Apply tack coat in accordance with reference specifications indicated in Part 1.03(B) of this Section.

E. Curing:
1. Do not allow traffic onto pavement until directed by the Remediation Engineer. Traffic will not be allowed on new asphalt concrete pavement until surface temperature is less than 140 degrees F.
2. Hold construction traffic on new pavement to a minimum as acceptable to the Remediation Engineer.

F. Defective Pavement Work:
1. When directed by the Remediation Engineer, remove and replace defective asphalt paving Work. Cut out such areas of defective pavement and fill with fresh asphalt concrete materials, compacted to required density.

3.04 FIELD QUALITY CONTROL

A. Site Tests: Employ a testing laboratory to perform field quality control testing.
1. Testing Laboratory Scope:
a. Perform field density tests to verify that required compaction of asphalt materials has been obtained.
b. Test the proposed materials for compliance with the Contract Documents, as directed by Remediation Engineer.
c. Submit reports of all test results to the Remediation Engineer and the Remediation Contractor.
2. Asphalt Concrete Mix Temperature: Measure temperature at time of placement, record, and submit to the Remediation Engineer.
3. Surface Smoothness:
a. Test finished surface of each asphalt paving course for smoothness, using a 10-foot straightedge applied parallel to and at right angles to centerline of paved areas.
b. Check surfaced areas at intervals as directed by the Remediation Engineer.
c. Surfaces will be acceptable relative to smoothness when measurements are equal to or less than the following:
1) Binder Course: 3/8 inch vertical in 10 feet horizontal.
2) Crowned Surfaces:
a) Test crowned surfaces with a crown template, centered and at right angles to the crown.
b) Surfaces will be acceptable when variance is equal to or less than 1/4 inch from the template.
c. Elevation: Finished surface of pavement will be within plus-or-minus 1/2 inch of elevations shown or indicated.
4. Density:
a. Asphalt: Test in accordance with ASTM D2950/D2950M. Test one sample every 1,000 square feet of pavement. Test for each asphalt concrete course installed.
b. Subbase: Test in accordance with ASTM D6938/D6938M. Test one sample every 1,000 square feet of pavement. Test for each lift of sub-base course installed.
c. In addition, when directed by Remediation Engineer, compare density of in-place asphalt paving materials against laboratory specimen or certificates on same asphalt pavement mixture, using nuclear density device.

d. Criteria for Acceptance: Density of in-place asphalt pavement material will be not less than 90 percent of the recorded laboratory specimen or certificate density. Density will be not greater than 98 percent.

5. Asphalt Concrete Pavement Thickness: Depth check readings will be taken for each course of compacted pavement at a frequency of one reading from every 1,000 square feet of compacted pavement. Comply with thickness tolerance specified in Part 3.03 of this Section.
6. Repair holes from test specimens in accordance with this Section's requirements for repairing defective Work.
7. Submit test results, certified by testing laboratory, to Remediation Engineer within 24 hours of completion of test.

3.05 ADJUSTING

A. Pavement Adjustment:
   1. Repair or replace in manner acceptable to the Remediation Engineer areas of pavement that are observed to pond or collect water.

3.06 CLEANING

A. After completing paving operations, clean surfaces of excess or spilled bituminous materials, excess asphalt concrete, and foreign matter.

3.07 PROTECTION

A. Protect finished pavement until pavement has become properly hardened and cool.
   1. Cover openings of drainage structures, manholes, valve boxes, and similar items in the paved area until permanent coverings are provided.

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SECTION 32 90 00

PLANTINGS AND RESTORATION

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. River bank and upland habitats (including existing drainage gutters, curbing, trail surfaces, etc.) that are affected, disturbed, damaged or destroyed while performing the work under or as a result of the Contract will be restored and maintained as specified herein.
   2. Furnish and/or provide all labor, tools, materials, equipment, and services, and complete all work, installed, tested, and ready for use.
   3. The quality of materials and the performance of work used in the restoration will produce a surface or feature equal to or better than the condition of each before the Project began, as reviewed by the Owner.
   4. Work includes soil amendments, mulching and fertilization, and the introduction of seeding and plants. Details for aggregate materials to be used are provided in Section 31 05 05, Aggregates for Earthwork.
   5. Work includes maintenance of riverbank and upland habitats, as defined in the Design Drawings.
   6. Types of products required include the following:
      a. Seed mixture.
      b. Shrub and tree plantings.
      c. Emergent vegetation species plantings.
      d. Soil amendments.
      e. Fertilizers.
      f. Mulches.
      g. Erosion control materials.
   7. Design details for the restoration of disturbed areas are presented on the Design Drawings for each specific area.

1.02 APPLICABLE CODES, STANDARDS, AND SPECS

A. New York State Department of Environmental Conservation (NYSDEC) Standards and Specifications for Erosion and Sediment Control, latest edition.

1.03 DEFINITIONS

A. The term “finish grade” will be used to describe the finished surface elevation of planting soil.

B. The term “percentage pure live seed” will be defined as the percent (%) purity multiplied by percent (%) germination divided by 100 to equal the percent pure live seed (PLS) and will be calculated for all seed lots using each seed lots own unique purity and germination test results. A PLS pound will be defined as the bulk weight of seed required to equal one pound of 100 percent pure, germinated seed.

C. Seed may be mixed by an approved method onsite or at the seed supplier’s facilities. If the seed is mixed onsite, each variety will be delivered in the original containers and will bear the

supplier's certified analysis. Where seed is mixed by the seed supplier, provide Remediation Engineer with the seed supplier's certified statement as to the composition of the mixture.

D. The term "emergent vegetation species plantings" will be defined as a live plant tubers, and/or rhizomes of species specified on Design Drawings, as native species of the Tioughnioga River basin to include American bur-reed (*Sparganium americanum*) and Arrow arum (*Peltandra virginica*).

E. The term "live stake" will be defined as a dormant section of parent plants that are 3 to 4 feet in length, with diameters of 1/4- to 1-inch, installed in pilot holes down 2 to 3 feet which allow 6 inches to 1 foot exposed of the live stake.

1.04 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's product data, specifications and installation instructions for all required materials including but not limited to; seed mix, fertilizers, and sediment, turbidity, and erosion control products (including biodegradable stakes).
      b. Composition and analysis of commercial fertilizers and all purchase receipts showing the total quantity actually purchased for this Project.
      c. Proportions of each component contained in hydro seed mixture, if required. Identify number of pounds of each component required for each 100 gallons of water. Include the number of square feet of bank or grassed mixture that can be installed with each full tank of hydro seed mixture.
   2. Certificates:
      3. Certification of seed mixture: For each seed mixture, furnish seed supplier's certification stating the botanical and common name, and percentage by weight of each species and variety, and percentage of purity, germination and weed seed (i.e. undesirable plant seeds). Include the year of production and date of packaging. Certify that seed has been stored in compliance with all recommendations of the seed supplier. Submit at least two weeks prior to time of planting.
      4. Certification of plant stock: Submit certificates from plant stock supplier for each group of plant stock required, stating botanical name, common name, origin, age, date of packaging, and name and address of supplier. Submit at least four weeks prior to planting.
      5. Description of the mulch material, the proposed mulching methods and application rates to be used within planting areas, as required in restoration plan.

B. Informational Submittals:
   1. Submit a schedule of restoration operations for review. Any changes to the agreed upon restoration schedule must be reviewed and accepted by the Owner and/or Remediation Engineer. The replacement of surfaces at any time, as scheduled or as directed, will not relieve the Remediation Contractor of the responsibility to repair damages by settlement or other failures.

C. Maintenance Submittal:
   1. Include maintenance instructions, application frequency and dosage of fertilizer, if necessary. Methods to control undesirable plant species and browsing and grazing by herbivores, such as Canada goose, whitetail deer and small mammals, will be included in this submittal.

1.05 QUALIFICATIONS

A. Seed Producer: Obtain seed stock only from established vendors capable of providing seed quantities adequate to complete this project. Seed vendors will be required to provide the data requested under Paragraph 1.04 of this Section prior to the use of that seed.

B. Planting Stock Supplier: Obtain planting stock only from established vendors capable of providing plant stocks in quantities and at quality levels adequate to complete the project. Plant vendors will be required to provide the data requested under Paragraph 1.04 of this Section prior to the use of that stock.

C. Installer: Company specializing in work of this Section with a minimum of 5 years' experience in planting and establishing natural plant communities with documented references. Personnel used to perform the installation of plant materials will also have occupational experience in restoration projects.

1.06 PROJECT CONDITIONS

A. Environmental Requirements of Seeding and Planting
   1. Proceed with and complete seed planting as rapidly as portions of the Site become available, working within the seasonal limitations for each type of seed mix required.
   2. Proceed with planting only when current and forecasted weather conditions are favorable to successful planting and establishment of turfs and grasses.
      a. Do not apply seed slurry when wind conditions are such that materials would be carried beyond designated areas or that materials would not be uniformly applied.
      b. Do not spread seed when wind velocity exceeds five miles per hour.
      c. Seeding activities should not be carried out on days with heavy precipitation which will result in the washing of littoral plantings into the body of water where they will not survive.
      d. Do not install plant life when the temperature may drop below 35 degrees F or rise above 90 degrees F.
      e. Do not install plant life when the wind velocity exceeds 30 miles per hour.
      f. Do not plant when drought, or excessive moisture, or other unsatisfactory conditions prevail.

B. Scheduling:
   1. Schedule topsoil placement to permit seeding and planting operations under optimum growing conditions during normal planting seasons. Do not compact topsoil prior to seeding and/or planting.
   2. Coordinate planting with specified extended service periods to provide required service from date of Substantial Completion. Plant during one of the following periods:
      a. Install live stake plant materials while still dormant between March 1 and May 15. Live stakes will not be planted if they have "budded out" (at greater than ¼ inch).
      b. Emergent vegetation species plantings will be installed from May 1 to June 30, subject to modification based on field conditions with the approval of the Remedial Engineer. Install when water depths at the planting area are between 1 and 4 inches.
      c. Trees and shrubs will be planted either in the spring or the fall, and not in the summer, as defined as between June 15 and September 15. Fall planting after October 15 is acceptable only with species approved by the Remediation Engineer with root-balled or containerized material only.
      d. Seeding operations for permanent cover will be between April 1, or as soon thereafter as the soil can be worked, and June 15. Seeding may also be done from

September 15 to freeze-up. Seeding is not recommended between June 15 and September 15.

1) If topsoil placement occurs between June 15 and September 15, apply a cover crop of annual ryegrass at a rate of 25 pounds per acre, in addition to the specified seed mix, and cover with erosion control fabric to provide temporary erosion protection.
2) If topsoil placement occurs after freeze-up, apply a cover crop of winter ryegrass (Secale cereale, 'Aroostook' or equivalent) at a rate of 100 pounds per acre, in addition to the specified seed mix, and cover with erosion control fabric to provide temporary erosion protection.

1.07 WARRANTY

A. General Warranty: Establish a dense, healthy stand of perennial grass cover, with a uniform cover density of at least 80 percent. Maintain all vegetative ground cover (including grass), monitor, and maintain temporary erosion and sedimentation controls, repair any observed erosion, and reseed areas of poor grass growth until a dense, healthy stand of grass cover has been established. Upon full establishment of grass cover (i.e. to 80% cover density), remove all remaining temporary erosion and sedimentation controls (straw/hay/straw bales, silt fence, fiber logs, etc.) from the Site.

B. Guarantee all planted trees and shrubs (other than the live stakes or emergent vegetation species plantings) for two-years post-planting. Live stake plantings and emergent vegetation species plantings placed in the Inundated Shoreline Planting Area or Emergent Vegetation Planting Area, respectively, will not be subject to same warranty.

1.08 QUALITY ASSURANCE

A. Topsoil materials tested in accordance with the standard and frequencies – see Section 31 05 05, Aggregates for Earthwork.

B. Source quality control of mulch and fertilizers will comply with certificates of inspection and applicable regulations as required by governmental authorities. Remediation Engineer will request inspection of delivery slips for materials to verify specified quantities of bulk deliveries of soil amendments, mulch, and fertilizers.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Aggregates, including native river rock or gradated river backfill, soil-choked rip-rap, and topsoil where needed – See Section 31 05 05, Aggregates for Earthwork.

B. Coir log will be as specified on the Design Drawings.

C. Seed Mix:
   1. Seed Species:
      Seed species for each of the specified planting areas found in the Design Drawings and described in the Restoration Plan will consist of the following mixtures specified in Tables 32 90 00-A through 32 90 00-F:

TABLE 32 90 00-A
WET MEADOW SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Deertongue	Panicum clandestinum	21.5%
Virginia Wild Rye	Elymus virginicus	20.0%
Big Bluestem	Andropogon gerardii	16.6%
Japanese Millet	Echinochloa crusgalli var. frumentacea	15.0%
Fox Sedge	Carex vulpinoidea	10.0%
Switchgrass	Panicum virgatum	8.0%
Partridge Pea	Chamaecrista fasciculata	4.0%
Blue Vervain	Verbena hastata	1.5%
Ox Eye Sunflower	Heliopsis helianthoides	1.0%
Soft Rush	Juncus effusus	1.0%
Autumn Bentgrass	Agrostis perennans	0.8%
Swamp Milkweed	Panicum clandestinum	0.1%
New England Aster	Aster novae-angliae	0.1%
Joe Pye Weed	Eupatorium fistulosum	0.1%
Boneset	Eupatorium perfoliatum	0.1%
Wild Bergamot	Monarda fistulosa	0.1%
Narrowleaf Mountainmint	Pycnantheumum tenuifolium	0.1%

[1] Apply seed mix at a minimum of 30 pounds per acre. The addition of annual ryegrass (Lolium multiflorum) will be applied as a cover crop to wet meadow seed mix at same application rate.

TABLE 32 90 00-B
EMERGENT WETLAND SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Fox Sedge	Carex vulpinoidea	20.0%
Virginia Wild Rye	Elymus virginicus	20.0%
Hop Sedge	Carex lupulina	10.0%
Lurid Sedge	Carex lurida	10.0%
Blunt Broom Sedge	Carex scoparia	10.0%
Fowl Bluegrass	Poa palustris	8.5%
Deertongue	Panicum clandestinum	6.5%
American Bur-Reed	Sparganium americanum	4.5%
Giant Bur-Reed	Sparganium eurycarpum	4.0%
Soft Rush	Juncus effusus	3.0%
Rice Cutgrass	Leersia oryzoides	2.0%
Nodding Sedge	Carex crinita	0.5%
Green Bulrush	Scirpus atrovirens	0.5%
Woolgrass	Scripus cyperinus	0.5%

[1] Apply seed mix at a minimum of 30 pounds per acre.

TABLE 32 90 00-C
BANK SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Deertongue	Panicum clandestinum	30.0%
Virginia Wild Rye	Elymus virginicus	20.0%
Big Bluestem	Andropogon gerardii	11.8%
Indiangrass	Sorghastrum nutans	10.5%
Switchgrass	Panicum virgatum	5.0%
Partridge Pea	Chamaecrista fasciculata	4.0%
Blue Vervain	Verbena hastata	4.0%
Soft Rush	Juncus effusus	3.0%
Blackeyed Susan	Rudbeckia hirta	3.0%
Ox Eye Sunflower	Heliopsis helianthoides	2.0%
Swamp Milkweed	Panicum clandestinum	1.0%
New England Aster	Aster novae-angliae	0.7%
Flat Topped White Aster	Aster umbellatus	0.7%
Boneset	Eupatorium perfoliatum	0.7%
Autumn Bentgrass	Agrostis perennans	0.5%
Common Sneezeweed	Helenium autumnale	0.5%
Wild Bergamot	Monarda fistulosa	0.5%
New York Ironweed	Vernonia noveboracensis	0.5%
Narrowleaf Mountainmint	Pycnantheumum tenuifolium	0.4%
Roughleaf Goldenrod	Solidago patula	0.4%
Joe Pye Weed	Eupatorium fistulosum	0.1%
Great Blue Lobelia	Lobelia siphilitica	0.1%
Purplestem Aster	Aster puniceus	0.1%

[1] Apply seed mix at a minimum of 30 pounds per acre. The addition of annual ryegrass (Lolium multiflorum) will be applied as a cover crop to wet meadow seed mix at same application rate.

TABLE 32 90 00-D
FLOODPLAIN SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Big Bluestem	Andropogon gerardii	40.0%
Virginia Wild Rye	Elymus virginicus	25.0%
Switchgrass	Panicum virgatum	15.0%
Partridge Pea	Chamaecrista fasciculata	8.0%
Indiangrass	Sorghastrum nutans	5.0%
Purple Coneflower	Echinacea purpurea	3.9%
Blackeyed Susan	Rudbeckia hirta	3.0%
Wild Bergamot	Monarda fistulosa	0.1%

[1] Apply seed mix at a minimum of 30 pounds per acre. The addition of annual ryegrass (Lolium multiflorum) will be applied as a cover crop to wet meadow seed mix at same application rate.

TABLE 32 90 00-E
UPLAND SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Sheep Fescue	Festuca ovina	73.2%
Annual Ryegrass	Lolium multiflorum	17.0%
Shasta Daisy	Chrysanthemum maximum	3.0%
Lanceleaf Coreopsis	Coreopsis lanceolata	2.0%
Blackeyed Susan	Rudbeckia hirta	2.0%
Common Yarrow	Achillea millefolium	0.5%
Butterfly Milkweed	Acsclepias tuberosa	0.5%
Partridge Pea	Chamaecrista fasciculata	0.3%
Mistflower	Eupatorium coelestinum	0.3%
Orange Coneflower	Rudbeckia fulgida var. fulgida	0.3%
Hairy Beardtongue	Penstemon hirsutus	0.2%
Narrowleaf Mountainmint	Pycnantheumum tenuifolium	0.2%
Aromatic Aster	Aster oblongifolius	0.1%
Zigzag Aster	Aster prenanthoides	0.1%
Yellow False Indigo	Baptisia tinctoria	0.1%
Virginia Spiderwort	Tradescantia virginiana	0.1%

[1] Apply seed mix at a minimum of 30 pounds per acre.

TABLE 32 90 00-F
GRASS PLANTING SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Creeping Red Fescue	Festuca rubra	25.0%
Annual Ryegrass	Lolium multiflorum	25.0%
Perennial Ryegrass, "Amazing A+' (turf type)	Lolium perenne, 'Amazing A+'	25.0%
Perennial Ryegrass, "Confetti III' (turf type)	Lolium perenne, 'Confetti III'	25.0%

[1] Apply seed mix at a minimum of 75 pounds per acre.

2. Seed mixtures will be blended by the vendor and the ratios of the various species specified above and will be guaranteed by the vendor. The seed mix may be modified depending on seed availability. If alternative seeds are necessary, the design criteria and ecological function of the mix will remain unchanged.
3. Seed mixtures should be delivered in original sealed containers. Seeds in damaged packaging are not acceptable. Label containers with the following information:
   a. Analysis of seed mixture.
   b. Percentage of pure seed.
   c. Year of production.
   d. Net weight.
   e. Date when tagged and location.
   f. Percentage of germination.
   g. Name and address of distributor
4. Seeds will be stored in weatherproof and rodent-proof enclosures.
5. All seeds will have the proper stratification and/or scarification to break seed dormancy for other than fall planting.

D. Emergent Vegetation Species Plantings:
   1. Emergent Vegetation species will be plants and tubers of American bur-reed (*Sparganium americanum*) and Arrow arum (*Peltandra virginica)* obtained from a nursery or laboratory stock. Plant species will be native to the Tioughnioga River watershed. Source of plant material will be accepted by the Remedial Engineer.

E. Shrub and Tree Plant Stock:
   1. The shrub and sapling species, plant types, sizes, and planting densities are specified per restoration area on each of the Design Drawings.
   2. Plants will be true to their name as specified. Species may vary based on availability. Alternate species may be proposed at the time of planting if listed species are not available locally and have prior approval of the Remediation Engineer.
   3. Trees will be 2-inch diameter to the extent practicable.
   4. Shrubs will be 1-gallon container stock.
   5. Live stakes will be at least 3- to 4-feet in length.
   6. Plants will be free of insects and diseases and will show the appearance of healthy growth and vigor. Root stocks will display evidence of new growth prior to planting.
   7. All plant materials, including collected stock, will comply with state and federal laws with respect to inspection for plant diseases and insect infestations. Collected plant materials will be obtained in strict compliance with any applicable species protection programs.
   8. Each species will be handled and placed in a manner that is consistent with good trade practice to insure the arrival of the plants at site in good condition. Plants that arrive dried out, exposed to excessive heat, or that have been in storage for extended periods of time, will not be accepted. If, upon inspection, the plants or root stocks display mold or decay, the material will not be accepted.
   9. All woody shrubs and trees will have a heavy fibrous root system that has been developed by proper horticultural treatment, transplanting, and root pruning. All shrubs and saplings will be container grown.
   10. All live stakes will be pre-conditioned for placement in potentially inundated and rip rap areas by being held in a moist environment (i.e., wrapped in damp burlap or equivalent and kept out of direct sunlight) at the nursery prior to shipment to site.
   11. All plant stock will be stored in aboveground locations in non-construction areas approved by the Remediation Engineer if not transplanted directly to the areas for restoration. All plant stock will have soil placed about roots sufficient to protect from desiccation and to provide nourishment during storage. All plants stored in the field prior to installation will be kept cool and will be sheltered from the drying effects of direct sunlight and prevailing winds. Plants should not be subject to freezing, drying, or warming. Supply adequate water for all plant stock in order to maintain it in a healthy and vigorous state suitable for transplanting. Plants shall be watered within 24 hours of planting.

F. Soil Amendments and Fertilizers:
   1. Deliver fertilizers in waterproof bags showing weight, chemical analysis, and the name of the manufacturer. Application of fertilizers and soil amendments will be dictated by the results of soil testing and subject to the Remediation Engineer's prior approval.
   2. If needed, fertilizers will be slow release Osmocote fertilizer or similar.
   3. Mulch will consist of stalks of oats, wheat, rye, or other approved crops that are free of noxious weeds. Wood chips can be used to mulch woody plantings.
   4. Fungal amendment for tree and shrub planting, if used, will be mycorrhizal inoculant or similar.
   5. Water absorbing gel, if used, will be Terra-Sorb or similar.

G. Erosion-Control Materials:
   1. Erosion-Control Mesh: For slopes <3H:1V, 100% Biodegradable straw fiber matrix with organic fiber netting, a minimum of 9.12 ounces per square yard in accordance with Tensar North American Green BioNet® S75BN or approved equal.
   2. Erosion Control Blanket: For slopes >3:1, 100% biodegradable coconut fiber matrix with jute netting, a minimum of 9.79 ounces per square yard in accordance with Tensar North American Green BioNet® C125BN or approved equal. see Design Drawings for installation details.
   3. Coir Log: Biodegradable coir logs will have a minimum density of 9 pounds per cubic foot as manufactured by East Coast Erosion, Rolanka, GEI Works, or approved equal.
   4. Anchors: Secure erosion control materials per manufacturer guidelines with biodegradable stakes (as approved by NYSDEC) or wood pegs. Biodegradable stakes must be approved by NYSDEC prior to use.

PART 3 - EXECUTION

3.01 INSPECTION

A. Restoration planting work will be performed under the direction of the Remediation Engineer's Restoration Ecologist.

B. Examine the areas and conditions under which planting and restoration Work is to be performed, and notify Remediation Engineer, in writing, of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to Remediation Engineer.

C. Inspect the proposed restoration areas with the Remediation Engineer at least one week prior to the onset of field planting activities to review the condition of the Site. The Site condition is defined as an evaluation of soils, water levels, and grades of the Site in terms of conditions which are appropriate for introduction of plantings. Do not proceed with the planting program or other restoration in any area until all necessary modifications and/or corrections are completed and approved by the Remediation Engineer. If other conditions that are detrimental to feature installation or plant growth or the safety of the crew are encountered, immediately notify the Remediation Engineer prior to initiating restoration work.

3.02 PREPARATION OF SURFACES FOR VEGETATIVE RESTORATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
   1. Protect adjacent and adjoining areas from hydro seeding overspray, as necessary.

B. Remove all construction debris, trash, rubble and all extraneous materials from area to be restored. In the event that fuels, oils, concrete washout or other material harmful to plant growth or germination have been spilled into the area, excavate the area sufficiently to remove all such harmful materials and fill with approved fill, compacted to the required compaction level (where required).

C. Backfill topsoil (or other finish-grade material, where appropriate and as indicated on the Design Drawings), as required, to bring elevations to existing surface grade. Maintain all angles of repose. Confirm that final grade is at proper elevations and that no further earthwork is required to bring the final grade to proper elevations.

D. Where temporary access roads were installed over previously vegetated areas, to restore the area, the temporary access road material will be removed and the areas will be tilled to depth of 6-12 inches prior to seeding. Remove debris, sticks, rubbish, and other extraneous matter.

3.03 PLANTING

A. Seeding
   1. Use seed type as specified on the Design Drawings by specific area.
   2. Sow seed mixture at the minimum rates specified below unless alternate mixtures and application formulae are developed which have been reviewed and approved for use by the Remediation Engineer.
      a. Wet Meadow Seed Mix, Floodplain Seed Mix, and Bank Seed Mix: Seed mix will be broadcast spread over clean weed-free soil at a rate of 30 pounds per acre.
         1) Apply a cover crop of annual ryegrass at a rate of 30 pounds per acre, in addition to the specified seed mix.
      b. Emergent Wetland Seed Mix: Seed mix will be broadcast spread over clean weed-free soil and/or sediment at a rate of 30 pounds per acre.
      c. Upland Seed Mix: Seed mix will be broadcast spread over clean weed-free soil at a rate of 30 pounds per acre.
      d. Grass Planting Area Seed Mix: Seed mix will be broadcast spread over clean weed-free soil at a rate of 75 pounds per acre.
      e. Late fall and winter dormant seeding require an increase in the seeding rate. A light mulching of weed-free straw will be applied immediately following seeding for all planting areas, except where Bank Seed Mix and Emergent Wetland Seed Mix are applied. In both these areas, use of erosion control fabric may be applied based on bank slope or stabilization needs in near-shore areas. Alternatively, hydroseeding may be utilized to apply seed and mulch.
   3. Apply specified seed mix without delay (immediately after surface preparation and before a precipitation event) to prevent erosion or displacement of soils and discharge of soil-bearing runoff to adjacent properties or waterways.
   4. Perform seeding within the time guidelines specified in Section 1.06.B.
   5. Prior to seeding, the ground will be scarified, harrowed, raked, and broomed until the surface is smooth and of uniformly fine texture.
   6. Shallow disc and subsequently rake the seedbed of the areas to be restored to provide a uniform and firm seedbed, free of all live plant materials, including perennial rhizomes. If the soil is saturated, tilling may not be necessary.
   7. Ensure the entire area receives seed. Reseed areas with gaps in the areas of seeding in excess of 8 square feet.
   8. Where saturated soils make the use of mechanical seeding equipment impractical, the broadcast or hydroseeding techniques may be used with the prior approval of the Remediation Engineer and NYSDEC.
   9. Seeding of each area will be done twice, in two directions at right angles to each other.
   10. Employ the broadcast method to put annual and short-lived perennials into the successional growth areas. Lightly rake broadcast areas within 12 hours to ensure proper soil-seed contact.
   11. Mark seeded areas to prevent intrusion by foot traffic and/or equipment. Exercise the necessary precautions to keep the area undisturbed until the vegetation is established.
   12. Provide and install mulch by hand or machine spreading to form a continuous blanket over the seed bed, approximately 2 inches uniform thickness at loose measurement. Mulch will be weed-free and spread as needed with a minimum amount of damage to the seeded area

13. Perform an initial watering of seeded areas within 24 hours of seeding at a rate of 25,000 gallons per acre and repeated after the second- and fourth-weeks following seeding if natural rainfall is less than 1 inch per week. Avoid creating rills and furrows as a result of watering and must repair and reseed any rills and furrows resulting from over watering
14. Protect seeded areas, with slopes less than one on three, by stabilizing with hydroseed and straw mulch or by providing erosion-control fiber mesh where surface runoff potential is high and where slopes exceed one on three, by providing erosion-control blankets. Install erosion-control materials according to manufacturer's written instructions, and for erosion-control blanket, as illustrated on the Design Drawings.
15. Using a uniform fine spray, thoroughly and evenly water seeded areas. Provide adequate water to moisten seedbed to a depth of 2 inches.
16. Maintain all seedbeds in a uniformly moist condition, conducive to seed germination and plant establishment, as specified.
17. Reseed areas that remain without mulch or erosion controls for longer than three days.
18. Take precautions to prevent damage or staining of construction or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.
19. Prevent foot or vehicular traffic, or the movement of equipment, over the mulched areas. Reseed areas damaged as a result of such activity.
20. Hydroseeding, if used: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

B. Emergent Vegetation Species Planting
    1. Mark an area to be planted with 2-inch plugs by placing five (5) lengths of lead line marked at 2.5 feet intervals (or similar tool for ensuring spacing interval) onto the ground surface up to a water depth of 6 inches. Spacing between the lead lines will be 2.5 feet to allow plantings to be installed on 2.5 feet centers. Alternative methods, such as planting grids, to ensure proper spacing interval and layout may be submitted to the Remedial Engineer for review and approval.
    2. For American bur-reed and Arrow arum, a planting unit consists of a minimum of one shoot containing growing leaves, roots, rhizomes and growing medium contained within a plug tray. Remove the planting unit from the plug tray, place the planting unit on the backfill surface and press into the backfill so that the roots and rhizomes are covered with backfill. Install anchoring device to hold the roots and rhizomes in contact with the river bed. Metal anchors in planting units are prohibited. Anchor material may not be metallic or plastic and must be able to remain intact for a minimum of 3 months.

C. Planting
    1. Use species plant types, sizes, and spacing densities as specified on the Design Drawings by specific area.
    2. Perform planting within the time guidelines specified in Section 1.06.B.
    3. Dig pits and beds to the dimensions specified on Design Drawings.
    4. Remove non-biodegradable containers prior to planting.
    5. Plant root stocks, bulbs, tubers, and rhizomes by hand unless weighted placement or mechanical means are approved by the Remediation Engineer.
    6. Set plants into their final locations following recommended horticultural practice for that species, taking specific note to plant emergent plants at the shallow end of their depth tolerances. Plant hydrophytes in groupings to establish vegetative communities.
    7. Place bare root plants vertically in holes of adequate size to allow roots to spread in all directions from the plant and adequately cover with soil. Assure adequate water supply.
    8. Root stocks introduced into hydric soils may require a hand tool to facilitate planting. Space the plantings based upon horticultural experience for each specie and the desired

density of the stand of vegetation sought. This will be accomplished with the coordination and guidance of Remediation Engineer's Restoration Ecologist.

9. Support plants as follows:
    a. Two-inch and four-inch diameters: two stakes and two ties.
10. Provide and install wood chip mulch by hand to form a continuous blanket over the soil surrounding the plant, approximately 2 inches uniform thickness at loose measurement.
11. Perform an initial watering of planted areas at a rate of 25,000 gallons per acre and repeated after the second and fourth weeks following seeding if natural rainfall is less than 1 inch per week. Avoid creating rills and furrows as a result of watering and must repair and reseed any rills and furrows resulting from over watering.
12. If needed, mix fertilizers with backfilled topsoil and distributed throughout the hole dug for plantings.

D. Maintenance
    1. Perform all necessary watering throughout the first two years post-seeding and post-planting.
    2. Maintain planted areas until accepted by the Remediation Engineer. Maintenance responsibilities begin immediately after planting and continue through two full growing seasons following the year of planting.
    3. Maintenance responsibilities include control of herbivores and other vectors which threaten the establishment of a vegetative community; acts of nature which result in erosions, wind damage, and similar situations. Take necessary action to correct and restore the system.
    4. Notify the Remediation Engineer prior to and following any maintenance activity.
    5. At a minimum, maintenance will be performed in the spring and fall before optimal planting and seeding season.
    6. Replace dead or unhealthy plants with plants of the same size and species as specified and planted in the next growing season and subject to maintenance efforts to assure their survival.
    7. Maintain sediment and erosion control of works and remove collected sediments, as necessary. Maintain until vegetation areas have been stabilized with vegetation.

E. Protection of Finished Work
    1. Mark seeded and planted areas to prevent intrusion by foot traffic and/or equipment.
    2. Institute measures to protect completed landscape areas.
    3. Containerized trees and shrubs will be protected from rodent and deer damage by installation of appropriate deer fencing or rigid plastic mesh tree bark protector of appropriate height. The rigid plastic should have a mesh size of ¾'' x ¾''. Determine the selected approach and submit to the Remediation Engineer for approval.
    4. Herbaceous species planted will be protected from geese using appropriate measures as determined necessary. Determine the selected approach and submit to the Remediation Engineer for approval.
    5. The Remediation Contractor's two-year guarantee (Section 1.07.B) includes protection from potential herbivory by deer, rodents, geese, or other wildlife.

3.04 OTHER TYPES OF RESTORATION

A. Stone or gravel surfacing
    1. All areas surfaced with stone or gravel will be replaced with material to match the existing surface unless otherwise specified.
        a. The depth of the stone or gravel will be at least equal to the existing.

b. After compaction, the surface will conform to the slope and grade of the area being replaced.

B. Fences destroyed or removed as a result of the construction operations will be replaced in like size and material and will be replaced at the original location, or as directed by the Owner.

C. Concrete curbs, gutters, and sidewalks destroyed or removed as a result of the construction operations will be replaced in like size and material and will be replaced at the original location, or as directed by the Owner.

D. All bituminous concrete pavement or other paved driveways will be replaced with material to match the existing surface condition and in accordance with Section 32 12 00, Flexible Paving, unless otherwise specified.

E. Other site features removed or damaged as a result of the construction operations will be restored in-kind to their original location and condition unless otherwise directed by the Owner.

3.05 ACCEPTANCE CRITERIA

A. Work will be considered acceptable when:
   1. A dense, healthy stand of herbaceous ground cover exists with a uniform cover density of at least a minimum of 85% for a minimum of one-year post-seeding.
   2. Tree and shrub survival for a minimum of two-year post-planting.

B. Promptly remove soil and debris, created by turfs and grasses Work, from paved areas. Clean wheels of vehicles before leaving Site to avoid tracking soil and topsoil onto roads, walks, or other paved areas.

C. If applicable, remove non-biodegradable erosion-control measures after turfs and grasses extended service period ends.

D. Take all precautions to ensure that hydroseed slurry, if hydroseeding techniques are used, is only placed on the areas designated. Completely clean any overspray, on areas not designated to receive slurry.

E. Where restored features (trees, shrubs, curbs, pavement, etc.) do not comply with specified acceptance criteria, reestablish the feature and continue extended service period until the feature(s) comply with criteria for acceptance.

F. The finished products of restoration will be maintained in an acceptable condition for and during a period of two years following the date of substantial completion or other such date as determined by the Owner.

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APPENDIX C

Community Air Monitoring Plan

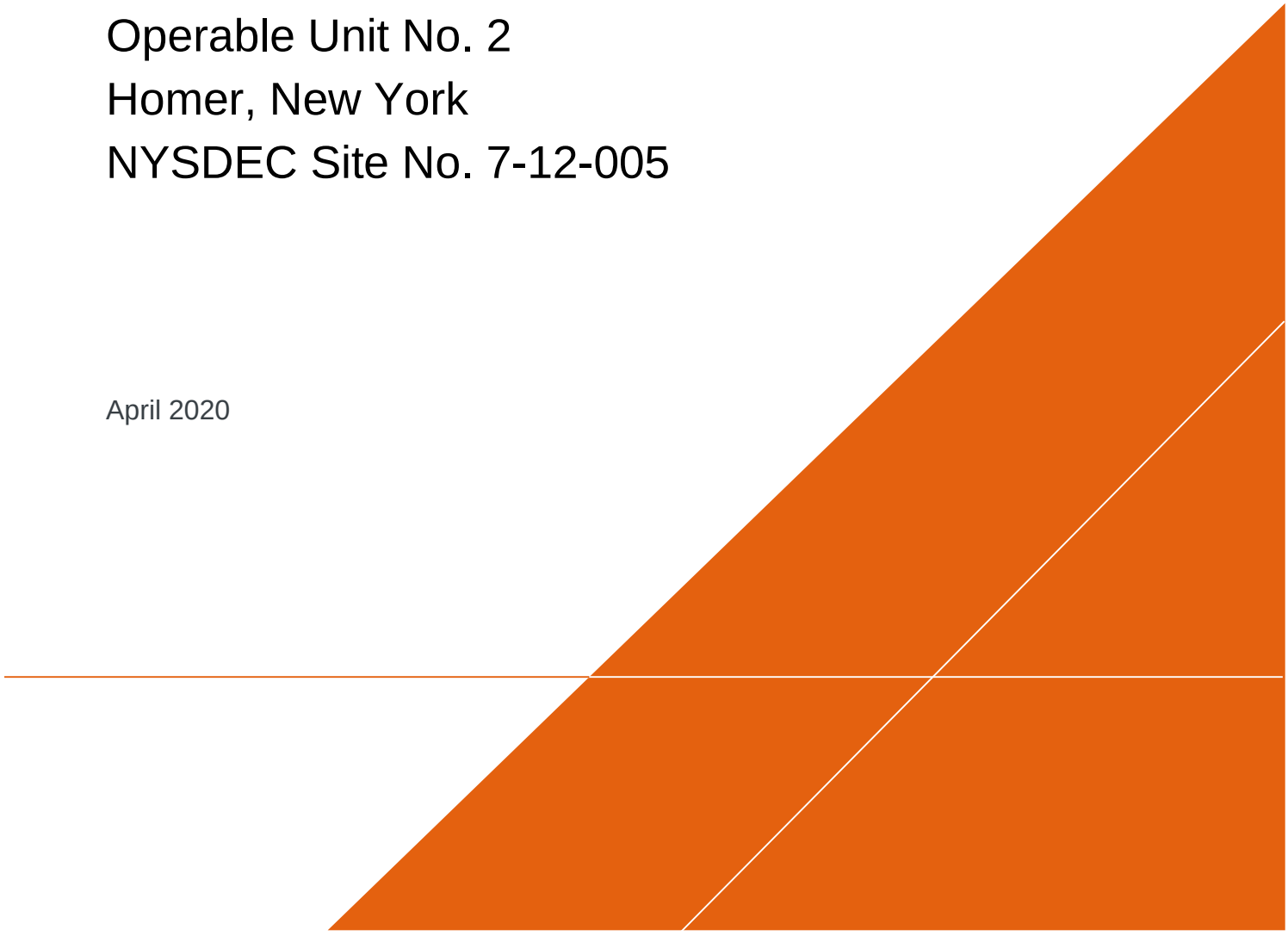
ARCADIS Design & Consultancy for natural and built assets

NYSEG

COMMUNITY AIR MONITORING PLAN

Cortland-Homer Former MGP Site
Operable Unit No. 2
Homer, New York
NYSDEC Site No. 7-12-005

April 2020



COMMUNITY AIR MONITORING PLAN

Cortland-Homer Former MGP Site
Operable Unit No. 2
Homer, New York
NYSDEC Site No. 7-12-005

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ATTACHMENTS

1. Generic Community Air Monitoring Plan
2. Vapor Emission Response Plan

1 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared to support the implementation of remedial activities for the New York State Department of Environmental Conservation- (NYSDEC-) selected remedy for the New York State Electric & Gas (NYSEG) Cortland-Homer Former Manufactured Gas Plant (MGP) site located in Homer, New York (Site No. 7-12-005) (the Site). Details related to the remedial activities are presented in the accompanying Remedial Design Report (Remedial Design). Specification Sections referenced in this CAMP are included in Appendix B of the Remedial Design.

The purpose of this CAMP is to describe the monitoring activities that will be conducted by the Remediation Engineer to monitor for potential airborne releases of constituents of concern (COCs) during the implementation of remedial activities. This CAMP specifies the air emission action levels, air monitoring procedures, monitoring schedule, and data collection and reporting to be performed during the implementation of remedial activities.

As indicated in Specification Section 01 35 49, CAMP, the Remediation Engineer is responsible for providing all labor, materials, and equipment necessary to implement the community air monitoring program specified herein. The Remediation Contractor is ultimately responsible for confirming that all corrective measures associated with the community air monitoring program (including the control of dust, vapors, and odors) are conducted in accordance with this CAMP and Specification Section 01 57 05, Temporary Controls.

1.1 Site Location and Description

The Site, which is located in the Village of Homer, Cortland County, New York, just north of the City of Cortland, consists of two Operable Units (OUs):

- OU-1 encompasses the former MGP plant west of US Route 11.
- OU-2 includes a portion of the NYSEG property east of US Route 11 that is hydraulically downgradient from OU-1. OU-2 also includes sediments in the West Branch of the Tioughnioga River containing MGP-related impacts.

The Site is located at 216 (northernmost OU-1 consisting of a small portion of the former MGP), 218 (remaining footprint of OU-1), and 221 (OU-2) South Main Street (i.e., US Route 11). The majority of OU-1 is owned by NYSEG with a small northern portion owned by a commercial company and the westernmost portion owned by the New York Susquehanna and Western (NYSW) railroad line. NYSEG also owns the upland portion of OU-2.

Additional details regarding the site description are provided in the Remedial Design.

1.2 Summary of Remedial Activities

In general, the remedial activities to be performed at the Site consist of removal of Tioughnioga River sediment containing visual impacts and/or polycyclic aromatic hydrocarbons (PAHs) at concentrations greater than 6.2 milligrams per kilogram (mg/kg). Limits of sediment removal are shown on the Design

Drawings (Appendix A of the Remedial Design) and figures associated with Remedial Design. Material will be removed from two main areas:

- Area 1 is generally located near the former MGP property, spanning from approximately 250 upstream of the NYSEG property to approximately 100 feet downstream of closed bridge located near the museum property.
- Area 2 is generally located adjacent to the NYSEG property at the north end of Front Street, spanning from approximately 300 downstream of the railroad bridge to approximately 100 feet upstream of Dry Creek (i.e., a tributary to the Tioughnioga River).

Additional details regarding remedial activities are provided in the Remedial Design.

2 ODOR, VAPOR, AND DUST CONTROL

As defined in the New York State Department of Health (NYSDOH) Generic CAMP (included as Attachment 1 to this CAMP), intrusive remedial activities to be performed at the Site have the potential to generate localized impacts to air quality. Remedial components that have the potential to generate air emissions include, but may not be limited to, the following:

- Installation of erosion and sediment controls and other site preparation activities
- Excavation of sediments
- Material handling (e.g., offloading of materials, manipulation of materials to render them suitable for off-site treatment/disposal, stockpiling of materials, and loading of materials for transport to an off-site treatment/disposal facility)
- Backfilling
- Restoration of excavation and support areas
- Other ancillary intrusive activities

Odor, vapor, and dust emissions resulting from these activities will be controlled using a combination of the following:

- Water spray
- BioSolve® PinkWater®
- Polyethylene sheeting (for covering material stockpiles)
- Vapor suppression foam (i.e., Rusmar AC-645 Long-Duration Foam)

BioSolve® PinkWater® and Rusmar AC-645 Long-Duration Foam will be mobilized to the Site before any intrusive or dust-generating activities are initiated and will be maintained on the Site in sufficient supply throughout the project. As warranted based on noted odors, a solution of BioSolve® PinkWater® and water (mixed per manufacturer's specifications) may be sprayed on excavated material during active excavation/load-out activities. Note that application of BioSolve® Pinkwater® to the water surface to or sediments below the mean high-water line (MHWL) is prohibited. As warranted based on noted odors, Rusmar AC-645 Long-Duration Foam may be sprayed on excavated soils/sediment to form a thick, viscous vapor barrier before extended work breaks and at the end of each workday. Any Rusmar AC-645 Long-Duration Foam applied to removal areas below the MHWL will be completely excavated/removed prior to backfilling/flooding removal cell.

The following construction techniques and site management practices will also be used during the project to control odor, vapor, and dust emissions:

- Removing and backfilling, and loading, handling, and unloading excavated material and clean fill material, in a manner that minimizes the generation of airborne dust
- Hauling excavated material and clean fill material in properly covered vehicles
- Proper handling/processing of excavated materials

- Restricting vehicle speeds on temporary access roads and active haul routes
- Covering stockpiles of clean fill material with polyethylene liners (anchored appropriately to resist wind forces) before extended work breaks and at the end of each workday
- Complying with applicable erosion and sediment control requirements of Specification Section 01 57 05, Temporary Controls
- Complying with cleaning requirements of Specification Section 01 74 05, Cleaning

As required by Specification Section 01 57 05, Temporary Controls, odor, vapor, and dust controls will be proactively employed by the Remediation Contractor during the work to:

- Prevent exceedances of the total volatile organic compounds (TVOCs) and Particulate Matter of 10 microns in diameter or smaller (PM10) action levels specified in Specification Section 01 35 49, CAMP and Section 3.4 of this CAMP.
- Mitigate MGP-related odor emissions to the extent practicable and to the satisfaction of NYSEG, the Remediation Engineer, NYSDEC, and NYSDOH.

3 AIR MONITORING PROCEDURES

The community air monitoring program is intended to be a discrete program that will be operated in conjunction with the exclusion zone (i.e., work zone) air monitoring program (conducted by the Remediation Contractor). The Remediation Engineer will conduct real-time community air monitoring throughout the remedial construction. Monitoring will be conducted at representative locations at the perimeter of the work zone (i.e., Excavation Areas) for TVOCs and PM_{10}. However, particulate monitoring will not be performed during precipitation events.

Additionally, each air monitoring station and the meteorological station shall be equipped with a telemetry package to allow for real-time management of community air monitoring data by office-based personnel (i.e., NYSEG and the Remediation Engineer) in accordance with Specification Section 01 35 49, CAMP Additional information regarding the monitoring locations, equipment, and action levels is presented below.

3.1 Monitoring Location Selection and Deployment

A full set of monitoring stations (i.e., one upwind and three downwind stations) will be required at the perimeter of the work zone. Monitoring station locations will be determined daily based on data from the on-site meteorological monitoring station and the nature of the anticipated remediation activities. An upwind location for both TVOC and PM_{10} monitoring will be selected at the start of each workday. Three downwind locations (based on predominant wind direction) for both TVOC and PM_{10} monitoring will also be selected. The TVOC and PM_{10} monitoring stations will be deployed each day before the start of work activities. If wind direction shifts radically during the workday and for an extended period of time, such that the upwind location and downwind locations no longer fall within acceptable guidelines (±60-degree compass change from the original wind direction), the monitoring stations will be relocated so that the upwind and downwind locations are maintained. Air monitoring location changes will be documented in a field logbook.

3.2 Total Volatile Organic Compound Monitoring

Real-time monitoring for TVOCs will be conducted at the Site during remedial activities. As required by the NYSDOH Generic CAMP (Attachment 1), TVOCs will be monitored continuously during intrusive and/or potential dust-generating activities (e.g., excavation, backfilling, and material handling activities) using instrumentation equipped with electronic data-logging capabilities. A real-time TVOC monitor equipped with a photoionization detector and calibrated per manufacturer's specifications, will be used to monitor for TVOCs. Proposed monitoring equipment can be found in Specification Section 01 35 49, CAMP. All time-weighted average (TWA) concentrations (calculated for continuous 15-minute increments [e.g., 08:00 to 08:15, 08:15 to 08:30]) and any instantaneous readings taken to facilitate activity decisions will be recorded using an electronic data logger and/or in the daily air monitoring report.

3.3 Total Suspended Particulate Monitoring

Real-time monitoring for PM_{10} will be conducted during remedial activities at the Site. As required by the NYSDOH Generic CAMP (Attachment 1), real-time airborne PM_{10} monitoring will be conducted continuously during intrusive and/or potential dust-generating activities (e.g., excavation, backfilling, and

material handling activities) using instrumentation equipped with electronic data-logging capabilities. A real-time PM_{10} monitor will be used for PM_{10} monitoring. Proposed monitoring equipment can be found in Specification Section 01 35 49, CAMP. All TWA concentrations (calculated for continuous 15-minute increments [e.g., 08:00 to 08:15, 08:15 to 08:30]) and any instantaneous readings taken to assess an appropriate course of action will be recorded using an electronic data logger and/or in the field logbook.

Fugitive dust migration will be visually assessed during all work activities, and reasonable dust-suppression techniques will be used during any site activities that may generate fugitive dust (Section 2).

3.4 Alert and Action Levels

Alert and action levels for TVOCs and ambient air PM_{10} concentrations are provided below and specified in Specification Section 01 35 49, CAMP. Alert and action levels are to be used to initiate corrective actions, if necessary, based on real-time monitoring. Each piece of monitoring equipment will have alarm capabilities (audible and/or visual) to indicate exceedances of the alert levels.

3.4.1 Alert Levels for TVOCs

As outlined in the NYSDOH Generic CAMP (Attachment 1 to this CAMP) and the Vapor Emission Response Plan (Attachment 2 to this CAMP), if the ambient air concentration for TVOCs exceeds 2.5 parts per million (ppm) above background (i.e., upwind location) for the 15-minute TWA, work may continue. The Remediation Contractor will attempt to identify the potential source of the exceedance and employ additional odor, vapor, and/or dust controls, as necessary, to abate emissions.

If the ambient air concentrations for TVOCs persist at levels in excess of 5 ppm but less than 25 ppm above background, Remediation Contractor shall stop all work activities, immediately notify NYSEG, identify the source of elevated TVOC concentrations, complete corrective actions to reduce or abate the emissions or modify construction techniques, as necessary, and continue air monitoring. Work activities may resume provided that the 15-minute average TVOC concentration remains below the alert levels. Remediation Engineer shall prepare an exceedance report in accordance with Specification Section 01 35 49, CAMP.

If the ambient air concentrations for TVOCs exceed 25 ppm above background, work shall not resume until authorized by NYSEG.

3.4.2 Action Levels for PM_{10}

As outlined in the NYSDOH Generic CAMP (Attachment 1), if the ambient air concentration for PM_{10} exceeds 100 micrograms per cubic meter ($\mu g/m^3$) above average background (i.e., upwind location) for the 15-minute TWA, or visible dust is observed leaving the work area, work may continue. The Remediation Contractor will attempt to identify the potential source of the exceedance and shall employ additional dust controls, or modify construction techniques, to abate emissions.

If the ambient air concentration for PM_{10} exceeds 150 $\mu g/m^3$ ppm above average background for the 15-minute TWA, or visible dust is observed leaving the work area, the Remediation Contractor shall stop all work activities, immediately notify NYSEG, identify the source of elevated PM_{10} concentrations, complete corrective actions to reduce or abate the emissions or modify construction techniques, as necessary, and continue air monitoring. Work activities may resume provided that the 15-minute TWA concentration

remains below the action levels. Remediation Engineer shall prepare an exceedance report in accordance with Specification Section 01 35 49, CAMP.

3.5 Manufactured Gas Plant-Related Odor Monitoring

During working hours, the Remediation Engineer will perform periodic walks around the perimeter of the work area(s) to monitor for MGP-related odors. These perimeter checks will be performed more frequently, as necessary, depending on the work being performed and meteorological factors such as change in wind direction. Meteorological factors that can influence odor generation and dissemination generally include temperature, humidity, precipitation, atmospheric pressure, wind direction, and wind speed. These factors can work synergistically with a positive or negative impact on MGP-related odor generation and transport/dispersion. For example, MGP-related odors generally tend to be less prevalent with lower temperatures, precipitation, or high humidity. Additionally, MGP-related odor dissemination is greatly influenced by wind direction and wind speed. Meteorological factors, including wind direction, will be monitored during the remedial construction activities.

If MGP-related odors are noticed along the perimeter of the work area, work will continue and odor-, vapor-, and dust-suppression techniques employed to abate emissions. Additionally, construction techniques will be evaluated and modified, if necessary and appropriate, and more frequent checks of the work area perimeter for MGP-related odors will be performed.

Odor complaints (if any) will be directed to the Remediation Engineer. The legitimacy of the complaint will be verified based on the work activities being performed, the predominant wind direction, and other meteorological factors. In response to verified odor complaints, perimeter monitoring will continue and additional odor, vapor, and dust controls will be employed to abate emissions. Additionally, construction techniques will be evaluated and modified, if necessary and appropriate. Odor monitoring results will be documented in the daily air monitoring report and/or odor monitoring log.

If MGP-related odors continue to be noticed at the perimeter of the work area, work will be stopped while activities are reevaluated. The source or cause of the MGP-related odors will be identified and additional modifications of construction techniques or additional methods to abate emissions will be implemented. Work will resume provided the measures are successful at abating the odors noticed along the work area perimeter. If the odor complaint cannot be resolved through implementation of the stated controls, NYSDEC will then investigate the complaint further.

3.6 Meteorological Monitoring

Meteorological monitoring will be conducted continuously at the Site using a portable meteorological monitoring system. The meteorological monitoring system will be deployed at a location in accordance with siting criteria established by the United States Environmental Protection Agency and NYSDEC for meteorological monitoring systems (Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV - Meteorological Measurements, as revised March 2008; and New York State Division of Air Resources Policy 2 (DAR-2) - “Oversight of Private Air Monitoring Networks,” dated December 16, 1997). Use of these guidelines enables the meteorological monitoring system to provide representative observations of the local meteorological conditions.

A digital meteorological monitoring system will be used to collect the meteorological data. Proposed meteorological equipment can be found in Specification Section 01 35 49, CAMP. At a minimum, the meteorological monitoring system will monitor wind speed, wind direction, relative humidity, and ambient temperature. The meteorological monitoring system will be equipped with electronic data-logging capabilities.

3.7 Instrument Calibration

Remediation Engineer shall calibrate air monitoring equipment on a daily basis (at a minimum), or other frequency recommended by the manufacturer. All instrument readings, field reference checks, and calibrations will be recorded in the field logbook.

4 MONITORING SCHEDULE AND REPORTING

The following subsections identify the monitoring schedule and data collection/reporting requirements.

4.1 Monitoring Schedule

Air monitoring will be conducted prior to initiation of the remedial action to establish adequate baseline data and until such time that significant material handling activities are complete (i.e., removal of stockpiled impacted materials for off-site transportation and treatment/disposal). As previously indicated, real-time TVOC and PM_{10} monitoring will be performed during intrusive and/or potential dust-generating activities (e.g., excavation, backfilling, and material handling activities).

The frequency of air monitoring will be relative to the level of site work activities being conducted and may be adjusted as the work proceeds and in consideration of the monitoring results. Air monitoring for TVOCs and PM_{10} may be discontinued during periods of heavy precipitation that would otherwise result in unreliable data or damage to the monitoring equipment. Meteorological monitoring will be performed continuously during work activities.

4.2 Reporting

The Remediation Engineer will prepare a daily summary of the 15-minute average community air monitoring results (for TVOCs and PM_{10}) to be submitted to NYSEG, NYSDEC and NYSDOH. The summary will also include, but not be limited to, a description of community air monitoring exceedances (if any), work activities associated with the exceedances, and corrective actions implemented to address the exceedances.

The time and outcome of each MGP-related odor perimeter check will be documented in a daily log, specifically noting the presence or absence of MGP-related odors and identifying the general location(s) along the perimeter where MGP-related odors (if any) are noticed. These daily logs, as well as documentation of any odor complaints received from the public, will be included in the aforementioned daily CAMP reports to be submitted to NYSEG, NYSDEC, and NYSDOH.

The daily summary will be submitted in an electronic format to the NYSEG, NYSDEC, and NYSDOH representatives listed in Table 4-1. A copy of the data will be maintained at the Remediation Engineer field office trailer.

Table 4-1. CAMP Contact List

Name	Affiliation	Contact Information
Justin Starr	NYSDEC	T: 518.402.9797 justin.starr@dec.ny.gov
Dan Tucholski	NYSDOH	T: 518.402.7860 daniel.tucholski@health.ny.gov
Tracy Blazicek	NYSEG	T: 585.484.6839 tlblazicek@nyseg.com

ATTACHMENT 1

Generic Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

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 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 DEC/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. APeriodic@ 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, particularly if wind direction changes. 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.

1. 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.

2. 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.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) 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.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/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 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/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 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

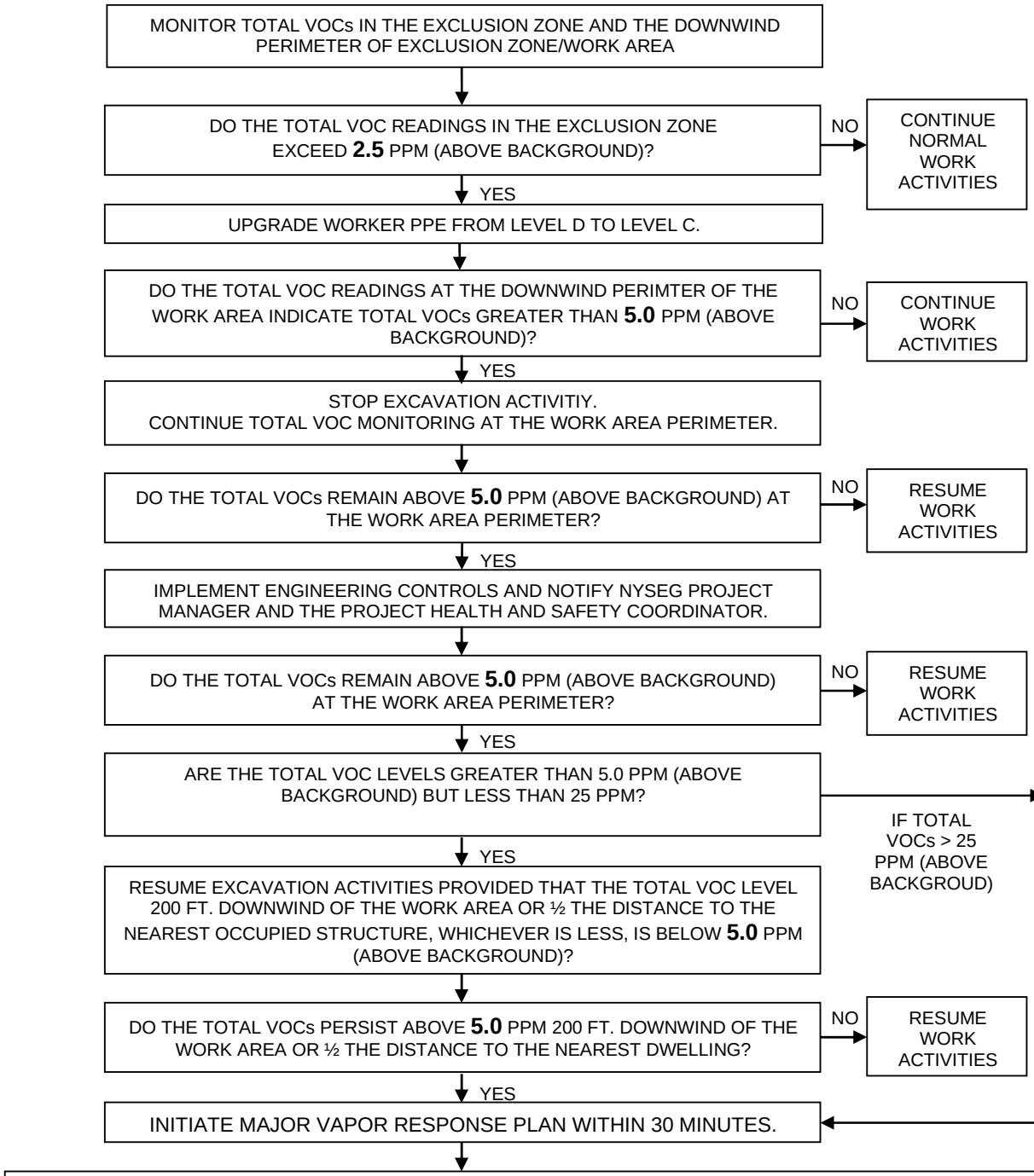
Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

ATTACHMENT 2

Vapor Emission Response Plan

Attachment 2 – Vapor Emission Response Plan
NYSEG – Cortland-Homer Former MGP Site OU-2 – Homer, New York



1. Cover the removal area and/or staged material with polyethylene sheeting.
2. Notify NYSEG – Tracy Blazicek at 585.484.6839; NYSDEC – Justin Starr at 518.402.9662; and NYSDOH – Dan Tucholski at 518.402.7860.
3. Total VOC levels will be monitored within 20 feet of the nearest downwind residential or commercial structure. (20-foot zone).
4. Continue air monitoring 15-minute intervals in the 20- foot zone. If two successive readings below action levels are measured, air monitoring intervals may be halted or modified by the Remediation Engineer, with approval of the NYSDEC and NYSDOH.
5. If the Total VOC levels persist above 5.0 PPM within the 20-foot zone, NYSEG and the Remediation Engineer will consult with the Emergency Response Agencies to determine appropriate actions to be implemented. NYSEG has the ultimate authority during major vapor emission emergencies.

APPENDIX D

Community and Environmental Response Plan

ARCADIS Design & Consultancy for natural and built assets

NYSEG

COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

Cortland-Homer Former MGP Site
Operable Unit No. 2
Homer, New York
NYSDEC Site No. 7-12-005

April 2020

COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

Cortland-Homer Former MGP Site
Operable Unit No. 2
Homer, New York
Site No. 7-12-005

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1 INTRODUCTION

This Community and Environmental Response Plan (CERP) has been prepared to support the implementation of remedial activities for the New York State Department of Environmental Conservation-(NYSDEC-) selected remedy for the New York State Electric & Gas (NYSEG) Cortland-Homer Former Manufactured Gas Plant (MGP) site located in Homer, New York (Site No. 7-12-005) (the Site). Details related to the remedial activities are presented in the accompanying Remedial Design Report (Remedial Design).

This CERP has been prepared in accordance with 2010 New York State Department of Environmental Conservation (NYSDEC) DER-10: Technical Guidance for Site Investigation and Remediation. The purpose of this CERP is to present a summary of the site monitoring and work practices that will be completed to address potential short-term impacts to the surrounding community and/or environmental resources. Additional details regarding site monitoring and work practices referenced in this CERP are presented in the Remedial Design and the associated appendices including, but not limited to:

- Design Drawings (Appendix A to the Remedial Design)
- Technical Specifications (Appendix B to the Remedial Design)
- Community Air Monitoring Plan (CAMP) (Appendix C to the Remedial Design)
- Contingency Plan (Appendix E to the Remedial Design)
- Storm Water Pollution Prevention Plan (SWPPP) (Appendix F to the Remedial Design)

Section 2 of this CERP summarizes the monitoring to be conducted during remedial construction activities, and Section 3 describes site management and controls.

1.1 Site Location and Description

The Site, which is located in the Village of Homer, Cortland County, New York, just north of the City of Cortland, consists of two Operable Units (OUs):

- OU-1 encompasses the former MGP plant west of US Route 11
- OU-2 includes a portion of the NYSEG property east of US Route 11 that is hydraulically downgradient from OU-1. OU-2 also includes sediments in the West Branch of the Tioughnioga River containing MGP-related impacts.

The Site is located at 216 (northernmost OU-1 consisting of a small portion of the former MGP), 218 (remaining footprint of OU-1), and 221 (OU-2) South Main Street (i.e., US Route 11). The majority of OU-1 is owned by NYSEG with a small northern portion owned by a commercial company and the westernmost portion owned by the New York Susquehanna and Western (NYSW) railroad line. NYSEG also owns the upland portion of OU-2.

Additional details regarding the site description are provided in the Remedial Design.

1.2 Summary of Remedial Activities

In general, the remedial activities to be performed at the Site consist of removal of Tioughnioga River sediment containing visual impacts and/or polycyclic aromatic hydrocarbons (PAHs) at concentrations greater than 6.2 milligrams per kilogram (mg/kg). Limits of sediment removal are shown on the Design Drawings (Appendix A of the Remedial Design) and figures associated with Remedial Design. Material will be removed from two main areas:

- Area 1 is generally located near the former MGP property, spanning from approximately 250 upstream of the NYSEG property to approximately 100 feet downstream of closed bridge located near the museum property.
- Area 2 is generally located adjacent to the NYSEG property at the north end of Front Street, spanning from approximately 300 downstream of the railroad bridge to approximately 100 feet upstream of Dry Creek (i.e., a tributary to the Tioughnioga River).

Additional details regarding remedial activities are provided in the Remedial Design.

1.3 Project Responsibilities

Responsibilities of the Owner (NYSEG), the Remediation Engineer, and the Remediation Contractor, as they relate to the implementation of this CERP, are as follows:

- NYSEG – Primary responsibility is to coordinate with the Remediation Contractor and Remediation Engineer (as necessary) to implement the required work activities in conformance with the Remedial Design. NYSEG is responsible for contracting with a Remediation Engineer; Remediation Contractor; and select waste haulers and waste treatment/disposal facilities.
- Remediation Engineer – Responsibility is to provide project management/oversight to observe and monitor implementation of the remedial activities. The Remediation Engineer is responsible for performing community air monitoring in accordance with the site-specific CAMP and reviewing turbidity monitoring data collected by the Remediation Contractor. The Remediation Engineer is also responsible for collecting imported fill samples, as necessary, and contracting with a laboratory for the analysis of collected samples.
- Remediation Contractor – Primary responsibility is to complete remedial activities as presented in the Remedial Design. The Remediation Contractor is responsible for verifying that community air monitoring is implemented prior to conducting intrusive site activities. The Remediation Contractor is responsible for performing turbidity monitoring in accordance with the Remedial Design and implementing controls to address community air or turbidity monitoring exceedances, if necessary. The Remediation Contractor is also responsible for collecting waste characterization samples, as necessary, and contracting with a laboratory for the analysis of collected samples and conducting and implementing the general site management practices and controls described in Section 3.

2 SITE MONITORING

This section presents a summary of the monitoring to be conducted during implementation of the remedial activities to evaluate potential short-term impacts to the surrounding community.

2.1 Community Air Monitoring

Community air monitoring will be conducted by the Remediation Engineer during intrusive and/or potential dust-generating activities (e.g., sediment removal, backfilling, and material handling activities). Detailed requirements for air monitoring procedures are presented in the site-specific CAMP and Specification Section 01 35 49, CAMP. Air monitoring procedures will be completed in accordance with the May 2010 New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan and generally consist of monitoring for volatile organic compounds (VOCs) and particulates (PM_{10}) at multiple locations to establish site background conditions and to evaluate air quality at the perimeter of the active work areas (e.g., sediment removal area[s] and OU-1 support area).

As presented in the CAMP and Specification Section 01 35 49, Community Air Monitoring Plan, exceedances of VOC and/or particulate action levels will require emission controls and dust-suppression measures. Control measures to be implemented by the Remediation Contractor are presented in Specification Section 01 57 05, Temporary Controls. Additionally, the CAMP includes community notification procedures to be conducted if air monitoring action levels continue to be exceeded after implementation of emission controls.

2.2 Odor Monitoring

During working hours, the Remediation Engineer shall perform periodic walks around the perimeter of the work area to monitor for MGP-related odors in accordance with the CAMP. The perimeter checks will be performed more frequently, as necessary, depending on the work being performed. If MGP-related odors are noticed along the perimeter of the work area, work will continue, and odor, vapor, and dust suppression techniques employed to abate emissions, in accordance with Specification Section 01 57 05, Temporary Controls. Additionally, construction techniques will be evaluated and modified, if necessary and appropriate, and more frequent checks of the work area perimeter for MGP-related odors will be performed. If MGP-related odors continue to be noticed at the perimeter of the work area, work will be stopped while activities are re-evaluated. The source or cause of the MGP-related odors will be identified and additional modifications of construction techniques or additional methods to abate emissions will be implemented. Work will resume provided the measures are successful at abating the odors noticed along the work area perimeter.

Detailed requirements of odor monitoring are presented in the CAMP.

2.3 Turbidity Monitoring

During the installation and removal of the temporary river bypass and during sediment removal and backfilling activities, the Remediation Contractor will conduct turbidity monitoring at locations both upstream and downstream of the active work area(s). Turbidity monitoring locations are shown on Design Drawings C-101 and C-104. The actual monitoring locations will be determined in the field based on

accessibility. The upstream location will represent the background turbidity level to support comparison to the downstream location. Details of turbidity monitoring are presented in the Remedial Design and Specification Section 01 57 05, Temporary Controls.

As specified in the Remedial Design, “early warning level” and “action level” values have been established, as have response actions required if each level is reached. The following actions will be taken if the “action level” is observed:

- Temporary cease of remedial activities to perform a visual inspection of the condition or performance of the existing erosion and sedimentation control measures.
- Continued monitoring at the downstream and upstream locations to determine if the prior result differential was an anomaly or if the elevated reading was possibly a short-duration event.
- Review of the ongoing activities and implementation of additional controls and/or operational modification(s) or suspension of work operations until the turbidity returns to an acceptable level.

2.4 Structural and Geotechnical Monitoring

During intrusive in-river work (i.e., installation and removal of the temporary river bypass system and sediment removal and backfill activities), the Remediation Contractor will conduct structural monitoring of the bridges and structures listed below:

- 215 South Main Street (former automotive shop)
- 207 South Main Street (automotive shop)
- 4386 US Route 11 (museum)
- The private bridge (crossing the Tioughnioga River) located immediately upstream of 215 South Main Street
- The private bridge (crossing the Tioughnioga River) located immediately downstream of 4386 US Route 11
- The railroad bridge located immediately upstream of Area 2

Structural monitoring will consist of vibration and/or optical survey monitoring of structures immediately adjacent to excavation areas. Optical survey points and vibration monitoring equipment will be installed at the locations shown on Design Drawings C-101 and C-104. Details for geotechnical instrumentation, installation, and monitoring (including notification and action levels) are presented in Specification Section 31 09 13, Geotechnical Instrumentation and Monitoring.

The Remediation Contractor shall contract with a third-party engineering firm to conduct pre- and post-construction structural surveys at the locations listed above. The pre-construction survey will serve as the baseline for the post-construction survey. The pre-construction survey will be conducted by a Professional Engineer licensed in the State of New York and will include, but not be limited to, visual inspection and photographic documentation of the existing conditions of the listed structures. Details for structural surveys are presented in Specification Section 02 21 19, Structural Surveys.

3 SITE MANAGEMENT AND CONTROLS

This section presents a summary of site management practices and controls that will be implemented to minimize potential short-term impacts to the surrounding community during remedial activities.

3.1 Site Security

Public access to the Site and work areas will be restricted during the remedial activities, to the extent practicable. Details regarding site security and project signage are presented on the Design Drawings and in Specification Sections 01 58 13, Temporary Project Signage and 01 71 33, Protection of Work and Property.

3.2 Erosion, Sediment, and Turbidity Controls

Erosion, sediment, and turbidity control measures (e.g., silt fence, straw bale, temporary river bypass system) will be provided, installed, and maintained by the Remediation Contractor to prevent silting and muddying of existing drainage systems, streams, rivers, etc. Details regarding locations and types of controls are presented on the Design Drawings and in Specification Sections 01 41 26, SWPPP and Permit, Section 01 57 05, Temporary Controls, and the SWPPP.

Erosion, sediment, and turbidity control measures will be installed and maintained in accordance with the latest edition of the NYSDEC New York State Standards and Specifications for Erosion and Sediment Control. At a minimum, the Remediation Contractor will inspect erosion, sediment, and turbidity control measures daily and after storm events. Inspection results will be summarized in weekly inspection reports. Report requirements are provided in Specification Section 01 41 26, SWPPP and Permit.

In general, the Remediation Contractor will take all precautions to prevent, or reduce to a minimum, any damage to surface water from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials within or adjacent to existing and new drainage systems, the Tioughnioga River, or other nearby water bodies. The Remediation Contractor is prohibited from the following:

- Dumping spoil material into any drainage way, surface waters, or unspecified locations.
- Pumping silt-laden water from trenches or from within the sediment removal area into any drainage way, surface waters, or unspecified locations.
- Damaging vegetation beyond the extent necessary for remedial construction.
- Disposing of trees, brush, and other debris in any stream corridors, drainage way, or unspecified locations.

Following completion of the remedial activities, the Remediation Contractor will restore disturbed surfaces as indicated in the Remedial Design, or as approved by NYSEG and the Remediation Engineer.

3.3 Waste Management

In general, waste materials generated during implementation of the remedial activities will be managed based on the results of the waste characterization sampling. NYSEG, the Remediation Engineer, and/or

the Remediation Contractor will be responsible for the following activities, in accordance with the Remedial Design:

- Contracting with a conditionally exempt waste disposal vendor (i.e., low-temperature thermal desorption [LTTD] treatment facility).
- Acting as the "Generator" for material resulting from the remediation activities for off-site treatment and/or disposal of the waste.
- Coordinating with potential disposal facilities to verify waste characterization analytical requirements prior to the collection of waste characterization samples.
- Collecting waste characterization samples, coordinating lab analysis, and preparing waste profiles for off-site treatment/disposal of solid and liquid wastes to be generated as part of the remediation activities.
- Reviewing and signing waste manifests/bills of lading for shipments of waste materials generated by the remediation activities.
- Maintaining an on-site project log containing waste manifests/bill of lading for wastes generated by the remediation activities.
- Contracting and coordinating with waste haulers and waste disposal vendors for treatment/disposal of non-hazardous solid and liquid wastes to be generated as part of the remediation activities.
- Coordinating with waste haulers and waste disposal vendors contracted by NYSEG to facilitate off-site transport of conditionally exempt material waste streams.

3.3.1 Solid Waste

A portion of the removed sediment material will be transported to a NYSEG-approved and permitted LTTD facility for treatment and disposal in accordance with the Remedial Design. Excavated solid waste not requiring LTTD treatment will be transported off-site to a NYSEG-approved non-hazardous solid waste disposal facility.

3.3.2 Liquid Waste

All construction-related waters generated during remedial activities (i.e., decontamination water, water from sediment dewatering, and water removed from material staging areas) will be collected and transported to the on-site temporary water treatment system, treated, and discharged into the Tioughnioga River under the SPDES Permit Equivalent. Details for water treatment and discharge are presented in Specification Section 01 53 53, Temporary Water Treatment and Management.

3.3.3 Non-Aqueous Phase Liquid

Free-phase non-aqueous phase liquid (NAPL) encountered during dredging/material dewatering activities will be collected (if in sufficient quantities to be recovered), placed in appropriate containers (e.g., 55-gallon drums), and staged on-site for characterization by the Remediation Engineer prior to off-site disposal at an NYSEG-approved (or selected) facility. Following characterization, the Remediation

Contractor will coordinate with the off-site disposal facility for the transportation and disposal of the containerized NAPL.

3.4 Transportation Controls

This section presents minimum transporter requirements to be followed during loading and transportation of solid and liquid non-hazardous and hazardous wastes generated by the remedial activities at the Site. The term “transporter” means the transporter of any waste materials and the Remediation Contractor if/when the transporter is subcontracted to the Remediation Contractor.

The transporter will provide all necessary supervision, labor, training, permits, hazardous waste manifests (when required), PPE, tools, equipment, materials, and all items incidental and necessary to transport solid waste between individual work areas on-site (i.e., removal area and/or temporary support areas) and from the Site to the permitted disposal facilities.

The transporter shall comply with the following minimum requirements:

- Any truck found to be unacceptable by the Remediation Engineer will be rejected, and the cost for any rejected truck shall be incurred by the transporter. If NYSDEC on-site personnel find any trucks to be unacceptable, NYSDEC should notify NYSEG (or the Remediation Contractor directly), which, in turn, shall notify the truck driver.
- The transporter shall adhere to the following rules while at the Site (including transportation between the removal area and/or temporary support areas), in transit from the Site to the waste disposal facility, and at the waste disposal facility:
    - Prior to entry to the Site, truck drivers shall stage trucks only in areas designated by the Remediation Contractor. While staged, truck engines shall be shut off. Trucks shall not idle for more than 5 minutes.
    - Truck drivers shall announce their arrival at the Site to the Remediation Contractor.
    - Truck drivers are generally restricted to their trucks and designated waiting areas. Drivers are not permitted to access the Site without permission from NYSEG, the Remediation Contractor, or the Remediation Engineer.
    - Transporters must supply and wear hard hats, safety glasses, safety shoes, long pants (jogging pants or warm-up pants are not permitted), and gloves, at a minimum, at all times when outside the truck cab for personal protection. Transporters are responsible for supplying any other protective equipment necessary for completing their tasks in a safe manner.
    - Transporters shall line the entire waste transport container (dump truck box, dump trailer, roll-off waste container, etc.) that will be used to haul hazardous solid waste, conditionally exempt MGP site remediation waste, or non-hazardous waste (e.g., to top of the side boards) with 6-mil thick polyethylene sheeting. Certain waste transport containers used to haul construction and demolition (C&D) debris may also need to be lined as indicated above. All waste transport containers shall have a watertight tailgate with a gasket between the box and tailgate, and tailgates shall be secured with locking turnbuckles. If free liquids are observed to be leaking from the container of the truck once loaded, the truck cannot leave the loading area.

- All trucks are subject to inspection by the Remediation Engineer upon arrival at the Site. If trucks are not clean (as determined by the Remediation Engineer), they will be rejected. Cleaning of trucks is not permitted at the Site.
- All trucks shall be equipped with working audible and visual backup signals.
- When waste transport containers are being loaded, and when directed by the Remediation Contractor, the engine shall be shut off. The engine may be restarted, and the truck driven away only after the “all clear” direction is provided to the driver by the loading equipment operator or by a site representative.
- No waste transport container shall be loaded above the sideboards and no waste shall be permitted to spill out of the waste transport container. Before trucks leave the loading areas, the exterior of the waste hauling portion of the vehicle and tires shall be cleaned (by the Remediation Contractor’s site workers) to remove any residual waste.
- The Remediation Contractor’s site workers shall reposition the cover bars over the waste material. Drivers shall not walk over waste material.
- Before leaving the loading area, drivers shall cover truck loads with a solid fabric (i.e., vinyl, reinforced polyethylene) that extends over the entire load and is secured to resist wind forces at highway speeds.
- Drivers shall obey all traffic signs and notices (obey the posted speed limit) and comply with weight restrictions.
- Drivers and operators shall obey rules posted on the Site and contained in any of the site-specific Health and Safety Plans used at the Site by the Remediation Contractor.
- Drivers and operators shall report any accidents to the NYSEG Project Coordinator and cooperate with any subsequent accident investigation.
- No children under 16 years of age shall be allowed at the Site.
- No passengers are allowed in the active work area(s) or loading area(s).
- Truck driver’s operators shall slow down and use extra caution during inclement weather (i.e., rain, fog, snow).
- Truck driver’s operators shall use extra caution around blind corners (watch for pedestrians and construction equipment).
- Smoking, eating, and/or drinking is not permitted within the active work area(s) or loading area(s), but may be permitted in designated areas of the Support Zone.

After disposal of waste, the transporter is responsible for properly decontaminating the waste hauling portion of the vehicle.

The following is the preferred trucking route for the off-site transportation of solid and liquid wastes generated by the remedial activities at the Site. The preferred trucking route for waste transporters, as well as haulers transporting materials to the Site, includes the following roadways (in order of closest to farthest from the Site):

- Area 1
  - US Route 11/South Main Street
  - Interstate 81
- Area 2
  - Front Street/North Street
  - Rickard Street
  - US Route 13/Clinton Ave
  - Interstate 81

Final trucking routes will be approved by NYSEG and/or the Remediation Engineer prior to use.

3.5 Decontamination

The Remediation Contractor will decontaminate (as necessary) all personnel and equipment that comes into contact with excavated or impacted materials prior to leaving the work areas to prevent the tracking of soil off-site (including vehicles transporting clean fill to the Site), in accordance with Specification Section 02 51 00, Decontamination. Decontamination will occur within the constructed decontamination area(s) illustrated on the Design Drawings (Appendix A of the Remedial Design), as appropriate based on the work being performed. At a minimum, the Remediation Contractor will perform decontamination activities until no visible soil, sediment, debris, or stains are present on the equipment surfaces (to the satisfaction of NYSEG, the Remediation Engineer, and/or NYSDEC).

Project equipment (including, but not limited to, removal equipment, trucks, pumps, and hand tools) that comes in contact with excavated or impacted materials will be decontaminated prior to using the equipment to handle clean material and/or equipment being removed from the Site. Any visible soils, sediments, or other debris will be promptly removed and disposed of in a manner consistent with the materials excavated.

APPENDIX E

Contingency Plan

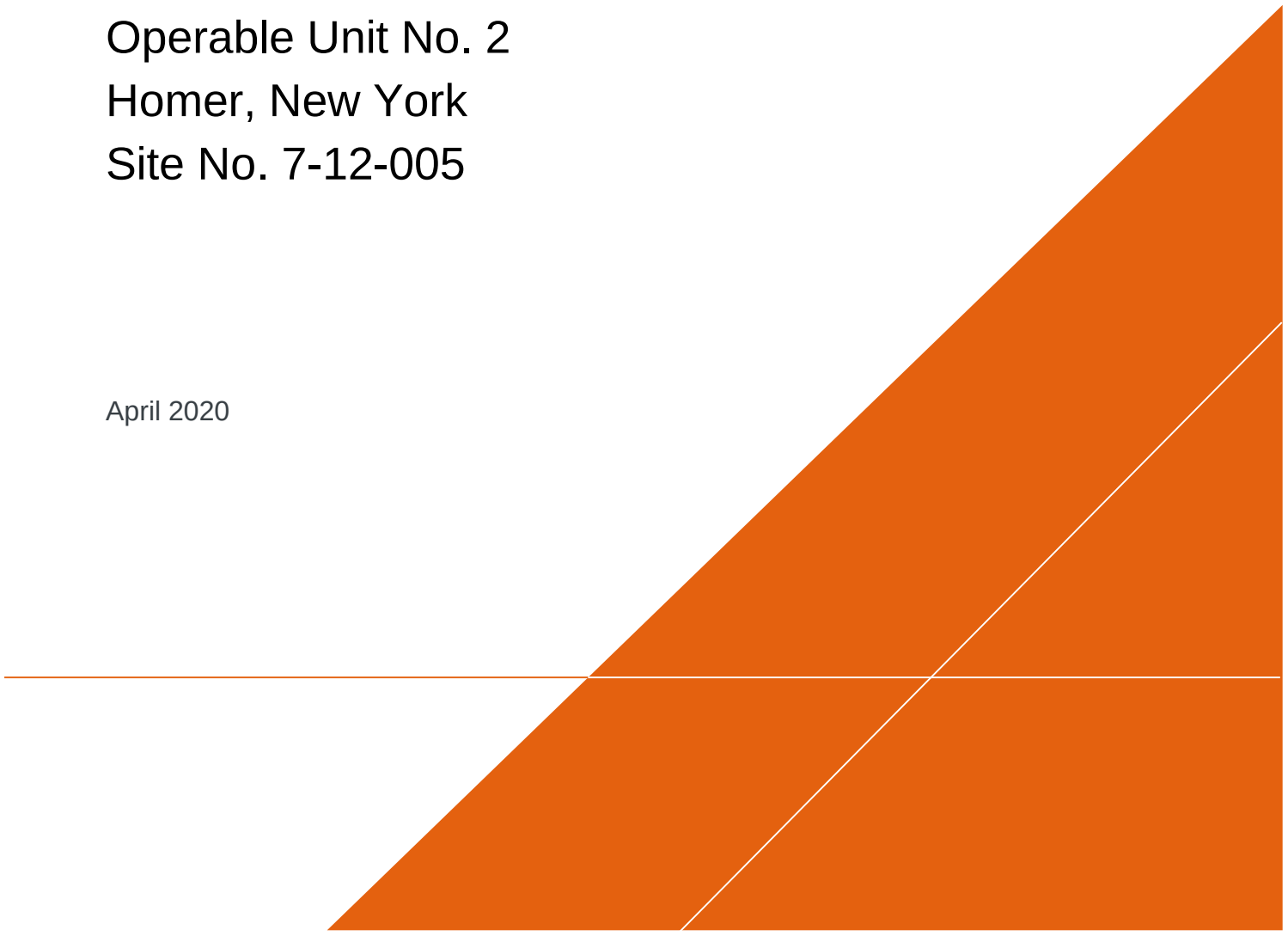
ARCADIS Design & Consultancy for natural and built assets

NYSEG

CONTINGENCY PLAN

Cortland-Homer Former MGP Site
Operable Unit No. 2
Homer, New York
Site No. 7-12-005

April 2020



CONTINGENCY PLAN

Cortland-Homer Former MGP Site
Operable Unit No. 2
Homer, New York
Site No. 7-12-005

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TABLE (IN-TEXT)

Table 1 – Response Action Matrix

FIGURE

Figure 1 Tioughnioga River Watershed and Approximate River Response Times

1 INTRODUCTION

This Contingency Plan has been prepared to support the implementation of remedial activities for the New York State Department of Environmental Conservation- (NYSDEC-) selected remedy for the New York State Electric & Gas (NYSEG) Cortland-Homer Former Manufactured Gas Plant (MGP) Site located in Homer, New York (Site No. 7-12-005) (the Site). This Contingency Plan outlines response procedures for potential emergencies that may occur during construction of the selected remedy at the Site. Details related to the selected remedy are presented in the Remedial Design Report (Remedial Design). Specification Sections referenced in this Contingency Plan are included in Appendix B to the Remedial Design.

1.1 Contingency Plan Responsibilities

NYSEG's Remediation Contractor will identify a Site Health and Safety Officer (SHSO) in accordance with Specification Section 01 15 00, Remediation Contractor's Project Operations Plan. The SHSO will be made aware of any emergencies and coordinate any response activities conducted at the Site. It is the responsibility of the Site HSO to perform the following duties as they relate to this Contingency Plan:

- Notify local public emergency representatives (as appropriate) of the nature of Site operations and post their telephone numbers (e.g., local fire department personnel who would respond for a water rescue) in the Site trailer. Verify that all on-site personnel have completed applicable training.
- Conduct training as part of Site orientation and safety meetings.
- Execute evacuation, notification, and re-entry procedures as discussed in Section 3 of this Contingency Plan.

The SHSO will also serve as the overall Project Emergency Coordinator (PEC) and have the ultimate authority in specifying and facilitating any contingency action. If the SHSO is not able to perform the duties of the PEC, the SHSO will specify another senior individual (working for the Remediation Contractor) to serve as the PEC, such as an on-site foreman and/or supervisor. The alternate PEC shall become familiar with contingency plans developed the Remediation Contractor and their subcontractors (if any). The PEC is also responsible for communicating requirements of this Contingency Plan to on-site personnel and subcontractors and implementing contingency measures as discussed in Section 2 of this Contingency Plan.

1.2 Emergency Contacts

Before field activities commence, the SHSO will inform the appropriate emergency contacts about the nature and duration of work expected at the Site, including the type of hazardous materials and potential health and safety hazards or emergencies involving these materials. Emergency services and contact numbers will be provided by the Remediation Contractor, reviewed prior to the start of remedial activities by the SHSO, and revised as necessary.

1.3 Identifying Hazards and Assessing Risk

The objectives during any emergency are to first protect human health and safety, and then the environment. Possible hazards to human health or the environment that may result from any emergency situation shall be identified by the PEC. The PEC shall take into consideration both direct and indirect effects of the incident. The PEC shall assess the possible risks to human health or the environment that may result from the emergency (e.g., release, fire, explosion, or severe weather conditions). The PEC shall make this assessment by:

- Identifying the materials involved in the incident
- Consulting the appropriate occupational health guideline or safety data sheets (SDSs) to determine the potential effects of exposure/release, and appropriate safety precautions
- Identifying the exposure and/or release pathways and the quantities of materials involved

Based on this information, the PEC shall determine the best course of action for dealing with the emergency and identify possible follow-up requirements (e.g., equipment repair and material disposal).

If the Remediation Contractor's personnel cannot control the incident without incurring undue risk, the PEC shall implement the Site Evacuation Procedures described in Section 3.1. If the offsite neighboring population is at risk, the PEC shall implement the Offsite Evacuation Procedures described in Section 3.2. The PEC shall notify the Remediation Engineer, NYSEG's Project Manager, and the appropriate government agencies and departments that a situation resulting in the need for evacuation has occurred. Should emergency assistance in treating injuries or carrying out the evacuation be required, the PEC shall request assistance of local emergency response personnel (e.g., ambulance service, fire department, and police department).

1.4 Conditions for Implementing the Contingency Plan

Potential emergency conditions that require implementation of this Contingency Plan include the following:

- Fire or explosion
- Occurrence of a spill or material release
- Physical or chemical injury to a worker
- Severe weather conditions
- Overtopping event (i.e., river flow overtops the headwater dam and/or sidewalls of the river bypass system)

These emergency conditions are discussed in the following subsections. Additional emergency conditions that may require implementation of this Contingency Plan shall be identified by the PEC.

1.4.1 Fire and/or Explosion Conditions

Contingency procedures shall immediately be implemented upon notification that any of the following scenarios involving a fire and/or explosion are imminent or have occurred:

- A fire that causes, or could cause, the release of toxic fumes
- A fire that could possibly ignite nearby flammable materials or could cause heat-induced explosions
- A fire that could possibly spread to offsite areas
- A danger that an explosion could occur, causing a safety or health hazard
- An explosion

1.4.2 Spill or Material Release Conditions

The following scenarios involving a spill or material release, whether imminent or having already occurred, shall cause implementation of contingency procedures:

- A spill or material release that could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard
- A spill or material release that could cause the release of toxic vapors or fumes into the atmosphere in concentrations higher than the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs)
- A spill or material release that can be contained on Site where a potential exists for groundwater or surface water contamination
- A spill or material release that cannot be contained on Site, resulting in a potential for offsite soil contamination, sediment contamination, and/or groundwater or surface water pollution

All spills or material releases shall be reported immediately to the PEC. The PEC shall immediately identify the character, source, amount, and extent of any release. Initial identification shall be based on visual analysis of the material and location of the release. If the released material cannot be identified, samples of potentially affected media shall be taken for analysis, as directed by NYSEG.

1.4.3 Physical or Chemical Injury Conditions

The following worker injuries shall cause implementation of contingency procedures:

- Major physical injuries
- Chemical injuries
- Severe symptoms of chemical overexposure

1.4.4 Severe Weather Conditions

The following severe weather conditions, whether imminent or having already occurred, shall cause implementation of contingency procedures:

- A tornado has been sighted in the area
- A tornado warning is in effect for the area

- A lightning storm is underway in the area (storm center less than 5 miles away)
- Other severe weather or weather-induced conditions (e.g., hurricane or flood)

1.4.5 Overtopping Event

The river bypass system is designed to convey the maximum bypass capacities as outlined in the Remedial Design. Overtopping of such system will cause implementation of response action contingency procedures. Avoidance measures and mitigation procedures will be implemented for the duration for which the bypass system is installed.

2 CONTINGENCY PROCEDURES

If any of the aforementioned conditions for implementing the Contingency Plan are met, the appropriate following contingency procedure(s) shall be performed.

2.1 Contingency Procedures for Fire/Explosion

When a fire or explosion appears imminent or has occurred, all normal site activity shall cease. The PEC shall assess the potential risk and severity of the situation and decide whether the emergency event is or is not readily controllable with existing portable fire extinguishers or site equipment and materials at hand. Firefighting shall not be conducted at the risk to site workers. Local fire departments shall be contacted in all situations in which fires and/or explosions have occurred. The following steps shall be taken for a localized fire:

- Contact local fire departments
- Move all personnel to an upwind location at an appropriately safe distance away
- Determine if fire is within on-site personnel capabilities to attempt initial firefighting
- Determine if smoke and/or fumes from fire are potentially impacting offsite areas
- If fire is not impacting offsite areas and is within on-site personnel capabilities, utilize the most appropriate means of extinguishing fire (e.g., fire extinguishers, water, covering with soil)
- Once fire is extinguished, containerize and properly dispose of any spilled material, runoff, or soil

If the situation appears uncontrollable and poses a direct threat to human life, fire departments shall be contacted and the evacuation procedures described in Section 3 shall be implemented. If the potential for an impending explosion is high, the entire area within a 1,000-foot radius of the fire source shall be evacuated. The PEC shall alert personnel when all danger has passed, as determined by the chief fire fighter from the responding fire departments. All equipment (e.g., fire extinguishers) used in the emergency shall be cleaned and refurbished as soon as possible after the emergency has passed so that it will be ready for use in the event of any future emergency.

2.2 Contingency Procedures for Spills or Material Releases

If a hazardous waste spill, material release, or process upset resulting in a probable vapor release is identified, the PEC shall immediately assess the magnitude and potential seriousness of the spill or release based upon:

- SDS for the material spilled or released
- Source of the release or spillage of hazardous material
- An estimate of the quantity released and the rate at which it is being released
- The direction in which the spill or air release is moving

- Personnel who may be or may have been in contact with the material, or air release, and possible injury or sickness as a result
- Potential for fire and/or explosion resulting from the situation
- Estimates of area under influence of the release

If the spill or release is determined to be within the on-site emergency response capabilities, the PEC shall initiate implementation of the necessary remedial action. If the accident is beyond the capabilities of the operating crew, all personnel not involved with emergency response activity shall be evacuated from the immediate area and the appropriate emergency response group(s) shall be contacted.

2.3 Contingency Procedures for Physical Injury to Workers

Regardless of the nature and degree of the injury, the PEC shall be notified of all injuries requiring first aid treatment of any kind. The PEC shall complete a report of the injury or incident.

Upon notification that a worker has been injured, the PEC shall immediately determine the severity of the accident, and whether the victim can be safely moved from the incident site. Local medical assistance shall be requested immediately, if appropriate.

Minor injuries sustained by workers shall be treated on Site using materials from first aid kits. Whenever possible, such treatment shall be administered by trained personnel in a “clean” support zone. Examples of minor injuries include small scrapes and blisters. Minor injuries would not be expected to trigger implementation of the Contingency Plan.

A major injury sustained by a worker will require professional medical attention at a hospital. The PEC shall immediately call for an ambulance and contact the hospital to which the injured worker will be transported. The PEC shall notify the NYSEG Project Manager as soon as practical. The hospital and ambulance should be advised of:

- The nature of the injury
- Whether the injured worker will be decontaminated prior to transport
- When and where the injury was sustained
- The present condition of the injured worker (e.g., conscious, breathing)

2.4 Contingency Procedures for Chemical Injury to Workers

Injuries involving hazardous chemicals or symptoms of severe chemical overexposure shall result in implementation of the Contingency Plan. Upon notification that a chemical injury has been sustained or severe symptoms of chemical exposure are being experienced, the PEC shall notify the hospital and ambulance of the occurrence. The PEC shall provide, to the extent possible, the following information:

- The nature of the injury (e.g., eyes contaminated)
- The chemical(s) involved
- The present condition of the injured worker (e.g., conscious, breathing)

- Whether the injured worker will be decontaminated prior to transport
- When and where the injury was sustained

The victim shall be immediately removed from the incident site using appropriate personal protective equipment (PPE) and safety equipment. Rescuers shall check for vital signs and, if possible, remove contaminated outer clothing. If the victim's eyes have been contaminated, personnel trained in administering first aid shall flush the victim's eyes with eyewash solution until the emergency response team arrives.

Details on the nature of the contaminant and methods for treating exposure or injury can be obtained from the SDSs or occupational health guidelines.

2.5 Contingency Procedures for Severe Weather

When severe weather is forecasted or occurs, the information shall be immediately relayed to the PEC. In the case of a tornado sighting, the PEC shall initiate emergency evacuation procedures (see Section 3), and all personnel shall be directed to proceed indoors after completing appropriate shutdown procedures. In the case of a tornado warning, or lightning storm, the PEC shall have operations stopped and direct all personnel to stand by for information regarding emergency procedures. Other types of weather or weather-induced conditions (e.g., hurricane or flooding) for which long-range prediction is available may also require action as identified herein.

When the severe weather has passed, the PEC shall direct the Remediation Contractor to inspect on-site equipment to check its readiness for operation prior to restarting operations. If an inspection indicates a fire, explosion, or release has occurred as a result of a severe weather condition, the contingency procedures for those events shall be followed.

If flooding is anticipated based on the results of weather and river level monitoring, the Remediation Contractor shall implement contingency procedures in accordance with Section 2.6.

2.6 Contingency Procedures for Overtopping Event

Contingency measures that will be performed to minimize the damaging effects of, or otherwise avoid, an overtopping event, and measures that will be performed in response to an overtopping event, have been grouped into three general categories: avoidance measures, mitigation procedures, and response actions.

2.6.1 Avoidance Measures / River Monitoring Procedures

The river bypass system, which primarily consists of steel sheet piles, is designed to convey the maximum bypass capacities as outlined in the Remedial Design. However, actual field and/or installation conditions may reduce (or increase) the actual capacity of the river bypass system. Direct observation of river water levels, with respect to critical hydraulic control structure elevations, will be the primary indicator of imminent overtopping conditions. The following sections describe the forecasting and monitoring procedures that will be used to predict river bypass system overtopping events.

2.6.1.1 Training

Visitors and any other Site personnel who wish to enter the in-river work areas must attend orientation and training to become familiar with the requirements of the Contingency Plan prior to doing so. General training for Site personnel who could potentially be subject to overtopping hazards should address the following:

- Individual roles and responsibilities
- Threats, hazards, and protective actions
- Notifications, warnings, and communications procedures
- Response action procedures
- Evacuation procedures, rallying point locations, and accountability procedures
- River re-entry procedures

All Site personnel must adhere to the procedures outlined in this Contingency Plan during the performance of their work. No person may work in a manner that conflicts with these procedures. After due warnings, the Construction Project Manager will dismiss from the Site any person or subcontractor who violates these procedures.

2.6.1.2 Weather Monitoring

Weather conditions will be monitored daily by the Remediation Contractor to provide advance warning of potential high-flow conditions. Figure 1 illustrates the approximate extent of the Tioughnioga River watershed and the approximate response times (i.e., time it would take for stormwater flows from upstream areas to reach the Site) for various portions of the watershed. It should be noted, however, that actual response times could be much less, depending on the size and path of a storm event (i.e., if a storm is moving west to east, across the Tioughnioga River drainage basin, response times may be controlled by the speed of the storm, rather than the speed of the river).

Numerous online resources are available for monitoring weather conditions, including the National Weather Service (NWS), www.weather.com, www.intellicast.com, and many others, nearly all of which provide access to daily forecasts and radar loops showing up-to-the-minute weather patterns.

At a minimum, regional weather patterns, radar, and local weather forecasts will be monitored three times a day (i.e., at the start of the workday, mid-day, and at the end of the workday), and more frequently as weather conditions dictate.

2.6.1.3 River Flow/Level Monitoring

Active river flow monitoring stations are currently not available for the west branch of the Tioughnioga River.

The procedures for performing direct visual observation during periods of relatively steady or declining flow, when water levels are at least 2 feet below adjacent hydraulic control structure crest elevations, will generally consist of the following:

- **Dry Weather Monitoring Procedures:** Dry weather is any period when there has been no rainfall the previous day and no rainfall forecasted for the current day. During dry weather periods, monitoring will be performed at approximately 4- to 5-hour intervals, as follows:
  - Morning – prior to personnel and equipment re-entry into river
  - End of Lunch Hour – prior to personnel and equipment re-entry into river
  - End of Work Day – prior to leaving Site
- **Wet Weather Monitoring Procedures:** Wet weather is any period when there has been rainfall on the previous or current day, or rainfall is forecasted for the current day. During wet weather periods, monitoring will be performed at approximately 2- to 3-hour intervals, as follows:
  - Morning – prior to personnel and equipment re-entry into river
  - Mid-Morning – approximately 2 to 3 hours after morning observation
  - Upon Breaking for Lunch Hour – as personnel and equipment are leaving river (or immediately prior)
  - End of Lunch Hour – prior to personnel and equipment re-entry into river
  - Mid-Afternoon – approximately 2 to 3 hours after last lunchtime observation
  - End of Work Day – prior to leaving Site

If, at any point in time, visual observations (whether associated with a monitoring event or not) indicate that water levels are within 2 feet of overtopping the adjacent hydraulic control structures, or suggest that river water levels are rising rapidly, appropriate response action will be taken in accordance with the Response Action Matrix (Table 1) provided in Section 2.6.3 of this Contingency Plan.

2.6.2 Mitigation Procedures

Mitigation procedures are activities to be performed regularly, or in the event of an overtopping, to reduce the amount of damage that could result from an overtopping event. Mitigation procedures include removal from the river channel, at the end of each workday, of all equipment not necessary for operation of the river bypass system.

2.6.3 Response Actions

Response actions are activities to be performed in the event of imminent or actual overtopping to minimize the potential for injury/damage to personnel and equipment. Response actions will be performed in response to specific threshold conditions, as outlined in Table 1 below.

Table 1. Response Action Matrix

Water Level Threshold	Response Action
Water level greater than 2 feet from overtopping and holding steady or falling	- Continue normal river monitoring procedures (Section 2.6.1)

Water Level Threshold	Response Action
Water level within 2 feet of overtopping and holding steady or falling	- Monitor the river at 1-hour intervals until new threshold reached
Water level within 2 feet of overtopping and rising	- Monitor the river at 15-minute intervals until water level stops rising or new threshold reached - Evacuate equipment and personnel immediately if water level is rising rapidly (refer to Section 3 - Evacuation Procedures) - Refer to Section 3.5 - Re-Entry Procedures, as needed
Water level within 1 foot of overtopping	- Evacuate equipment and personnel immediately (refer to Section 3 - Evacuation Procedures) - Monitor the river at appropriate intervals to determine appropriate time to allow re-entry - Refer to Section 3.5 - Re-Entry Procedures

In the event that the river bypass system is overtopped, the SHSO is responsible for notifying the Remediation Contractor Construction Project Manager and Corporate Project Manager, the Remediation Engineer, and the NYSEG Project Manager within 12 hours of the overtopping event. The NYSEG Project Manager will notify the NYSDEC Project Manager.

3 EMERGENCY EVACUATION PROCEDURES

In the event that emergency conditions require evacuation, the evacuation procedures described in the following subsections shall be implemented.

3.1 Site Evacuation Procedures

If an emergency occurs that requires the evacuation of an on-site area to ensure personnel safety, including, but not limited to, fire, explosion, hazardous waste/material spills, severe weather, overtopping event, or a significant release of vapors into the atmosphere, an air horn shall be sounded on the Site by the nearest person aware of the event. The horn shall sound continuously for approximately 15 seconds, signaling that immediate evacuation of all personnel from the area is necessary, as a result of an existing or impending danger. In areas where only two or three people are working side by side, and the need to evacuate can be communicated verbally by the nearest person aware of the event, the air horn is not necessary.

In the event that an evacuation alarm is signaled, all on-site personnel will proceed immediately to the designated rallying point(s) (established in the Remediation Contractor's Health and Safety Plan). Personnel and equipment within in-river work areas will promptly exit the river (see Section 3.3 for details regarding evacuation from in-river areas). Under no circumstance should medical treatment, first aid, or evacuation be delayed because of personal protective equipment or contamination of the victim. Areas and personnel can be surveyed and decontaminated later.

All heavy equipment in the area shall be shut down. Under no circumstances shall incoming visitors (other than emergency response personnel) be allowed to enter any area where an emergency is occurring. Visitors or observers and all non-essential personnel present in the area of an emergency shall be instructed to evacuate the area immediately.

The Remediation Contractor's foremen and/or supervisors will be responsible for ensuring that emergency response requirements specific to their own operations are implemented. These parties shall report their activities to the PEC. The PEC, however, has final authority regarding all emergency response activities.

All non-essential personnel shall evacuate the emergency areas and notify personnel in adjacent areas to evacuate. The evacuated workers shall assemble at the site construction office trailer, where the PEC shall give directions for implementing necessary actions. In the event that the primary assembly area is involved, unapproachable, or unsafe due to the event, evacuated workers shall assemble at the alternate assembly area identified by the PEC.

Personnel are to avoid encountering smoke/gas plumes as practicable during evacuation and assembling.

The PEC shall take charge of all emergency response activities and dictate the procedures to be followed until emergency personnel arrive. The PEC shall assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive.

After initiating emergency response procedures, the PEC shall assign appropriate personnel to check and attempt to ensure that access roads are not obstructed. If traffic control is necessary (e.g., in the event of

a fire or explosion), personnel who have been trained in traffic control procedures and designated at the project safety meeting shall take over these duties until emergency units arrive.

The PEC shall remain at the Site to provide any assistance requested by emergency response personnel when arriving at the Site. The PEC shall have the authority to shut down any part of or the entire project after an emergency, until the PEC deems it safe to continue operations. The PEC shall dictate any necessary changes in project safety practices as a result of the emergency that has occurred, or as required for preventing further emergencies.

3.2 Off-Site Evacuation Procedures

If the PEC deems that human health beyond the site limits is at risk, the PEC shall notify the appropriate agencies and departments (e.g., NYSEG Project Manager, police, NYSDEC, fire department) of the need, or potential need, to institute offsite evacuation procedures. The PEC shall provide, at a minimum, the following information:

- His or her name and telephone number
- Name and address of facility
- Time and type of incident (e.g., release, fire)
- Name and quantity of material or materials involved, to the extent this information is known
- The extent of injuries, if any
- The possible hazards to human health or environment
- Cleanup procedures

3.3 Tioughnioga River Evacuation Procedures

In the event that the PEC determines evacuation from the Tioughnioga River is necessary, all personnel shall proceed immediately to the designated rallying point (established in the Remediation Contractor's Health and Safety Plan). Personnel within in-river work areas will promptly return to land.

Separate evacuation routes will be established for personnel exiting the in-river work area on foot and those exiting the in-river work area via vehicle/equipment to reduce the potential for vehicle/worker accidents. These separate evacuation routes will be clearly marked in the field, with appropriate signage facing the in-river work area.

Upon exiting the in-river work area, project personnel shall proceed to the designated rallying point and immediately report to the PEC for roll call. The primary rallying point should be the material staging area or other designated area.

3.4 Personnel Accountability Procedures After Evacuation

After evacuation, all personnel are responsible for reporting to his or her foreman and/or supervisor so an accurate role call can be made. The foreman and/or supervisor will report the roll call for their group to the

PEC, who is responsible for accounting for each employee. All personnel will be accounted for by name. The PEC will then report their role call to the SHSO.

All site personnel and visitors not assigned to a foreman and/or supervisor will be required to sign in with the SHSO upon entering the Site. Upon evacuation, site personnel and visitors not assigned to a foreman and/or supervisor shall proceed promptly to the designated rallying point and report directly to the SHSO.

3.5 Re-Entry Procedures for Tioughnioga River (Overtopping Event)

Following an overtopping event or evacuation, personnel and equipment will not be allowed to re-enter in-river work areas until water levels have receded to at least 1 foot below the crest elevations of the nearest adjacent hydraulic control structures (i.e., as measured at the water level monitoring locations), while also factoring in weather forecast (e.g., re-entry may not be allowed if forecasted rainfall is expected to cause another overtopping event or require another evacuation in the near future). The SHSO will be responsible for initiating re-entry.

FIGURE

SYRACUSE

BINGHAMTON

ALBANY

APPROXIMATE RIVER REPSONSE TIMES

TIOUGHNIOGA RIVER
WEST BRANCH
WATERSHED

5 TO 7.5 HOURS

2.5 TO 5 HOURS

< 2.5 HOURS

0 4 8 Miles
GRAPHIC SCALE

0 14 28 Miles
GRAPHIC SCALE

NOTES:

1. WATERSHED BOUNDARY DATASET DOWNLOADED FROM UNITED STATES GEOLOGICAL SURVEY, STREAMSTATS AT https://streamstats.usgs.gov/ss/
2. APPROXIMATE RIVER RESPONSE TIMES ASSUME AN AVERAGE RIVER VELOCITY OF 4 FEET PER SECOND.

NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

REMEDIAL DESIGN REPORT

WEST BRANCH TIOUGHNIOGA RIVER WATERSHED AND APPROXIMATE RESPONSE TIMES

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

City: Citrix_Div/Group: IM Created By: K. SINSABAUGH Last Saved By: ksinsabaugh
NYSEG (30003477.00016)
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APPENDIX F

Storm Water Pollution Prevention Plan

ARCADIS Design & Consultancy for natural and built assets

NYSEG

STORM WATER POLLUTION PREVENTION PLAN

Cortland-Homer Former MGP Site
Operable Unit No. 2
Homer, New York
Site No. 7-12-005

April 2020

STORM WATER POLLUTION PREVENTION PLAN

Cortland-Homer Former MGP Site
Operable Unit No. 2
Homer, New York
Site No. 7-12-005

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April 2020

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ATTACHMENT

1. Natural Resources Conservation Service Soil Map

1 INTRODUCTION

This Storm Water Pollution Prevention Plan (SWPPP) has been prepared to support the implementation of remedial activities for the New York State Department of Environmental Conservation- (NYSDEC-) selected remedy for the New York State Electric & Gas (NYSEG) Cortland-Homer Former Manufactured Gas Plant (MGP) Site located in Homer, New York (Site No. 7-12-005) (the Site). Details related to the remedial activities are presented in the accompanying Remedial Design Report (Remedial Design). Specification Sections referenced in this SWPPP are included in Appendix B to the Remedial Design.

This SWPPP summarizes the storm water management practices that will be implemented during the remedial construction activities to control potential impacts to site-related storm water runoff. This SWPPP has been prepared in accordance with the substantive requirements of the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Storm Water Discharges from Construction Activity (SPDES General Permit) (NYSDEC 2015).

1.1 Summary of Remedial Activities

In general, the remedial activities to be performed at the Site consist of removal of sediment containing polycyclic aromatic hydrocarbons (PAHs) at concentrations greater than 6.2 milligrams per kilogram (mg/kg). Limits of sediment removal are shown on the Design Drawings (Appendix A of the Remedial Design). Material will be removed from two main areas:

- Area 1 is generally located near the former MGP property, spanning from approximately 250 upstream of the NYSEG property to approximately 100 feet downstream of closed bridge located near the museum property.
- Area 2 is generally located adjacent to the NYSEG property at the north end of Front Street, spanning from approximately 300 downstream of the railroad bridge to approximately 100 feet upstream of Dry Creek (i.e., a tributary to the Tioughnioga River).

Additional details regarding remedial activities are provided in the Remedial Design.

1.2 Revisions

This SWPPP will be kept current so that at all times it accurately documents the erosion, sediment, and turbidity control practices that are being used or will be used during construction. At a minimum, this SWPPP will be amended:

1. Whenever the current provisions prove to be ineffective at minimizing pollutants in storm water discharges from the Site;
2. Whenever there is a change in design, construction, operation, or maintenance at the Site that has or could have an effect on the discharge of pollutants;
3. To address issues or deficiencies identified during an inspection by the Remediation Contractor's qualified inspector, NYSDEC, or other regulatory authority having jurisdiction.

1.3 SWPPP Organization

The remainder of this SWPPP is organized as follows:

- Section 2 (Site Background) – Presents general information regarding existing (pre-construction) conditions at the Site.
- Section 3 (Erosion, Sediment, and Turbidity Controls) – Summarizes the means and methods that will be used to control erosion, sediment, and turbidity during the remedial construction activities.
- Section 4 (Pollution Prevention Practices) – Summarizes the pollution prevention and control measures that will be implemented during the remedial construction activities.
- Section 5 (References) – Presents a list of documents used in the preparation of this SWPPP.

2 SITE BACKGROUND

This section provides general information regarding the pre-remediation conditions at the Site.

2.1 Site Location and Description

The Site which is located, in the Village of Homer, Cortland County, New York, just north of the City of Cortland, consists of two Operable Units (OUs):

- OU-1 encompasses the former MGP plant west of US Route 11
- OU-2 includes a portion of the NYSEG property east of US Route 11 that is hydraulically downgradient from OU-1. OU-2 also includes sediments in the West Branch of the Tioughnioga River containing MGP-related impacts.

The Site is located at 216 (northernmost OU-1 consisting of a small portion of the former MGP), 218 (remaining footprint of OU-1), and 221 (OU-2) South Main Street (i.e., US Route 11). The majority of OU-1 is owned by NYSEG with a small northern portion owned by a commercial company and the westernmost portion owned by the New York Susquehanna and Western (NYSW) railroad line. NYSEG also owns the upland portion of OU-2.

A Natural Resources Conservation Service soil map is included as Attachment 1 of this plan.

2.2 Site Operational History

In 1858, the Cortland-Homer MGP plant was established and began supplying manufactured gas to the Village of Homer, New York under the name, “Homer and Cortland Gas Light Company”. Manufactured gas was produced at the Homer site using the coal gasification and carbureted water gas processes. Coal gas was manufactured on the site until 1921, and then carbureted water gas was produced from 1921 to 1932. A gas holder was used until early 1935 to store natural gas on the site.

In the 1940s the plant was partially decommissioned by NYSEG. In 1944, the Brockway Motor Company purchased the MGP property and razed the remaining structures. A new building was constructed and modified by subsequent owners. The building extended over most of the site.

The portion of the building covering OU-1 was demolished in 2010, and all utilities to the building were disconnected. As part of the 2012/2013 remedial construction activities, the at-grade slab remaining from building demolition of OU-1 was removed and a storage shed and concrete slab located on OU-2 were demolished.

2.3 Surface Water Hydrology

The West Branch of the Tioughnioga River flows to the southeast, toward the northern edge of Cortland County. Dry Creek joins the river near the NYSEG-owned property in the downstream area and then joins the East Branch of the Tioughnioga River on the eastern edge of the City of Cortland. The West Branch of the Tioughnioga River generally consists of riffles, slack waters, and pools. River sediments primarily consist of coarse sands and gravel, with cobbles and boulders. Fine-grain sediments accumulate in depositional and backwater areas.

The river is approximately 50 feet wide with depths varying from 1 to 3 feet near the upland portion of the Site. In the downstream area, the river is generally wider and deeper.

The West Branch of the Tioughnioga River is classified as C(T) water body, which designates the river for fish propagation and survival (including trout), as well as primary and secondary contract recreation. NYSDEC has historically stocked this segment of the river with brown trout.

3 EROSION, SEDIMENT, AND TURBIDITY CONTROLS

This section presents the means and methods for erosion, sediment, and turbidity control to be utilized as part of remedial construction activities.

3.1 Remedial Design Components

This section summarizes the erosion, sediment, and turbidity controls that will be used or constructed during the remedial construction activities. Erosion, sediment, and turbidity controls will be installed, inspected, and maintained by the Remediation Contractor in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (NYS Standards and Specifications) (NYSDEC 2016) and the following components of the Remedial Design:

- Specification Section 01 41 26, SWPPP and Permit
- Specification Section 01 57 05, Temporary Controls
- Specification Section 31 50 00, Bypass System
- Design Drawing G-103, Site Preparation Plan (Area 1)
- Design Drawing G-104, Site Preparation Plan (Area 2)
- Design Drawing G-501, Erosion, Sediment, and Turbidity Control Details
- Design Drawing C-101 and C-104, Excavation Plans (Area 1 and Area 2)
- Design Drawing C-107 and C-112, General Restoration Plans (Area 1 and Area 2)
- Design Drawing S-201 and S-202, Area 1 Sheet Pile Profile
- Design Drawing S-203 and S-204, Area 2 Sheet Pile Profile
- Design Drawing C-501, Temporary River Crossing and Alternative Bypass Details

Temporary erosion, sediment, and turbidity controls will be installed before initiating any intrusive activities, and additional controls will be installed during construction (as needed) to achieve the storm water management objectives of this SWPPP and the SPDES General Permit.

3.2 Temporary Structural Measures

This section describes the temporary structural measures to be utilized for erosion, sediment, and turbidity control as part of remedial construction activities.

3.2.1 Silt Fencing, Fiber Roll, and Straw Bale Dikes

Silt fencing, fiber roll, and/or straw bale dikes will be used to reduce or otherwise control the potential for off-site migration of suspended sediments in storm water runoff and will be installed before any existing soils or vegetation are disturbed at the Site. Silt fencing, fiber roll, and straw bale dikes (where used) will be installed and maintained by the Remediation Contractor in accordance with Section 5A of the NYS

Standards and Specifications, Specification Section 01 57 05, Temporary Controls, and the Design Drawings.

3.2.2 Temporary Containment (Bypass) System

Turbidity curtains and/or sheet piles will be installed to reduce the turbidity of suspended sediment downstream of the sediment removal area. Turbidity curtains will be installed and maintained by the Remediation Contractor in accordance with Specification Section 01 57 05, Temporary Controls and the Design Drawings. A River Bypass system will be installed and maintained by the Remediation Contractor in accordance with Specification Section 31 52 13, Bypass System and the Design Drawings. The Remediation Engineer will conduct turbidity monitoring in accordance with the requirements in Specification Section 01 57 05, Temporary Controls.

3.3 Periodic Inspections

The Remediation Contractor will inspect erosion, sediment, and turbidity controls at the frequency specified in Specification Section 01 41 26, SWPPP and Permit. Remediation Contractor personnel responsible for periodic inspections will meet the requirements of a “qualified inspector” as defined in Appendix A of the SPDES General Permit. The results of each inspection, including any corrective actions to be taken, will be documented using the Storm Water Inspection Report form included in Specification Section 01 41 26, SWPPP and Permit.

Any deficiencies observed during an inspection, and any maintenance activities or corrective actions required to address those deficiencies, will be communicated to the Remediation Engineer within one working day after the inspection. Maintenance activities and corrective actions will be initiated within two working days of the inspection and will be completed before the next scheduled inspection. If site conditions prevent the completion of maintenance activities or corrective actions before the next scheduled inspection, such conditions will be documented in the Storm Water Inspection Report, and the maintenance activities/corrective actions will be completed as soon as site conditions permit.

Erosion, sediment, and turbidity controls will be inspected and maintained by the Remediation Contractor for the duration of the remedial construction activities, and until such time as all disturbed or open-soil areas at the Site have achieved “final stabilization” as defined in Appendix A of the New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges (NYSDEC 2015).

3.4 Site Restoration

All disturbed areas will be restored to pre-construction grades and conditions. A final inspection will be performed by the Remediation Engineer to verify that all restoration areas have achieved final stabilization. If restoration areas are not sufficiently stabilized, corrective actions will be taken by the Remediation Contractor and a second final site inspection will be performed. Upon acceptance of the final site stabilization, the Remediation Contractor will remove any temporary erosion, sediment, and turbidity controls (e.g., silt fencing, straw bale dikes, turbidity curtain) that are no longer needed.

3.5 Post-Construction Storm Water Management Controls

Due to the nature of the work being performed (i.e., removal of impacted material under a NYSDEC-approved Remedial Design), post-construction water quality and quantity controls are not required.

4 POLLUTION PREVENTION PRACTICES

This section summarizes the prevention practices that will be implemented by the Remediation Contractor to control impacted materials, spills, and construction debris from becoming sources of pollutants in site-related storm water runoff.

4.1 Remedial Design Components

Pollution prevention measures will comply with the following components of the Remedial Design Report:

- Specification Section 01 35 29, Contractor's Health and Safety Plan
- Specification Section 01 35 43.13, Environmental Procedures for Hazardous Materials
- Specification Section 01 53 53, Temporary Water Treatment and Management
- Specification Section 01 57 05, Temporary Controls
- Specification Section 01 74 05, Cleaning
- Specification Section 01 74 19, Construction Waste Management and Disposal
- Specification Section 02 51 00, Decontamination
- Specification Section 02 61 15, Handling and Disposal of Impacted Materials
- Design Drawing G-103, Site Preparation Plan (Area 1)
- Design Drawing G-104, Site Preparation Plan (Area 2)
- Design Drawing G-501, Erosion, Sediment, and Turbidity Control Details
- Design Drawing G-502, G-503, Miscellaneous Details
- Design Drawing C-601, C-602, Temporary Water Treatment System Piping and Instrumentation Diagram
- Design Drawing C-101 to C-106, Excavation Plans (Area 1 and Area 2)
- Design Drawing C-107 and C-114, General Restoration Plans (Area 1 and Area 2)
- Design Drawing S-201 to S-202, Area 1 Sheet Pile Profile
- Design Drawing S-203 to S-204, Area 2 Sheet Pile Profile

4.2 Impacted Material Handling, Transportation, and Treatment/Disposal

This section outlines the handling, transportation, and treatment/disposal methods to be implemented for impacted material as part of remedial construction activities.

4.2.1 Sediment

Sediment will be excavated to the horizontal and vertical limits depicted on the Design Drawings. Excavated sediments will travel from the removal areas directly into the upland support area (via the temporary river crossing) at both removal areas. Additional handling and stabilization/solidification of the materials may be required prior to transport over public streets, in accordance with Section 02 61 15, Handling and Disposal of Impacted Materials (Appendix B of the Remedial Design).

Sediment to be transported over public roadways will be loaded into properly licensed and permitted vehicles (pursuant to Title 6, Part 364 of the New York Codes, Rules, and Regulations [6 NYCRR Part 364]), and will be transported in accordance with applicable laws and regulations. Transport vehicles will be watertight and/or fully lined with polyethylene liners (or equivalent), and will be equipped with functioning tailgate locks and non-mesh (solid), waterproof tarpaulins.

Before leaving the Site, transport vehicles will be staged and inspected and, will be cleaned of any visible soil (within the decontamination area). Upon leaving the Site, transport vehicles will follow approved haul routes as specified in the CERP.

4.2.2 Debris

Debris generated during the remedial activities may include bricks, concrete, and/or metal. Such materials will be segregated as appropriate from other excavated materials, downsized (as required by disposal facilities), and handled separately, where practicable. Debris free of visible impacts will be disposed of at an appropriate facility selected by NYSEG and handled in accordance with Specification Section 02 61 15, Handling and Disposal of Impacted Sediments and Debris. Before leaving the Site, transport vehicles will be staged and inspected, and will be cleaned of any visible debris (within the decontamination area). Upon leaving the Site, transport vehicles will follow approved haul routes as specified in the CERP.

4.2.3 Construction-Related Water

All construction-related waters generated during remedial activities (i.e., decontamination water, water from sediment dewatering, and water removed from material staging areas) will be collected and transported to the on-site temporary water treatment system, treated, and discharged into the Tioughnioga River under the SPDES Permit Equivalent. Details for water treatment and discharge are presented in Specification Section 01 53 53, Temporary Water Treatment and Management.

4.3 Spill Prevention, Control, and Response

As required by Specification Section 01 35 29, Contractor's Health and Safety Plan, the Remediation Contractor will prepare a site-specific Health and Safety Plan (HASP) that addresses spill prevention and control, and response procedures to spills and other site emergencies (see the Contingency Plan included as Appendix E of the Remedial Design) during the remedial construction activities. The HASP will include evacuation procedures for site personnel, directions and a figure showing the route to the local hospital, and a contact list with telephone numbers for local and state emergency responders (e.g., police, ambulance, fire, and poison control).

4.3.1 Spill Prevention

The Remediation Contractor's spill prevention practices will include, at a minimum, the following:

- Performing regular inspections of construction vehicles, equipment, and portable fuel tanks to check for leaks.
- Performing routine maintenance on construction vehicles and equipment in accordance with the manufacturer's specifications.
- Promptly repairing or replacing damaged or defective construction vehicles and equipment.
- Storing on-site fuel tanks within a secondary containment area or providing alternate secondary containment (e.g., double-walled fuel tanks, containment dikes).
- Refueling vehicles on level ground within a designated area away from steep slopes and storm water runoff conveyance features (e.g., ditches/diversions, storm sewers). Never performing refueling over the water without booms and/or absorbent pads.
- Attending to construction vehicles and equipment while refueling.
- Turning off internal combustion engines before refueling with a flammable liquid.
- Replacing the cap on vehicle fuel tanks before starting the engine.
- Securing/locking fuel pump dispensers when not in use to avoid accidental fuel release.
- Storing construction vehicles and equipment away from site hazards and sensitive resources, to the extent practicable.
- During material transport operations, inspecting all vehicles prior to leaving the upland staging or temporary support area to ensure no contaminated material is on the outside of the vehicle (i.e., tail gate, tires), and that the containment area within the vehicle is properly secured so that no contaminated material spills onto public roadways or waterways.

4.3.2 Spill Control and Response

The Remediation Contractor will maintain a sufficient quantity of fire extinguishers, spill kits, and oil-absorbent pads, rolls, and booms as required to contain spills (should they occur) and prevent the potential migration of pollutants beyond the work area. In the event of a spill, the Remediation Contractor will immediately notify NYSEG and implement the following response measures:

1. Stop/Isolate Source: As conditions allow, the Remediation Contractor will attempt to stop or isolate the source of the spill by closing valves and/or shutting down affected vehicles or equipment.
2. Containment: If the spilled material is floating on a water surface, spill-absorbent pads/booms will be placed across the path of the floating spill. If the spilled material sinks below the water surface, a dam, weir, or other containment method will be used to stop the flow of the spilled material. If the spill occurs on land, a containment unit will be constructed to stop the flow of the spilled material and sorbents will be applied as necessary.

3. Cleanup: Spills in water will be recovered using pumps and sorbents as necessary until the spilled material is recovered and no sheen or other evidence of the spill is observed on the water surface. Spills on land will be recovered using pumps, sorbents, and heavy equipment, as necessary until the spilled material is recovered. Construction vehicles and equipment used in the cleanup, or otherwise affected by the spill, will also be cleaned/decontaminated.
4. Collection, Storage, and Disposal: Impacted materials, sorbents, and other wastes will be collected and stored in New York State Department of Transportation-approved containers. The containers will be labeled with the waste type and date of accumulation and will be transported off Site for disposal at a permitted facility in accordance with all applicable laws and regulations.
5. Post-Spill Maintenance: Following the cleanup of the spill, the Remediation Contractor will verify that all impacted materials, vehicles, and equipment have been either transported off Site for disposal, or decontaminated, as appropriate. The vehicle or piece of equipment that may have caused the spill will also be repaired. If the vehicle or piece of equipment cannot be repaired, it will be removed from the Site and replaced.

Spill notifications and reporting to the necessary agencies will be coordinated by NYSEG and/or the Remediation Engineer. Appropriate emergency response groups, including the local fire department, NYSDEC, and the National Response Center, will be contacted immediately if the spill or material release has impacted soil, groundwater, or surface water, or is beyond the capabilities of on-site personnel to control using the methods described above.

4.4 Dust Controls

Dust controls will be used to prevent surface and air movement of dust from disturbed or open-soil areas and material staging areas that may cause off-site damage, health hazards, and traffic safety problems. Dust controls will be proactively employed by the Remediation Contractor in accordance with Specification Section 01 57 05, Temporary Controls, and may include one or more of the following practices:

- Excavating, loading, handling, and backfilling materials in a manner that minimizes the generation of dust.
- Hauling excavated materials and clean backfill materials in properly tarped/covered transport vehicles.
- Restricting vehicle speeds on temporary access roads and active haul routes.
- Covering excavations and temporary stockpiles with 10-mil polyethylene liners (anchored appropriately to resist wind forces) before extended work breaks and at the end of each work day.
- Wetting down temporary access roads and active haul roads.

4.5 Good Housekeeping Practices

Good housekeeping practices will be employed to reduce the potential for construction materials to enter site-related storm water runoff. The Remediation Contractor will maintain the Site in a neat and orderly

condition throughout the remedial construction activities in accordance with Specification Section 01 74 05, Cleaning. This will include:

- routine collection and disposal of trash, rubbish, and sanitary wastes
- proper storage of construction materials and equipment at the Site
- routine cleaning of public rights-of-way, streets, and sidewalks

5 REFERENCES

National Cooperative Soil Survey (Natural Resources Conservation Service). 2016. Soils information downloaded on May 17, 2019 from NRCS Web Soil Survey website: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Source information based on Cortland County, New York Soil Survey Area Version 17. September 2, 2018.

NYSDEC, 2015. SPDES General Permit for Stormwater Discharges from Construction Activity, Permit No. GP-0-10-001. January 29.

NYSDEC, 2016. New York State Standards and Specifications for Erosion and Sediment Control. November.

ATTACHMENT 1

NRCS Soil Map

Map Scale: 1:13,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cortland County, New York
Survey Area Data: Version 17, Sep 2, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 18, 2011—Oct 10, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6A	Wayland-Natchaug complex, 0 to 2 percent slopes, frequently flooded	0.4	0.1%
11A	Hemlock silt loam, 0 to 3 percent slopes, occasionally flooded	44.4	11.5%
33A	Halsey mucky silt loam, 0 to 3 percent slopes	1.9	0.5%
34A	Fredon silt loam, 0 to 3 percent slopes	4.8	1.2%
62C	Mardin channery silt loam, 8 to 15 percent slopes	10.1	2.6%
62D	Mardin channery silt loam, 15 to 25 percent slopes	27.1	7.0%
68C	Volusia channery silt loam, 8 to 15 percent slopes	0.5	0.1%
122A	Palmyra gravelly silt loam, 0 to 3 percent slopes	117.4	30.4%
122B	Palmyra gravelly silt loam, 3 to 8 percent slopes	6.4	1.6%
122C	Palmyra gravelly silt loam, 8 to 15 percent slopes	4.1	1.1%
134C	Bath channery silt loam, 8 to 15 percent slopes	10.9	2.8%
171D	Lordstown channery silt loam, 15 to 25 percent slopes, very stony	14.2	3.7%
171F	Cadosia-Lordstown complex, 25 to 70 percent slopes, very stony	20.8	5.4%
179B	Lordstown-Arnot complex, 3 to 8 percent slopes	1.7	0.4%
210A	Phelps gravelly silt loam, 0 to 3 percent slopes	106.6	27.6%
W	Water	14.8	3.8%
Totals for Area of Interest		**385.9**	**100.0%**

APPENDIX G

Preliminary Monitoring and Maintenance Plan

ARCADIS Design & Consultancy for natural and built assets

NYSEG

PRELIMINARY MONITORING AND MAINTENANCE PLAN

Cortland-Homer Former MGP Site

Operable Unit No. 2

Homer, New York

Site No. 7-12-005

April 2020

PRELIMINARY MONITORING AND MAINTENANCE PLAN

Cortland-Homer Former MGP Site
Operable Unit No. 2
Homer, New York
Site No. 7-12-005

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April 2020

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ATTACHMENTS

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Attachment 2 Example Herbicide Specifications

1 INTRODUCTION

This preliminary Monitoring and Maintenance Plan (MMP) has been prepared to support the implementation of remedial activities for the Operable Unit No. 2 (OU-2) of the NYSEG Cortland-Homer Former Manufactured Gas Plant (MGP) Site located in Homer, New York (Site No. 7-12-005) (the Site). Details related to the remedial activities are presented in the Remedial Design Report (Remedial Design).

In general, this MMP presents bank and floodplain vegetation and riverbank monitoring methods/timing, as well as the performance standards that will be used to evaluate monitoring results. Additionally, potential corrective actions to be implemented (if performance standards are not achieved) are included in this section.

In general, restoration will be completed in “Year 0” and “as-built” restoration will reflect baseline conditions. Each restored area will be monitored and maintained for up to 5 years (i.e., Years 1 through 5) to document establishment of the desired communities. Based on the anticipated restoration sequence and schedule (described in Section 5.9 of the Remedial Design), future monitoring is anticipated to commence in 2022 in Area 1 and in 2023 in Area 2 (i.e., the year following the completion of remediation construction and restoration at each area).

Monitoring and maintenance criteria and corrective actions described herein consider that restoration communities may take two to three years to mature, and the plan has been developed to avoid micromanagement during restoration monitoring to allow time for the ecosystem and habitat to reestablish naturally. Additionally, monitoring can be terminated at any point in the designed program, if the restoration is deemed acceptable by the New York State Department of Environmental Conservation (NYSDEC).

It should be noted that monitoring of restored portions of private property is assumed to be performed from public and/or NYSEG-owned land, and as such qualitative and quantitative assessment may not be feasible on such private parcels. NYSEG will attempt to gain access to private property to perform monitoring and maintenance in accordance with this plan; however, if access is not granted to NYSEG, and NYSDEC is not able to obtain access on NYSEG’s behalf, such areas will only be generally and qualitatively noted from observations made from adjacent public and/or NYSEG-owned land.

2 VEGETATION SURVIVAL

Vegetation restoration areas will be monitored and maintained for up to 5 years following restoration to:

- Evaluate the status of the restoration relative to performance objectives.
- Identify the need for additional maintenance or corrective action (e.g., seeding, planting, exotic/invasive species control, regrading).

Qualitative and quantitative data, to be collected as described in the following subsections, will be reviewed to evaluate restoration conditions and identify circumstances that would warrant corrective action. Performance criteria will be used to evaluate the success of the completed restoration activities. If the completed restoration activities do not meet the performance criteria, the adaptive management activities (presented Section 4) may be required to meet the performance criteria.

2.1 Performance Criteria

The following performance criteria will be used to evaluate the success of the completed restoration activities for areas above the mean high-water level (MHWL):

- Trees:
  - 100% survival within the first two growing seasons (limit to two replacements total)
  - 90% survival by Year 5 monitoring
- Shrubs (not including those planted below the MHWL):
  - 80% survival within the first two growing seasons (limit to two replacements total)
  - 90% survival by Year 5 monitoring
- Total vegetative cover (defined as ground and canopy cover):[1]
  - 85% cover within one growing season
  - 90% cover by Year 3 of monitoring
  - 95% cover by Year 5 of monitoring
- Ground cover of invasive plant species[2]: 0% of “prohibited” species and <5% of other (i.e., “regulated”) species each monitoring event

Vegetation planted below the MHWL includes the installation of shrub species (planted either as live stake or 1-gallon container stock) and emergent wetland vegetation (via plug installations and wetland seeding application). Based on the potential for disturbance from flow events below the MHWL, the monitoring and maintenance requirements will be subject to reduced performance standards. Due to the expected lower success rate of any woody or aquatic vegetation planted below the MHWL (i.e., shrubs [live stakes and container stock] and emergent plugs), NYSEG will only perform one replanting, as necessary, for vegetation installed below the MHWL that succumbs to undesirable growth or mortality. Below the MHWL, the performance criteria for shrubs (live stakes and container stock) and emergent wetland vegetation will be 80% total cover by Year 5 of monitoring.

[1] Specific to plant communities that will be seeded as detailed within this Restoration Plan based on assumed hydrologic conditions.
[2] As defined in the New York State Prohibited and Regulated Invasive Plants, published by the NYSDEC and the New York State Department of Agriculture and Markets in September 10, 2014 (NYSDEC 2014).

2.2 Annual Considerations

Annual considerations for monitoring and maintenance considerations for trees, shrubs, herbaceous cover, and vegetation is summarized below.

2.2.1 Trees and Shrubs

The tally of the trees and shrubs counted during the monitoring event will be compared to the as-built quantities established in Year 0 to determine survival percentage, if applicable. As a reminder, tree and shrub counts and assessment of coverage will include natural recruits of native species (i.e., "volunteers"). To evaluate the sapling and shrub stratum, planted trees and shrubs species within each circle plot will be identified; classified as planted or naturally recruited (having a height greater than 24 inches[3]); and measured to the nearest inch. Monitoring criteria for trees and shrubs consist of the following:

Trees

- Years 1 through 2 – survival will be assessed against a 100% survival performance criterion. Any trees that do not survive the first growing season following initial planting will be replaced in-kind, and similarly any trees that do not survive the second growing season following initial planting will be replaced in-kind (limit to two replacements total). Plantings may be altered (i.e., not in-kind) if significant survivability issues are observed with a specific species. Monitoring will continue in the subsequent year.
- Years 3 through 5 – survival will be assessed against a 90% survival performance criterion for each type of planting area. If tree survival is less than 90% of the original planting density (i.e., Year 0), in-kind trees (or equivalent species) will be planted to bring the density of trees and/or shrubs up to the 90% survival by Year 5 performance criteria. Monitoring will continue in the subsequent year, up to Year 5.

Shrubs

- Years 1 through 2 – survival will be assessed against an 80% survival performance criterion. If shrub survival is less than 80% of the original planting density (i.e., Year 0), in-kind shrubs (or equivalent species) will be planted to bring the density of shrubs up to 80% survival performance criterion (limit to two replacements total over the course of Years 1 and 2). Plantings may be altered (i.e., not in-kind) if significant survivability issues are observed with a specific species. Monitoring will continue in the subsequent year.
- Years 3 through 5 – survival will be assessed against a 90% survival performance criterion for each type of planting area. If shrub survival is less than 90% of the original planting density (i.e., Year 0), in-kind shrubs (or equivalent species) will be planted to bring the density of shrubs up to the 90% survival by Year 5 performance criteria. Monitoring will continue in the subsequent year, up to Year 5.

[3] The minimum plant height is based on the approximate height of containerized shrubs typically available from nurseries.

NYSEG intends to meet the performance criteria presented in Section 2.1 however, NYSEG will not be responsible for replacing vegetation that does not survive due to forces beyond NYSEG's control (e.g., beavers, flooding, storms, blight, etc.) or events that are beyond NYSEG's control (e.g., if vegetation is removed by property owners, or others).

2.2.2 Herbaceous Ground Cover

The total percent herbaceous ground cover will be determined by averaging the percent cover observed in the grass planting and wet meadow planting areas. Proposed maintenance will consist of the following:

- Years 1 and 2 – If herbaceous ground cover is less than 85% average coverage by the end of either Year 1 or Year 2 of monitoring, the area(s) with sparse vegetation will be re-seeded (per original seeding requirements, with fertilizer, mulch, and erosion control blanket). Monitoring will continue in the subsequent year.
- Years 3 and 4 – If by the end of Years 3 or 4 of monitoring, herbaceous ground cover exhibits at least 90% average cover, no further monitoring or maintenance will be performed. If herbaceous ground cover is less than 90% average coverage by the end of either Years 3 or 4 of monitoring, the area(s) with sparse vegetation will be re-seeded (per original seeding requirements), and monitoring will continue in the subsequent year.
- Year 5 – If by the end of Year 5, herbaceous ground cover exhibits at least 95% average cover, no further monitoring or maintenance will be performed. If herbaceous ground cover is less than 95% average coverage, the area(s) with sparse vegetation will be re-seeded (per original seeding requirements), and no further monitoring or maintenance will be performed. As appropriate, NYSEG may consult with NYSDEC regarding additional measures to help support better herbaceous ground cover in any remaining areas with less than 95% coverage by the end of Year 5. This would include the successional areas of forested floodplain habitat, where herbaceous ground cover may be naturally reduced through canopy development.

Additionally, an assessment of the percent cover by invasive species will also be performed during the vegetation inspection, to determine if any areas are being dominated by non-desirable species. If "prohibited" invasive species as defined in the New York State Prohibited and Regulated Invasive Plants (NYSDEC 2014) are observed: the species, location, and size of the population will be recorded, NYSEG will consult with NYSDEC to select an approved control method, the species will be treated/removed in accordance with that approved method (and the control method and date of control action will also be recorded). If other invasive species listed in the New York State Prohibited and Regulated Invasive Plants (NYSDEC 2014) but not considered "prohibited" are observed to cover more than 5% of the monitored area, NYSEG will also consult with NYSDEC to select and approved control method and the species will be treated/removed in accordance with that approved method. Note that NYSEG may elect to implement control methods prior to other listed invasive species reaching the 5% cover criteria (i.e., in an effort to manage the spread of invasive species).

2.2.3 Vegetation Restored Below MHWL

The percent total (shrub/herbaceous) cover will be determined by averaging the percent cover observed in the Inundated Shoreline and Emergent Vegetation Planting Areas. Proposed maintenance will consist of the following:

- Years 1 and 2 – If the establishment of plantings and seeding within the Inundated Shoreline and Emergent Vegetation Planting Areas has an average percent total vegetative cover that is less than 80%, then assess any potential corrective actions (e.g., changes to seed mix composition, application rates, amending planting substrate conditions) that may increase the survivability of shrubs (live stakes and container stock) and emergent vegetation (plugs) species. Apply additional wetland seed mix (per original seeding requirements) to sparse bank areas above the typical base flow elevation, as required to improve herbaceous bank cover.
- Year 3 – If the plant community has an average percent total vegetative cover that is less than 80%, then implement potential corrective actions to re-install shrubs (live stakes and container stock) and emergent vegetation (plugs) species and apply additional wetland seed mix, as needed to bring average percent cover above 80%.
- Years 4 and 5 – If the plant community has an average percent total vegetative cover that is greater than 80%, then no further monitoring or maintenance will be performed. If the plant community has an average percent total vegetative cover that is less than 80%, then re-seed with additional wetland seed mix. As appropriate, NYSEG may consult with NYSDEC regarding additional measures to help support better total vegetative cover in any remaining areas with less than 80% coverage by the end of Year 5.

2.3 Monitoring Methods

Monitoring/inspection events will be conducted a minimum of twice annually (spring and late summer) during low-flow conditions, to the extent practicable, to provide an assessment of tree and shrub survival and ground cover establishment. The spring event will consist of qualitative monitoring of the restored areas to identify potential problems early in the growing season. The late summer monitoring event will consist of the collection of quantitative and qualitative data regarding vegetative species composition, invasive species presence, wildlife use, and effectiveness of the soil stabilization techniques. All work will be directed by a Restoration Ecologist familiar with the Remedial Design and this MMP.

The spring (April or May) qualitative event will be focused on identifying any erosion control issues (if they exist) associated with restored channel and/or channel banks, significant tree or shrub mortality over the winter, as well as presence of non-native invasive species that could establish within the restored area. Planted and/or seeded vegetation will be evaluated for general health, and identification of any signs of stress (i.e., herbivory, drought). Photographs will be taken at approximately 36 permanently established locations at pre-determined cardinal directions. Photographs will document progress of the restoration area. The preliminary locations are illustrated on Figures 1 and 2. Final locations will be determined in consultation with NYSDEC. If final locations are not associated with permanent site features (e.g., monitoring well, utility pole), they will be demarcated with a 6-foot high green metal fence post (if permitted by the property owner), and will be surveyed with a sub-meter accurate global positioning

system (GPS) unit. GPS positions and final monitoring locations will be provided as part of the baseline monitoring report (Year 1).

The late summer (August or September) quantitative event will be focused on data collection necessary to evaluate achievement of performance criteria. Specifically, the event will include the following:

- Quantitative tree (where applicable) and shrub counts for all planting areas. Planted trees (i.e., those with 2-inch DBH or larger) will be individually counted during monitoring events (i.e., not subsampled). However, as thick and tall herbaceous understory commonly make identification of shrubs and other small woody vegetation difficult, shrubs and volunteer tree species will be subsampled in sample plots, as described below.

  Permanent sample plots will be established to subsample the tree and shrub counts for the entire restored area. The sample plots will cover a minimum of 20 percent of the overall restored area and will be either 1/10-acre (radius 37.3 feet) or 1/100 acre (radius 11.7 feet) circular plots. The size and location of the plot will be determined by final restoration boundaries, and at the discretion of the Restoration Ecologist managing the final planting. These locations will be demarcated with a permanent site feature (e.g., monitoring well, utility pole) or a post (e.g., a 6-foot high green metal fence post, or similar, if permitted), and surveyed with a sub-meter accurate GPS unit. GPS positions and final monitoring locations will be provided as part of the annual monitoring reports, as needed. Within each sample plot, the following measurements will be taken annually:

  - Total vegetative cover
  - Total tree cover
  - Total shrub cover
  - Total herbaceous cover
  - Identification of all trees and shrubs within plot
  - Percent cover of all tree and shrub species
  - Height of all trees and shrubs within plot
  - Observations of stress or herbivory
- Quantitative assessment of herbaceous understory within the restored habitats using randomly placed 1-meter by 1-meter sample quadrats nested within the circular plots described above. This will include a minimum of five sample quadrats within each type of restored planting area. Additional quadrats may be warranted based upon a species area curve specific to the respective community type. Within each quadrat, the following measurements will be taken annually:

  - Total percent vegetative cover
  - Cover class measurements of all species within quadrat to assess presence of native and potential invasive species.
  - General cover type characterization (i.e., cover percent estimations for various cover types such as vegetation, bare soil, open water, woody debris, rock, other)
  - Identification of predominant species within quadrat

  - Average and maximum height of vegetation within quadrat
  - Observations of stress or herbivory
  - Characterization of soil moisture (i.e., depth of surface water, saturated to surface, water stained leaves).

- Quantitative assessment of shrubs (live stakes and container stock) and emergent vegetation restored below the MHWL will be conducted using sample plots to represent the entirety of the restored area. Monitoring for the percent cover of the shrubs (live stakes and container stock) and emergent vegetation will be performed during the typical mean baseflow conditions. Based on the nature of the disturbance areas and type of vegetation installations (shrubs (live stakes and container stock), emergent vegetation plugs, and herbaceous wetland seed mix), fixed sample plots will be used for the assessment. Nested 1-meter by 1-meter sample quadrats within the circular plots, will be established to subsample the live stake counts for the entire restored area. Emergent vegetation plugs will not be counted individually, but will be included as part of the overall herbaceous cover assessed within each plot. The plots will cover a minimum of 20 percent of the overall area and will be approximately 1/100 acre (radius 11.7 feet) circular plots. The exact location of the plots will be determined by final restoration boundaries and will be positioned at random locations throughout the restoration area at the discretion of the Restoration Ecologist managing the final planting. The centers of the plots will be surveyed with a sub-meter accurate GPS unit; however, due to being located below the MHWL no permanent demarcations will be installed. GPS positions and final monitoring locations will be provided as part of the annual monitoring reports, as needed. Within each plot, the following measurements will be taken:
  - Total percent vegetative cover
  - General cover type characterization (i.e., cover percent estimations for various cover types such as vegetation, open water, exposed rock, other)
  - Observations of stress or herbivory

All cover class measurements will be recorded using cover class midpoints (Table 1). Each permanent plot and quadrat will be photo-documented. In addition, photographs will be taken at each of the permanently established photo-documentation points.

During the annual quantitative monitoring events, the quantity of observed trees and shrubs (i.e., woody vegetation) will be tallied. Tree and shrub counts and assessment of percent cover for herbaceous growth and vegetation restored below the MHWL will include natural recruits of native species.

Vegetation conditions/quantity will be documented in the field via the Monitoring Inspection Checklist and associated monitoring summary table (included as Attachment 2). The checklists and tables will be included as part of the Inspection Report or Annual Monitoring Report (discussed in Section 5), as appropriate. Potential corrective actions to be take are presented in Section 4.

3 RIVERBANK STABILITY

Bank stability of restored areas will be assessed to determine the need for and/or extent of potential maintenance activities. Qualitative riverbank stability monitoring will be performed for up to five years concurrently with each of the vegetation monitoring events (i.e., in spring and summer). Additionally, qualitative riverbank stability monitoring will be performed after a 5-year interval storm event. During the riverbank inspection, restored riverbanks will be visually inspected for the following:

- Evidence of significant erosion (e.g., undercutting, lateral erosion above rock protection, exposed geotextile fabric, erosion down the face of the bank from surface runoff).
- Areas where excessive settlement has occurred relative to the surrounding areas.
- Drainage problems.

Additionally, during the summer quantitative vegetation monitoring event, riverbank stability monitoring will include measurements at select transects to identify potential concerning developments that could require corrective actions. Specifically, at the select transects, survey or measurement will be performed of key spots on the restored bank, such as:

- Elevation at edge of water.
- Elevation of the channel vegetation/scour line.

A total of seven transects along the restored banks will be monitored, and the preliminary locations are illustrated on Figures 1 and 2. Final locations will be determined in consultation with NYSDEC. If final locations are not associated with permanent site features (e.g., monitoring well, utility pole), they will be demarcated with a 6-foot high green metal fence post (if permitted by the property owners), and will be surveyed with a sub-meter accurate GPS unit. GPS positions and final monitoring locations will be provided as part of the baseline monitoring report (Year 1).

Riverbank areas observed to show signs of any of these stability inspection elements will be noted on the Monitoring Inspection Checklist and monitoring summary table (included in Attachment 1) and documented in the Inspection Report or Annual Monitoring Report (discussed in Section 5), as appropriate. Potential corrective actions to be take are presented in Section 4.

4 MAINTENANCE ACTIVITIES AND CORRECTIVE ACTIONS

The process of adaptive management will be used to monitor and maintain the completed restoration. This proactive management strategy uses information gathered over time to identify successful management practices and identify opportunities for improvement that will help to achieve the restoration objectives. As such, routine monitoring is an important component of adaptive management. Information collected during monitoring events provides a means to identify and build on effective management practices and to develop recommendations to modify ineffective practices and implement corrective actions. The remainder of this section provides additional information on adaptive management and outlines the details of the invasive species control plan and watering plan for the restored areas.

4.1.1 Adaptive Management

For corrective actions to address tree or shrub mortality, “equivalent species” that show greater survivability may be favored for replacement plantings (compared to the plant species originally specified) to improve long-term survivability of the vegetation within the restored area(s). Although restoration plant species were selected based on the anticipated hydrologic conditions, some plant species exhibit better survival for undetermined reasons (i.e., genetics, variable quality stock, non-palatability to herbivores, etc.). During monitoring activities, observations of species-specific survival characteristics in the various habitats will assist in the design of the replanting efforts, if needed.

As part of the adaptive management approach, signage and/or passive barriers will be considered to protect the restoration features, if observations during monitoring events indicate such barriers or signage are warranted. Such institutional controls may remain in place through the 5-year monitoring period.

4.1.2 Invasive Species Control

Implementation of an exotic/invasive species control plan is an essential component of restoration project maintenance. Control of exotic/invasive species will be accomplished through an integrated approach that includes the use of mechanical, chemical and biological methods, as appropriate. The methods and techniques chosen to manage a particular species will be a function of the target plant’s life history, level of infestation, and site-specific conditions that may preclude or exclude a particular method or technique.

As appropriate mechanical methods, such as mowing, hand pulling or cutting may be combined with chemical methods, such as foliar application, direct wipe or cut-stem to provide multiple stressors to the target plant. Biological techniques may also be included if available and appropriate for the scale or level of infestation for a particular target species. As previously stated, the methods and techniques selected will be based on what has been identified in the literature as effective and the decision to include a particular technique will be based on site-specific conditions or constraints and the decision will be made in consult with NYSDEC. For example, if mowing is an effective method of control but the goal is to establish a forested community, mowing may not be an appropriate method. Likewise, if a particular species is not responsive to available products for chemical treatment then mechanical or biological agents will need to be identified.

With respect to chemical treatments, herbicides will be selected based on the species they effectively treat and the areas they are labeled for use (e.g., habitat restoration sites, uplands). Chemicals that may

be used include glyphosate-based or triclopyr-based products such as AquaNeat or Garlon3A (specifications for these examples are included in Attachment 2). However, this is not an exhaustive list and may change as target species and the respective available chemicals for control are identified. A combination of products may be used strategically to minimize the development of chemical resistance or as site-conditions change and the use of a selective of non-selective herbicide becomes more appropriate. Herbicide application as part of the exotic/invasive species control program will be conducted by a licensed applicator. Additionally, application will only be in terrestrial areas and herbicides will not be applied to bodies of water without pre-approval of an Aquatic Pesticide Permit, pursuant to NYCRR 327. Notification and treatment area posting requirements identified in NYCRR Parts 325 and 327 will be followed as applicable.

As noted in Section 2, the invasive species control program will vary slightly for “prohibited” and “regulated” invasive species, as defined in the New York State Prohibited and Regulated Invasive Plants (NYSDEC 2014). Specifically, the steps for each program include:

- “Prohibited” invasive species:
    - Record the species, location, and size of the population
    - Consult with NYSDEC to select an approved control method
    - Treat/remove the invasive species in accordance with the approved method
    - Record the control method and date of control action.
- Other (i.e., “regulated”) invasive species:
    - Consult with NYSDEC to select and approved control method
    - Treat/remove the invasive species in accordance with that approved method.

Invasive species plant refuse will be appropriately disposed (i.e., burned or landfilled in non-translucent bags), and will not be composted, added to stockpile soils, or handled in a way that would lead to reuse at this or any other site.

The frequency of control events will be established through data collected during monitoring events. Herbicide application as part of the exotic/invasive species control program will be conducted by a licensed applicator. Additionally, with agreement from NYSDEC, control methods may be adapted over time based on the outcome of initial control efforts. Efforts to eliminate invasive species will continue throughout the monitoring period within the restored areas.

4.1.3 Watering Plan

Per Section 32 90 00, Planting and Restoration (Appendix B to the Remedial Design), an initial watering of seeded areas will be performed within 24 hours of seeding repeated after the second- and fourth-weeks following seeding, if natural rainfall is less than 1 inch per week. Additionally, during the first growing season following initial planting, a water plan for the management of the planted trees will be implemented. Between the spring and summer monitoring events, rainfall in Homer, New York will be monitored. If less than 0.5 inches of rain are observed over the course of 14 consecutive days, NYSEG

will arrange for the planted trees to be watered within 3-5 business days of the end of that 14-consecutive day period.

4.1.4 Corrective Action

If the riverbank areas are observed to show signs of any of the above-mentioned stability inspection elements, appropriate corrective action(s) will be proposed to address any conditions that could jeopardize the performance of the completed remediation action.

NYSEG will propose any corrective actions (if necessary), for NYSDEC review and approval prior to implementation and within four weeks of completing the spring (i.e., in the Inspection Report) and/or summer monitoring event (via an email correspondence). Corrective actions may include, but will not be limited to: planting alternate vegetation species; re-grading, additional soil amendment, implementing a watering plan; herbicide application or other mechanical control of invasive/exotic species; and installation of additional armoring or other bank stability measures. If warranted, additional seeding/planting will be implemented in the spring or fall, and exotic/invasive species will be controlled at the most suitable time for target species. Corrective actions taken will be documented in the Annual Monitoring Report (discussed in Section 5).

5 REPORTING

The baseline number of trees, shrubs, and live stakes (i.e., woody vegetation) in each area will be established during the initial planting (i.e., in Year 0). “As-built” restoration conditions will be documented (e.g., as part of a Construction Completion Report, Final Engineering Report, or a separate submittal) and submitted to NYSDEC. The as-built conditions will serve as the baseline for the performance monitoring and adaptive management. Boundaries of vegetation community types present in the restoration areas will be identified and mapped, as well as a complete final accounting of plants installed within each restoration area.

Observed site conditions will be documented in the Inspect Report and Annual Monitoring Report, in accordance with requirements presented in the following subsections.

5.1 Inspection Report

After the spring monitoring event, an Inspection Report will be submitted to NYSDEC to document the results of the event and propose corrective actions, if necessary. The Inspection Report will include the following:

- An introduction, including a summary of the performance criteria and objectives of the annual monitoring events.
- A summary of the methods used to compete the qualitative monitoring event.
- A summary of the observations made during the monitoring activities, a comparison to “as-built” conditions and defined performance criteria.
- Figures illustrating the location of any key observations made and photograph locations/direction.
- A photo log depicting the conditions observed during the monitoring event. Photographs will have captions describing the location and direction of photograph.
- Completed the Monitoring Inspection Checklist to support the required performance standard calculations (see Attachment 1).
- A summary of the corrective actions or adaptive management actions implemented since the last inspection, if any, including photographs and figures noting the location(s) of plantings. If herbicide is used, a summary of location(s) of application, application rate, and type of herbicide used.
- Discussion of progress toward, or deviation from, the performance criteria as defined in this Restoration Plan, and if necessary, corrective actions to move or maintain progress toward the performance criteria.
- The planned monitoring activities and/or recommendations for the following (i.e., summer) inspection, if any.

The Inspection Report will be submitted within 30 days of the spring monitoring event.

5.2 Annual Monitoring Report

An Annual Monitoring Report will be submitted to NYSDEC, each year that monitoring is conducted, to document the results of the annual monitoring event (and the as-built condition of corrective actions, if implemented). Qualitative and quantitative monitoring data collected during routine monitoring events will be evaluated to develop appropriate recommendations for the restoration project. The Annual Monitoring Report will include the following:

- An introduction, including a summary of the performance criteria and objectives of the annual monitoring events.
- A brief summary of the observations made during the quantitative (spring) monitoring event, with the Inspection Report attached for reference.
- A summary of the methods used to compete the quantitative (summer) monitoring event.
- A summary of the observations made during the monitoring activities, including the quantitative assessment of the vegetative cover throughout the restoration area and a comparison to “as-built” conditions and defined performance criteria.
- Figures illustrating the monitoring quadrants observed, the location of any key observations made, and photograph locations/direction.
- A photo log depicting the conditions observed during the monitoring event. Photographs will have captions describing the location and direction of photograph.
- Completed the Monitoring Inspection Checklist and associated summary tables to support the required performance standard calculations (see Attachment 1).
- A summary of the corrective actions or adaptive management actions implemented, if any, including photographs and figures noting the location(s) of plantings. If herbicide is used, a summary of location(s) of application, application rate, and type of herbicide used.
- Discussion of progress toward, or deviation from, the performance criteria as defined in this Restoration Plan, and if necessary, corrective actions to move or maintain progress toward the performance criteria.
- The planned monitoring activities and/or recommendations for the following year, if any.

The Annual Monitoring Report will be submitted within 90 days of the summer monitoring event.

6 REFERENCES

NYSDEC. 2014. 6 NYCRR Part 575 Prohibited and Regulated Invasive Species. September 10. http://www.dec.ny.gov/docs/lands_forests_pdf/islist.pdf

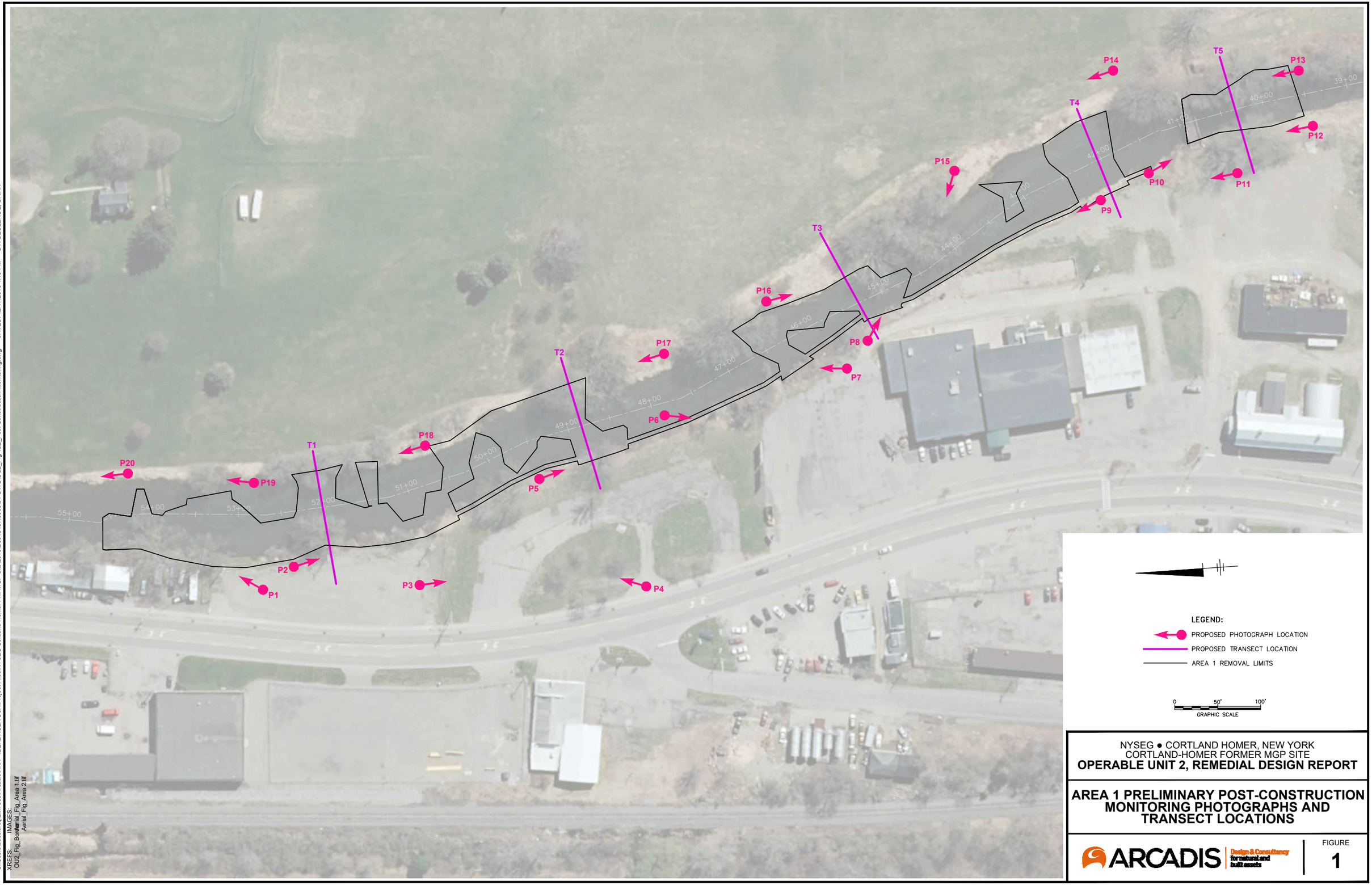
TABLE

Table 1
Cover Class Midpoints
NYSEG Cortland-Homer Former MGP Site (OU-2)

Percent Cover Range	Cover Class Midpoint
<1%	0.5
1 - 5%	3
6 - 15%	10.5
16 - 25%	20.5
26 - 50%	38
51 - 75%	63
76 - 95%	85.5
>95%	98

Source: Daubenmire R. A Canopy-Coverage Method of Vegetational Analysis. North West Sd. 33:43-64. 1959.

FIGURES



LEGEND:

- PROPOSED PHOTOGRAPH LOCATION
- PROPOSED TRANSECT LOCATION
- AREA 1 REMOVAL LIMITS

0 50' 100'
GRAPHIC SCALE

NYSEG ● CORTLAND HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 1 PRELIMINARY POST-CONSTRUCTION MONITORING PHOTOGRAPHS AND TRANSECT LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

C:\Users\bdeclercq\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2019\B0013137.000801-DWG\OU2_Fig 1&2_Post Construction Monitoring.dwg SAVED: 12/17/2019 1:10 PM BY: DECLERCQ, BRIAN

XREFS:
OU2_Fig_Boundary

IMAGES:
Aerial_Fig_Area 1.tif
Aerial_Fig_Area 2.tif

LEGEND:

- PROPOSED PHOTOGRAPH LOCATION
- PROPOSED TRANSECT LOCATION
- AREA 2 REMOVAL LIMITS

0 40' 80'
GRAPHIC SCALE

NYSEG ● CORTLAND HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 2 PRELIMINARY POST-CONSTRUCTION MONITORING PHOTOGRAPHS AND TRANSECT LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2

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XREFS:
OU2_Fig_Boundary

IMAGES:
Aerial_Fig_Area 1.tif
Aerial_Fig_Area 2.tif

ATTACHMENT 1

Preliminary Inspection Checklist and Tables

Bi-Annual Monitoring Inspection Checklist
Cortland-Homer Former MGP Site

I. GENERAL INFORMATION

Inspection Date: _____

Conducted By: _____

Weather Conditions: _____

II. INSPECTION SUMMARY

1. Vegetation

A. Woody Vegetation *(Note evidence of damage from trespassing or herbivory, note physical changes since last inspection. If a quantitative assessment is performed, complete the attached field form for each planting area.)*

B. Herbaceous Vegetation *(Note evidence of areas of bare/sparse vegetation; note any damage from trespassing or herbivory; note any physical changes since last inspection. If a quantitative assessment is performed, complete the attached field form for each planting area.)*

C. Presence of Invasive Species *(Note the invasive species present. If a quantitative assessment is performed, complete the attached field form for each planting area. If "prohibited" invasive species are observed, record the species, location, and size of the population observed.)*

D. Vegetation below MHWL *(Note evidence of damage from trespassing or herbivory, note physical changes since last inspection. If a quantitative assessment is performed, complete the attached field form for each planting area.)*

2. Riverbank Stability *(Note any physical changes since last inspection; note evidence of significant erosion [e.g., slope failure, ruts, gullies, washouts, or sloughing]; note other conditions that could jeopardize the performance of the completed remediation actions. If a quantitative assessment is performed, complete the attached field form for each transect.)*

3. Other Observations *(Confirm that repair/maintenance activities identified during prior inspection, if any, have been performed; note any other general observations.)*

III. FOLLOW-UP MAINTENANCE AND REPAIR ACTIVITIES

ATTACH ADDITIONAL INFORMATION AS APPROPRIATE

Summary of Quantitative Vegetation Assessment - Trees ≥ 2-inch DBH (Year 5 [example])

Cortland-Homer Former MGP Site

Date(s) of Monitoring:

Planting Area	Drawing Reference	Trees (≥ 2-inch DBH)			
		# Planted	# Counted	% Survival	> 90% Survival?
Inundated Planting Area	C-108				
	C-109				
	C-110				
	Total				
Bank Planting Area	C-109				
	C-111				
	C-113				
	C-114				
	Total				
Floodplain Planting Area	C-108				
	C-109				
	C-110				
	C-111				
	C-113				
	C-114				
	Total				
Grass Planting Area	C-109				
	C-110				
	C-111				
	Total				

Note:
1. DBH = diameter breast height.

Summary of Quantitative Vegetation Assessment - Sample Plots (Year 5 [example])

Cortland-Homer Former MGP Site

Date(s) of Monitoring:

Planting Area	Sample Plot No. (if applicable)	Trees				Shrubs / Live Stakes				Herbaceous Ground Cover		"Prohibited" Invasive Species[2]		"Other" Invasive Species	
		# Planted	# Counted	% Survival	Performance Criteria Met?	# Planted	# Counted	% Survival	Performance Criteria Met?	% Cover	Performance Criteria Met?	% Cover	Performance Criteria Met?	% Cover	Performance Criteria Met?
Emergent Vegetation	TBD	NA	NA	NA	NA	NA	NA	NA	NA						
	TBD	NA	NA	NA	NA	NA	NA	NA	NA						
	Average														
Inundated Shoreline	TBD	NA	NA	NA	NA										
	TBD	NA	NA	NA	NA										
	Average														
Bank	TBD														
	TBD														
	Average														
Floodplain	TBD														
	TBD														
	Average														
Upland	TBD														
	TBD														
	Average														
Grass	TBD					NA	NA	NA	NA						
	TBD					NA	NA	NA	NA						
	Average														

Notes:
1. NA indicates "not applicable".
2. Note, for "prohibited" invasive species, % cover applies to the entire site, not only the sample plots.

Summary of Quantitative Bank Stability Assessment (Year 5 [example])

Cortland-Homer Former MGP Site

Date(s) of Monitoring:
Daily Average Flow at USGS gauging station 04273500 on Date(s) of Monitoring:

Transect	Elevation of Edge of Water	Elevation of Vegetation/ Scour Line
1		
2		
3		
4		
5		
6		
7		

Notes:
1. Elevations are in feet and are referenced to North American Vertical Datum of 1929.

ATTACHMENT 2

Example Herbicide Specifications

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GROUP 9 HERBICIDE

AquaNeat®

Aquatic Herbicide

FOR USE ON EMERGED AQUATIC WEEDS AND BRUSH IN AQUATIC SITES. FOR USE IN FORESTRY (INCLUDING WEED CONTROL IN CHRISTMAS TREE PLANTATIONS), PASTURES, RANGELANDS, RIGHTS-OF-WAY, HABITAT RESTORATION AREAS, NON-CROP AND OTHER LISTED APPLICATION SITES.

ACTIVE INGREDIENT:	
Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt*	53.8%
OTHER INGREDIENTS:	46.2%
TOTAL:	100.0%

*Contains 648 grams per litre or 5.4 pounds per U.S. gallon of the active ingredient, glyphosate, in the form of its isopropylamine salt. Equivalent to 480 grams per litre or 4 pounds per U.S. gallon of the acid, glyphosate.

KEEP OUT OF REACH OF CHILDREN

CAUTION / PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

SEE INSIDE BOOKLET FOR FIRST AID AND ADDITIONAL PRECAUTIONARY STATEMENTS

EPA Reg. No. 228-365

EPA Est. No. 228-IL-001

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300

For Medical Emergencies Only, Call (877) 325-1840

Manufactured for
Nufarm Americas Inc.
11901 S. Austin Avenue
Alsip, IL 60803

Nufarm Grow a better tomorrow.

7 36211 76276 4

Net Contents

2.5 Gal.

(9.46 L)

Nonrefillable Container

14501000 [3]

file: 67720-1_book_art
folder: 67720-1_Nufarm_14501000[3]
colors: black, 348, 4625, 329
barcode: upca, 80%, -39m

created: 03/11/09 md
alt: 06-01-15 jw
size: 5.5"(w) x 6.5"(h)
☐ dp proofed____

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION / PRECAUCION

Harmful if inhaled. Avoid breathing spray mist. Remove contaminated clothing and wash clothing before reuse. Wash thoroughly with soap and water after handling.

FIRST AID	
IF INHALED	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.
You may also contact 1-877-325-1840 for emergency medical treatment information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):
Applicators and other handlers must wear long-sleeved shirt and long pants and shoes plus socks. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exists, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Control Statements: When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d)], the handler PPE requirements may be reduced or modified as specified in the WPS.

USER SAFETY RECOMMENDATIONS

Users Should:
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

ENVIRONMENTAL HAZARDS

For aquatic uses, do not contaminate water when disposing of equipment washwaters. Treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss can cause fish suffocation.

For terrestrial uses, do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark.

In case of, SPILL OR LEAK, soak up and remove to a landfill. Do not contaminate water when disposing of equipment washwaters or rinsate.

PHYSICAL OR CHEMICAL HAZARDS

Spray solutions of this product must be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic and plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the State or Tribal agency responsible for pesticide regulation.

Read the entire label before using this product. Use strictly in accordance with label precautionary statements and directions.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protection equipment (PPE) and Restricted-Entry Interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the Restricted-Entry Interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: coveralls, shoes plus socks, and waterproof gloves.

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses. Keep people and pets off treated areas until spray solution has dried.

PRODUCT INFORMATION

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS AS SPECIFIED WITHIN THIS LABEL OR CURRENT SUPPLEMENTAL LABELING ISSUED BY MANUFACTURER.

This product, a water-soluble liquid, mixes readily with water and nonionic surfactant to be applied as a foliar spray after dilution and thoroughly mixing with water in accordance with label instructions for the control or destruction of many herbaceous and woody plants.

Always use the higher rate of this product per acre within the specified range when vegetation is heavy or dense, when treating dense multi-canopied sites, or woody vegetation or difficult-to-control herbaceous or woody plants.

This product moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within 2 to 4 days but on most perennial brush species may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow the activity of this product and delay visual effects of control. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts.

Unless otherwise directed on this label, delay application until vegetation has emerged and reached the stages described for control of such vegetation under the "WEEDS CONTROLLED" section of this label.

Unemerged plants arising from unattached underground rhizomes or root stocks of perennials or brush will not be affected by the spray and will continue to grow. For this reason best control of most perennial weeds or brush is obtained when treatment is made at late growth stages approaching maturity.

Do not treat weeds or brush under poor growing conditions such as drought stress, disease or insect damage, as reduced control may result. Reduced results may also occur when treating weeds or brush heavily covered with dust.

Reduced control may result when applications are made to any weed or brush species that have been mowed, grazed or cut, and have not been allowed to regrow to the recommended stage for treatment.

Rainfall or irrigation occurring within 6 hours after application may reduce effectiveness. Heavy rainfall or irrigation within 2 hours after application may wash the product off the foliage and a repeat treatment may be required.

Mixing this product with herbicides or other materials not instructed in this label may result in reduced performance. However, unless otherwise prohibited on this label or the label of an intended tank mix product may be applied in combination with any herbicide registered for the same site, timing, and method of application. Observe the most restrictive label statements of various tank mix products used. TO THE FULLEST EXTENT PERMITTED BY LAW, BUYER AND ALL USERS ARE RESPONSIBLE FOR ALL LOSS OR DAMAGE IN CONNECTION WITH THE USE OR HANDLING OF MIXTURES OF THIS PRODUCT OR OTHER MATERIALS THAT ARE NOT EXPRESSLY SPECIFIED IN THIS LABEL.

For best results, spray coverage must be uniform and complete. Do not spray weed foliage to the point of runoff.

When this product comes in contact with soil (on the soil surface or as suspended soil or sediment in water) it is bound to soil particles. Under labeled use situations, once this product is bound to soil particles, it is not available for plant uptake and will not harm off-site vegetation where roots grow into the treatment area or if the soil is transported off-site. Under labeled use conditions, the strong affinity of this product to soil particles prevents this product from leaching out of the soil profile and entering ground water. The affinity between this product and soil particles remains until this product is degraded, which is primarily a biological degradation process carried out under both aerobic and anaerobic conditions by soil micro flora.

This product does not provide residual weed control. For subsequent residual weed control, follow a label-approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Read "**WARRANTY DISCLAIMER**" and "**LIMITATION OF LIABILITY**" before buying or using. If items are not acceptable, return at once unopened. Buyer and all users are responsible for all loss or damage in connection with the use of handling of mixtures of this product or other materials that are not expressly specified in this label.

For more product information, call toll-free 1-800-345-3330.

ATTENTION

AVOID CONTACT WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS, OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, SINCE SEVERE INJURY OR DESTRUCTION MAY RESULT. AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended. The likelihood of plant or crop injury occurring from the use of this product is greatest when winds are gusty or in excess of 5 miles per hour or when other conditions, including lesser wind velocities, will allow spray drift to occur. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) which are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences. When not in use, keep container closed to prevent spills and contamination.

WEED RESISTANCE

Any weed population may contain plants that are naturally resistant to glyphosate, the active ingredient in this product, and to other herbicides with the same mode of action. ATTENTION: These resistant weed biotypes will not be controlled by this product. Consult advisors such as your local agricultural extension service for agronomic management practices to minimize the occurrence of glyphosate resistance and considerations for supplemental control measures.

Weed Management

To minimize the occurrence of glyphosate-resistant biotypes, observe the following general weed management practices:

- Scout application site before and after herbicide applications.
- Start with a clean application site, using either a burndown herbicide application or tillage.
- Control weeds early when they are relatively small.
- Add other herbicides (e.g. a selective and/or a residual herbicide) and cultural practices (e.g. tillage or crop rotation) where appropriate.
- Utilize the specified label rate for the most difficult to control weed in your field. Avoid tank mixtures with other herbicides that reduce this product's efficacy (through antagonism), or tank mixture directions that encourage application rates of this product below the label directions.
- Control weed escapes and prevent weeds from setting seeds.
- Clean equipment before moving from field to field to minimize the spread of weed seed or plant parts.
- Report any incidence of repeated non-performance of this product on a particular weed to your Nufarm representative, local retailer, or county extension agent.

Management of Glyphosate-Resistant Biotypes

Since the occurrence of new glyphosate-resistant weeds cannot be determined until after product use and scientific confirmation, manufacturer is not responsible for any losses that may result from the failure of this product to control glyphosate-resistant weed biotypes.

The following good agronomic practices are recommended to reduce the spread of confirmed glyphosate-resistant biotypes:

- If a naturally occurring resistant biotype is present in your application site, this product should be tank-mixed or applied sequentially with an appropriately labeled herbicide with a different mode of action to achieve control.
- Cultural and mechanical control practices (e.g. crop rotation or tillage) may also be used as appropriate.
- Scout treated application site after herbicide applications and control escaping weeds including resistant biotypes before they set seed.
- Thoroughly clean equipment before leaving fields known to contain resistant biotypes.

MIXING AND APPLICATION INSTRUCTIONS

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES. HAND-GUN APPLICATIONS MUST BE PROPERLY DIRECTED TO AVOID SPRAYING DESIRABLE PLANTS. NOTE: REDUCED RESULTS MAY OCCUR IF WATER CONTAINING SOIL IS USED, SUCH AS WATER FROM PONDS AND UNLINED DITCHES.

TANK MIXTURES

Always predetermine the compatibility of labeled tank mixtures of this product with water carrier by mixing small proportional quantities in advance. Mix labeled tank mixtures of this product with water as follows:

1. Place a 20 to 35 mesh screen or wetting basket over filling port.
2. Through the screen, fill the spray tank one-half full with water and start agitation.
3. If a wettable powder is used, make a slurry with the water carrier, and add it SLOWLY through the screen into the tank. Continue agitation.
4. If a flowable formulation is used, premix one part flowable with one part water. Add diluted mixture SLOWLY through the screen into the tank. Continue agitation.
5. If an emulsifiable concentrate formulation is used, premix one part emulsifiable concentrate with two parts water. Add diluted SLOWLY through the screen into the tank. Continue agitation.
6. Continue filling the spray tank with water and add the required amount of this product near the end of the filling process.
7. Where nonionic surfactant is recommended, add this to the spray tank before completing the filling process.
8. Add individual formulations to the spray tank as follows: wettable powder, flowable, emulsifiable concentrate, drift control additive, water soluble liquid followed by surfactant.

Maintain good agitation at all times until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation is required to resuspend the mixture before spraying is resumed. To prevent or minimize foam, avoid the use of mechanical agitators, place the filling hose below the surface of the spray solution, terminate by-pass and return lines at the bottom of the tank and if needed use an approved anti-foam or defoaming agent.

Use screen size in nozzle or line strainers that are no finer than 50 mesh. Carefully select proper nozzle to avoid spraying a fine mist. For best results with conventional ground application equipment, use flat fan nozzles.

Clean sprayer and parts immediately after using this product by thoroughly flushing with water.

For best results with conventional ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

When using this product, mix 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution. Use a nonionic surfactant labeled for use with herbicides. The surfactant must contain 50 percent or more active ingredient.

Always read and follow the manufacturer's surfactant label instructions for best results.

Do not use surfactants in excess of 1 quart per acre when making broadcast applications.

Colorants or marking dyes approved for use with herbicides may be added to spray mixtures of this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilutions. Use colorants or dyes according to the manufacturer's label instructions.

Clean sprayer and parts immediately after using this product by thoroughly flushing with water and dispose of rinsate according to labeled use or disposal instructions.

Carefully observe all cautionary statements and other information appearing in the surfactant label.

APPLICATION EQUIPMENT AND TECHNIQUES

This product may be applied with the following application equipment:

Broadcast Spray

Controlled Droplet Applicator (CDA) - Hand-held or boom-mounted applicators which produce a spray consisting of a narrow range of droplet sizes.

Hand-Held and High-Volume Spray Equipment* - Knapsack and backpack sprayers, pump-up pressure sprayers, handguns, handwands, lances and other hand-held and motorized spray equipment used to direct the spray onto weed foliage.

*This product is not registered in California or Arizona for use in mistblowers.

Selective Equipment - Recirculating sprayers and wiper applicators. See the appropriate part of this section for specific instructions and rates of application.

Aerial - Fixed Wing and Helicopter

APPLICATION INFORMATION

Observe the following directions to minimize off-site movement during aerial application of this herbicide. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor, and aerial applicator.

BOOM EQUIPMENT

For control of weed or brush species listed in this label using conventional boom equipment - Use the specified rates of this product and surfactant in 3 to 30 gallons of water per acre as a broadcast spray, unless otherwise specified. See the "WEEDS CONTROLLED" section of this label for specific rates. As density of vegetation increases, spray volume may be increased within the specified range to ensure complete coverage. Carefully select correct nozzle to avoid spraying a fine mist. For best results with ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

HAND-HELD AND HIGH-VOLUME EQUIPMENT

Use Coarse Sprays Only

For control of weeds listed in this label using knapsack sprayers or high-volume spraying equipment utilizing handguns or other suitable nozzle arrangements - Prepare a 0.75 to 2 percent solution of this product in water, add a nonionic surfactant and apply to foliage of vegetation to be controlled. For specific rates of application and instructions for control of various annual and perennial weeds, see the "WEEDS CONTROLLED" section in this label.

Apply on a spray-to-wet basis so that the spray coverage is uniform and complete. Do not spray to point of runoff.

This product may be used as a 5 to 8 percent solution plus 0.5 to 1 fluid ounce non-ionic surfactant per gallon spray solution for low-volume directed sprays for spot treatment of trees and brush. It is most effective in areas where there is a low density of undesirable trees or brush. If a straight stream nozzle is used, start the application at the top of the targeted vegetation and spray from top to bottom in a lateral zig-zag motion. Ensure that at least 50 percent of the leaves are contacted by the spray solution. For flat fan and cone nozzles and with hand-directed mist blowers, mist the application over the foliage of the targeted vegetation. Small, open-branched trees need only be treated from one side. If the foliage is thick or there are multiple root sprouts, applications must be made from several sides to ensure adequate spray coverage.

For use in knapsack sprayers, it is suggested that the specified amount of this product be mixed with water in a large container. Fill sprayer with the mixed solution and add the correct amount of surfactant.

Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

SPRAY SOLUTION

DESIRED VOLUME	AMOUNT OF PRODUCT					
	0.75%	1.0%	1.25%	1.5%	5.0%	8.0%
1 Gallon	1.0 fl. oz.	1.33 fl. oz.	1.66 fl. oz.	2.0 fl. oz.	6.0 fl. oz.	10.25 fl. oz.
25 Gallons	1.5 pts.	1.0 qt.	1.25 qts.	1.5 qts.	5.0 qts.	2.0 gals.
100 Gallons	3.0 qts.	1.0 gal.	1.25 gals.	1.5 gals.	5.0 gals.	8.0 gals.

2 Tablespoons = 1 fluid ounce

SELECTIVE EQUIPMENT

For terrestrial application, this product may be applied through a shielded applicator, or a wiper applicator after dilution and thorough mixing with water to listed weeds growing in any non-crop site specified on this label.

- A shielded applicator directs the herbicide solution onto weeds, while shielding desirable vegetation from the herbicide.
- A wiper applicator applies the herbicide solution onto weeds by rubbing the weed with an absorbent material containing the herbicide solution.

AVOID CONTACT WITH DESIRABLE VEGETATION.

This section summarizes the general weed control spectrum and rates of application for this herbicide. Additional information specific to individual use patterns is detailed in following sections.

AERIAL EQUIPMENT

Use the specified rates of this product and surfactant in 3 to 20 gallons of water per acre as a broadcast spray, unless otherwise specified. See the "WEEDS CONTROLLED" section of this label for specific rates. Unless otherwise specified, do not exceed 1.5 pints per acre. Aerial applications of this product may only be made as specified in this label.

AVOID DRIFT - DO NOT APPLY DURING LOW-LEVEL INVERSION CONDITIONS, WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH WILL ALLOW DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations which dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure above the manufacturer's instructions.

Drift control additives may be used. When a drift control additive is used, read and carefully observe the precautionary statements and all other information appearing in the additive label.

Ensure uniform application - To avoid streaked, uneven or overlapped application, use appropriate marking devices.

Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. LANDING GEAR ARE MOST SUSCEPTIBLE. The maintenance of an organic coating (paint) which meets aerospace specification MIL-C-38413 may prevent corrosion.

For use of this product by air in California see additional instructions in "FOR AERIAL APPLICATION IN CALIFORNIA ONLY" Section.

FOR AERIAL APPLICATION IN CALIFORNIA ONLY

EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF SPRAY WITH FOLIAGE, GREEN STEMS, OR FRUIT OF DESIRABLE CROPS, PLANTS, TREES, OR OTHER DESIRABLE VEGETATION SINCE SEVERE DAMAGE OR DESTRUCTION MAY RESULT.

Written Directions

A written direction MUST be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. This written direction MUST state the proximity of surrounding crops, and that conditions of each manufacturer's applicable product label(s) and this label have been satisfied.

Aerial Applicator Training and Equipment

Aerial application of this herbicide is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight, and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to insure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved "fly-ins" constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Application at night
Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

Aquatic and Other Noncrop Sites
When applied as directed and under the conditions described in the "Weeds Controlled" section of the label booklet for this product, this herbicide will control or partially control the labeled weeds growing in the following industrial, recreational and public areas, or other similar sites.

Aquatic Sites-including all bodies of fresh and brackish water which may be flowing, nonflowing or transient. This includes lakes, rivers, streams, ponds, seeps, irrigation and drainage ditches, canals, reservoirs, estuaries and similar sites.

If aquatic sites are present in the noncrop areas and are part of the intended treatment, read and observe the following directions: There is no limit on the use of treated water for irrigation, recreation or domestic purposes.

Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.

NOTE: Do not apply this product within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within 1/2 mile of an active potable water intake in a standing body of water such as a lake, pond or reservoir. To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made ONLY in those cases where there are alternative water sources or holding ponds which would permit the turning off of an active potable water intake for a minimum period of 48 hours after application.

This product does not control plants which are completely submerged or have a majority of their foliage underwater.

AVOID DRIFT - DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH WILL ALLOW DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Use the following guidelines when aerial applications are made near crops or desirable perennial vegetation after bud break and before total leaf drop, and/or near other desirable vegetation or annual crops.

1. Do not apply within 100 feet of all desirable vegetation or crop(s).
2. If wind up to 5 miles per hour is blowing toward desirable vegetation or crop(s), do not apply within 500 feet of the desirable vegetation or crop(s).
3. Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crop(s) may require buffer zones in excess of 500 feet.
4. Do not apply when winds are in excess of 10 miles per hour or when inversion conditions exist.

FOR AERIAL APPLICATION IN FRESNO COUNTY, CALIFORNIA ONLY

(From February 15 through March 31 only)

For aerial application outside of these dates (April 1 through February 14), refer to the "FOR AERIAL APPLICATION IN CALIFORNIA ONLY" section printed above.

Applicable Area
This supplement only applies to the area contained inside the following boundaries within Fresno County, California only.

North: Fresno County line
South: Fresno County line
East: State Highway 99
West: Fresno County line

Information
Always read and follow the label directions and precautionary statements for all products used in the aerial application. Observe the following directions to minimize off-site movement during aerial application of this product. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor and aerial applicator.

Written directions MUST be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. This written direction MUST state the proximity of surrounding crops, and that conditions of each manufacturer's product label and this label have been satisfied.

Aerial Applicator Training and Equipment
Aerial application of this product is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to insure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved fly-ins constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Applications at Night— Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

For aerial application from April 1 through February 14, refer to the "FOR AERIAL APPLICATION IN CALIFORNIA ONLY" section printed above.

SPRAY DRIFT MANAGEMENT

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target drift movement from aerial applications. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

1. The distance of the outer most operating nozzles on the boom must not exceed 3/4 the length of the rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downward more than 45 degrees. Where states have more stringent regulations, they must be observed.

The applicator must be familiar with and take into account the information covered in the Aerial Drift Reduction Advisory Information.

Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions sections of this label).

Controlling Droplet Size

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's specified pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure. Higher pressure reduces droplet size and does not improve canopy protection.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released backwards, parallel to the air stream produces larger droplets than other orientations. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.
- **Boom Length** - For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.
- **Application Height** - Applications must not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance must increase, with increasing drift potential (higher wind, smaller drops, etc.).

Wind

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Do not make applications when wind speed is below 2 mph due to variable wind direction and high inversion potential. Note: Local terrain can influence wind patterns. Every applicator must be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Applications must not occur during a local, low level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas
Only make applications when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g. when wind is blowing away from the sensitive areas).

WEEDS CONTROLLED

ANNUAL WEEDS
Apply to actively growing annual grasses and broadleaf weeds.

Allow at least 3 days after application before disturbing treated vegetation. After this period the weeds may be mowed, tilled or burned. See "DIRECTIONS FOR USE", "PRODUCT INFORMATION" and "MIXING AND APPLICATION INSTRUCTIONS" for labeled uses and specific application instructions.

Broadcast Application - Use 1-1/2 pints of this product per acre plus 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution, if weeds are less than 6 inches tall. If weeds are greater than 6 inches tall, use 2-1/2 pints of this product per acre plus 2 or more quarts of an approved nonionic surfactant per 100 gallons of spray solution.

Hand-Held, High-Volume Application - Use a 3/4 percent solution of this product in water plus 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution and apply to foliage of vegetation to be controlled.

When applied as directed under the conditions described in this label, this product plus nonionic surfactant WILL CONTROL the following ANNUAL WEEDS:

Balsamapple**
Momordica charantia
Barley
Hordeum vulgare
Barnyardgrass
Echinochloa crus-galli
Bassia, fivehook
Bassia hyssopifolia
Bluegrass, annual
Poa annua
Bluegrass, bulbous
Poa bulbosa
Brome*
Bromus spp.
Buttercup
Ranunculus spp.
Cheat
Bromus secalinus
Chickweed, mouseear
Cerastium vulgatum
Cocklebur
Xanthium strumarium
Corn, volunteer
Zea mays
Crabgrass
Digitaria spp.
Dwarf dandelion
Krigia cespitosa
False dandelion
Krigia cespitosa
Falseflax, smallseed
Camelina microcarpa
Fiddleneck*
Amsinckia spp.
Flax leaf fleabane*
Conyza bonariensis
Fleabane
Erigeron spp.
Foxtail
Setaria spp.
Foxtail, Carolina
Alopecurus carolinianus
Groundsel, common
Senecio vulgaris
Horseweed/Marestail
Conyza canadensis
Kochia*
Kochia scoparia
Lambsquarters, common
Chenopodium album
Lettuce, prickly*
Lactuca serriola
Morningglory
Ipomoea spp.
Mustard, blue
Chorispora tenella
Mustard, tansy
Descurainia pinnata
Mustard, tumble
Sisymbrium altissimum
Mustard, wild
Sinapis arvensis
Oats, wild
Avena fatua
Panicum*
Panicum spp.
Pennycress, field
Thlaspi arvense
Pigweed, redroot
Amaranthus retroflexus
Pigweed, smooth
Amaranthus hybridus
Ragweed, common*
Ambrosia artemisiifolia
Ragweed, giant*
Ambrosia trifida
Rocket, London
Sisymbrium irio
Rye
Secale cereale
Ryegrass, Italian*
Lolium multiflorum
Sandbur, field
Cenchrus spp.
Shattercane
Sorghum bicolor
Shepherd's-purse
Capsella bursa-pastoris
Signalgrass, broadleaf
Brachiaria platyphylla
Smartweed, Pennsylvania
Polygonum pensylvanicum
Sowthistle, annual*
Sonchus oleraceus
Spanishneedles*
Bidens bipinnata
Spurry, umbrella
Holosteum umbellatum
Stinkgrass
Eragrostis cilianensis
Sunflower*
Helianthus annuus
Thistle, Russian
Salsola kali
Velvetleaf*
Abutilon theophrasti
Wheat
Triticum aestivum
Witchgrass
Panicum capillare

*Apply 3 pints of this product per acre.
**Apply with hand-held equipment only.

Annual weeds will generally continue to germinate from seed throughout the growing season. Repeat treatments will be necessary to control later germinating weeds.

PERENNIAL WEEDS

Apply this product as follows to control or destroy most vigorously growing perennial weeds. Unless otherwise directed, allow at least 7 days after application before disturbing vegetation.

See individual control instructions for specific weeds following the table. For other perennials listed on this label, apply 4-1/2 to 7-1/2 pints of product per acre as a broadcast spray or as a 3/4 to 1-1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached early head or early bud stage of growth.

Add 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution to the rates of this product given in this list. See the "PRODUCT INFORMATION", "DIRECTIONS FOR USE" and "MIXING AND APPLICATION" sections in this label for specific uses and application instructions.

NOTE: If weeds have been mowed or tilled, do not treat until regrowth has reached the recommended stages. Fall treatments must be applied before a killing frost.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seed.

When applied as specified under the conditions described, this product plus surfactant WILL CONTROL the following PERENNIAL WEEDS:

Alfalfa
Medicago sativa
Alligatorweed*
Alternanthera philoxeroides
Anise/Fennel
Foeniculum vulgare
Artichoke, Jerusalem
Helianthus tuberosus
Bahiagrass
Paspalum notatum
Bermudagrass
Cynodon dactylon
Bindweed, field
Convolvulus arvensis
Bluegrass, Kentucky
Poa pratensis
Blueweed, Texas
Helianthus ciliaris
Brackenfern
Pteridium spp.
Bromegrass, smooth
Bromus inermis
Canarygrass, reed
Phalaris arundinacea
Cattail
Typha spp.
Clover, red
Trifolium pratense
Clover, white
Trifolium repens
Cogongrass
Imperata cylindrica
Cordgrass
Spartina spp.
Cutgrass, giant*
Zizaniopsis miliacea
Dallisgrass
Paspalum dilatatum
Dandelion
Taraxacum officinale
Dock, curly
Rumex crispus
Dogbane, hemp
Apocynum cannabinum
Fescue
Festuca spp.
Fescue, tall
Festuca arundinacea
Guineagrass
Panicum maximum
Hemlock, poison
Conium maculatum
Horsenettle
Solanum carolinense
Horseradish
Armoracia rusticana
Ice Plant
Mesembryanthemum crystallinum
Johnsongrass
Sorghum halepense
Kikuyugrass
Pennisetum clandestinum
Knapweed
Centaurea repens
Lantana
Lantana camara
Lespedeza: common, services
Lespedeza striata
Lespedeza cuneata
Loosestrife, purple
Lythrum salicaria
Lotus, American
Nelumbo lutea
Maidencane
Panicum hematomon
Milkweed
Asclepias spp.
Muhly, wirestem
Muhlenbergia frondonsa
Mullein, common
Verbascum thapsus
Napiergrass
Pennisetum purpureum
Nightshade, silverleaf
Solanum elaeagnifolium
Nutsedge: purple, yellow
Cyperus rotundus
Cyperus esculentus
Orchardgrass
Dactylis glomerata
Pampas grass
Cortaderia jubata
Paragrass
Brachiaria mutica
Phragmites**
Phragmites spp.
Quackgrass
Agropyron repens
Reed, giant
Arundo donax
Ryegrass, perennial
Lolium perenne
Smartweed, swamp
Polygonum coccineum
Spatterdock
Nuphar luteum
Starthistle, yellow
Centaurea solstitalis
Sweet potato, wild*
Ipomoea pandurata
Thistle, artichoke
Cynara cardunculus
Thistle, Canada
Cirsium arvense
Timothy
Phleum pratense
Torpedograss*
Panicum repens
Tules, common
Scirpus acutus
Vaseygrass
Paspalum urvillei
Velvetgrass
Holcus spp.
Waterhyacinth
Eichornia crassipes
Waterlettuce
Pistia stratiotes
Waterprimrose
Ludwigia spp.
Wheatgrass, western
Agropyron smithii

*Partial control.
**Partial control in southeastern states. See specific instructions below.

Alligatorweed - Apply 6 pints of this product per acre as a broadcast spray or as a 1-1/4 percent solution with hand-held equipment to provide partial control of alligatorweed. Apply when most of the target plants are in bloom. Repeat applications will be required to maintain such control.

Bermudagrass - Apply 7-1/2 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and when seedheads appear.

Bindweed, field/Silverleaf Nightshade/Texas Blueweed - Apply 6 to 7-1/2 pints of this product per acre as a broadcast spray west of the Mississippi River and 4-1/2 to 6 pints of this product per acre east of the Mississippi River. With hand-held equipment, use a 1-1/2 percent solution. Apply when target plants are actively growing and are at or beyond full bloom. For silverleaf nightshade, best results can be obtained when application is made after berries are formed. Do not treat when weeds are under drought stress. New leaf development indicates active growth. For best results apply in late summer or fall.

Brackenfern - Apply 4-1/2 to 6 pints of this product per acre as a broadcast spray or as a 3/4 to 1 percent solution with hand-held equipment. Apply to fully expanded fronds which are at least 18 inches long.

Cattail - Apply 4-1/2 to 6 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when target plants are actively growing and are at or beyond the early-to-full bloom stage of growth. Best results are achieved when application is made during the summer or fall months.

Cogongrass - Apply 4-1/2 to 7-1/2 pints of this product per acre as a broadcast spray. Apply when cogongrass is at least 18 inches tall and actively growing in late summer or fall. Allow 7 or more days after application before tillage or mowing. Due to uneven stages of growth and the dense nature of vegetation preventing good spray coverage, repeat treatments may be necessary to maintain control.

Cordgrass - Apply 4-1/2 to 7-1/2 pints of this product per acre as a broadcast spray or as a 1 to 2 percent solution with hand-held equipment. Schedule applications in order to allow 6 hours before treated plants are covered by tidewater. The presence of debris and silt on the cordgrass plants will reduce performance. It may be necessary to wash targeted plants prior to application to improve uptake of this product into the plant.

Cutgrass, giant - Apply 6 pints of this product per acre as a broadcast spray or as a 1 percent solution with hand-held equipment to provide partial control of giant cutgrass. Repeat applications will be required to maintain such control, especially where vegetation is partially submerged in water. Allow for substantial regrowth to the 7- to 10-leaf stage prior to retreatment.

Dogbane, hemp/Knapweed/Horseradish - Apply 6 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the late bud-to-flower stage of growth. For best results, apply in late summer or fall.

Fescue, tall - Apply 4-1/2 pints of this product per acre as a broadcast spray or as a 1 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained.

Guineagrass - Apply 4-1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when target plants are actively growing and when most have reached at least the 7-leaf stage of growth.

Johnsongrass/Bluegrass, Kentucky/Bromegrass, smooth/Canarygrass, reed/Orchardgrass/Ryegrass, perennial/Timothy/Wheatgrass, western - Apply 3 to 4-1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown.

Lantana - Apply this product as a 3/4 to 1 percent solution with hand-held equipment. Apply to actively growing Lantana at or beyond the bloom stage of growth. Use the higher application rate for plants that have reached the woody stage of growth.

Loosestrife, purple - Apply 4 pints of this product per acre as a broadcast spray or as a 1 to 1-1/2 percent solution using hand-held equipment. Treat when plants are actively growing at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost.

Lotus, American - Apply 4 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Treat when plants are actively growing at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost. Repeat treatment may be necessary to control regrowth from underground parts and seeds.

Maidencane/Paragrass - Apply 6 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Repeat treatments will be required, especially to vegetation partially submerged in water. Under these conditions, allow for regrowth to the 7- to 10-leaf stage prior to retreatment.

Milkweed, common - Apply 4-1/2 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the late bud-to-flower stage of growth.

Nutsedge: purple, yellow - Apply 4-1/2 pints of this product per acre as a broadcast spray, or as a 3/4 percent solution with hand-held equipment to control existing nutsedge plants and immature nutlets attached to treated plants. Apply when target plants are in flower or when new nutlets can be found at rhizome tips. Nutlets which have not germinated will not be controlled and may germinate following treatment. Repeat treatments will be required for long-term control.

Pampasgrass - Apply a 1-1/2 percent solution of this product with hand-held equipment when plants are actively growing.

Phragmites - For partial control of phragmites in Florida and the counties of other states bordering the Gulf of Mexico, apply 7-1/2 pints per acre as a broadcast spray or apply a 1-1/2 percent solution with hand-held equipment. In other areas of the U.S., apply 4 to 6 pints per acre as a broadcast spray or apply a 3/4 percent solution with hand-held equipment for partial control. For best results, treat during late summer or fall months when plants are actively growing and in full bloom. Due to the dense nature of the vegetation, which may prevent good spray coverage and uneven stages of growth, repeat treatments may be necessary to maintain control. Visual control symptoms will be slow to develop.

Quackgrass/Kikuyugrass/Muhly, wirestem - Apply 3 to 4-1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment when most quackgrass or wirestem muhly is at least 8 inches in height (3- to 4-leaf stage of growth) and actively growing. Allow 3 or more days after application before tillage.

Reed, giant/ice plant - For control of giant reed and ice plant, apply a 1-1/2 percent solution of this product with hand-held equipment when plants are actively growing. For giant reed, best results are obtained when applications are made in late summer to fall.

Spatterdock - Apply 6 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when most plants are in full bloom. For best results, apply during the summer or fall months.

Sweet potato, wild - Apply this product as a 1-1/2 percent solution using hand-held equipment. Apply to actively growing weeds that are at or beyond the bloom stage of growth. Repeat applications will be required. Allow the plant to reach the recommended stage of growth before retreatment.

Thistle: Canada, artichoke - Apply 3 to 4-1/2 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment for Canada thistle. To control artichoke thistle, apply a 2 percent solution as a spray to wet application. Apply when target plants are actively growing and are at or beyond the bud stage of growth.

Torpedograss - Apply 6 to 7-1/2 pints of this product per acre as a broadcast spray or as a 3/4 to 1-1/2 percent solution with hand-held equipment to provide partial control of torpedograss. Use the lower rates under terrestrial conditions, and the higher rates under partially submerged or a floating mat condition. Repeat treatments will be required to maintain such control.

Tules, common - Apply this product as a 1-1/2 percent solution with hand-held equipment. Apply to actively growing plants at or beyond the seedhead stage of growth. After application, visual symptoms will be slow to appear and may not occur for 3 or more weeks.

Waterhyacinth - Apply 5 to 6 pints of this product per acre as a broadcast spray or apply a 3/4 to 1 percent solution with hand-held equipment. Apply when target plants are actively growing and at or beyond the early bloom stage of growth. After application, visual symptoms may require 3 or more weeks to appear with complete necrosis and decomposition usually occurring within 60 to 90 days. Use the higher rates when more rapid visual effects are desired.

Waterlettuce - For control, apply a 3/4 to 1 percent solution using hand-held equipment to actively growing plants. Use higher rates where infestations are heavy. Best results are obtained from mid-summer through winter applications. Spring applications may require retreatment.

Waterprimrose - Apply this product as a 3/4 percent solution using hand-held equipment. Apply to plants that are actively growing at or beyond the bloom stage of growth, but before fall color changes occur. Thorough coverage is necessary for best control.

Other perennials listed on this label - Apply 4-1/2 to 7-1/2 pints of this product per acre as a broadcast spray or as a 3/4 to 1-1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached early head or early bud stage of growth.

WOODY BRUSH AND TREES

See individual control instructions for specific woody brush and trees to be controlled in the following table. For partial control of other woody brush and trees listed in the table, apply 1.5 to 7.5 quarts of this product per acre as a broadcast spray or as a 0.75 to 10 percent solution with hand-held equipment.

Apply the specified rate of this product plus 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution when plants are actively growing and, unless otherwise directed, after full-leaf expansion. Use the higher rate for larger plants and/or dense areas of growth. On vines, use the higher rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late Summer or Fall after fruit formation.

Applied as a 5 to 8 percent solution as a directed application as described in the "HAND-HELD AND HIGH-VOLUME EQUIPMENT" section, this product will control or partially control all species listed in this section of the label. Use the higher rate of application for dense stands and larger woody brush and trees.

In arid areas, best results are obtained when application is made in the Spring or early Summer when brush species are at high moisture content and are flowering. Ensure thorough coverage when using hand-held equipment. Symptoms may not appear prior to frost or senescence with Fall treatment.

Allow 7 or more days after application before mowing or removal. Repeat treatments may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if Fall treatments are made following a frost.

Application Rates[1]

METHOD OF APPLICATION	APPLICATION RATE	SPRAY VOLUME (Gallons/Acre)
Broadcast		
Aerial	1.5 to 7.5 qts./ acre	5 to 30
Ground	1.5 to 7.5 qts./ acre	10 to 60
Spray-to-Wet		
Handgun, Backpack, Mistblower	0.75% to 2.0% by volume	Spray-to-Wet
Low Volume Directed Spray[2]		
Handgun, Backpack, Mistblower	5.0% to 10.0% by volume	Partial Coverage

[1] Where repeat applications are necessary do not exceed 8.0 quarts per acre per year.

[2] For low volume directed spray applications, coverage should be uniform with at least 50 percent of the foliage contacted. For best results, coverage of the top one-half of the plant is important.

NOTE: If brush has been mowed or tilled or trees have been cut, do not treat until regrowth has reached the recommended stage of growth.

When applied as specified under the conditions described, this product plus surfactant CONTROLS or PARTIALLY CONTROLS the following woody brush plants and trees:

Alder
Alnus spp.
Ash*
Fraxinus spp.
Aspen, quaking
Populus tremuloides
Bearclover, Bearmat
Chamaebatia foliolosa
Birch
Betula spp.
Blackberry
Rubus spp.
Broom:
French
Cytisus monspessulanus
Scotch
Cytisus scoparius
Buckwheat, California*
Eriogonum fasciculatum
Cascara*
Rhamnus purshiana
Catsclaw*
Acacia greggi
Ceanothus
Ceanothus spp.
Chamise
Adenostoma fasciculatum
Cherry:
Bitter
Prunus emarginata
Black
Prunus serotina
Pin
Prunus pensylvanica
Coyote brush
Bacharis consanguinea
Creeper, Virginia*
Parthenocissus quinquefolia
Dewberry
Rubus trivialis
Dogwood
Cornus spp.
Elderberry
Sambucus spp.
Elm*
Ulmus spp.
Eucalyptus, bluegum
Eucalyptus globules
Hasardia*
Haplopappus squamosus
Hawthorn
Crataegus spp.
Hazel
Corylus spp.
Hickory
Carya spp.
Holly, Florida; Brazilian Peppertree
Schinus terebinthifolius
Honeysuckle
Lonicera spp.
Hornbeam, American
Carpinus caroliniana
Kudzu
Pueraria lobata
Locust, black*
Robinia pseudoacacia
Manzanita
Arctostaphylos spp.
Maple:
Red**
Acer rubrum
Sugar
Acer saccharum
Vine*
Acer circinatum
Monkey Flower*
Mimulus guttatus
Oak:
Black*
Quercus velutina
Northern pine
Quercus palustris
Post
Quercus stellata
Red
Quercus rubra
Southern red
Quercus falcata
White*
Quercus alba
Persimmon*
Diospyros spp.
Poison Ivy
Rhus radicans
Poison Oak
Rhus toxicodendron
Poplar, yellow*
Liriodendron tulipifera
Prunus
Prunus spp.
Raspberry
Rubus spp.
Redbud, eastern
Cercis canadensis
Rose, multiflora
Rosa multiflora
Russian-olive
Elaeagnus angustifolia
Sage: black, white
Salvia spp.
Sagebrush, California
Artemisia californica

(continued)

Salmonberry
Rubus spectabilis
Salt cedar*
Tamarix spp.
Saltbush, Sea myrtle
Baccharis halimifolia
Sassafras
Sassafras aibidum
Sourwood*
Oxydendrum arboreum

Sumac:
Poison*
Rhus vernix
Smooth*
Rhus glabra
Winged*
Phus copallina
Sweet gum
Liquidambar styraciflua
Swordfern*
Polystichum munitum

Tallowtree, Chinese
Sapium sebiferum
Thimbleberry
Rubus parviflorus
Tobacco, tree*
Nicotiana glauca
Trumpetcreeper
Campsis radicans
Waxmyrtle, southern*
Myrica cerifera
Willow
Salix spp.

*Partial control
**See below for control or partial control instruction.

See the "DIRECTIONS FOR USE" and "MIXING AND APPLICATION INSTRUCTIONS" sections in this label for labeled use and specific application instructions.

Apply the product as follows to control or partially control the following woody brush and trees.

Alder/Blackberry/Dewberry/Honeysuckle/Oak, Post/Raspberry - For control, apply 4-1/2 to 6 pints per acre as a broadcast spray or as a 3/4 to 1-1/4 percent solution with hand-held equipment.

Aspen, Quaking/Hawthorn/Trumpetcreeper - For control, apply 3 to 4-1/4 pints of this product per acre as a broadcast spray or as a 3/4 to 1-1/4 percent solution with hand-held equipment.

Birch/Elderberry/Hazel/Salmonberry/Thimbleberry - For control, apply 3 pints per acre of this product as a broadcast spray or as a 3/4 percent solution with hand-held equipment.

Broom: French, Scotch - For control, apply a 1-1/4 to 1-1/2 percent solution with hand-held equipment.

Buckwheat, California/Hasardia/Monkey Flower/Tobacco, Tree - For partial control of these species apply a 3/4 to 1-1/2 percent solution of this product as a foliar spray with hand-held equipment. Thorough coverage of foliage is necessary for best results.

Catsclaw - For partial control, apply a 1-1/4 to 1-1/2 percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Cherry: Bitter, Black, Pin/Oak, Southern Red/Sweet Gum/Prunus - For control, apply 3 to 7-1/2 pints of this product per acre as a broadcast spray or as a 1 to 1-1/2 percent solution with hand-held equipment.

Coyote brush - For control, apply a 1-1/4 to 1-1/2 percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Dogwood/Hickory/Salt cedar - For partial control, apply a 1 to 2 percent solution of this product with hand-held equipment or 6 to 7-1/2 pints per acre as a broadcast spray.

Eucalyptus, bluegum - For control of eucalyptus resprouts, apply a 1-1/2 percent solution of this product with hand-held equipment when resprouts are 6- to 12-feet tall. Ensure complete coverage. Apply when plants are actively growing. Avoid application to drought-stressed plants.

Holly, Florida/Waxmyrtle, southern - For partial control, apply this product as a 1-1/2 percent solution with hand-held equipment.

Kudzu - For control, apply 6 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment. Repeat applications will be required to maintain control.

Maple, Red - For control, apply as a 3/4 to 1-1/4 percent solution with hand-held equipment when leaves are fully developed. For partial control, apply 2 to 7-1/2 pints of this product per acre as a broadcast spray.

Maple, Sugar/Oak: Northern Pine, Red - For control, apply as a 3/4 to 1-1/4 percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Poison Ivy/Poison Oak - For control, apply 6 to 7-1/2 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment. Repeat applications may be required to maintain control. Fall treatments must be applied before leaves lose green color.

Rose, multiflora - For control, apply 3 pints of this product per acre as a broadcast spray or as a 3/4 to 1-1/2 percent solution with handheld equipment. Make treatments prior to leaf deterioration by leaf-feeding insects.

Sage, black/Sagebrush, California/Chamise/Tallowtree, Chinese - For control of these species, apply a 3/4 percent solution with hand-held equipment. Thorough coverage of foliage is necessary for best results.

Saltbush, Sea myrtle - For control, apply this product as a 1 percent solution with hand-held equipment.

Willow - For control, apply 4-1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment.

Other woody brush and trees listed in this label - For partial control, apply 3 to 7-1/2 pints of this product per acre as a broadcast spray or as a 3/4 to 1-1/2 percent solution with hand-held equipment.

PASTURE AND RANGELANDS

PASTURES

LABELED GRASSES: Bahiagrass, Bermudagrass, Bluegrass, Brome, Fescue, Guineagrass, Kikuyugrass, Orchardgrass, Pangola grass, Ryegrass, Timothy and Wheatgrass.

TYPES OF APPLICATIONS: Preplant, Preemergence, Pasture Renovation, Spot Treatment, Over-the-Top Wiper Applications, Postemergent Weed Control (Broadcast Treatments).

Preplant, Preemergence, Pasture Renovation

USE INSTRUCTIONS: This product can be applied prior to planting or emergence of forage grasses or used to control perennial pasture species listed on this label prior to re-planting.

RESTRICTIONS: If application rates total 4.5 pints per acre or less, no waiting period between treatment and feeding of livestock grazing is required. If the rate is greater than 4.5 pints per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting. Crops listed for treatment in this label may be planted into the treated area at any time; for other crops, wait 30 days between application and planting.

Spot Treatment, Over-the-Top Wiper Applications

USE INSTRUCTIONS: This product can be applied as a spot treatment or with wiper applicators in pastures. Applications may be made in the same area at 30-day intervals.

PRECAUTIONS: To achieve maximum performance, remove domestic livestock before application and wait 7 days after application before grazing livestock or harvesting.

RESTRICTIONS: For spot treatments or wiper application methods using rates of 4.5 pints per acre or less, the entire field or any portion of it may be treated. When spot treatments or wiper application are made using rates above 4.5 pints per acre, no more than 10 percent of the total pasture may be treated at any one time.

Postemergent Weed Control (Broadcast Treatments)

USE INSTRUCTIONS: This product can be used to suppress competitive growth and seed production of annual weeds and undesirable vegetation in pastures. For selective applications with broadcast spray equipment, apply 9 to 12 fluid ounces of this product per acre in early spring before desirable perennial grasses break dormancy and initiate green growth. Late fall applications can be made after desirable perennial grasses have reached dormancy.

PRECAUTIONS: Some stunting of perennial grasses will occur if broadcast applications are made when plants are not dormant. No waiting period is required between application and grazing or harvesting for feed. Use of higher application rates will cause stand reductions.

RESTRICTIONS: Do not apply more than 72 fluid ounces per acre per year onto pasture grasses except for renovation uses (see instructions above). If replanting is needed due to severe stand reduction, applications must be made at least 30 days prior to planting any crop not listed for treatment in this label.

RANGELANDS

TYPES OF APPLICATIONS: Postemergence.

This product will control or suppress many annual weeds growing in perennial cool and warm-season grass rangelands.

Preventing viable seed production is key to the successful control and invasion of annual grassy weeds in rangelands. Follow-up applications in sequential years should eliminate most of the viable seeds. Delay grazing of treated areas to encourage growth of desirable perennials. Allowing desirable perennials to flower and reseed in the treated area will encourage successful transition.

USE INSTRUCTIONS: Apply 9 to 12 fluid ounces of this product per acre to control or suppress many weeds, including downy brome, cheatgrass, cereal rye and jointed goatgrass in rangelands. Apply when most brome plants are in early flower and before the plants, including seedheads, turn color. Allowing for secondary weed flushes to occur in the spring following rain events further depletes the seed reserve and encourages perennial grass conversion on weedy sites. Fall applications are possible, and recommended, where spring moisture is usually limited and fall germination allows for good weed growth.

For medusahead, apply 12 fluid ounces of this product per acre at the 3-leaf stage. Delaying applications beyond this stage will result in reduced or unacceptable control. Controlled burning may be useful in eliminating the thatch layer produced by slow decaying culms prior to application. Allow new growth to occur before spraying after a burn. Repeat applications in subsequent years may be necessary to eliminate the seedbank before reestablishing desirable perennial grasses in medusahead-dominated rangelands.

PRECAUTIONS: Slight discoloration of the desirable grasses may occur, but they will regreen and regrow under moist soil conditions as effects of this product wear off. No waiting period between treatment and feeding of livestock or grazing is required.

RESTRICTIONS: Do not use ammonium sulfate when spraying rangeland grasses with this product. Do not apply more than 4.5 pints per acre per year.

RANGELAND AND PASTURE THE USE OF SURFACTANT

When using this product for use on Rangeland and Pasture the use of a nonionic surfactant is required. Mix two or more quarts of a nonionic surfactant per 100 gallons of spray solution. Examples of when to use the higher surfactant rate include, but are not limited to: high water volumes, adverse environmental conditions, tough to control weeds, weeds under stress, surfactants with less than 70 percent active ingredient, tank mixes, etc.

When applied as directed under the conditions described, this product controls annual and perennial weeds listed in the label booklet. Do not reduce rates of this product when adding surfactant. DO NOT add buffering agents or pH adjusting agents to the spray solution when AquaNeat is the only pesticide used.

NON-CROP USES

See "PRODUCT INFORMATION" and "MIXING AND APPLICATION INSTRUCTIONS" sections of this label for essential product performance information and the following "NON-CROP" sections for specific uses.

EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OR SPRAY WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE TURFGRASSES, TREES, SHRUBS OR OTHER DESIRABLE VEGETATION SINCE SEVERE DAMAGE OR DESTRUCTION MAY RESULT.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seeds. Where repeat applications are necessary, do not exceed 8 quarts of this product per acre per year.

This product does not provide residual weed control. For subsequent weed control, follow a label-approved herbicide program.

Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used.

INDUSTRIAL, RECREATIONAL AND PUBLIC AREAS

When applied as directed for "NON-CROP USES", under conditions described, this product may be used to control the listed weeds.

Non-Crop Sites - This product may be used to control the listed weeds in terrestrial noncrop sites and/or in aquatic sites within these areas:

airfields; airports; alleys, lanes, trails & access roads; around commercial or industrial structures or outbuildings; around farm and ranch structures and outbuildings; around ornamental gardens; around ornamental trees & shrubs; bare ground; beaches; campgrounds; construction sites; ditch banks; drive-in theaters; driveways & ramps; dry ditches & canals; fences & fencerows; firebreaks; golf courses: gravel yards; habitat restoration & management areas; highways & roadsides (including aprons, medians, guardrails & right of ways); industrial plant sites; industrial areas; lumber yards; mulched areas; natural areas; paths and trails; parking areas; parks; paved areas; petroleum & other tank farms; pumping installations; pipeline, power, telephone & utility rights-of-way; power stations; preplant to turf & ornamental plants; railroad rights-of way; recreation areas; refineries; resorts; schools; sidewalks; sports areas; storage areas; substations; tennis courts; uncropped farmstead areas; uncultivated non-agricultural areas; vacant lots; walkways; wastelands; & wildlife habitat areas.

This product is a non-selective herbicide that is diluted and applied to the foliage of actively growing weeds as a spot or broadcast application. It is absorbed by the leaves and moves throughout the stem and roots to control the entire plant. Visible symptoms may require a week or more to appear, with burndown usually occurring in 2 to 4 weeks. Symptoms are a gradual wilting and yellowing of the sprayed plant followed by deterioration of both shoots and roots. This product has no herbicide activity in the soil and will not wash or leach to affect nearby vegetation. Any ornamental species may be planted in treated areas 7 days or more after application. For most effective results, delay mowing, clipping, planting or sodding of treated areas for at least 7 days after application. This allows time for this product to move within the plant.

For specific rates of application and instructions for control of particular annual weeds, perennial weeds, woody brush and trees, see the "WEEDS CONTROLLED" section of this label. These applications may be made to large affected areas or as spot treatments. For general use in small areas, see alternative instructions below under "Small Area Treatment With Hand-held Sprayers".

Unless the "Agriculture Use Requirements" on this label are observed, the following restrictions apply:

Not for use on plants being grown for sale or other commercial use, or for commercial seed production, or for research purposes. For use on plants intended for aesthetic purposes or climactic modification and being grown in ornamental gardens or parks, or on golf courses or lawns and grounds.

AVOID SPRAY DRIFT CONTACT WITH DESIRABLE LAWN GRASSES, FLOWERS, VEGETABLES, SHRUBS OR TREES. DO NOT CONTACT GREEN BARK OF TREES OR SHRUBS. IF DESIRABLE VEGETATION IS CONTACTED, WASH IMMEDIATELY WITH WATER.

Depending on the type of non-crop application, this product may be applied with boom equipment, high-volume spray equipment and hand-held sprayers as described in the respective portions of the "APPLICATION EQUIPMENT and TECHNIQUES" section of the label. Additionally, the product may be applied with recirculating sprayers, shielded applicators, or wiper applicators in any non-crop site specified on this label. See the "Selective Equipment" part of "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on proper use and calibration of this equipment.

Small Area Treatment With Hand-held Sprayers

Add 2.25 to 4.5 fluid ounces of this product plus 0.5 to 1 fluid ounce of nonionic surfactant to 1 gallon of clean water. Use the low rate for many grasses and annual weeds. Use the higher specified rate for control of perennials and brush. Use pump-up sprayer, backpack sprayer or other sprayer suitable for small areas. Adjust equipment to deliver a coarse spray pattern. USE OF HOSE-END SPRAYERS OR SPRINKLER-TYPE DEVICES MAY NOT BE USED.

TANK MIXTURES FOR NON-CROP SITES

When applied as a tank mixture, this product provides control of the emerged annual weeds and partial control of the emerged perennial weeds listed in this label. When applied as a tank mixture, the following residual herbicides will provide preemergence control of the weeds listed in the individual product labels.

This product PLUS Diuron
This product PLUS Krovar® I
This product PLUS Princep®, Caliber®90, Simazine 4L, 80W or 90DF
This product PLUS Surflan®75W, Surflan AS
This product PLUS Ronstar®50WP
This product PLUS Spyder or Spyder Extra
This product PLUS ProClipse
This product PLUS Polaris AC Complete

When tank mixing with residual herbicides, add an nonionic surfactant at 0.5 to 1 percent by volume of spray solution. See the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label before preparing these tank mixtures.

Read and carefully observe the label claims, precautionary statements, specified use rate and all other information on the labels of all products used in these tank mixtures.

Use according to the most restrictive label directions for each product in the mixture.

CONTROL OF EMERGED WEEDS

Note: For backpack sprayer and handgun applications, see the "HAND-HELD AND HIGH VOLUME EQUIPMENT" section for specified rates.

Annual Weeds

Apply 1.5 pints per acre of this product in these tank mixtures when weeds are less than 6 inches tall and 2.25 pints per acre when weeds are more than 6 inches tall.

Perennial Weeds

For partial control of perennial weeds using these tank mixtures, apply 1.5 to 7.5 pints per acre of this product. Follow the recommendations in the "WEEDS CONTROLLED" section of this label for stage of growth and rate of application for specific perennial weeds.

PREEMERGENCE WEED CONTROL

For preemergence weed control, refer to the individual product labels for specific non-crop sites, rates, carrier volumes and precautionary statements.

Mix only the quantity of spray solution which can be used during the same day. Do not allow these tank mixtures to stand overnight as this may result in reduced weed control.

BROADCAST APPLICATION FOR WEED CONTROL IN CHRISTMAS TREE PLANTATIONS

NOTE: IF THIS PRODUCT IS IMPROPERLY APPLIED, IT HAS THE POTENTIAL TO CAUSE SEVERE INJURY TO CHRISTMAS TREES. FOLLOW ALL LABELED DIRECTIONS.

This product may be applied as a broadcast spray over established Christmas trees. To prevent drift onto nearby desirable crops or vegetation, ensure that adequate buffers are maintained.

The following Christmas tree species are approved for this application:

- Douglas Fir (*Pseudotsuga menziesii*)
- Fir species (*Abies* spp.)
- Spruce species (*Picea* spp.)

Do not apply this product until trees have completed at least a full growing season since planting or transplanting.
Pre-harvest Interval (PHI): Do not apply within 1 full year prior to tree harvest.

In the fall, applications may only be made after the formation of final conifer resting buds. Final resting buds must be in the dormant stage and fully hardened. If applications are made at any other time, unacceptable Christmas tree injury may occur.

Avoid spray pattern overlap, as injury may result.

Apply 24 fluid ounces of this product per acre in 5 to 30 gallons of water per acre.

NOTE: ADDING SURFACTANTS, ADDITIVES CONTAINING SURFACTANTS, OR ANY OTHER ADDITIVES TO THIS PRODUCT MAY RESULT IN SEVERE CHRISTMAS TREE INJURY.

In some areas, this product may be used at rates from 24 to 48 fluid ounces per acre. Consult your local Nufarm representative for specific instructions if you require rates that exceed 24 fluid ounces per acre.

Do not use drift control additives as they may increase Christmas tree injury. Do not use other herbicides in a tank mix with this product as Christmas trees could be severely injured.

SILVICULTURAL SITES AND RIGHTS-OF-WAY

NOTE: DO NOT USE AS AN OVER-THE-TOP BROADCAST SPRAY IN SILVICULTURAL NURSERIES.

When applied as directed for "NON-CROP USES" under conditions described this product controls undesirable vegetation listed on this label. This product also suppresses or controls undesirable vegetation listed on this label when applied at specified rates for release of established coniferous species listed on this label.

For specific rates of application and instructions for control of various brush, annual and perennial weeds, see the "WEEDS CONTROLLED" section of this label. For specific rates of application for release of listed coniferous species, see the "CONIFER RELEASE" part of this section of the label.

Where repeat applications are necessary, do not exceed 8 quarts of this product per acre per year.

Aerial Application

This product may be applied using aerial spray equipment for silvicultural site preparation, conifer release and rights-of-way treatments. See the "APPLICATION EQUIPMENT and TECHNIQUES" part of the "MIXING AND APPLICATION INSTRUCTIONS APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on how to apply this product by air.

DO NOT APPLY THIS PRODUCT BY AIR TO RIGHTS-OF-WAY SITES IN THE STATE OF CALIFORNIA.

For aerial application, do not exceed 8 quarts per acre per year.

The maximum aerial application rate is 7-1/2 quarts per application.

SITE PREPARATION

Following preplant applications of this product, any silvicultural species may be planted.

POST DIRECTED SPRAY

In established silvicultural sites, use as a spray on the foliage of undesirable vegetation. Care must be exercised to avoid contact of spray, drift or mist with foliage or green bark of desirable species.

CONIFER RELEASE

For release, apply at the end of the first growing season, except in California. Do not disturb vegetation of target weeds or trees prior to treatment or until visual symptoms appear after treatment. Symptoms of treatment are slow to appear, especially in woody species treated in late Fall. **Injury may occur to conifers treated for release, especially where spray patterns overlap or the higher rates are applied or when applications are made during periods of active conifer growth.**

Applications must be made after formation of final conifer resting buds in the fall or prior to initial bud swelling in spring. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Use the following rates for conifer release to control or partially control the weeds listed in the "WEEDS CONTROLLED" section of this label.

For release of the following conifer species:

Douglas Fir	**Fir**	**Hemlock**	**Pines***	**Spruce**
Pseudotsuga menziesii	*Abies* spp.	*Tsuga* spp.	*Pinus* spp.	*Picea* spp.

*Includes all species except eastern white pine, loblolly pine or slash pine.

Apply 2.25 to 3 pints of this product per acre except in Washington and Oregon, west of the crest of the Cascade Mountains. For Spring treatments west of the crest of the Cascade Mountains, apply 1 quart of this product per acre before conifer bud swell for control of annual weeds. For Fall treatments in Washington and Oregon, west of the crest of the Cascade Mountains, apply 1.5 to 2.25 pints of this product per acre before any major leaf drop of deciduous species. Add 10 fluid ounces nonionic surfactant per 2 pints of this product. In Maine, up to 4.5 pints per acre may be used for the control of difficult weeds.

Note for Douglas fir release: Ensure that surfactant has been adequately tested for Douglas fir safety and follow manufacturer's specifications for rate of application.

For release of Western hemlock, apply 1 quart of this product per acre.

For release of the following conifer species:

Loblolly Pine	**Eastern white pine**	**Slash pine**
Pinus taeda	*Pinus strobus*	*Pinus elliottii*

Late Season Application - Apply 2-1/4 to 3 pints of this product in a minimum of 5 gallons of spray solution per acre during early autumn. Nufarm does not recommend the use of a crop oil concentrate or MSO (methylated seed oil) based surfactant for use in southern conifer species release with this product. The addition of a tested and approved southern conifer release surfactant is recommended. Applications made prior to September 1 or when conditions are conducive to rapid growth of conifers will create the potential for increased injury in the form of tip and/or needle burn. Injury may decrease with later applications. Some autumn colors are acceptable at time of application. Apply prior to frost or leaf drop of undesirable plants.

Applications made according to label directions will release loblolly pine, eastern white pine and slash pine by reducing competition from the following species:

Ash	**Hawthorn**	**Oak, Post**	**Poplar, yellow**	**Sumac, Smooth**
Fraxinus spp.	*Crataegus* spp.	*Quercus stellata*	*Liriodendron tulipfera*	*Rhus glabra*
Cherry, Black	**Locust, Black**	**Oak, Southern Red**	**Sassafras**	**Sumac, Winged**
Prunus serotina	*Robinia pseudoacacia*	*Quercus falcata*	*Sassafras aibidum*	*Rhus copallina*
Cherry, Pin	**Maple, Red**	**Oak, White**	**Sourwood**	**Sweetgum**
Prunus pensylvanica	*Acer rubra*	*Quercus alba*	*Oxydendrum arboreum*	*Liquidambar styraciflua*
Elm	**Oak, Black**	**Persimmon**	**Sumac, Poison**	
Ulmus spp.	*Quercus velutina*	*Diospyros* spp.	*Rhus vernix*	

Apply only to those sites where woody brush and trees listed in this label constitute the majority of the undesirable species.

For aerial application, do not exceed 8 quarts per acre per year.

The maximum aerial application rate is 7-1/2 quarts per application.

THIS PRODUCT PLUS SPYDER TANK MIXTURES FOR CONIFER RELEASE FROM HERBACEOUS WEEDS

To release Loblolly pines, Slash, Red pine and Virginia pine from herbaceous weeds, tank mixtures of this product with Spyder will provide control of annual weeds listed in the "WEEDS CONTROLLED" section of this and the Spyder label, and partial control of the perennial weeds listed below .

Apply 12 to 18 fluid ounces of this product plus 2 to 4 fluid ounces of Spyder in 10 to 30 gallons of spray solution per acre. Nufarm does not recommend the use of a crop oil concentrate or MSO (methylated seed oil) based surfactant for use in southern conifer species release with this product. The addition of a tested and approved southern conifer release surfactant is recommended. Make application to actively growing weeds as a broadcast spray over the top of the young Loblolly pine, Red pine, Slash pine and Virginia pine.

This tank mixture may be applied using aerial equipment. For aerial application, do not exceed 8 quarts of this product (8 lbs. ae glyphosate) per acre per year. The maximum aerial application rate is 7-1/2 quarts per application.

When applying by air, use the specified rate in 5 to 15 gallons of spray solution per acre. This product plus Spyder tank mixtures may not be applied by air in California.

For control of annual weeds below 12 inches in height (or runner length on annual vines), use the lower rates of both products.

Use the higher rates of both products when annual weeds are in more advanced stages of growth and approaching flower or seed formation.

Use the higher rates of both products for partial control of the following perennial weeds. Use the lower rates for suppression of growth.

Bahiagrass	**Dock, curly**	**Fescues, tall**	**Poorjoe***	**Vaseygrass**
Paspalum notatum	*Rumex crispus*	*Festuca arundinacea*	*Diodia teres*	*Paspalum urvillei*
Broomsedge	**Dogfennel**	**Johnsongrass***	**Trumpetcreeper****	**Vervain, blue**
Andropogon virginicus	*Eupatorium capilliflorium*	*Sorghum halepense*	*Campsis radicans*	*Verbena hastata*

*Control at the higher rates
**Suppression at the higher rates only.

Pine damage may occur or can be accentuated if treatment takes place when young trees are under stress from drought, flood water, insects or disease, or are in an active growth stage.

Read and observe the cautionary statements and all other information appearing on the labels of all herbicides used.

Note To User: This product must not be used in areas where adverse impact on federally designated endangered/threatened plant or aquatic species is likely. Prior to making applications, the user of this product must determine that no such species are located in or immediately adjacent to the area to be treated.

WILDLIFE HABITAT RESTORATION AND MANAGEMENT AREAS

This product is for the restoration and/or maintenance of native habitat and in wildlife management areas.

Habitat Restoration and Maintenance

When applied as directed, exotic and other undesirable vegetation may be controlled in habitat management areas. Applications may be made to allow recovery of native plant species, to open up water to attract waterfowl, and for similar broad-spectrum vegetation control requirements in habitat management areas. Spot treatments may be made to selectively remove unwanted plants for habitat enhancement. For spot treatments, care must be exercised to keep spray off of desirable plants.

Wildlife Food Plots

This product may be used as site preparation treatment prior to planting wildlife food plots. Apply as directed to control vegetation in the plot area. Any wildlife food species may be planted after applying this product, or native species may be allowed to re-infest the area. If tillage is needed to prepare a seedbed, wait 7 days after applying this product before tilling to allow for maximum effectiveness.

WIPER APPLICATIONS

For wick or wiper applications, mix 1 gallon of this product with 2 gallons of clean water to make a 33 percent solution. Addition of a nonionic surfactant at a rate of 10 percent by volume of total herbicide solution is recommended.

Wiper applications can be used to control or suppress annual and perennial weeds listed on this label. In heavy weed stands, a double application in opposite directions may improve results. See the "WEEDS CONTROLLED" section in this label for specified timing, growth stage and other instructions for achieving optimum results.

CUT STUMP APPLICATION

Woody vegetation may be controlled by treating freshly cut stumps of trees and resprouts with this product. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut vegetation close to the soil surface. **Apply a 50 to 100 percent solution of this product to the freshly-cut surface immediately after cutting.** Delay in application may result in reduced performance. For best results, make applications during periods of active growth and full leaf expansion.

When used according to directions for cut stump application, this product will control, partially control or suppress many types of woody brush and tree species, some of which are listed below:

Alder	**Eucalyptus**	**Maple**	**Reed, Giant**	**Sycamore**
Alnus spp.	*Eucalyptus* spp.	*Acer* spp.	*Arundo donax*	*Platanus occidentalis*
Coyote Brush	**Hickory**	**Oak**	**Salt cedar**	**Tan Oak**
Baccharis consanguinea	*Carya* spp.	*Quercus* spp.	*Tamarix* spp.	*Lithocarpus densiflorus*
Dogwood	**Madrone**	**Poplar**	**Sweet gum**	**Willow**
Cornus spp.	*Arbutus menziesii*	*Populus spp.*	*Liquidambar styraciflua*	*Salix* spp.

INJECTION AND FRILL APPLICATIONS

Woody vegetation may be controlled by injection or frill application of this product. Apply this product using suitable equipment which must penetrate into living tissue. Apply the equivalent of 1 ml of this product per 2 to 3 inches of trunk diameter. This is best achieved by applying 25 to 100 percent concentration of this product either to a continuous frill around the tree or as cuts evenly spaced around the tree below all branches. As tree diameter increases in size, better results are achieved by applying dilute material to a continuous frill or more closely spaced cuttings. Avoid application techniques that allow runoff to occur from frill or cut areas in species that exude sap freely after frills or cutting. In species such as these, make frill or cut at an oblique angle so as to produce a cupping effect and use undiluted material. For best results, make applications during periods of active growth and full leaf expansion.

Control		Suppression	
Oak	*Quercus* spp.	**Black Gum***	*Nyssa sylvatica*
Poplar	*Populus* spp.	**Dogwood**	*Cornus* spp.
Sweetgum	*Liquidambar styraciflua*	**Hickory**	*Carya* spp.
Sycamore	*Platanus occidentalis*	**Maple, Red**	*Acer rubrum*

*This product is not approved for this use on this species in the state of California.

INJECTION METHOD FOR CONTROL OF JAPANESE KNOTWEED *(Polygonum cuspidatum)* & GIANT KNOTWEED *(Polygonum polystachyum)*

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling.

This label must be in the possession of the user at the time of application.

All applicable directions and precautions in the AquaNeat Herbicide label booklet must be followed.

See the "PRODUCT INFORMATION" and "MIXING AND APPLICATION INSTRUCTIONS" sections of this product's label booklet for essential product performance information.

This product may be used for control of Japanese knotweed and giant knotweed using individual stem treatment. Individual knotweed stems may be treated by injecting up to 5 ml of this product, undiluted directly into the hollow stem just below a node. Make a hole suitable for injecting the herbicide through both sides of the stem using an awl or other convenient pointed tool about 6 inches above the ground, just below a node. (Nodes are circular thickenings or scars surrounding the stem where leaves are or were previously attached.) The herbicide is then injected into this hole. Each stem of the knotweed plant must be treated.

This product can be injected using any injection device capable of delivering a 5 ml dose. For convenience and accuracy, a hand-operated injection device designed to deliver repeated pre-measured doses from a supply reservoir is recommended.

Commercially available dose measuring equipment may be adapted for this purpose. Calibrate the devise to deliver a dose of 5 ml per injection cycle. A sharpened hollow probe for puncturing the stem and delivery of the herbicide can also be integrated into the delivery system.

Restriction: Do not apply more than 7.5 quarts of this product per acre. At 5 ml per stem, 7.5 quarts is sufficient to treat a maximum of 1,420 stems per acre.

RELEASE OF BERMUDAGRASS OR BAHIAGRASS ON NONCROP SITES
RELEASE OF DORMANT BERMUDAGRASS AND BAHIAGRASS

When applied as directed, this product will provide control or suppression of many winter annual weeds and tall fescue for effective release of dormant bermudagrass or bahiagrass. Make applications to dormant bermudagrass or bahiagrass.

For best results on winter annuals, treat when weeds are in an early growth stage (below 6 inches in height) after most have germinated. For best results on tall fescue, treat when fescue is in or beyond the 4- to 6-leaf stage.

WEEDS CONTROLLED

Rate for control or suppression of winter annuals and tall fescue are listed below.

Apply the specified rates of this product in 10 to 25 gallons of water per acre, plus 2 quarts nonionic surfactant per 100 gallons of total spray volume.

WEEDS CONTROLLED OR SUPPRESSED*

NOTE: C = Control
S = Suppression

	AQUANEAT AQUATIC HERBICIDE (FLUID OZ/ACRE)					
WEED SPECIES	**6**	**9**	**12**	**18**	**24**	**48**
Barley, little *Hordeum pusillum*	S	C	C	C	C	C
Bedstraw, catchweed *Galium aparine*	S	C	C	C	C	C
Bluegrass, annual *Poa annual*	S	C	C	C	C	C
Chervil *Chaerophyllum tainturieri*	S	C	C	C	C	C
Chickweed, common *Stellaria media*	S	C	C	C	C	C
Clover, crimson *Trifolium incarnatum*	.	S	S	C	C	C
Clover, large hop *Trifolium campestre*	.	S	S	C	C	C
Speedwell, corn *Veronica arvensis*	S	C	C	C	C	C
Fescue, tall *Festuca arundinacea*	.	.	.	.	S	S
Geranium, Carolina *Geranium carolinianum*	.	.	S	S	C	C
Henbit *Lamium amplexicaule*	.	S	C	C	C	C
Ryegrass, Italian *Lolium multiflorum*	.	.	S	C	C	C
Vetch, common *Vicia sativa*	.	.	S	C	C	C

*These rates apply only to sites where an established competitive turf is present.

RELEASE OF ACTIVELY GROWING BERMUDAGRASS

NOTE: USE ONLY ON SITES WHERE BAHIAGRASS OR BERMUDAGRASS ARE DESIRED FOR GROUND COVER AND SOME TEMPORARY INJURY OR YELLOWING OF THE GRASSES CAN BE TOLERATED.

When applied as directed, this product will aid in the release of bermudagrass by providing control of annual species listed in the "WEEDS CONTROLLED" section in this label, and suppression or partial control of certain perennial weeds.

For control or suppression of those annual species listed in this label, use 3/4 to 2-1/4 pints of this product as a broadcast spray in 10 to 25 gallons of spray solution per acre, plus 2 quarts of a nonionic surfactant per 100 gallons of total spray volume. Use the lower rate when treating annual weeds below 6 inches in height (or length of runner in annual vines). Use the higher rate as size of plants increases or as they approach flower or seedhead formation.

Use the higher rate for partial control or longer-term suppression of the following perennial species. Use lower rates for shorter-term suppression of growth.

Bahiagrass Johnsongrass**
Dallisgrass Trumpetcreeper*
Fescue (tall) Vaseygrass

*Suppression at the higher rate only.
**Johnsongrass is controlled at the higher rate.

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment but regrowth will occur under moist conditions. Do not make repeat applications in the same season, since severe injury may result.

BAHIAGRASS SEEDHEAD AND VEGETATIVE SUPPRESSION

When applied as directed in the "NONCROP SITES" section in this label, this product will provide significant inhibition of seedhead emergence and will suppress vegetative growth for a period of approximately 45 days with single applications and approximately 120 days with sequential applications.

Apply this product 1 to 2 weeks after full green-up of bahiagrass or after the bahiagrass has been mowed to a uniform height of 3 to 4 inches. Applications must be made prior to seedhead emergence. Apply 5 fluid ounces per acre of this product, plus 2 quarts of an approved nonionic surfactant per 100 gallons of total spray volume in 10 to 25 gallons of water per acre.

Sequential applications of this product plus nonionic surfactant may be made at approximately 45-day intervals to extend the period of seedhead and vegetative growth suppression. For continued vegetative growth suppression, sequential applications must be made prior to seedhead emergence.

Apply no more than 2 sequential applications per year. As a first sequential application, apply 3 fluid ounces of this product per acre plus nonionic surfactant. A second sequential application of 2 to 3 fluid ounces per acre plus nonionic surfactant may be made approximately 45 days after the last application.

ANNUAL GRASS GROWTH SUPPRESSION

For growth suppression of some annual grasses, such as annual ryegrass, wild barley and wild oats growing in coarse turf on roadsides or other industrial areas, apply 3 to 4 ounces of this product in 10 to 40 gallons of spray solution per acre. Mix 2 quarts of a nonionic surfactant per 100 gallons of spray solution. Make application when annual grasses are actively growing and before the seedheads are in the boot stage of development. Treatments made after seedhead emergence may cause injury to the desired grasses.

AQUATIC SITES

When applied as directed and under the conditions described in the "WEEDS CONTROLLED" section in this label, this product will control or partially control the labeled weeds growing in aquatic sites.

Aquatic Sites - This product may be applied to emerged weeds in all bodies of fresh and brackish water which may be flowing, non-flowing or transient. This includes lakes, rivers, streams, ponds, estuaries, rice levees, seeps, irrigation and drainage ditches, canals, reservoirs, wastewater treatment facilities, wildlife habitat restoration and management areas, and similar sites.

Wetland Sites - This product may be used in and around water (aquatic areas) and wetlands found in forestry and in power, telephone and pipeline rights-of-way sites including where these sites are adjacent to or surrounding domestic water supply reservoirs, supply streams, lakes and ponds. Read and observe the following before making applications in and around water.

If aquatic sites are present in the noncrop area and are part of the intended treatment, read and observe the following directions:

This product does not control plants which are completely submerged or have a majority of their foliage under water.

There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.

Consult local state fish and game agency and water control authorities before applying this product in, around and to public water. Permits may be required to treat such water.

Do not spray open bodies of water where woody brush, trees and herbaceous weeds do not exist. The maximum application rate of 3.75 quarts per acre must not be exceeded in a single over-water broadcast application except as follows, where any specified rate may be applied:

- Stream crossings in utility right-of-way.
- Where applications will result in less than 20 percent of the total water area being treated.

Restrictions: Do not apply this product directly to water within 1/2 mile up-stream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within 1/2 mile of an active potable water intake in a standing body of water such as lake, pond or reservoir. To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made ONLY in those cases where there are alternative water sources or holding ponds which would permit the turning off of an active potable water intake for a minimum period of 48 hours after the applications. This restriction does not apply to intermittent inadvertent overspray of water in terrestrial use sites.

For treatments after drawdown of water or in dry ditches, allow 7 or more days after treatment before reintroduction of water to achieve maximum weed control. Apply this product within 1 day after drawdown to ensure application to actively growing weeds. Floating Mats of vegetation may require retreatment. Avoid wash-off of sprayed foliage by spray boat or recreational boat backwash or by rainfall within 6 hours of application. Do not re-treat within 24 hours following the initial treatment.

Applications made to moving bodies of water must be made while traveling upstream to prevent concentration of this herbicide in water. When making any bankside applications, do not overlap more than 1 foot into open water. Do not spray in bodies of water where weeds do not exist.

Maximum Application Rate: Do not exceed 8 quarts per acre per year. The maximum application rate of 7-1/2 quarts per acre must not be exceeded in any single ground broadcast application or aerial broadcast application that is being made over water.

When emerged infestations require treatment of the total surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in fish kill.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Do not store below 32°F or above 100°F. Store in original container in a well-ventilated area separately from fertilizer, feed, and food stuffs. Avoid cross-contamination with other pesticides.

PESTICIDE DISPOSAL: Pesticide wastes are toxic. Wastes resulting from this product may be disposed of on site or at an approved waste disposal facility. Improper disposal of excess pesticide, spray mix, or rinsate is a violation of federal law. If these wastes cannot be disposed of according to label instructions, contact the state agency responsible for pesticide regulation or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER HANDLING:

NOTE: This product is available in multiple containers. Refer to the Net Contents section of this products labeling for the applicable "Nonrefillable" or "Refillable" designation. Follow the container handling instructions below that apply to your container type / size.

Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke

Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

WARRANTY DISCLAIMER

The directions for use of this product must be followed carefully. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, (1) THE GOODS DELIVERED TO YOU ARE FURNISHED "AS IS" BY MANUFACTURER OR SELLER AND (2) MANUFACTURER AND SELLER MAKE NO WARRANTIES, GUARANTEES, OR REPRESENTATIONS OF ANY KIND TO BUYER OR USER, EITHER EXPRESS OR IMPLIED, OR BY USAGE OF TRADE, STATUTORY OR OTHERWISE, WITH REGARD TO THE PRODUCT SOLD, INCLUDING, BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, USE, OR ELIGIBILITY OF THE PRODUCT FOR ANY PARTICULAR TRADE USAGE. UNINTENDED CONSEQUENCES, INCLUDING BUT NOT LIMITED TO INEFFECTIVENESS, MAY RESULT BECAUSE OF SUCH FACTORS AS THE PRESENCE OR ABSENCE OF OTHER MATERIALS USED IN COMBINATION WITH THE GOODS, OR THE MANNER OF USE OR APPLICATION, INCLUDING WEATHER, ALL OF WHICH ARE BEYOND THE CONTROL OF MANUFACTURER OR SELLER AND ASSUMED BY BUYER OR USER. THIS WRITING CONTAINS ALL OF THE REPRESENTATIONS AND AGREEMENTS BETWEEN BUYER, MANUFACTURER AND SELLER, AND NO PERSON OR AGENT OF MANUFACTURER OR SELLER HAS ANY AUTHORITY TO MAKE ANY REPRESENTATION OR WARRANTY OR AGREEMENT RELATING IN ANY WAY TO THESE GOODS.

LIMITATION OF LIABILITY

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR DAMAGES IN THEIR NATURE OF PENALTIES RELATING TO THE GOODS SOLD, INCLUDING USE, APPLICATION, HANDLING, AND DISPOSAL. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, MANUFACTURER OR SELLER SHALL NOT BE LIABLE TO BUYER OR USER BY WAY OF INDEMNIFICATION TO BUYER OR TO CUSTOMERS OF BUYER, IF ANY, OR FOR ANY DAMAGES OR SUMS OF MONEY, CLAIMS OR DEMANDS WHATSOEVER, RESULTING FROM OR BY REASON OF, OR RISING OUT OF THE MISUSE, OR FAILURE TO FOLLOW LABEL WARNINGS OR INSTRUCTIONS FOR USE, OF THE GOODS SOLD BY MANUFACTURER OR SELLER TO BUYER. ALL SUCH RISKS SHALL BE ASSUMED BY THE BUYER, USER, OR ITS CUSTOMERS. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BUYER'S OR USER'S EXCLUSIVE REMEDY, AND MANUFACTURER'S OR SELLER'S TOTAL LIABILITY SHALL BE FOR DAMAGES NOT EXCEEDING THE COST OF THE PRODUCT.

If you do not agree with or do not accept any of the directions for use, the warranty disclaimers, or limitations on liability, do not use the product, and return it unopened to the Seller, and the purchase price will be refunded.

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AquaNeat is a registered trademark of Nufarm, Inc.

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AquaNeat®

Aquatic Herbicide

GROUP 9 HERBICIDE

PULL HERE TO OPEN

FOR USE ON EMERGED AQUATIC WEEDS AND BRUSH IN AQUATIC SITES. FOR USE IN FORESTRY (INCLUDING WEED CONTROL IN CHRISTMAS TREE PLANTATIONS), PASTURES, RANGELANDS, RIGHTS-OF-WAY, HABITAT RESTORATION AREAS, NON-CROP AND OTHER LISTED APPLICATION SITES.

ACTIVE INGREDIENT:	
Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt*	53.8%
OTHER INGREDIENTS:	46.2%
TOTAL:	100.0%

*Contains 648 grams per litre or 5.4 pounds per U.S. gallon of the active ingredient, glyphosate, in the form of its isopropylamine salt. Equivalent to 480 grams per litre or 4 pounds per U.S. gallon of the acid, glyphosate.

KEEP OUT OF REACH OF CHILDREN

CAUTION / PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

SEE ATTACHED BOOKLET FOR COMPLETE PRECAUTIONARY STATEMENTS AND DIRECTIONS FOR USE

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300
For Medical Emergencies Only, Call (877) 325-1840

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION / PRECAUCION

Harmful if inhaled. Avoid breathing spray mist. Remove contaminated clothing and wash clothing before reuse. Wash thoroughly with soap and water after handling.

FIRST AID	
IF INHALED	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-325-1840 for emergency medical treatment information.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Do not store below 32°F or above 100°F. Store in original container in a well-ventilated area separately from fertilizer, feed, and food stuffs. Avoid cross-contamination with other pesticides.

PESTICIDE DISPOSAL: Pesticide wastes are toxic. Wastes resulting from this product may be disposed of on site or at an approved waste disposal facility. Improper disposal of excess pesticide, spray mix, or rinsate is a violation of federal law. If these wastes cannot be disposed of according to label instructions, contact the state agency responsible for pesticide regulation or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

(continued)

EPA Reg. No. 228-365
EPA Est. No. 228-IL-001

Manufactured for
Nufarm Americas Inc.
11901 S. Austin Avenue
Alsip, IL 60803

STORAGE AND DISPOSAL *(continued)*

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Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

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Specimen Label

Dow AgroSciences

Garlon® 3A

SPECIALTY HERBICIDE

®Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

For the control of woody plants, broadleaf weeds in range and pasture, forests and non-crop areas, including manufacturing and storage sites, rights-of-way such as electrical power lines, communication lines, pipelines, roadsides, railroads, fence rows, non-irrigation ditch banks, and around farm buildings; and applications to grazed areas, and establishment and maintenance of wildlife openings, and in Christmas tree plantations and aquatic sites.

For use in New York State, comply with Section 24(c) Special Local Need labeling for Garlon 3A, SLN NY-110005.

GROUP	4	HERBICIDE

Active Ingredient:	
Triclopyr: 2-[(3,5,6-trichloro-2-pyridinyl)oxy] acetic acid, triethylamine salt	44.4%
Other Ingredients	55.6%
Total	100.0%

Acid equivalent: triclopyr - 31.8% - 3 lb/gal

Precautionary Statements

Hazard to Humans and Domestic Animals

EPA Reg. No. 62719-37

DANGER

Corrosive • Causes Irreversible Eye Damage • Harmful If Swallowed Or Absorbed Through Skin • Prolonged Or Frequently Repeated Skin Contact May Cause Allergic Reaction In Some Individuals

Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Protective eyewear
- Chemical resistant gloves (≥14 mils) such as butyl rubber, natural rubber, neoprene rubber or nitrile rubber

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR 170.240(d)(4-6)), the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

First Aid

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person. Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Note to Applicator: Allergic skin reaction is not expected from exposure to spray mixtures of Garlon 3A herbicide when used as directed.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

Environmental Hazards

Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Under certain conditions, treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants, which may contribute to fish suffocation. This loss can cause fish suffocation. Therefore, to minimize this hazard, do not treat more than one-third to one-half of the water area in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State agency for fish and game before applying to public water to determine if a permit is needed.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Physical or Chemical Hazards

Combustible. Do not use or store the product near heat or open flame.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Shoes plus socks
- Protective eyewear
- Chemical-resistant gloves (≥14 mils) such as butyl rubber, natural rubber, neoprene rubber or nitrile rubber

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for Agricultural Pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Entry Restrictions for Non-WPS Uses: For applications to non-cropland areas, do not allow entry into areas until sprays have dried, unless applicator and other handler PPE is worn.

Storage and Disposal

Do not contaminate water, food, or feed by storage and disposal. Open dumping is prohibited.
Pesticide Storage: Store above 28°F or agitate before use.
Pesticide Disposal: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

Nonrefillable containers 5 gallons or less:
Container Handling: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers 5 gallons or larger:
Container Handling: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

Nonrefillable containers 5 gallons or larger:
Container Handling: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Product Information

Use Garlon® 3A specialty herbicide for the control of woody plants and broadleaf weeds in range and pasture, forests and non-crop areas including manufacturing and storage sites, rights-of-way such as electrical power lines, communication lines, pipelines, roadsides, railroads, fence rows, non-irrigation ditch banks, and around farm buildings, and applications to grazed areas, and establishment and maintenance of wildlife openings, and in Christmas tree plantations and aquatic sites.
Obtain Required Permits: Consult with appropriate state or local water authorities before applying this product to public waters. State or local public agencies may require permits.

Use Precautions

It is permissible to treat non-irrigation ditch banks, seasonally dry wetlands (such as flood plains, deltas, marshes, swamps, or bogs), and transitional areas between upland and lowland sites.

When making applications to control unwanted plants on banks or shorelines of moving water sites, minimize overspray to open water.

Use Restrictions

For use in New York State, comply with Section 24(c) Special Local Need labeling for Garlon 3A, SLN NY-110005.

Chemigation: Do not apply this product through any type of irrigation system.

Do not apply Garlon 3A directly to, or otherwise permit it to come into direct contact with, grapes, tobacco, vegetable crops, flowers, or other desirable broadleaf plants. Do not permit spray mists containing Garlon 3A to drift onto such plants.

Do not apply to salt water bays or estuaries.

Do not apply directly to un-impounded rivers or streams.

Do not apply on ditches or canals currently being used to transport irrigation water or that will be used for irrigation within 4 months following treatment. It is permissible to treat irrigation and non-irrigation ditch banks.

Do not apply where runoff water may flow onto agricultural land as injury to crops may result.

Do not apply with a mistblower.

Water treated with Garlon 3A may not be used for irrigation purposes for 120 days after application or until residue levels of Garlon 3A are determined by laboratory analysis, or other appropriate means of analysis, to be 1 ppb or less.

Seasonal Irrigation Waters: Garlon 3A may be applied during the off-season to surface waters that are used for irrigation on a seasonable basis provided that there is a minimum of 120 days between applying Garlon 3A and the first use of treated water for irrigation purposes, or until residue levels of Garlon 3A are determined by laboratory analysis, or other appropriate means of analysis, to be 1 ppb or less.

Irrigation Canals/Ditches: Do not apply Garlon 3A to irrigation canals/ditches unless the 120-day restriction on irrigation water usage can be observed or residue levels of Garlon 3A are determined by laboratory analysis, or other appropriate means of analysis, to be 1 ppb or less.

Maximum Use Rates

- Apply no more than 6 lb ae of triclopyr (2 gallons of Garlon 3A) per acre per year on aquatic sites.
- Apply no more than 2 lb ae of triclopyr (2/3 gallon of Garlon 3A) per acre per growing season on range and pasture sites, including rights-of-way, fence rows or any area where grazing or harvesting of hay is allowed.
- On forestry sites, Garlon 3A may be used at rates up to 6 lb ae of triclopyr (2 gallons of Garlon 3A) per acre per year.
- For all terrestrial use sites other than range, pasture, forestry sites, and grazed/hayed areas, the maximum application rate is 9 lb ae of triclopyr (3 gallons of Garlon 3A) per acre per year.

Precautions for Potable Water Intakes for Emerged Aquatic Weed Control
See chart below for specific setback distances near functioning potable water intakes. **Note:** Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

	Garlon 3A Application Rate			
Area Treated	**2 qt/acre**	**4 qt/acre**	**6 qt/acre**	**8 qt/acre**
(acres)	**Setback Distance (ft)**			
4	0	200	400	500
>4 - 8	0	200	700	900
>8 - 16	0	200	700	1000
>16	0	200	900	1300

To apply Garlon 3A around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

Recreational Use of Water in Treatment Area: There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.

Livestock Use of Water from Treatment Area: There are no restrictions on livestock consumption of water from the treatment area.

Grazing and Haying Restrictions

Grazing green forage:
- There are no grazing restrictions for livestock or dairy animals on treated areas.

Haying (harvesting of dried forage)
- Do not harvest hay for 14 days after application.

Slaughter Restrictions: During the season of application, withdraw livestock from grazing treated grass at least 3 days before slaughter.

Avoiding Injurious Spray Drift

Make applications only when there is little or no hazard from spray drift. Small quantities of spray, which may not be visible, may seriously injure susceptible plants. Do not spray when wind is blowing toward susceptible crops or ornamental plants that are near enough to be injured. It is suggested that a continuous smoke column at or near the spray site or a smoke generator on the spray equipment be used to detect air movement, lapse conditions, or temperature inversions (stable air). If the smoke layers or indicates a potential of hazardous spray drift, do not spray.

Aerial Application: For aerial application on rights-of-way or other areas near susceptible crops, apply through a Microfoil† or Thru-Valve boom†, or use an agriculturally labeled drift control additive. Other drift reducing systems or thickened sprays prepared by using high viscosity inverting systems may be used if they are made as drift-free as mixtures containing agriculturally labeled thickening agents or applications made with the Microfoil or Thru-Valve boom. Keep spray pressures low enough to provide coarse spray droplets. Spray boom should be no longer than 3/4 of the rotor length. Do not use a thickening agent with the Microfoil or Thru-Valve booms, or other systems that cannot accommodate thick sprays. Spray only when the wind velocity is low (follow state regulations). Avoid application during air inversions. If a spray thickening agent is used, follow all use recommendations and precautions on the product label.

†Reference within this label to a particular piece of equipment produced by or available from other parties is provided without consideration for use by the reader at its discretion and subject to the reader's independent circumstances, evaluation, and expertise. Such reference by Dow AgroSciences is not intended as an endorsement of such equipment, shall not constitute a warranty (express or implied) of such equipment, and is not intended to imply that other equipment is not available and equally suitable. Any discussion of methods of use of such equipment does not imply that the reader should use the equipment other than is advised in directions available from the equipment's manufacturer. The reader is responsible for exercising its own judgment and expertise, or consulting with sources other than Dow AgroSciences, in selecting and determining how to use its equipment.

Spray Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications:

1. The distance of the outer most operating nozzles on the boom must not exceed 3/4 the length of the rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they must be observed.

The applicator should be familiar with and take into account the information covered in the following Aerial Drift Reduction Advisory. [This information is advisory in nature and does not supersede mandatory label requirements.]

Aerial Drift Reduction Advisory

Information on Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size:
- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: For some use patterns, reducing the effective boom length to less than 3/4 of the rotor length may further reduce drift without reducing swath width.

Application Height: Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Applications should not occur during a local, low level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas: The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Ground Equipment: To aid in reducing spray drift, Garlon 3A should be used in thickened (high viscosity) spray mixtures using an agriculturally labeled drift control additive, high viscosity invert system, or equivalent as directed by the manufacturer. With ground equipment, spray drift can be reduced by keeping the spray boom as low as possible; by applying 20 gallons or more of spray per acre; by keeping the operating spray pressures at the lower end of the manufacturer's recommended pressures for the specific nozzle type used (low pressure nozzles are available from spray equipment manufacturers); and by spraying when wind velocity is low (follow state regulations). In hand-gun applications, select the minimum spray pressure that will provide adequate plant coverage (without forming a mist). Do not apply with nozzles that produce a fine-droplet spray.

High Volume Leaf-Stem Treatment: To minimize spray drift, do not use pressure exceeding 50 psi at the spray nozzle and keep sprays no higher than brush tops. An agriculturally labeled thickening agent may be used to reduce drift.

Weed Resistance Management:

Triclopyr, the active ingredient in this product, is a Group 4 herbicide based on the mode of action classification system of the Weed Science Society of America. Any weed population may contain or develop plants resistant to Group 4 herbicides. Resistant weeds may dominate the weed population if these herbicides are used repeatedly in the same field. Such resistant weed plants may not be effectively managed using Group 4 herbicides but may be effectively managed utilizing other herbicides alone or in mixtures from a different herbicide Groups that are labeled for control of these weeds and/or by using cultural or mechanical practices. However, a herbicide mode of action classification by itself may not adequately address specific weeds that are resistant to specific herbicides. Consult your local company representative, state cooperative

extension service, professional consultants or other qualified authorities to determine appropriate actions for treating specific resistant weeds.

Best Management Practices:

Proactively implementing diversified weed control strategies to minimize selection for weed populations resistant to one or more herbicides is recommended. A diversified weed management program may include the use of multiple herbicides with different modes of action and overlapping weed spectrum with or without tillage operations and/or other cultural practices. Research has demonstrated that using the labeled rate and directions for use is important to delay the selection for resistant weeds. Scouting after a herbicide application is important because it can facilitate the early identification of weed shifts and/or weed resistance and thus provide direction on future weed management practices. One of the best ways to contain resistant weed populations is to implement measures to avoid allowing weeds to reproduce by seed or to proliferate vegetatively. Cleaning equipment between sites and avoiding movement of plant material between sites will greatly aid in reducing the spread of resistant weed seed.

Plants Controlled

Woody Plant Species

alder
arrowwood
ash
aspen
Australian pine
bear clover (bearmat)
beech
birch
blackberry
blackgum
Brazilian pepper
cascara
ceanothus
cherry
chinquapin
choke cherry
cottonwood
crataegus (hawthorn)
Douglas fir
dogwood
elderberry
elm
gallberry
hazel
hornbean
kudzu[1]
locust
madrone
maples
mulberry
oaks
persimmon
pine
poison ivy
poison oak
poplar
salt-bush (*Baccharis* spp.)
salt cedar[2]
salmonberry
sassafras
scotch broom
sumac
sweetbay magnolia
sweetgum
sycamore
tanoak
thimbleberry
tulip poplar
waxmyrtle
western hemlock
wild rose
willow
winged elm

[1]For complete control, re-treatment may be necessary.
[2]Use cut surface treatments for best results.

Annual and Perennial Broadleaf Weeds

bindweed
burdock
Canada thistle
chicory
curly dock
dandelion
field bindweed
lambsquarter
Mexican petunia
plantain
purple loosestrife
ragweed
smartweed
Spanish needles/ common beggarthicks
tansy ragwort
tropical soda apple
vetch
wedelia
wild lettuce

Purple Loosestrife (*Lythrum salicaria*)

Purple loosestrife can be controlled with foliar applications of Garlon 3A. For broadcast applications, use a minimum of 4 1/2 to 6 lb ae of triclopyr (6 to 8 quarts of Garlon 3A) per acre. Apply Garlon 3A when purple loosestrife is at the bud to mid-flowering stage of growth. Follow-up applications for control of regrowth should be made the following year in order to achieve increased control of this weed species. For all applications, a non-ionic surfactant should be added to the spray mixture. Follow all directions and use precautions on the label of the surfactant. Thorough wetting of the foliage and stems is necessary to achieve satisfactory control. A minimum spray volume of 50 gallons per acre is neededfor ground broadcast applications.

If using a backpack sprayer, a spray mixture containing 1% to 1.5% Garlon 3A or 5 to 7.6 fl oz of Garlon 3A per 4 gallons of water should be used. All purple loosestrife plants should be thoroughly wetted.

Application Methods

Use Garlon 3A at rates of 3/4 to 9 lb ae of triclopyr (1/4 to 3 gallons of Garlon 3A) per acre to control broadleaf weeds and woody plants. In all cases, use the amount specified in enough water to give uniform and complete coverage of the plants to be controlled. Use only water suitable for spraying. Use an agriculturally labeled non-ionic surfactant for all foliar applications. When using surfactants, follow the use directions and precautions listed on the surfactant manufacturer's label. Use the higher concentrations of surfactant in the spray mixture when applying lower spray volumes per acre. The order of addition to the spray tank is water, spray thickening agent (if used), additional herbicide (if used), and Garlon 3A. Surfactant should be added to the spray tank last or as recommended on the product label. If combined with emulsifiable concentrate herbicides, moderate continuous adequate agitation is required.

Before using any recommended tank mixtures, read the directions and all use precautions on both labels. **Note:** If tank mixing with Rodeo® herbicide, mix the Garlon 3A with at least 75% of the total spray volume desired and ensure that Garlon 3A is well mixed before adding the Rodeo to avoid incompatibility.

For best results, apply when woody plants and weeds are actively growing. When hard to control species such as ash, blackgum, choke cherry, elm, maples, oaks, pines, or winged elm are prevalent and during applications made in late summer when the plants are mature and during drought conditions, use the higher rates of Garlon 3A alone or in combination with Tordon® 101 Mixture specialty herbicide. (Tordon 101 Mixture is a restricted use pesticide. See product label.) Tordon 101 Mixture is not registered for use in the states of California and Florida.

When using Garlon 3A in combination with 2,4-D 3.8 lb amine, like DMA 4 IVM, or low volatile ester herbicides, generally the higher rates should be used for satisfactory brush control.

Use the higher dosage rates when brush approaches an average of 15 feet in height or when the brush covers more than 60% of the area to be treated. If lower rates are used on hard to control species, resprouting may occur the year following treatment.

On sites where easy to control brush species dominate, rates less than those listed may be effective. Consult State or Local Extension personnel for such information.

Foliage Treatment With Ground Equipment
High Volume Foliage Treatment

For control of woody plants, use Garlon 3A at the rate of 3 to 9 lb ae of triclopyr (1 to 3 gallons of Garlon 3A) per 100 gallons of spray solution, or Garlon 3A at 3/4 to 3 lb ae of triclopyr (1 to 4 quarts of Garlon 3A) may be tank mixed with 2,4-D amine, like DMA 4 IVM, or low volatile ester or Tordon 101 Mixture and diluted to make 100 gallons of spray solution. Apply at a volume of 100 to 400 gallons of total spray per acre depending upon size and density of woody plants. Coverage should be thorough to wet all leaves, stems, and root collars. (See Use Precautions and Restrictions.) Do not exceed maximum allowable use rates per acre (see table below). Tordon 101 Mixture is not registered for use in the states of California and Florida.

Maximum Labeled Rate versus Spray Volume per Acre

Total Spray Volume (gal/acre)	Maximum Rate of Garlon 3A		
	Range and Pasture Sites[1] (gal/100 gal of spray)	Forestry Sites[2] (gal/100 gal of spray)	Other Non-Cropland Sites[3] (gal/100 gal of spray)
400	Do not use	0.5	0.75
300	Do not use	0.67	1
200	Do not use	1	1.5
100	0.67	2	3
50	1.33	4	6
40	1.67	5	7.5
30	2.33	6.65	10
20	3.33	10	15
10	6.67	20	30

[1]Do not exceed the maximum use rate of 2 lb ae of triclopyr (2/3 gal of Garlon 3A)/acre/year.
[2]Do not exceed the maximum use rate of 6 lb ae of triclopyr (2 gal of Garlon 3A)/acre/year.
[3]Do not exceed the maximum use rate of 9 lb ae of triclopyr (3 gal of Garlon 3A)/acre/year on non-cropland use sites other than rangeland, pasture, forestry, and grazed/hayed areas.

Low Volume Foliage Treatment
To control susceptible woody plants, apply up to 15 lb ae of triclopyr (5 gallons of Garlon 3A) in 10 to 100 gallons of finished spray. The maximum volume of the finish spray applied to an acre is limited by the maximum use rate per site type (See Maximum Use Rates section - Range and Pasture, Grazing, Haying sites 2 lb ae, Forestry sites 6 lb ae, and all other sites 9 lb ae triclopyr).The spray concentration of Garlon 3A and total spray volume per acre should be adjusted according to the size and density of target woody plants and kind of spray equipment used. With low volume sprays, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars (see General Use Precautions and Restrictions). For best results, a surfactant should be added to all spray mixtures. Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 psi may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

Tank Mixing: As a low volume foliar spray, up to 9 lb ae of triclopyr (3 gallons of Garlon 3A) may be applied in tank mix combination with Tordon K or Tordon 101 Mixture in 10 to 100 gallons of finished spray. The maximum volume of the finish spray applied to an acre is limited by the maximum use rate per site type (See Maximum Use Rates section - Range and Pasture, Grazing, Haying sites 2 lb ae, Forestry sites 6 lb ae, and all other sites 9 lb ae triclopyr). Tordon 101 Mixture and Tordon K are not registered for use in the states of California and Florida.

When applying this product in tank mix combination, follow all applicable use directions, precautions and limitations on each manufacturer's label. **Note:** If tank mixing with Rodeo® herbicide, mix the Garlon 3A with at least 75% of the total spray volume desired and ensure that Garlon 3A is well mixed before adding the Rodeo to avoid incompatibility.

Broadcast Applications With Ground Equipment
Apply using equipment that will assure uniform coverage of the spray volumes applied. To improve spray coverage, add an agriculturally labeled non-ionic surfactant as described later under Directions for Use. See Maximum Labeled Rate versus Spray Volume per Acre table above for relationship between mixing rate, spray volume and maximum application rate.

Woody Plant Control
Foliage Treatment: Use 6 to 9 lb ae of triclopyr (2 to 3 gallons of Garlon 3A) in enough water to make 20 to 100 gallons of total spray per acre or 1 1/2 to 3 lb ae of triclopyr (1/2 to 1 gallon of Garlon 3A) may be combined with 2,4-D amine, like DMA 4 IVM, or low volatile esters or Tordon 101 Mixture in sufficient water to make 20 to 100 gallons of total spray per acre. Tordon 101 Mixture is not registered for use in the states of California and Florida.

Broadleaf Weed Control
Use Garlon 3A at rates of 1 to 4 1/2 lb ae of triclopyr (1/3 to 1 1/2 gallons of Garlon 3A) in a total volume of 20 to 100 gallons of water per acre. Apply any time during the growing season. Garlon 3A at 1 to 3 lb ae of triclopyr (1/3 to 1 gallon of Garlon 3A) may be tank mixed with Tordon K, Tordon 101 Mixture or 2,4-D amine, like DMA 4 IVM, or low volatile herbicides to improve the spectrum of activity. Tordon 101 Mixture and Tordon K are not registered for use in the states of California and Florida.

Aerial Application (Helicopter Only)
Aerial sprays should be applied using suitable drift control. (See Use Precautions and Restrictions.) Add an agriculturally labeled non-ionic surfactant as described under Directions for Use. See Maximum Labeled Rate versus Spray Volume per Acre table above for relationship between mixing rate, spray volume and maximum application rate.

Foliage Treatment (Non-Grazed Rights-of-Way)
Non-grazed areas: Use 6 to 9 lb ae of triclopyr (2 to 3 gallons of Garlon 3A) or 3 to 4 1/2 lb ae of triclopyr (1 to 1 1/2 gallons of Garlon 3A) in a tank mix combination with 2,4-D amine, like DMA 4 IVM, or low volatile esters or Tordon 101 Mixture, and apply in a total spray volume of 10 to 30 gallons per acre. Use the higher rates and volumes when plants are dense or under drought conditions. Tordon 101 Mixture is not registered for use in the states of California and Florida.

Interspersed areas in non-grazed rights-of-ways that may be subject to grazing may be spot treated if the treated area comprises no more than 10% of the total grazable area.

Cut Surface Treatments
Individual plant treatments such as basal bark and cut surface applications may be used on any use site listed on this label at a maximum use rate of 2.67 gallons of Garlon 3A (8 lb ae of triclopyr) per acre. These types of applications are made directly to ungrazed parts of plants and, therefore, are not restricted by the grazing maximum rate of 2/3 of a gallon of Garlon 3A (2 lb ae of triclopyr) per acre.

To control unwanted trees of hardwood species such as elm, maple, oak and conifers in labeled sites, apply Garlon 3A, either undiluted or diluted in a 1 to 1 ratio with water, as directed below.

With Tree Injector Method
Apply by injecting 1/2 milliliter of undiluted Garlon 3A or 1 milliliter of the diluted solution through the bark at intervals of 3 to 4 inches between centers of the injector wound. The injections should completely surround the tree at any convenient height. **Note: No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is injected directly into plants.**

With Hack and Squirt Method
Make cuts around the tree trunk at a convenient height with a hatchet or similar equipment so that the cuts overlap slightly and make a continuous circle around the trunk. Spray 1/2 milliliter of undiluted Garlon 3A or 1 milliliter of the diluted solution into the pocket created between the bark and the inner stem/trunk by each cut.

With Frill or Girdle Method
Make a single girdle through the bark completely around the tree at a convenient height. The frill should allow for the herbicide to remain next to the inner stem and absorb into the plant. Wet the cut surface with undiluted or diluted solution.

Both of the above methods may be used successfully at any season except during periods of heavy sap flow of certain species - for example, maples.

Stump Treatment
Spray or paint the cut surfaces of freshly cut stumps and stubs with undiluted Garlon 3A. The cambium area next to the bark is the most vital area to wet.

Forest Management Applications
For best control from broadcast applications of Garlon 3A, use a spray volume which will provide thorough plant coverage. Recommended spray volumes are usually 10 to 25 gallons per acre by air or 10 to 100 gallons per acre by ground. To improve spray coverage of spray volumes less than 50 gallons per acre, add an agriculturally labeled non-ionic surfactant as described under Directions for Use. Application systems should be used to prevent hazardous drift to off-target sites. Nozzles or additives that produce larger droplets of spray may require higher spray volumes to maintain brush control.

Forest Site Preparation (Not for Conifer Release)
Use up to 6 lb ae of triclopyr (2 gallons of Garlon 3A) and apply in a total spray volume of 10 to 30 gallons per acre or Garlon 3A at 3 to 4 1/2 lb ae of triclopyr (1 to 1 1/2 gallons of Garlon 3A) may be used with Tordon 101 Mixture or 2,4-D low volatile ester in a tank mix combination in a total spray volume of 10 to 30 gallons per acre. Use a non-ionic agricultural surfactant for all foliar applications as described under Directions for Use. Tordon 101 Mixture is not registered for use in the states of California and Florida.

Note: Conifers planted sooner than one month after treatment with Garlon 3A at less than 4 lb ae of triclopyr (1 1/3 gallons of Garlon 3A) per acre or sooner than two months after treatment at 4 to 6 lb ae of triclopyr (1 1/3 to 2 gallons of Garlon 3A) per acre may be injured. When tank mixtures of herbicides are used for forest site preparation, labels for all products in the mixture mustbe consulted and the longest recommended waiting period before planting observed.

Directed Spray Applications for Conifer Release
To release conifers from competing hardwoods such as red maple, sugar maple, striped maple, sweetgum, red and white oaks, ash, hickory, alder, birch, aspen, and pin cherry, mix 3 to 6 lb ae of triclopyr (1 to 2 gallons of Garlon 3A) in enough water to make 100 gallons of spray mixture. To improve spray coverage, add an agriculturally labeled non-ionic surfactant as described under Directions for Use. The spray mixture should be directed onto foliage of competitive hardwoods using knapsack or backpack sprayers with flat fan nozzles or equivalent any time after hardwoods have reached full leaf size, but before autumn coloration. The majority of treated hardwoods should be less than 6 feet in height to ensure adequate spray coverage. Care should be taken to direct spray away from contact with conifer foliage, particularly foliage of desirable pines.

Note: Spray may cause temporary damage and growth suppression where contact with conifers occurs; however, injured conifers should recover and grow normally. Over-the-top spray applications can kill pines.

Broadcast Applications for Conifer Release in the Northeastern United States
To release spruce, fir, red pine and white pine from competing hardwoods, such as red maple, sugar maple, striped maple, alder, birch (white, yellow or gray), aspen, ash, pin cherry and *Rubus* spp. and perennial and annual broadleaf weeds, use Garlon 3A at rates of 1 1/2 to 3 lb ae of triclopyr (2 to 4 quarts of Garlon 3A) per acre alone or with 2,4-D amine, like DMA 4 IVM, or 2,4-D ester to provide no more than 4 lb ae per acre

from both products. Apply in late summer or early fall after conifers have formed their over wintering buds and hardwoods are in full leaf and prior to autumn coloration.

Broadcast Applications for Douglas-Fir Release in the Pacific Northwest and California

To release Douglas-fir from susceptible competing vegetation such as broadleaf weeds, alder, blackberry or Scotch broom, apply Garlon 3A at 1 to 1 1/2 lb ae of triclopyr (1 1/3 to 2 quarts of Garlon 3A) per acre alone or in combination with 4 lb per acre of atrazine. Mix all sprays in a water carrier with a non-ionic surfactant. Apply in early spring after hardwoods begin growth and before Douglas fir bud break ("early foliar" hardwood stage) or after Douglas fir seasonal growth has "hardened off" (set winter buds) in late summer, but while hardwoods are still actively growing. When treating after Douglas fir bud set, apply prior to onset of autumn coloration in hardwood foliage. **Note:** Treatments applied during active Douglas fir shoot growth (after spring bud break and prior to bud set) may cause injury to Douglas fir trees.

Christmas Tree Plantations

Use Garlon 3A for the control of woody plants and annual and perennial broadleaf weeds in established Christmas tree plantations. For best results, apply when woody plants and weeds are actively growing. Garlon 3A does not control weeds which have not emerged at the time of application. If lower rates are used on hard to control woody species, resprouting may occur the year following treatment. Brush over 8 feet tall is difficult to treat efficiently using hand equipment such as backpack or knapsack sprayers. When treating large brush or trees or hard to control species such as ash, blackgum, choke cherry, elm, hazel, madrone, maples, oaks or sweetgum, and for applications made during drought conditions or in late summer when the leaves are mature, use the higher rates of Garlon 3A or use cut surface application methods. For foliar applications, apply in enough water to give uniform and complete coverage of the plants to be controlled. Applications made under drought conditions may provide less than desirable results.

Use Precautions:

- Newly seeded turf (alleyways, etc.) should be mowed two or three times before any treatment with Garlon 3A.

Use Restrictions:

- Do not use on newly seeded grass until well established as indicated by vigorous growth and development of secondary root system and tillering
- Do not reseed Christmas tree areas treated with Garlon 3A for a minimum of three weeks after application.
- Do not use Garlon 3A if legumes, such as clover, are present and injury cannot be tolerated.

Spray Preparation

The order of addition to the spray tank is water, drift control agent (if used), non-ionic agricultural surfactant and Garlon 3A. Continue moderate agitation while mixing and spraying. Use a non-ionic agricultural surfactant for all applications. When using surfactants, follow use directions and precautions listed on the manufacturer's label. Use the higher recommended concentrations of surfactant in the spray mixture when applying lower spray volumes per acre. **Note:** If tank mixing with Rodeo herbicide, mix the Garlon 3A with at least 75% of the total spray volume desired and ensure that Garlon 3A is well mixed before adding the Rodeo to avoid incompatibility.

Application

Apply in late summer or early autumn after terminal growth of Christmas trees has hardened of, but before leaf drop of, target weeds. Apply at a rate of 3/4 to 1 3/4 lb ae of triclopyr (2 to 5 pints of Garlon 3A) per acre as a foliar spray directed toward the base of Christmas trees. Use sufficient spray volume to provide uniform coverage of target plants (20 to 100 gallons per acre). **Do not apply with 2,4-D.** Application rates of Garlon 3A directed for Christmas trees will only suppress some well established woody plants that are greater than 2 to 3 years old (see table below). Broadcast sprays may also be applied in bands between the rows of planted trees. Use spray equipment that will assure uniform coverage of the desired spray volume.

Spray solution from Garlon 3A can cause needle and branch injury to Christmas trees. To minimize injury to Christmas trees, direct sprays so as to minimize contact with foliage. Blue spruce, white spruce, balsam fir and Frasier fir are less susceptible to injury than white pine and Douglas fir.

Restriction: Apply Garlon 3A only to established Christmas trees that were planted at least one full year prior to application.

Application Rates and Species Controlled:

Garlon 3A		
2 pints/acre (3/4 lb ae of triclopyr)	3 to 4 pints/acre (1 1/2 lb ae of triclopyr)	5 pints/acre (1 3/4 lb ae of triclopyr)
clover	bindweed, field (TG)	arrowwood (SDL)
dandelion	blackberry[1]	aspen
dock, curly	chicory (s)	beech (SDL)
lambsquarters	fireweed	birch (SDL)
lespedeza	ivy, ground	chinquapin
plantain, broadleaf	lettuce, wild	cottonwood (SDL)
plantain, buckhorn	oxalis	elderberry
ragweed, common	poison ivy	grape, wild
vetch	smartweed (TG)	mulberry (SDL)
	thistle, Canada (TG)	poplar (SDL)
	violet, wild	sassafras (SDL)
	Virginia creeper[1]	sumac (SDL)
		sycamore (SDL)

(TG) Top growth control, retreatment may be necessary
(S) Suppression
(SDL) Seedlings less than 2 to 3 years old
[1]Use 4 pint per acre rate

Directed Applications

To control hardwoods such as red maple, sugar maple, striped maple, sweetgum, red and white oaks, ash, alder, birch, aspen, and pin cherry, mix 4 to 20 fl oz of Garlon 3A in enough water to make 3 gallons of spray mixture. For directed applications, do not exceed 6 lb ae of triclopyr (2 gallons of Garlon 3A) per acre per year. To improve coverage, add a non-ionic agricultural surfactant to the spray. This spray mixture should be directed onto foliage of competitive hardwoods using knapsack or backpack sprayers with flat fan nozzles or equivalent any time after hardwoods have reached full leaf size, but before autumn coloration (when plants are actively growing). The majority of treated hardwoods should be less than 8 feet in height to ensure adequate spray coverage. **Note:** To prevent Christmas tree injury, care should be taken to direct spray away from contact with Christmas tree foliage.

Cut Surface Treatments

When treating large brush or trees or hard to control species such as ash, blackgum, choke cherry, elm, hazel, madrone, maples, oaks, salt cedar or sweetgum, and for applications made during drought conditions or in late summer when the leaves are mature, use cut surface treatments. (See directions for Cut Surface Treatments in preceding section of this label.)

Wetland Sites in Forests and Non-Crop Areas

Garlon 3A may be used within forests and non-crop sites to control target vegetation in and around standing water sites, such as marshes, wetlands, and the banks of ponds and lakes and transition areas between upland and lowland sites.

For control of woody plants and broadleaf weeds in these sites, follow use directions and application methods on this label for forestry and non-cropland sites.

Use Precautions:

Minimize overspray to open water when treating target vegetation in and around non-flowing, quiescent or transient water. When making applications to control unwanted plants on banks or shorelines of flowing water, minimize overspray to open water. **Note:** Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat such areas.

Terms and Conditions of Use

If terms of the following Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. To the extent permitted by law, otherwise, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitations of Remedies.

Warranty Disclaimer

Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. To the extent permitted by law, Dow AgroSciences MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Dow AgroSciences or the seller. All such risks shall be assumed by buyer.

Limitation of Remedies

To the extent permitted by law, the exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Dow AgroSciences' election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used.

Dow AgroSciences shall not be liable for losses or damages resulting from handling or use of this product unless Dow AgroSciences is promptly notified of such loss or damage in writing. To the extent permitted by law, in no case shall Dow AgroSciences be liable for consequential or incidental damages or losses.

The terms of the Warranty Disclaimer, Inherent Risks of Use, and this Limitation of Remedies cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Dow AgroSciences or the seller is authorized to vary or exceed the terms of the Warranty Disclaimer or this Limitation of Remedies in any manner.

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Produced for
Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268

Label Code: D02-101-041
Replaced Label: D02-101-040
LOES Number: 010-00084

EPA accepted 02/25/16

Revisions:

1. Added Crop Group 4 Herbicide box MOA, Weed Resistance Management and Best Management Practices language.
2. Updated Active Ingredient section.
3. Updated the Hazard to Human and Domestic Animals section.
4. Updated language under Engineering Controls section.
5. Updated the User Safety Recommendations section.
6. Updated the Use Precautions and Use Restrictions sections.
7. Added the title for Maximum Use Rates section and updated section.
8. Added/updated the Grazing and Haying Restriction as follow:

   Grazing and Haying Restrictions

   Grazing green forage:
   - There are no grazing restrictions for livestock or dairy animals on treated areas.

   Haying (harvesting of dried forage)
   - Do not harvest hay for 14 days after application.

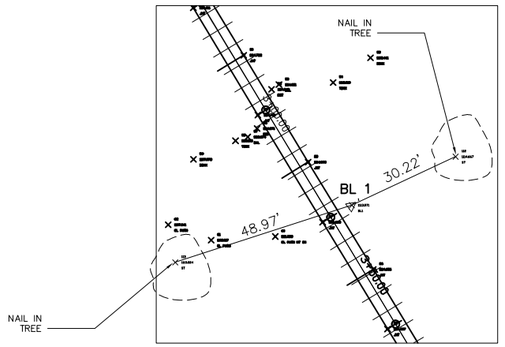
   Slaughter Restrictions: During the season of application, withdraw livestock from grazing treated grass at least 3 days before slaughter.
9. Removed all tank mix partner rates throughout the label.
10. Added the following sentence to direct users to the Maximum Use Rates section: The maximum volume of the finish spray applied to an acre is limited by the maximum use rate per site type (See Maximum Use Rates section - Range and Pasture, Grazing, Haying sites 2 lb ae, Forestry sites 6 lb ae, and all other sites 9 lb ae triclopyr).
11. Corrected 4 to 9 lb ae of triclopyr to 4 to 6 lb and update 3 gallons of Garlon 3A to 2 gallons.
12. Changed the word recommended to directed throughout the label.

ATTACHMENT 1

Temporary Railroad Crossing Design

DESIGN SUPERVISOR C.M. MINKLER | JOB MANAGER ------- | ESTIMATED BY ------- | DRAFTED BY ------- | DESIGNED BY ------- | CHECKED BY C.M. MINKLER | QUALITY CONTROL BY C.M. MINKLER

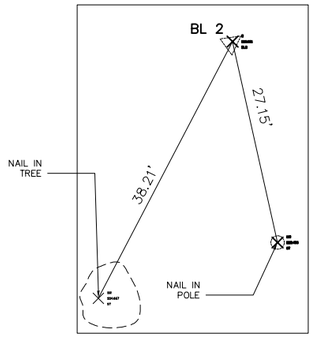
FED. ROAD REG. NO.	STATE	CONTRACT NO.	SHEET NO.	TOTAL SHEETS
	NEW YORK		1	3
CITY OF CORTLAND				
RAIL CROSSING NEAR MP235.45				
CORTLAND COUNTY				
P.I.N.----------		B.I.N.----------		



BL 1 928583.7664' 951235.4351' 1113.971'

BASELINE POINT # 1 - SWING TIES

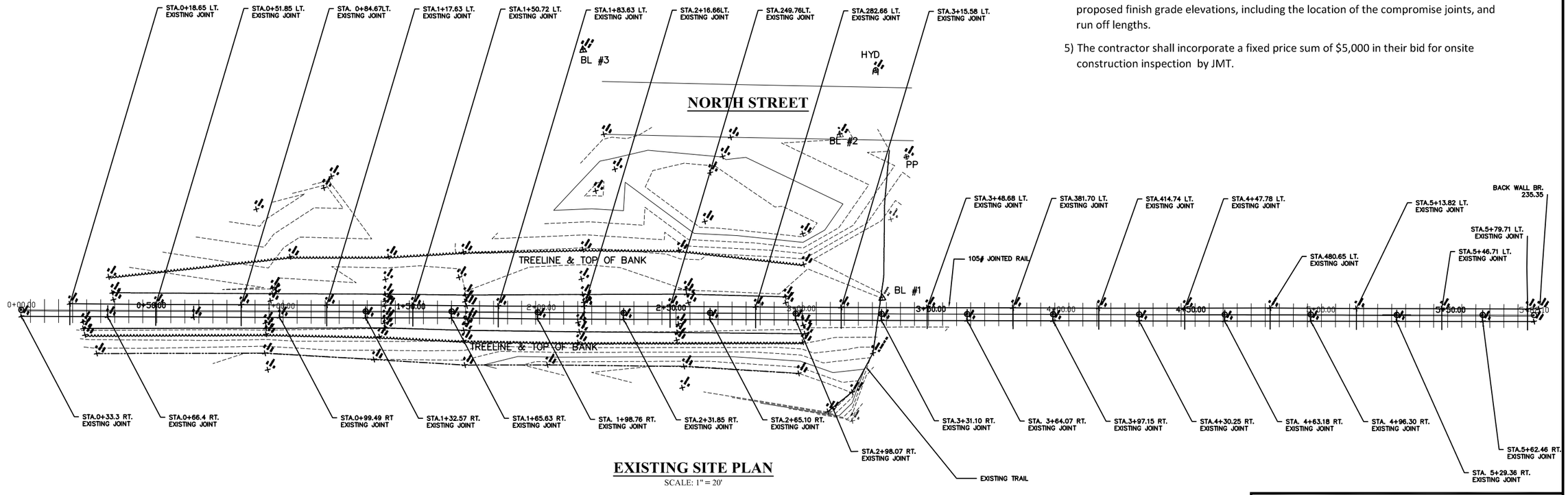
SCALE: N.T.S.



BL 2 928628.8432' 951282.0780' 1110.631'

BASELINE POINT # 2 - SWING TIES

SCALE: N.T.S.



EXISTING SITE PLAN

SCALE: 1" = 20'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.

DESIGN AND CONSTRUCTION NOTES:

DUE TO THE TIME FRAME OF THE CONSTRUCTION PHASE OF THE PROJECT, THE FOLLOWING NOTES SHALL APPLY:

1) Both roadway approaches to the crossing have been designed by others. JMT assumes no responsibility for the design or construction .
2) If the crossing is not constructed by the NYS&W RAILWAY, herein referred to as the client. The following notes will be the responsibility of the contractor.
3) All materials used in the construction of the crossing, including but not limited to the concrete panels, subbase material, fabric, ballast, rail, ties, tie plates, spikes, and compromise joints shall be approved by the client and JMT prior to the start of construction.
4) The contractor shall verify all top of rail elevations and submit to the client, and JMT all proposed finish grade elevations, including the location of the compromise joints, and run off lengths.
5) The contractor shall incorporate a fixed price sum of $5,000 in their bid for onsite construction inspection by JMT.

REVISION		
NO.	DATE	DESCRIPTION

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STATE OF NEW YORK · CHRISTINA MARIE MINKLER · 094891 · LICENSED PROFESSIONAL ENGINEER

Christina Minkler

CITY OF CORTLAND

ROAD CROSSING NEAR MP 235.45

EXISTING SITE PLAN

DATE :	10/28/19	SHEET NO.	1 OF 3
SCALE :	AS SHOWN		
FILE NO. :	19.02094N.001	DRAWING NO.	19-02094.001
CAD FILE NO. :	SITE PLAN		

FED. ROAD REG. NO.	STATE	CONTRACT NO.	SHEET NO.	TOTAL SHEETS
	NEW YORK		2	3

CITY OF CORTLAND

RAIL CROSSING NEAR MP235.45

CORTLAND COUNTY

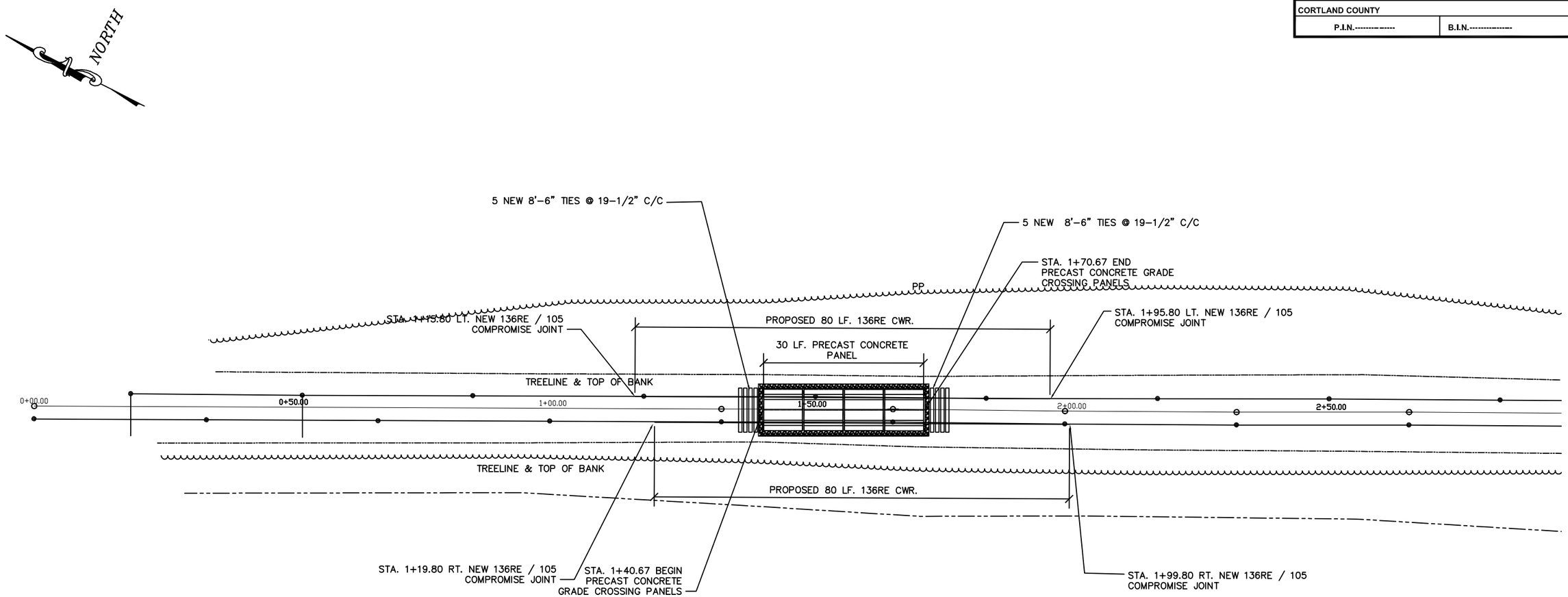
P.I.N.---------- B.I.N.----------

DESIGNED BY C.M. MINKLER CHECKED BY C.M. MINKLER

DRAFTED BY ------- ESTIMATED BY -------

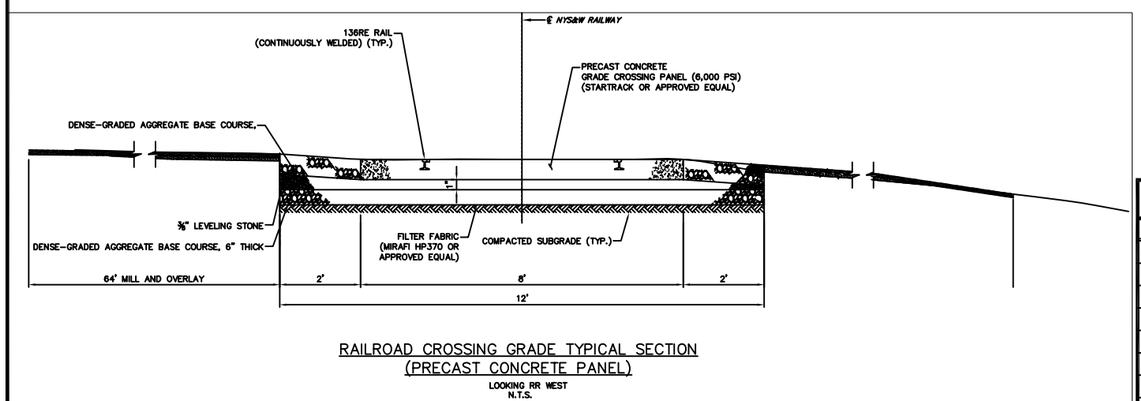
CHECKED BY C.M. MINKLER JOB MANAGER -------

DESIGN SUPERVISOR C.M. MINKLER



PROPOSED SITE PLAN

SCALE: 1" = 10'



RAILROAD CROSSING GRADE TYPICAL SECTION
(PRECAST CONCRETE PANEL)

LOOKING RR WEST
N.T.S.

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

REVISION		
NO.	DATE	DESCRIPTION

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Christina Minkler

CITY OF CORTLAND

ROAD CROSSING NEAR MP 235.45

PROPOSED SITE PLAN

DATE :	10/28/19	SHEET NO.	2 OF 3
SCALE :	AS SHOWN		
FILE NO. :	19-02094N-001	DRAWING NO.	19-02094.001
CAD FILE NO. :	SITE PLAN		

FED. ROAD REG. NO.	STATE	CONTRACT NO.	SHEET NO.	TOTAL SHEETS
	NEW YORK		3	3

CITY OF CORTLAND

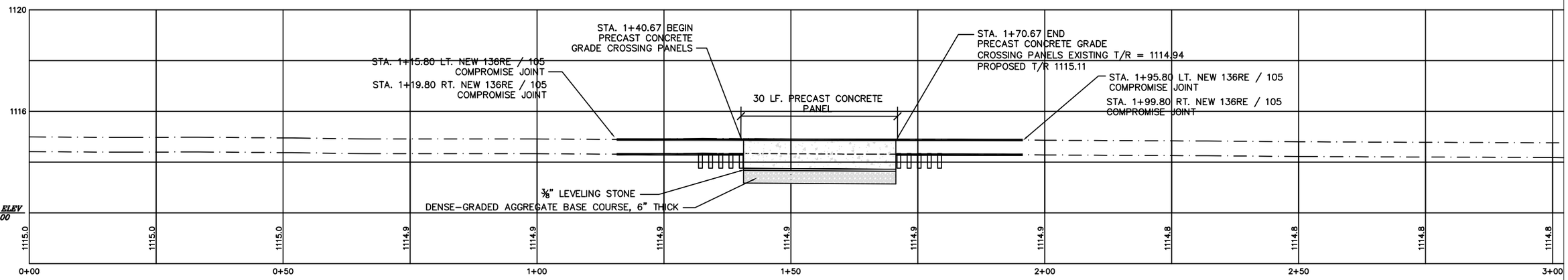
RAIL CROSSING NEAR MP235.45

CORTLAND COUNTY

P.I.N.---------- B.I.N.----------

DESIGN SUPERVISOR ___C.M. MINKLER___ JOB MANAGER ___C.M. MINKLER___ DESIGNED BY ___JCS___ DRAFTED BY ___------___ ESTIMATED BY ___C.M. MINKLER___ CHECKED BY ___C.M. MINKLER___

NORTH



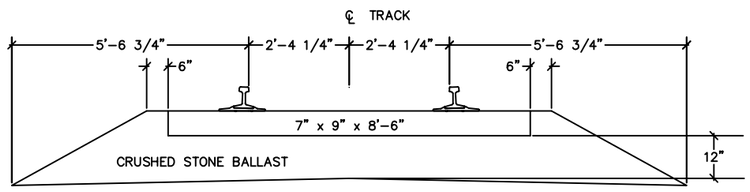
PROPOSED PROFILE

SCALE: H 1" = 10'
V 1" = 2'

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



TANGENT – SINGLE TRACK

NTS

REVISION		
NO.	DATE	DESCRIPTION

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C. Minkler

CITY OF CORTLAND

ROAD CROSSING NEAR MP 235.45

PROPOSED SITE PLAN

DATE :	10/28/19	SHEET NO.	3 OF 3
SCALE :	AS SHOWN		
FILE NO. :	19-02094.001	DRAWING NO.	19-02094.001
CAD FILE NO. :	SITE PLAN		

ATTACHMENT 2

2016 Pre-Design Investigation Summary Report (Provided Electronically)

ARCADIS Design & Consultancy for natural and built assets

Ms. Sarah Saucier
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7014

Arcadis of New York, Inc.
6723 Towpath Road
PO Box 66
Syracuse
New York 13214-0066
Tel 315 446 9120
Fax 315 446 8053
www.arcadis.com

ENVIRONMENT

Subject:
Cortland-Homer Former MGP Site
Operable Unit 2 Pre-Design Investigation
Tioughnioga River Sediments
Pre-Design Investigation Letter Report

Date:
February 29, 2016

Contact:
David A. Cornell, P.G.

Phone:
315 671 9379

Email:
David.Cornell@arcadis.com

Our ref:
B0013137.0001

Dear Ms. Saucier:

This letter presents the results of the Pre-Design Investigation (PDI) completed for the Cortland-Homer former manufactured gas plant (MGP) site (the site) located in Homer, New York. The PDI was conducted by Arcadis of New York, Inc. (Arcadis), on behalf of New York State Electric & Gas (NYSEG), between November 10, 2014 and July 24, 2015. The fieldwork was performed in accordance with the following correspondence:

- Supplemental Sediment Drilling Work Plan dated April 11, 2013;
- New York State Department of Environmental Conservation's (NYSDEC) approval letter to NYSEG dated March 31, 2014;
- Recommendations proposed in the Phase 1 Supplemental Sediment Assessment Letter Report dated October 6, 2014; and
- An email from Arcadis to the NYSDEC on November 12, 2014 summarizing agreements between NYSEG and NYSDEC during a November 10, 2014 discussion regarding the additional delineation of MGP-related impacts.

The PDI objectives and background are provided below, followed by a discussion of the completed fieldwork and results of the PDI.

Objectives and Background

The overall objective of the PDI was to further delineate MGP-related impacts in sediments based on the initial findings of the near site, downstream, and upstream sediment cores and samples as reported in the Phase I Supplemental Sediment Assessment Letter Report, dated October 6, 2014. The Phase I supplemental sediment assessment was conducted by Arcadis, on behalf of NYSEG, between April 28 and May 9, 2014 and is included as **Attachment 1**.

Additional areas for vertical and horizontal delineation were identified based on the findings of the Phase I supplemental assessment. NYSEG and the NYSDEC agreed that additional data would be required to delineate the extent of MGP-related impacts within the 2005 Record of Decision (ROD) defined areas in the Tioughnioga River adjacent and downstream of the site. These areas include the area adjacent to the site (Near Site Area), the areas just downstream from the site extending to the closed bridge (Near Downstream Area and West Bank Area), and the areas further downstream of the site from the railroad bridge to the sediment trap (Downstream - Meander Area, Sandbar Area and Sediment Trap Area). This additional field work was completed in two mobilizations. The first mobilization began on November 10, 2014, and extended through December 19, 2014. At that time drilling was suspended due to high water levels and unsafe working conditions throughout the winter. At the request of the NYSDEC as to not disrupt the trout fishing season, the second mobilization was postponed until June 2015. Subsequently the second and final mobilization began on June 22, 2015, and field work was completed on July 24, 2015.

As set forth in the November 2014 email correspondence, the specific objectives of the PDI were to:

- evaluate the distribution of visual impacts [i.e., sheens, non-aqueous phase liquid (NAPL)] in deeper sediments in comparison to the impacts observed during the 2003 supplemental remedial investigation (SRI, Stearns & Wheler Companies).
- assess the concentration and distribution of site-related polycyclic aromatic hydrocarbons (PAHs) in sediments at levels above background concentrations.
- obtain the necessary geotechnical data to support a remedial design.

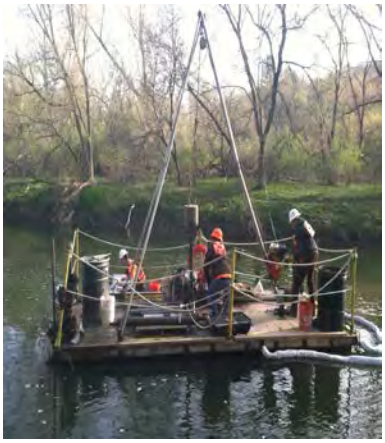
This letter report describes the additional PDI activities, provides the cumulative PDI results from each sediment core and sample, provides the revised horizontal and vertical extents of each ROD defined area, and sets forth the next steps towards implementing the remedial design.

Pre-Design Investigation Sediment Drilling and Sampling

From November 10 to December 19, 2014, 43 planned (SED-139 to SED-181) sediment cores were advanced in the Tioughnioga River to approximately ten feet below the sediment surface (bss) or until refusal. These sediment cores were located directly adjacent to the site and downstream of the site extending to the closed bridge in the *Near Site Area* and the *Near Downstream and West Bank Areas*, respectively (**Figures 1 and 2**). Core locations SED-165, SED-166, and SED-168 were advanced beyond ten feet based on field observations and to obtain geotechnical data. In addition, there were a total of five planned sediment cores (SED 132 through SED-135 and SED-137), and 13 contingency cores (SED-103A through SED-103C, SED-109A and SED-109B, SED-110A, SED-112A, SED-113B and SED-113C, SED-114A, SED-118A, SED-124E, and SED-125A) collected downstream of the site between the railroad bridge and the “sediment trap” in the *Downstream Area* (**Figure 3**). Each of these locations were advanced to ten feet bss or refusal. Due to shallow water conditions the drilling barge could not access locations SED-136 and SED-138, therefore they were not completed. Additionally, winter weather conditions prevented the advancement of supplemental contingency locations planned during the 2014 mobilization. These areas were addressed by additional core locations advanced during the 2015 mobilization.

Little Beaver Rig

From June 22, 2015 to July 24, 2015, 23 planned sediment cores (SED-184 through SED-207) and five contingency borings (SED-190A, SED-23A, SED-199A, SED-201A and SED-206A) were installed adjacent to the site and downstream to the closed bridge in the *Near Site Area* and the *Near Downstream Area*, respectively (**Figures 1 and 2**). Further downstream between the railroad bridge and sediment trap in the *Downstream Areas* (**Figure 3**), an additional 10 planned sediment cores (SED-182, SED-183, and SED-208 through SED-215) and six contingency borings (SED-110B, SED-122A, SED-182A, SED-208A, SED-208B and SED-214A) were completed from two to ten feet bss or refusal. Additionally, 12 shallow samples (SED-23R, SED-116R, SED-135R, SED-140R, SED-141R, SED-142R, SED-143R, SED-149R, SED-164R, SED-192R, SED-193R, and SED-195R,) were recollected to various depths from 0 to 5 feet to refine the vertical delineation of impacts. The original cores at each of the recollection locations exhibited only odors at shallower intervals and samples were not collected at these intervals. However, based on low concentrations of PAHs in the deeper intervals, additional shallow samples were obtained to evaluate if any impacts exist at shallower depths at each of the locations. Sediment core logs are provided in **Attachment 2**.


Barge-Mounted Cathead Rig

Due to the heavily armored bottom and channelized nature of the downstream sections of the Tioughnioga River, borings were advanced by Parratt-Wolff Inc. using drive and wash methods and multiple barge mounted configurations including a Little Beaver® drill rig and a Tripod mounted Portable Cathead. The portion of the Tioughnioga River adjacent to the site and downstream to the closed bridge was too shallow for a float or barge therefore borings were advanced by an ATV-mounted CME 55 using drive and wash methods (**Figures 1 and 2**). Sediment locations SED-214 and SED-182 were advanced by Arcadis using a tripod-mounted Potable Cathead due to the boring location being exposed above the water line of the river. Shallow recollection locations were advanced manually using a slide hammer to drive a 4-foot Macrocore® barrel containing an expendable 2-inch diameter liner.

ATV Rig

For sediment cores advanced using the barge-mounted setup, an oil absorbent boom was placed around the downstream portion of the barge to contain any sheens produced by the drilling activities. A temporary casing was also set prior to borehole advancement to contain any suspended sediment created by the drilling process. Sediment within the temporary casing was allowed to settle following completion of the boring before being removed from the stream bed. Sediment samples were obtained continuously using a 3-inch diameter by 2-foot long split spoon sampler driven by a 300-pound hammer. The barge mounted borings were generally advanced to a

depth of 10 feet into the sediment or until refusal. Sediment cores advanced using the ATV-mounted CME 55 also utilized the same sampling techniques and methods used for the barge setup. Water depths, blow-counts, sample recoveries, and/or any observed impacts produced by the drilling were noted during the sediment investigation.

Prior to initiating the sediment drilling activities, a utility clearance was performed. Equipment used during the drilling program was decontaminated prior to, in between, and after all intrusive activities using an Alconox wash or by steam cleaning. Decontamination water, sediment cuttings and all investigation-derived waste (IDW) were containerized in 55-gallon drums for subsequent off-site disposal by NYSEG. Upon completion, sediment core holes were allowed to naturally collapse as requested by the NYSDEC. Core holes where sheens were observed on the water column were backfilled with bentonite chips. The location and sediment surface elevations of each boring were surveyed by Arcadis using a global positioning system (GPS) relative to North American Datum of 1983 (NAD 83) and North American Vertical Datum of 1988 (NAVD 88), respectively.

Recovered sediment samples were visually characterized for color, composition, and presence/absence of potential MGP-related impacts (i.e., NAPL, blebs, coating, sheens, staining, or odors) and headspace screened for volatile organic compounds using a photoionization detector (PID). One sediment sample from each location was submitted for laboratory analysis and an additional sample from a lower interval was submitted to be held pending the initial results. A total of 146 samples were submitted for laboratory analysis (including quality assurance/quality control [QA/QC] samples) during this phase of the investigation for a total of 188 samples. Sediment sampling intervals were selected for laboratory analysis based on field observations described in the Supplemental Sediment Drilling Work Plan. When sediment samples exhibited field observations of potential impacts at the pre-determined termination depth, additional deeper intervals were sampled until at least 2 feet of visually clean sediment was encountered. Sediment samples were submitted to Accutest Laboratories for analysis of PAHs using United States Environmental Protection Agency (USEPA) SW-846 Method 8270.

Arcadis validated the laboratory analytical data and prepared a Data Usability Summary Report (DUSR) for each individual sample delivery group (SDG) using the most-recent versions of the USEPA's Function Guidelines (USEPA, 1999; 2002) and USEPA Region II SOPs for data validation. The DUSRs include an assessment of data accuracy, precision, and completeness; significant quality assurance problems, solutions, corrections, and potential consequences; and analytical data validation reports. The results of the data validation have been incorporated into the analytical data presented in **Table 1** which includes the results of all the 2014 and 2015 samples. Analytical data generated during the PDI will be submitted to the NYSDEC in their electronic data deliverable (EDD) format (EQuIS) and DUSR's will be provided upon request.

Pre-Design Investigation Results

The following discussion of the PDI supplemental sediment assessment results is divided into subsections based on the areas that were investigated, specifically the area adjacent to the site (*Near Site Area;* **Figure 1**), the areas downstream of the site to the closed bridge (*Near Downstream and West Bank Areas*; **Figures 1 and 2**) and the areas further downstream of the site (*Downstream – Meander, Sandbar and Sediment Trap Areas*; **Figure 3**).

Based on the results of the 2014-15 PDI investigation, the 2013 sediment assessment and the SRI (**Attachment 3**) the 2005 ROD areas for remedial consideration were refined. The refinement was based on the following criteria:

- Visual observations of site-related NAPLs defined in the 2005 ROD as free tar and oil in sediments;
- Sediment generating a sheen when the sediment is disturbed; and
- Site-related total target compound list PAHs ($TPAH_{17}$) greater than the background value of 6.2 milligrams per kilogram (mg/kg) as defined in the 2005 ROD.

In addition, other considerations used for the refinement of the areas for remedial consideration included:

- The age of the data;
- The background data robustness; and
- The potential for non-site related PAHs to be present.

The SRI data was collected approximately 15 years ago. As such if there are discrepancies in the SRI and the PDI data, the more recent PDI data is given precedence.

The SRI sediment background was based on $TPAH_{17}$ concentrations from six upstream sediment samples ranging from 0 to 6.2 mg/kg collected from four boring locations (7, 8, 10, and 11). The highest end of this range, 6.2 mg/kg, was selected as the site-specific background. It should be noted that boring 13, also advanced during the SRI, located approximately 180 feet upstream from the former MGP-site in close proximity to background location 8, contained a $TPAH_{17}$ concentration of 59.89 mg/kg and although three "clean" borings (14, 15 and 16) are located between the site and boring 13, this location was not considered in the ROD when determining the site background concentration. Subsequent to the SRI, additional PDI data collected from the same background areas suggest that the sediment background is likely higher than 6.2 mg/kg such as 14.1 mg/kg at SED-130 or even higher. As such when $TPAH_{17}$ concentrations are just above 6.2 mg/kg, the delineation evaluates such values on a case by case basis in consideration of the adjacent sample concentrations and the likelihood that the PAHs are site-related or non-site related. SRI and PDI background data are summarized in the adjacent table.

Background Location	Total PAHs mg/kg
7	5.37
8	6.22
10	4.12
11	2.44
SED-129	6.14
SED-130	14.10
SED-131	2.67

Near Site Area

The Near Site Area is located adjacent to the former MGP site (**Figure 1**). Cross sections of the stream along select transects in the Near Site Area are depicted on **Figure 4.** Based on 53 sediment cores, the sediments of the Near Site Area are primarily described as fine to coarse gravels, sands and cobbles with occasional fine sand and silt lenses that are approximately 0.5 to 2 feet in thickness at SED128, SED-193/SED-193R and SED-195/ SED-195R. Field observations of potential impacts were noted at 17 of the 53 sediment core locations and included granular tar, solid tar, tar-like substance, blebs, taffy-like tar, dark/black staining, and sheens. In addition, trace sheens and MGP-like odors were observed at seven locations. No saturated NAPL conditions were encountered. $TPAH_{17}$ concentrations ranged from non-detect (ND) at SED-180 (0-2), 15

Near Site Area

(2-4, 4-6), SED-179 (0-2), SED-178 (0-2), SED-177 (2-4), 16 (2-4), SED-170 (0-2), and SED-195 (2-4) to 5,000 mg/kg at SED-190 (0-2). A more comprehensive list of field observations and $TPAH_{17}$ concentrations at the Near Site Area is provided in **Table 2**.

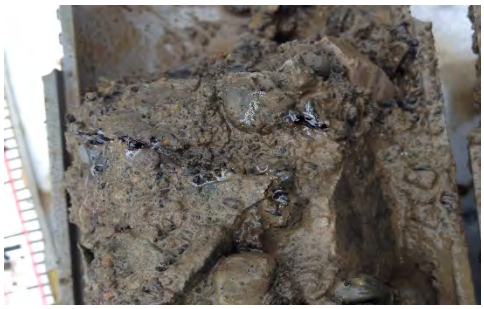
Near Downstream Area

The Near Downstream Area is divided into two subareas, specifically, Near Downstream Area 1 and the West Bank Area. (**Figures 1 and 2**). Cross sections of the stream along select transects in the Near Downstream Area are depicted on **Figure 5.**

Near Downstream Area

Near Downstream Area 1

Based on 49 sediment cores, the sediments of Near Downstream Area 1 are primarily described as fine to coarse gravels, sands and cobbles with occasional fine to medium sand and silt lenses that are approximately 0.5 to 1 feet in thickness at SED-142/SED-142R and SED-141R. Field observations of potential impacts were noted at 3 of the 49 sediment core locations and included tar blebs and taffy-like tar blebs. In addition, faint MGP odors were observed at five core location and a trace sheen was observed at one location. No saturated NAPL conditions were encountered. $TPAH_{17}$ concentrations ranged from ND at 25 (4-6), SED-154 (0-2), SED-153 (0-2), SED-148 (6-8), SED-203 (0-2), 27 (2-4), SED-145 (0-2), 29 (4-6) SED-143 (2-4), SED-142 (2-4), 28 (2-4, 4-6), SED-140 (2-4), SED-139 (0-2), and SED-139A (2-4) to 155 mg/kg at SED-151 (0-2). A more comprehensive list of field observations and $TPAH_{17}$ concentrations at Near Downstream Area 1 is provided in **Table 3**.



SED-148 Blebs (3.2 feet bss)

West Bank Area

Based on the 2013 sediment probing, sheening was observed upon disturbance of the sediments of the West Bank Area along the western bank of the Tioughnioga River from the edge of the site (Transect 23) and continuing downstream approximately 900 feet to within 45 feet of the closed bridge (**Figures 1 and 2**). Most sediment cores obtained in Near Site Area 1 and Near Downstream Area 1 along the west bank (i.e. SED-164/SED-164R, SED-194, SED-161, SED-160, SED-197, SED-158, SED-196, SED-156, SED-155, SED-153, SED-151, SED-200, SED-150, SED-146, 27, SED-145, 29, SED-143/SED-143R, SED-142/SED-142R, SED-140/SED-140R, SED-139, and SED-139A) had no field observations of potential impacts (other than faint odors and trace sheen) and $TPAH_{17}$ concentrations less than background in surface sediment. Two sediment cores contained NAPL blebs (SED-147 and SED_148) and three surface samples had $TPAH_{17}$ concentrations above background (SED-158, SED-151, and SED-197). A more comprehensive list of probing results, field observations and $TPAH_{17}$ concentrations at the West Bank Area is provided in **Table 4**.

Downstream Area

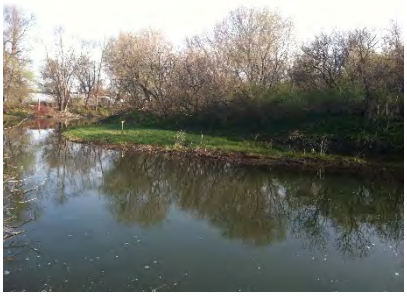
The Down Stream Area is divided into three subareas, specifically the Meander Area, the Sandbar Area and the Sediment Trap Area (**Figure 3**). Cross sections of the stream along select transects in the Downstream Area are depicted on **Figures 6 and 7**.

The Meander Area

Downstream Meander Area

Based on 32 sediment cores, sediments of the Meander Area are primarily described as fine to coarse gravels and sands with occasional fine to medium sand and silt lenses that are approximately 0.1 to 2 feet in thickness at SED124A, SED-124C, and SED-120 and at SED-124 where fine sands and organics were observed in the upper 4 feet of sediments. Field observations of potential impacts were noted at 9 of the 32 sediment core locations and included black staining, rubber-like tar blebs, tar blebs, NAPL coating, and sheens. In addition, trace sheens and MGP odors were observed at three locations. No saturated NAPL conditions were encountered. $TPAH_{17}$ concentrations ranged from ND at SED-135R (0-2) and SED-137 (0-2) to 8,060 mg/kg at SED-124C (3-4). A more comprehensive list of field observations and $TPAH_{17}$ concentrations at The Meander Area is provided in **Table 5**.

The Sandbar Area



Downstream Sandbar Area

Based on 34 sediment cores, sediments of the Sandbar Area are primarily described as fine to coarse gravels and sands with occasional fine to medium sand and silt lenses that are approximately 0.5 to 2.5 feet in thickness at locations SED-116, SED-116R, SED-112, SED-214, SED-111, SED-182, and SED-109. Field observations of potential impacts were noted at 7 of the 34 sediment core locations and included black staining, tar blebs, rubber-like tar, taffy-like tar, and sheens. In addition, trace MGP odors were observed at five locations. No saturated NAPL conditions were encountered. $TPAH_{17}$ concentrations ranged from ND at SED-113C (2-4) and SED-214A (0-3.6) to 23,000 mg/kg at SED-113 (4-6). A more comprehensive list of field observations and $TPAH_{17}$ concentrations at the Sandbar Area are provided in **Table 6**.

Downstream Sediment Trap Area

The Sediment Trap Area

Based on 11 sediment cores, sediments of the Sediment Trap Area are primarily described as fine to coarse gravels and sands grading to cobbles and/or till at depth with occasional fine to medium sand and silt lenses that are approximately 0.5 to 1.5 feet in thickness. Field observations of potential impacts were noted at 1 of the 11 sediment

core locations (43) and included possible tar. In addition, faint MGP odors were observed at one location. No saturated NAPL conditions were encountered. $TPAH_{17}$ concentrations ranged from 0.008 mg/kg at SED-101 (2-4) to 3,570.3 mg/kg at SRI location 43. A more comprehensive list of field observations and $TPAH_{17}$ concentrations at the Sediment Trap Area is provided in **Table 7**.

Areas for Remedial Consideration

The proposed areas for remedial consideration set forth in the March 2005 ROD were revised based on the PDI results, the 2013 probing results, as well as previous investigation results. Specifically the following were included in the remedial extent: field observations of NAPL blebs, coating, staining, and sheen (except for trace or slight sheen); $TPAH_{17}$ concentrations greater than 6.2 mg/kg (2005 ROD defined background in consideration of additional background data with $TPAH_{17}$ concentrations up to 14.1 mg/kg); and the presence of sheens during the 2013 probing. **Figures 8, 9 and 10** depict the 2014 and 2015 boring locations, the 2013 sediment probing and sample locations, SRI sampling locations, and the newly defined areas for remedial consideration based on this PDI. The rationale for the remedial extents are provided below by subareas within the Near Site, Near Downstream, and Downstream Areas.

Near Site Area

The horizontal extent of the Near Site Area is based on the field observations of no NAPL blebs, coating, staining, and sheens, and $TPAH_{17}$ concentrations near 6.2 mg/kg at the following locations from north to south:

- SED-180, 15, SED-179, SED-178, SED-185, 16, SED-174, 18, 20, SED-170, SED-189, SED-191, SED-167, SED-192/ SED-192R, SED-165, 23A, SED-164/ SED-164R, SED-163, SED-194, SED-161, and 24.

The $TPAH_{17}$ concentrations at SRI locations 20 and 24 are slightly higher than 6.2 mg/kg but are lower than 14.1 mg/kg (SED-130) obtained in the upstream background location. Furthermore these older SRI locations are adjacent to more current PDI locations with lower $TPAH_{17}$ concentrations.

The vertical extent of the Near Site Area is based on the field observations of no NAPL blebs, coating, staining, and sheens and $TPAH_{17}$ concentrations near 6.2 mg/kg below visual observations of potential impacts at the following locations:

Location	Vertical Extent (rounded to the nearest foot)
RB-2	2 feet (based on SED-177)
SED-176	2 feet
RB-3	2 feet (based on SED-176)
17	2 feet
SED-173	2 feet (based on 17)
SED-172	2 feet
SED-171	2 feet
SED-187	2 feet
21	2 feet
SED-169	4 feet
SED-168	2 feet

Location	Vertical Extent (rounded to the nearest foot)
SED-188	2 feet
22	4 feet
SED-193/ SED-193R	2 feet
SED-166	2 feet (based on SED-193)
23/ SED-23R	2 feet

In addition, for locations where $TPAH_{17}$ concentrations were greater than background without potential visual impacts, vertical extents of 2 to 4 feet were based on samples with $TPAH_{17}$ concentrations less than 6.2 mg/kg and recent background at the following locations:

- SED-177, SED-175, SED-190, SED-162, and SED-195/SED-195R (2 feet); and
- 19 (4 feet).

The vertical extents of the following locations were determined based on adjacent borings as follows:

- SED-128 (2 feet based on 17);
- SED-186 (2 feet based on SED-171);
- SED-127 (2 feet based on SED-168); and
- SED-190A (2 feet based on SED-190).

The Near Site Area is depicted on **Figure 8**.

As shown on **Figure 8** and detailed in **Table 2**, one SRI boring (RB-1) was not included in the Near Site Area. Granular tar was observed at location RB-1 from 0-0.3 feet during the 2001 SRI. These observations are superseded and surrounded by the 2014 and 2015 boring locations SED-180, SED-179, and SED-178 as well as SRI locations 14 and 15 where tar was not observed and $TPAH_{17}$ concentrations were below 6.2 mg/kg.

Near Downstream Area

Near Downstream Area 1

The horizontal extent of Near Downstream Area 1 is based on the field observations of no NAPL blebs, coating, staining, and sheens, and $TPAH_{17}$ concentrations near 6.2 mg/kg at the following locations from north to south:

- SED-160, SED-159, SED-198, SED-196, SED-157, SED-156, 25, SED-155, SED-154, SED-153, SED-152, SED-200, SED-201A, SED-150, SED-202, SED-203, SED-204, SED-146, 27, SED-145, SED-207, 29, SED-205, SED-206A , SED-143, 28, SED-140, SED-139, SED-139A, and SED-184.

The $TPAH_{17}$ concentrations at SED-159, SED-156, SED-152, SED-201A, SED-202, 28 and SED-184 are slightly higher than 6.2 mg/kg but are lower than 14.1 mg/kg (SED-130) obtained in the upstream background location.

The vertical extent of Near Downstream Area 1 is based on the field observations of no NAPL blebs, coating, staining, and sheens and $TPAH_{17}$ concentrations near 6.2 mg/kg below visual observations of potential impacts at the following locations:

Location	Vertical Extent (rounded to the nearest foot)
SED-148	5 feet
SED-147	4 feet

In addition, for locations where $TPAH_{17}$ concentrations were greater than background without potential visual impacts, vertical extents of 2 feet were based on samples with $TPAH_{17}$ concentrations less than 6.2 mg/kg and recent background at the following locations::

- SED-158, SED-199, SED-151, 26, SED-201, SED-149/ SED-149R, SED-206 and SED-142/SED-142R.

The vertical extent of SED-197 is 2 feet based on adjacent core location SED-158. The vertical extent of SED-199A is 2 feet based on adjacent core location SED-199. The vertical extent of SED-144 is 2 feet based on adjacent core location SED-206, and the vertical extent at SED-141 is 1 foot based on observations at SED-141R.

Near Downstream Area 1 is depicted on **Figures 8 and 9**.

West Bank Area

The horizontal extent of the West Bank Area is based on the field observations of sheening during probing from Transect 23 to within 45 feet of the downstream closed bridge. Laterally and vertically the extent of the West Bank Area is defined as the approximately area from the west bank and extending 5 feet into the river to a depth of 1 foot except in areas described in the Near Site Area and Near Downstream Area 1.

The West Bank Area is depicted on **Figures 8 and 9**.

Downstream Areas

Meander Area

The horizontal extent of the Meander Area is based on the field observations of no NAPL blebs, coating, staining, and sheens, and $TPAH_{17}$ concentrations near 6.2 mg/kg at the following locations from north to south:

- SED-126, SED-125, SED-208B, SED-208A, SED-209, SED-210, SED-135/ SED-135R, SED-211, SED-121, SED-212, SED-120, SED-118A, SED-137, 40, and SED-117.

The $TPAH_{17}$ concentrations at SED-208A, SED-208B, SED-210 and SED_118A are slightly higher than 6.2 mg/kg but are lower than 14.1 mg/kg (SED-130) obtained in the upstream background location.

The vertical extent of the Meander Area is based on the field observations of no NAPL blebs, coating, staining, and sheens and $TPAH_{17}$ concentrations near 6.2 mg/kg below visual observations of potential impacts at the following locations:

Location	Vertical Extent (rounded to the nearest foot)
SED-125A	2 feet based on SED-208
SED-124	4 feet
SED-208	2 feet
SED-123	4 feet based on SED-134
SED-124C	4 feet
SED-134	4 feet
38	3 feet
SED-122A	2 feet
SED-124D	3 feet based on 38

In addition, for locations where $TPAH_{17}$ concentrations were greater than background without potential visual impacts, vertical extents of 2 feet were based on samples with $TPAH_{17}$ concentrations less than 6.2 mg/kg and recent background at locations SED-132 and SED-124E. The vertical extents of the following locations were determined based on adjacent borings as follows:

- SED-124A (2 feet based on SED-208);
- SED-124B (4 feet based on SED-124); and
- SED-122 (2 feet based on SED-124E).

The vertical extent at SED-119 is assumed to be 4 feet based on the SED-119 (2-4) $TPAH_{17}$ analytical results as no other adjacent borings (39, SED-121 and SED-212) had field observations or $TPAH_{17}$ concentrations greater than background.

The Meander Area is depicted on **Figure 10**.

As shown on **Figure 10** and detailed in **Table 5**, two SRI boring locations (40 and 39) were not included in the Meander Area. At location 40, no visual observations were present within the sediment; however, $TPAH_{17}$ concentrations greater than 6.2 mg/kg and recent background were present. Because the data from location 40 was collected in 2001, this data is superseded and surrounded by the 2014 and 2015 boring locations SED-137 and SED-117, as well as SED114A and SED-213 discussed below for the Sandbar Area where $TPAH_{17}$ concentrations were near 6.2 mg/kg and the recent background data. No analytical samples were collected from location 39 during the SRI and no visual impacts were recorded in the boring log. Boring 39 is also located adjacent to two borings (SED-120 and SED-121) with $TPAH_{17}$ concentrations less than 6.2 mg/kg; therefore, this location was also not included in the removal area.

Sandbar Area

The horizontal extent of the Sandbar Area is based on the field observations of no NAPL, tar blebs, staining, and sheens, and $TPAH_{17}$ concentrations near 6.2 mg/kg at the following locations from north to south:

- SED-118, SED-213, SED-114A, SED-114 ,SED-115, SED-183, SED-112A, SED-110, SED-215, SED-109B, SED-108, and SED-107.

The $TPAH_{17}$ concentrations at SED-118, SED-114A, SED-114, SED-112A, and SED-109B are slightly higher than 6.2 mg/kg but are lower than 14.1 mg/kg (SED-130) obtained in the upstream background location.

The vertical extent of the Sandbar Area is based on the field observations of no NAPL blebs, coating, staining, and sheens and $TPAH_{17}$ concentrations near 6.2 mg/kg below visual observations of potential impacts at the following locations:

Location	Vertical Extent (rounded to the nearest foot)
SED-116/ SED-116R	2 feet
SED-133	3 feet
SED-113	6 feet
SED-112	7 feet
SED-214	7 feet
SED-111	7 feet
SED-182	7 feet

In addition, for at locations SED-113B, SED-113C, and SED-109A where $TPAH_{17}$ concentrations were greater than background without potential visual impacts, vertical extents of 4, 2, and 2 feet, respectively were based on samples with $TPAH_{17}$ concentrations less than 6.2 mg/kg and recent background. Vertical extent intervals are presented for locations 42, SED-111A, SED-214A, SED-182A, and SED-110B based on the visual extent at SED-182 and SED-214 and for locations SED-116B and SED-113A based on the visual extent at SED-113. Furthermore, the vertical extent of SED-116A is based on SED-116, the vertical extent of SRI location 41 is based on SED-133, and the vertical extents of SED-109 and SED-110A is based on SED-109A.

The Sandbar Area is depicted on **Figure 10**.

Sediment Trap Area

The horizontal extent of the Sediment Trap Area is based on the field observations of no NAPLs, and $TPAH_{17}$ concentrations near 6.2 mg/kg at the following locations from north to south:

- SED-106, SED-105, SED-104, SED-103A, SED-102, SED-101, SED-100, and SED-103B.

The vertical extent of the Sediment Trap Area is based on the field observations of no NAPL blebs, coating, staining, and sheens and $TPAH_{17}$ concentrations near 6.2 mg/kg below visual observations of potential impacts at the following location:

Location	Vertical Extent (rounded to the nearest foot)
43	3 feet

In addition, for locations where $TPAH_{17}$ concentrations were greater than background without potential visual impacts, vertical extents of 2 feet were based on samples with $TPAH_{17}$ concentrations less than 6.2 mg/kg and recent background at locations SED-103 and SED-103C. .

The Sediment Trap Area is depicted on **Figure 10**.

In summary, based on the results of the most recent investigations, NYSEG believes that sediments impacted with site related constituents have been adequately delineated. Therefore, with NYSDEC concurrence, NYSEG plans to move forward with a remedial design based on the vertical and horizontal removal of shallow sediments as described in this report and as depicted by the above described areas in this report and as depicted in **Figures 8, 9 and 10**.

Please feel free to contact Tracy Blazicek (NYSEG) or me if you have any questions or comments.

Sincerely,

Arcadis of New York, Inc.

David A. Cornell, P.G.
Senior Geologist

Copies:
Tracy Blazicek, CHMM, NYSEG
Nancy Gensky, P.G., ARCADIS
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Attachments

TABLES

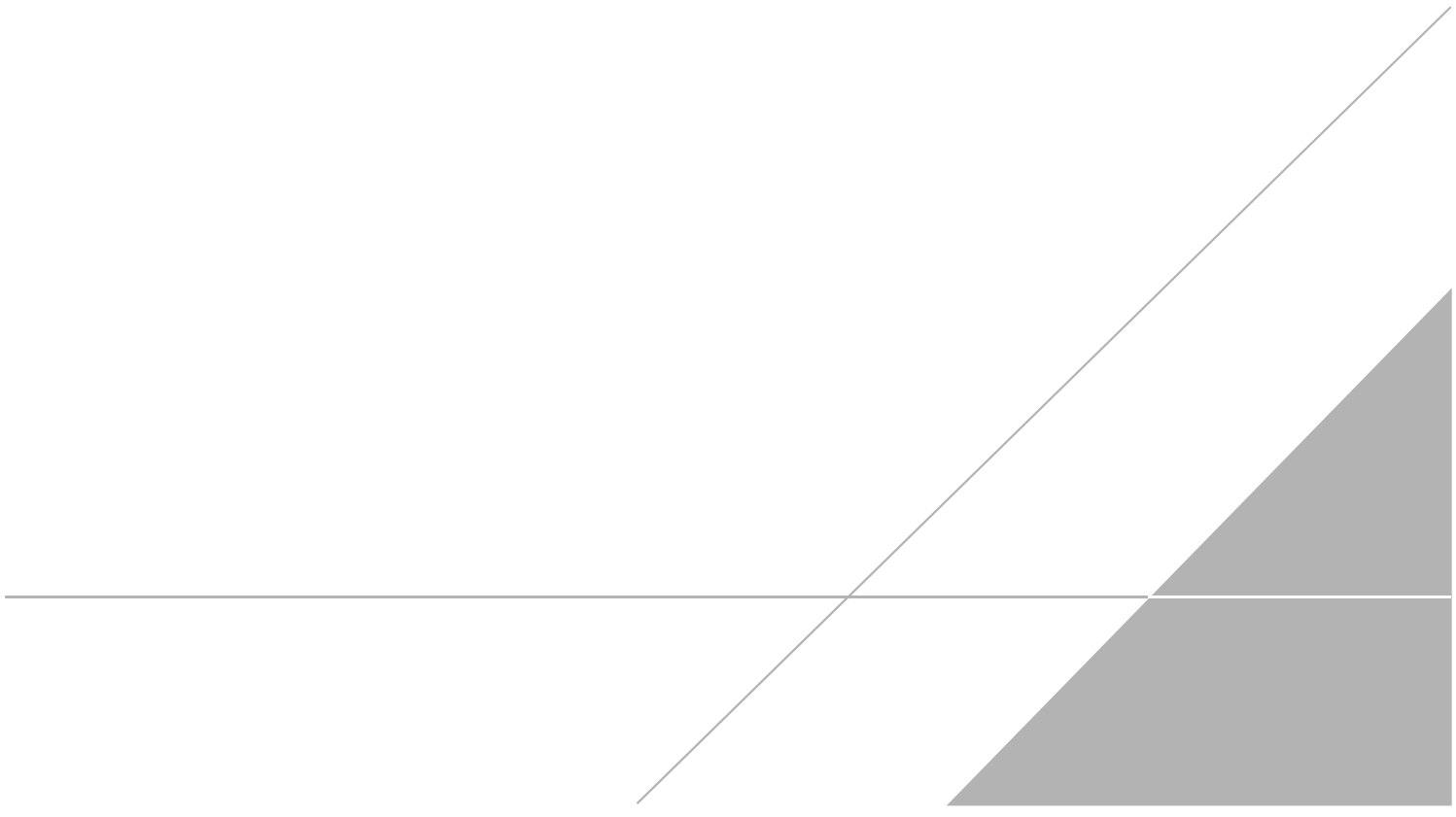

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

ARCADIS Design & Consultancy for natural and built assets

Location ID: Sample Depth(Feet): Date Collected:	Units	SED-23A 0 - 2 07/23/15	SED-100 2 - 4 05/08/14	SED-101 2 - 4 05/08/14	SED-102 0 - 2 05/07/14	SED-102 2 - 4 05/07/14	SED-103 0 - 2 05/07/14	SED-103A 0 - 2 11/19/14	SED-103B 0 - 2 11/20/14	SED-103C 0 - 2 11/20/14	SED-103C 2 - 4 11/20/14	SED-104 0 - 2 05/07/14	SED-105 0 - 2 05/07/14
Semivolatile Organics													
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	110 U	NA	NA	NA	NA	NA	110 UJ	110 UJ	14.2 J	110 U	NA	NA
Acenaphthene	ug/kg	87.4 J	6.90	4.20 U	10.4	4.30 U	23,700	110 U	110 U	83.2 J	110 U	6.10 [4.30]	3.90 J
Acenaphthylene	ug/kg	69.9 J	9.00	4.20 U	21.5	4.30 U	13,800	21.3 J	110 U	361	110 U	10.9 [15.5]	21.7
Anthracene	ug/kg	143	13.6	4.20 U	105	4.30 U	50,000	25.1 J	110 U	750	41.5 J	37.4 J [69.2 J]	39.5
Benzo(a)anthracene	ug/kg	300	18.2	4.20 U	86.8	2.20 J	42,800	87.8 J	26.0 J	2,150	91.7 J	42.4 [50.2]	53.3
Benzo(a)pyrene	ug/kg	262	16.5	4.20 U	70.8	4.30 U	34,100	73.8 J	24.7 J	1,700	66.2 J	34.7 [41.5]	48.2
Benzo(b)fluoranthene	ug/kg	154	10.9 J	4.20 U	58.8	4.30 U	19,400	55.2 J	22.0 J	989	56.3 J	28.0 J [30.4]	32.4
Benzo(g,h,i)perylene	ug/kg	111	8.10	4.20 U	37.3	4.30 U	13,200	33.7 J	17.0 J	693	27.3 J	17.7 [20.2]	24.4
Benzo(k)fluoranthene	ug/kg	184	7.30	4.20 U	66.8	4.30 U	26,300	54.5 J	18.6 J	1,360	57.2 J	34.3 [38.6]	45.0
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	10.3	4.20 U	40.9	4.30 U	20,600	NA	NA	NA	NA	21.2 [24.9]	33.2
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	5.80	4.20 U	19.9	4.30 U	5,160	NA	NA	NA	NA	9.00 [10.6]	12.9
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	4.10 U	4.20 U	12.1	4.30 U	1,470	NA	NA	NA	NA	4.10 U [5.20]	4.10 U
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	4.10 U	4.20 U	4.10 U	4.30 U	789	NA	NA	NA	NA	4.10 U [4.20 U]	4.10 U
Chrysene	ug/kg	222	18.3 J	4.20 U	96.5	3.00 J	41,300	84.1 J	22.7 J	1,890	71.9 J	47.0 J [53.4]	60.0
Dibenzo(a,h)anthracene	ug/kg	34.4 J	3.10 J	4.20 U	14.6	4.30 U	4,510 J	110 U	110 U	76.2 J	18.4 J	6.40 J [7.40]	10.0
Fluoranthene	ug/kg	525	43.7	2.40 J	209	5.90	95,500	134	33.0 J	3,820	173 J	103 [108]	105
Fluorene	ug/kg	33.5 J	5.90	4.20 U	23.1	4.30 U	26,900	110 U	110 U	154	16.0 J	11.2 [9.30]	6.30
Indeno(1,2,3-cd)pyrene	ug/kg	107 J	7.50 J	4.20 U	38.2	4.30 U	14,100	38.6 J	18.7 J	805	34.8 J	17.5 J [21.3]	24.9
Naphthalene	ug/kg	110 U	4.10 U	4.20 U	5.00	4.30 U	386	110 U	110 U	22.6 J	110 U	3.70 J [3.00 J]	3.00 J
Phenanthrene	ug/kg	245	35.3	2.70 J	148	8.20	133,000	74.6 J	19.7 J	2,190	149 J	83.7 [68.4]	55.3
Pyrene	ug/kg	581	54.2	2.90 J	186	7.10	117,000	182	36.2 J	5,250	146 J	88.7 [109]	127
C1-Naphthalenes	ug/kg	NA	4.10 U	4.20 U	7.10	2.30 J	2,940	NA	NA	NA	NA	4.20 [3.90 J]	3.70 J
C2-Naphthalenes	ug/kg	NA	8.80	4.20 U	17.1	3.60 J	12,400	NA	NA	NA	NA	11.1 [10.1]	9.80
C3-Naphthalenes	ug/kg	NA	6.70	4.20 U	12.6	2.40 J	9,460	NA	NA	NA	NA	6.50 [8.80]	6.40
C4-Naphthalenes	ug/kg	NA	4.80	4.20 U	6.50	4.10 J	2,300	NA	NA	NA	NA	6.00 [5.80]	6.00
C1-Fluorenes	ug/kg	NA	6.40	4.20 U	11.8	4.30 U	13,300	NA	NA	NA	NA	5.20 [7.60]	7.90
C2-Fluorenes	ug/kg	NA	4.40	4.20 U	10.8	4.30 U	4,720	NA	NA	NA	NA	4.20 [6.80]	7.20
C3-Fluorenes	ug/kg	NA	4.10 U	4.20 U	4.10 U	4.30 U	2,600	NA	NA	NA	NA	4.10 U [4.20 U]	4.10 U
C1-Phenanthrenes/Anthracenes	ug/kg	NA	29.7	2.70 J	89.6	5.90	79,400	NA	NA	NA	NA	45.2 [56.4]	62.1
C2-Phenanthrenes/Anthracenes	ug/kg	NA	10.8	2.30 J	38.0	2.60 J	22,900	NA	NA	NA	NA	21.6 [22.5]	30.7
C3-Phenanthrenes/Anthracenes	ug/kg	NA	3.40 J	4.20 U	12.5	4.30 U	4,570	NA	NA	NA	NA	6.20 [8.00]	10.8
C4-Phenanthrenes/Anthracenes	ug/kg	NA	4.10 U	4.20 U	3.80 J	4.30 U	773	NA	NA	NA	NA	4.10 U [2.40 J]	3.30 J
C1-Fluoranthenes/Pyrenes	ug/kg	NA	33.1	2.90 J	109	5.00	79,000	NA	NA	NA	NA	52.5 [68.9]	90.5
Benzo[e]pyrene	ug/kg	NA	10.3	4.20 U	48.1	4.30 U	17,900	NA	NA	NA	NA	22.9 [27.0]	31.7
Perylene	ug/kg	NA	4.50	4.20 U	20.2	4.30 U	5,900 J	NA	NA	NA	NA	9.50 [10.6]	11.2
Total TCL PAHs	ug/kg	3,060 J	259 J	8.00 J	1,180	26.4 J	656,000 J	865 J	239 J	22,300 J	949 J	573 J [650 J]	660 J
Miscellaneous													
Solids, Percent	%	89.2	90.3	92.5	91.9	91.4	90.4	90	90.8	90.4	94.1	93.9 [93]	91.4
Total Organic Carbon	ug/kg	NA	1,180,000	807,000	3,890,000	857,000	8,570,000	NA	NA	NA	NA	4,100,000 [4,260,000]	1,740,000

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

ARCADIS Design & Consultancy for natural and built assets

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-106 2 - 4 05/07/14	SED-107 2 - 4 05/06/14	SED-108 0 - 2 05/06/14	SED-109 0 - 2 05/06/14	SED-109A 0 - 2 11/19/14	SED-109A 2 - 4 11/19/14	SED-109B 0 - 2 11/19/14	SED-110 2 - 4 05/05/14	SED-110A 0 - 2 11/18/14	SED-110B 2 - 3 07/24/15	SED-111 2 - 4 05/06/14	SED-111A 2 - 3 05/07/14
Semivolatile Organics													
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	649,000 DJ	NA
2-Methylnaphthalene	ug/kg	NA	NA	NA	NA	110 UJ	110 U	110 UJ	NA	950 UJ	36.3 J	1,070,000 DJ	NA
Acenaphthene	ug/kg	3.90 U [4.00 U]	24.5	9.90	653	120	110 U	120	4.00 U	689 J	212	1,300,000 DJ	17,000
Acenaphthylene	ug/kg	3.90 UB [4.30 UB]	6.20	8.80	3,420 J	427	110 U	108 J	4.00 U	1,410	1,580	282,000 J	6,870
Anthracene	ug/kg	3.10 J [6.10]	24.4 J	17.3 J	5,450 J	1,050	110 U	261	2.40 J	3,440	2,320	1,160,000 DJ	24,500
Benzo(a)anthracene	ug/kg	6.40 [7.00]	22.3	28.4	10,800	2,590	110 U	739	4.10	7,580	7,520 J	671,000 J	22,400
Benzo(a)pyrene	ug/kg	5.70 [5.70]	16.1	20.7	8,900 J	2,040	110 U	638	4.10	6,190	6,370 J	563,000 J	18,300
Benzo(b)fluoranthene	ug/kg	3.90 [4.70]	19.6	10.9	5,160 J	1,220	110 U	383	3.00 J	3,830	4,780 DJ	320,000 J	10,500
Benzo(g,h,i)perylene	ug/kg	3.00 J [3.00 J]	8.50	10.7	3,760 J	811	110 U	285	2.80 J	2,760	2,540	238,000 J	7,030
Benzo(k)fluoranthene	ug/kg	5.30 [5.50]	8.50	9.60	2,910 J	1,470	110 U	491	4.00 U	4,870	4,390 J	209,000 J	14,000
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	4.50 [4.50]	9.00	15.3	5,600	NA	NA	NA	3.00 J	NA	NA	395,000 J	10,300
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	2.30 J [2.30 J]	2.90 J	4.40 J	1,590	NA	NA	NA	2.20 J	NA	NA	111,000 J	2,430
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	3.90 U [4.00 U]	4.00 U	4.70 U	496	NA	NA	NA	4.00 U	NA	NA	34,700 J	727
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	3.90 U [4.00 U]	4.00 U	4.70 U	298	NA	NA	NA	4.00 U	NA	NA	13,100 J	367
Chrysene	ug/kg	7.60 [8.40]	29.8 J	31.1 J	10,800 J	2,250	110 U	601	6.20 J	6,780	7,030 J	670,000 J	21,400
Dibenzo(a,h)anthracene	ug/kg	3.90 U [4.00 U]	2.50 J	2.80 J	1,130	83.7 J	110 U	77.8 J	4.00 U	1,230	967	75,900 J	2,380
Fluoranthene	ug/kg	13.4 [17.3]	72.0 J	72.6 J	20,100 J	4,510	110 U	1,370	11.6 J	13,900	13,900 D	1,920,000 DJ	52,100
Fluorene	ug/kg	3.90 U [3.20 J]	19.7	7.70	914 J	248	110 U	129	4.00 U	997	413	1,150,000 DJ	16,700
Indeno(1,2,3-cd)pyrene	ug/kg	3.00 J [2.90 J]	4.00 U	10.0	3,530 J	932	110 U	330	2.90 J	3,260	2,470	242,000 J	7,650
Naphthalene	ug/kg	3.90 U [4.00 U]	14.4	6.70	225	24.3 J	110 U	110 U	4.00 U	190 J	59.9 J	646,000 J	3,040
Phenanthrene	ug/kg	7.90 [16.7]	106	53.8	9,170	3,600	110 U	1,320	7.80	8,330	5,520 J	3,650,000 DJ	75,800
Pyrene	ug/kg	16.0 [16.1]	78.1 J	86.8 J	23,800 J	6,240	12.9 J	1,770	11.2 J	15,800	17,500 D	2,330,000 DJ	62,600
C1-Naphthalenes	ug/kg	3.90 U [2.10 J]	20.6	8.60	211	NA	NA	NA	2.00 J	NA	NA	862,000 J	7,100
C2-Naphthalenes	ug/kg	4.90 [6.20]	21.8	11.2	686	NA	NA	NA	4.60	NA	NA	838,000 J	11,100
C3-Naphthalenes	ug/kg	2.70 J [3.30 J]	8.00	6.90	869	NA	NA	NA	2.50 J	NA	NA	301,000 J	5,790
C4-Naphthalenes	ug/kg	2.70 J [2.70 J]	3.80 J	4.50 J	533	NA	NA	NA	4.50	NA	NA	57,700 J	1,530
C1-Fluorenes	ug/kg	2.20 J [3.10 J]	7.80	7.10	1,190	NA	NA	NA	4.00 U	NA	NA	355,000 J	7,050
C2-Fluorenes	ug/kg	2.30 J [2.80 J]	4.00	4.50 J	1,100	NA	NA	NA	4.00 U	NA	NA	128,000 J	2,880
C3-Fluorenes	ug/kg	3.90 U [4.00 U]	4.00 U	4.70 U	556	NA	NA	NA	4.00 U	NA	NA	62,100 J	1,070
C1-Phenanthrenes/Anthracenes	ug/kg	10.1 [11.4]	42.8	47.3	10,900	NA	NA	NA	6.70	NA	NA	1,450,000 J	41,800
C2-Phenanthrenes/Anthracenes	ug/kg	5.30 [5.30]	15.7	22.3	5,330	NA	NA	NA	5.90	NA	NA	450,000 J	12,100
C3-Phenanthrenes/Anthracenes	ug/kg	3.90 U [2.20 J]	3.50 J	6.20	1,410	NA	NA	NA	3.30 J	NA	NA	91,800 J	2,440
C4-Phenanthrenes/Anthracenes	ug/kg	3.90 U [4.00 U]	4.00 U	4.70 U	342	NA	NA	NA	4.00 U	NA	NA	20,600 J	440
C1-Fluoranthenes/Pyrenes	ug/kg	12.1 [11.1]	36.7	49.1	15,300	NA	NA	NA	6.90	NA	NA	1,420,000 J	41,800
Benzo[e]pyrene	ug/kg	4.10 [4.30]	12.2	14.9	4,700 J	NA	NA	NA	3.60 J	NA	NA	295,000 J	9,540
Perylene	ug/kg	3.90 U [4.00 U]	4.30 J	5.40 J	1,730 J	NA	NA	NA	4.00 U	NA	NA	113,000 J	3,300
Total TCL PAHs	ug/kg	75.3 J [96.6 J]	453 J	388 J	111,000 J	27,600 J	12.9 J	8,620 J	56.1 J	81,300 J	77,600 J	16,500,000 J	362,000
Miscellaneous													
Solids, Percent	%	87.3 [87]	87.7	80.3	85.5	91	92	88.1	89.6	52.3	87.1	79.6	69.5
Total Organic Carbon	ug/kg	1,110,000 [1,070,000]	1,140,000	921,000	32,100,000	NA	NA	NA	994,000	NA	NA	219,000,000	30,500,000

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

ARCADIS Design & Consultancy for natural and built assets

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-112 1 - 2 05/06/14	SED-112A 0 - 2 11/18/14	SED-113 4 - 6 05/06/14	SED-113B 2 - 4 11/17/14	SED-113B 4 - 6 11/18/14	SED-113C 0 - 2 11/20/14	SED-113C 2 - 4 11/20/14	SED-114 0 - 2 05/05/14	SED-114A 0 - 2 11/21/14	SED-115 0 - 2 05/05/14	SED-116 0 - 2 05/06/14	SED-116R 3 - 4 07/24/15
Semivolatile Organics													
1-Methylnaphthalene	ug/kg	NA	NA	897,000 DJ	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	NA	13.7 J	1,400,000 DJ	1,430 J	68.2 J	21.1 J	100 U	NA	110 UJ	NA	NA	101 J
Acenaphthene	ug/kg	47,000	85.3 J	1,610,000 DJ	2,990	664	172	100 U	90.4	49.9 J	3.20 J	219	700
Acenaphthylene	ug/kg	28,000	166	251,000 J	496	127	352	100 U	232	142	17.6	698	205
Anthracene	ug/kg	59,600	636	2,380,000 DJ	2,790	1,020	1,080	100 U	360 J	317	21.5 J	1,320	759
Benzo(a)anthracene	ug/kg	79,700	840	1,260,000 DJ	2,820	688	2,250	100 U	811	798	60.8	2,190	1,070
Benzo(a)pyrene	ug/kg	65,800	698	502,000 J	1,970	543	1,640	100 U	635	634	59.4	1,880	849
Benzo(b)fluoranthene	ug/kg	37,500	393	277,000 J	1,030	264	1,010	100 U	373	379	47.8	1,160	445
Benzo(g,h,i)perylene	ug/kg	28,000	313	208,000 J	939	203	662	100 U	309	290	37.0	922	323
Benzo(k)fluoranthene	ug/kg	44,500	551	342,000 J	1,390	424	1,350	100 U	195	533	27.7	698	724
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	40,700	NA	375,000 J	NA	NA	NA	NA	409	NA	35.6	1,110	NA
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	11,500	NA	105,000 J	NA	NA	NA	NA	138	NA	15.7	333	NA
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	2,610	NA	27,500 J	NA	NA	NA	NA	35.5	NA	10.3	136	NA
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	1,370	NA	13,800 J	NA	NA	NA	NA	20.6	NA	3.80 U	26.0 U	NA
Chrysene	ug/kg	77,700 J	711	1,310,000 DJ	1,980	623	2,070	100 U	724 J	714	71.8 J	2,200 J	1,040
Dibenzo(a,h)anthracene	ug/kg	8,380	81.8 J	69,200 J	289	74.0 J	81.2 J	100 U	97.5	77.6 J	3.80 U	255	115 J
Fluoranthene	ug/kg	155,000 J	1,520	2,730,000 DJ	5,060	1,390	3,950	100 U	1,760 J	1,440	125 J	4,660 J	2,070
Fluorene	ug/kg	42,200	131	1,740,000 DJ	2,790	679	302	100 U	131	95.6 J	3.80 U	287	638
Indeno(1,2,3-cd)pyrene	ug/kg	29,900	367	212,000 J	970	246	798	100 U	320	338	37.2	828	304
Naphthalene	ug/kg	3,140	25.0 J	424,000 J	820	33.1 J	110 U	100 U	15.3	110 U	4.00	99.0	62.4 J
Phenanthrene	ug/kg	138,000	1,180	5,050,000 DJ	12,200 D	2,990	3,000	100 U	1,280	1,180	40.5	2,340	2,030
Pyrene	ug/kg	191,000 J	1,930	3,250,000 DJ	6,180	1,930	5,360	100 U	2,070 J	2,020	120 J	5,090 J	2,880
C1-Naphthalenes	ug/kg	13,600	NA	694,000 J	NA	NA	NA	NA	18.6	NA	2.60 J	89.4	NA
C2-Naphthalenes	ug/kg	26,600	NA	787,000 J	NA	NA	NA	NA	91.4	NA	7.00	307	NA
C3-Naphthalenes	ug/kg	14,500	NA	293,000 J	NA	NA	NA	NA	99.7	NA	6.20	318	NA
C4-Naphthalenes	ug/kg	4,180	NA	62,300 J	NA	NA	NA	NA	48.6	NA	7.50	130	NA
C1-Fluorenes	ug/kg	17,700	NA	336,000 J	NA	NA	NA	NA	117	NA	5.30	356	NA
C2-Fluorenes	ug/kg	7,040	NA	129,000 J	NA	NA	NA	NA	57.3	NA	6.60	248	NA
C3-Fluorenes	ug/kg	3,250	NA	62,900 J	NA	NA	NA	NA	68.6	NA	3.80 U	204	NA
C1-Phenanthrenes/Anthracenes	ug/kg	99,800	NA	1,340,000 J	NA	NA	NA	NA	1,030	NA	42.6	2,460	NA
C2-Phenanthrenes/Anthracenes	ug/kg	38,700	NA	430,000 J	NA	NA	NA	NA	340	NA	28.2	1,000	NA
C3-Phenanthrenes/Anthracenes	ug/kg	8,800	NA	94,200 J	NA	NA	NA	NA	104	NA	11.9	301	NA
C4-Phenanthrenes/Anthracenes	ug/kg	1,550	NA	17,700 J	NA	NA	NA	NA	27.4	NA	4.80	82.3	NA
C1-Fluoranthenes/Pyrenes	ug/kg	128,000	NA	1,320,000 J	NA	NA	NA	NA	1,120	NA	64.0	2,820	NA
Benzo[e]pyrene	ug/kg	34,700	NA	259,000 J	NA	NA	NA	NA	385	NA	43.5	1,070	NA
Perylene	ug/kg	12,200	NA	103,000 J	NA	NA	NA	NA	128 J	NA	18.6 J	760	NA
Total TCL PAHs	ug/kg	1,040,000 J	9,640 J	23,000,000 J	46,100	12,000 J	24,100 J	ND	9,400 J	9,010 J	674 J	24,800 J	14,300 J
Miscellaneous													
Solids, Percent	%	61	94	67.1	90.6	93.4	86.1	94.2	91.6	91.1	88.8	65.8	85.7
Total Organic Carbon	ug/kg	28,700,000	NA	323,000,000	NA	NA	NA	NA	8,090,000	NA	1,340,000	26,900,000	NA

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

ARCADIS Design & Consultancy for natural and built assets

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-116B 3.8 - 6 05/07/14	SED-117 0 - 2 05/05/14	SED-118 0 - 2 04/30/14	SED-118A 0 - 2 11/14/14	SED-119 2 - 4 04/30/14	SED-120 2 - 4 04/30/14	SED-121 2 - 4 04/30/14	SED-122 0 - 2 04/29/14	SED-122A 4 - 5 07/24/15	SED-123 0 - 3 04/29/14	SED-124 2 - 4 04/29/14	SED-124 6 - 8 04/29/14
Semivolatile Organics													
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	NA	NA	NA	110 U [110 U]	NA	NA	NA	NA	23.0 J	NA	NA	NA
Acenaphthene	ug/kg	359,000	3.00 J	36.7	43.2 J [46.5 J]	508	19.2	35.8	75,200	70.8 J	28,900 D	184,000	2,120
Acenaphthylene	ug/kg	78,200	11.1	169	115 [141]	1,760	45.0	175	25,400	49.8 J	35,300 D	54,300	512
Anthracene	ug/kg	359,000	15.7 J	353	265 [268]	3,520	47.2	228	85,900	140	77,100 D	200,000	1,980
Benzo(a)anthracene	ug/kg	233,000	28.9	684	633 [883]	4,520	123	483	65,900	196	80,300 D	137,000	1,640
Benzo(a)pyrene	ug/kg	184,000	23.3	593	507 [721]	3,940	126	452	56,000	148	65,200 D	117,000	1,370
Benzo(b)fluoranthene	ug/kg	105,000	15.2	407	277 [495]	2,290	87.3	264	30,100	82.3 J	34,500 D	61,000	752
Benzo(g,h,i)perylene	ug/kg	69,200	13.1	275 J	225 [304]	1,720 J	73.6 J	218 J	22,200	54.3 J	24,100 D	46,100	562 J
Benzo(k)fluoranthene	ug/kg	135,000	10.3	438	422 [551]	2,830	48.5	128	36,900	115 J	43,400 D	78,600	906
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	116,000	16.3	347	NA	2,670	73.1	263	37,100	NA	40,400	76,700	878
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	31,600	4.60	129	NA	872	29.4	88.3	10,400	NA	13,500	22,200	278
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	8,180	4.30 U	50.5	NA	247	14.9	33.1	3,350	NA	5,360	5,950	55.7
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	4,310	4.30 U	32.6	NA	146	4.10 U	18.6	1,590	NA	1,690	3,670	26.8
Chrysene	ug/kg	229,000	33.4 J	676 J	548 [777]	4,570 J	141 J	482 J	62,000	193	74,500 D	128,000	1,580 J
Dibenzo(a,h)anthracene	ug/kg	24,300	5.00	88.5 J	67.1 J [32.1 J]	535 J	18.9 J	60.2 J	7,270	19.7 J	7,300	16,000	164 J
Fluoranthene	ug/kg	536,000 D	67.9 J	1,430	1,070 [1,610]	8,860	261	847	162,000 D	300	161,000 D	370,000 D	3,570
Fluorene	ug/kg	306,000	4.90	71.3	66.5 J [66.5 J]	874	16.0	44.9	74,300	74.8 J	32,200 D	178,000	1,870
Indeno(1,2,3-cd)pyrene	ug/kg	78,400	13.9	280	251 [369]	1,680	69.6	204	23,200	54.7 J	27,000 D	51,100	545
Naphthalene	ug/kg	172,000	3.10 J	34.2	110 U [110 U]	102	17.7	27.8	14,000	120 U	718	79,200	1,200
Phenanthrene	ug/kg	1,110,000 D	37.3	728	638 [832]	6,690	155	401	290,000 D	284	163,000 D	724,000 D	5,950
Pyrene	ug/kg	659,000 D	80.5 J	1,380	1,580 [2,210]	11,900 DJ	285	954	196,000 D	614	193,000 D	447,000 D	4,310
C1-Naphthalenes	ug/kg	288,000	3.90 J	23.3	NA	87.4	11.6	18.5	38,200	NA	2,990	133,000	1,760
C2-Naphthalenes	ug/kg	284,000	8.40	59.8	NA	558	24.4	45.6	54,000	NA	13,300	148,000	1,770
C3-Naphthalenes	ug/kg	107,000	5.90	77.4	NA	662	17.4	47.1	23,500	NA	15,400	57,000	669
C4-Naphthalenes	ug/kg	21,400	4.30	52.7	NA	275	10.0	29.6	5,410	NA	5,000	12,400	169
C1-Fluorenes	ug/kg	105,000	6.10	88.6	NA	1,000	18.8	53.0	26,600	NA	23,900	67,800	722
C2-Fluorenes	ug/kg	39,200	5.30	70.9	NA	548	16.1	48.7	11,700	NA	11,800	26,100	323
C3-Fluorenes	ug/kg	14,500	4.30 U	59.4	NA	500	4.10 U	97.7	4,260	NA	5,300	11,100	170
C1-Phenanthrenes/Anthracenes	ug/kg	514,000	39.2	603	NA	6,260	127	402	131,000	NA	107,000	286,000	3,230
C2-Phenanthrenes/Anthracenes	ug/kg	145,000	20.7	290	NA	2,530	65.7	208	40,800	NA	39,900	88,800	975
C3-Phenanthrenes/Anthracenes	ug/kg	26,400	5.90	101	NA	592	21.5	69.6	8,890	NA	10,800	19,200	267
C4-Phenanthrenes/Anthracenes	ug/kg	6,590	4.30 U	25.9	NA	114	7.60	17.8	1,950	NA	2,580	4,110	45.1
C1-Fluoranthenes/Pyrenes	ug/kg	458,000	45.0	841	NA	7,290	160	649	121,000	NA	125,000	266,000	2,980
Benzo[e]pyrene	ug/kg	93,600	16.0	341 J	NA	2,200 J	83.3 J	255 J	27,900	NA	31,700 D	58,300	697 J
Perylene	ug/kg	32,600	5.90 J	149 J	NA	820 J	31.2 J	107 J	10,300 J	NA	10,400 J	21,400 J	245 J
Total TCL PAHs	ug/kg	4,640,000	367 J	7,640 J	6,710 J [9,310 J]	56,300 J	1,530 J	5,000 J	1,230,000	2,420 J	1,050,000	2,870,000	29,000 J
Miscellaneous													
Solids, Percent	%	65.5	91.7	87.7	93.1 [90.1]	85.6	88.8	86.2	69.2	82.1	53.9	86.2	88
Total Organic Carbon	ug/kg	55,800,000	1,500,000	2,950,000	NA	24,100,000	2,220,000	6,890,000	33,700,000	NA	22,800,000	17,000,000	1,400,000

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

ARCADIS Design & Consultancy for natural and built assets

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-124A 0 - 2 05/08/14	SED-124B 0 - 2 05/08/14	SED-124C 3 - 4 05/08/14	SED-124D 0 - 2 05/09/14	SED-124E 0 - 2 11/13/14	SED-124E 2 - 4 11/13/14	SED-125 0 - 2 04/29/14	SED-125A 0 - 2 11/13/14	SED-126 0 - 2 04/28/14	SED-127 0 - 3 05/08/14	SED-128 0 - 1.8 05/08/14	SED-129 0 - 2 05/08/14
Semivolatile Organics													
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	NA	NA	NA	NA	182	110 U	NA	35.2 J	NA	NA	NA	NA
Acenaphthene	ug/kg	1,380	455,000 DJ	402,000 J	8,950	659	23.1 J	18.2	2,350	9.00	21,700	20,200	22.6
Acenaphthylene	ug/kg	609	137,000 J	86,600 J	3,870	1,170	23.5 J	65.5	561	112	5,910	22,100	88.4
Anthracene	ug/kg	790	569,000 DJ	382,000 J	13,200	12,000 D	136	133	1,930	98.9	15,800	43,200	133
Benzo(a)anthracene	ug/kg	1,970 J	408,000 J	260,000 J	11,300	7,360	146	184	3,300	318	15,500	29,100	475
Benzo(a)pyrene	ug/kg	1,690 J	331,000 J	206,000 J	9,110	5,810	106 J	161	2,740	279	12,000	25,800	681
Benzo(b)fluoranthene	ug/kg	902	186,000 J	114,000 J	5,050	3,720	64.6 J	120	1,470	159	6,710	19,400	499
Benzo(g,h,i)perylene	ug/kg	621	127,000 J	79,300 J	3,560	2,220	41.5 J	83.7 J	1,020	125 J	4,650	12,900	496
Benzo(k)fluoranthene	ug/kg	1,090 J	252,000 J	157,000 J	7,010	4,200	78.0 J	66.4	1,910	85.7 J	8,880	20,700	350
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	855	215,000 J	138,000 J	5,420	NA	NA	95.6	NA	213	7,540	10,600	1,680
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	253	53,100 J	36,100 J	1,530	NA	NA	59.1	NA	82.3	1,960	3,670	2,050
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	95.1	17,700 J	11,400 J	379	NA	NA	25.0	NA	27.2	616	1,600	1,630
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	65.6	7,830 J	5,330 J	128	NA	NA	12.6	NA	29.5 J	325	924	1,190
Chrysene	ug/kg	1,690 J	416,000 J	255,000 J	10,900	6,860	140	191 J	2,970	339 J	17,400	29,300	871
Dibenzo(a,h)anthracene	ug/kg	201	45,000 J	27,700 J	1,180	670	14.1 J	27.6 J	314	36.1 J	1,650	4,190	122
Fluoranthene	ug/kg	4,260 J	929,000 DJ	1,300,000 DJ	26,900	13,400 D	229	408	6,570	391	36,500	86,000	687
Fluorene	ug/kg	410	427,000 DJ	329,000 J	8,860	1,850	41.4 J	56.3	1,580	18.7	9,740	23,900	27.0
Indeno(1,2,3-cd)pyrene	ug/kg	624	140,000 J	86,500 J	3,840	2,590	46.8 J	79.4	1,170	111	5,060	14,900	290
Naphthalene	ug/kg	30.9	4,300 J	165,000 J	203	148	110 U	8.80	47.2 J	10.8	7,280	3,430	13.5
Phenanthrene	ug/kg	2,470 J	1,850,000 DJ	2,620,000 DJ	35,200	14,800 D	292	327	6,450	100	46,700	107,000	192
Pyrene	ug/kg	5,090 J	1,140,000 DJ	1,590,000 DJ	33,200	16,400 D	355	345	8,680	521	43,500	76,100	1,190
C1-Naphthalenes	ug/kg	25.7	85,800 J	310,000 J	898	NA	NA	25.2	NA	11.0	16,400	5,600	23.2
C2-Naphthalenes	ug/kg	312	199,000 J	337,000 J	3,810	NA	NA	46.7	NA	27.7	18,400	11,500	47.7
C3-Naphthalenes	ug/kg	517	152,000 J	137,000 J	3,420	NA	NA	37.6	NA	20.9	9,190	7,400	37.5
C4-Naphthalenes	ug/kg	209	32,900 J	29,100 J	1,000	NA	NA	20.8	NA	22.3	2,200	2,070	32.2
C1-Fluorenes	ug/kg	899	180,000 J	120,000 J	3,950	NA	NA	31.3	NA	30.6	5,800	7,860	26.9
C2-Fluorenes	ug/kg	316	63,100 J	47,700 J	1,680	NA	NA	36.0	NA	47.3	2,460	2,950	58.0
C3-Fluorenes	ug/kg	150	27,800 J	21,500 J	632	NA	NA	22.6	NA	35.3	927	1,510	118
C1-Phenanthrenes/Anthracenes	ug/kg	2,770	897,000 J	602,000 J	22,100	NA	NA	183	NA	233	30,200	36,100	215
C2-Phenanthrenes/Anthracenes	ug/kg	1,000	248,000 J	179,000 J	6,380	NA	NA	89.5	NA	195	8,510	10,600	450
C3-Phenanthrenes/Anthracenes	ug/kg	229	48,500 J	38,900 J	1,320	NA	NA	34.6	NA	69.7	1,880	2,920	563
C4-Phenanthrenes/Anthracenes	ug/kg	59.5	10,000 J	7,900 J	250	NA	NA	12.8	NA	17.8	333	652	427
C1-Fluoranthenes/Pyrenes	ug/kg	3,060	834,000 J	519,000 J	21,300	NA	NA	215	NA	525	28,800	35,900	1,580
Benzo[e]pyrene	ug/kg	774	171,000 J	107,000 J	4,760	NA	NA	102 J	NA	151 J	6,220	15,200	1,030
Perylene	ug/kg	285	59,900 J	37,100 J	1,640	NA	NA	43.8 J	NA	55.9 J	2,270	7,610	218
Total TCL PAHs	ug/kg	23,800 J	7,420,000 J	8,060,000 J	182,000	94,000	1,740 J	2,270 J	43,100 J	2,710 J	259,000	538,000	6,140
Miscellaneous													
Solids, Percent	%	77.6	84	57.1	84.6	82.5	92.6	91.8	89.6	93.1	50.7	38.1	78.9
Total Organic Carbon	ug/kg	30,200,000	62,600,000	68,400,000	23,200,000	NA	NA	1,560,000	NA	2,000,000	36,500,000	135,000,000	11,000,000

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-130 0 - 1.5 05/08/14	SED-131 0 - 1 05/08/14	SED-132 0 - 2 11/11/14	SED-132 2 - 4 11/11/14	SED-133 4 - 6 11/14/14	SED-134 4 - 6 11/12/14	SED-135 0 - 2 11/11/14	SED-135R 0 - 2 07/22/15	SED-137 0 - 2 11/14/14	SED-139 0 - 2 12/19/14	SED-139A 2 - 4 07/01/15	SED-140R 0 - 2 07/23/15	SED-140 2 - 4 12/19/14	SED-141 0 - 2 12/19/14
Semivolatile Organics															
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	NA	NA	14.8 J	100 U	332	110 U	100 U	110 U	100 U	100 U	110 U	110 U	110 U	110 U [110 U]
Acenaphthene	ug/kg	49.4	14.1	108 J	100 U	546	16.4 J	100 U	110 U	100 U	100 U	110 U	19.1 J	110 U	110 U [17.1 J]
Acenaphthylene	ug/kg	202	101	406	100 U	92.0 J	110 U	11.0 J	110 U	100 U	100 U	110 U	53.6 J	110 U	110 U [32.4 J]
Anthracene	ug/kg	572	132	967	100 U	482	16.6 J	25.4 J	110 U	100 U	100 U	110 U	89.7 J	110 U	40.5 J [84.6 J]
Benzo(a)anthracene	ug/kg	1,410	233	2,840	22.9 J	505	18.0 J	44.8 J	110 U	100 U	100 U	110 U	208	110 U	102 J [183]
Benzo(a)pyrene	ug/kg	1,120	233	2,340	18.0 J	388	11.8 J	34.7 J	110 U	100 U	100 U	110 U	185	110 U	80.7 J [152]
Benzo(b)fluoranthene	ug/kg	993 J	202	1,100	100 U	200	110 U	24.6 J	110 U	100 U	100 U	110 U	135	110 U	72.9 J [106 J]
Benzo(g,h,i)perylene	ug/kg	512	137	805	100 U	135	110 U	16.9 J	110 U	100 U	100 U	110 U	98.8 J	110 U	38.2 J [68.0 J]
Benzo(k)fluoranthene	ug/kg	1,090	203	1,690	100 U	275	110 U	24.1 J	110 U	100 U	100 U	110 U	149	110 U	66.1 J [117]
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	633	204	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	297	134	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	120	85.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	87.1	70.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	1,350 J	266	2,420	22.6 J	391	14.9 J	35.6 J	110 U	100 U	100 U	110 U	193	110 U	88.2 J [148]
Dibenzo(a,h)anthracene	ug/kg	10.1 J	55.0	257	100 U	16.4 J	110 U	100 U	110 U	100 U	100 U	110 U	54.6 J	110 U	17.8 J [110 U]
Fluoranthene	ug/kg	2,840	393	4,810	36.2 J	989	27.9 J	52.4 J	110 U	100 U	100 U	110 U	295	110 U	205 [353]
Fluorene	ug/kg	90.8	16.1	206	100 U	478	16.7 J	100 U	110 U	100 U	100 U	110 U	25.6 J	110 U	110 U [26.1 J]
Indeno(1,2,3-cd)pyrene	ug/kg	632 J	142	1,000	100 U	169	110 U	21.8 J	110 U	100 U	100 U	110 U	88.1 J	110 U	40.7 J [66.7 J]
Naphthalene	ug/kg	12.4	23.2	27.8 J	100 U	206	110 U	100 U	110 U	100 U	100 U	110 U	110 U	110 U	110 U [110 U]
Phenanthrene	ug/kg	1,010	158	2,890	28.2 J	2,150	54.1 J	37.0 J	110 U	100 U	100 U	110 U	152	110 U	105 J [232]
Pyrene	ug/kg	2,180	359	6,880	58.2 J	1,500	49.2 J	84.4 J	110 U	100 U	100 U	110 U	363	110 U	180 [372]
C1-Naphthalenes	ug/kg	11.1	19.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Naphthalenes	ug/kg	44.6	44.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Naphthalenes	ug/kg	67.2	57.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Naphthalenes	ug/kg	55.6	46.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluorenes	ug/kg	68.4	25.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Fluorenes	ug/kg	76.5	52.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Fluorenes	ug/kg	92.2	66.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Phenanthrenes/Anthracenes	ug/kg	791	205	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Phenanthrenes/Anthracenes	ug/kg	417	197	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Phenanthrenes/Anthracenes	ug/kg	155	98.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Phenanthrenes/Anthracenes	ug/kg	40.5	36.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluoranthenes/Pyrenes	ug/kg	1,260	289	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[e]pyrene	ug/kg	692	175	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perylene	ug/kg	322	103	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCL PAHs	ug/kg	14,100 J	2,670	28,800 J	186 J	8,850 J	226 J	413 J	ND	ND	ND	ND	2,110 J	ND	1,040 J [1,960 J]
Miscellaneous															
Solids, Percent	%	80	83.7	87.1	93	87.9	90.7	93.6	88.6	92.6	92.8	91.8	86.7	94.2	89.1 [90.1]
Total Organic Carbon	ug/kg	5,420,000	11,400,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-142R 0 - 2 07/23/15	SED-142 2 - 4 12/19/14	SED-143R 0 - 2 07/23/15	SED-143 2 - 4 12/19/14	SED-144 0 - 2 12/18/14	SED-145 0 - 2 12/18/14	SED-146 0 - 2 12/18/14	SED-147 4 - 6 12/18/14	SED-148 6 - 8 12/17/14	SED-149R 0 - 2 07/23/15	SED-149 2 - 4 12/17/14	SED-150 0 - 2 12/17/14	SED-151 0 - 2 12/17/14	SED-151 2 - 4 12/17/14
Semivolatile Organics															
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	94.0 J	120 U	110 U	110 U [100 U]	304 J	110 U	110 U	110 U	110 U	82.2 J	20.4 J	21.1 J	159 J	100 UJ
Acenaphthene	ug/kg	3,670	120 U	110 U	110 U [100 U]	580 U	110 U	110 U	110 U	110 U	66.5 J	14.5 J	110 U	281 J	100 UJ
Acenaphthylene	ug/kg	1,360	120 U	110 U	110 U [100 U]	1,000	110 U	110 U	15.2 J	110 U	1,740	88.4 J	81.5 J	2,530	100 UJ
Anthracene	ug/kg	5,050	120 U	110 U	110 U [100 U]	1,530	110 U	18.9 J	21.9 J	110 U	6,060	338	673	8,610	30.3 J
Benzo(a)anthracene	ug/kg	10,100	120 U	110 U	110 U [100 U]	6,310	110 U	50.9 J	42.9 J	110 U	10,000 D	381	423	15,100	44.7 J
Benzo(a)pyrene	ug/kg	8,270	120 U	110 U	110 U [100 U]	4,380	110 U	49.5 J	29.2 J	110 U	6,590	274	306	11,900	32.1 J
Benzo(b)fluoranthene	ug/kg	4,240 D	120 U	110 U	110 U [100 U]	2,770	110 U	35.1 J	13.5 J	110 U	4,110	136	174	8,040	30.7 J
Benzo(g,h,i)perylene	ug/kg	2,550	120 U	110 U	110 U [100 U]	1,930	110 U	29.9 J	110 U	110 U	2,150	105 J	129	5,540	16.2 J
Benzo(k)fluoranthene	ug/kg	4,610	120 U	110 U	110 U [100 U]	3,190	110 U	47.0 J	18.7 J	110 U	4,420	195	243	8,510	19.7 J
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	8,510	120 U	110 U	110 U [100 U]	5,760	110 U	49.8 J	34.5 J	110 U	8,170	342	455	12,800	40.7 J
Dibenzo(a,h)anthracene	ug/kg	898	120 U	110 U	110 U [100 U]	678	110 U	110 U	110 U	110 U	822	34.5 J	43.8 J	2,010	100 UJ
Fluoranthene	ug/kg	20,500 D	120 U	15.8 J	110 U [100 U]	8,510	110 U	102 J	52.7 J	110 U	14,300 D	654	465	27,400	79.6 J
Fluorene	ug/kg	4,210	120 U	110 U	110 U [100 U]	120 J	110 U	110 U	110 U	110 U	544	102 J	15.6 J	1,590	100 UJ
Indeno(1,2,3-cd)pyrene	ug/kg	2,520	120 U	110 U	110 U [100 U]	1,710	110 U	26.2 J	110 U	110 U	2,080	89.4 J	108 J	5,250	14.9 J
Naphthalene	ug/kg	233	120 U	110 U	110 U [100 U]	580 U	110 U	110 U	110 U	110 U	158	110 U	110 U	218 J	100 UJ
Phenanthrene	ug/kg	22,600 D	120 U	110 U	110 U [100 U]	1,840	110 U	51.1 J	42.0 J	110 U	7,280	849	80.2 J	16,600	42.1 J
Pyrene	ug/kg	24,500 D	120 U	16.8 J	110 U [100 U]	10,700	110 U	95.5 J	72.0 J	110 U	19,500 D	849	666	28,600	90.0 J
C1-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluoranthenes/Pyrenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[e]pyrene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perylene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCL PAHs	ug/kg	124,000	ND	32.6 J	ND [ND]	50,700 J	ND	556 J	343 J	ND	88,100 J	4,470 J	3,880 J	155,000 J	441 J
Miscellaneous															
Solids, Percent	%	76.5	85.3	88.3	90.2 [95.2]	84.6	90.2	88.5	91.7	90.4	91.5	90.9	89.1	91.2	NA
Total Organic Carbon	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

ARCADIS Design & Consultancy for natural and built assets

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-152 0 - 2 12/17/14	SED-152 2 - 4 12/17/14	SED-153 0 - 2 12/16/14	SED-154 0 - 2 12/16/14	SED-155 0 - 2 12/16/14	SED-156 0 - 2 12/16/14	SED-156 2 - 4 12/16/14	SED-157 0 - 2 12/15/14	SED-158 0 - 2 12/15/14	SED-158 2 - 4 12/15/14	SED-159 0 - 2 12/15/14	SED-159 2 - 4 12/15/14	SED-160 0 - 2 12/15/14	SED-161 0 - 2 12/12/14	SED-162 0 - 2 12/12/14
Semivolatile Organics																
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	110 U	100 UJ	100 U	110 U	110 U	100 U	110 UJ	110 U	83.7 J	110 UJ	110 U	100 UJ	100 U	110 U	591
Acenaphthene	ug/kg	71.0 J	100 UJ	100 U	110 U	110 U	76.2 J	110 UJ	110 U	166 J	110 UJ	88.3 J	100 UJ	100 U	27.8 J	2,300
Acenaphthylene	ug/kg	119	100 UJ	100 U	110 U	110 U	101	11.5 J	15.2 J	804	110 UJ	162	100 UJ	30.1 J	23.4 J	13,400
Anthracene	ug/kg	297	100 UJ	100 U	110 U	110 U	1,040	27.4 J	57.8 J	5,040	110 UJ	455	15.4 J	44.8 J	110 U	59,400 DJ
Benzo(a)anthracene	ug/kg	716	20.8 J	100 U	110 U	110 U	536	28.6 J	95.2 J	5,810	14.7 J	1,200	61.0 J	102	110 U	46,300 D
Benzo(a)pyrene	ug/kg	635	100 UJ	100 U	110 U	110 U	435	110 UJ	68.3 J	4,810	110 UJ	1,060	51.8 J	83.2 J	110 U	34,000
Benzo(b)fluoranthene	ug/kg	499	100 UJ	100 U	110 U	110 U	227	110 UJ	49.8 J	3,290	110 UJ	804	45.2 J	45.8 J	110 U	19,100
Benzo(g,h,i)perylene	ug/kg	318	100 UJ	100 U	110 U	110 U	183	110 UJ	26.5 J	2,110	110 UJ	476	22.5 J	36.1 J	110 U	11,900
Benzo(k)fluoranthene	ug/kg	504	100 UJ	100 U	110 U	110 U	330	110 UJ	54.7 J	3,860	110 UJ	934	42.5 J	61.9 J	110 U	20,700
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	618	19.8 J	100 U	110 U	110 U	504	23.3 J	95.6 J	5,130	110 UJ	1,070	58.8 J	89.5 J	110 U	43,100
Dibenzo(a,h)anthracene	ug/kg	86.6 J	100 UJ	100 U	110 U	110 U	58.2 J	110 UJ	110 U	743	110 UJ	197	100 UJ	12.9 J	110 U	3,620 J
Fluoranthene	ug/kg	1,470	31.9 J	100 U	110 U	17.1 J	1,010	43.7 J	182	11,400	20.3 J	2,270	90.9 J	157	40.4 J	92,300 D
Fluorene	ug/kg	96.8 J	100 UJ	100 U	110 U	110 U	198	110 UJ	110 U	765	110 UJ	149	100 UJ	100 U	110 U	17,100
Indeno(1,2,3-cd)pyrene	ug/kg	305	100 UJ	100 U	110 U	110 U	163	110 UJ	27.8 J	2,070	110 UJ	479	24.1 J	30.4 J	110 U	11,200
Naphthalene	ug/kg	24.8 J	100 UJ	100 U	110 U	110 U	100 U	110 UJ	110 U	119 J	110 UJ	25.5 J	100 UJ	100 U	25.3 J	993
Phenanthrene	ug/kg	907	100 UJ	100 U	110 U	110 U	1,160	36.2 J	96.3 J	6,910	110 UJ	1,440	25.1 J	48.0 J	110 U	151,000 D
Pyrene	ug/kg	1,390	29.9 J	100 U	110 U	19.7 J	1,250	59.2 J	164	10,800	20.0 J	2,110	88.3 J	200	40.6 J	106,000 D
C1-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluoranthenes/Pyrenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[e]pyrene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perylene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCL PAHs	ug/kg	8,060 J	102 J	ND	ND	36.8 J	7,270 J	230 J	933 J	63,900 J	55.0 J	12,900 J	526 J	942 J	158 J	633,000
Miscellaneous																
Solids, Percent	%	86.7	NA	93.2	91.2	90.6	93.2	NA	91	85.2	NA	88.7	NA	92.9	90.8	82.7
Total Organic Carbon	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

ARCADIS Design & Consultancy for natural and built assets

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-162 2 - 4 12/12/14	SED-163 0 - 2 12/12/14	SED-164R 0 - 2 07/23/15	SED-164 4 - 6 12/11/14	SED-165 0 - 2 12/09/14	SED-166 12 - 14 12/11/14	SED-167 0 - 2 12/08/14	SED-168 18 - 20 12/09/14	SED-169 2 - 4 12/08/14	SED-169 4 - 6 12/08/14	SED-170 0 - 2 12/02/14	SED-171 2 - 4 12/02/14	SED-172 2 - 4 12/05/14	SED-173 4 - 6 12/05/14	SED-174 0 - 2 12/04/14
Semivolatile Organics																
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	110 U	110 U	130 U	16.0 J	110 U	21.5 J	57.3 J	24.0 J	102 J	42.6 J	110 UJ	110 UJ	110 UJ	67.3 J	120 UJ
Acenaphthene	ug/kg	110 U	65.3 J	123 J	211	74.3 J	112	19.0 J	119	3,260	19.7 J	110 U	135	110 U	456	120 U
Acenaphthylene	ug/kg	353	53.6 J	55.3 J	32.7 J	111	40.3 J	129	49.6 J	1,480	21.2 J	110 U	63.0 J	31.3 J	174	69.7 J
Anthracene	ug/kg	1,370	49.8 J	58.1 J	31.7 J	384	16.8 J	323	14.0 J	8,210	110 U	110 U	241	147	827	180
Benzo(a)anthracene	ug/kg	2,060	159	171	19.4 J	467	100 U	610	110 U	6,320	110 U	110 U	149	74.4 J	377	232
Benzo(a)pyrene	ug/kg	1,500	110	168	13.1 J	406	100 U	467	110 U	5,110	110 U	110 U	122	63.2 J	310	201
Benzo(b)fluoranthene	ug/kg	783	72.9 J	126 J	100 U	282	100 U	341	110 U	3,000	110 U	110 U	93.3 J	41.7 J	195	132
Benzo(g,h,i)perylene	ug/kg	594	34.8 J	81.7 J	100 U	193	100 U	177	110 U	2,150	110 U	110 U	63.2 J	34.1 J	159	97.6 J
Benzo(k)fluoranthene	ug/kg	1,180	101 J	135	100 U	294	100 U	343	110 U	3,610	110 U	110 U	81.8 J	46.0 J	232	155
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	2,050	129	163	100 U	402	100 U	545	110 U	5,100	110 U	110 U	130	70.4 J	344	204
Dibenzo(a,h)anthracene	ug/kg	234	21.9 J	130 U	100 U	49.3 J	100 U	93.0 J	110 U	947	110 U	110 U	110 U	110 U	85.6 J	120 U
Fluoranthene	ug/kg	3,110	273	236	42.2 J	1,070	30.7 J	1,040	110 U	16,300 D	110 U	110 U	351	192	908	486
Fluorene	ug/kg	109 J	110 U	130 U	51.5 J	95.8 J	40.4 J	35.4 J	18.8 J	4,710	110 U	110 U	94.2 J	61.7 J	383	84.9 J
Indeno(1,2,3-cd)pyrene	ug/kg	546	38.6 J	79.8 J	100 U	173	100 U	183	110 U	2,050	110 U	110 U	72.2 J	39.8 J	189	122
Naphthalene	ug/kg	110 U	32.0 J	41.2 J	127	79.5 J	137	184	143	342	155	110 U	110 U	110 U	173	120 U
Phenanthrene	ug/kg	1,870	91.7 J	88.3 J	87.5 J	852	60.9 J	352	50.4 J	26,100 D	28.0 J	110 U	370	266	1,390	487
Pyrene	ug/kg	3,870	236	301	42.3 J	981	31.1 J	993	110 U	16,600 D	110 U	110 U	289	153	763	410
C1-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluoranthenes/Pyrenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[e]pyrene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perylene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCL PAHs	ug/kg	19,600 J	1,470 J	1,830 J	674 J	5,910 J	491 J	5,890 J	419 J	105,000	267 J	ND	2,250 J	1,220 J	7,030 J	2,860 J
Miscellaneous																
Solids, Percent	%	92.8	89.2	72.7	92.1	87.8	92.3	87.8	92.7	90.9	NA	89.1	89.2	91.9	92.4	85.5
Total Organic Carbon	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

ARCADIS Design & Consultancy for natural and built assets

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-175 0 - 2 12/04/14	SED-175 2 - 4 12/04/14	SED-176 2 - 4 12/04/14	SED-177 0 - 2 12/03/14	SED-177 2 - 4 12/03/14	SED-178 0 - 2 12/03/14	SED-179 0 - 2 12/03/14	SED-180 0 - 2 12/03/14	SED-181 0 - 2 12/03/14	SED-182 8 - 8.8 07/22/15	SED-182A 0 - 3.5 07/22/15	SED-183 0 - 2 07/06/15	SED-184 0 - 1 07/01/15	SED-185 0 - 2 06/10/15	SED-186 2 - 4 06/10/15
Semivolatile Organics																
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	360 J	100 U	16.4 J	496 J	110 U	110 UJ	110 UJ	110 UJ	110 UJ	173	120 U	110 U	550 U	120 U	81.1 J
Acenaphthene	ug/kg	2,330	100 U	136	1,230	110 U	110 U	110 U	110 U	110 U	231	120 U	110 U	106 J	120 U	409
Acenaphthylene	ug/kg	6,760	12.4 J	168	1,020	110 U	110 U	110 U	110 U	17.7 J	45.0 J	120 U	37.2 J	154 J	120 U	234
Anthracene	ug/kg	25,900	87.4 J	894	22,500 D	110 U	110 U	110 U	110 U	58.2 J	282	120 U	67.6 J	263 J	29.5 J	2,230
Benzo(a)anthracene	ug/kg	36,300	89.6 J	397	5,350	110 U	110 U	110 U	110 U	228	223	120 U	161	758	63.7 J	766
Benzo(a)pyrene	ug/kg	31,500	84.8 J	318	4,340	110 U	110 U	110 U	110 U	197	183	120 U	133	642	52.8 J	613
Benzo(b)fluoranthene	ug/kg	29,000	62.3 J	279	4,010	110 U	110 U	110 U	110 U	185	101	120 U	89.9 J	493 J	39.1 J	259
Benzo(g,h,i)perylene	ug/kg	18,300	43.5 J	170	2,390	110 U	110 U	110 U	110 U	94.9 J	77.0 J	120 U	70.7 J	357 J	25.4 J	246
Benzo(k)fluoranthene	ug/kg	15,600	59.9 J	175	1,900	110 U	110 U	110 U	110 U	146	132	120 U	96.5 J	458 J	44.4 J	488
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	29,500	83.3 J	364	4,810	110 U	110 U	110 U	110 U	197	208	120 U	149	721	57.9 J	762
Dibenzo(a,h)anthracene	ug/kg	7,730	100 U	57.6 J	836	110 U	110 U	110 U	110 U	110 U	23.1 J	120 U	21.3 J	111 J	120 U	74.3 J
Fluoranthene	ug/kg	97,700 D	237 J	891	12,600 D	110 U	110 U	110 U	110 U	375	501	17.3 J	281	1,410	116 J	1,520
Fluorene	ug/kg	9,830	26.6 J	332	2,790	110 U	110 U	110 U	110 U	110 U	232	120 U	15.9 J	92.7 J	120 U	542
Indeno(1,2,3-cd)pyrene	ug/kg	21,300	39.9 J	208	2,540	110 U	110 U	110 U	110 U	113	65.4 J	120 U	62.8 J	326 J	23.1 J	224
Naphthalene	ug/kg	1,600	100 U	74.0 J	488	110 U	110 U	110 U	110 U	110 U	121	120 U	110 U	550 U	120 U	270
Phenanthrene	ug/kg	85,400 D	199 J	1,210	14,900 D	110 U	110 U	110 U	110 U	139	819	120 U	150	804	71.0 J	2,580
Pyrene	ug/kg	71,400 D	189 J	782	11,000 D	110 U	110 U	110 U	110 U	273	558	18.2 J	333	1,480	115 J	2,110
C1-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluoranthenes/Pyrenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[e]pyrene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perylene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCL PAHs	ug/kg	491,000	1,210 J	6,470 J	93,200J	ND	ND	ND	ND	2,020 J	3,970 J	35.5 J	1,670 J	8,180 J	638 J	13,400 J
Miscellaneous																
Solids, Percent	%	82.2	92.7	89	82.8	92	90.4	89.1	88.8	86.5	93.6	83.8	87.8	87.7	81.4	91.9
Total Organic Carbon	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

ARCADIS Design & Consultancy for natural and built assets

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-186 4 - 6 06/10/15	SED-187 4 - 6 06/25/15	SED-188 2 - 4 06/22/15	SED-189 0 - 2 06/10/15	SED-190 0 - 2 06/22/15	SED-190 2 - 4 06/22/15	SED-190A 0 - 2 07/24/15	SED-191 0 - 2 06/22/15	SED-192R 0 - 2 07/23/15	SED-192 2 - 4 06/22/15	SED-193R 0 - 2 07/23/15	SED-193 2 - 4 06/22/15	SED-194 0 - 2 06/24/15
Semivolatile Organics														
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	30.5 J	34.6 J	23.4 J	22.9 J	7,170 J	94.0 J	150 U	31.5 J [26.8 J]	110 U [26.0 J]	44.1 J	184	110 U	100 U
Acenaphthene	ug/kg	297 J	158	90.2 J	33.6 J	15,600	98.6 J	48.8 J	110 U [110 U]	172 [345]	75.3 J	7,070	82.1 J	66.0 J
Acenaphthylene	ug/kg	216 J	79.8 J	27.4 J	93.1 J	88,200	499	204	58.2 J [110 U]	34.6 J [105 J]	21.0 J	1,510	13.9 J	19.5 J
Anthracene	ug/kg	870 J	302	222	320	494,000	1,810	511	117 [110 U]	61.4 J [351]	43.6 J	5,600	29.5 J	100 U
Benzo(a)anthracene	ug/kg	775 J	243	113	486	353,000	1,940	1,490	268 [14.3 J]	123 [447]	110 U	9,760	110 U	100 U
Benzo(a)pyrene	ug/kg	635 J	222	92.8 J	401	305,000	1,640	1,450	249 [110 U]	109 J [411]	110 U	8,500	110 U	100 U
Benzo(b)fluoranthene	ug/kg	335 J	138	61.0 J	230	188,000	1,090	1,120	156 [110 U]	72.1 J [316]	110 U	5,750	110 U	100 U
Benzo(g,h,i)perylene	ug/kg	225 J	112	49.6 J	179	127,000	721	744	126 [110 U]	49.0 J [201]	110 U	2,900	110 U	100 U
Benzo(k)fluoranthene	ug/kg	431 J	156	73.5 J	335	198,000	1,210	1,250	171 [110 U]	83.0 J [317]	110 U	6,590	110 U	100 U
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	548 J	200	115	461	305,000	1,690	1,430	266 [110 U]	98.8 J [378]	110 U	8,770	110 U	100 U
Dibenzo(a,h)anthracene	ug/kg	70.4 J	33.8 J	110 U	60.2 J	42,000	235	230	44.3 J [110 U]	18.5 J [65.0 J]	110 U	1,220	110 U	100 U
Fluoranthene	ug/kg	1,580 J	444	249	905	824,000	4,510	3,930	401 J [21.6 J]	165 J [1,030 J]	29.3 J	12,600	18.6 J	23.7 J
Fluorene	ug/kg	448 J	149	59.1 J	66.6 J	166,000	538	235	110 U [110 U]	81.8 J [223]	46.1 J	2,380	33.9 J	100 U
Indeno(1,2,3-cd)pyrene	ug/kg	215 J	110	47.7 J	168	131,000	734	713	109 J [110 U]	47.5 J [194]	110 U	3,120	110 U	100 U
Naphthalene	ug/kg	92.8 J	164	129	56.7 J	15,300	102 J	31.5 J	94.3 J [53.5 J]	68.1 J [237]	333	1,440	75.4 J	21.9 J
Phenanthrene	ug/kg	2,860 J	468	247	634	915,000 D	4,470	2,720	164 [110 U]	277 J [1,080 J]	96.2 J	9,450	44.5 J	14.9 J
Pyrene	ug/kg	2,280 J	447	253	1,010	825,000	4,270	3,360	452 J [22.9 J]	181 J [999 J]	33.3 J	13,900	21.8 J	27.0 J
C1-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluoranthenes/Pyrenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[e]pyrene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perylene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCL PAHs	ug/kg	11,900 J	3,460 J	1,850 J	5,460 J	5,000,000	25,700 J	19,500 J	2,710 J [139 J]	1,640 J [6,730 J]	722 J	101,000	320 J	173 J
Miscellaneous														
Solids, Percent	%	85.9	91	93.3	89.7	89.9	90.7	88.7	87.9 [92]	90.1 [86.1]	93.2	53.1	90.6	92.6
Total Organic Carbon	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

ARCADIS Design & Consultancy for natural and built assets

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-195R 0 - 2 07/23/15	SED-195 2 - 4 06/24/15	SED-196 0 - 2 06/24/15	SED-197 0 - 2 06/24/15	SED-198 0 - 2 06/24/15	SED-199 0 - 2 06/24/15	SED-199A 0 - 2 07/23/15	SED-199 2 - 4 06/24/15	SED-200 0 - 2 06/24/15	SED-201 0 - 2 06/25/15	SED-201A 0 - 2 07/23/15	SED-201 2 - 4 06/25/15
Semivolatile Organics													
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	19.9 J [30.5 J]	110 U	110 U	110 U [104 J]	110 U	37.6 J	71.8 J	15.4 J	100 U [110 U]	16.3 J	110 U	110 U
Acenaphthene	ug/kg	44.8 J [72.1 J]	110 U	110 U	110 U [118 J]	110 U	68.0 J	601	110 U	100 U [110 U]	43.0 J	110 U	110 U
Acenaphthylene	ug/kg	1,130 [1,680]	110 U	79.1 J	112 J [1,910 J]	17.1 J	492	890	147	62.7 J [24.9 J]	252	126	42.2 J
Anthracene	ug/kg	903 J [1,770 J]	110 U	427	204 J [3,970 J]	63.1 J	1,770	3,050	814	362 [79.3 J]	605	414	171
Benzo(a)anthracene	ug/kg	4,950 [7,200]	110 U	471	636 J [12,500 J]	147	2,940 J	4,580	682	446 [158]	1,480	1,150	239
Benzo(a)pyrene	ug/kg	4,200 [6,220]	110 U	397	527 J [10,100 J]	114	2,500 J	3,870	575	390 [138]	1,250	773	197
Benzo(b)fluoranthene	ug/kg	2,160 [3,550]	110 U	187	313 J [5,490 J]	94.0 J	1,550	2,540	370	239 [87.4 J]	712	476	117
Benzo(g,h,i)perylene	ug/kg	1,410 [2,080]	110 U	158	190 J [3,830 J]	45.9 J	1,180	1,580	226	181 [64.9 J]	556	251	79.1 J
Benzo(k)fluoranthene	ug/kg	3,090 [4,270]	110 U	279	397 J [7,110 J]	80.6 J	1,790 J	3,110	467	305 [107 J]	990	744	163
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	4,640 [6,630]	110 U	395	564 J [10,900 J]	125	2,490 J	4,040	654	404 [149]	1,300	996	212
Dibenzo(a,h)anthracene	ug/kg	531 [799]	110 U	45.4 J	65.2 J [1,300 J]	110 U	369	553	88.7 J	61.3 J [29.8 J]	176	116	36.7 J
Fluoranthene	ug/kg	5,150 [8,130]	110 U	805	883 J [18,100 J]	253	5,360 J	8,430	1,020	809 J [259 J]	2,540	1,820	429
Fluorene	ug/kg	38.0 J [105 J]	110 U	90.1 J	34.5 J [446 J]	110 U	230	874	80.4 J	36.2 J [110 U]	123	20.8 J	32.1 J
Indeno(1,2,3-cd)pyrene	ug/kg	1,340 [1,930]	110 U	143	198 J [3,800 J]	45.1 J	1,090	1,550	222	175 [62.4 J]	527	279	80.0 J
Naphthalene	ug/kg	32.1 J [53.6 J]	110 U	110 U	110 U [195 J]	110 U	61.7 J	180	27.2 J	100 U [110 U]	31.2 J	21.8 J	110 U
Phenanthrene	ug/kg	607 J [1,670 J]	110 U	676	383 J [5,880 J]	127	2,850 J	6,590	663	413 [117]	1,410	371	291
Pyrene	ug/kg	7,700 [11,400]	110 U	1,180	1,070 J [22,300 J]	238	6,820 J	10,300 D	1,290	908 J [300 J]	3,100	1,890	499
C1-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluoranthenes/Pyrenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[e]pyrene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perylene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCL PAHs	ug/kg	37,900 J [57,600 J]	ND	5,330 J	5,580 J [108,000 J]	1,350 J	31,600 J	52,800	7,340 J	4,790 J [1,580 J]	15,100 J	9,450 J	2,590 J
Miscellaneous													
Solids, Percent	%	78.1 [66.8]	91.2	91.6	88.6 [87]	90.5	87.2	82.7	86	91.6 [88]	85.1	88.6	94.1
Total Organic Carbon	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-202 0 - 2 06/25/15	SED-203 0 - 2 06/25/15	SED-204 0 - 2 06/25/15	SED-205 0 - 2 06/25/15	SED-206 0 - 2 06/25/15	SED-206A 0 - 2 07/23/15	SED-206 2 - 4 06/25/15	SED-207 0 - 2 06/25/15	SED-207 2 - 4 06/25/15	SED-208 2 - 4 06/30/15	SED-208A 0 - 2 07/22/15	SED-208B 0 - 2 07/22/15	SED-209 0 - 2 06/30/15	SED-210 0 - 2 06/30/15
Semivolatile Organics															
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	110 U	110 U	110 U	110 U	49.5 J	110 U	110 U	110 U	110 U	100 U	19.0 J	110 UJ	110 U	100 U
Acenaphthene	ug/kg	110 U	110 U	110 U	110 U	73.6 J	110 U	32.7 J	110 U	110 U	48.1 J	187 J	23.1 J	40.2 J	39.5 J
Acenaphthylene	ug/kg	112	110 U	110 U	115	747	54.9 J	62.4 J	13.3 J	19.3 J	39.6 J	196 J	190 J	83.8 J	158
Anthracene	ug/kg	516	110 U	110 U	34.6 J	1,150	31.6 J	135	16.4 J	54.8 J	92.5 J	693 J	193 J	116	312
Benzo(a)anthracene	ug/kg	661	110 U	15.9 J	361	3,300	174	362	60.9 J	117	194	952 J	1,130 J	418	908
Benzo(a)pyrene	ug/kg	537	110 U	110 U	304	2,930	135	300	56.4 J	117	152	777 J	892 J	345	764
Benzo(b)fluoranthene	ug/kg	331	110 U	110 U	161	2,150	78.7 J	197	37.9 J	85.2 J	73.7 J	426 J	483 J	214	405
Benzo(g,h,i)perylene	ug/kg	228	110 U	110 U	120	1,320	59.1 J	132	29.2 J	58.6 J	64.1 J	310 J	353 J	167	338
Benzo(k)fluoranthene	ug/kg	377	110 U	110 U	208	1,920	123	227	43.5 J	95.2 J	124	587 J	650 J	256	569
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	594	110 U	13.7 J	344	3,010	167	301	55.1 J	110	176	885 J	957 J	396	814
Dibenzo(a,h)anthracene	ug/kg	68.4 J	110 U	110 U	36.9 J	424	22.1 J	40.3 J	110 U	26.6 J	20.5 J	96.2 J	110 J	54.1 J	101
Fluoranthene	ug/kg	1,010	110 U	23.4 J	240	6,140	207	753	92.0 J	224	302	1,910 J	2,000 J	637	1,450
Fluorene	ug/kg	42.6 J	110 U	110 U	110 U	187	110 U	44.5 J	110 U	17.2 J	59.7 J	364 J	44.0 J	49.0 J	57.8 J
Indeno(1,2,3-cd)pyrene	ug/kg	216	110 U	110 U	112	1,230	53.1 J	125	28.7 J	60.4 J	64.4 J	294 J	326 J	148	316
Naphthalene	ug/kg	110 U	110 U	110 U	110 U	73.1 J	110 U	110 U	110 U	110 U	100 U	100 UJ	110 UJ	110 U	100 U
Phenanthrene	ug/kg	455	110 U	110 U	16.5 J	2,760	45.9 J	526	44.5 J	130	272	2,540 J	569 J	306	741
Pyrene	ug/kg	1,330	110 U	30.8 J	381	6,270	283	753	88.3 J	199	386	2,410 J	2,580 J	806	1,850
C1-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-Fluoranthenes/Pyrenes	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[e]pyrene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perylene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCL PAHs	ug/kg	6,480 J	ND	83.8 J	2,430 J	33,700 J	1,430 J	3,990 J	566 J	1,310 J	2,070 J	12,700 J	10,600 J	4,040 J	8,820 J
Miscellaneous															
Solids, Percent	%	90.7	91.2	91.2	89.8	84.7	83.7	91.7	91.2	91.1	93.9	92.9	92.8	94	93.6
Total Organic Carbon	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

Location ID: Sample Depth(Feet): Date Collected:	Units	SED-211 0 - 2 06/30/15	SED-212 0 - 2 07/22/15	SED-213 0 - 2 07/06/15	SED-214 8 - 8.8 07/22/15	SED-214A 0 - 3.6 07/22/15	SED-215 0 - 2 07/06/15
Semivolatile Organics							
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	110 U	110 U	110 U	649	110 U	100 U
Acenaphthene	ug/kg	110 U	110 U	24.5 J	954	110 U	100 U
Acenaphthylene	ug/kg	110 U	110 U	37.6 J	129	110 U	100 U
Anthracene	ug/kg	110 U	110 U	94.7 J	1,680	110 U	100 U
Benzo(a)anthracene	ug/kg	25.5 J	19.7 J	214	719	110 U	15.9 J
Benzo(a)pyrene	ug/kg	21.0 J	16.3 J	190	565	110 U	11.8 J
Benzo(b)fluoranthene	ug/kg	14.1 J	110 U	136	264	110 U	100 U
Benzo(g,h,i)perylene	ug/kg	13.0 J	110 U	104 J	222	110 U	100 U
Benzo(k)fluoranthene	ug/kg	18.3 J	110 U	157	445	110 U	100 U
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	23.6 J	18.5 J	206	719	110 U	14.4 J
Dibenzo(a,h)anthracene	ug/kg	110 U	110 U	34.4 J	67.2 J	110 U	100 U
Fluoranthene	ug/kg	43.1 J	27.8 J	426	1,680	110 U	23.9 J
Fluorene	ug/kg	110 U	110 U	31.2 J	946	110 U	100 U
Indeno(1,2,3-cd)pyrene	ug/kg	110 U	110 U	90.7 J	205	110 U	100 U
Naphthalene	ug/kg	110 U	110 U	110 U	325	110 U	100 U
Phenanthrene	ug/kg	23.9 J	110 U	283	3,290	110 U	14.5 J
Pyrene	ug/kg	50.2 J	32.4 J	438	1,900	110 U	27.8 J
C1-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA
C2-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA
C3-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA
C4-Naphthalenes	ug/kg	NA	NA	NA	NA	NA	NA
C1-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA
C2-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA
C3-Fluorenes	ug/kg	NA	NA	NA	NA	NA	NA
C1-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA
C2-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA
C3-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA
C4-Phenanthrenes/Anthracenes	ug/kg	NA	NA	NA	NA	NA	NA
C1-Fluoranthenes/Pyrenes	ug/kg	NA	NA	NA	NA	NA	NA
Benzo[e]pyrene	ug/kg	NA	NA	NA	NA	NA	NA
Perylene	ug/kg	NA	NA	NA	NA	NA	NA
Total TCL PAHs	ug/kg	233 J	115 J	2,470 J	14,800 J	ND	108 J
Miscellaneous							
Solids, Percent	%	90.9	88.7	89.3	92.4	91.4	92.3
Total Organic Carbon	ug/kg	NA	NA	NA	NA	NA	NA

See Notes on Page 15.

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

Lab Qualifiers	Definition
B	Analyte was also detected in the associated method blank.
D	Compound quantitated using a secondary dilution.
J	Indicates an estimated value.
ND	None detected.
U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Note:
Sediment sampling locations identified with and "R" suffix are borings that were revisited to obtain additional sampling intervals based on laboratory results.

Table 2
Near Site Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

ARCADIS Design & Consultancy for natural and built assets

Investigation Location	Field Observations (ft bss)	Total PAHs mg/kg (ft bss)	Proposed PDI Use
SED-180	None (0-10)	ND (0-2)	Horizontal delineation
RB-1	Granular tar (0-0.3) TD=4	NA	NA
15	None (0-8)	0.946 (0-2) ND (2-4) ND (4-6)	Horizontal delineation
SED-179	None (0-10)	ND (0-2)	Horizontal delineation
SED-178	None (0-10)	ND (0-2)	Horizontal delineation
SED-177	None (0-20)	93.2 (0-2) ND (2-4)	Vertical delineation (2 feet)
RB-2	Solid tar (0-0.25) TD=4	NA	Vertical delineation (2 feet) based on SED-177
SED-176	MGP-like odors, black staining (0-2) TD=10	6.47 (2-4)	Vertical delineation (2 feet)
SED-175	None (0-10)	491 (0-2) 1.21 (2-4)	Vertical delineation (2 feet)
SED-185	None (0-8)	0.638 (0-2)	Horizontal delineation
16	None (0-8)	1.566(0-2) ND (2-4) 0.05 (4-6)	Horizontal delineation
RB-3	Solid tar (0-0.25) TD=4	NA	Vertical delineation (2 feet) based on SED-176
SED-128	Trace sheen, MGP-like odor (0-1.8)	538 (0-1.8)	Vertical delineation (2 feet) based on 17
17	Faint tar like odor and some tar like substance (0-2) TD=8	3,523.9 (0-2) 30. 595 (2-4) 1.106 (4-6)	Vertical delineation (2 feet)
SED-173	Black staining, a MGP-like odor (0-2) Odor (2-4) TD=10	7.03 (4-6)	Vertical delineation (2 feet) based on 17
SED-174	None (0-10)	2.86 (0-2)	Horizontal delineation
18	None (0-8)	4.185 (0-2) 0.201 (2-4) 0.041 (4-6)	Horizontal delineation
SED-172	Black staining, MGP-like odor (0-0.2) TD=10	1.22 (2-4)	Vertical delineation (2 feet)
SED-171	MGP –like odors, trace sheens, black staining (0-0.5) Faint odor (0.5-2) TD=10	2.25 (2-4)	Vertical delineation (2 feet)
SED-186	Trace sheen (0-1) TD=10	13. 40 (2-4) 11.90 (4-6)	Vertical delineation (2 feet)
19	Slight tar-like odor (2-4) TD=8	176.64 (0-2) 677.3 (2-4) 38.15 (4-6)	Vertical delineation (4 feet)
SED-170	None (0-10)	ND (0-2)	Horizontal delineation

Table 2
Near Site Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

ARCADIS Design & Consultancy for natural and built assets

Investigation Location	Field Observations (ft bss)	Total PAHs mg/kg (ft bss)	Proposed PDI Use
20	None (0-8)	11.384 (0-2) 0.505 (2-4) 0.563 (4-6)	Horizontal delineation
SED-189	None (0-10)	5.46 (0-2)	Horizontal delineation
SED-187	Trace sheen, trace NAPL blebs, MGP-like odor (0-0.7) MGP-like odor (2-13.6) Black staining (4-8.1) TD=14	3.46 (4-6)	Vertical delineation (2 feet) based on analytical
21	Dark and oil stained, but no sheen, faint tar like odor (0-2) TD=8	18.73 (0-2) 2.193 (2-4) 1.808 (4-6)	Vertical delineation (2 feet)
SED-169	Trace black sand, faint MGP-like odor (0-2) TD=10	105 (2-4) 0.267 (4-6)	Vertical delineation (4 feet)
SED-190	None (0-10)	5000 (0-2) 25.70 (2-4)	Vertical delineation (2 feet)
SED-190A	None (0-2)	19.50 (0-2)	Vertical delineation (2 feet) based on SED-190
SED-127	MGP-like odor, trace sheen (0-3)	259.0 (0-3)	Vertical delineation (2 feet) based on SED-168
SED-168	Black staining (0-2), MGP-like odor (0-14.4) TD=22	0.419 (18-20)	Vertical delineation (2 feet)
SED-188	Taffy like tar, sheens, MGP-like odor (0.2-0.5) Faint MGP like odor (2-3.1)	1.85 (2-4)	Vertical delineation (2 feet)
SED-191	None (0-10)	2.71 [0.139] (0-2)	Horizontal delineation
22	Dark and oil stained, but no sheen, faint tar like odor; slight odor (2-4) TD=8	7.93 (0-2) 13.44 (2-4) 0.74 (4-6)	Vertical delineation (2 feet)
SED-167	None 0-10	5.89 (0-2)	Horizontal delineation
SED-193	Black staining, MGP-like odor (0-0.1) Faint MGP like odor (0.6-1.3)	0. 32 (2-4)	Vertical delineation (2 feet)
SED-193R	None (0-2)	101.0 (0-2)	Vertical delineation (2 feet)
SED-192	MGP-like odor (0-1.1) Faint MGP-like odor (2.6-3.5)	0.722 (2-4)	Horizontal delineation
SED-192R	None (0-2)	1.64 [6.73] (0-2)	Horizontal delineation
SED-166	Black sand (0-0.2), MGP-like odor (0-10.6) TD=16	0.491 (12-14)	Vertical delineation (2 feet) based on SED-193
23	None (0-8)	134.58 (0-2) 16.106 (2-4) 2.616 (4-6)	Vertical delineation (2 feet)
SED-23R	Taffy-like tar, MGP-like odor (0-0.1)	NA	Vertical delineation (2 feet)
SED-23A	None (0-2)	3.06 (0-2)	Horizontal delineation
SED-165	None (0-20)	5.91 (0-2)	Horizontal delineation

Table 2
Near Site Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

Investigation Location	Field Observations (ft bss)	Total PAHs mg/kg (ft bss)	Proposed PDI Use
SED-164	MGP-like odors (0-0.2) TD=10	0.674 (4-6)	Horizontal delineation
SED-164R	None TD=2.0	1.83 (0-2)	Horizontal delineation
SED-163	None 0-10	1.47 (0-2)	Horizontal delineation
SED-194	None (0-10)	0.173 (0-2)	Horizontal delineation
SED-161	None (0-10)	0.158 (0-2)	Horizontal delineation
24	None (0-8)	10.301 (0-2) 0.339 (2-4) 0.097 (4-6)	Horizontal delineation
SED-162	None 0-10	633 (0-2) 19.6 (2-4)	Vertical delineation (2 feet)
SED-195	Trace sheen (0-0.4) TD=10	ND (2-4)	Vertical delineation (2 feet)
SED-195R	None TD=2	37.9 [57.6] (0-2)	Vertical delineation (2 feet)

Note:
Sediment sampling locations identified with and “R” suffix are borings that were revisited to obtain additional sampling intervals based on laboratory results.

Table 3
Near Down Stream Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

ARCADIS Design & Consultancy for natural and built assets

Investigation Location	Field Observations (ft bss)	Total PAHs mg/kg (ft bss)	Proposed PDI Use
SED-160	None (0-10)	0.942 (0-2)	Horizontal delineation
SED-159	None (0-10)	12.9 (0-2) 0.526 (2-4)	Horizontal delineation
SED-197	None (0-10)	5.58/108 (0-2)	Vertical delineation (2 feet based on SED-158)
SED-158	None (0-10)	63.9 (0-2) 0.055 (2-4)	Vertical delineation (2 feet)
SED-198	None (0-10)	1.35 (0-2)	Horizontal delineation
SED-196	None (0-10)	5.33 (0-2)	Horizontal delineation
SED-157	None (0-10)	0.933 (0-2)	Horizontal delineation
SED-156	None (0-10)	7.27 (0-2) 0.23 (2-4)	Horizontal delineation
25	None (0-8)	0.224 (0-2) 0.061 (2-4) ND (4-6)	Horizontal delineation
SED-155	None (0-10)	0.0368 (0-2)	Horizontal delineation
SED-154	None (0-10)	ND (0-2)	Horizontal delineation
SED-153	None (0-10)	ND (0-2)	Horizontal delineation
SED-152	None (0-10)	8.06 (0-2) 0.102 (2-4)	Horizontal delineation
SED-199	None (0-10)	31.6 (0-2) 7.34 (2-4)	Vertical delineation (2 feet)
SED-199A	None (0-2)	52.8 (0-2)	Vertical delineation (2 feet) based on SED-199
SED-151	None (0-10)	155 (0-2) 0.441 (2-4)	Vertical delineation (2 feet)
SED-200	None (0-10)	4.79/1.58 (0-2)	Horizontal delineation
26	None (0-8)	87.01 (0-2) 0.893 (2-4)	Vertical delineation (2 feet)
SED-201	None (0-10)	15.1 (0-2) 2.59 (2-4)	Vertical delineation (2 feet)
SED-201A	None (0-2)	9.45 (0-2)	Horizontal delineation
SED-150	None (0-10)	3.88(0-2)	Horizontal delineation
SED-149	Faint MGP-like odors (0.5-1.3) TD=10	4.47(2-4)	Vertical delineation (2 feet)
SED-149R	None TD=2	88.1 (0-2)	Vertical delineation (2 feet)
SED-148	Taffy like NAPL blebs (3.2-3.3) MGP-like odor (3.3-3.5) Trace NAPL blebs, trace sheens, and faint MGP-like odor (4-4.4) Faint MGP-like odor (4.4-5.2) TD=10	ND (6-8)	Vertical delineation (5 feet)
SED-202	None (0-10)	6.48 (0-2)	Horizontal delineation
SED-147	Tar blebs (2-2.6) Faint MGP-like odor (2.6-3.5) TD=10	0.343 (4-6)	Vertical delineation (4 feet)
SED-203	None (0-10)	ND (0-2)	Horizontal delineation
SED-204	None (0-10)	0.0838 (0-2)	Horizontal delineation

Table 3
Near Down Stream Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

ARCADIS Design & Consultancy for natural and built assets

Investigation Location	Field Observations (ft bss)	Total PAHs mg/kg (ft bss)	Proposed PDI Use
SED-146	None (0-10)	0.556 (0-2)	Horizontal delineation
27	None (0-8)	0.005 (0-2) ND (2-4) 0.881 (4-6) 0.046 (6-8)	Horizontal delineation
SED-145	None (0-10)	ND (0-2)	Horizontal delineation
29	None (0-8)	4.393 (0-2) 0.104 (2-4) ND (4-6)	Horizontal delineation
SED-207	None (0-10)	0.566 (0-2) 1.31 (2-4)	Horizontal delineation
SED-144	None (0-10)	50.7 (0-2)	Vertical delineation (2 feet from SED-206)
SED-206	None (0-10)	33.7 (0-2) 3.99 (2-4)	Vertical delineation (2 feet)
SED-206A	None (0-2)	1.43 (0-2)	Horizontal delineation
SED-205	None (0-10)	2.43 (0-2)	Horizontal delineation
SED-143	Faint MGP-like and Petroleum-like odor (0-2) TD=10	ND/ND (2-4)	Horizontal delineation
SED-143R	None TD=2	0.0326 (0-2)	Horizontal delineation
SED-142	Faint petroleum-like odor (0-2) TD=10	ND (2-4)	Vertical delineation (2 feet)
SED-142R	None TD=2	124 (0-2)	Vertical delineation (2 feet)
28	None	11.729 (0-2) ND (2-4) ND (4-6)	Horizontal delineation
SED-141	None (0-10)	1.04/1.96 (0-2)	Vertical delineation (1 foot based on SED-141R)
SED-141R	Faint MGP-like odor (0-0.2) Light NAPL coating (0.2-0.3) TD=2	NA	Vertical delineation (1 foot)
SED-140	Faint MGP-like odor (0.3-1.3) TD=10	ND (2-4)	Horizontal delineation
SED-140R	None TD=2	2.11 (0-2)	Horizontal delineation
SED-139	None (0-10)	ND (0-2)	Horizontal delineation
SED-139A	MGP-like odor and trace sheen (0-0.4) TD=4	ND (2-4)	Horizontal delineation
SED-184	None (0-3)	8.18 (0-1)	Horizontal delineation

Note:
Sediment sampling locations identified with and “R” suffix are borings that were revisited to obtain additional sampling intervals based on laboratory results.

Table 4
West Bank Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

ARCADIS Design & Consultancy for natural and built assets

Investigation Location	Field Observations (ft bss)	Total PAHs mg/kg (ft bss)	Proposed PDI Use
T-23	Sheen observed edge of west bank	NA	Horizontal delineation (within 4 ft of west bank)
T-24	Sheen observed edge of west bank	NA	Horizontal delineation (within 2 ft of west bank)
T-25	Sheen observed edge of west bank	NA	Horizontal delineation (within 5 ft of west bank)
T-26	Sheen observed edge of west bank	NA	Horizontal delineation (within 5 ft of west bank)
T-27	Sheen observed edge of west bank	NA	Horizontal delineation (within 1 ft of west bank)
2014-15 Spot Probing Between T-27 and the Closed Bridge	Sheens observed along the immediate edge of west bank from T-27 to 45 feet north of the closed bridge (near SED-139A)	NA	Horizontal delineation (within 4 ft of west bank)
SED-164	MGP-like odors (0 - 0.2) TD=10	0.674 (4 - 6)	Horizontal delineation (based on SED-164R)
SED-164R	None (0 - 2) TD=2	1.83 (0 - 2)	Horizontal delineation
SED-194	None (0-10)	0.173 (0 - 2)	Horizontal delineation
SED-161	None (0 - 10)	0.158 (0 - 2)	Horizontal delineation
SED-160	None (0 - 10)	0.942 (0 - 2)	Horizontal delineation
SED-197	None (0 - 10)	5.58/108 (0 - 2)	Vertical delineation (2 feet based on SED-158)
SED-158	None (0 - 10)	63.9 (0 - 2) 0.055 (2 - 4)	Vertical delineation (2 feet)
SED-196	None (0 - 10)	5.33 (0 - 2)	Horizontal delineation
SED-156	None (0 - 10)	7.27 (0 - 2) 0.23 (2 - 4)	Horizontal delineation
SED-155	None (0 - 10)	0.0368(0 - 2)	Horizontal delineation.
SED-153	None (0 - 10)	ND (0 - 2)	Horizontal delineation.
SED-151	None (0 - 10)	155 (0 - 2) 0.441 (2 - 4)	Vertical delineation (2 feet)
SED-200	None (0 - 10)	4.79/1.58 (0 - 2)	Horizontal delineation
SED-150	None (0 - 10)	3.88 (0 - 2)	Horizontal delineation
SED-148	Taffy like NAPL blebs (3.2 - 3.3) MGP-like odor (3.3 - 3.5) Trace NAPL blebs, trace sheens, and faint MGP-like odor (4 - 4.4) Faint MGP-like odor (4.4 - 5.2) TD=10	ND (6 - 8)	Vertical delineation (5 feet)
SED-147	Tar blebs and sheen (2 - 2.6) Faint MGP-like odor (2.6 - 3.5) TD=10	0.343 (4 - 6)	Vertical delineation (4 feet)
SED-146	None (0 - 10)	0.556 (0 - 2)	Horizontal delineation.
27	None (0 - 8)	0.005 (0 - 2) ND (2 - 4) 0.881 (4-6) 0.046 (6-8)	Horizontal delineation.
SED-145	None (0-10)	ND (0 - 2)	Horizontal delineation.

Table 4
West Bank Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

Investigation Location	Field Observations (ft bss)	Total PAHs mg/kg (ft bss)	Proposed PDI Use
29	None (0 - 8)	4.393 (0 – 2) 0.104 (2 – 4) ND (4 – 6)	Horizontal delineation.
SED-143	Faint MGP-like odor (0 - 1.4) Faint petroleum-like odor (0.4 - 2)	ND/ND (2 - 4)	Horizontal delineation
SED-143R	None (0 - 2)	0.0326 (0 - 2)	Horizontal delineation.
SED-142	Faint petroleum-like odor (0 - 2)	ND (2 - 4)	Horizontal delineation.
SED-142R	None (0 - 2)	124.0 (0 - 2)	Vertical delineation.(2 feet)
SED-140	Faint MGP-like odor (0.3 - 2)	ND (2 - 4)	Horizontal delineation.
SED-140R	None (0 - 2)	2.11 (0 - 2)	Horizontal delineation.
SED-139	None (0 - 10)	ND (0 - 2)	Horizontal delineation.
SED-139A	Trace sheen, MGP-like odor (0 - 0.4)	ND (2 - 4)	Horizontal delineation.

Note:
Sediment sampling locations identified with and “R” suffix are borings that were revisited to obtain additional sampling intervals based on laboratory results.

Table 5
Downstream Meander Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

ARCADIS Design & Consultancy for natural and built assets

Investigation Location	Field Observations (ft bss)	Total PAH_{16} mg/kg (ft bss)	Proposed PDI Use
SED- 126	None (0-8)	2.71 (0-2)	Horizontal delineation
SED-125	None (0-8)	2.27 (0-2)	Horizontal delineation
SED-125A	Thin lense (<0.01) of black staining in 0-0.6 interval TD=4	43.1 (0-2)	Vertical delineation (2 feet) based on SED-208
SED-124A	Faint MGP like odor (0-0.5) TD=6	23.8 (0-2)	Vertical delineation (2 feet based on SED-208)
SED-124	Faint MGP like odor (2-3) MGP like odor and thick rubber like tar blebs (3-4) Faint MGP like odor (4-4.5) TD=8	2,870 (2-4) 29 (6-8)	Vertical delineation (4 feet)
SED-124B	MGP like odor (0.5-0.7) TD=6	7,420 (0-2)	Vertical delineation (4 feet based on SED-124A)
SED-208	Trace sheen, black staining, MGP-like odor (0.5-0.7) TD=5.1 feet	2.07 (2-4)	Vertical delineation (2 feet)
SED-208A	None (0-2)	12.6 (0-2)	Horizontal delineation
SED-208B	None (0-2)	10.5(0-2)	Horizontal delineation
SED-132	None (0-8.1)	28.8(0-2) 0.186 (2-4)	Vertical delineation (2 feet)
SED-209	None (0-10)	4.04 (0-2)	Horizontal delineation
SED-123	Sheen, faint odor (0-2.8)	1,050 (0-2.8)	Vertical delineation (4 feet) based on SED-134
SED-124C	MGP like odor, trace sheens (2.6-2.8) Tar blebs throughout, MGP like odor (3.1-3.5) TD=6	8,060 (3-4)	Vertical delineation (4 feet)
SED-134	Black staining and MGP-like odors (2-2.7) TD=17	0.226 (4-6)	Vertical delineation (4 feet)
SED-210	None (0-10)	8.82 (0-2)	Horizontal delineation
SED-135	None (0-10)	0.413 (0-2)	Horizontal delineation
SED-135R	None (0-2)	ND (0-2)	Horizontal delineation
38	Sheen and tar odor (2-3) Wood w/ creosote (5) TD=5	100.42 (0-2) 15.668 (2-3) 36.97 (3-5)	Vertical delineation (3 feet)
SED-122	Faint odor (3-3.3) TD=8	1,230 (0-2)	Vertical delineation (2 feet based on SED-124E)
SED-122A	Thin lenses of light NAPL coating, MGP-like odor (0.9-1.2) TD=5	2.4 (4-5)	Vertical delineation (2 feet)
SED-124D	Faint odor (0-2.4) Trace sheen (0.8-1) Staining (2.4-2.6) TD=6	182 (0-2)	Vertical delineation (3 feet) based on 38
SED-124 E	None (0-10)	94.0 (0-2) 1.74 (2-4)	Vertical delineation (2 feet)
SED-211	None (0-10)	0.233 (0-2)	Horizontal delineation

Table 5
Downstream Meander Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

Investigation Location	Field Observations (ft bss)	Total PAH_{16} mg/kg (ft bss)	Proposed PDI Use
SED-121	None (0-8)	5.0 (2-4)	Horizontal delineation
39	None (0-3)	NA	Horizontal delineation
SED-119	None (0-8)	56.3 (2-4)	Vertical delineation (4 feet)
SED-212 SED-212R	None (0-10) None (0-2) (Note resampled due to broken sample	0.115 (0-2)	Horizontal delineation
SED-120	None (0-8)	1.53 (2-4)	Horizontal delineation
SED-118A	None (0-8)	6.71 / 9.31 (0-2)	Horizontal delineation
SED-137	None (0-10)	ND (0-2)	Horizontal delineation
40	None (0-3)	22.77 (0-2) 34.634 (2-3)	NA
SED-117	None (0-8)	0.367 (0-2)	Horizontal delineation

Note:
Sediment sampling locations identified with and “R” suffix are borings that were revisited to obtain additional sampling intervals based on laboratory results.

Table 6
Downstream Sandbar Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

ARCADIS Design & Consultancy for natural and built assets

Investigation Location	Field Observations (ft bss)	Total PAH_{16} mg/kg (ft bss)	Proposed PDI Use
SED-118	None (0-8)	7.64 (0-2)	Horizontal delineation
SED-213	None (0-8)	2.47 (0-2)	Horizontal delineation
SED-114A	None (0-8)	9.01 (0-2)	Horizontal delineation
SED-116	None (0-6)	24.8 (0-2)	Vertical delineation (2 feet)
SED-116R	Black staining, moderate MGP-like odor (0.7-1.3) Faint MGP-like odor (1.3-1.7) TD=4	14.3 (3-4)	Vertical delineation (2 feet)
SED-116A	MGP-like odor (3-4) TD=4	NA	Vertical delineation (2 feet based on SED-116)
SED-116B	MGP-like odor (3-6) TD=6	4,640 (3.8-6)	Vertical delineation (6 feet based on SED-113)
SED-133	Trace black staining faint MGP-like odors (2.2-2.5) TD=16	8.85 (4-6)	Vertical delineation (3 feet)
SED-113A	MGP-like odor (2.5-4) TD=4	NA	Vertical delineation (6 feet based on SED-113)
SED-113	MGP like odor, rubber-like tar (3.2-3.6) Trace sheen faint odor (6-7.3) TD=8	23,000 (4-6)	Vertical delineation (6 feet)
41	None (0-3)	34.71 (0-2) 296.45 (2-3)	Vertical delineation (4 feet) based on SED-133
SED-114	None (0-8)	9.4 (0-2)	Horizontal delineation
SED-115	None (0-5.3)	0.674 (0-2)	Horizontal delineation
SED-183	None (0-3.2)	1.67 (0-2)	Horizontal delineation
SED-113B	Faint MGP-like odor (2-2.2) TD=10	46.1 (2-4) 12.0 (4-6)	Vertical delineation (4 feet)
SED-113C	None (0-8)	24.1 (0-2) ND (2-4)	Vertical delineation (2 feet)
SED-112	MGP like odor, tar blebs throughout (1-2) Faint odor (2-2.9) TD=6	1,040 (1-2)	Vertical delineation (7 feet based on SED-182)
SED-214	Faint MGP-like odor (2-3) Thin lens of taffy-like tar ~.1' thick, strong odor(3.4) Sheen MGP-like odor(6-7.1) Faint MGP-Like odor (7.1-7.7) TD=8.8	14.8 (8-8.8)	Vertical delineation (7 feet)
SED-214A	None TD=3.6	ND (0-3.6)	Vertical delineation (7 feet based on SED-182 and SED-214)
SED-111	Faint MGP-like odor (2-2.4) Taffy-like tar blebs MGP-like odor (2.6-2.9) TD=4	16,500 (2-4)	Vertical delineation (7 feet based on SED-182)
42	None (0-3)	20.257 (0-2) 57.52 (2-3)	Vertical delineation (7 feet based on SED-182 and SED-214)
SED-111A	MGP like odor (0.7-3) TD=3	362 (2-3)	Vertical delineation (7 feet based on SED-182 and SED-214)

Table 6
Downstream Sandbar Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

Investigation Location	Field Observations (ft bss)	Total PAH_{16} mg/kg (ft bss)	Proposed PDI Use
SED-182	Faint MGP-like odor (2-2.9) Taffy-like tar, strong MGP- like odor (2.9-3.6) Sheen MGP-like odor (6-7.2) Faint MGP-like odor (7.2-7.8) TD=8.8	3.97 (8-8.8)	Vertical delineation (7 feet)
SED-182A	None TD=3.5	0.035 (0-3.5)	Vertical delineation (7 feet based on SED-182 and SED-214)
SED-110	None (0-8)	0.0561 (2-4)	Horizontal delineation
SED-215	None (0-6.7)	0.108 (0-2)	Horizontal delineation
SED-112A	None (0-10)	9.64 (0-2)	Horizontal delineation
SED-109	None (0-8)	111(0-2)	Vertical delineation (2 feet) based on SED-109A
SED-110A	None (0-7.2)	81.3 (0-2)	Vertical delineation (2 feet) based on SD-109A
SED-110B	None (0-3)	77.6 (2-3)	Vertical delineation (7 feet based on SED-182 and SED-214)
SED-108	None (0-8)	0.388 (0-2)	Horizontal delineation
SED-107	None (0-8)	0.453 (2-4)	Horizontal delineation
SED-109B	None (0-8)	8.62 (0-2)	Horizontal delineation
SED-109A	None (0-8)	27.6 (0-2) 0.0129 (2-4)	Vertical delineation (2 feet)

Note:
Sediment sampling locations identified with and “R” suffix are borings that were revisited to obtain additional sampling intervals based on laboratory results.

Table 7
Downstream Sediment Trap Area
Tioughnioga River
Cortland-Homer Former MGP Site
Sediment PDI

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Investigation Location	Field Observations (ft bss)	Total PAHs mg/kg (ft bss)	Proposed PDI Use
SED-106	None (0-8)	0.0753/0.0966 (2-4)	Horizontal delineation
SED- 105	None (0-8)	0.66 (0-2)	Horizontal delineation
SED-104	None (0-8)	0.573/0.65 (0-2)	Horizontal delineation
SED-103	Faint MGP like odor (0-0.3) TD=8	656 (0-2)	Vertical delineation (2 feet) based on SED-103C
43	Possible Tar (@ 0 and 2.5) Tar odor (@ 2.5) TD=5	23.654 (0-2) 3,570.3 (2-3) 86.94 (3-5)	Vertical delineation (3 feet)
SED-103A	None (0-8)	0.865 (0-2)	Horizontal delineation
SED-102	None (0-8)	1.18 (0-2) 0.0264 (2-4)	Horizontal delineation
SED-101	None (0-8)	0.008 (2-4)	Horizontal delineation
SED-100	None (0-8)	0.259 (2-4)	Horizontal delineation
SED-103C	None (0-8)	22.3 (0-2) 0.949 (2-4)	Vertical delineation (2 feet)
SED-103B	None (0-8)	0.239 (0-2)	Horizontal delineation

Note:
Sediment sampling locations identified with and “R” suffix are borings that were revisited to obtain additional sampling intervals based on laboratory results.

FIGURES

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB: K.SARTORI PIC:/PM:/TM:D.CORNELL LYR:(Opt)ON=*;OFF=*REF*
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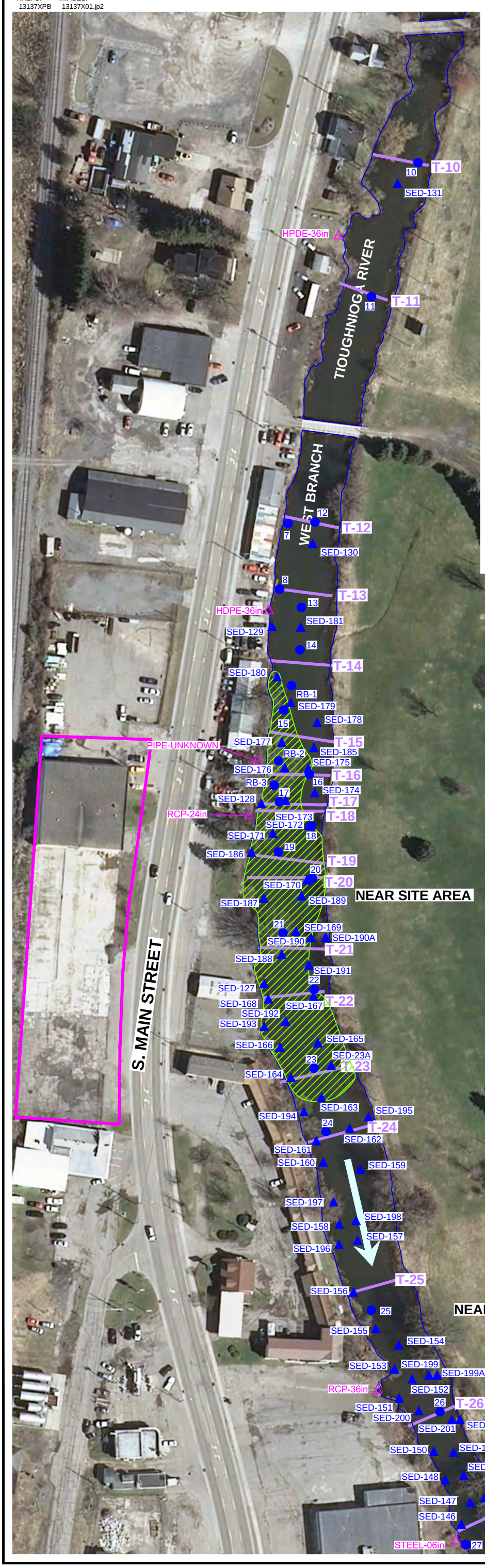

LEGEND:

- HISTORICAL SEDIMENT BORING LOCATION
- OUTFALL/GROUNDWATER SEEP
- PHASE I AND II SEDIMENT BORING LOCATION
- FORMER MGP SITE
- 2013 PROBING TRANSECTS
- MARCH 2005 ROD–DEFINED SEDIMENT REMOVAL AREA

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. AERIAL PHOTOGRAPHY OBTAINED FROM THE NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS (NYSGIS) WEBSITE DATED 2011.
3. HISTORICAL SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5–16 THROUGH 5–19 AND DESCRIPTIONS ON TABLE 5–19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 120' 240'
GRAPHIC SCALE

NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT PDI

SEDIMENT BORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB: K.SARTORI PIC:/PM:/TM:D.CORNELL LYR:(Opt)ON=*;OFF=*REF*
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LEGEND:

- HISTORICAL SEDIMENT BORING LOCATION
- OUTFALL/GROUNDWATER SEEP
- PHASE I AND II SEDIMENT BORING LOCATION
- FORMER MGP SITE
- 2013 PROBING TRANSECTS
- MARCH 2005 ROD–DEFINED SEDIMENT REMOVAL AREA

NOTES:

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3. HISTORICAL SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5–16 THROUGH 5–19 AND DESCRIPTIONS ON TABLE 5–19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 120' 240'
GRAPHIC SCALE

NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT PDI

SEDIMENT BORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB: K.SARTORI PIC:/PM:/TM:D.CORNELL) LYR:(Opt)ON=*;OFF=*REF*
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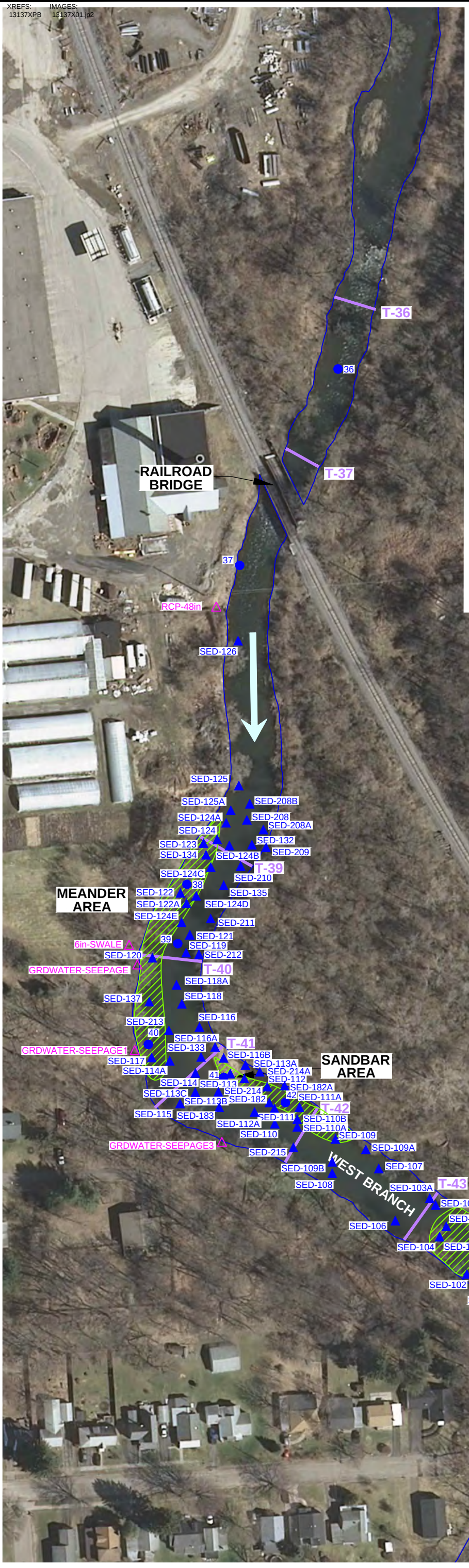


LEGEND:

- HISTORICAL SEDIMENT BORING LOCATION
- OUTFALL/GROUNDWATER SEEP
- PHASE I AND II SEDIMENT BORING LOCATION
- FORMER MGP SITE
- 2013 PROBING TRANSECTS
- MARCH 2005 ROD–DEFINED SEDIMENT REMOVAL AREA

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. AERIAL PHOTOGRAPHY OBTAINED FROM THE NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS (NYSGIS) WEBSITE DATED 2011.
3. HISTORICAL SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5–16 THROUGH 5–19 AND DESCRIPTIONS ON TABLE 5–19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

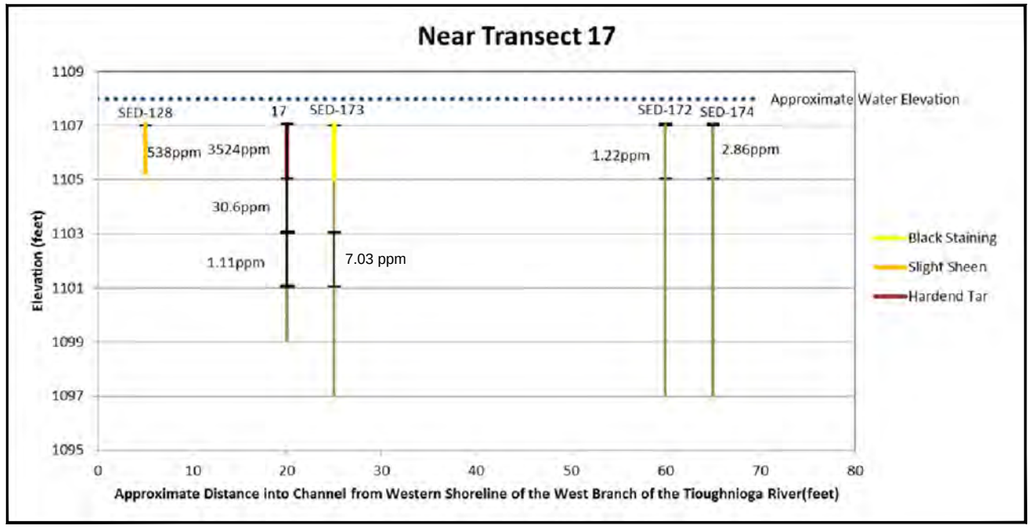
0 120’ 240’
GRAPHIC SCALE

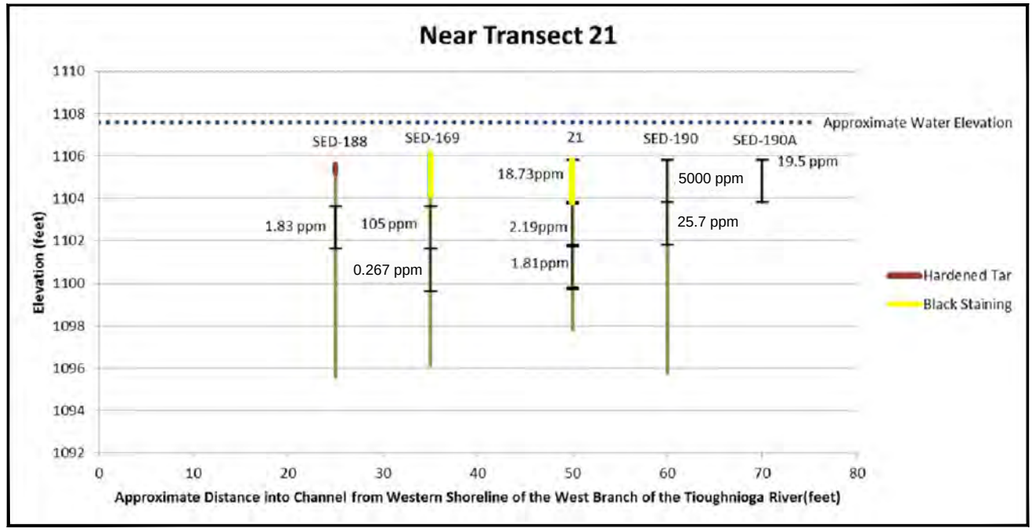
NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT PDI

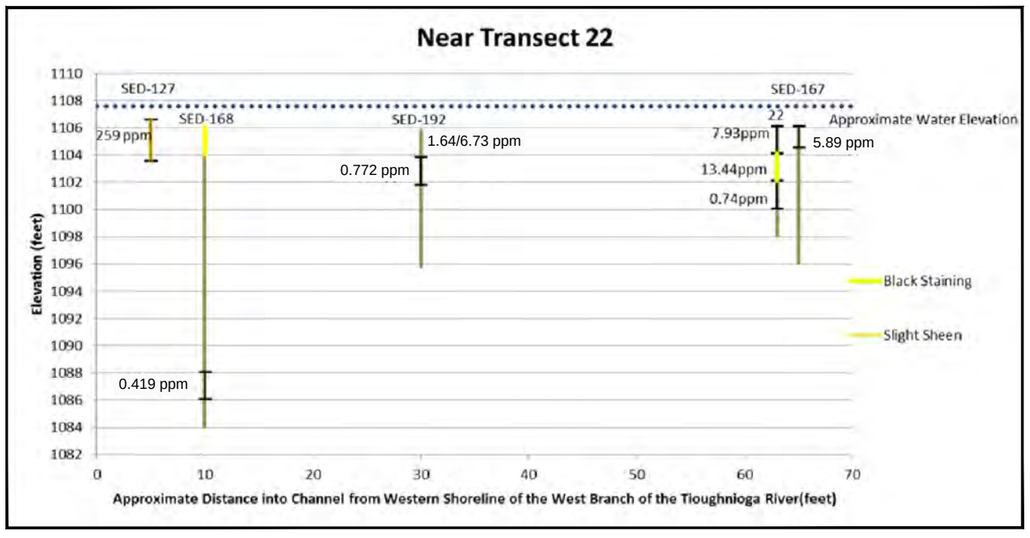
SEDIMENT BORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3







NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT PDI

NEAR SITE TRANSECT CROSS SECTIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4

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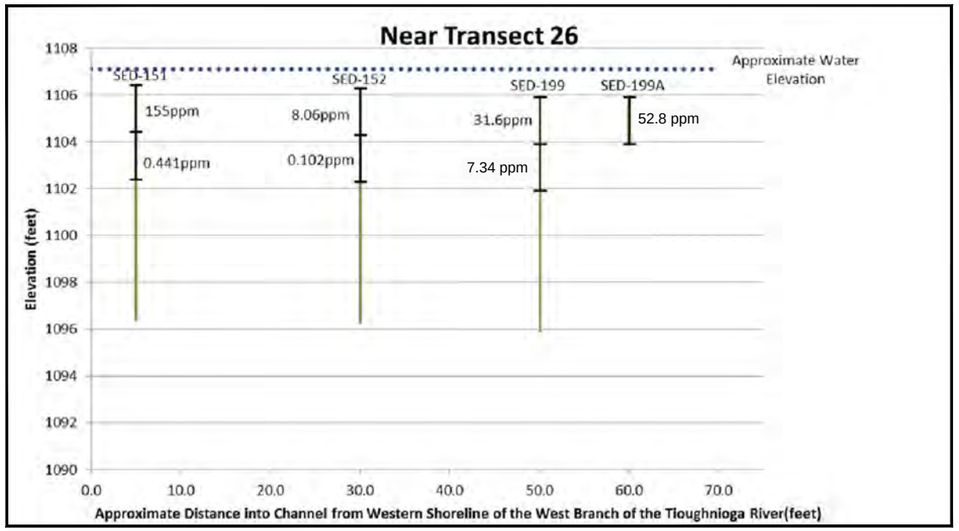

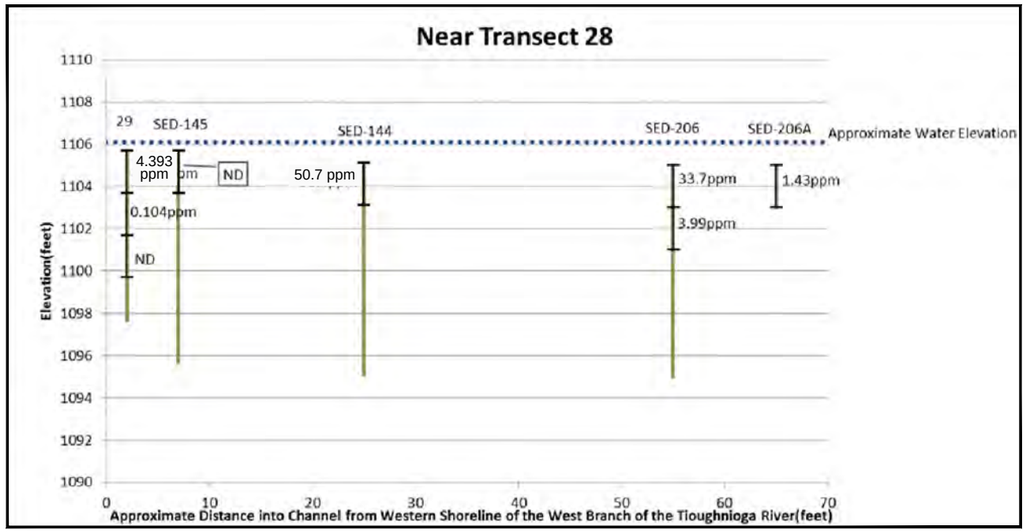

NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT PDI

NEAR DOWNSTREAM AREA TRANSECT CROSS SECTIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB: K.SARTORI PIC:/PM:/TM:D.CORNELL LYR:(Opt)ON=*;OFF=*REF*
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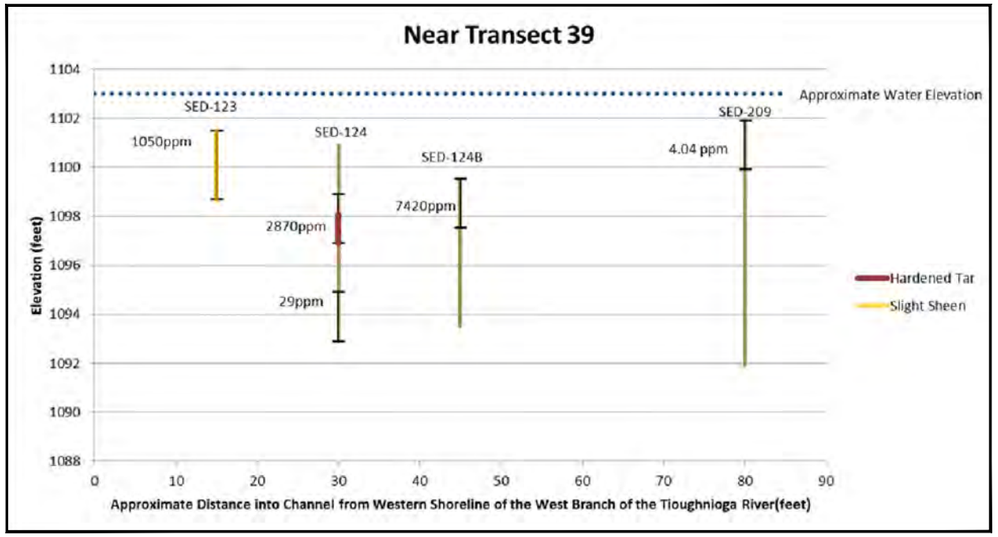

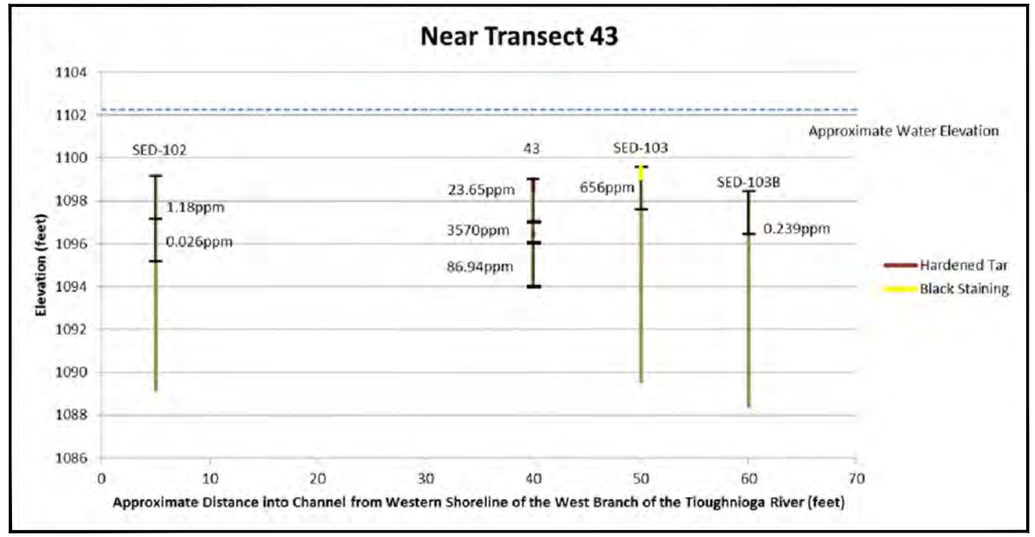

NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT PDI

MEANDER AND SEDIMENT TRAP AREA TRANSECT CROSS SECTIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
6

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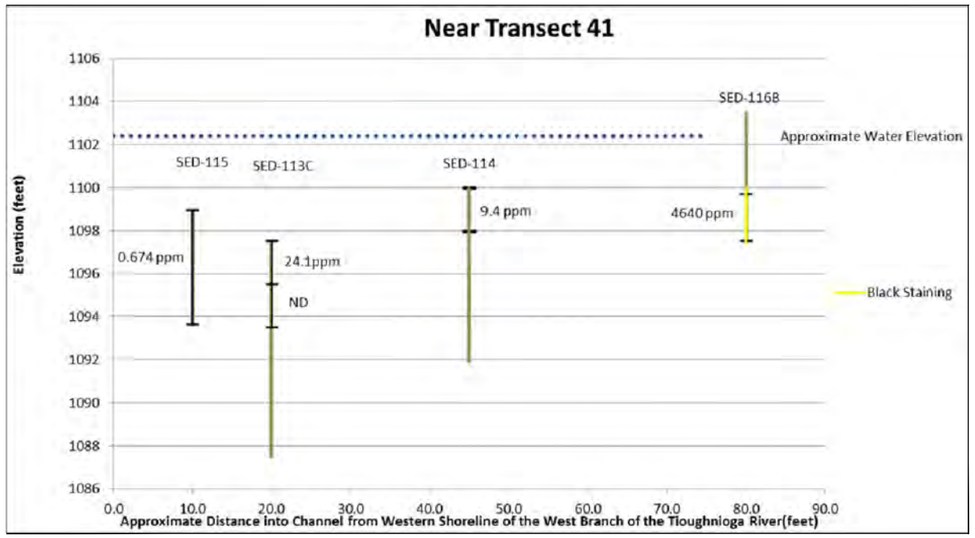

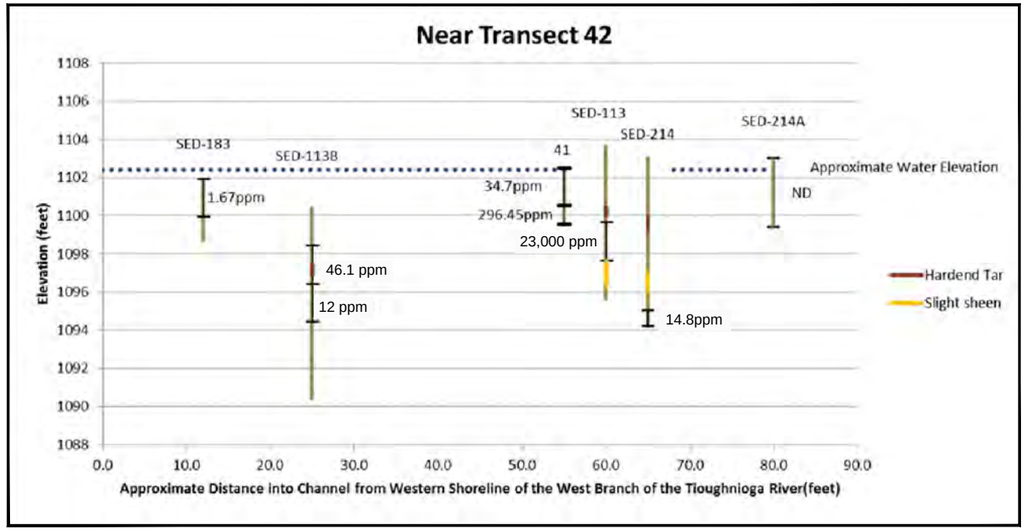

NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT PDI

SANDBAR AREA TRANSECT CROSS SECTIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
7

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB: K.SARTORI PIC:/PM:/TM:D.CORNELL LYR:(OptjON=;OFF=*REF*
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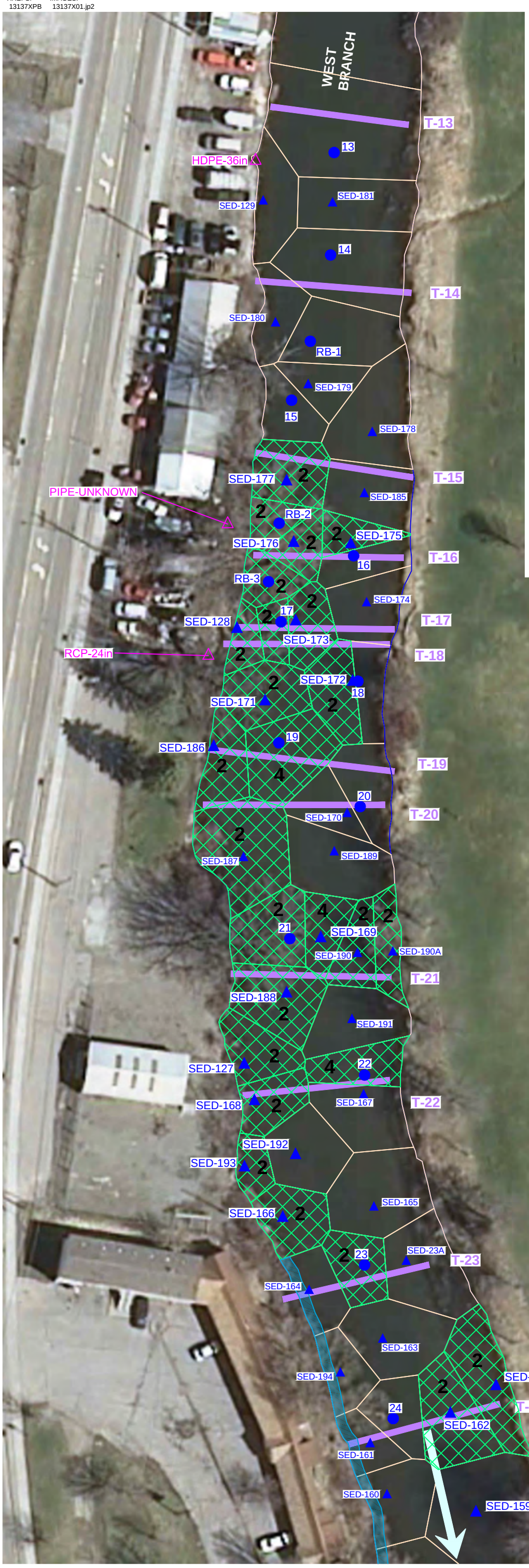

LEGEND:

- HISTORICAL SEDIMENT BORING LOCATION
- OUTFALL/GROUNDWATER SEEP
- PHASE I AND II SEDIMENT BORING LOCATION
- FORMER MGP SITE
- 2013 PROBING TRANSECTS
- THIESSEN POLYGONS
- 2 — PROPOSED DEPTH OF SEDIMENT REMOVAL (FEET BELOW SEDIMENT SURFACE) NEAR SITE AREA
- WEST BANK AREA

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. AERIAL PHOTOGRAPHY OBTAINED FROM THE NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS (NYSGIS) WEBSITE DATED 2011.
3. HISTORICAL SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5–16 THROUGH 5–19 AND DESCRIPTIONS ON TABLE 5–19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 50’ 100’
GRAPHIC SCALE

NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT PDI

SEDIMENT BORING LOCATIONS AND POTENTIAL REMOVAL AREAS NEAR SITE AREA

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FIGURE
8

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB: K.SARTORI PIC:/PM:/TM:D.CORNELL) LYR:(Opt)ON=*;OFF=*REF*
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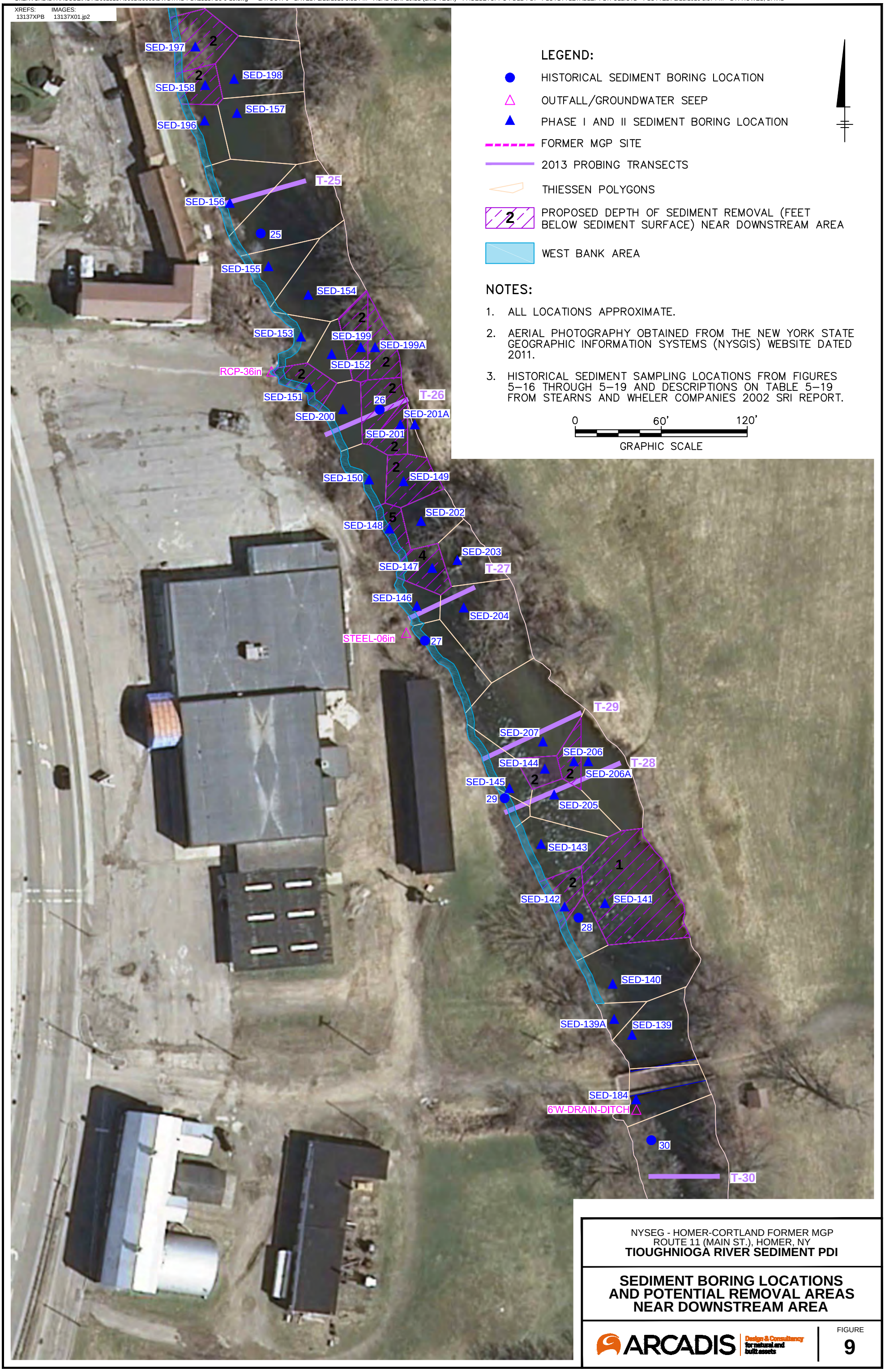

LEGEND:

- HISTORICAL SEDIMENT BORING LOCATION
- OUTFALL/GROUNDWATER SEEP
- PHASE I AND II SEDIMENT BORING LOCATION
- FORMER MGP SITE
- 2013 PROBING TRANSECTS
- THIESSEN POLYGONS
- 2 — PROPOSED DEPTH OF SEDIMENT REMOVAL (FEET BELOW SEDIMENT SURFACE) NEAR DOWNSTREAM AREA
- WEST BANK AREA

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. AERIAL PHOTOGRAPHY OBTAINED FROM THE NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS (NYSGIS) WEBSITE DATED 2011.
3. HISTORICAL SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5–16 THROUGH 5–19 AND DESCRIPTIONS ON TABLE 5–19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 60' 120'
GRAPHIC SCALE

NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT PDI

SEDIMENT BORING LOCATIONS AND POTENTIAL REMOVAL AREAS NEAR DOWNSTREAM AREA

ARCADIS Design & Consultancy for natural and built assets

FIGURE 9

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB: K.SARTORI PIC:/PM:/TM:D.CORNELL) LYR:(Opt)ON=*;OFF=*REF*
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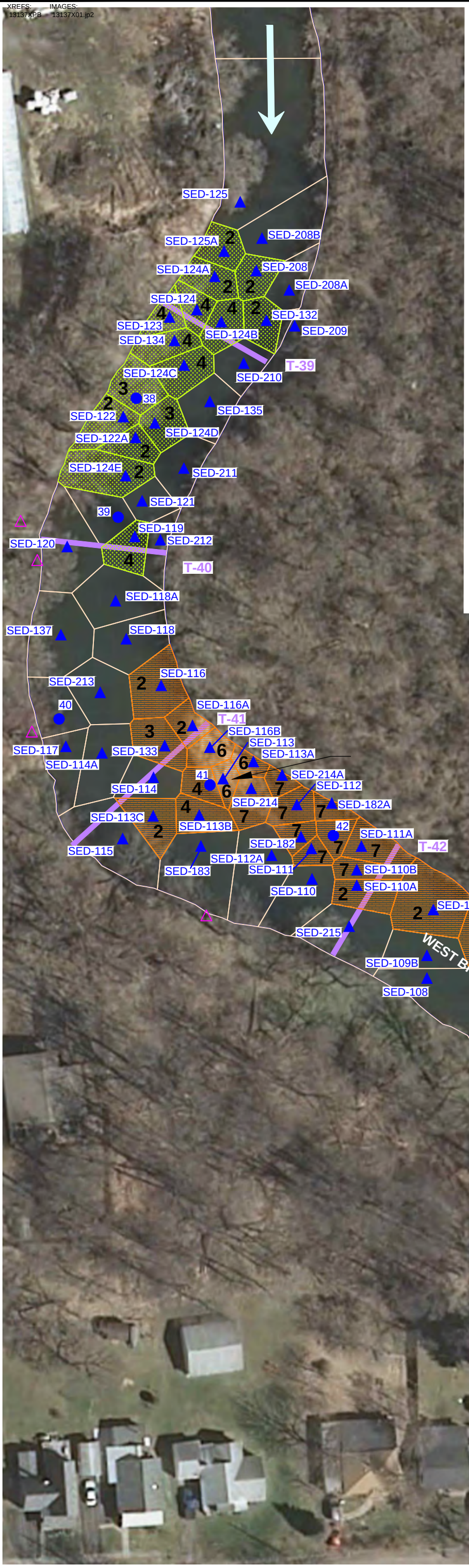

LEGEND:

- HISTORICAL SEDIMENT BORING LOCATION
- OUTFALL/GROUNDWATER SEEP
- PHASE I AND II SEDIMENT BORING LOCATION
- FORMER MGP SITE
- 2013 PROBING TRANSECTS
- THIESSEN POLYGONS
- 2 MEANDER AREA
- 2 SAND BAR AREA
- 2 SEDIMENT TRAP AREA

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. AERIAL PHOTOGRAPHY OBTAINED FROM THE NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS (NYSGIS) WEBSITE DATED 2011.
3. HISTORICAL SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5–16 THROUGH 5–19 AND DESCRIPTIONS ON TABLE 5–19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 60' 120'
GRAPHIC SCALE

NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT PDI

SEDIMENT BORING LOCATIONS AND POTENTIAL REMOVAL AREAS MEANDER, SANDBAR AND SEDIMENT TRAP AREAS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
10

ATTACHMENT 1

Phase I Supplemental Sediment Assessment

ARCADIS of New York, Inc.
6723 Towpath Road
PO Box 66
Syracuse
New York 13214-0066
Tel 315.446.9120
Fax 315.446.8053
www.arcadis-us.com

ENVIRONMENT

Mr. William Ports
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7014

Subject:
Cortland - Homer Former MGP Site
Tioughnioga River
Phase 1 Supplemental Sediment Assessment Letter Report

Date:
October 6, 2014

Contact:
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B0013124.0001.00003

Dear Mr. Ports:

This letter presents the results of the Phase I supplemental sediment assessment completed in connection with the Cortland-Homer former manufactured gas plant (MGP) site (the "site") located in Homer, New York. The Phase I supplemental sediment assessment was conducted by ARCADIS, on behalf of NYSEG, between April 28 and May 9, 2014. The fieldwork was performed in accordance with the following correspondence:

- Supplemental Sediment Drilling Work Plan dated April 11, 2013
- New York State Department of Environmental Conservation's (NYSDEC) approval letter to NYSEG dated March 31, 2014

The assessment objectives and background are provided below, followed by a discussion of the completed fieldwork and results of the assessment.

Objectives and Background

The overall objective of the supplemental sediment assessment was to further assess the quality of sediments and distribution of MGP-related impacts in the Tioughnioga River upstream, adjacent to, and downstream from the site. The supplemental sampling consisted of further delineation of surface and subsurface MGP-related impacts documented approximately 10 years ago during the 2003 Supplemental Remedial Investigation (SRI) and more recently during a supplemental sediment assessment completed in January and February 2013.

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In 2013, ARCADIS conducted a reconnaissance and sediment probing assessment at the site to determine whether regions of affected sediments documented in the 2003 SRI Report still existed. The need for this additional assessment was precipitated by the occurrence of two major flood events on the river subsequent to the 2003 SRI Report. The assessment involved probing sediments along the same stretch of the Tioughnioga River that was investigated during the 2003 SRI (**Figures 1 through 3**). This area extends from approximately 900 feet upstream from the site to approximately 5,000 feet downstream from the site at the location of a "sediment trap" observed near the confluence with Dry Creek. The results of the 2013 assessment indicate that distribution of visual impacts observed in surficial sediments adjacent to and downstream from the site did not match with the distribution of visual impacts previously observed during the 2003 SRI. As a result of the 2013 probing assessment findings, and based on conversations between the NYSDEC and NYSEG on March 21, 2013, NYSEG determined that additional analytical sampling and deeper penetration into the sediments was required to further verify the findings of the 2013 sediment probing assessment.

The specific objectives of the supplemental sediment assessment were to evaluate:

- the distribution of visual impacts (i.e., sheens, non-aqueous phase liquid [NAPL]) in deeper sediments in comparison to the impacts observed during the 2003 SRI
- the concentration and distribution of MGP-related polycyclic aromatic hydrocarbons (PAHs) in sediments at levels above the background concentration of 6.2 parts per million (ppm) that was established in the 2005 Record of Decision (ROD)

The results of the supplemental sediment assessment will be used to further refine the sediment areas for remedial consideration identified in the ROD. The sediment areas identified in the ROD for remedial consideration are shown on **Figures 1 through 3.**

This letter report describes the Phase I supplemental sediment assessment activities; provides the Phase I assessment results from areas upstream, adjacent to, and downstream of the former site; and sets forth proposed additional Phase II supplemental sediment assessment activities for the downstream area. Upon completion of Phase II, a comprehensive compilation of the 2013 and 2104 sediment assessment activities and the revised areas for remedial consideration will be provided in a Pre-Design Investigation Report (PDI Report).

Phase I Sediment Drilling and Sampling

A total of 40 sediment borings were advanced during this investigation as shown on **Figures 1 and 3**. Twenty seven (27) planned borings (SED-100 to SED-126) and 8 contingency borings (SED-111A, SED113A, SED-116A and B, and SED-124A to D) for a total of 35 borings were advanced between the railroad bridge and the "sediment trap" downstream of the site (**Figure 3**). The contingency borings were installed to further delineate the presence of NAPL blebs or to further refine the extent where no visual field observations were noted. Two planned borings (SED-127 and SED-128) were advanced adjacent to the site and three planned borings (SED-129 to SED-131) were advanced upstream of the site (**Figure 1**).

Due to the heavily armored bottom of the Tioughnioga River, borings were primarily advanced by Parratt-Wolff Inc. using a barge mounted portable tripod rig and where conditions allowed, a few borings were advanced manually by ARCADIS. For the sediment borings advanced using a barge-mounted portable tripod rig, an oil absorbent boom was placed around the barge during the drilling activities, a temporary casing was set prior to borehole advancement, and sediment samples were obtained continuously using a 3-inch 2-foot split spoon sampler driven by a 300-pound hammer. The tripod borings were generally advanced to a depth of 8 feet below sediment surface (bss) into the till or until refusal. For the sediment borings advanced manually, the sediment samples were obtained using a slide hammer to drive a 4-foot Macrocore® barrel containing a 2-inch diameter disposable liner. The manual borings were advanced to a depth of 4 feet bss or until refusal. Shallow (1 to 3 feet bss) refusals were noted in the borings adjacent to and upstream of the site, which were all installed manually. Water depths, blow-counts, sample recoveries, and/or any observed impacts produced by the drilling were also noted during the sediment investigation.

Recovered sediment samples were visually characterized for color, composition, and presence/absence of potential MGP-related impacts (i.e., NAPL, blebs, sheens, staining, or odors) and headspace screened for volatile organic compounds using a photoionization detector (PID). One sediment sample from each boring except SED-113A and SED-116A was submitted for laboratory analysis, and two sediment samples were submitted from SED-102 and SED-124 for a total of 40 samples for laboratory analysis (plus quality assurance/quality control [QA/QC] samples). Sediment sampling intervals were selected for laboratory analysis based on observations made during drilling. Sediment samples exhibiting field observations of potential impacts (i.e., sediments containing NAPL, blebs, sheen, staining odor, or elevated PID reading) were selected for analysis. Where sediment samples did not exhibit field observations of potential impacts, then an interval corresponding to the impacted depths (generally either the 0 to 2 foot or 2 to 4 foot bss interval) identified in the 2003 SRI was selected for analysis. Sediment samples were submitted to Accutest Laboratories for analysis of National Oceanic and Atmospheric Administration (NOAA) 34 PAHs using SW-846 Method 8270 and total organic carbon (TOC) using the Lloyd Kahn method.

ARCADIS validated the laboratory analytical data and prepared a data usability summary report (DUSR) for each individual sample delivery group (SDG) using the most-recent versions of the USEPA's Function Guidelines (USEPA, 1999; 2002) and USEPA Region II SOPs for data validation. The DUSRs include an assessment of data accuracy, precision, and completeness; significant quality assurance problems, solutions, corrections, and potential consequences; and analytical data validation reports. The results of the data validation have been incorporated into the analytical data presented in **Table 1**.

Prior to initiating the sediment drilling activities, a utility clearance was performed. Equipment used during the drilling program was decontaminated prior to, in between, and after all intrusive activities using an Alconox wash or by steam cleaning. Decontamination water, sediment cuttings and all investigation-derived waste (IDW) were containerized in 55-gallon drums for subsequent off-site disposal by NYSEG. All sediment borings were backfilled naturally by sediment collapse. The location and sediment surface elevations of each boring were surveyed by ARCADIS using a global

positioning system (GPS) relative to North American Datum of 1983 (NAD 83) and North American Vertical Datum of 1988 (NAVD 88), respectively.

Phase I Supplemental Sediment Assessment Results

The following discussion of the Phase I 2014 supplemental sediment assessment results is divided into subsections based on the areas that were investigated, specifically the areas upstream, adjacent to, and downstream of the site. **Figures 1 and 3** were developed to support the discussion. These figures depicts the 2013 sediment probing transects, the 2014 sediment sampling locations, historical sampling locations from the 2003 SRI, and the removal areas (green hatching) set forth in the March 2005 ROD. The 2014 sediment sampling analytical results are summarized in text boxes on **Figures 1 and 3**. The total PAH (TPAH) concentrations shown on these figures are a summation of the 16 total priority pollutant list (PPL) PAHs. Analytical data from the Phase 1 sediment assessment are provided in **Table 1**, and the sediment boring logs are provided in **Attachment 1**.

Upstream Area

The sediments upstream of the site are described as fine to medium sands (SED-129) and coarse to medium/ coarse sands and fine to coarse gravels (SED-130 and (SED-131). No field observations of potential impacts were noted except for a faint odor at SED-129. TPAH concentrations measured from the upper 1 to 2 feet of sediment in this area ranged from 2.67 milligrams per kilogram (mg/kg) (SED-129) to 14.1 mg/kg (SED-130).

Adjacent Area

The sediments adjacent to the site are described as fine to coarse gravels, some fine to coarse sand (SED-127) and silt and fine sands, some fine to medium gravels (SED-128). In both borings MGP-like odors and trace sheens were observed. TPAH concentrations measured from the upper 1.8 to 3 feet of sediment in this area ranged from 259 mg/kg (SED-127) to 538 mg/kg (SED-128).

Downstream Area

The downstream area was further subdivided into three areas from the north to the south (upstream to downstream) as follows: Downstream Area 1 (SED-126 to SED-117), Downstream Area 2 (SED-116 to SED-107), and Downstream Area 3 (SED-106 to SED-100). Results from each of these areas are discussed below.

Downstream Area 1

The sediments in this area were predominately medium to coarse sands and fine to coarse gravels. Fine to medium sand and occasionally silt lenses were also observed. At sediment borings SED-118 to SED-120, till was observed in approximately the bottom two feet of these borings. At sediment borings SED-124, SED-124A, SED-124C and SED-124D, cobbles were observed in the bottom two to three feet of the borings. Most sediments were medium dense to very dense; loose

density sediments were only observed at a few locations in the upper 2 feet of sediment (SED-119, SED-124, SED-124B, and SED-124D). Water depths ranged from 1.5 to 4.7 feet to the top of sediment.

Tar blebs were only observed at SED-124 (2.8 to 3.2 feet bss) and SED-124C (3.1 to 3.5 feet bss). Trace sheens were observed at SED-123 (0 to 3 feet bss), SED-124C (2.6 to 2.8 feet bss), and SED-124D (0.8 to1 feet bss). Odors described as MGP-like were also observed at SED-124, SED-124A to SED-124C; faint odors were also noted at SED-122 and SED-123. PID headspace measurements were only observed at borings SED-124 and SED-124A to SED-124D.

TPAH concentrations measured from the upper 2 to 4 feet of sediment in this area ranged from 0.367 mg/kg (SED-117) to 8,060 mg/kg (SED-124C). At sediment boring SED-124, two samples were obtained: TPAH concentrations from 2 to 4 feet bss and 6 to 8 feet bss were 2,870 and 29 mg/kg, respectively.

Downstream Area 2

The sediments in this area were finer grained than in Downstream Area 1 with predominately fine to medium sands with silts and fine to coarse gravels. Coarser sediments (medium to coarse sands, fine to coarse gravels, and cobbles) were observed in borings SED-108, SED-110, and SED-115. Most sediments were medium dense to very dense; loose density sediments were only observed at one location in the upper 2 feet of sediment (SED-113). Water depths ranged from 0 to 4.9 feet to the top of sediment.

Rubber like tar was only observed at SED-113 (3.2 to 6 feet bss), and tar blebs were observed at SED-111 (2 to 4 feet bss) and SED-112 (1 to 2 feet bss). Trace sheens were only observed at SED-113 (6 to 8 feet bss). Odors described as MGP-like were also observed at SED-111 to SED-113 and SED-116A and SED-116B; faint odors were also noted at SED-112 from 2 to 6 feet bss. Trace sheens at the water surface were observed near sampling location SED-112. PID headspace measurements were only observed at borings SED-111 to SED-113.

TPAH concentrations measured from the upper 2 to 4 feet of sediment in this area ranged from 0.056 mg/kg (SED-110) to 15,400 mg/kg (SED-111). At sediment boring SED-113, a deeper samples from 4 to 6 feet bss was obtained in the interval with the rubber like tar; the TPAH concentrations from this interval was 21,600 mg/kg. At sediment boring SED-116B, a deeper samples from 3.8 to 6 feet bss was obtained in the interval with MGP-like odors; the TPAH concentrations from this interval was 4,640 mg/kg.

Downstream Area 3

The sediments in this area were predominately fine to medium sands and fine to coarse gravels. At sediment borings SED-100 to SED-101, till was observed in approximately the bottom two feet of these borings. At sediment borings SED-103 to SED-106, cobbles were observed in the bottom two to five feet of the borings. Most

sediments were dense to very dense. Water depths ranged from 3.1 to 4 feet to the top of sediment.

No tars, blebs, sheens, or staining were observed Odors described as faint MGP-like were only observed at SED-103. Likewise, PID headspace measurements were only observed at boring SED-103.

TPAH concentrations measured from the upper 2 to 4 feet of sediment in this area ranged from 0.008 mg/kg (SED-101) to 1.18 mg/kg (SED-102) except at SED-103 (655 mg/kg).

Phase II – Proposed Additional Borings

The Phase 1 results for the downstream area were evaluated to identify data gaps and propose additional laboratory analyses or sampling activities during Phase II. These additional sediment borings in the downstream area (**Figure 3**) will be obtaining during Phase II of the supplemental sediment assessment; the other Phase II boring locations as set forth in the 2013 Supplemental Sediment Drilling Work Plan are depicted on **Figures 1 and 2.**

In Downstream Area 1, four additional sediment borings are proposed to further delineate the horizontal and vertical extent of this area for remedial consideration as follows:

Location	Field Observations (feet bss)	Total PAHs mg/kg (feet bss)	Proposed Phase II Activities
SED-124B	MGP-like odor (0.5 to 0.7)	7,420 (0 to 2)	Install boring to east for further horizontal delineation
SED-124C	Trace sheen, MGP-like odor (2.6 to 2.8) MGP-like odor, tar blebs (3.1 to 3.5)	8,060 (3 to 4)	Install boring to east of 124C and 124D for further horizontal delineation
SED-124D	Trace Sheen (0.8 to 1) Staining (2.4 to 2.6)	182 (0 to 2)	
SED-117 SED-120	None (0 to 8) None (0 to 8)	0.367 (0 to 2) 1.53 (2 to 4)	Install boring between SED-117 and SED-120 to confirm horizontal and vertical delineation
SED-123	Trace sheen, faint odor (0 to 3)	1,050 (0 to 3)	Install boring near SED-123 for vertical delineation.

In Downstream Area 2, two additional sediment borings and one laboratory analysis of an archived sample are proposed to further delineate the vertical extent of this area for remedial consideration as follows:

Location	Field Observations (feet bss)	Total PAHs mg/kg (feet bss)	Proposed Phase II Activities
Vertical Extent			
SED-116B	Odor/ MGP-like odor (2.5 to 4)	4,640 (3.8 to 6)	Install boring near SED-116B for vertical delineation
SED-113	MGP-like odor, rubber-like tar (3.2 to 6) Trace sheen, faint odor (6-8)	21,600 (4 to 6)	Analyze sample from 6 to 8 for vertical delineation
SED-112	Tar blebs and MGP odor (1 to 2) Faint odor (2 to 6)	1,040 (1 to 2)	Install boring between SED-113 and SED-111 near SED-112 for vertical delineation
SED-111	MGP-like odor (1 to 2.9) Taffy-like tar blebs (2.6 to 2.9)	15,400 (2 to 4)	See above

In Downstream Area 3, no additional sediment borings and one laboratory analysis of an archived sample are proposed to further delineate the vertical extent of this area for remedial consideration as follows:

Location	Field Observations (feet bss)	Total PAHs mg/kg (feet bss)	Proposed Phase II Activities
SED-103	Faint MGP-like odor (0 to 0.3)	656 (0 to 2)	Analyze sample from 2 to 4 for vertical delineation

In summary, in addition to the 44 near site sediment borings, six additional borings will be installed in the area downstream of the site between the railroad bridge and the "sediment trap", and two archived samples will be analyzed for PPL PAHs and TOC as part of the Phase II sediment drilling program.

Please feel free to contact Tracy Blazicek (NYSEG) or me if you have any questions or comments.

Sincerely,

ARCADIS of New York, Inc.

David A. Cornell, P.G.
Senior Geologist

Attachments:
Table 1
Figures 1 through 3
Attachment 1

Copies:
Keith White, C.P.G., ARCADIS
Tracy Blazicek, CHMM, NYSEG

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-100 2 - 4 05/08/14	SED-101 2 - 4 05/08/14	SED-102 0 - 2 05/07/14	SED-102 2 - 4 05/07/14	SED-103 0 - 2 05/07/14	SED-104 0 - 2 05/07/14	SED-105 0 - 2 05/07/14	SED-106 2 - 4 05/07/14	SED-107 2 - 4 05/06/14	SED-108 0 - 2 05/06/14	SED-109 0 - 2 05/06/14	SED-110 2 - 4 05/05/14	SED-111 2 - 4 05/06/14
Semivolatile Organics														
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	649,000 DJ
2-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,070,000 DJ
Acenaphthene	ug/kg	6.90	4.20 U	10.4	4.30 U	23,700	6.10 [4.30]	3.90 J	3.90 U [4.00 U]	24.5	9.90	653	4.00 U	1,300,000 DJ
Acenaphthylene	ug/kg	9.00	4.20 U	21.5	4.30 U	13,800	10.9 [15.5]	21.7	3.90 UB [4.30 UB]	6.20	8.80	3,420 J	4.00 U	282,000 J
Anthracene	ug/kg	13.6	4.20 U	105	4.30 U	50,000	37.4 J [69.2 J]	39.5	3.10 J [6.10]	24.4 J	17.3 J	5,450 J	2.40 J	1,160,000 DJ
Benzo(a)anthracene	ug/kg	18.2	4.20 U	86.8	2.20 J	42,800	42.4 [50.2]	53.3	6.40 [7.00]	22.3	28.4	10,800	4.10	671,000 J
Benzo(a)pyrene	ug/kg	16.5	4.20 U	70.8	4.30 U	34,100	34.7 [41.5]	48.2	5.70 [5.70]	16.1	20.7	8,900 J	4.10	563,000 J
Benzo(b)fluoranthene	ug/kg	10.9 J	4.20 U	58.8	4.30 U	19,400	28.0 J [30.4]	32.4	3.90 [4.70]	19.6	10.9	5,160 J	3.00 J	320,000 J
Benzo(g,h,i)perylene	ug/kg	8.10	4.20 U	37.3	4.30 U	13,200	17.7 [20.2]	24.4	3.00 J [3.00 J]	8.50	10.7	3,760 J	2.80 J	238,000 J
Benzo(k)fluoranthene	ug/kg	7.30	4.20 U	66.8	4.30 U	26,300	34.3 [38.6]	45.0	5.30 [5.50]	8.50	9.60	2,910 J	4.00 U	209,000 J
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	10.3	4.20 U	40.9	4.30 U	20,600	21.2 [24.9]	33.2	4.50 [4.50]	9.00	15.3	5,600	3.00 J	395,000 J
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	5.80	4.20 U	19.9	4.30 U	5,160	9.00 [10.6]	12.9	2.30 J [2.30 J]	2.90 J	4.40 J	1,590	2.20 J	111,000 J
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	4.10 U	4.20 U	12.1	4.30 U	1,470	4.10 U [5.20]	4.10 U	3.90 U [4.00 U]	4.00 U	4.70 U	496	4.00 U	34,700 J
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	4.10 U	4.20 U	4.10 U	4.30 U	789	4.10 U [4.20 U]	4.10 U	3.90 U [4.00 U]	4.00 U	4.70 U	298	4.00 U	13,100 J
Chrysene	ug/kg	18.3 J	4.20 U	96.5	3.00 J	41,300	47.0 J [53.4]	60.0	7.60 [8.40]	29.8 J	31.1 J	10,800 J	6.20 J	670,000 J
Dibenzo(a,h)anthracene	ug/kg	3.10 J	4.20 U	14.6	4.30 U	4,510 J	6.40 J [7.40]	10.0	3.90 U [4.00 U]	2.50 J	2.80 J	1,130	4.00 U	75,900 J
Fluoranthene	ug/kg	43.7	2.40 J	209	5.90	95,500	103 [108]	105	13.4 [17.3]	72.0 J	72.6 J	20,100 J	11.6 J	1,920,000 DJ
Fluorene	ug/kg	5.90	4.20 U	23.1	4.30 U	26,900	11.2 [9.30]	6.30	3.90 U [3.20 J]	19.7	7.70	914 J	4.00 U	1,150,000 DJ
Indeno(1,2,3-cd)pyrene	ug/kg	7.50 J	4.20 U	38.2	4.30 U	14,100	17.5 J [21.3]	24.9	3.00 J [2.90 J]	4.00 U	10.0	3,530 J	2.90 J	242,000 J
Naphthalene	ug/kg	4.10 U	4.20 U	5.00	4.30 U	386	3.70 J [3.00 J]	3.00 J	3.90 U [4.00 U]	14.4	6.70	225	4.00 U	646,000 J
Phenanthrene	ug/kg	35.3	2.70 J	148	8.20	133,000	83.7 [68.4]	55.3	7.90 [16.7]	106	53.8	9,170	7.80	3,650,000 DJ
Pyrene	ug/kg	54.2	2.90 J	186	7.10	117,000	88.7 [109]	127	16.0 [16.1]	78.1 J	86.8 J	23,800 J	11.2 J	2,330,000 DJ
C1-Naphthalenes	ug/kg	4.10 U	4.20 U	7.10	2.30 J	2,940	4.20 [3.90 J]	3.70 J	3.90 U [2.10 J]	20.6	8.60	211	2.00 J	862,000 J
C2-Naphthalenes	ug/kg	8.80	4.20 U	17.1	3.60 J	12,400	11.1 [10.1]	9.80	4.90 [6.20]	21.8	11.2	686	4.60	838,000 J
C3-Naphthalenes	ug/kg	6.70	4.20 U	12.6	2.40 J	9,460	6.50 [8.80]	6.40	2.70 J [3.30 J]	8.00	6.90	869	2.50 J	301,000 J
C4-Naphthalenes	ug/kg	4.80	4.20 U	6.50	4.10 J	2,300	6.00 [5.80]	6.00	2.70 J [2.70 J]	3.80 J	4.50 J	533	4.50	57,700 J
C1-Fluorenes	ug/kg	6.40	4.20 U	11.8	4.30 U	13,300	5.20 [7.60]	7.90	2.20 J [3.10 J]	7.80	7.10	1,190	4.00 U	355,000 J
C2-Fluorenes	ug/kg	4.40	4.20 U	10.8	4.30 U	4,720	4.20 [6.80]	7.20	2.30 J [2.80 J]	4.00	4.50 J	1,100	4.00 U	128,000 J
C3-Fluorenes	ug/kg	4.10 U	4.20 U	4.10 U	4.30 U	2,600	4.10 U [4.20 U]	4.10 U	3.90 U [4.00 U]	4.00 U	4.70 U	556	4.00 U	62,100 J
C1-Phenanthrenes/Anthracenes	ug/kg	29.7	2.70 J	89.6	5.90	79,400	45.2 [56.4]	62.1	10.1 [11.4]	42.8	47.3	10,900	6.70	1,450,000 J
C2-Phenanthrenes/Anthracenes	ug/kg	10.8	2.30 J	38.0	2.60 J	22,900	21.6 [22.5]	30.7	5.30 [5.30]	15.7	22.3	5,330	5.90	450,000 J
C3-Phenanthrenes/Anthracenes	ug/kg	3.40 J	4.20 U	12.5	4.30 U	4,570	6.20 [8.00]	10.8	3.90 U [2.20 J]	3.50 J	6.20	1,410	3.30 J	91,800 J
C4-Phenanthrenes/Anthracenes	ug/kg	4.10 U	4.20 U	3.80 J	4.30 U	773	4.10 U [2.40 J]	3.30 J	3.90 U [4.00 U]	4.00 U	4.70 U	342	4.00 U	20,600 J
C1-Fluoranthenes/Pyrenes	ug/kg	33.1	2.90 J	109	5.00	79,000	52.5 [68.9]	90.5	12.1 [11.1]	36.7	49.1	15,300	6.90	1,420,000 J
Benzo[e]pyrene	ug/kg	10.3	4.20 U	48.1	4.30 U	17,900	22.9 [27.0]	31.7	4.10 [4.30]	12.2	14.9	4,700 J	3.60 J	295,000 J
Perylene	ug/kg	4.50	4.20 U	20.2	4.30 U	5,900 J	9.50 [10.6]	11.2	3.90 U [4.00 U]	4.30 J	5.40 J	1,730 J	4.00 U	113,000 J
Total Priority Pollutant PAHs	ug/kg	259 J	8.00 J	1,180	26.4 J	656,000 J	573 J [650 J]	660 J	75.3 J [96.6 J]	453 J	388 J	111,000 J	56.1 J	15,400,000 J
Miscellaneous														
Solids, Percent	%	90.3	92.5	91.9	91.4	90.4	93.9 [93]	91.4	87.3 [87]	87.7	80.3	85.5	89.6	79.6
Total Organic Carbon	mg/kg	1,180	807	3,890	857	8,570	4,100 [4,260]	1,740	1,110 [1,070]	1,140	921	32,100	994	219,000

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-111A 2 - 3 05/07/14	SED-112 1 - 2 05/06/14	SED-113 4 - 6 05/06/14	SED-114 0 - 2 05/05/14	SED-115 0 - 2 05/05/14	SED-116 0 - 2 05/06/14	SED-116B 3.8 - 6 05/07/14	SED-117 0 - 2 05/05/14	SED-118 0 - 2 04/30/14	SED-119 2 - 4 04/30/14	SED-120 2 - 4 04/30/14	SED-121 2 - 4 04/30/14	SED-122 0 - 2 04/29/14	SED-123 0 - 3 04/29/14
Semivolatile Organics															
1-Methylnaphthalene	ug/kg	NA	NA	897,000 DJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	NA	NA	1,400,000 DJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	ug/kg	17,000	47,000	1,610,000 DJ	90.4	3.20 J	219	359,000	3.00 J	36.7	508	19.2	35.8	75,200	28,900 D
Acenaphthylene	ug/kg	6,870	28,000	251,000 J	232	17.6	698	78,200	11.1	169	1,760	45.0	175	25,400	35,300 D
Anthracene	ug/kg	24,500	59,600	2,380,000 DJ	360 J	21.5 J	1,320	359,000	15.7 J	353	3,520	47.2	228	85,900	77,100 D
Benzo(a)anthracene	ug/kg	22,400	79,700	1,260,000 DJ	811	60.8	2,190	233,000	28.9	684	4,520	123	483	65,900	80,300 D
Benzo(a)pyrene	ug/kg	18,300	65,800	502,000 J	635	59.4	1,880	184,000	23.3	593	3,940	126	452	56,000	65,200 D
Benzo(b)fluoranthene	ug/kg	10,500	37,500	277,000 J	373	47.8	1,160	105,000	15.2	407	2,290	87.3	264	30,100	34,500 D
Benzo(g,h,i)perylene	ug/kg	7,030	28,000	208,000 J	309	37.0	922	69,200	13.1	275 J	1,720 J	73.6 J	218 J	22,200	24,100 D
Benzo(k)fluoranthene	ug/kg	14,000	44,500	342,000 J	195	27.7	698	135,000	10.3	438	2,830	48.5	128	36,900	43,400 D
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	10,300	40,700	375,000 J	409	35.6	1,110	116,000	16.3	347	2,670	73.1	263	37,100	40,400
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	2,430	11,500	105,000 J	138	15.7	333	31,600	4.60	129	872	29.4	88.3	10,400	13,500
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	727	2,610	27,500 J	35.5	10.3	136	8,180	4.30 U	50.5	247	14.9	33.1	3,350	5,360
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	367	1,370	13,800 J	20.6	3.80 U	26.0 U	4,310	4.30 U	32.6	146	4.10 U	18.6	1,590	1,690
Chrysene	ug/kg	21,400	77,700 J	1,310,000 DJ	724 J	71.8 J	2,200 J	229,000	33.4 J	676 J	4,570 J	141 J	482 J	62,000	74,500 D
Dibenzo(a,h)anthracene	ug/kg	2,380	8,380	69,200 J	97.5	3.80 U	255	24,300	5.00	88.5 J	535 J	18.9 J	60.2 J	7,270	7,300
Fluoranthene	ug/kg	52,100	155,000 J	2,730,000 DJ	1,760 J	125 J	4,660 J	536,000 D	67.9 J	1,430	8,860	261	847	162,000 D	161,000 D
Fluorene	ug/kg	16,700	42,200	1,740,000 DJ	131	3.80 U	287	306,000	4.90	71.3	874	16.0	44.9	74,300	32,200 D
Indeno(1,2,3-cd)pyrene	ug/kg	7,650	29,900	212,000 J	320	37.2	828	78,400	13.9	280	1,680	69.6	204	23,200	27,000 D
Naphthalene	ug/kg	3,040	3,140	424,000 J	15.3	4.00	99.0	172,000	3.10 J	34.2	102	17.7	27.8	14,000	718
Phenanthrene	ug/kg	75,800	138,000	5,050,000 DJ	1,280	40.5	2,340	1,110,000 D	37.3	728	6,690	155	401	290,000 D	163,000 D
Pyrene	ug/kg	62,600	191,000 J	3,250,000 DJ	2,070 J	120 J	5,090 J	659,000 D	80.5 J	1,380	11,900 DJ	285	954	196,000 D	193,000 D
C1-Naphthalenes	ug/kg	7,100	13,600	694,000 J	18.6	2.60 J	89.4	288,000	3.90 J	23.3	87.4	11.6	18.5	38,200	2,990
C2-Naphthalenes	ug/kg	11,100	26,600	787,000 J	91.4	7.00	307	284,000	8.40	59.8	558	24.4	45.6	54,000	13,300
C3-Naphthalenes	ug/kg	5,790	14,500	293,000 J	99.7	6.20	318	107,000	5.90	77.4	662	17.4	47.1	23,500	15,400
C4-Naphthalenes	ug/kg	1,530	4,180	62,300 J	48.6	7.50	130	21,400	4.30	52.7	275	10.0	29.6	5,410	5,000
C1-Fluorenes	ug/kg	7,050	17,700	336,000 J	117	5.30	356	105,000	6.10	88.6	1,000	18.8	53.0	26,600	23,900
C2-Fluorenes	ug/kg	2,880	7,040	129,000 J	57.3	6.60	248	39,200	5.30	70.9	548	16.1	48.7	11,700	11,800
C3-Fluorenes	ug/kg	1,070	3,250	62,900 J	68.6	3.80 U	204	14,500	4.30 U	59.4	500	4.10 U	97.7	4,260	5,300
C1-Phenanthrenes/Anthracenes	ug/kg	41,800	99,800	1,340,000 J	1,030	42.6	2,460	514,000	39.2	603	6,260	127	402	131,000	107,000
C2-Phenanthrenes/Anthracenes	ug/kg	12,100	38,700	430,000 J	340	28.2	1,000	145,000	20.7	290	2,530	65.7	208	40,800	39,900
C3-Phenanthrenes/Anthracenes	ug/kg	2,440	8,800	94,200 J	104	11.9	301	26,400	5.90	101	592	21.5	69.6	8,890	10,800
C4-Phenanthrenes/Anthracenes	ug/kg	440	1,550	17,700 J	27.4	4.80	82.3	6,590	4.30 U	25.9	114	7.60	17.8	1,950	2,580
C1-Fluoranthenes/Pyrenes	ug/kg	41,800	128,000	1,320,000 J	1,120	64.0	2,820	458,000	45.0	841	7,290	160	649	121,000	125,000
Benzo[e]pyrene	ug/kg	9,540	34,700	259,000 J	385	43.5	1,070	93,600	16.0	341 J	2,200 J	83.3 J	255 J	27,900	31,700 D
Perylene	ug/kg	3,300	12,200	103,000 J	128 J	18.6 J	760	32,600	5.90 J	149 J	820 J	31.2 J	107 J	10,300 J	10,400 J
Total Priority Pollutant PAHs	ug/kg	362,000	1,040,000 J	21,600,000 J	9,400 J	674 J	24,800 J	4,640,000	367 J	7,640 J	56,300 J	1,530 J	5,000 J	1,230,000	1,050,000
Miscellaneous															
Solids, Percent	%	69.5	61	67.1	91.6	88.8	65.8	65.5	91.7	87.7	85.6	88.8	86.2	69.2	53.9
Total Organic Carbon	mg/kg	30,500	28,700	323,000	8,090	1,340	26,900	55,800	1,500	2,950	24,100	2,220	6,890	33,700	22,800

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

Location ID: / Sample Depth(Feet): / Date Collected:	Units	SED-124 2 - 4 04/29/14	SED-124 6 - 8 04/29/14	SED-124A 0 - 2 05/08/14	SED-124B 0 - 2 05/08/14	SED-124C 3 - 4 05/08/14	SED-124D 0 - 2 05/09/14	SED-125 0 - 2 04/29/14	SED-126 0 - 2 04/28/14	SED-127 0 - 3 05/08/14	SED-128 0 - 1.8 05/08/14	SED-129 0 - 2 05/08/14	SED-130 0 - 1.5 05/08/14	SED-131 0 - 1 05/08/14
Semivolatile Organics														
1-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	ug/kg	184,000	2,120	1,380	455,000 DJ	402,000 J	8,950	18.2	9.00	21,700	20,200	22.6	49.4	14.1
Acenaphthylene	ug/kg	54,300	512	609	137,000 J	86,600 J	3,870	65.5	112	5,910	22,100	88.4	202	101
Anthracene	ug/kg	200,000	1,980	790	569,000 DJ	382,000 J	13,200	133	98.9	15,800	43,200	133	572	132
Benzo(a)anthracene	ug/kg	137,000	1,640	1,970 J	408,000 J	260,000 J	11,300	184	318	15,500	29,100	475	1,410	233
Benzo(a)pyrene	ug/kg	117,000	1,370	1,690 J	331,000 J	206,000 J	9,110	161	279	12,000	25,800	681	1,120	233
Benzo(b)fluoranthene	ug/kg	61,000	752	902	186,000 J	114,000 J	5,050	120	159	6,710	19,400	499	993 J	202
Benzo(g,h,i)perylene	ug/kg	46,100	562 J	621	127,000 J	79,300 J	3,560	83.7 J	125 J	4,650	12,900	496	512	137
Benzo(k)fluoranthene	ug/kg	78,600	906	1,090 J	252,000 J	157,000 J	7,010	66.4	85.7 J	8,880	20,700	350	1,090	203
C1-Benzo(a)anthracenes/Chrysenes	ug/kg	76,700	878	855	215,000 J	138,000 J	5,420	95.6	213	7,540	10,600	1,680	633	204
C2-Benzo(a)anthracenes/Chrysenes	ug/kg	22,200	278	253	53,100 J	36,100 J	1,530	59.1	82.3	1,960	3,670	2,050	297	134
C3-Benzo(a)anthracenes/Chrysenes	ug/kg	5,950	55.7	95.1	17,700 J	11,400 J	379	25.0	27.2	616	1,600	1,630	120	85.4
C4-Benzo(a)anthracenes/Chrysenes	ug/kg	3,670	26.8	65.6	7,830 J	5,330 J	128	12.6	29.5 J	325	924	1,190	87.1	70.1
Chrysene	ug/kg	128,000	1,580 J	1,690 J	416,000 J	255,000 J	10,900	191 J	339 J	17,400	29,300	871	1,350 J	266
Dibenzo(a,h)anthracene	ug/kg	16,000	164 J	201	45,000 J	27,700 J	1,180	27.6 J	36.1 J	1,650	4,190	122	10.1 J	55.0
Fluoranthene	ug/kg	370,000 D	3,570	4,260 J	929,000 DJ	1,300,000 DJ	26,900	408	391	36,500	86,000	687	2,840	393
Fluorene	ug/kg	178,000	1,870	410	427,000 DJ	329,000 J	8,860	56.3	18.7	9,740	23,900	27.0	90.8	16.1
Indeno(1,2,3-cd)pyrene	ug/kg	51,100	545	624	140,000 J	86,500 J	3,840	79.4	111	5,060	14,900	290	632 J	142
Naphthalene	ug/kg	79,200	1,200	30.9	4,300 J	165,000 J	203	8.80	10.8	7,280	3,430	13.5	12.4	23.2
Phenanthrene	ug/kg	724,000 D	5,950	2,470 J	1,850,000 DJ	2,620,000 DJ	35,200	327	100	46,700	107,000	192	1,010	158
Pyrene	ug/kg	447,000 D	4,310	5,090 J	1,140,000 DJ	1,590,000 DJ	33,200	345	521	43,500	76,100	1,190	2,180	359
C1-Naphthalenes	ug/kg	133,000	1,760	25.7	85,800 J	310,000 J	898	25.2	11.0	16,400	5,600	23.2	11.1	19.9
C2-Naphthalenes	ug/kg	148,000	1,770	312	199,000 J	337,000 J	3,810	46.7	27.7	18,400	11,500	47.7	44.6	44.1
C3-Naphthalenes	ug/kg	57,000	669	517	152,000 J	137,000 J	3,420	37.6	20.9	9,190	7,400	37.5	67.2	57.3
C4-Naphthalenes	ug/kg	12,400	169	209	32,900 J	29,100 J	1,000	20.8	22.3	2,200	2,070	32.2	55.6	46.8
C1-Fluorenes	ug/kg	67,800	722	899	180,000 J	120,000 J	3,950	31.3	30.6	5,800	7,860	26.9	68.4	25.7
C2-Fluorenes	ug/kg	26,100	323	316	63,100 J	47,700 J	1,680	36.0	47.3	2,460	2,950	58.0	76.5	52.1
C3-Fluorenes	ug/kg	11,100	170	150	27,800 J	21,500 J	632	22.6	35.3	927	1,510	118	92.2	66.0
C1-Phenanthrenes/Anthracenes	ug/kg	286,000	3,230	2,770	897,000 J	602,000 J	22,100	183	233	30,200	36,100	215	791	205
C2-Phenanthrenes/Anthracenes	ug/kg	88,800	975	1,000	248,000 J	179,000 J	6,380	89.5	195	8,510	10,600	450	417	197
C3-Phenanthrenes/Anthracenes	ug/kg	19,200	267	229	48,500 J	38,900 J	1,320	34.6	69.7	1,880	2,920	563	155	98.5
C4-Phenanthrenes/Anthracenes	ug/kg	4,110	45.1	59.5	10,000 J	7,900 J	250	12.8	17.8	333	652	427	40.5	36.3
C1-Fluoranthenes/Pyrenes	ug/kg	266,000	2,980	3,060	834,000 J	519,000 J	21,300	215	525	28,800	35,900	1,580	1,260	289
Benzo[e]pyrene	ug/kg	58,300	697 J	774	171,000 J	107,000 J	4,760	102 J	151 J	6,220	15,200	1,030	692	175
Perylene	ug/kg	21,400 J	245 J	285	59,900 J	37,100 J	1,640	43.8 J	55.9 J	2,270	7,610	218	322	103
Total Priority Pollutant PAHs	ug/kg	2,870,000	29,000 J	23,800 J	7,420,000 J	8,060,000 J	182,000	2,270 J	2,710 J	259,000	538,000	6,140	14,100 J	2,670
Miscellaneous														
Solids, Percent	%	86.2	88	77.6	84	57.1	84.6	91.8	93.1	50.7	38.1	78.9	80	83.7
Total Organic Carbon	mg/kg	17,000	1,400	30,200	62,600	68,400	23,200	1,560	2,000	36,500	135,000	11,000	5,420	11,400

Table 1
Summary of Sediment Sample Analytical Results
Tioughnioga River
Cortland-Homer Former MGP Site
Phase I Supplemental Sediment Assessment

Table 1 Notes:

Qualifier Type	Lab Qualifiers	Definition
Inorganic	D	
Inorganic	DJ	
Inorganic	J	Indicates an estimated value.
Inorganic	U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
Inorganic	UB	
Organic	D	Compound quantitated using a secondary dilution.
Organic	DJ	
Organic	J	Indicates an estimated value.
Organic	U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
Organic	UB	

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB:A. SCHILLING, R. ALLEN LD:(Opt) PIC:(Opt) PM:S. POWLIN TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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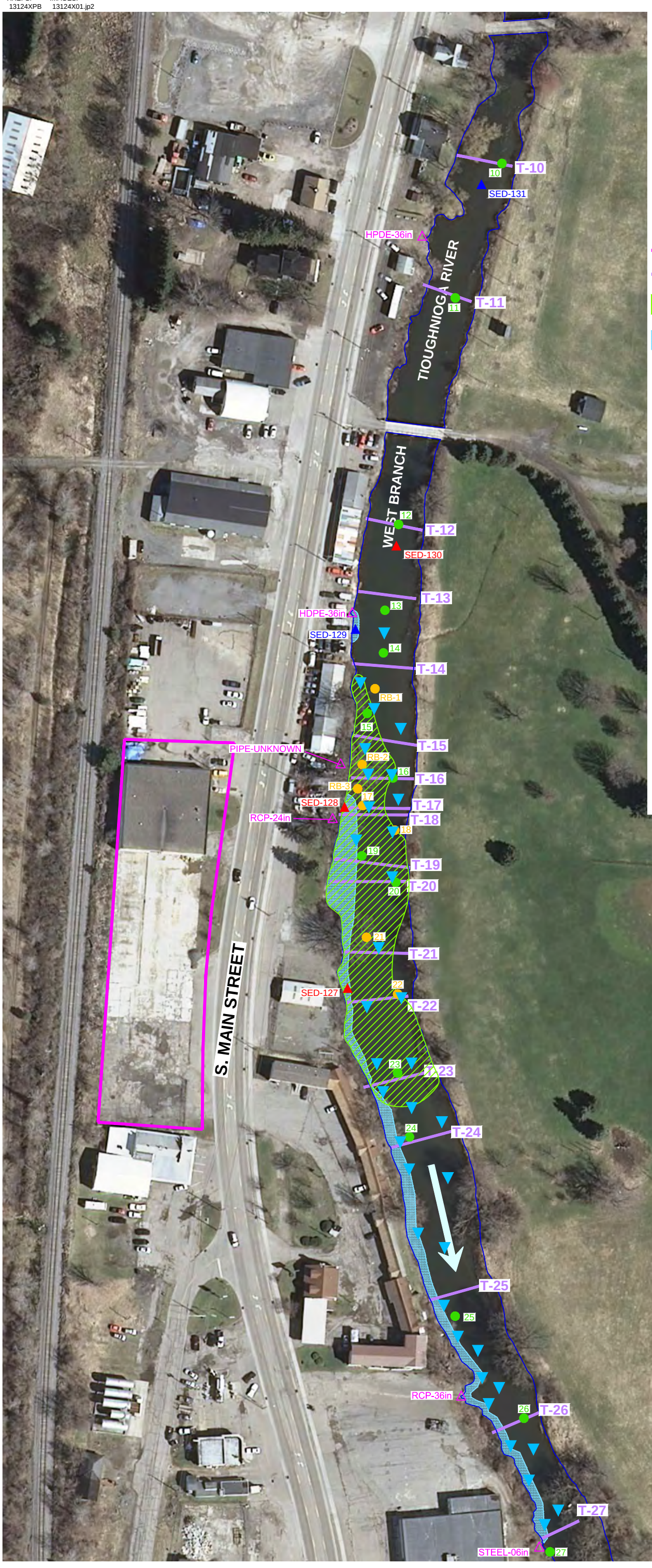

LEGEND:

- HISTORICAL SEDIMENT BORING LOCATION WHERE NO VISUAL IMPACTS WERE OBSERVED (2001)
- HISTORICAL SEDIMENT BORING LOCATION WHERE VISUAL IMPACTS WERE OBSERVED (2001)
- OUTFALL/SEEP
- PHASE I SEDIMENT BORING GREATER THAN 6.2 PPM TOTAL PAHs (SPRING 2014)
- PHASE I SEDIMENT BORING LESS THAN 6.2 PPM TOTAL PAHS (SPRING 2014)
- PROPOSED PHASE II SEDIMENT BORING
- FORMER MGP SITE
- 2013 PROBING TRANSECTS
- MARCH 2005 ROD–DEFINED SEDIMENT REMOVAL AREA
- AREA OF OBSERVED VISUAL IMPACTS IDENTIFIED DURING 2013 PROBING

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. AERIAL PHOTOGRAPHY OBTAINED FROM THE NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS (NYSGIS) WEBSITE DATED 2011.
3. SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5–16 THROUGH 5–19 AND DESCRIPTIONS ON TABLE 5–19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 120' 240'
GRAPHIC SCALE

LOCATION	DEPTH INTERVAL (FT BGS)	TOTAL PAH–16 RESULTS (PPM)
SED–127	0–3	**259**
SED–128	0–1.8	**538**
SED–129	0–2	6.14
SED–130	0–1.5	**14.1**
SED–131	0–1	2.67

NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT ASSESSMENT

PHASE I SEDIMENT RESULTS

ARCADIS

FIGURE
1

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB:A. SCHILLING, R. ALLEN LD:(Opt) PIC:(Opt) PM:S. POWLIN TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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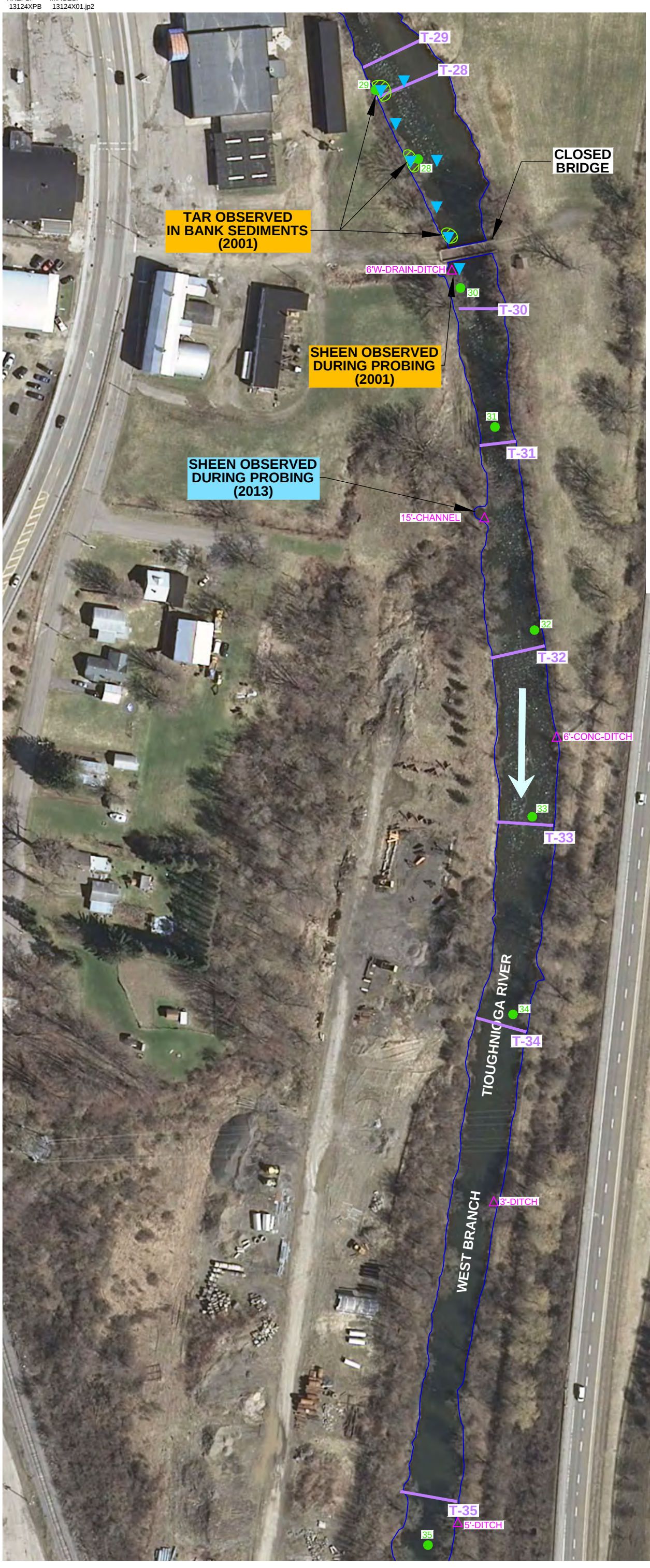

LEGEND:

- HISTORICAL SEDIMENT BORING LOCATION WHERE NO VISUAL IMPACTS WERE OBSERVED (2001)
- HISTORICAL SEDIMENT BORING LOCATION WHERE VISUAL IMPACTS WERE OBSERVED (2001)
- OUTFALL/SEEP
- PROPOSED PHASE II SEDIMENT BORING
- FORMER MGP SITE
- 2013 PROBING TRANSECTS
- MARCH 2005 ROD–DEFINED SEDIMENT REMOVAL AREA

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. AERIAL PHOTOGRAPHY OBTAINED FROM THE NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS (NYSGIS) WEBSITE DATED 2011.
3. SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5–16 THROUGH 5–19 AND DESCRIPTIONS ON TABLE 5–19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 120' 240'
GRAPHIC SCALE

NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT ASSESSMENT

PROPOSED PHASE II SEDIMENT BORING LOCATIONS

ARCADIS

FIGURE
2

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB:A. SCHILLING, R. ALLEN LD:(Opt) PIC:(Opt) PM:S. POWLIN TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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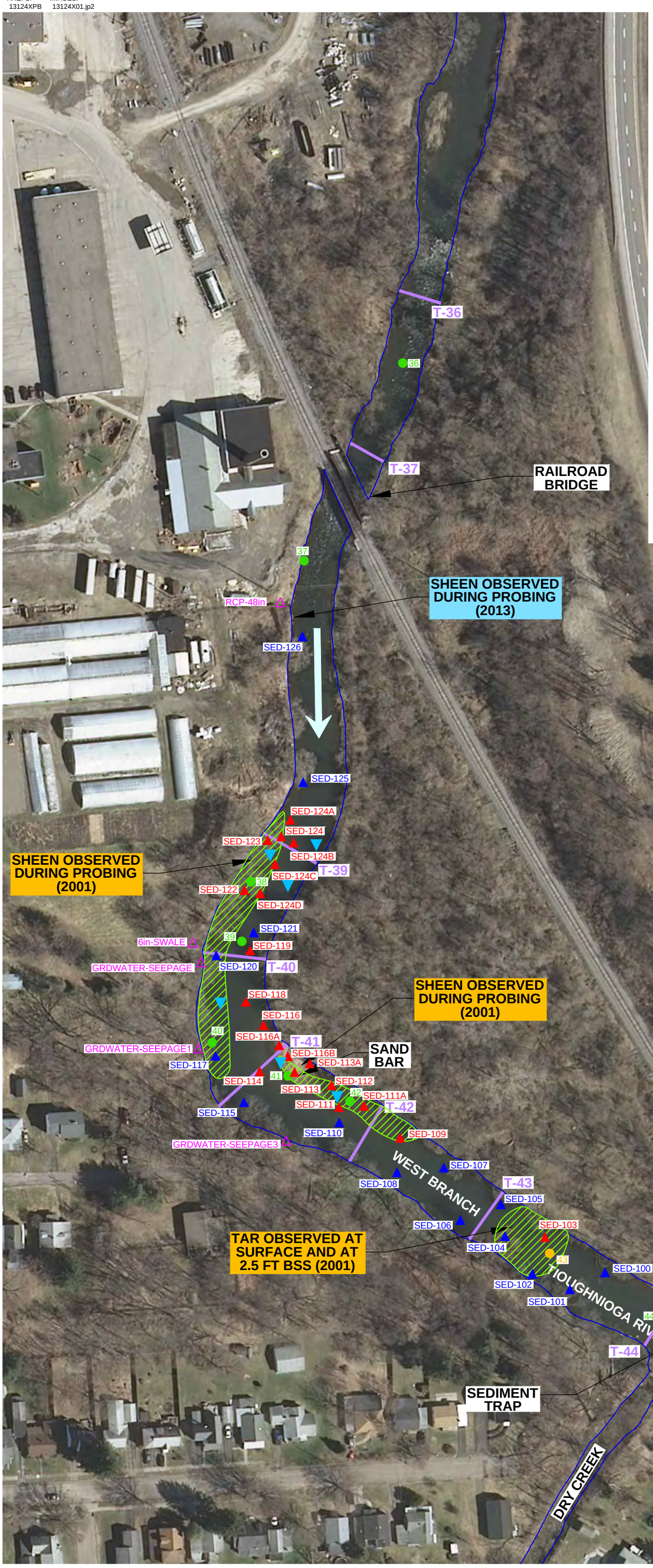

LEGEND:

- HISTORICAL SEDIMENT BORING LOCATION WHERE NO VISUAL IMPACTS WERE OBSERVED (2001)
- HISTORICAL SEDIMENT BORING LOCATION WHERE VISUAL IMPACTS WERE OBSERVED (2001)
- OUTFALL/SEEP
- PHASE I SEDIMENT BORING GREATER THAN 6.2 PPM TOTAL PAHS (SPRING 2014)
- PHASE I SEDIMENT BORING LESS THAN 6.2 PPM TOTAL PAHS (SPRING 2014)
- PROPOSED PHASE II SEDIMENT BORING
- FORMER MGP SITE
- 2013 PROBING TRANSECTS
- MARCH 2005 ROD–DEFINED SEDIMENT REMOVAL AREA

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. AERIAL PHOTOGRAPHY OBTAINED FROM THE NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS (NYSGIS) WEBSITE DATED 2011.
3. SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5–16 THROUGH 5–19 AND DESCRIPTIONS ON TABLE 5–19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 120' 240'
GRAPHIC SCALE

LOCATION	DEPTH INTERVAL (FT BGS)	TOTAL PAH–16 RESULTS (PPM)
SED–100	2–4	0.259
SED–101	2–4	0.008
SED–102	0–2	1.18
SED–102	2–4	0.026
SED–103	0–2	**656**
SED–104	0–2	0.573 [0.650]
SED–105	0–2	0.66
SED–106	2–4	0.075 [0.096]
SED–107	2–4	0.453
SED–108	0–2	0.388
SED–109	0–2	**111**
SED–110	2–4	0.056
SED–111	2–4	**15,400**
SED–111A	2–3	**362**
SED–112	1–2	**1,040**
SED–113	4–6	**21,600**
SED–114	0–2	**9.4**
SED–115	0–2	0.674
SED–116	0–2	**24.8**
SED–116B	3.8–6	**4,640**
SED–117	0–2	0.367
SED–118	0–2	**7.64**
SED–119	2–4	**56.3**
SED–120	2–4	1.53
SED–121	2–4	5.0
SED–122	0–2	**1,230**
SED–123	0–3	**1,050**
SED–124	2–4	**2,870**
SED–124	6–8	**29.0**
SED–124A	0–2	**23.8**
SED–124B	0–2	**7,420**
SED–124C	3–4	**8,060**
SED–124D	0–2	**182**
SED–125	0–2	2.27
SED–126	0–2	2.71

NYSEG - HOMER-CORTLAND FORMER MGP
ROUTE 11 (MAIN ST.), HOMER, NY
TIOUGHNIOGA RIVER SEDIMENT ASSESSMENT

PHASE I SEDIMENT RESULTS

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FIGURE
3

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Attachment 1

Sediment Boring Logs

Date Start/Finish: 5/8/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951269.7472
Easting: 928337.6893
Sediment Surface Elevation: 1098.0948' AMSL
Borehole Depth: 8' bss
Water Depth: NA

Descriptions By: Amy Allen

Well/Boring ID: SED-100
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0									
	1	0-2	1.4	18, 25, 27, 40	52	0.0			Brown and gray rounded medium to coarse GRAVEL, little fine Gravel, trace Vegetation.
									Brownish gray fine to medium subrounded GRAVEL coarsening with depth, little coarse Gravel, little to trace Silt and fine to coarse Sand, moderately loose, wet.
1095	2	2-4	2.0	49, 28, 30, 31	58	0.0			Brownish gray Silty fine SAND, some fine to coarse rounded to angular Gravel, trace Cobbles, tight, wet. [possible TILL]
									Grayish brown fine SAND coarsening with depth to a coarse SAND, some medium Sand, loose, wet.
5	3	4-6	0.5	18, 13, 25, 25	41	0.0			Gray and red subrounded coarse GRAVEL, trace fine to coarse Sand, loose, wet.
									Brownish gray fine to medium rounded GRAVEL, little to trace fine to coarse Sand and Silt, trace coarse Gravel, loose, wet.
									Brownish gray fine SAND coarsening with depth to rounded medium Gravel, trace Silt and coarse Gravel, loose, wet.
	4	6-8	2.0	33, 30, 42, 48	72	0.0			Brown fine to coarse rounded to angular GRAVEL, some Silt and Sand, moderately tight, wet. [TILL]
1090									End of boring at 8.0' bss.
10									

Well/Boring Construction: Borehole allowed to naturally collapse.

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 2-4' bss. Archive sample collected from 0-2' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 5/8/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951249.3878
Easting: 928295.2746
Sediment Surface Elevation: 1098.6954' AMSL
Borehole Depth: 8' bss
Water Depth: NA
Descriptions By: Amy Allen

Well/Boring ID: SED-101
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
	1	0-2	1.4	17, 24, 22, 30	111	0.0			Brownish gray fine to medium rounded and angular GRAVEL, some coarse rounded and angular Gravel, little Silt, trace fine to coarse Sand, loose, wet.	
	2	2-4	1.5	46, 33, 26, 40	246	0.0			Brownish gray fine to medium rounded and angular GRAVEL, little coarse Sand, trace fine to medium Sand, Silt, and coarse Gravel.	
									Reddish gray SILT, some to little fine to coarse Gravel, trace fine to coarse Sand, tight, till-like, wet.	
1095									Brownish gray fine GRAVEL, some fine to coarse Sand, little to trace Silt, loose, wet.	
	3	4-6	0.9	16, 30, 74, 48	151	0.0			Brownish gray coarse SAND, some to little fine to medium Sand, trace rounded fine Gravel, loose wet.	Borehole allowed to naturally collapse.
5									Brownish gray fine rounded GRAVEL, little medium rounded Gravel, trace fine Sand and Silt, loose, wet.	
	4	6-8	2.0	69, 52, 108, 63	106	0.0			Brownish gray fine SAND and SILT, some fine to coarse rounded Gravel, Cobble in shoe, very tight, wet. [TILL]	
1090									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 2-4' bss. Archive sample collected from 0-2' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/7/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951267.9797
Easting: 928250.0936
Sediment Surface Elevation: 1099.1534' AMSL
Borehole Depth: 8' bss
Water Depth: 3.1'
Descriptions By: William Stephens

Well/Boring ID: SED-102
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.0	28, 41, 70, 53	111	0.0			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, loose, saturated.	
	2	2-4	1.0	51, 190, 56, 62	246	0.0			Gray to grayish brown fine to coarse subangular GRAVEL, some fine Silt and Sand, little Cobble fragments, trace Clay, stiff, saturated.	
1095 / 5	3	4-6	0.4	31, 29, 122, 112	151	0.0				Borehole allowed to naturally collapse.
	4	6-8	1.6	99, 48, 58, 53	106	0.0			Grayish brown fine to coarse subangular GRAVEL and fine to medium SAND, little Cobble fragments, trace Silt, tightly packed, stiff.	
									End of boring at 8.0' bss.	
1090 / 10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 2-4' bss. Archive sample collected from 0-2' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/7/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951312.2519
Easting: 928265.3307
Sediment Surface Elevation: 1099.5713' AMSL
Borehole Depth: 8' bss
Water Depth: 3.5'

Descriptions By: William Stephens

Well/Boring ID: SED-103
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100										
0	1	0-2	1.0	7 14 13 30	27	0.4			Black fine SAND, some Silt, trace fine to coarse subangular Gravel, saturated, faint MGP-like odor. Brown fine to coarse subangular GRAVEL, some fine to coarse Sand, little to trace Silt, saturated.	
	2	2-4	1.3	13 22 17 16	39	0.0			Gray fine to medium subangular to subrounded GRAVEL and medium to coarse SAND, trace Silt, loose, saturated. Gray fine SAND, some medium to coarse subangular Gravel, trace Silt and Cobble fragments, loose, saturated.	
1095	3	4-6	1.5	20 22 25 20	47	0.0			Gray fine to coarse subangular GRAVEL, some to little fine to coarse Sand, little Silt, trace lenses of Clay, saturated.	Borehole allowed to naturally collapse.
5	4	6-8	0.2	22 34 37 43	71	0.0			COBBLE (~0.2') in shoe.	
									End of boring at 8.0' bss.	
1090										
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/7/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951313.2454
Easting: 928217.0744
Sediment Surface Elevation: 1098.1651' AMSL
Borehole Depth: 8' bss
Water Depth: 4.0'
Descriptions By: William Stephens

Well/Boring ID: SED-104
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
	1	0-2	1.1	18 162 23 23	185	0.0			Gray fine subrounded GRAVEL, trace fine Sand, loose, saturated. Brown fine to medium SAND, some fine to coarse subangular Gravel, trace Silt, loose, saturated.	
	2	2-4	1.4	33 82 49 40	131	0.0			Brownish gray medium to coarse SAND, some to little fine subangular Gravel, trace Silt, loose. Gray COBBLE FRAGMENTS, some fine Sand, trace Silt, loose, saturated.	
1095										
5	3	4-6	NR	51 48 88 102	136	NA			NO RECOVERY.	Borehole allowed to naturally collapse.
	4	6-8	1.2	29 38 24 19	62	0.0			Gray COBBLE FRAGMENTS, little lenses of fine Sand and Silt, little fine to coarse subangular Gravel, loose, saturated.	
1090									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/7/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951351.7166
Easting: 928212.1784
Sediment Surface Elevation: 1098.331' AMSL
Borehole Depth: 8' bss
Water Depth: NA
Descriptions By: William Stephens

Well/Boring ID: SED-105
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
	1	0-2	1.3	8 17 28 18	45	0.0			Brown fine to medium SAND and fine to medium subangular GRAVEL, trace Organics, loose, saturated. Gray medium to coarse subangular GRAVEL, some fine to medium Sand, trace Silt, loose, saturated.	
	2	2-4	1.7	26 30 23 19	53	0.0				
1095										
	3	4-6	0.8	16 27 41 43	68	0.0			Gray fine to medium subangular GRAVEL, some medium Sand, loose, saturated.	Borehole allowed to naturally collapse.
5										
	4	6-8	1.7	38 29 40 63	69	0.0			Gray coarse GRAVEL and COBBLE FRAGMENTS, some fine to medium Sand, loose, saturated.	
1090									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/7/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951332.7507
Easting: 928163.364
Sediment Surface Elevation: 1097.7059' AMSL
Borehole Depth: 8' bss
Water Depth: NA
Descriptions By: William Stephens

Well/Boring ID: SED-106
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
	1	0-2	0.8	7 25 25 35	50	0.0			Brown fine to medium subrounded GRAVEL, trace fine Sand, loose, saturated. Brown fine to medium SAND and subrounded GRAVEL, trace Silt, and subangular coarse Gravel, loose, saturated.	
									Grayish brown medium SAND, little fine to medium subroundd Gravel, trace fine Sand, loose, saturated.	
1095	2	2-4	1.2	21 50 66 43	116	0.0			Brown fine to medium SAND and medium to coarse subangular GRAVEL, little Cobble fragments, trace Silt, loose, saturated.	
	3	4-6	NR	22 52 37 33	89	NA			NO RECOVERY.	Borehole allowed to naturally collapse.
5										
	4	6-8	1.6	36 64 38 44	102	0.0			Gray COBBLE Fragments, some fine to coarse subangular Gravel, little fine to coarse Sand, loose, saturated.	
1090										
									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 2-4' bss. Archive sample collected from 6-8' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951395.8328
Easting: 928143.4173
Sediment Surface Elevation: 1097.7111' AMSL
Borehole Depth: 8' bss
Water Depth: 4.9'
Descriptions By: William Stephens

Well/Boring ID: SED-107
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
	1	0-2	1.2	13 21 25 66	46	0.0			Black fine SAND, some Silt, little fine Gravel, trace Wood, soft, saturated. Gray fine to medium SAND, some fine to medium subrounded Gravel, trace Silt, soft, loose.	
1095	2	2-4	1.3	15 41 60 62	101	0.0			Brown fine SAND, some Cobble fragments, little Silt, trace Clay, saturated, low plasticity.	
5	3	4-6	0.6	76 151 44 37	195	0.0			Gray fine to medium SAND and fine to medium subangular GRAVEL, trace Silt, moist, loose.	Borehole allowed to naturally collapse.
1090	4	6-8	2.0	51 35 33 55	68	0.0			Brown fine to medium SAND and coarse subangular GRAVEL, some to little Cobble fragments, trace Silt and Clay, stiff.	
									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 2-4' bss. Archive sample collected from 4-6' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951390.2602
Easting: 928086.9949
Sediment Surface Elevation: 1097.8946' AMSL
Borehole Depth: 8' bss
Water Depth: 4.1'
Descriptions By: William Stephens

Well/Boring ID: SED-108
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
1095	1	0-2	1.1	7, 16, 20, 40	36	0.0			Grayish brown medium to coarse SAND, some fine to coarse subangular Gravel, little to trace Silt, trace Clay lenses, loose, saturated.	
	2	2-4	1.1	14, 17, 76, 52	93	0.0				
5	3	4-6	NR	78, 34, 26, 29	60	NA			NO RECOVERY.	Borehole allowed to naturally collapse.
1090	4	6-8	2.0	22, 18, 15, 16	33	0.0			Brown fine to coarse subangular GRAVEL, some medium to coarse Sand, trace Silt and lenses of Clay, stiff, saturated.	
									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951431.6782
Easting: 928090.8678
Sediment Surface Elevation: 1099.926' AMSL
Borehole Depth: 8' bss
Water Depth: 3.4'
Descriptions By: William Stephens

Well/Boring ID: SED-109
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1100										
		1	0-2	1.6	1 13 86 24	99	0.0			Dark gray fine SAND, some Silt, little Organics (leaf litter), loose, soft, saturated. Brown fine SAND, some medium to coarse subrounded Gravel, little Silt, trace Clay, saturated. Gray fine to coarse subangular GRAVEL, some to little fine Sand, trace Cobble fragments, loose, saturated.	
		2	2-4	1.6	52 37 28 44	65	0.0			Reddish brown fine to coarse subangular GRAVEL, some to little fine Sand, little Silt, trace Clay, tightly packed.	
5	1095	3	4-6	0.6	17 15 28 24	43	0.0			Grayish brown medium SAND, some fine to medium subrounded Gravel, little fine Sand, loose, saturated.	Borehole allowed to naturally collapse.
		4	6-8	2.0	24 41 50 53	91	0.0			Reddish brown fine to coarse subangular GRAVEL, some to little fine Sand, little Silt, trace Clay, tightly packed.	
10	1090									End of boring at 8.0' bss.	

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Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/5/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951450.2257
Easting: 928017.3645
Sediment Surface Elevation: 1098.7113' AMSL
Borehole Depth: 8' bss
Water Depth: 4.9'
Descriptions By: William Stephens

Well/Boring ID: **SED-110**
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
	1	0-2	1.2	11 96 68 139	164	0.0			Gray fine to medium subrounded GRAVEL, some medium to coarse Sand, trace fine Sand, loose, saturated. Reddish brown fine to coarse SAND and fine to coarse subangular GRAVEL, little to trace Silt, tightly packed.	
	2	2-4	1.2	18 25 16 16	41	0.0			Gray fine to medium subrounded GRAVEL, some medium to coarse Sand, loose, saturated. Dark gray COBBLE fragments, little fine Gravel, fine to medium Sand, and Silt, trace Clay, tight/stiff, saturated.	
1095										
	3	4-6	0.9	59 44 36 30	80	0.0			Grayish brown fine to coarse subrounded GRAVEL, some medium to coarse Sand, trace Silt and Clay, stiff.	Borehole allowed to naturally collapse.
5										
	4	6-8	2.0	47 73 83 92	156	0.0				
									End of boring at 8.0' bss.	
1090										
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 2-4' bss. Archive sample collected from 4-6' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
Macro core barrel and 300 lbs Hammer

Northing: 951468.5898
Easting: 928017.0179
Sediment Surface Elevation: 1102.5476' AMSL
Borehole Depth: 4' bss
Water Depth: NA
Descriptions By: William Stephens

Well/Boring ID: SED-111
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
0	1	0-4	1.7	NA	NA	8.3			Dark gray to black SILT and SAND, some Organics (Wood, Leaf litter), Organic odor, soft.	Borehole allowed to naturally collapse.
									Dark brown to black SAND, some Silt, little Wood, MGP-like odor, soft, saturated.	
									Brown to black fine SAND, some Silt, little Organics (Wood, Leaf litter), thick taffy-like tar blebs, MGP-like odor, soft, saturated.	
1100									Attempt #1: 2.0-2.4' bss: Black medium SAND, some fine Sand, trace Silt, faint MGP-like odor.	
									Attempt #1: 2.4-2.6' bss: Black COAL seam.	
									Attempt #1: 2.6-2.9' bss: Black fine SAND, little Silt, little Organics (Wood), taffy-like tar blebs, MGP-like odor.	
5									Refusal at 4.0' bss.	
1095										
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 2-4' bss.Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

Two attempts were required due to shallow refusal. Descriptions are from second attempt with some annotations from the first attempt, Attempt #1.

Date Start/Finish: 5/7/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & David Cornell
Rig Type: Manual
Sampling Method: 4' Macro core barrel with slide hammer.
~~Sampling Method 2~~

Northing: 951470.0608
Easting: 928047.2605
Sediment Surface Elevation: 1101.9028' AMSL
Borehole Depth: 3.0' bss
Water Depth: 0.5'
Descriptions By: William Stephens

Well/Boring ID: SED-111A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
1100	1	0-3.0	2.5	NA	NA	NA			Dark gray to black SILT and SAND, some Organics (Wood, Leaf litter), Organic odor, soft.	
									Dark brown to black SAND, some Silt, little Wood, MGP-like odor, soft, saturated.	
									Black fine SAND, some Silt, little Organics (Wood, Leaf litter), MGP-like odor.	Borehole allowed to naturally collapse.
5									End of borehole at 3.0' bss.	
1095										
10										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical samples collected from 2-3' bss. Samples were analyzed for NOAA 34 PAH and TOC analyses.

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Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
Macro core barrel and 300 lbs Hammer

Northing: 951495.1143
Easting: 928008.166
Sediment Surface Elevation: 1101.7862' AMSL
Borehole Depth: 6' bss
Water Depth: NA

Descriptions By: William Stephens

Well/Boring ID: SED-112
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
									Trace Sheen at water surface near sampling location.	
0									Grayish brown fine to medium SAND, some Silt, little Organics (Wood).	
	1	0-2	1.8	NA	NA	12.1			Grayish brown SILT and fine SAND, some Organics (Woods), soft, tar blebs and MGP-like odor throughout.	
1100									Gray fine to medium SNAD, little Silt, trae Organics (Wood), faint odor.	Borehole allowed to naturally collapse.
	2	2-6	1.4	NA	NA	45.6				
5										
									Refusal at 6.0' bss.	
1095										
10										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 1-2 and 4-6' bss.Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

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Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
Macro core barrel and 300 lbs Hammer

Northing: 951510.9305
Easting: 927963.4771
Sediment Surface Elevation: 1103.6373' AMSL
Borehole Depth: 8' bss
Water Depth: NA
Descriptions By: William Stephens

Well/Boring ID: SED-113
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
	1	0-2	0.7	7	NA	0.0			Brown fine SAND, some Silt, little Organics, soft, moist.	
									Gray fine to medium SAND, some to little fine subangular Gravel, little Silt, soft, odor.	
1100									Dark brown to black fine SAND and SILT, some Organics, trace fine Gravel, MGP-like odor, rubber-like tar present, soft.	
	2	2-6	1.6	NA	NA	8.2				Borehole allowed to naturally collapse.
5										
	3	6-8	1.3	NA	NA	1.2			Grayish brown fine to medium SAND, little fine to medium Gravel, trace Silt, Wood, and Sheen, faint odor, large piece of Gravel in shoe.	
1095									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 4-6' bss. Archive sample collected from 6-8' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

Date Start/Finish: 5/7/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & David Cornell
Rig Type: Manual.
Sampling Method: 4' Macro core barrel with slide hammer.

Northing: 951521.2333
Easting: 927981.8955
Sediment Surface Elevation: 1102.7585' AMSL
Borehole Depth: 4' bss
Water Depth: 0.0
Descriptions By: William Stephens

Well/Boring ID: SED-113A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
0 / 1100	1	0-4	3.5	NA	NA	NA			Brown fine SAND, some Silt, little Organics, soft, moist.	Borehole allowed to naturally collapse.
									Gray fine to medium SAND, some to little fine subangular Gravel, little Silt, soft, odor.	
									Dark brown to black fine SAND and SILT, some Organics, trace fine Gravel, MGP-like odor.	
									End of boring at 4.0' bss.	
5 / 1095										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 4-6' bss. Archive sample collected from 6-8' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

Date Start/Finish: 5/5/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951511.6739
Easting: 927921.3568
Sediment Surface Elevation: 1099.9571' AMSL
Borehole Depth: 8' bss
Water Depth: 2.5'

Descriptions By: William Stephens

Well/Boring ID: SED-114
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-2	1.5	9, 8, 7, 7	15	0.0			Brownish gray fine to meium subrounded to subangular GRAVEL, some fine to coarse brown Sand, trace Silt, loose, saturated. 0.6-0.9' bss trace Silt.	
	2	2-4	NR	10, 10, 14, 20	24	0.0			NO RECOVERY	
5 / 1095	3	4-6	1.2	68, 92, 100, 92	192	0.0			Grayish brown medium SAND, little fine subrounded Gravel, little fine Sand, loose, saturated. Brownish gray fine to medium subrounded GRAVEL, little coarse subangular Gravel, little fine to medium Sand, trace Cobble fragments, saturated.	Borehole allowed to naturally collapse.
	4	6-8	1.5	86, 65, 70, 81	135	0.0			Gray fine to coarse subangular GRAVEL, some to little fine Sand, trace Silt, tight, saturated. Fine to coarse SAND, some coarse subangular Gravel, little Silt, tight/stiff, saturated.	
10 / 1090									End of boring at 8.0' bss.	

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-2' bss. Archive sample collected from 4-6' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/5/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951474.6457
Easting: 927902.6667
Sediment Surface Elevation: 1098.9278' AMSL
Borehole Depth: 8' bss
Water Depth: 3.8'

Descriptions By: William Stephens

Well/Boring ID: SED-115
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
	1	0-2	1.4	8 18 26 31	44	0.0			Gray COBBLE fragments, some medium to coarse Sand, little fine to medium Gravel, trace Silt and Concrete fragments, loose, saturated.	
	2	2-4	1.8	36 36 32 32	68	0.0			Grayish brown medium to coarse SAND and fine to coarse GRAVEL, little Cobble fragments, trace Silt, tight, saturated.	Borehole allowed to naturally collapse.
1095										
	3	4-5.3	1.1	24 30 150/ 0.3'	NA	0.0			Gray COBBLE fragments in shoe of split spoon.	
5									Refusal at 5.3' bss.	
1090										
10										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
Macro core barrel and 300 lbs Hammer

Northing: 951567.2686
Easting: 927926.0301
Sediment Surface Elevation: 1101.8586' AMSL
Borehole Depth: 6' bss
Water Depth: NA

Descriptions By: William Stephens

Well/Boring ID: **SED-116**
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
0	1	0-2	1.0	NA	NA	0.0			Grayish brown fine SAND, some Silt, trace Organics (Wood, Leaf litter), soft, saturated.	
									Gray fine to medium SAND, little Silt, trace Organics, soft, saturated.	
1100									Dark gray to black fine to medium SAND, some fine to medium Gravel, trace Silt, soft, saturated.	
	2	2-6	1.2	NA	NA	0.0			Brown fine to medium Gravel, some fine to medium Sand, loose, saturated.	Borehole allowed to naturally collapse.
5										
1095									End of boring at 6.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

Date Start/Finish: 5/7/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & David Cornell
Rig Type: Manual.
Sampling Method: 4' Macro core barrel with slide hammer.

Northing: 951543.126
Easting: 927945.0338
Sediment Surface Elevation: 1103.6125' AMSL
Borehole Depth: 4' bss
Water Depth: 0.0
Descriptions By: William Stephens

Well/Boring ID: SED-116A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1	0-4	3.5	NA	NA	NA			Brown fine SAND, some Silt, little Organics, soft, moist.	Borehole allowed to naturally collapse.
									Gray fine to medium SAND, some to little fine subangular Gravel, little Silt, soft, odor.	
1100									Dark brown to black fine SAND and SILT, some Organics, trace fine Gravel, MGP-like odor.	
									End of boring at 4.0' bss.	
5										
1095										
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 4-6' bss. Archive sample collected from 6-8' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

Date Start/Finish: 5/7/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & David Cornell
Rig Type: Manual.
Sampling Method: 4' Macro core barrel with slide hammer.

Northing: 951529.9153
Easting: 927955.4559
Sediment Surface Elevation: 1103.4951' AMSL
Borehole Depth: 6' bss
Water Depth: 0.0
Descriptions By: William Stephens

Well/Boring ID: SED-116B
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1	0-6	3.5	NA	NA	NA			Brown fine SAND, some Silt, little Organics, soft, moist.	Borehole allowed to naturally collapse.
									Gray fine to medium SAND, some to little fine subangular Gravel, little Silt, soft, odor.	
1100									Dark brown to black fine SAND and SILT, some Organics, trace fine Gravel, MGP-like odor.	
5										
									End of boring at 6.0' bss.	
1095										
10										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 3.8-6' bss and analyzed for NOAA 34 PAH and TOC.

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Date Start/Finish: 5/5/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951530.4383
Easting: 927868.3043
Sediment Surface Elevation: 1099.6756' AMSL
Borehole Depth: 8' bss
Water Depth: 3.1'

Descriptions By: William Stephens

Well/Boring ID: SED-117
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	1100										
0		1	0-2	1.4	9 27 42 37	69	0.0			Brown fine to medium SAND, some coarse subangular Gravel, little Cobbles and Cobble fragments, trace Silt, saturated.	
		2	2-4	1.8	25 28 23 31	51	0.0			Gray coarse SAND, some fine to medium Gravel, little medium Sand, loose, saturated. Brown medium to coarse SAND and subangular medium to coarse GRAVEL, little fine Gravel and fine Sand, trace Cobble fragments, moderately tight, saturated.	
5	1095	3	4-6	1.1	39 34 34 60	68	0.0			Brownish gray medium to coarse SAND, little fine to medium Gravel, trace Silt, loose, saturated. Gray fine to coarse subangular GRAVEL, some medium to coarse Sand, loose, saturated.	Borehole allowed to naturally collapse.
		4	6-8	2.0	41 79 81 37	160	0.0			Brownish gray coarse GRAVEL, some medium to coarse Sand, little Cobble fragments, trace Silt, tightly packed, saturated.	
10	1090									End of boring at 8.0' bss.	

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Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/30/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951595.4983
Easting: 927904.8564
Sediment Surface Elevation: 1098.7796' AMSL
Borehole Depth: 8' bss
Water Depth: 4.7'
Descriptions By: Amy Allen

Well/Boring ID: SED-118
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1	0-2	1.4	9 7 4 12	11	0.0			Grayish brown fine to medium subangular GRAVEL, some medium to coarse Sand, loose, saturated. 0.6-0.9' bss trace Silt Grayish brown fine to medium SAND. Grayish brown medium SAND, some fine to medium subangular Gravel, trace Silt, loose. COBBLE fragments in splitspoon shoe.	
1095	2	2-4	NR	76 40 88 65	128	0.0			NO RECOVERY	
5	3	4-6	1.2	24 67 41 44	108	0.0			Brown fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt and Cobble fragments, loose, saturated.	Borehole allowed to naturally collapse.
	4	6-8	2.0	44 71 68 70	139	0.0			Brown fine to coarse subangular GRAVEL, some fine to medium Sand, little to trace Silt, moderately loose, saturated.	
1090									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from: 0-2' bss

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/30/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951657.4104
Easting: 927910.0105
Sediment Surface Elevation: 1098.522 AMSL
Borehole Depth: 8' bss
Water Depth: 4.3'
Descriptions By: Amy Allen

Well/Boring ID: SED-119
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
	1	0-2	0.0	5 3 4 26	7	0.0			NO RECOVERY	
	2	2-4	1.1	26 16 18 20	44	0.0			Brown coarse SAND, little fine to medium Gravel, trace fine to medium Sand and coarse Gravel, trace Organics (leaf litter). Brown angular coarse GRAVEL, little Silt and fine to medium Gravel, trace fine to coarse Sand.	
1095										
5	3	4-6	0.8	6 8 36 38	79	0.0			Brown and gray rounded fine GRAVEL, some medium to coarse rounded Gravel, little fine to coarse Sand, tace Silt, coarsening with depth.	Borehole allowed to naturally collapse.
	4	6-8	2.0	45 48 53 72	101	0.0			Brown fine to medium SAND and fine to coarse subangular GRAVEL, little to trace Silt, trace Cobbles, stiff. [TILL].	
1090									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from: 2-4' bss

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/30/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951651.3053
Easting: 927869.1135
Sediment Surface Elevation: 1098.9776' AMSL
Borehole Depth: 8' bss
Water Depth: 4.6'
Descriptions By: Amy Allen

Well/Boring ID: SED-120
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
	1	0-2	0.0	5 19 24 31	43	0.0			NO RECOVERY	
	2	2-4	1.0	38 52 30 26	82	0.0			Grayish brown fine to coarse SAND and SILT, little fine Gravel increasing with depth, trace Brick and Organics (leaf litter). Grayish brown SILT and fine SAND, little medium to coarse Sand and fine to coarse Gravel, trace Cobbles (granite), moderately stiff. [TILL-like].	
1095										Borehole allowed to naturally collapse.
5	3	4-6	2.0	32 42 61 68	103	0.0			Grayish brown medium rounded GRAVEL, little fine rounded Gravel and coarse Sand, trace fine to medium Sand and Silt. Brownish gray medium to coarse SAND, trace fine Sand and Silt.	
	4	6-8	2.0	57 71 99 129	170	0.0			Grayish brown coarse GRAVEL and COBBLES, little Silt, trace fine to coarse Sand. Lense of Silty SAND. Light brown SILT, SAND, and GRAVEL varying from fine to coarse and rounded to angular, stiff. [TILL].	
									End of boring at 8.0' bss.	
1090										
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from: 2-4' bss

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/30/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: NA
Easting: NA
Sediment Surface Elevation: NA
Borehole Depth: 8' bss
Water Depth: 4.0'
Descriptions By: Amy Allen

Well/Boring ID: SED-121
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.7	10 9 16 19	25	0.0			Gray and brown fine to medium GRAVEL, little coarse Sand, trace fine to medium Sand, Silt, and coarse Gravel.	
										Brownish gray medium to coarse SAND, trace fine Gravel and fine Sand coarsening with depth.	
		2	2-4	2.0	13 18 22 28	40	0.0			Brownish gray rounded fine to medium GRAVEL, little to trace coarse Sand, trace Silt, coarsening with depth.	
										Gray medium subangular GRAVEL, some fine to coarse Gravel, little Silt, trace fine to coarse Sand.	
5	-5	3	4-6	0.6	56 33 46 40	79	0.0			Brown and gray rounded fine to medium GRAVEL, some Silt, trace coarse Sand and coarse Gravel.	Borehole allowed to naturally collapse.
		4	6-8	2.0	44 79 74 55	153	0.0			Gray fine to medium rounded and angular GRAVEL, some Silt, trace coarse Gravel and coarse Sand, very stiff. [TILL].	
										Reddish brown angular coarse GRAVEL, some medium Gravel.	
10	-10									End of boring at 8.0' bss.	

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from: 2-4' bss

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/29/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951729.865
Easting: 927903.078
Sediment Surface Elevation: 1101.2256 AMSL
Borehole Depth: 8' bss
Water Depth: 2.6'
Descriptions By: William Stephens

Well/Boring ID: SED-122
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
1100	1	0-2	0.8	4 2 2 5	4	0.0			Grayish brown medium to coarse SAND, some fine subangular Gravel, trace Silt and Organics (Leaf litter), loose.	
	2	2-4	1.3	12 23 40 18	63	0.0			Trace medium to coarse subrounded Gravel below 2' bss.	
5	3	4-6	2.0	15 21 18 18	39	0.0			Gray medium to coarse subrounded to subangular GRAVEL, some medium to coarse Sand, trace Silt, faint odor, saturated.	Borehole allowed to naturally collapse.
1095	4	6-8	1.0	70 40 68 72	108	0.0			Tightly packed below 6' bss.	
									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from: 0-2' bss

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/29/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: 927931.088
Easting: 951790.17
Sediment Surface Elevation: 1101.4957 AMSL
Borehole Depth: 2.8' bss
Water Depth: 1.5'

Descriptions By: William Stephens

Well/Boring ID: **SED-123**
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
1100	1	0-1	1.0						Dark gray to black fine to coarse SAND, some medium to coarse subangular Gravel, little Silt, trace Organics (Leaf litter) and Sheen, faint odor, saturated.	
	2	1-1.6	0.6	NA	NA	0.0				Borehole allowed to naturally collapse.
	3	1.6-2.8	1.2							
5									End of boring at 2.8' bss.	
1095										
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from: 0-3' bss

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/29/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951794.6558
Easting: 927947.5859
Sediment Surface Elevation: 1100.889' AMSL
Borehole Depth: 8' bss
Water Depth: 1.5'

Descriptions By: William Stephens

Well/Boring ID: SED-124
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0									
1100	1	0-2	0.4	5 3 2 2	5	0.0			Dark gray to black fine SAND, some Organics (Wood, Leaf litter), little Silt, trace fine subangular Gravel, loose, saturated.
	2	2-4	1.2	2 6 7 3	13	5.2			Dark gray to black fine to coarse SAND, some fine to medium subangular Gravel, trace Silt and Organics, slight MGP-like odor, saturated. Black fine SAND, some fine to medium subrounded Gravel, little Organics (Wood), trace Silt and red Brick, MGP-like odor, <0.01' thick tar blebs (rubber-like).
5	3	4-6	1.4	6 20 96 7	116	0.2			Dark gray medium to coarse SAND, some fine to medium subangular Gravel, trace Silt and Organics, faint MGP-like odor. Dark gray fine subangular GRAVEL and medium to coarse SAND, trace Silt, loose, saturated. Gray COBBLE fragments, little Silt, trace fine Sand, saturated.
1095	4	6-8	1.0	10 42 48 61	90	0.0			
10									End of boring at 8.0' bss.

Well/Boring Construction: Borehole allowed to naturally collapse.

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical samples collected from 2-4 and 6-8' bss. Archive sample also collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/8/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951814.7737
Easting: 927958.4822
Sediment Surface Elevation: 1100.1262' AMSL
Borehole Depth: 6' bss
Water Depth: 2.4'
Descriptions By: William Stephens

Well/Boring ID: SED-124A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1100	1	0-2	1.3	5 30 38 22	68	0.6			Dark gray to black fine to medium SAND and SILT, some fine to medium subangular Gravel, little Organics, soft, faint Organic and MGP-like odor, saturated. Gray fine to medium GRAVEL, some fine to medium Sand, trace Silt, loose, saturated.	
		2	2-4	1.0	15 24 30 33	54	0.1			4-6' bss increasing Cobble Fragments and stiffness.	Borehole allowed to naturally collapse.
5	1095	3	4-6	2.0	40 30 38 36	68	0.0			End of boring at 6.0' bss.	

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical samples collected from: 0-2' bss (MS/MSD). Archive samples collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 5/8/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951787.2867
Easting: 927962.3707
Sediment Surface Elevation: 1099.5079' AMSL
Borehole Depth: 6' bss
Water Depth: NA
Descriptions By: William Stephens

Well/Boring ID: SED-124B
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100										
0	1	0-2	1.0	4 7 7 9	14	3.7			Brownish gray fine to coarse subrounded GRAVEL, some to little medium to coarse Sand, loose, saturated. Lense of black medium SAND, some to little fine Gravel, trace Wood, MGP-like odor, saturated. Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, loose, saturated.	
	2	2-4	1.6	36 25 40 24	65	0.0			Gray fine to coarse GRAVEL, some medium to coarse Sand, trace Silt and Cobble Fragments, tightly packed/stiff, saturated.	Borehole allowed to naturally collapse.
1095 5	3	4-6	0.2	25 25 25 28	50	NA			COBBLE (~0.2') in shoe.	
									End of boring at 6.0' bss.	
1090 10										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical samples collected from: 0-2' bss. Archive samples collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 5/8/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951761.1222
Easting: 927939.9221
Sediment Surface Elevation: 1100.6199' AMSL
Borehole Depth: 6' bss
Water Depth: NA
Descriptions By: William Stephens

Well/Boring ID: SED-124C
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-2	0.5	7, 27, 28, 30	55	0.0			Grayish brown fine to coarse subangular GRAVEL, trace medium to coarse Sand, loose, saturated.	
	2	2-4	1.8	21, 27, 26, 21	53	4.7			Gray medium to coarse SAND and fine to medium GRAVEL, trace Silt. Grayish black fine to coarse SAND, some fine to medium Gravel, trace Organics (wood) and Sheen, MGP-like odor. Gray fine to coarse SAND and fine to coarse subangular GRAVEL, little to trace Silt, loose, saturated. Black fine to medium SAND, little fine subangular Gracel, little Organics (wood), little Silt, tar blebs (~1 cm) throughout, MGP-like odor. SILT lense.	
5 / 1095	3	4-6	NR	28, 36, 31, 33	67	NA			Gray coarse GRAVEL, some to little fine Sand and Silt, trace Cobble Fragments. COBBLE FRAGMENTS (~0.2') in shoe.	
									End of boring at 6.0' bss.	
10										

Borehole allowed to naturally collapse.

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 3-4' bss. Archive sample collected from 2-3' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/9/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: NA
Easting: NA
Sediment Surface Elevation: NA
Borehole Depth: 6' bss
Water Depth: NA

Descriptions By: William Stephens

Well/Boring ID: **SED-124D**
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.0	6 4 3 5	7	0.5			Brown medium to coarse SAND, some fine to coarse subrounded Gravel, trace Organics, faint odor, loose, saturated. 0.8-1.0' bss trace Sheen.	
		2	2-4	1.1	6 10 21 23	31	0.0			Black fine subangular GRAVEL, some fine to medium Sand, little Organics (wood, leaf litter), black staining, loose, saturated. Gray fine to coarse subangular GRAVEL and fine to medium Sand, little Silt, loose, saturated.	Borehole allowed to naturally collapse.
5	-5	3	4-6	0.3	25 30 24 35	54	0.0			Gray COBBLE (0.3') in shoe.	
										End of boring at 6.0' bss.	
10	-10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/29/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951859.867
Easting: 927973.864
Sediment Surface Elevation: 1098.6226 AMSL
Borehole Depth: 8' bss
Water Depth: 3.0'
Descriptions By: William Stephens

Well/Boring ID: SED-125
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
	1	0-2	1.2	63 83 40 74	123	0.0			Gray fine to coarse subrounded to subangular GRAVEL, some to little medium to coarse Sand, trace fine Sand, saturated. Gray coarse SAND and fine subangular GRAVEL, trace fine Sand and Silt, saturated. Gray coarse GRAVEL, some Cobble fragments, little fine Gravel, saturated.	
	2	2-4	0.3	30 105 134 122	239	0.0				
1095										
	3	4-6	1.3	104 47 55 43	102	0.0			Gray fine to medium subrounded to subangular GRAVEL, some coarse Sand, little coarse subangular Gravel, trace Cobble fragments, loose, saturated.	Borehole allowed to naturally collapse.
5										
	4	6-8	2.0	47 67 65 67	132	0.0			Gray medium SAND and gray fine to medium subangular GRAVEL, little coarse Sand, loose, saturated.	
1090									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from: 0-2' bss

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/28/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Rig Type:
Barge-mounted tripod w/ portable cathead
Sampling Method:
3" x 2' Split Spoon using 300 lbs Hammer

Northing: 952035.493
Easting: 927972.998
Sediment Surface Elevation: 1099.6456 AMSL
Borehole Depth: 8' bss
Water Depth: 2.5'

Descriptions By: William Stephens

Well/Boring ID: SED-126
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100										
0	1	0-2	1.4	10, 12, 24, 50	36	0.0			Gray subangular fine to coarse GRAVEL, little fine to coarse Sand, trace Cobble fragments, saturated.	
	2	2-4	1.7	76, 44, 38, 38	82	0.0			Gray coarse SAND, some fine to coarse Gravel, trace fine to medium Sand, loose, saturated.	
									Gray fine to coarse subangular GRAVEL, some coarse Sand, trace Cobble fragments, loose, saturated.	Borehole allowed to naturally collapse.
1095	3	4-6	1.4	32, 30, 26, 21	56	0.0				
5	4	6-8	2.0	20, 20, 22, 30	42	0.0				
1090									End of boring at 8.0' bss.	
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from: 0-2' bss

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/8/14
Drilling Company: ARCADIS of New York, Inc.
Driller's Name: Will Stephens & Tom O'Rourke
Rig Type:
Manual with slide hammer
Sampling Method:
4' Macrocore barrel with acetate liner

Northing: 955421.0977
Easting: 927824.1894
Sediment Surface Elevation: 1106.5721' AMSL
Borehole Depth: 3.0' bss
Water Depth: NA

Descriptions By: Will Stephens

Well/Boring ID: **SED-127**
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-3.0	1.8	NA	NA	NA			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, MGP-like odor, trace Sheen, loose, saturated.	Borehole allowed to naturally collapse.
									Refusal at 3.0' bss.	
5 / 1100										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-3.0' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*NO BLOW COUNTS WITH MACROCORE SAMPLING

Date Start/Finish: 5/8/14
Drilling Company: ARCADIS of New York, Inc.
Driller's Name: Will Stephens & Tom O'Rourke
Rig Type:
Manual with slide hammer.
Sampling Method:
4' Macrocore barrel with acetate liner

Northing: 951269.7472
Easting: 928337.6893
Sediment Surface Elevation: 1107.0371' AMSL
Borehole Depth: 1.8' bss
Water Depth: NA
Descriptions By: Will Stephens

Well/Boring ID: **SED-128**
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1	0-1.8	1.8	NA	NA	NA			Dark gray to black SILT and fine SAND, some fine to medium subangular Gravel, little Organics (Wood), trace Sheen, MGP-like odor, soft.	Borehole allowed to naturally collapse.
1105									Refusal at 1.8' bss.	
5										
1100										
10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-1.8' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*NO BLOW COUNTS WITH MACROCORE SAMPLING

Date Start/Finish: 5/8/14
Drilling Company: ARCADIS of New York, Inc.
Driller's Name: Will Stephens & Tom O'Rourke
Rig Type:
Manual with slide hammer.
Sampling Method:
4' Macrocore barrel with acetate liner

Northing: 955854.1895
Easting: 927833.7143
Sediment Surface Elevation: 1106.5737' AMSL
Borehole Depth: 2.0' bss
Water Depth: NA
Descriptions By: Will Stephens

Well/Boring ID: SED-129
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2.0	NA	NA	NA	NA			Gray fine to medium SAND, little Silt, trace Organics, soft, faint odor.	Borehole allowed to naturally collapse.
									Refusal at 2.0' bss.	
5 / 1100										
10										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-2' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*NO BLOW COUNTS WITH MACROCORE SAMPLING

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Date Start/Finish: 5/8/14
Drilling Company: ARCADIS of New York, Inc.
Driller's Name: Will Stephens & Tom O'Rourke
Rig Type:
Manual with slide hammer.
Sampling Method:
4' Macrocore barrel with acetate liner

Northing: 955954.7123
Easting: 927883.0788
Sediment Surface Elevation: 1106.0128' AMSL
Borehole Depth: 1.5' bss
Water Depth: NA

Descriptions By: Will Stephens

Well/Boring ID: **SED-130**
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-1.5	NA	NA	NA	NA			Gray coarse SAND and fine to medium subrounded GRAVEL, loose, saturated.	Borehole allowed to naturally collapse.
									Refusal at 1.5' bss.	
5 / 1100										
10										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-1.5' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*NO BLOW COUNTS WITH MACROCORE SAMPLING

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Date Start/Finish: 5/8/14
Drilling Company: ARCADIS of New York, Inc.
Driller's Name: Will Stephens & Tom O'Rourke
Rig Type:
Manual with slide hammer.
Sampling Method:
4' Macrocore barrel with acetate liner

Northing: NA
Easting: NA
Sediment Surface Elevation: NA
Borehole Depth: 1.0' bss
Water Depth: NA

Descriptions By: Will Stephens

Well/Boring ID: **SED-131**
Client: NYSEG

Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample Interval	Recovery (feet)	Blow Counts	N - Value*	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-1.0	NA	NA	NA	NA			Gray to brown medium to coarse SAND and fine to coarse subrounded GRAVEL, loose, saturated.	Borehole allowed to naturally collapse.
										Refusal at 1.0' bss.	
5	-5										
10	-10										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical and archive samples collected from 0-1' bss.

Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

*NO BLOW COUNTS WITH MACROCORE SAMPLING

ATTACHMENT 2

Sediment Core Logs

Date Start/Finish: 5/8/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4" Casing
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951269.7472
Easting: 928337.6893
Water Depth: NA
Borehole Depth: 8' bss
Sediment Surface Elevation: 1098.0948' AMSL
Descriptions By: Amy Allen

Well/Boring ID: SED-100
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100										
0	1	0-2	1.4	18, 25, 27, 40	52	0.0			Brown and gray rounded medium to coarse GRAVEL, little fine Gravel, trace Vegetation.	
									Brownish gray fine to medium subrounded GRAVEL coarsening with depth, little coarse Gravel, little to trace Silt and fine to coarse Sand, moderately loose, wet.	
1095	2	2-4	2.0	49, 28, 30, 31	58	0.0			Brownish gray Silty fine SAND, some fine to coarse rounded to angular Gravel, trace Cobbles, tight, wet. [possible TILL]	
	3	4-6	0.5	18, 13, 25, 25	41	0.0			Grayish brown fine SAND coarsening with depth to a coarse SAND, some medium Sand, loose, wet.	Borehole allowed to naturally collapse.
5									Gray and red subrounded coarse GRAVEL, trace fine to coarse Sand, loose, wet.	
									Brownish gray fine to medium rounded GRAVEL, little to trace fine to coarse Sand and Silt, trace coarse Gravel, loose, wet.	
	4	6-8	2.0	33, 30, 42, 48	72	0.0			Brownish gray fine SAND coarsening with depth to rounded medium Gravel, trace Silt and coarse Gravel, loose, wet.	
1090									Brown fine to coarse rounded to angular GRAVEL, some Silt and Sand, moderately tight, wet. [TILL]	
									End of boring at 8.0' bss.	
10										
1085										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 2-4' bss. Archive sample collected from 0-2' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/8/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951249.3878
Easting: 928295.2746
Water Depth: NA
Borehole Depth: 8' bss
Sediment Surface Elevation: 1098.6954' AMSL
Descriptions By: Amy Allen

Well/Boring ID: SED-101
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.4	17, 24, 22, 30	46	0.0			Brownish gray fine to medium rounded and angular GRAVEL, some coarse rounded and angular Gravel, little Silt, trace fine to coarse Sand, loose, wet.	
	2	2-4	1.5	46, 33, 26, 40	59	0.0			Brownish gray fine to medium rounded and angular GRAVEL, little coarse Sand, trace fine to medium Sand, Silt, and coarse Gravel.	
1095									Reddish gray SILT, some to little fine to coarse Gravel, trace fine to coarse Sand, tight, till-like, wet.	
5	3	4-6	0.9	16, 30, 74, 48	104	0.0			Brownish gray fine GRAVEL, some fine to coarse Sand, little to trace Silt, loose, wet.	Borehole allowed to naturally collapse.
									Brownish gray coarse SAND, some to little fine to medium Sand, trace rounded fine Gravel, loose wet.	
									Brownish gray fine rounded GRAVEL, little medium rounded Gravel, trace fine Sand and Silt, loose, wet.	
	4	6-8	2.0	69, 52, 108, 63	160	0.0			Brownish gray fine SAND and SILT, some fine to coarse rounded Gravel, Cobble in shoe, very tight, wet. [TILL]	
1090									End of boring at 8.0' bss.	
10										
1085										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 2-4' bss. Archive sample collected from 0-2' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/7/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951267.9797
Easting: 928250.0936
Water Depth: 3.1'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1099.1534' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-102
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.0	28, 41, 70, 53	111	0.0			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, loose, saturated.	
	2	2-4	1.0	51, 190, 56, 62	246	0.0			Gray to grayish brown fine to coarse subangular GRAVEL, some fine Silt and Sand, little Cobble fragments, trace Clay, stiff, saturated.	
1095 / 5	3	4-6	0.4	31, 29, 122, 112	151	0.0				Borehole allowed to naturally collapse.
	4	6-8	1.6	99, 48, 58, 53	106	0.0			Grayish brown fine to coarse subangular GRAVEL and fine to medium SAND, little Cobble fragments, trace Silt, tightly packed, stiff.	
									End of boring at 8.0' bss.	
1090 / 10										
1085 / 15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 2-4' bss. Archive sample collected from 0-2' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/7/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951312.2519
Easting: 928265.3307
Water Depth: 3.5'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1099.5713' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-103
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.0	7 14 13 30	27	0.4			Black fine SAND, some Silt, trace fine to coarse subangular Gravel, saturated, faint MGP-like odor. Brown fine to coarse subangular GRAVEL, some fine to coarse Sand, little to trace Silt, saturated.	
	2	2-4	1.3	13 22 17 16	39	0.0			Gray fine to medium subangular to subrounded GRAVEL and medium to coarse SAND, trace Silt, loose, saturated. Gray fine SAND, some medium to coarse subangular Gravel, trace Silt and Cobble fragments, loose, saturated.	
1095 / 5	3	4-6	1.5	20 22 25 20	47	0.0			Gray fine to coarse subangular GRAVEL, some to little fine to coarse Sand, little Silt, trace lenses of Clay, saturated.	Borehole allowed to naturally collapse.
	4	6-8	0.2	22 34 37 43	71	0.0			COBBLE (~0.2') in shoe.	
									End of boring at 8.0' bss.	
1090 / 10										
1085 / 15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 11/19/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 928205.11
Northing: 951359.988
Water Depth: NA
Borehole Depth: 8.0'
Sediment Surface Elevation: 1098.68' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-103A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	0.6	7, 10, 16, 19	26	0.0			Dark Gray to brown fine to coarse SAND, some fine to medium Gravel, trace Silt, trace Organics (leaves), trace Silt, wet. Brown fine to coarse SAND, some fine to coarse Gravel, trace Silt, loose, wet.	
	2	2-4	1.0	22, 19, 29, 31	48	0.0			Gray fine to coarse angular GRAVEL and fine to medium SAND, trace Silt, trace Cobbles, stiff, wet.	
1095 / 5	3	4-6	1.0	45, 30, 16, 10	46	0.0				Borehole allowed to naturally collapse.
	4	6-8	0.9	16, 20, 24, 25	44	0.0			End of boring at 8.0' bss.	
1090 / 10										
1085 / 15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/20/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 928225.156
Northing: 951325.95
Water Depth: 3.0'
Borehole Depth: 8.0'
Sediment Surface Elevation: 1098.43' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-103B
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100										
0	1	0-2	1.1	11, 16, 29, 30	45	0.0			Dark Gray SILT, some fine Sand, little Organics (leaves, wood), soft, organic-like odor, wet. Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, stiff, wet.	
1095	2	2-4	NR	94, 61, 42, 29	103	NA			No Recovery.	
5	3	4-6	0.5	26, 45, 60, 51	105	0.0			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, stiff, wet.	Borehole allowed to naturally collapse.
	4	6-8	0.8	45, 30, 25, 32	55	0.0				
1090									End of boring at 8.0' bss.	
10										
1085										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 4-6' bss.
Samples will be analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/20/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 928292.112
Northing: 951306.987
Water Depth: 3.0'
Borehole Depth: 8.0'
Sediment Surface Elevation: 1099.32' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-103C
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100										
0	1	0-2	0.6	61 56 27 22	83	0.0			Gray fine to medium GRAVEL, some fine to medium Sand, loose, wet. Gray fine to coarse subangular GRAVEL, little fine to coarse Sand, stiff, wet.	
	2	2-4	0.9	30 34 61 92	95	0.0			Brown to gray fine to coarse SAND, some fine to coarse Gravel, loose, wet.	
1095	3	4-6	0.8	122 65 13 27	78	0.0			Gray to reddish brown fine to coarse GRAVEL and fine to coarse SAND, trace Silt, stiff, wet.	Borehole allowed to naturally collapse.
5	4	6-8	0.6	35 23 25 19	48	0.0				
									End of boring at 8.0' bss.	
1090										
10										
1085										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples will be analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/7/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951313.2454
Easting: 928217.0744
Water Depth: 4.0'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1098.1651' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-104
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100										
0										
	1	0-2	1.1	18 162 23 23	185	0.0			Gray fine subrounded GRAVEL, trace fine Sand, loose, saturated. Brown fine to medium SAND, some fine to coarse subangular Gravel, trace Silt, loose, saturated.	
1095	2	2-4	1.4	33 82 49 40	131	0.0			Brownish gray medium to coarse SAND, some to little fine subangular Gravel, trace Silt, loose. Gray COBBLE FRAGMENTS, some fine Sand, trace Silt, loose, saturated.	
5	3	4-6	NR	51 48 88 102	136	NA			NO RECOVERY.	Borehole allowed to naturally collapse.
	4	6-8	1.2	29 38 24 19	62	0.0			Gray COBBLE FRAGMENTS, little lenses of fine Sand and Silt, little fine to coarse subangular Gravel, loose, saturated.	
1090									End of boring at 8.0' bss.	
10										
1085										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/7/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951351.7166
Easting: 928212.1784
Water Depth: NA
Borehole Depth: 8' bss
Sediment Surface Elevation: 1098.331' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-105
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.3	8, 17, 28, 18	45	0.0			Brown fine to medium SAND and fine to medium subangular GRAVEL, trace Organics, loose, saturated.	
									Gray medium to coarse subangular GRAVEL, some fine to medium Sand, trace Silt, loose, saturated.	
1095	2	2-4	1.7	26, 30, 23, 19	53	0.0				
	3	4-6	0.8	16, 27, 41, 43	68	0.0			Gray fine to medium subangular GRAVEL, some medium Sand, loose, saturated.	Borehole allowed to naturally collapse.
5	4	6-8	1.7	38, 29, 40, 63	69	0.0			Gray coarse GRAVEL and COBBLE FRAGMENTS, some fine to medium Sand, loose, saturated.	
1090									End of boring at 8.0' bss.	
10										
1085										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/7/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951332.7507
Easting: 928163.364
Water Depth: NA
Borehole Depth: 8' bss
Sediment Surface Elevation: 1097.7059' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-106
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100										
0										
	1	0-2	0.8	7 25 25 35	50	0.0			Brown fine to medium subrounded GRAVEL, trace fine Sand, loose, saturated. Brown fine to medium SAND and subrounded GRAVEL, trace Silt, and subangular coarse Gravel, loose, saturated. Grayish brown medium SAND, little fine to medium subroundd Gravel, trace fine Sand, loose, saturated.	
1095	2	2-4	1.2	21 50 66 43	116	0.0			Brown fine to medium SAND and medium to coarse subangular GRAVEL, little Cobble fragments, trace Silt, loose, saturated.	
5	3	4-6	NR	22 52 37 33	89	NA			NO RECOVERY.	Borehole allowed to naturally collapse.
1090	4	6-8	1.6	36 64 38 44	102	0.0			Gray COBBLE Fragments, some fine to coarse subangular Gravel, little fine to coarse Sand, loose, saturated.	
									End of boring at 8.0' bss.	
10										
1085										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 2-4' bss. Archive sample collected from 6-8' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951395.8328
Easting: 928143.4173
Water Depth: 4.9'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1097.7111' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-107
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.2	13, 21, 25, 66	46	0.0			Black fine SAND, some Silt, little fine Gravel, trace Wood, soft, saturated. Gray fine to medium SAND, some fine to medium subrounded Gravel, trace Silt, soft, loose.	
1095	2	2-4	1.3	15, 41, 60, 62	101	0.0			Brown fine SAND, some Cobble fragments, little Silt, trace Clay, saturated, low plasticity.	
5	3	4-6	0.6	76, 151, 44, 37	195	0.0			Gray fine to medium SAND and fine to medium subangular GRAVEL, trace Silt, moist, loose.	Borehole allowed to naturally collapse.
1090	4	6-8	2.0	51, 35, 33, 55	68	0.0			Brown fine to medium SAND and coarse subangular GRAVEL, some to little Cobble fragments, trace Silt and Clay, stiff.	
									End of boring at 8.0' bss.	
10										
1085										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 2-4' bss. Archive sample collected from 4-6' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951390.2602
Easting: 928086.9949
Water Depth: 4.1'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1097.8946' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-108
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.1	7, 16, 20, 40	36	0.0			Grayish brown medium to coarse SAND, some fine to coarse subangular Gravel, little to trace Silt, trace Clay lenses, loose, saturated.	
1095	2	2-4	1.1	14, 17, 76, 52	93	0.0				
5	3	4-6	NR	78, 34, 26, 29	60	NA			NO RECOVERY.	Borehole allowed to naturally collapse.
1090	4	6-8	2.0	22, 18, 15, 16	33	0.0			Brown fine to coarse subangular GRAVEL, some medium to coarse Sand, trace Silt and lenses of Clay, stiff, saturated.	
									End of boring at 8.0' bss.	
10										
1085										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951431.6782
Easting: 928090.8678
Water Depth: 3.4'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1099.926' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-109
Client: NYSEG
Location: Enter Location Here

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1100										
		1	0-2	1.6	1 13 86 24	99	0.0			Dark gray fine SAND, some Silt, little Organics (leaf litter), loose, soft, saturated. Brown fine SAND, some medium to coarse subrounded Gravel, little Silt, trace Clay, saturated.	
		2	2-4	1.6	52 37 28 44	65	0.0			Gray fine to coarse subangular GRAVEL, some to little fine Sand, trace Cobble fragments, loose, saturated. Reddish brown fine to coarse subangular GRAVEL, some to little fine Sand, little Silt, trace Clay, tightly packed.	
5	1095	3	4-6	0.6	17 15 28 24	43	0.0			Grayish brown medium SAND, some fine to medium subrounded Gravel, little fine Sand, loose, saturated.	Borehole allowed to naturally collapse.
		4	6-8	2.0	24 41 50 53	91	0.0			Reddish brown fine to coarse subangular GRAVEL, some to little fine Sand, little Silt, trace Clay, tightly packed.	
										End of boring at 8.0' bss.	
10	1090										
15	1085										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/19/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 928127.687
Northing: 951419.006
Water Depth: 6.0'
Borehole Depth: 8.0'
Sediment Surface Elevation: 1099.69' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-109A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	0.7	7, 4, 10, 21	14	0.0			Brown fine to coarse subround to subangular GRAVEL, some fine to coarse Sand, trace Silt, loose, wet.	
	2	2-4	1.3	36, 38, 25, 31	63	0.0			Gray fine to medium SAND and fine to coarse subangular GRAVEL, trace Cobbles, trace Silt, stiff, wet.	
1095 / 5	3	4-6	0.9	42, 57, 38, 43	95	0.0			Gray coarse GRAVEL, some fine to medium Sand, trace Silt, stiff, wet.	Borehole allowed to naturally collapse.
	4	6-8	NR	6, 5, 4, 10	9	NA			No Recovery.	
									End of boring at 8.0' bss.	
1090 / 10										
1085 / 15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/19/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 928086.959
Northing: 951403.996
Water Depth: 6.0'
Borehole Depth: 8.0'
Sediment Surface Elevation: 1097.06' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-109B
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100										
0	1	0-2	0.5	5, 9, 12, 33	21	0.0			Gray to brown fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, trace Cobble fragments, loose, wet.	
1095	2	2-4	1.0	71, 51, 30, 32	81	0.0			Brown fine to coarse angular GRAVEL, some fine to coarse Sand, trace Silt, stiff, wet.	
5	3	4-6	1.3	40, 39, 42, 40	81	0.0			Gray to reddish brown coarse angular GRAVEL, some Silt, little Sand, little Clay, stiff, moist to wet.	Borehole allowed to naturally collapse.
1090	4	6-8	1.1	21, 19, 97, 50	116	0.0			Gray fine to medium GRAVEL and fine to coarse SAND, loose, wet. Gray to red brown coarse subangular GRAVEL, some fine to coarse Sand, little Silt, stiff, wet.	
									End of boring at 8.0' bss.	
10										
1085										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/5/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951450.2257
Easting: 928017.3645
Water Depth: 4.9'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1098.7113' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-110
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.2	11, 96, 68, 139	164	0.0			Gray fine to medium subrounded GRAVEL, some medium to coarse Sand, trace fine Sand, loose, saturated. Reddish brown fine to coarse SAND and fine to coarse subangular GRAVEL, little to trace Silt, tightly packed.	
	2	2-4	1.2	18, 25, 16, 16	41	0.0			Gray fine to medium subrounded GRAVEL, some medium to coarse Sand, loose, saturated. Dark gray COBBLE fragments, little fine Gravel, fine to medium Sand, and Silt, trace Clay, tight/stiff, saturated.	
1095 / 5	3	4-6	0.9	59, 44, 36, 30	80	0.0			Grayish brown fine to coarse subrounded GRAVEL, some medium to coarse Sand, trace Silt and Clay, stiff.	Borehole allowed to naturally collapse.
	4	6-8	2.0	47, 73, 83, 92	156	0.0				
1090 / 10									End of boring at 8.0' bss.	
1085 / 15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 2-4' bss. Archive sample collected from 4-6' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/18/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 928044.525
Northing: 951446.391
Water Depth: NA
Borehole Depth: 7.2'
Sediment Surface Elevation: 1100.9' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-110A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-2	0.5	1, 1, 1, 1	2	0.0			Dark gray to black ORGANICS (leaves, wood, shells), some fine Sand, little Silt, soft, wet. Gray fine subangular GRAVEL, some fine to coarse Sand, loose, wet.	
	2	2-4	0.9	1, 2, 35, 96/0	37	0.0			Brown fine to coarse subangular to angular GRAVEL, some Silt, little fine Sand, trace Clay, dense (stiff), wet. Spoon refusal at 3.5'. Drove 4" steel casing to 4' bss.	Borehole allowed to naturally collapse.
5 / 1095	3	4-6	0.8	39, 42, 66, 19	108	0.0			Brown fine to coarse subangular to angular GRAVEL, some Sand, little Silt, dense, wet.	
	4	6-7.2	0.4	20, 62, 100/.2	NA	0.0			Brown fine to coarse subangular to angular GRAVEL, some Sand, trace Silt, trace Cobble fragments, dense, wet.	
10 / 1090									Refusal at 7.2' bss.	
15 / 1085										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified method 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 7/24/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2"x3' Acetate liner

Northing: NA
Easting: NA
Water Depth: NA
Borehole Depth: 3.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-110B
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-3	1.3	NA	NA	0.0			Multicolored fine subangular GRAVEL, trace fine Sand, loose, wet.	
										Gray-brown fine to coarse angular GRAVEL, little fine to coarse Sand, dense, wet.	Borehole allowed to naturally collapse.
										Refusal at 3.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoons
Analytical Sample collected 2-3' bss and analyzed for 8270 PAH's.

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Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method:
Macro core barrel and 30 lbs Slide Hammer
Sampling Method:
4' x 2" Acetate Liners

Northing: 951468.5898
Easting: 928017.0179
Water Depth: NA
Borehole Depth:
4' bss
Sediment Surface Elevation:
1102.5476' AMSL
Descriptions By:
William Stephens

Well/Boring ID: SED-111
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1105										
0									Dark gray to black SILT and SAND, some Organics (Wood, Leaf litter), Organic odor, soft.	
									Dark brown to black SAND, some Silt, little Wood, MGP-like odor, soft, saturated.	
1100	1	0-4	1.7	NA	NA	8.3			Brown to black fine SAND, some Silt, little Organics (Wood, Leaf litter), thick taffy-like tar blebs, MGP-like odor, soft, saturated. Attempt #1: 2.0-2.4' bss: Black medium SAND, some fine Sand, trace Silt, faint MGP-like odor. Attempt #1: 2.4-2.6' bss: Black COAL seam. Attempt #1: 2.6-2.9' bss: Black fine SAND, little Silt, little Organics (Wood), taffy-like tar blebs, MGP-like odor.	Borehole allowed to naturally collapse.
									Refusal at 4.0' bss.	
5										
1095										
10										
1090										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 2-4' bss.Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.Two attempts were required due to shallow refusal. Descriptions are from second attempt with some annotations from the first attempt, Attempt #1.

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Date Start/Finish: 5/7/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & David Cornell
Drilling Method:
4' Macro core barrel and 30 lbs. slide hammer
Sampling Method:
4'x 2" Acetate Liners

Northing: 951470.0608
Easting: 928047.2605
Water Depth: 0.5'
Borehole Depth:
3.0' bss
Sediment Surface Elevation:
1101.9028' AMSL
Descriptions By:
William Stephens

Well/Boring ID: SED-111A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-3.0	2.5	NA	NA	NA			Dark gray to black SILT and SAND, some Organics (Wood, Leaf litter), Organic odor, soft. Dark brown to black SAND, some Silt, little Wood, MGP-like odor, soft, saturated. Black fine SAND, some Silt, little Organics (Wood, Leaf litter), MGP-like odor.	Borehole allowed to naturally collapse.
									End of borehole at 3.0' bss.	
5 / 1095										
10 / 1090										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical samples collected from 2-3' bss. Samples were analyzed for NOAA 34 PAH and TOC analyses.

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Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method:
4' Macro core barrel and 30lbs. Slide Hammer
Sampling Method:
4'x2" Acetate Liner

Northing: 951495.1143
Easting: 928008.166
Water Depth: NA
Borehole Depth:
6' bss
Sediment Surface Elevation:
1101.7862' AMSL
Descriptions By:
William Stephens

Well/Boring ID: SED-112
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
									Trace Sheen at water surface near sampling location.	
0										
	1	0-2	1.8	NA	NA	12.1			Grayish brown fine to medium SAND, some Silt, little Organics (Wood).	
1100									Grayish brown SILT and fine SAND, some Organics (Woods), soft, tar blebs and MGP-like odor throughout.	
									Gray fine to medium SNAD, little Silt, trae Organics (Wood), faint odor.	Borehole allowed to naturally collapse.
	2	2-6	1.4	NA	NA	45.6				
5										
									Refusal at 6.0' bss.	
1095										
10										
1090										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 1-2 and 4-6' bss.Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

Date Start/Finish: 11/17/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 927992.872
Northing: 951464.54
Water Depth: NA
Borehole Depth: 10.0'
Sediment Surface Elevation: 1099.94' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-112A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1100	1	0-2	0.9	2, 2, 27, 25	29	0.0			Brown fine to medium SAND, little Silt, little Organics (leaves), trace fine Gravel, soft, wet. Gray fine to medium subangular GRAVEL, some fine to coarse Sand, loose, wet.	
		2	2-4	1.0	17, 11, 10, 22	21	0.0			Gray medium to coarse subangular GRAVEL, little fine to medium Sand, loose, wet. Brown fine to medium SAND, little coarse subround Gravel, trace Silt, trace Clay, loose, wet.	
5	1095	3	4-6	0.7	30, 33, 32, 52	65	0.0			Gray to brown medium to coarse GRAVEL, some to little fine to coarse Sand, loose, wet.	Borehole allowed to naturally collapse.
		4	6-8	1.2	58, 48, 63, 42	111	0.0			Brown fine to coarse SAND, trace Silt, stiff, wet.	
		5	8-10	1.0	36, 40, 41, 32	81	0.0			Gray to brown fine to coarse subangular GRAVEL, some fine to coarse Sand, little Silt, trace Clay, stiff, wet.	
10	1090									End of boring at 10.0' bss.	
15	1085										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/7/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & David Cornell
Drilling Method:
Macro core barrel with 30 lbs slide hammer
Sampling Method:
4'x2" Acetate Liner

Northing: 951510.9305
Easting: 927963.4771
Water Depth: NA
Borehole Depth:
8' bss
Sediment Surface Elevation:
1103.6373' AMSL
Descriptions By:
William Stephens

Well/Boring ID: SED-113
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1105										
0	1	0-2	0.7	7	NA	0.0			Brown fine SAND, some Silt, little Organics, soft, moist.	
									Gray fine to medium SAND, some to little fine subangular Gravel, little Silt, soft, odor.	
1100	2	2-6	1.6	NA	NA	8.2			Dark brown to black fine SAND and SILT, some Organics, trace fine Gravel, MGP-like odor, rubber-like tar present, soft.	Borehole allowed to naturally collapse.
5	3	6-8	1.3	NA	NA	1.2			Grayish brown fine to medium SAND, little fine to medium Gravel, trace Silt, Wood, and Sheen, faint odor, large piece of Gravel in shoe.	
									End of boring at 8.0' bss.	
1095										
10										
1090										
15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 4-6' bss. Archive sample collected from 6-8' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

Date Start/Finish: 5/7/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & David Cornell
Drilling Method:
Macro core barrel with 30lbs.slide hammer
Sampling Method:
4'x2" Acetate Liner

Northing: 951521.2333
Easting: 927981.8955
Water Depth: NA
Borehole Depth:
4' bss
Sediment Surface Elevation:
1102.7585' AMSL
Descriptions By:
William Stephens

Well/Boring ID: **SED-113A**
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1105 / 0										
1100	1	0-4	3.5	NA	NA	NA			Brown fine SAND, some Silt, little Organics, soft, moist.	Borehole allowed to naturally collapse.
									Gray fine to medium SAND, some to little fine subangular Gravel, little Silt, soft, odor.	
									Dark brown to black fine SAND and SILT, some Organics, trace fine Gravel, MGP-like odor.	
5									End of boring at 4.0' bss.	
1095 / 10										
1090 / 15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 4-6' bss. Archive sample collected from 6-8' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

Date Start/Finish: 11/17/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 927949.063
Northing: 951488.827
Water Depth: 2.0'
Borehole Depth: 10.0'
Sediment Surface Elevation: 1100.41' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-113B
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-2	0.4	9, 10, 14, 18	24	0.0			Brown fine SAND, some Silt, little Organics (leaves), Organic-like odor, soft, wet.	
									Brown to gray fine to medium SAND, some fine to medium subangular Gravel, trace Silt, trace Organics, soft, wet.	
	2	2-4	0.5	27, 21, 16, 16	30	0.0			Gray to brown fine to medium SAND, some fine to medium subangular Gravel, trace Silt, trace FIll [Metal], faint MGP-like odor, wet.	
									Gray fine to coarse subangular GRAVEL, some fine to medium Sand, trace Silt, loose, wet.	
5 / 1095	3	4-6	0.5	15, 20, 22, 21	87	0.0				Borehole allowed to naturally collapse.
	4	6-8	0.8	51, 51, 54, 32	69	0.0			Brown fine to medium SAND, trace Silt, loose, wet.	
	5	8-10	0.4	18, 14, 19, 26	122	0.0			Gray fine to coarse GRAVEL, some fine to coarse Sand, trace Silt, loose, wet.	
10 / 1090									End of boring at 10.0' bss.	
15 / 1085										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/20/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: 6.0'
Borehole Depth: 8.0'
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-113C
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.8	18 20 27 74	47	0.0			Brown fine to medium GRAVEL and fine to coarse SAND, loose, wet.	
		2	2-4	1.1	101 41 46 32	87	0.0			Brown medium to coarse GRAVEL, some fine to coarse Sand, stiff, wet.	
5	-5	3	4-6	1.0	41 39 27 21	66	0.0				
		4	6-8	0.4	14 15 9 6	24	0.0			Brown medium to coarse SAND, some fine to medium Gravel, loose, wet.	
										End of boring at 8.0' bss.	
10	-10										
15	-15										

Borehole allowed to naturally collapse.

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/5/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951511.6739
Easting: 927921.3568
Water Depth: 2.5'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1099.9571' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-114
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-2	1.5	9, 8, 7, 7	15	0.0			Brownish gray fine to meium subrounded to subangular GRAVEL, some fine to coarse brown Sand, trace Silt, loose, saturated. 0.6-0.9' bss trace Silt.	
	2	2-4	NR	10, 10, 14, 20	24	0.0			NO RECOVERY Grayish brown medium SAND, little fine subrounded Gravel, little fine Sand, loose, saturated.	
5 / 1095	3	4-6	1.2	68, 92, 100, 92	192	0.0			Brownish gray fine to medium subrounded GRAVEL, little coarse subangular Gravel, little fine to medium Sand, trace Cobble fragments, saturated. Gray fine to coarse subangular GRAVEL, some to little fine Sand, trace Silt, tight, saturated.	Borehole allowed to naturally collapse.
	4	6-8	1.5	86, 65, 70, 81	135	0.0			Fine to coarse SAND, some coarse subangular Gravel, little Silt, tight/stiff, saturated.	
									End of boring at 8.0' bss.	
10 / 1090										
15 / 1085										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-2' bss. Archive sample collected from 4-6' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/20/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: 4.0'
Borehole Depth: 8.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-114A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.7	11 20 22 29	42	0.0			Brown fine to medium SAND, little fine to medium subangular Gravel, loose, wet. Brown fine to medium SAND and fine medium Gravel, loose, wet.	
		2	2-4	1.1	101 90 80 56	170	0.0			Gray COBBLE. Brown fine to coarse GRAVEL, little fine to coarse Sand, trace Silt, stiff, wet.	Borehole allowed to naturally collapse.
5	-5	3	4-6	0.8	45 48 10 17	58	0.0				
		4	6-8	0.9	30 32 40 35	72	0.0			End of boring at 8.0' bss.	
10	-10										
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/5/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951474.6457
Easting: 927902.6667
Water Depth: 3.8'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1098.9278' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-115
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.4	8, 18, 26, 31	44	0.0			Gray COBBLE fragments, some medium to coarse Sand, little fine to medium Gravel, trace Silt and Concrete fragments, loose, saturated.	
	2	2-4	1.8	36, 36, 32, 32	68	0.0			Grayish brown medium to coarse SAND and fine to coarse GRAVEL, little Cobble fragments, trace Silt, tight, saturated.	Borehole allowed to naturally collapse.
1095 / 5	3	4-5.3	1.1	24, 30, 150/0.3'	NA	0.0			Gray COBBLE fragments in shoe of split spoon.	
									Refusal at 5.3' bss.	
1090 / 10										
1085 / 15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 5/6/14
Drilling Company: Parratt-Wolff Inc.
Driller's Name: L. Pech & D. Annabelle
Drilling Method:
Macro core barrel with slide hammer
Sampling Method:
2 & 4'x2" Acetate Liner

Northing: 951567.2686
Easting: 927926.0301
Water Depth: NA
Borehole Depth:
6' bss
Sediment Surface Elevation:
1101.8586' AMSL
Descriptions By:
William Stephens

Well/Boring ID: **SED-116**
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
1100	1	0-2	1.0	NA	NA	0.0			Grayish brown fine SAND, some Silt, trace Organics (Wood, Leaf litter), soft, saturated.	
									Gray fine to medium SAND, little Silt, trace Organics, soft, saturated.	
									Dark gray to black fine to medium SAND, some fine to medium Gravel, trace Silt, soft, saturated.	
	2	2-6	1.2	NA	NA	0.0			Brown fine to medium Gravel, some fine to medium Sand, loose, saturated.	Borehole allowed to naturally collapse.
5										
1095									End of boring at 6.0' bss.	
10										
1090										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

Date Start/Finish: 5/7/14
Drilling Company: Paratt Wolff, Inc.
Driller's Name: Will Stephens & David Cornell
Drilling Method:
4' Macro core barrel with 30 lbs. slide hammer
Sampling Method:
4'x 2" Acetate Liners

Northing: 951543.126
Easting: 927945.0338
Water Depth: NA
Borehole Depth:
4' bss
Sediment Surface Elevation:
1103.6125' AMSL
Descriptions By:
William Stephens

Well/Boring ID: **SED-116A**
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1105 / 0										
	1	0-4	3.5	NA	NA	NA			Brown fine SAND, some Silt, little Organics, soft, moist.	Borehole allowed to naturally collapse.
1100									Gray fine to medium SAND, some to little fine subangular Gravel, little Silt, soft, odor.	
									Dark brown to black fine SAND and SILT, some Organics, trace fine Gravel, MGP-like odor.	
5									End of boring at 4.0' bss.	
1095										
10										
1090										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 4-6' bss. Archive sample collected from 6-8' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

Date Start/Finish: 5/7/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & David Cornell
Drilling Method:
4' Macro core barrel with slide hammer.
Sampling Method:
4' Acetate liner

Northing: 951529.9153
Easting: 927955.4559
Water Depth: NA
Borehole Depth:
6' bss
Sediment Surface Elevation:
1103.4951' AMSL
Descriptions By:
William Stephens

Well/Boring ID: **SED-116B**
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1105										
0	1	0-4	3.5	NA	NA	NA			Brown fine SAND, some Silt, little Organics, soft, moist.	
1100									Gray fine to medium SAND, some to little fine subangular Gravel, little Silt, soft, odor.	Borehole allowed to naturally collapse.
5	2	4-6	1.0	NA	NA	NA			Dark brown to black fine SAND and SILT, some Organics, trace fine Gravel, MGP-like odor.	
1095									End of boring at 6.0' bss.	
10										
1090										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 3.8-6' bss and analyzed for NOAA 34 PAH and TOC.

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Project Number: B0013124.00001
Data File: SED-16B.dat
Template: G:\Logplot Logs\B0013124\2014 BH and MW Logs\boring_well HSA 2007 analytical.tdx
Date: 1/26/2016 Created/Edited by: ASA

Date Start/Finish: 7/24/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method:
4' Macro core w. 30 lbs slide hammer
Sampling Method:
2"x4' Acetate Liner

Northing: 951567.2686
Easting: 927926.0301
Water Depth: 1.7'
Borehole Depth:
4.0' bss
Sediment Surface Elevation:
1101.8586' AMSL
Descriptions By:
William Stephens

Well/Boring ID: **SED-116R**
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-4	2.7	NA	NA	1.2			Dark gray to brown fine to coarse SAND, some fine to medium angular Gravel, Organic-like odor, wet. Dark gray to black SILT, trace fine Sand, moderate MGP-like odor, black staining, wet. Gray medium to coarse GRAVEL, little fine to coarse Sand, trace Silt , faint MGP-like odor, wet.	Borehole allowed to naturally collapse.
										Refusal at 4.0' bss.	
5	-5										
10	-10										
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Resampling SED-116 for additional delineation.
Sample collected from 2-4' bss and analyzed using method 8270 (PAH).

Date Start/Finish: 5/5/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951530.4383
Easting: 927868.3043
Water Depth: 3.1'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1099.6756' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-117
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.4	9, 27, 42, 37	69	0.0			Brown fine to medium SAND, some coarse subangular Gravel, little Cobbles and Cobble fragments, trace Silt, saturated.	
									Gray coarse SAND, some fine to medium Gravel, little medium Sand, loose, saturated.	
	2	2-4	1.8	25, 28, 23, 31	51	0.0			Brown medium to coarse SAND and subangular medium to coarse GRAVEL, little fine Gravel and fine Sand, trace Cobble fragments, moderately tight, saturated.	
									Brownish gray medium to coarse SAND, little fine to medium Gravel, trace Silt, loose, saturated.	Borehole allowed to naturally collapse.
1095 / 5	3	4-6	1.1	39, 34, 34, 60	68	0.0			Gray fine to coarse subangular GRAVEL, some medium to coarse Sand, loose, saturated.	
	4	6-8	2.0	41, 79, 81, 37	160	0.0			Brownish gray coarse GRAVEL, some medium to coarse Sand, little Cobble fragments, trace Silt, tightly packed, saturated.	
									End of boring at 8.0' bss.	
1090 / 10										
1085 / 15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-2' bss. Archive sample collected from 2-4' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/30/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951595.4983
Easting: 927904.8564
Water Depth: 4.7'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1098.7796' AMSL
Descriptions By: Amy Allen

Well/Boring ID: SED-118
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.4	9, 7, 4, 12	11	0.0			Grayish brown fine to medium subangular GRAVEL, some medium to coarse Sand, loose, saturated. 0.6-0.9' bss trace Silt. Grayish brown fine to medium SAND.	
	2	2-4	NR	76, 40, 88, 65	128	0.0			Grayish brown medium SAND, some fine to medium subangular Gravel, trace Silt, loose. COBBLE fragments in splitspoon shoe. NO RECOVERY	
1095 / 5	3	4-6	1.2	24, 67, 41, 44	108	0.0			Brown fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt and Cobble fragments, loose, saturated.	Borehole allowed to naturally collapse.
	4	6-8	2.0	44, 71, 68, 70	139	0.0			Brown fine to coarse subangular GRAVEL, some fine to medium Sand, little to trace Silt, moderately loose, saturated.	
1090 / 10									End of boring at 8.0' bss.	
1085 / 15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical samples collected from: 0-2' bss
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/14/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 927898.407
Northing: 951618.518
Water Depth: 4.4'
Borehole Depth: 8.0' bss
Sediment Surface Elevation: 1098.1' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-118A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100										
0	1	0-2	0.9	4, 14, 12, 13	26	0.0			Gray fine to coarse subangular GRAVEL, some to little fine to coarse Sand, trace red Brick, wet. Gray fine SAND, trace fine Gravel, loose, wet. Gray fine to coarse GRAVEL, some fine to coarse Sand, little Silt, loose, wet.	
1095	2	2-4	1.1	16, 22, 19, 42	41	0.0			Gray fine to medium GRAVEL, some to little fine to coarse Sand, trace Silt, loose, wet. Gray coarse GRAVEL, trace Silt, stiff, wet.	
5	3	4-6	0.8	60, 58, 23, 27	81	0.0			Gray coarse GRAVEL, little Silt, trace fine Sand, stiff, wet.	Borehole allowed to naturally collapse.
	4	6-8	1.0	26, 20, 25, 39	45	0.0			Gray fine to coarse GRAVEL, little fine Sand, little Silt, stiff, wet. Reddish brown fine to coarse GRAVEL, little fine Sand, trace Silt, stiff, wet.	
1090									End of boring at 8.0' bss.	
10										
1085										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/30/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951657.4104
Easting: 927910.0105
Water Depth: 4.3'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1098.522' AMSL
Descriptions By: Amy Allen

Well/Boring ID: SED-119
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100										
0	1	0-2	0.0	5, 3, 4, 26	7	0.0			NO RECOVERY	
	2	2-4	1.1	26, 16, 18, 20	44	0.0			Brown coarse SAND, little fine to medium Gravel, trace fine to medium Sand and coarse Gravel, trace Organics (leaf litter). Brown angular coarse GRAVEL, little Silt and fine to medium Gravel, trace fine to coarse Sand.	
1095										
5	3	4-6	0.8	6, 8, 36, 38	79	0.0			Brown and gray rounded fine GRAVEL, some medium to coarse rounded Gravel, little fine to coarse Sand, tace Silt, coarsening with depth.	Borehole allowed to naturally collapse.
	4	6-8	2.0	45, 48, 53, 72	101	0.0			Brown fine to medium SAND and fine to coarse subangular GRAVEL, little to trace Silt, trace Cobbles, stiff. [TILL].	
1090									End of boring at 8.0' bss.	
10										
1085										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from: 2-4' bss
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 4/30/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951651.3053
Easting: 927869.1135
Water Depth: 4.6'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1098.9776' AMSL
Descriptions By: Amy Allen

Well/Boring ID: SED-120
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	0.0	5, 19, 24, 31	43	0.0			NO RECOVERY	
	2	2-4	1.0	38, 52, 30, 26	82	0.0			Grayish brown fine to coarse SAND and SILT, little fine Gravel increasing with depth, trace Brick and Organics (leaf litter).	
1095 / 5	3	4-6	2.0	32, 42, 61, 68	103	0.0			Grayish brown SILT and fine SAND, little medium to coarse Sand and fine to coarse Gravel, trace Cobbles (granite), moderately stiff. [TILL-like].	Borehole allowed to naturally collapse.
	4	6-8	2.0	57, 71, 99, 129	170	0.0			Grayish brown medium rounded GRAVEL, little fine rounded Gravel and coarse Sand, trace fine to medium Sand and Silt.	
									Brownish gray medium to coarse SAND, trace fine Sand and Silt.	
									Grayish brown coarse GRAVEL and COBBLES, little Silt, trace fine to coarse Sand.	
									Lense of Silty SAND.	
									Light brown SILT, SAND, and GRAVEL varying from fine to coarse and rounded to angular, stiff. [TILL].	
									End of boring at 8.0' bss.	
1090 / 10										
1085 / 15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from: 2-4' bss
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/30/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: NA
Easting: NA
Water Depth: 4.0'
Borehole Depth: 8' bss
Sediment Surface Elevation: NA
Descriptions By: Amy Allen

Well/Boring ID: SED-121
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.7	10 9 16 19	25	0.0			Gray and brown fine to medium GRAVEL, little coarse Sand, trace fine to medium Sand, Silt, and coarse Gravel.	
										Brownish gray medium to coarse SAND, trace fine Gravel and fine Sand coarsening with depth.	
		2	2-4	2.0	13 18 22 28	40	0.0			Brownish gray rounded fine to medium GRAVEL, little to trace coarse Sand, trace Silt, coarsening with depth.	
										Gray medium subangular GRAVEL, some fine to coarse Gravel, little Silt, trace fine to coarse Sand.	
5	-5	3	4-6	0.6	56 33 46 40	79	0.0			Brown and gray rounded fine to medium GRAVEL, some Silt, trace coarse Sand and coarse Gravel.	Borehole allowed to naturally collapse.
		4	6-8	2.0	44 79 74 55	153	0.0			Gray fine to medium rounded and angular GRAVEL, some Silt, trace coarse Gravel and coarse Sand, very stiff. [TILL].	
										Reddish brown angular coarse GRAVEL, some medium Gravel.	
										End of boring at 8.0' bss.	
10	-10										
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical samples collected from: 2-4' bss
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 4/29/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951729.865
Easting: 927903.078
Water Depth: 2.6'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1101.2256 AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-122
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
1100	1	0-2	0.8	4 2 2 5	4	0.0			Grayish brown medium to coarse SAND, some fine subangular Gravel, trace Silt and Organics (Leaf litter), loose.	
	2	2-4	1.3	12 23 40 18	63	0.0			Trace medium to coarse subrounded Gravel below 2' bss.	
5	3	4-6	2.0	15 21 18 18	39	0.0			Gray medium to coarse subrounded to subangular GRAVEL, some medium to coarse Sand, trace Silt, faint odor, saturated.	Borehole allowed to naturally collapse.
1095	4	6-8	1.0	70 40 68 72	108	0.0			Tightly packed below 6' bss.	
10									End of boring at 8.0' bss.	
1090										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from: 0-2' bss
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 4/29/14
Drilling Company: Parratt-Wolff, Inc.
Driller's Name: L. Pech & D. Annabelle
Drilling Method: 3' Macro Core barrel
Casing Diameter: 4"
Rig Type: Hand Sampling
Sampling Method: 3'x 2" Acetate Liner

Easting: 927931.088
Northing: 951790.17
Water Depth: 1.5'
Borehole Depth: 2.8' bss
Sediment Surface Elevation: 1101.4957' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-123
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-2.8	1.2	NA	NA	0.0			Dark gray to black fine to coarse SAND, some medium to coarse subangular Gravel, little Silt, trace Organics (Leaf litter) and Sheen, faint odor, saturated.	Borehole allowed to naturally collapse.
									Refusal at 2.8' bss.	
5 / 1095										
10 / 1090										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from: 0-2.8' bss
3 attempts hit refusal at 2.8' bss
Recovery on 3 attempts 1.0', 0.6', and 1.2'

Date Start/Finish: 4/29/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951794.6558
Easting: 927947.5859
Water Depth: 1.5'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1100.889' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-124
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-2	0.4	5, 3, 2, 2	5	0.0			Dark gray to black fine SAND, some Organics (Wood, Leaf litter), little Silt, trace fine subangular Gravel, loose, saturated.	
	2	2-4	1.2	2, 6, 7, 3	13	5.2			Dark gray to black fine to coarse SAND, some fine to medium subangular Gravel, trace Silt and Organics, faint MGP-like odor, saturated.	
									Black fine SAND, some fine to medium subrounded Gravel, little Organics (Wood), trace Silt and red Brick, MGP-like odor, <0.01' thick tar blebs (rubber-like).	
									Dark gray medium to coarse SAND, some fine to medium subangular Gravel, trace Silt and Organics, faint MGP-like odor.	Borehole allowed to naturally collapse.
5 / 1095	3	4-6	1.4	6, 20, 96, 7	116	0.2			Dark gray fine subangular GRAVEL and medium to coarse SAND, trace Silt, loose, saturated.	
									Gray COBBLE fragments, little Silt, trace fine Sand, saturated.	
	4	6-8	1.0	10, 42, 48, 61	90	0.0				
									End of boring at 8.0' bss.	
10 / 1090										
15 / 1085										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical samples collected from 2-4 and 6-8' bss. Archive sample also collected from 2-4' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/8/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951814.7737
Easting: 927958.4822
Water Depth: 2.4'
Borehole Depth: 6' bss
Sediment Surface Elevation: 1100.1262' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-124A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1100	1	0-2	1.3	5 30 38 22	68	0.6			Dark gray to black fine to medium SAND and SILT, some fine to medium subangular Gravel, little Organics, soft, faint Organic and MGP-like odor, saturated.	
										Gray fine to medium GRAVEL, some fine to medium Sand, trace Silt, loose, saturated.	
		2	2-4	1.0	15 24 30 33	54	0.1			4-6' bss increasing Cobble Fragments and stiffness.	Borehole allowed to naturally collapse.
5	1095	3	4-6	2.0	40 30 38 36	68	0.0				
										End of boring at 6.0' bss.	
10	1090										
15	1085										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical samples collected from: 0-2' bss (MS/MSD). Archive samples collected from 2-4' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/8/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951787.2867
Easting: 927962.3707
Water Depth: NA
Borehole Depth: 6' bss
Sediment Surface Elevation: 1099.5079' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-124B
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.0	4, 7, 7, 9	14	3.7			Brownish gray fine to coarse subrounded GRAVEL, some to little medium to coarse Sand, loose, saturated. Lense of black medium SAND, some to little fine Gravel, trace Wood, MGP-like odor, saturated.	
	2	2-4	1.6	36, 25, 40, 24	65	0.0			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, loose, saturated. Gray fine to coarse GRAVEL, some medium to coarse Sand, trace Silt and Cobble Fragments, tightly packed/stiff, saturated.	Borehole allowed to naturally collapse.
1095 / 5	3	4-6	0.2	25, 25, 25, 28	50	NA			COBBLE (~0.2') in shoe.	
									End of boring at 6.0' bss.	
1090 / 10										
1085 / 15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical samples collected from: 0-2' bss. Archive samples collected from 2-4' bss. Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 5/8/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951761.1222
Easting: 927939.9221
Water Depth: NA
Borehole Depth: 6' bss
Sediment Surface Elevation: 1100.6199' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-124C
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-2	0.5	7, 27, 28, 30	55	0.0			Grayish brown fine to coarse subangular GRAVEL, trace medium to coarse Sand, loose, saturated.	
	2	2-4	1.8	21, 27, 26, 21	53	4.7			Gray medium to coarse SAND and fine to medium GRAVEL, trace Silt. Grayish black fine to coarse SAND, some fine to medium Gravel, trace Organics (wood) and Sheen, MGP-like odor. Gray fine to coarse SAND and fine to coarse subangular GRAVEL, little to trace Silt, loose, saturated.	Borehole allowed to naturally collapse.
5 / 1095	3	4-6	NR	28, 36, 31, 33	67	NA			Black fine to medium SAND, little fine subangular Gracel, little Organics (wood), little Silt, tar blebs (~1 cm) throughout, MGP-like odor. SILT lense. Gray coarse GRAVEL, some to little fine Sand and Silt, trace Cobble Fragments. End of boring at 6.0' bss. COBBLE FRAGMENTS (~0.2') in shoe.	
10 / 1090										
15 / 1085										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 3-4' bss. Archive sample collected from 2-3' bss. Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/9/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: NA
Easting: NA
Water Depth: NA
Borehole Depth: 6' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-124D
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.0	6, 4, 3, 5	7	0.5			Brown medium to coarse SAND, some fine to coarse subrounded Gravel, trace Organics, faint odor, loose, saturated. 0.8-1.0' bss trace Sheen.	
										Black fine subangular GRAVEL, some fine to medium Sand, little Organics (wood, leaf litter), black staining, loose, saturated.	
		2	2-4	1.1	6, 10, 21, 23	31	0.0			Gray fine to coarse subangular GRAVEL and fine to medium Sand, little Silt, loose, saturated.	Borehole allowed to naturally collapse.
5	-5	3	4-6	0.3	25, 30, 24, 35	54	0.0			Gray COBBLE (0.3') in shoe.	
										End of boring at 6.0' bss.	
10	-10										
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss. Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/13/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 927904.51
Northing: 951694.217
Water Depth: 3.0'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1099.11' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-124E
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	0.5	8, 23, 30, 21	53	0.0			Gray fine to medium GRAVEL, some fine to coarse Sand, trace Silt, trace Organics (Wood, Leaves), loose, wet. Gray coarse GRAVEL, some fine Sand, loose, wet.	
	2	2-4	0.9	18, 22, 20, 22	42	0.0			Gray fine to coarse subangular GRAVEL and fine to coarse SAND, trace Silt, stiff, wet.	
1095 / 5	3	4-6	0.9	15, 13, 22, 23	35	0.0				Borehole allowed to naturally collapse.
	4	6-8	0.7	42, 160, 40, 38	200	0.0				
1090 / 10	5	8-10	1.4	28, 25, 25, 24	50	0.0			End of boring at 10.0' bss.	
1085 / 15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 4/29/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 951859.867
Easting: 927973.864
Water Depth: 3.0'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1098.6226 AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-125
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.2	63 83 40 74	123	0.0			Gray fine to coarse subrounded to subangular GRAVEL, some to little medium to coarse Sand, trace fine Sand, saturated. Gray coarse SAND and fine subangular GRAVEL, trace fine Sand and Silt, saturated. Gray coarse GRAVEL, some Cobble fragments, little fine Gravel, saturated.	
	2	2-4	0.3	30 105 134 122	239	0.0				
1095 / 5	3	4-6	1.3	104 47 55 43	102	0.0			Gray fine to medium subrounded to subangular GRAVEL, some coarse Sand, little coarse subangular Gravel, trace Cobble fragments, loose, saturated.	Borehole allowed to naturally collapse.
	4	6-8	2.0	47 67 65 67	132	0.0			Gray medium SAND and gray fine to medium subangular GRAVEL, little coarse Sand, loose, saturated.	
1090 / 10									End of boring at 8.0' bss.	
1085 / 15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from: 0-2' bss
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/13/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Northing: 927964.133
Easting: 951829.97
Water Depth: 3.0'
Borehole Depth: 4.0' bss
Sediment Surface Elevation: 1099.48' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-125A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.2	9, 16, 13, 24	29	0.0			Dark gray to black fine to coarse GRAVEL, some fine to coarse Sand, trace Silt, thin lens of black staining (<0.1' thick), loose, wet.	
	2	2-4	1.0	37, 63, 23, 44	86	0.0			Gray to gray-brown fine to coarse GRAVEL, some to little fine to coarse Sand, little Silt, trace Clay, dense, no obvious impacts, wet.	Borehole allowed to naturally collapse.
1095 / 5									End of boring at 4.0' bss.	
1090 / 10										
1085 / 15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified method 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 4/28/14
Drilling Company: Parratt-Wolff
Driller's Name: L. Pech & D. Annabelle
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge-mounted tripod w/ portable cathead
Sampling Method: 3" x 2' Split Spoon using 300 lbs Hammer

Northing: 952035.493
Easting: 927972.998
Water Depth: 2.5'
Borehole Depth: 8' bss
Sediment Surface Elevation: 1099.6456 AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-126
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1100 / 0										
	1	0-2	1.4	10, 12, 24, 50	36	0.0			Gray subangular fine to coarse GRAVEL, little fine to coarse Sand, trace Cobble fragments, saturated.	
	2	2-4	1.7	76, 44, 38, 38	82	0.0			Gray coarse SAND, some fine to coarse Gravel, trace fine to medium Sand, loose, saturated.	
1095 / 5	3	4-6	1.4	32, 30, 26, 21	56	0.0			Gray fine to coarse subangular GRAVEL, some coarse Sand, trace Cobble fragments, loose, saturated.	Borehole allowed to naturally collapse.
	4	6-8	2.0	20, 20, 22, 30	42	0.0				
1090 / 10									End of boring at 8.0' bss.	
1085 / 15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from: 0-2' bss
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 5/8/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & Tom O'Rourke
Drilling Method: Hand Sampling
Sampling Method: 4' Macro core barrel with acetate liner

Northing: 955421.0977
Easting: 927824.1894
Water Depth: NA
Borehole Depth: 3.0' bss
Sediment Surface Elevation: 1106.5721' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-127
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-3.0	1.8	NA	NA	NA			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, MGP-like odor, trace Sheen, loose, saturated.	Borehole allowed to naturally collapse.
									Refusal at 3.0' bss.	
5 / 1100										
10 / 1095										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-3.0' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

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Date Start/Finish: 5/8/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & Tom O'Rourke
Drilling Method: Hand Sampling
Sampling Method: 4' Macro core barrel with acetate liner

Northing: 951269.7472
Easting: 928337.6893
Water Depth: NA
Borehole Depth: 1.8' bss
Sediment Surface Elevation: 1107.0371' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-128
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1110										
0	1	0-1.8	1.8	NA	NA	NA			Dark gray to black SILT and fine SAND, some fine to medium subangular Gravel, little Organics (Wood), trace Sheen, MGP-like odor, soft.	Borehole allowed to naturally collapse.
1105									Refusal at 1.8' bss.	
5										
1100										
10										
1095										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-1.8' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

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Date Start/Finish: 5/8/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & Tom O'Rourke
Drilling Method: Hand Sampling
Sampling Method: 4' Macro core barrel with acetate liner

Northing: 955854.1895
Easting: 927833.7143
Water Depth: NA
Borehole Depth: 2.0' bss
Sediment Surface Elevation: 1106.5737' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-129
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2.0	NA	NA	NA	NA	X		Gray fine to medium SAND, little Silt, trace Organics, soft, faint odor.	Borehole allowed to naturally collapse.
									Refusal at 2.0' bss.	
5 / 1100										
10 / 1095										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-2' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

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Date Start/Finish: 5/8/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & Tom O'Rourke
Drilling Method: Hand Sampling
Sampling Method: 4' Macro core barrel with acetate liner

Northing: 955954.7123
Easting: 927883.0788
Water Depth: NA
Borehole Depth: 1.5' bss
Sediment Surface Elevation: 1106.0128' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-130
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-1.5	NA	NA	NA	NA			Gray coarse SAND and fine to medium subrounded GRAVEL, loose, saturated.	Borehole allowed to naturally collapse.
									Refusal at 1.5' bss.	
5 / 1100										
10 / 1095										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery.
Analytical and archive samples collected from 0-1.5' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 5/8/14
Drilling Company: ARCADIS
Driller's Name: Will Stephens & Tom O'Rourke
Drilling Method: Hand Sampling
Sampling Method: 4' Macro core barrel with acetate liner

Northing: NA
Easting: NA
Water Depth: NA
Borehole Depth: 1.0' bss
Sediment Surface Elevation: NA
Descriptions By: Will Stephens

Well/Boring ID: SED-131
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-1.0	NA	NA	NA	NA			Gray to brown medium to coarse SAND and fine to coarse subrounded GRAVEL, loose, saturated.	Borehole allowed to naturally collapse.
										Refusal at 1.0' bss.	
5	-5										
10	-10										
15	-15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical and archive samples collected from 0-1' bss.
Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

Date Start/Finish: 11/11/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: 4.0'
Borehole Depth: Refusal at 8.1' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-132
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.8	9 34 55 49	89	0.0			Gray medium to coarse subrounded GRAVEL, trace fine Sand, loose, wet. Dark gray fine to coarse SAND and fine to coarse subangular GRAVEL, loose, wet. Dark gray COBBLE fragments, trace fine Sand, trace Silt, wet.	
		2	2-4	0.9	25 51 72 61	123	0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, stiff, wet to moist (silt).	
5	-5	3	4-6	0.5	40 54 60 49	114	0.0				Borehole allowed to naturally collapse.
		4	6-8	1.8	48 50 51 83	101	0.0				
		5	8-8.1	NR	50/.1	NA	NA			Refusal at 8.1' bss.	
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss. Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 11/14/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 927917.22
Northing: 951530.96
Water Depth: 2.0'
Borehole Depth: 16.0' bss
Sediment Surface Elevation: 1100.72' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-133
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.6	WH 1 3 3	4	0.0			Gray to brown fine to coarse SAND and fine to medium GRAVEL, trace Debris (glass), trace Organics (shells), wet.	
	2	2-4	0.8	6 3 1 10	4	0.0			Brown to gray fine to coarse SAND, some fine to medium Gravel, wet. Brown fine to medium SAND, trace fine to medium Gravel, trace Silt, trace black staining, faint MGP-like odor (2.2-2.5' bss), wet.	
5 / 1100	3	4-6	0.8	12 20 27 25	47	0.0			Gray to brown fine to coarse GRAVEL, some fine to medium Sand, little to trace Silt, stiff, wet.	
	4	6-8	0.8	91 38 37 33	75	0.0				
	5	8-10	0.9	61 35 25 22	60	0.0				
10 / 1095	6	10-12	0.5	43 34 53 53	87	0.0			Gray to brown fine to coarse GRAVEL, some fine to coarse Sand, little Silt, very stiff (dense), wet to moist.	
	7	12-14	1.3	48 35 32 37	37	0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, stiff, moist to wet.	
15 / 1090	8	14-16	0.9	80 58 97 262/.5	156	0.0			Gray to brown fine to coarse GRAVEL, some fine to medium Sand, little Silt, trace Clay, very stiff, Cobble in shoe of split spoon, wet.	Backfilled with Bentonite chips

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 6-8' bss.
Samples put on hold to be analyzed using Modified method 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 11/12/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: 2.0'
Borehole Depth: 17.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-134
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.6	2, 2, 3, 2	5	0.0			Gray fine to medium subrounded GRAVEL, some to little fine to coarse Sand, trace Silt, trace Organics (leaves), loose, wet.	
		2	2-4	0.7	15, 6, 4, 14	10	24.7			Dark gray fine to coarse SAND, some fine to coarse Gravel, trace black staining, loose, wet.	
5	-5	3	4-6	0.8	9, 11, 11, 15	22	0.0			Gray fine to coarse subangular GRAVEL, some to little Sand, trace Silt, no observed impacts, stiff, wet.	
		4	6-8	1.3	33, 46, 36, 27	82	0.0			Gray fine to coarse subangular GRAVEL and fine to coarse SAND, little Cobble fragments, trace Silt, stiff, wet.	
		5	8-10	1.0	27, 23, 20, 23	43	0.0				Borehole allowed to naturally collapse.
10	-10	6	10-12	1.4	32, 36, 44, 52	80	0.0				
		7	12-14	1.4	39, 44, 34, 26	78	0.0			Gray fine to coarse subangular GRAVEL and fine to coarse SAND, trace Silt, stiff, wet.	
15	-15	8	14-16	0.8	38, 22, 120, 127	142	0.0				
			14-16								

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 4-6' bss. Archive sample collected from 6-8' bss.
Archive samples will be analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/12/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: 2.0'
Borehole Depth: 17.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-134
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	9	16-17	0.4	135 150	NA	0.0			Gray fine to coarse subangular GRAVEL and fine to coarse SAND, trace Silt, stiff, wet.	Borehole allowed to naturally collapse.
									End of boring at 17.0' bss.	
20 -20										
25 -25										
30 -30										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 4-6' bss. Archive sample collected from 6-8' bss.
Archive samples will be analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 11/11/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: 3.0'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-135
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0										
		1	0-2	0.9	7 27 31 23	58	0.0			Gray fine to coarse SAND, some fine to medium subangular Gravel, loose, wet. Gray fine to coarse subangular GRAVEL, some fine to medium Sand, stiff, wet.	
		2	2-4	0.9	18 9 15 15	24	0.0			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, loose, wet.	
5	-5	3	4-6	0.7	19 24 40 49	64	0.0				Borehole allowed to naturally collapse.
		4	6-8	0.7	12 49 30 22	79	0.0			Gray fine to coarse subangular GRAVEL, some to little fine to coarse Sand, trace Silt, stiff, wet.	
		5	8-10	0.3	23 42 58 33	100	0.0				
10	10									End of boring at 10.0' bss.	
15	-15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss. Archive samples will be analyzed using Modified 8270 PAH and 8015 (TPH) pending results from NOAA 34 PAH and TOC analyses.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/22/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2" x 2' Macro Core Barrel w. Acetate Liner

Northing: NA
Easting: NA
Water Depth: 2.0'
Borehole Depth: 2.0'
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-135R
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.6	NA	NA	0.0			Dark gray fine to medium SAND, some fine to medium angular Gravel, wet.	Borehole allowed to naturally collapse.
										End of boring at 2.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Collected samples for analysis via method 8270 (PAH) from 0-2' bss.
Resample of boring location SED-135.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 11/14/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge Mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 927865.321
Northing: 951597.96
Water Depth: 3.0'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1099.12' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-137
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	1100										
0		1	0-2	0.9	9 10 14 18	24	0.0			Gray COBBLE. Gray fine to coarse GRAVEL, some fine to coarse Sand, loose, wet.	
		2	2-4	0.6	27 21 16 16	37	0.0			Gray to brown fine to coarse GRAVEL, some Sand, trace Silt, stiff, wet.	
	1095	3	4-6	0.7	15 20 22 21	42	0.0				Borehole allowed to naturally collapse.
5		4	6-8	NR	51 51 54 32	105	0.0			No Recovery	
		5	8-10	1.1	18 14 19 26	33	0.0			Brown fine to coarse GRAVEL, some fine medium Sand, stiff, wet.	
	1090										
10										End of boring at 10.0' bss.	
	1085										
15											

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Archive samples will be analyzed using Modified 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/19/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928213.191
Northing: 954466.874
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.17' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-139
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1105	1	0-2	1.0	9 8 8 9	16	0.0			Gray fine to coarse subround GRAVEL, little fine to coarse Sand, loose, wet. Tan fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, loose, wet.	
		2	2-4	1.1	10 6 7 10	13	0.0			Tan fine to coarse SAND, some fine to coarse subangular Gravel, loose, wet.	
5	1100	3	4-6	1.	7 8 12 8	20	0.0				Borehole allowed to collapse naturally.
		4	6-8	0.7	7 7 12 18	19	0.0			Gray coarse angular GRAVEL, some to little fine to coarse Sand, loose, wet.	
		5	8-10	1.2	16 10 14 11	24	0.0				
10	1095									End of boring at 10.0' bss.	
15	1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified method 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 7/1/15
Drilling Company: ARCADIS
Driller's Name: William Stephens
Drilling Method: Hand Sampling
Sampling Method: 2" x 4' Macro Core Barrel w. Acetate Liner

Northing: NA
Easting: NA
Water Depth: 1.5'
Borehole Depth: 4'
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-139A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-4	2.2	NA	NA	0.0			Black fine to coarse SAND, little Silt, trace Organics (wood), trace fine angular Gravel, MGP-like odor, trace irridescent sheens, soft, wet Brown to gray fine SAND, some fine angular Gravel, trace Organics (wood), no impacts, dense, wet. Brown Silty SAND, little fine angular Gravel, dense, wet. Brown to gray fine to medium SAND and fine to medium angular GRAVEL, loose, wet. Gray fine subangular GRAVEL, little fine to coarse Sand, loose, wet.	Borehole allowed to naturally collapse.
										End of boring at 4.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Collected samples for analysis via method 8270 (PAH) from 2-4' bss.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 12/19/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928199.704
Northing: 954502.521
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.41' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-140
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.3	8, 10, 12, 15	22	0.0			Gray fine to coarse subangular GRAVEL, loose, wet. Gray fine to coarse subangular GRAVEL and fine to coarse SAND, faint MGP-like odor, loose, wet.	
	2	2-4	1.5	13, 9, 7, 8	16	0.0			Reddish-brown fine to coarse GRAVEL, little fine to coarse Sand, loose, wet.	
5 / 1100	3	4-6	1.1	9, 11, 10, 10	21	0.0			Tan fine to coarse GRAVEL, litle fine to coarse Sand, trace Silt, loose, wet.	Borehole allowed to collapse naturally.
	4	6-8	1.0	14, 9, 8, 11	17	0.0			Gray fine to medium GRAVEL and fine to coarse SAND, loose, wet.	
	5	8-10	1.3	11, 15, 15, 16	30	0.0			Gray fine to coarse GRAVEL, little fine to coarse Sand, loose, wet. Gray fine to coarse SAND, some fine to coarse Gravel, trace Silt, loose, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.
Samples analyzed using Modified method 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2" x 2' Macro Core Barrel w. Acetate Liner

Northing: 954502.521
Easting: 928199.704
Water Depth: 1.2'
Borehole Depth: 2.0'
Sediment Surface Elevation: 1105.41' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-140R
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.7	NA	NA	0.0			Gray medium to coarse SAND and fine to coarse angular GRAVEL, trace Fill (glass), dense, wet.	Borehole allowed to naturally collapse.
										End of boring at 2.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Collected samples for analysis via method 8270 (PAH) from 0-2' bss.
Resample of boring location SED-140.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 12/19/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928194.304
Northing: 954558.814
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1104.66' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-141
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1105										
0	1	0-2	1.0	11, 10, 7, 9	17	0.0			Gray fine to coarse subround GRAVEL, trace Organics (wood, leaves), loose, wet.	
									Gray fine to medium subround GRAVEL, some fine to coarse Sand, loose, wet.	
	2	2-4	0.9	13, 11, 8, 8	19	0.0			Gray fine to coarse SAND, some fine to coarse Gravel, trace Silt, loose, wet.	
1100 5	3	4-6	0.9	10, 11, 9, 6	20	0.0			Gray fine to coarse subangular Gravel, some fine to coarse Sand, trace Silt, loose, wet.	Borehole allowed to collapse naturally.
	4	6-8	1.0	7, 8, 8, 10	16	0.0			Brown fine to coarse SAND, some fine to coarse Gravel, trace Silt, loose, wet.	
1095 10	5	8-10	1.0	11, 7, 13, 12	20	0.0			End of boring at 10.0' bss.	
1090 15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
Samples analyzed using Modified method 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2" x 2' Macro Core Barrel w. Acetate Liner

Northing: 954558.814
Easting: 928194.304
Water Depth: 1.3'
Borehole Depth: 2.0'
Sediment Surface Elevation: 1104.66' AMSL
Descriptions By: Marcus Hagan

Well/Boring ID: SED-141R
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.2	NA	NA	1.3			Gray medium to coarse SAND and fine to coarse GRAVEL, loose, faint MGP-like odor, wet. Gray fine to medium SAND, brown light NAPL coating, wet. Gray SILT, trace fine to medium Sand, wet. Brown fine to medium SAND, some fine to coarse subangular Gravel, wet.	Borehole allowed to naturally collapse.
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Collected samples for analysis via method 8270 (PAH) from 0-2' bss.
Resample of boring location SED-141.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 12/19/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928166.112
Northing: 954556.368
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.35' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-142
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.3	2 7 8 9	15	0.0			Gray to brown fine to medium SAND, little fine subangular Gravel, trace Organics (leaves, wood), trace Silt, faint petroleum-like odor, loose, wet.	
									Brown SILT, little fine Sand, trace Clay, faint petroleum-like odor, soft, wet.	
									Brown fine to coarse subangular GRAVEL, some fine to coarse Sand, faint petroleum-like odor, loose, wet.	
	2	2-4	1.3	17 9 8 7	17	0.0			Brown fine to coarse subangular GRAVEL, some fine to coarse Sand, no odor, loose, wet.	
5 / 1100	3	4-6	1.1	7 6 6 9	12	0.0				Borehole allowed to collapse naturally.
	4	6-8	1.0	9 9 9 8	18	0.0			Brown coarse subangular GRAVEL, some to little fine to coarse Sand, loose, wet.	
	5	8-10	1.3	9 10 10 12	20	0.0			Brown fine to coarse subangular GRAVEL, some fine to coarse Sand, loose, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.
Samples analyzed using Modified method 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2" x 2' Macro Core Barrel w. Acetate Liner

Northing: 954556.368
Easting: 928166.112
Water Depth: 1.3'
Borehole Depth: 2.0'
Sediment Surface Elevation: 1105.35' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-142R
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.7	NA	NA	0.0			Gray fine to medium SAND, some fine to medium subangular Gravel, trace Organics, wet. Gray Silty SAND, trace fine angular Gravel, wet. Gray-brown medium to coarse GRAVEL, some medium to coarse Sand, wet. End of boring at 2.0' bss.	Borehole allowed to naturally collapse.
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Collected samples for analysis via method 8270 (PAH) from 0-2' bss.
Resample of boring location SED-142.

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Date Start/Finish: 12/19/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928149.727
Northing: 954600.067
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.06' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-143
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1105	1	0-2	1.4	6 8 8 9	16	0.0			Dark brown to dark gray fine to medium SAND, little fine subangular Gravel, little Silt, faint MGP-like odor, firm, wet. Gray fine to coarse SAND and fine to medium subangular GRAVEL, petroleum-like odor, faint MGP-like odor, loose, wet.	
		2	2-4	1.0	13 20 20 14	40	0.0			Brown fine to coarse subangular GRAVEL, some to little fine to coarse Sand, no odor, loose, wet.	
5	1100	3	4-6	1.1	10 9 9 8	18	0.0				Borehole allowed to collapse naturally.
		4	6-8	0.8	11 9 6 8	15	0.0			Gray fine to medium subangular GRAVEL, some medium to coarse Sand, little coarse Gravel, loose, wet.	
		5	8-10	1.1	15 11 14 12	25	0.0			Gray fine to coarse subangular GRAVEL, little fine to coarse Sand, loose, wet.	
10	1095									End of boring at 10.0' bss.	
15	1090										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery
Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.
Samples analyzed using Modified method 8270 PAH.
*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2" x 2' Macro Core Barrel w. Acetate Liner

Northing: 954600.067
Easting: 928149.727
Water Depth: 1.2'
Borehole Depth: 2.0'
Sediment Surface Elevation: 1105.06' AMSL
Descriptions By: Marcus Hagan

Well/Boring ID: SED-143R
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.0	NA	NA	0.0			Gray medium to coarse SAND and fine to coarse subangularto angular GRAVEL, trace Silt, dense, wet.	Borehole allowed to naturally collapse.
										End of boring at 2.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Collected samples for analysis via method 8270 (PAH) from 0-2' bss.
Resample of boring location SED-143.
MS/MSD collected

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 12/18/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928152.35
Northing: 954652.608
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.1' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-144
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1105	1	0-2	1.1	4 5 5 7	10	0.0			Gray to brown fine to coarse SAND and fine to coarse subangular GRAVEL, loose, wet.	
		2	2-4	1.4	13 9 11 12	20	0.0			Reddish-brown fine to medium GRAVEL, little fine Sand, trace Sit, loose, wet.	
5	1100	3	4-6	1.2	10 12 13 10	25	0.0			Brown fine to medium GRAVEL, some fine to coarse Sand, loose, wet.	Borehole allowed to collapse naturally.
		4	6-8	0.9	7 9 16 8	25	0.0			Gray to brown fine to coarse subangular GRAVEL, some to little fine to coarse Sand, trace Silt, loose, wet.	
		5	8-10	0.9	6 6 7 8	13	0.0				
10	1095									End of boring at 10.0' bss.	
15	1090										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified method 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/18/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928127.657
Northing: 954639.079
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.69' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-145
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.2	9, 9, 19, 24	28	0.0			Gray coarse subangular GRAVEL, little fine to medium Sand, loose, wet. Gray fine to coarse SAND and fine to coarse subangular GRAVEL, loose, wet.	
	2	2-4	1.5	14, 15, 12, 11	27	0.0			Gray to reddish brown medium to coarse GRAVEL, some fine to coarse Sand, loose, wet.	
5 / 1100	3	4-6	1.2	7, 9, 9, 8	18	0.0			Gray to brown fine to coarse GRAVEL and fine to coarse SAND, loose, wet.	Borehole allowed to collapse naturally.
	4	6-8	0.9	6, 6, 9, 13	15	0.0			Lens of brown to brownish orange oxidized fine to medium subangular GRAVEL, loose, wet.	
	5	8-10	1.0	17, 19, 19, 21	38	0.0			Gray fine to coarse GRAVEL and fine to coarse SAND, loose, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified method 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/18/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928062.994
Northing: 954766.263
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.15' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-146
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.6	6, 12, 17, 21	29	0.0			Gray to brown fine to coarse subangular GRAVEL, little medium to coarse Sand, loose, wet.	
	2	2-4	1.4	11, 9, 7, 7	16	0.0			Brown fine to coarse subangular GRAVEL, some fine to coarse Sand, loose, wet.	
									Brown fine to coarse SAND, some subangular fine to medium Gravel, loose, wet.	
5	3	4-6	1.0	6, 6, 5, 9	11	0.0			Gray fine to medium subangular GRAVEL, some fine to coarse Sand, loose, wet.	Borehole allowed to collapse naturally.
1100									Gray medium SAND, some fine to medium subangular Gravel, loose, wet.	
	4	6-8	1.1	6, 9, 8, 8	17	0.0			Gray coarse angular GRAVEL, some fine to medium subangular Gravel, little fine to coarse Sand, loose, wet.	
	5	8-10	0.9	9, 9, 7, 8	16	0.0				
10									End of boring at 10.0' bss.	
1095										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified method 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/18/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928073.751
Northing: 954792.732
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.96' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-147
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.7	4 5 12 14	17	0.0			Gray fine to coarse subangular GRAVEL, little fine to medium Sand, loose, wet.	
									Brown fine to coarse SAND and fine to coarse subangular to subround GRAVEL, MGP-like odor, trace tar blebs (<1/8" diameter with 1 to 2 blebs per 0.1'), trace iridescent sheen, loose, wet.	
	2	2-4	1.5	11 8 9 8	17	0.0			Brown fine to coarse SAND and fine to coarse subangular to subround GRAVEL, MGP-like odor, no visual impacts, loose, wet.	
	3	4-6	0.9	6 6 5 6	11	0.0			Gray to brown fine to coarse subangular GRAVEL, some fine to coarse Sand, loose, wet.	
5 / 1100	4	6-8	0.9	10 8 7 7	15	0.0				
	5	8-10	0.6	6 7 6 5	13	0.0			Gray medium to coarse SAND, some fine subangular Gravel, loose, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

Backfilled boring with Bentonite chips

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 4-6' bss. Archive sample collected from 6-8' bss.

Samples analyzed using Modified method 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/17/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928043.811
Northing: 954820.232
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.88' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-148
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.1	7, 11, 12, 13	23	0.0			Brown fine to coarse SAND, little fine to medium subangular Gravel, loose, wet. Gray to brown fine to medium subangular to subround GRAVEL, some fine to coarse Sand, loose, wet.	
	2	2-4	1.5	13, 8, 8, 10	16	1.3			Gray to brown fine to medium subangular to subround GRAVEL, some fine to coarse Sand, black taffy-like NAPL tar blebs (<0.1" thick), MGP-like odor, loose, wet. Gray to brown fine to medium subangular to subround GRAVEL, some fine to coarse Sand, MGP-like odor, loose, wet.	
5 / 1100	3	4-6	1.2	8, 12, 9, 9	21	0.0			Gray to brown fine to coarse subangular GRAVEL and fine to coarse SAND, trace iridescent sheens, trace brown NAPL blebs (<0.1" diameter), faint MGP-like odor, loose, wet. Gray to brown fine to coarse subangular GRAVEL and fine to coarse SAND, faint MGP-like odor, loose, wet.	Backfilled boring with Bentonite chips
	4	6-8	0.9	8, 10, 7, 8	17	0.0			Gray to brown fine to medium GRAVEL, some medium to coarse Sand, trace coarse Gravel, no impacts observed, loose, wet.	
	5	8-10	1.0	7, 8, 11, 11	19	0.0				
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 6-8' bss. Archive sample collected from 8-10' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/17/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name:
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method:
3" x 2' Split Spoon

Easting: 928053.757
Northing: 954853.29
Water Depth: NA
Borehole Depth:
10.0' bss
Sediment Surface Elevation:
1105.76' AMSL
Descriptions By:
Will Stephens

Well/Boring ID: SED-149
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.3	9 9 9 8	18	0.0			Brown fine to medium SAND, some fine to coarse subround to subangular Gravel, loose, wet. Gray fine to coarse subangular GRAVEL, little fine to medium Sand, faint MGP-like odor, no visual impacts, loose, wet.	
	2	2-4	1.4	7 7 7 7	14	0.0			Gray fine to coarse subangular GRAVEL, little fine to medium Sand, no observed impacts, loose, wet.	
5 / 1100	3	4-6	1.0	7 8 7 8	15	0.0			Gray to brown fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	Borehole allowed to collapse naturally.
	4	6-8	1.0	9 9 14 7	23	0.0				
	5	8-10	1.2	10 10 11 13	21	0.0			Gray coarse subangular GRAVEL, some fine to medium Sand, little fine to medium Gravel, trace Silt, loose, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2" x 2' Macro Core Barrel w. Acetate Liner

Northing: 954853.29
Easting: 928053.757
Water Depth: 1.3'
Borehole Depth: 2.0'
Sediment Surface Elevation: 1105.76' AMSL
Descriptions By: Marcus Hagan

Well/Boring ID: SED-149R
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.0	NA	NA	0.0			Gray medium to coarse SAND and medium to coarse subangular to angular GRAVEL, dense, wet.	Borehole allowed to naturally collapse.
										End of boring at 2.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Collected samples for analysis via method 8270 (PAH) from 0-2' bss.
Resample of boring location SED-149.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 12/17/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928029.664
Northing: 954854.495
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.71' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-150
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.8	4, 4, 7, 7	11	0.0			Gray to brown medium to coarse subangular to angular GRAVEL, trace fine to coarse Sand, loose, wet.	
	2	2-4	1.1	6, 7, 7, 6	14	0.0			Gray fine to coarse SAND, some fine to medium Gravel, loose, wet. Gray fine to medium subangular GRAVEL, little coarse subangular Gravel, little fine to medium Sand, loose, wet.	
5 / 1100	3	4-6	0.9	7, 7, 7, 10	14	0.0			Gray to brown fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	Borehole allowed to collapse naturally.
	4	6-8	0.7	8, 15, 13, 13	28	0.0				
	5	8-10	1.0	12, 14, 14, 15	28	0.0			Gray to brown medium to coarse subangular GRAVEL, some fine to coarse Sand, loose,wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/17/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927987.802
Northing: 954918.982
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.21' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-151
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.8	4 4 4 5	8	0.0			Brown-gray fine to coarse SAND, some fine to medium subangular Gravel, loose, wet.	
	2	2-4	1.0	6 6 7 6	13	0.0			Brown fine to coarse SAND, some fine to coarse subangular Gravel, loose, wet.	
5	3	4-6	0.8	7 7 8 16	15	0.0			Gray coarse subangular GRAVEL, little fine to medium Gravel, little medium to coarse Sand, loose, wet.	Borehole allowed to collapse naturally.
1100	4	6-8	1.2	8 12 11 9	23	0.0			Multicolored (gray, brown, dark gray) medium to coarse subangular to subround GRAVEL, some fine to coarse Sand, loose, wet.	
	5	8-10	1.5	13 14 15 15	29	0.0			Brown to gray fine to coarse Sand, trace Silt, loose, wet.	
10									End of boring at 10.0' bss.	
1095										
15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/17/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 928003.501
Northing: 954942.159
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.28' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-152
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.6	10, 7, 11, 9	18	0.0			Brown fine to medium SAND, some fine to medium subangular to subround Gravel, trace Silt, loose, wet.	
	2	2-4	0.9	9, 10, 11, 8	21	0.0			Gray COBBLE.	
5 / 1100	3	4-6	1.2	6, 8, 8, 14	16	0.0			Brown fine to coarse SAND and fine to medium subangular GRAVEL, trace Silt, loose, wet. Gray coarse GRAVEL, some fine to coarse Sand, loose, wet.	Borehole allowed to collapse naturally.
	4	6-8	1.1	12, 7, 12, 11	19	0.0			Multicolored (red, brown, and gray) fine to coarse subround GRAVEL, some fine to coarse Sand, loose, wet.	
	5	8-10	1.1	7, 7, 7, 9	14	0.0			Brown fine to coarse SAND, some medium to coarse subangular Gravel, loose, wet.	
10 / 1095									End of boring at 10.0' bss.	
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 12/16/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927982.181
Northing: 954954.248
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.39' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-153
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.7	10, 7, 7, 13	14	0.0			Brown fine to coarse SAND, some fine to medium subangular Gravel, loose, wet.	
	2	2-4	0.9	11, 12, 12, 16	24	0.0			Grayish brown fine to medium SAND, some to little fine to coarse subangular Gravel, trace Silt, loose, wet.	
				17					Gray fine to coarse SAND and fine to medium subangular GRAVEL, loose, wet.	
5	3	4-6	0.9	14, 9, 15	23	0.0			Gray coarse GRAVEL, some fine to coarse Sand, loose, wet.	Borehole allowed to collapse naturally.
1100	4	6-8	1.2	0, 9, 12, 10	21	0.0			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, loose, wet.	
	5	8-10	0.9	14, 16, 14, 16	29	0.0				
10									End of boring at 10.0' bss.	
1095										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/16/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927987.188
Northing: 954983.397
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.23' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-154
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.1	15, 13, 10, 9	23	0.0			Brown fine to coarse SAND, little fine to medium subangular Gravel, loose, wet.	
									Gray fine to coarse SAND, some fine to coarse subangular Gravel, loose, wet.	
	2	2-4	1.0	10, 17, 13, 16	30	0.0				
5 / 1100	3	4-6	1.1	11, 12, 13, 27	25	0.0			Mulitcolored (tan, gray, and brown) fine to coarse subangular to subround GRAVEL, trace fine to medium Sand, loose, wet.	Borehole allowed to collapse naturally.
	4	6-8	1.0	13, 18, 10, 10	28	0.0			Brown to orange (oxidized) coarse GRAVEL, little fine to medium Sand, loose, wet.	
	5	8-10	1.0	17, 19, 20, 22	39	0.0			Brown to orange-brown medium to coarse GRAVEL, some to little fine to medium Sand, loose, wet.	
10 / 1095									End of boring at 10.0' bss.	
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 12/16/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927959.468
Northing: 955003.359
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.10' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-155
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.0	15, 31, 15, 16	46	0.0			Gray fine to medium SAND, some to little fine to coarse subangular Gravel, loose, wet.	
									Gray fine to coarse GRAVEL, some fine to medium Sand, loose, wet.	
	2	2-4	0.7	48, 47, 46, 25	93	0.0			Gray fine to coarse GRAVEL, some fine to medium Sand, trace Silt, loose, wet.	
5	3	4-6	0.9	23, 19, 27, 30	46	0.0			Gray COBBLE.	Borehole allowed to collapse naturally.
1100	4	6-8	1.0	14, 17, 15, 13	32	0.0			Gray fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	
	5	8-10	1.0	15, 16, 21, 22	37	0.0			Brown to orange-brown fine to coarse GRAVEL, some fine to coarse Sand, loose, wet.	
10 / 1095									End of boring at 10.0' bss.	
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/16/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927932.432
Northing: 955047.58
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.24' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-156
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.7	14, 19, 24, 17	43	0.0			Brown fine to medium SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	
	2	2-4	1.2	11, 11, 12, 10	23	0.0			Gray to brown fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	
5	3	4-6	0.7	10, 10, 15, 14	25	0.0				Borehole allowed to collapse naturally.
1100	4	6-8	1.0	11, 16, 11, 16	27	0.0			Light brown to orange fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	
	5	8-10	1.0	10, 8, 11, 13	19	0.0			Gravel content increasing with depth.	
10									End of boring at 10.0' bss.	
1095										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 12/15/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927937.424
Northing: 955110.313
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.16' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-157
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.1	13, 17, 17, 14	34	0.0			Gray coarse subangular GRAVEL, little fine to coarse Sand, loose, wet.	
	2	2-4	1.4	11, 11, 11, 10	22	0.0			Gray to tan fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	
5 / 1100	3	4-6	1.4	11, 11, 11, 15	22	0.0			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, loose, wet.	Borehole allowed to collapse naturally.
	4	6-8	0.4	12, 28, 16, 10	44	0.0			Tan fine to coarse SAND, some fine to coarse Gravel, trace Silt, loose, wet.	
	5	8-10	0.4	8, 14, 11, 12	25	0.0				
10 / 1095									End of boring at 10.0' bss.	
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/15/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927915.251
Northing: 955129.791
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.89' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-158
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.6	5, 11, 9, 7	20	0.0			Gray fine to coarse subround GRAVEL, some fine to coarse Sand, loose, wet. Tan fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	
	2	2-4	1.3	8, 8, 10, 8	18	0.0				
	3	4-6	0.7	15, 12, 9, 12	21	0.0			Gray fine to coarse subangular GRAVEL, little fine to coarse Sand, loose, wet. Tan fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	
5 / 1100	4	6-8	1.0	8, 12, 10, 10	22	0.0				Borehole allowed to collapse naturally.
	5	8-10	1.0	11, 16, 18, 17	34	0.0				
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 12/15/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927940.55
Northing: 955196.333
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.05' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-159
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
1105	1	0-2	0.6	7 9 8 8	17	0.0			Dark brown fine to coarse SAND, some fine to medium subround Gravel, loose, saturated.	
									Tan fine to coarse SAND and fine to coarse subround GRAVEL, trace Silt, loose, wet.	
	2	2-4	1.1	12 12 11 13	23	0.0			Brown fine to coarse SAND, some fine to medium subround Gravel, moderately dense, wet.	
5	3	4-6	1.3	9 10 14 11	24	0.0			Tan fine to coarse SAND, some fine to coarse subangular GRAVEL, trace Silt, loose, wet.	Borehole allowed to collapse naturally.
1100	4	6-8	1.0	8 12 14 13	26	0.0				
	5	8-10	1.0	15 15 16 17	31	0.0			Becoming moderately dense with depth.	
10									End of boring at 10.0' bss.	
1095										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/15/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927895.893
Northing: 955205.105
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.27' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-160
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.0	17, 16, 7, 7	23	0.0			Gray fine to coarse subangular GRAVEL, little fine to coarse Sand, trace Silt, loose, wet. Tan fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	
	2	2-4	1.8	11, 10, 10, 11	20	0.0			Gray fine to coarse SAND, some fine to medium subangular Gravel, moderately dense, wet.	
5	3	4-6	1.0	9, 10, 10, 8	20	0.0				Borehole allowed to collapse naturally.
1100	4	6-8	1.0	10, 19, 19, 11	38	0.0			Gray fine to coarse SAND, some fine to coarse subangular Gravel, moderately dense, wet.	
	5	8-10	1.0	10, 10, 9, 8	19	0.0				
10									End of boring at 10.0' bss.	
1095										
15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/12/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927887.404
Northing: 955230.72
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.17' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-161
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.2	11, 16, 15, 12	31	0.0			Gray and tan fine to coarse SAND, some fine to coarse subround Gravel, trace Silt, loose, wet.	
	2	2-4	1.7	15, 11, 12, 10	23	0.0				
	3	4-6	1.3	16, 14, 10, 15	24	0.0			Tan fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	
5									Tan fine to coarse SAND, little fine to coarse subangular Gravel, little Silt, loose, wet.	Borehole allowed to naturally collapse.
1100	4	6-8	0.8	10, 10, 14, 14	24	0.0			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, loose, wet.	
	5	8-10	0.9	15, 16, 13, 12	29	0.0			Tan to dark gray fine to coarse SAND, some fine to coarse Gravel, moderately dense, wet.	
10									End of boring at 10.0' bss.	
1095										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Sample analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 12/12/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927927.733
Northing: 955245.93
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.08' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-162
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.8	8, 6, 10, 12	16	0.0			Gray fine to medium rounded GRAVEL, little fine to coarse Sand, loose, wet. Tan fine to coarse SAND, some fine to coarse subround Gravel, trace Silt, loose, wet.	
	2	2-4	0.6	16, 21, 15, 18	36	0.0				
5 / 1100	3	4-6	1.3	16, 18, 15, 14	33	0.0			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, loose, wet.	Borehole allowed to naturally collapse.
	4	6-8	1.0	18, 21, 23, 14	44	0.0				
	5	8-10	1.2	17, 14, 20, 14	34	0.0			Tan and gray fine to coarse SAND, some fine to medium subround Gravel, moderately dense, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/11/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927893.674
Northing: 955283.183
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.98' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-163
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.2	15, 10, 12, 13	22	0.0			Gray fine to coarse subround GRAVEL, some fine to coarse Sand, loose, wet.	
									Tan fine to coarse SAND, some fine to coarse subround Gravel, trace Silt, oxidized lens (<.1' thick) at 0.5 and 1.0' bss, loose, wet.	
	2	2-4	0.9	15, 21, 26, 28	47	0.0			Tan fine to coarse SAND, little fine to medium subangular Gravel, loose, wet.	
5 / 1100	3	4-6	1.1	11, 12, 15, 23	27	0.0			Tan fine to coarse SAND, some fine to coarse Gravel, trace Silt, loose, wet.	Borehole allowed to naturally collapse.
	4	6-8	0.8	15, 23, 14, 15	37	0.0				
	5	8-10	1.1	7, 11, 8, 10	19	0.0			Tan fine to coarse SAND, little fine to medium Gravel, moderately dense, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 12/11/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927856.738
Northing: 955307.607
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.97' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-164
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.2	10, 11, 14, 12	25	0.0			Dark gray to black fine to coarse SAND, some fine to medium subround Gravel, MGP-like odor, loose, wet. Tan fine to coarse SAND and fine to coarse subangular GRAVEL, loose, wet.	
	2	2-4	1.3	12, 13, 10, 12	23	0.0			Gray and tan fine to coarse SAND and fine to coarse subangular GRAVEL, loose, wet.	
5 / 1100	3	4-6	1.1	15, 11, 10, 14	21	0.0			Gray to tan fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	Borehole allowed to naturally collapse.
	4	6-8	0.6	25, 23, 21, 20	44	0.0				
	5	8-10	0.8	24, 22, 21, 23	43	0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL, some Silt, loose, wet.	
10 / 1095									End of boring at 10.0' bss.	
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2" x 2' Macro Core Barrel w. Acetate Liner

Northing: 955307.607
Easting: 927856.738
Water Depth: 1.0'
Borehole Depth: 2.0'
Sediment Surface Elevation: 1105.97' AMSL
Descriptions By: Marcus Hagan

Well/Boring ID: SED-164R
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.6	NA	NA	0.0			Gray fine to coarse SAND, some medium to coarse Gravel, trace Silt, trace Organics, dense, no odor, wet.	Borehole allowed to naturally collapse.
										End of boring at 2.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Collected samples for analysis via method 8270 (PAH) from 0-2' bss.
Resample of boring location SED-164.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 12/9/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927843.551
Northing: 955344.169
Water Depth: NA
Borehole Depth: 20.0' bss
Sediment Surface Elevation: 1105.75' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-165
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.9	10, 11, 12, 12	23	0.0			Light brown to gray SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	
	2	2-4	1.3	19, 18, 14, 13	32	0.0			Gray brown fine to coarse SAND, some fine to medium subround Gravel, wet.	
5 / 1100	3	4-6	1.0	17, 20, 21, 19	41	0.0			Gray brown fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	
	4	6-8	1.1	10, 10, 9, 8	19	0.0			Gray fine to medium SAND, some fine to medium subround Gravel, moderately dense, wet.	
	5	8-10	0.9	16, 18, 20, 21	38	0.0			Dark gray fine to coarse SAND, trace Silt, moderatley dense, wet.	Backfilled with Bentonite chips
10 / 1095	6	10-12	1.3	12, 18, 21, 23	39	0.0			Gray fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	
	7	12-14	1.2	16, 13, 10, 12	23	0.0			Dark gray fine to coarse SAND, trace Silt moderately dense, wet.	
15 / 1090	8	14-16	0.5	10, 12, 16, 20	28	0.0			Tan to gray fine to medium SAND, liitle fine to coarse Gravel, trace Silt, moderatley dense, wet.	

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified method 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 12/9/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927843.551
Northing: 955344.169
Water Depth: NA
Borehole Depth: 20.0' bss
Sediment Surface Elevation: 1105.75' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-165
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	9	16-18	0.6	25 31 28 32	59	0.0				
	10	18-20	0.5	18 17 19 23	36	0.0			Tan to gray fine to medium SAND, liitle fine to coarse Gravel, trace Silt, moderatlely dense, wet.	
20 1085									End of boring at 20.0' bss.	
25 1080										
30 1075										
35										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified method 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/11/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Barge mounted Little Beaver
Sampling Method: 3" x 2' Split Spoon

Easting: 927889.292
Northing: 955349.424
Water Depth: 2.0'
Borehole Depth: 16.0' bss
Sediment Surface Elevation: 1100.72' AMSL
Descriptions By: Will Stephens

Well/Boring ID: SED-166
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.6	9, 10, 10, 13	20	0.0			Black fine to medium SAND, little fine to coarse subangular Gravel, trace Silt, MGP-like odor, loose, wet.	
									Tanish-gray fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, MGP-like odor, loose, wet.	
	2	2-4	1.0	15, 13, 17, 13	30	0.0				
	3	4-6	1.1	12, 12, 12, 12	24	0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, MGP-like odor, loose, wet.	
5 / 1100	4	6-8	0.7	7, 14, 11, 9	25	0.0				
	5	8-10	0.7	9, 12, 10, 13	22	0.0				Backfilled with Bentonite chips
10 / 1095	6	10-12	1.3	14, 13, 11, 12	24	0.0			Brown fine to coarse SAND, some subangular fine to medium Gravel, trace Silt, moderately dense, wet.	
	7	12-14	1.1	8, 8, 9, 12	17	0.0			Gray fine to coarse GRAVEL, some fine to coarse Sand, loose, wet.	
15 / 1090	8	14-16	1.4	15, 14, 13, 13	27	0.0			Gray fine to coarse SAND, some fine to coarse Gravel, moderately dense, wet.	
									End of boring at 16.0' bss.	

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 12-14' bss. Archive sample collected from 14-16' bss.

Samples analyzed using Modified method 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/8/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927884.112
Northing: 955405.773
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.08' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-167
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.0	10, 8, 9, 12	17	0.0			Brown fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	
	2	2-4	1.4	12, 15, 19, 21	34	0.0				
5	3	4-6	1.3	17, 19, 18, 14	37	0.0			Brown fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, loose, wet.	Borehole allowed to naturally collapse.
1100	4	6-8	0.8	6, 9, 7, 7	16	0.0			Brown fine to coarse SAND, some fine to medium subrounded Gravel, trace Silt, loose, wet.	
	5	8-10	0.9	6, 9, 7, 8	16	0.0				
10 / 1095									End of boring at 10.0' bss.	
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Archive samples will be analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/8/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927829.307
Northing: 955402.702
Water Depth: NA
Borehole Depth: 22.0' bss
Sediment Surface Elevation: 1106.06' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-168
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1105	1	0-2	0.8	9 9 5 6	14	0.0			Black to gray fine to coarse SAND, some fine to coarse subangular Gravel, MGP-like odor, black staining (0-2' bss), loose, wet.	
		2	2-4	1.2	17 15 12 19	27	0.0				
5	1100	3	4-6	1.2	18 16 26 18	36	0.0				
		4	6-8	0.8	9 11 8 8	19	0.0				
		5	8-10	0.8	15 26 18 19	44	0.0				
10	1095	6	10-12	1.4	8 21 21 18	42	0.0			Grayish brown fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, MGP-like odor, loose, wet.	Backfilled with Bentonite chips
		7	12-14	0.8	14 9 9 10	18	0.0				
15	1090	8	14-16	0.4	8 8 18 18	26	0.0			Gray to brown fine to coarse SAND, trace Silt, MGP-like odor, loose, wet.	

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 18-20' bss. Archive sample collected from 20-22' bss.

Samples analyzed using Modified method 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/8/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927829.307
Northing: 955402.702
Water Depth: NA
Borehole Depth: 22.0' bss
Sediment Surface Elevation: 1106.06' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-168
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		9	16-18	0.9	29 47 31 41	78	0.0			Dark gray fine to coarse SAND, some fine to coarse subangular Gravel, loose, wet.	
		10	18-20	0.6	22 22 26 19	48	0.0			Dark gray fine to coarse SAND, some fine to coarse subangular Gravel, loose, wet.	
20	1085	11	20-22	1.5	19 26 25 25	51	0.0			Gray fine to coarse SAND, some fine to medium subround Gravel, wet.	
										End of boring at 22.0' bss.	
25	1080										
30	1075										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 18-20' bss. Archive sample collected from 20-22' bss.

Samples analyzed using Modified method 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 12/8/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927862.614
Northing: 955484.506
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.13' AMSL
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-169
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.8	13, 10, 10, 10	20	0.0			Light brown fine to coarse SAND, some Cobbles, little fine to coarse subangular Gravel, trace black Sand, faint MGP-like odor, loose, wet.	
	2	2-4	1.1	17, 17, 21, 19	38	0.0			Tan fine to coarse SAND, some fine to coarse subround Gravel, loose, wet.	
5	3	4-6	0.8	23, 21, 17, 19	38	0.0				Borehole allowed to naturally collapse.
1100	4	6-8	0.6	8, 19, 15, 15	34	0.0			Tan to gray fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	
	5	8-10	0.7	11, 15, 18, 21	33	0.0				
10									End of boring at 10.0' bss.	
1095										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/2/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: 927875.821
Northing: 955546.862
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.93' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-170
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.2	6, 5, 6, 8	11	0.0			Brown fine to coarse SAND, some fine to medium subangular to angular Gravel, trace Silt, loose, wet.	
	2	2-4	1.6	6, 10, 7, 7	17	0.0			Brown fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, wet.	
									Gray to brown fine to coarse SAND, trace fine subangular Gravel, loose, wet.	
5 / 1100	3	4-6	1.7	6, 4, 6, 6	10	0.0			Brown fine to coarse SAND and fine to medium GRAVEL, trace Silt, loose, wet.	Borehole allowed to naturally collapse.
	4	6-8	1.2	7, 5, 6, 10	11	0.0				
	5	8-10	0.6	16, 22, 24, 50	46	0.0			Gray fine subangular GRAVEL, some fine to coarse Sand, trace Silt, stiff, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 12/2/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: NA
Northing: NA
Water Depth: NA
Borehole Depth: 10.0'
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-171
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.2	9 9 7 9	11	0.5			Dark gray to black fine SAND, some Silt, little Organics, black staining, faint MGP-like odor, trace iridescent sheens, loose, wet.	
										Gray fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, faint MGP-like odor,wet.	
		2	2-4	1.2	10 10 9 7	17	0.0			Gray fine to coarse GRAVEL, some fine to coarse Sand, trace Silt, stiff, wet.	
5	-5	3	4-6	0.6	5 9 9 8	10	0.0				Borehole allowed to naturally collapse.
		4	6-8	0.9	11 9 10 7	11	0.0			Gravel coarsening with depth.	
		5	8-10	0.8	7 9 17 11	46	0.0				
10	-10									End of boring at 10.0' bss.	
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/5/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: NA
Northing: NA
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: NA
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-172
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0										
		1	0-2	0.9	7 7 8 10	15	0.0			Black fine to coarse SAND, some fine to coarse Gravel, loose, MGP-like odor, black staining, wet.	
										Tannish- Gray fine to coarse SAND and fine to coarse subrounded GRAVEL, trace SIlt, loose, wet.	
		2	2-4	1.2	14 15 14 13	29	0.0				
5	-5	3	4-6	1.3	11 12 14 10	26	0.0				Borehole allowed to naturally collapse.
		4	6-8	0.7	8 8 7 9	15	0.0				
		5	8-10	0.8	12 10 14 14	24	0.0				
10	10									End of boring at 10.0' bss.	
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.

Samples will be analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 12/5/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: NA
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-173
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.9	14, 10, 11, 12	21	0.0			Gray to black fine to coarse GRAVEL, some fine to coarse Sand, MGP-like odor, black staining, loose, wet.	
		2	2-4	1.2	12, 13, 11, 9	24	0.0			Gray fine to coarse GRAVEL, some fine to coarse Sand, some Silt, MGP-like odor, loose, wet.	
5	-5	3	4-6	1.3	15, 18, 18, 17	36	0.0			Gray fine to coarse SAND, some fine to coarse Gravel, trace Silt, loose, wet.	Borehole allowed to naturally collapse.
		4	6-8	0.7	6, 10, 30, 34	40	0.0			Gray fine to coarse SAND and fine to medium GRAVEL, some Silt, loose, wet.	
		5	8-10	0.8	21, 19, 20, 21	39	0.0				
10	10									End of boring at 10.0' bss.	
15	-15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 4-6' bss. Archive sample collected from 6-8' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/5/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: NA
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-174
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.1	7, 9, 8, 8	17	0.0			Brown to gray fine to medium SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	
		2	2-4	1.0	12, 14, 12, 13	26	0.0			Brown fine to medium SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	
5	-5	3	4-6	1.1	13, 13, 14, 11	27	0.3			Brown SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	Borehole allowed to naturally collapse.
		4	6-8	1.0	8, 12, 13, 12	25	0.0				
		5	8-10	1.0	11, 11, 20, 19	31	0.0				
10	10									End of boring at 10.0' bss.	
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/4/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: NA
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-175
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.3	14, 17, 18, 11	35	0.0			Gray to brown fine to coarse SAND, some fine to coarse subround, loose, wet.	
		2	2-4	1.3	11, 17, 41, 50/.3	58	0.0			Gray to brown fine to coarse subround GRAVEL, some to coarse Sand, loose, wet.	
5	-5	3	4-6	1.0	11, 22, 15, 16	37	0.0				Borehole allowed to naturally collapse.
		4	6-8	1.0	5, 11, 118, 15	129	0.0				
		5	8-10	1.0	7, 8, 9, 8	17	0.0				
10	-10									End of boring at 10.0' bss.	
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/4/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: NA
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-176
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.5	11, 20, 12, 32	32	0.0			Black fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, loose, MGP-like odor, black staining, wet.	
		2	2-4	1.1	30, 20, 12, 12	32	0.0			Brown fine to coarse GRAVEL, some fine to coarse Sand, loose, wet.	
5	-5	3	4-6	1.1	12, 13, 14, 12	27	0.0			Brown to gray fine to coarse GRAVEL, some fine to coarse subangular Gravel, loose, wet.	Borehole allowed to naturally collapse.
		4	6-8	1.0	7, 15, 6, 15	21	0.0			Brown fine to coarse SAND, some fine to medium subangular Gravel, loose, wet.	
										Gray to black fine to coarse SAND, some fine to coarse Gravel, loose, wet.	
		5	8-10	1.0	17, 17, 16, 17	33	0.0			Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, loose, wet.	
10	-10									End of boring at 10.0' bss.	
15	-15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/3/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: 1.7'
Borehole Depth: 20.0' bss
Sediment Surface Elevation: NA
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-177
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1105	1	0-2	0.6	19 20 26 27	46	0.0			Gray fine to medium SAND, some fine to medium subangular Gravel, loose, wet. Gray COBBLE.	
		2	2-4	1.3	26 5 7 18	12	0.0			Gray to brown fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, loose, wet.	
5	1100	3	4-6	1.1	12 12 15 48	27	0.0			Gray fine to coarse GRAVEL, some fine to coarse Sand, trace fine Sand, loose, wet.	
		4	6-8	1.0	20 22 15 11	37	0.0			Gray brown fine to coarse SAND, some fine to medium subround Gravel, loose, wet.	
		5	8-10	1.6	11 11 18 19	29	0.0			Gray brown fine to coarse SAND and fine to coarse GRAVEL, loose, wet.	
10	1095	6	10-12	1.2	7 8 11 10	19	0.0			Gray fine to medium SAND, little fine to medium subangular Gravel, loose, wet. Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, loose, wet.	Backfilled with Bentonite chips
		7	12-14	1.4	10 14 15 16	29	0.0				
15	1090	8	14-16	0.8	16 24 18 14	42	0.0				

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified method 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/3/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: 1.7'
Borehole Depth: 20.0' bss
Sediment Surface Elevation: NA
Descriptions By: Nicholle Griffith

Well/Boring ID: SED-177
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		9	16-18	1.2	12 18 21 22	39	0.0				
		10	18-20	1.2	25 24 24 26	48	0.0			Brown coarse GRAVEL, some fine to coarse Sand, trace Silt, loose, wet.	
20	1085									End of boring at 20.0' bss.	
25	1080										
30	1075										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified method 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 12/3/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-178
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0										
		1	0-2	1.0	8 8 9 11	17	0.0			Brown fine to coarse SAND, some fine to medium subangular Gravel, loose, wet.	
										Brown fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	
		2	2-4	1.4	6 6 7 7	13	0.0			Brown fine to coarse SAND, some fine to medium Gravel, trace Silt, loose, wet.	
										Gray COBBLE fragments.	
										Brown fine to coarse SAND and fine to coarse GRAVEL, loose, wet.	
5	-5	3	4-6	1.1	11 13 15 15	28	0.0				Borehole allowed to naturally collapse.
		4	6-8	0.9	16 13 24 26	40	0.0				
		5	8-10	1.2	22 18 19 20	37	0.0			Reddish brown medium to coarse GRAVEL, some fine to coarse Sand, trace Silt, stiff, wet.	
10	-10									End of boring at 10.0' bss.	
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/3/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Northing: NA
Easting: NA
Water Depth: 1.3'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-179
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.0	9, 5, 11, 11	16	0.0			Brown to gray fine to coarse SAND, some fine to coarse Gravel, trace Silt, loose, wet.	
		2	2-4	1.5	10, 11, 13, 19	24	0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	
5	-5	3	4-6	0.8	6, 10, 14, 12	24	0.0				Borehole allowed to naturally collapse.
		4	6-8	0.7	17, 23, 14, 18	37	0.0				
		5	8-10	0.5	22, 18, 16, 17	34	0.0				
10	10									End of boring at 10.0' bss.	
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/3/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: NA
Northing: NA
Water Depth: 1.2'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-180
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.9	7 6 6 8	12	0.0			Brown fine to medium SAND, some fine to coarse Gravel, trace Silt, loose, wet. Gray fine to medium SAND and fine to coarse subangular GRAVEL, loose, wet.	
		2	2-4	1.1	9 12 12 12	24	0.0			Gray to brown fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	
5	-5	3	4-6	NR	9 13 13 13	26	NA			No Recovery.	Borehole allowed to naturally collapse.
		4	6-8	0.6	13 11 10 15	21	0.0			Gray to brown fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	
		5	8-10	0.8	19 15 15 17	30	0.0			Gray angular coarse GRAVEL, some fine to medium Gravel, little fine to coarse Sand, loose, wet.	
10	-10									End of boring at 10.0' bss.	
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 12/3/14
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon

Easting: NA
Northing: NA
Water Depth: NA
Borehole Depth: 10.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-181
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.1	7, 9, 10, 13	19	0.0			Gray to brown fine to coarse SAND, some fine to coarse subangular to subround Gravel, loose, wet.	
		2	2-4	1.7	14, 12, 15, 11	27	0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, loose, wet.	
					5					Gray fine to medium SAND, trace fine to medium subangular Gravel, trace Silt, loose, wet.	
5	-5	3	4-6	1.4	9, 11, 14	20	0.0			Gray fine to coarse GRAVEL and fine to coarse SAND, trace Silt, wet.	Borehole allowed to naturally collapse.
		4	6-8	0.9	20, 20, 18, 16	38	0.0			Gray fine to coarse GRAVEL, some fine to coarse Sand, stiff, wet.	
		5	8-10	1.1	21, 20, 18, 19	38	0.0				
10	-10									End of boring at 10.0' bss.	
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/22/15
Drilling Company: ARCADIS
Driller's Name: Doug Richmond
Drilling Method: Direct Push via 140 lbs Hammer
Casing Diameter: 2"
Rig Type: Tripod w. Portable Cathead
Sampling Method: 2"x4' Macro Core Barrel

Easting: 928017.9125
Northing: 951491.0217
Water Depth: NA
Borehole Depth: 8.8' bss
Sediment Surface Elevation: 1101.5' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-182
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-2	0.8	NA	NA	0.4			Gray Silty SAND, some Organics (roots), trace fine to medium Sand, soft, moist.	
									Dark gray-brown fine to medium SAND, trace Organics (shells), faint MGP-like odor, dense, moist.	
									Dark gray fine SAND, little Silt, little Organics (wood), strong MGP-like odor, thick black taffy-like tar, wet.	
5	2	2-6	1.7	NA	NA	10.8			Gray to dark gray Silty SAND, trace Organics, dense, wet.	Borehole backfilled with Bentonite Chips
1095	3	6-8.8	2.4	NA	NA	0.5			Gray fine to coarse SAND, trace Silt, trace irridescent sheen, MGP-like odor, wet.	
									Gray Silty SAND, faint MGP-like odor, soft, wet.	
									Brown fine to coarse SAND, some medium to coarse angular Gravel, wet.	
									Refusal at 8.8' bss.	
10 / 1090										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

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Date Start/Finish: 7/22/15
Drilling Company: ARCADIS
Driller's Name: William Stephens
Drilling Method: Hand Sampling
Sampling Method: 4' Macro Core w. Acetate Liner

Northing: NA
Easting: NA
Water Depth: NA
Borehole Depth: 3.5' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-182A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-3.5	1.5	NA	NA	0.9			Gray-brown fine to coarse SAND, some fine to coarse angular Gravel, dense, wet.	Borehole allowed to naturally collapse.
										Refusal at 3.5' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Samples collected from 0-3.5' bss and anlayzed via method 8270.

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Project Number: B0013137.0000
Data File: SED-182A.dat
Template: G:\Div11\Rockware\Logplot Logs\B0013137
Date: 2/2/2016
Created/Edited by: WDS

Date Start/Finish: 7/6/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Float mounted Tripod w. Portable Cathead
Sampling Method: 3"x2' & 3"x4' Split Spoons

Easting: 927884.1858
Northing: 951463.558
Water Depth: 6.0'
Borehole Depth: 3.2' bss
Sediment Surface Elevation: 1101.9' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-183
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-2	1.0	33, 55, 32, 54	87	0.0			Gray fine to coarse subround GRAVEL, some fine to coarse Sand, wet.	
	2	2-4	1.7	27, 27, 40, 46	67	0.0			Gray fine to coarse subangular GRAVEL and fine to coarse SAND, wet.	
									Gray medium to coarse subround to subangular GRAVEL, little fine to coarse Sand, trace Silt, wet.	
5	3	4-6	1.5	30, 29, 33, 45	62	0.0			Gray fine to coarse angular GRAVEL and fine to coarse SAND, dense, wet.	Borehole allowed to naturally collapse.
1095	4	6-10	2.4	21, 40, 45, 38	85	0.0				
				52, 60, 46, 65	106	0.0				
10									End of boring at 10.0' bss.	
1090										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-3.2' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/1/15
Drilling Company: ARCADIS
Driller's Name: William Stephens
Drilling Method: Hand Sampling
Casing Diameter:
Rig Type: Macro Core w. 30 lbs Slide Hammer
Sampling Method:
4' Macro Core w. Acetate Liner

Northing: 954412.62
Easting: 928227.82
Water Depth: NA
Borehole Depth:
3.0' bss
Sediment Surface Elevation:
1104.5' AMSL
Descriptions By:
William Stephens

Well/Boring ID: **SED-184**
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1105 / 0										
	1	0-4	1.6	NA	NA	0.0			Dark gray medium to coarse SAND, trace Silt, wet.	
									Brownish-gray fine to coarse angular GRAVEL, some to little fine to coarse Sand, wet.	Borehole allowed to naturally collapse.
									Refusal at 3.0' bss.	
1100 / 5										
1095 / 10										
1090 / 15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Samples collected from 0-1 and 1-3' bss (anlayzed via method 8270).

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Date Start/Finish: 6/10/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon & 3" x 4' SS

Easting: 927884.8187
Northing: 955707.3921
Water Depth: 1.9'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.8' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-185
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.3	6, 10, 9, 10	19	0.0			Dark gray fine to coarse angular GRAVEL, some fine to coarse Sand, trace sheen, wet.	
	2	2-4	1.3	10, 15, 42, 35	57	0.0			Dark gray fine to coarse angular GRAVEL, some fine to coarse Sand, no sheen, wet.	
5 / 1100	3	4-6	1.3	25, 24, 16, 22	40	0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL, faint MGP-like odor, wet. Gray fine to coarse SAND, little fine to coarse angular Gravel, dense, wet. Gray fine to coarse SAND, little fine to coarse angular Gravel, dense, wet.	Borehole allowed to naturally collapse.
	4	6-10	1.7	22, 18, 15, 25, 12, 13, 18, 15	33, 31	0.0, 0.0			Gray fine to coarse SAND and fine to coarse angular GRAVEL, gray Silt lense at 8.2' (<0.1' thick), wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 6/10/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' SS & 3" x 4' SS

Easting: 927808.7131
Northing: 955580.9379
Water Depth: 1.5'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.3' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-186
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
1105	1	0-2	1.0	6 10 12 14	22	0.0			Dark gray fine to coarse angular GRAVEL, some fine to coarse Sand, trace sheen, wet.	
	2	2-4	1.3	7 10 12 14	22	0.0			Dark gray fine to coarse angular GRAVEL, some fine to coarse Sand, wet.	
5	3	4-6	1.6	12 9 12 20	21	0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL wet. Gray fine to coarse SAND, little fine to coarse angular Gravel, dense, wet. Gray fine to coarse SAND, little fine to coarse angular Gravel, dense, wet.	Borehole allowed to naturally collapse.
1100	4	6-10	2.3	12 14 20 20 23 18 22 20	34 40	0.0 0.0			Gray fine to coarse SAND and fine to coarse angular GRAVEL, gray Silt lense at 8.2' (<0.1' thick), wet.	
10									End of boring at 10.0' bss.	
1095										
15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 6/10/15 & 6/26/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' SS & 3" x 4' SS

Easting: 927823.7777
Northing: 955524.3707
Water Depth: 1.7'
Borehole Depth: 14' bss
Sediment Surface Elevation: 1105.5' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-187
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.7	7, 5, 12, 25	17	1.2			Black fine to coarse angular GRAVEL, some fine to coarse Sand, trace Silt, MGP-like odor, trace irridescent sheens, trace brown NAPL blebs (1 mm diameter), loose, wet.	
	2	2-4	1.0	17, 24, 25, 24	49	0.1			Dark gray to black fine to coarse subangular GRAVEL, some to little fine to coarse Sand, trace Organics (muscle shells), trace Fill (glass), faint MGP-like odor, wet.	
5 / 1100	3	4-6	1.3	13, 14, 26, 28	40	0.3			Black fine to coarse SAND, some fine to coarse angular Gravel, black staining, MGP-like odor, wet.	
	4	6-10	2.1	25, 17, 23, 24	40	0.2				Borehole allowed to naturally collapse.
				23, 14, 18, 24	32	0.3			Due to observed olfactory impacts, ARCADIS returned to location on 6-26-15, blind drilled to 10' bss, and sampled 10-14' bss.	
10 / 1095	5	10-12	1.5	19, 12, 14, 9	26	0.5			Dark gray fine SAND, some fine angular Gravel, trace Silt, dense, MGP-like odor, wet.	
	6	12-14	1.6	18, 18, 17, 25	35	0.0			Gray to black coarse angular GRAVEL, little fine to coarse Sand, no odor, wet.	
									Dark gray fine to medium subangular GRAVEL, little fine to coarse Sand, little to trace coarse angular Gravel, no odor, wet.	
15 / 1090									End of boring at 14.0' bss.	

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 4-6' bss. Archive sample collected from 6-8', 10-12', and 12-14' bss.

Samples analyzed using Modified 8270 PAH.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 6/22/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' SS & 3" x 4' SS

Easting: 927841.9323
Northing: 955458.5399
Water Depth: 2.0'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.6' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-188
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.0	13, 11, 10, 11	21	30.1			Gray COBBLE Brown WOOD Black fine to medium SAND(stained), thick taffy-like tar present, coal tar-like odor, irridescent sheens, wet.	
	2	2-4	1.1	30, 18, 21, 17	39	0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL, dense, wet. Gray fine to coarse angular GRAVEL, some fine to coarse Sand, faint MGP-like odor (0-3.1' bss), wet.	
5 / 1100	3	4-6	1.4	15, 16, 12, 19	28	0.0				Borehole allowed to naturally collapse.
	4	6-10	2.8	12, 22, 24, 25	46	0.0			Dark gray to gray fine to coarse SAND and fine to coarse subangular GRAVEL, wet.	
				19, 12, 22, 17	34	0.0				
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 6/10/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' SS & 3" x 4' SS

Easting: 927869.3159
Northing: 955527.9247
Water Depth: 1.8'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.9' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-189
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.0	13, 10, 9, 8	19	0.0			Brown fine to coarse SAND and fine to coarse subangular GRAVEL, wet.	
	2	2-4	1.3	7, 8, 9, 10	17	0.0			Gray COBBLE in shoe of split spoon.	
5 / 1100	3	4-6	0.2	12, 13, 10, 18	23	0.0			No Recovery.	Borehole allowed to naturally collapse.
	4	6-10	2.6	9, 17, 14, 15, 39, 24, 28, 29	31, 57	0.0, 0.0			Gray coarse SAND, trace fine angular Gravel, wet. Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, dense, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 6/22/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' SS & 3" x 4' SS

Easting: 927881.2336
Northing: 955476.6369
Water Depth: 1.8'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.8' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-190
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.5	12, 7, 11, 9	18	0.0			Gray fine to medium subangular GRAVEL, some fine to coarse Sand, dense, wet.	
	2	2-4	1.7	17, 22, 12, 25	34	0.0			No Recovery first attempt 0-2' bss. Gray to brown fine to coarse subangular GRAVEL, some fine to coarse Sand, trace Silt, wet.	
5 / 1100	3	4-6	1.3	18, 13, 16, 16	29	0.0				Borehole allowed to naturally collapse.
	4	6-10	2.8	12, 20, 24, 24	44	0.0			Gray fine subangular GRAVEL and medium to coarse SAND, wet.	
				20, 23, 18, 20	41	0.0			Gray fine to coarse subangular to angular GRAVEL, some fine to coarse SAND, densely packed, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/24/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2"x2' Macro Core Barrel w. Acetate Liner

Northing: NA
Easting: NA
Water Depth: 1.0'
Borehole Depth: 2.0' bss
Sediment Surface Elevation: NA
Descriptions By: Marcus Hagan

Well/Boring ID: SED-190A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.7	NA	NA	0.0			Gray- brown medium to coarse GRAVEL, little fine to medium Sand, trace Silt, loose, wet.	Borehole allowed to naturally collapse.
										End of boring at 2.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Analytical samples collected from 0-2' bss (Method 8270).

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 6/22/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon & 3" x 4' SS

Northing: 955375.9707
Easting: 927849.4238
Water Depth: 1.8'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1105.8' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-192
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.1	7, 9, 12, 12	21	1.5			Gray fine to coarse SAND, some to little fine to coaurse subangular Gravel, MGP-like odor, wet.	
	2	2-4	1.5	12, 15, 20, 16	35	0.0			Gray fine to coarse subangular GRAVEL, little fine to coarse Sand, faint MGP-like odor (2.6-3.5'), wet.	
5 / 1100	3	4-6	1.2	24, 21, 20, 14	41	0.0				Borehole allowed to naturally collapse.
	4	6-10	2.5	22, 23, 12, 24	35	0.0				
				21, 25, 22, 22	47	0.0				
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 2-4' bss. Archive sample collected from 4-6', 6-8', and 8-10' bss.

Samples analyzed using Modified 8270 PAH.

Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2"x2' Macro Core Barrel w. Acetate Liner

Northing: 955375.97
Easting: 927849.42
Water Depth: 1.6'
Borehole Depth: 2.0' bss
Sediment Surface Elevation: 1105.8' AMSL
Descriptions By: Marcus Hagan

Well/Boring ID: SED-192R
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.8	NA	NA	0.0			Gray angular to subangular GRAVEL, some medium to coarse Sand, dense, wet.	Borehole allowed to naturally collapse.
									End of boring at 2.0' bss.	
5 / 1100										
10 / 1095										
15 / 1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Resampled at sediment boring SED-192. Analytical samples collected from 0-2' bss (Method 8270).
DUP-06-072315 collected.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 6/22/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 3" x 2' Split Spoon & 3" x 4' SS

Northing: 955369.2778
Easting: 927824.3284
Water Depth: 0.7'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1106.6' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-193
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
1105	1	0-2	1.3	10 7 8 7	15	1.5			Black fine to medium SAND, trace Organics(wood), MGP-like odor, black staining, wet. Light gray fine SAND, some coarse angular Gravel, dense, wet. Gray fine to coarse SAND and fine to coarse subangular GRAVEL, faint MGP-like odor, wet.	
	2	2-4	1.1	16 19 25 34	44	0.0				
5	3	4-6	1.1	16 12 11 18	23	0.0				Borehole allowed to naturally collapse.
1100	4	6-10	2.3	16 14 12 18	26	0.0			Gray brown fine to coarse angular GRAVEL, some fine to coarse Sand, dense, wet.	
				24 21 36 27	57	0.0				
10									End of boring at 10.0' bss.	
1095										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2"x2' Macro Core Barrel w. Acetate Liner

Northing: 955369.28
Easting: 927824.33
Water Depth: 1.2'
Borehole Depth: 2.0 'bss
Sediment Surface Elevation: 1106.6' AMSL
Descriptions By: Marcus Hagan

Well/Boring ID: SED-193R
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.4	NA	NA	0.0			Dark gray SILT, som fine Sand, trace medium to coarse Gravel, trace Organics, loose, organic-like odor, wet.	Borehole allowed to naturally collapse.
									End of boring at 2.0' bss.	
5 / 1100										
10 / 1095										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Resampled at sediment boring SED-193. Analytical samples collected from 0-2' bss (Method 8270).

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 6/24/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 955264.6821
Easting: 927871.436
Water Depth: 1.5'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1106.6' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-194
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
1105	1	0-2	0.7	7, 7, 12, 14	19	1.2			Grayish-brown fine to coarse subangular GRAVEL, little medium to coarse Sand, medium density, wet.	
	2	2-4	1.0	20, 18, 15, 24	33	0.1			Grayish-brown fine to coarse subangular GRAVEL, some medium to coarse Sand, medium density, wet.	
5	3	4-6	1.3	20, 21, 19, 24	40	0.3			Grayish-brown fine to coarse SAND AND fine to coarse subangular GRAVEL, medium density, wet. Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, medium density, wet.	Borehole allowed to naturally collapse.
1100	4	6-10	2.1	17, 21, 25, 23, 22, 31, 38, 40	46, 69	0.2, 0.3			Gray- brown medium to cvoarse SAND, little to some fine to coarse angular Gravel, dense, wet.	
10									End of boring 10.0' bss	
1095										
15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 6/24/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 955259.9208
Easting: 927950.4834
Water Depth: 1.5'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1106.8' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-195
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0											
	1105	1	0-2	1.2	7, 7, 12, 14	19	0.0			Grayish-brown fine to coarse subangular GRAVEL, little medium to coarse Sand, moderately dense, wet.	
		2	2-4	1.5	20, 18, 15, 24	33	0.0			Grayish-brown fine to coarse subangular GRAVEL, some medium to coarse Sand, moderately dense, wet.	
5		3	4-6	1.1	20, 21, 19, 24	40	0.0			Grayish-brown fine to coarse SAND and fine to coarse subangular GRAVEL, moderately dense, wet. / Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, moderately dense, wet.	Borehole allowed to naturally collapse.
	1100	4	6-10	2.0	17, 21, 25, 23, 22, 31, 38, 40	46, 69	0.0, 0.0			Gray brown medium to coarse SAND, some to little fine to coarse angular Gravel, dense, wet.	
10										End of boring at 10.0' bss.	
	1095										
15											

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 2-4' bss. Archive sample collected from 4-6' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2"x2' Macro Core Barrel w. Acetate Liner

Northing: 955259.92
Easting: 927950.48
Water Depth: 1.4'
Borehole Depth: 2.0' bss
Sediment Surface Elevation: 1106.8' AMSL
Descriptions By: Marcus Hagan

Well/Boring ID: SED-195R
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.7	NA	NA	0.0			Dark gray SILT, some fine to medium SAND, trace medium to coarse Gravel, trace Organics, loose, no odor, wet. Gray medium to coarse SAND and medium subangular GRAVEL, dense, no odor, wet. End of boring at 2.0' bss.	Borehole allowed to naturally collapse.
5 / 1100										
10 / 1095										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Resample of boring location SED-195. Analytical samples collected from 0-2' bss (Method 8270).

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 6/24/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 955104.9217
Easting: 927914.7123
Water Depth: 1.5'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1105.8' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-196
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.0	6, 5, 6, 7	11	0.0			Gray fine to coarse subangular GRAVEL and fine to coarse SAND, loose, wet.	
	2	2-4	1.1	11, 12, 14, 15	26	0.0			Gray-brown fine to coarse subangular GRAVEL and fine to coarse SAND, trace Silt, loose, wet.	
									Gray-brown fine to coarse SAND, little fine angular Gravel, trace Silt, dense, wet.	
									Black lense of fine to coarse SAND, no odor, dense, wet.	
5 / 1100	3	4-6	1.1	10, 12, 14, 9	26	0.0			Brown fine to coarse subangular GRAVEL and fine to coarse SAND, moderately dense, wet.	Borehole allowed to naturally collapse.
	4	6-10	2.2	6, 9, 12, 14, 12	21	0.0				
				16, 18, 20	34	0.0				
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 6/24/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 955159.384
Easting: 927909.0027
Water Depth: 1.3'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1105.9' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-197
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.3	7, 10, 22, 31	32	0.0			Gray fine to coarse SAND, some to little fine to coarse subround Gravel, gray Cobble at 1.3', loose, wet.	
	2	2-4	1.0	12, 19, 13, 16	32	0.0			Gray-brown fine to coarse SAND, some fine to medium subround Gravel, trace coarse angular Gravel, wet.	
5 / 1100	3	4-6	1.1	15, 17, 9, 8	28	0.0				Borehole allowed to naturally collapse.
	4	6-10	2.4	12, 11, 12, 12, 14, 12, 11, 10	23, 23	0.0, 0.0			Gray-brown fine to coarse subangular to subround GRAVEL and fine to coarse SAND, moderately dense, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
DUP-04-062415 collected from 0-2'
Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 6/24/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 955134.3117
Easting: 927935.5334
Water Depth: 1.6'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1105.7' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-198
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.2	12, 10, 12, 9	22	0.0			Gray-brown fine to coarse subangular GRAVEL, little medium to coarse Sand, loose, wet.	
	2	2-4	1.3	7, 10, 11, 10	21	0.0			Gray-brown fine to coarse subangular GRAVEL, some fine to coarse Sand, moderately dense, wet.	
									Gray-brown fine to medium SAND, some subangular fine to medium Gravel, trace Silt, dense, wet.	
5 / 1100	3	4-6	1.4	10, 15, 10, 8	35	0.0			Gray-brown fine to coarse subangular GRAVEL, some fine to coarse Sand, moderately dense, wet.	Borehole allowed to naturally collapse.
	4	6-10	2.1	5, 6, 6, 7	12	0.0				
				7, 12, 14, 14	26	0.0				
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 6/24/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 954944.271
Easting: 928023.0868
Water Depth: 1.2'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1105.09' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-199
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1105	1	0-2	0.8	10 10 18 17	28	0.0			Brown fine to coarse subangular GRAVEL, some medium to coarse Sand, loose, wet.	
		2	2-4	0.8	12 17 10 9	27	0.0			Gray COBBLE in shoe. No Recovery.	
5	1100	3	4-6	NR	12 15 15 14	30	0.0				Borehole allowed to naturally collapse.
		4	6-10	2.2	6 6 11 12 14	27	0.0			Gray-brown fine to coarse angular GRAVEL, some fine to coarse Sand, trace Silt, dense, wet.	
					9 15 20	24	0.0				
10	1095									End of boring at 10.0' bss.	
15	1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
MS/MSD collected 0-2'
Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2"x2' Macro Core Barrel w. Acetate Liner

Northing: NA
Easting: NA
Water Depth: 1.7'
Borehole Depth: 2.0' bss
Sediment Surface Elevation: NA
Descriptions By: Marcus Hagan

Well/Boring ID: SED-199A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.8	NA	NA	0.0			Gray fine to medium SAND and medium to coarse subangular GRAVEL, trace Silt, dense, no odor, wet.	Borehole allowed to naturally collapse.
										End of boring at 2.0' bss.	
5	-5										
10	-10										
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Analytical samples collected from 0-2' bss (Method 8270).

Date Start/Finish: 6/24/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 954903.528
Easting: 928011.4984
Water Depth: 1.7'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1105.6' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-200
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.8	10, 10, 18, 17	28	0.0			Brown fine to coarse subangular GRAVEL, some medium to coarse Sand, loose, wet.	
	2	2-4	0.8	12, 17, 10, 9	27	0.0			Gray COBBLE in shoe. No Recovery.	
5 / 1100	3	4-6	NR	12, 15, 15, 14	30	0.0				Borehole allowed to naturally collapse.
	4	6-10	2.2	6, 6, 11, 12, 14	27	0.0			Gray-brown fine to coarse angular GRAVEL, some fine to coarse Sand, trace Silt, dense, wet.	
				9, 15, 20	24	0.0				
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 6/25/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boada
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 954892.7839
Easting: 928051.4475
Water Depth: 1.2'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1105.9' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-201
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.8	10 12 9 12	21	0.0			Gray coarse angular GRAVEL, some fine to coarse Sand, trace Slag and Cinders, wet.	
		2	2-4	1.4	12 20 22 20	42	0.0			Gray-brown fine to coarse angular GRAVEL, some fine to coarse Sand, wet.	
5	-5	3	4-6	0.8	10 11 12 13	23	0.0				Borehole allowed to naturally collapse.
		4	6-10	2.0	10 13 8 8 10 12 18 24	21 30	0.0 0.0			Gray-brown fine to coarse subangular GRAVEL, some fine to coarse Sand, dense, wet.	
10	-10									End of boring at 10.0' bss.	
15	-15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2"x2' Macro Core Barrel w. Acetate Liner

Northing: NA
Easting: NA
Water Depth: 1.6'
Borehole Depth: 2.0'
Sediment Surface Elevation: NA
Descriptions By: Marcus Hagan

Well/Boring ID: SED-201A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.0	NA	NA	0.0			Gray fine to medium SAND and fine to coarse subangular GRAVEL, dense, no odor, wet.	Borehole allowed to naturally collapse.
										End of boring at 2.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Analytical samples collected from 0-2' bss (Method 8270).

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Date Start/Finish: 6/25/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 954825.3996
Easting: 928065.8472
Water Depth: 1.6'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1105.5' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-202
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	0.8	10, 12, 9, 12	21	0.0			Gray coarse angular GRAVEL, some fine to coarse Sand, trace Slag and Cinders, wet.	
	2	2-4	1.4	12, 20, 22, 20	42	0.0			Gray-brown fine to coarse angular GRAVEL, some fine to coarse Sand, wet.	
5 / 1100	3	4-6	0.8	10, 11, 12, 13	23	0.0				Borehole allowed to naturally collapse.
	4	6-10	2.0	10, 13, 8, 8, 10, 12, 18, 24	21, 30	0.0, 0.0			Gray-brown fine to coarse subangular GRAVEL, some fine to coarse Sand, dense, wet.	
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
MS/MSD collecte 0-2'
Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 6/25/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 954799.0755
Easting: 928089.102
Water Depth: 1.6'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1105.2' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-203
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1105	1	0-2	1.0	8 9 12 15	21	0.0			Gray-brown coarse angular GRAVEL, some fine to coarse Sand, loose, wet.	
		2	2-4	0.8	8 8 14 15	22	0.0			Gray-brown fine to coarse angular GRAVEL and fine to coarse SAND, wet.	
5	1100	3	4-6	0.9	20 14 11 12	25	0.0			Dark gray fine to coarse SAND, some fine to medium angular Gravel, loose, wet.	Borehole allowed to naturally collapse.
		4	6-10	2.0	12 11 12 14 18 15 8 8	23 23	0.0 0.0			Dark gray fine to coarse SAND and fine to coarse subround GRAVEL, loose, wet.	
10	1095									End of boring at 10.0' bss.	
15	1090										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.
MS/MSD collecte 0-2'
Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 6/25/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 954765.43
Easting: 928095.1702
Water Depth: 1.5'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1105.3' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-204
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1105	1	0-2	1.1	12 12 13 14	18	0.0			Brown fine to coarse SAND, some fine to coarse subround Gravel, loose, wet.	
										Brown fine coarse SAND and fine to coarse subround GRAVEL, loose, wet	
		2	2-4	1.1	7 6 8 8	19	0.0				
5	1100	3	4-6	1.1	6 8 5 5	27	0.0				Borehole allowed to naturally collapse.
		4	6-10	1.8	5 6 8 12 14 16 8 6	30 33	0.0 0.0			Gray fine to coarse angular to subangular GRAVEL, some fine to coarse Sand, wet.	
10	1095									End of boring at 10.0' bss.	
15	1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 6/25/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 954634.8376
Easting: 928158.8199
Water Depth: 1.7'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1104.9' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-205
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1105										
		1	0-2	0.9	8 10 10 12	20	0.0			Gray-brown fine to coarse SAND, some fine to coarse angular Gravel, wet. Gray COBBLE. Gray-brown fine to coarse SAND, some fine to coarse angular Gravel, wet.	
		2	2-4	0.6	14 14 13 15	27	0.0			Gray COBBLE. No Recovery.	
5	1100	3	4-6	1.4	18 17 15 14	32	NA			Gray-brown fine to medium SAND, some medium to coarse angular Gravel, trace Silt, dense, wet. Reddish-brown fine to coarse angular GRAVEL, some fine to coarse Sand, dense, wet.	Borehole allowed to naturally collapse.
		4	6-10	1.5	10 11 10 14 14 15 18 17	21 33	0.0 0.0				
10	1095									End of boring at 10.0' bss.	
15	1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 6/25/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 954634.8376
Easting: 928158.8199
Water Depth: 1.3'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1105' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-206
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1105	1	0-2	0.9	8 10 10 12	20	0.0			Gray medium to coarse SAND, little fine to medium angular Gravel, trace Organics (shells), loose, wet. Brownish-red COBBLE, wet.	
		2	2-4	0.6	14 14 13 15	27	0.0			Gray medium to coarse SAND, little fine to medium angular Gravel, traace Organics (shells), loose, wet. Gray coarse angular GRAVEL, some fine to coarse Sand, little angular fine to medium Gravel, loose, wet.	
5	1100	3	4-6	1.4	18 17 15 14	32	NA			No Recovery.	Borehole allowed to naturally collapse.
		4	6-10	1.5	10 11 10 14 14 15 18 17	21 33	0.0 0.0			Gray to reddish-brown fine to coarse angular GRAVEL, some fine to coarse Sand, dense, wet.	
10	1095									End of boring at 10.0' bss.	
15	1090										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/23/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2"x2' Macro Core Barrel w. Acetate Line

Northing: NA
Easting: NA
Water Depth: 1.6'
Borehole Depth: 2.0'
Sediment Surface Elevation: NA
Descriptions By: Marcus Hagan

Well/Boring ID: SED-206A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.0	NA	NA	0.0			Gray medium to coarse SAND and medium to coarse subangular to angular GRAVEL, dense, wet.	Borehole allowed to naturally collapse.
										End of boring at 2.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Resample of boring location SED-206. Analytical samples collected from 0-2' bss (Method 8270).

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Date Start/Finish: 6/25/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Sean Boda
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: ATV mounted CME 55
Sampling Method: 2'x3" & 4'x3" Split Spoons

Northing: 954671.6254
Easting: 928151.046
Water Depth: 1.1'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1105.3' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-207
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1105	1	0-2	1.6	8, 16, 12, 12	28	0.0			Multicolored fine subround GRAVEL, some medium to coarse Sand, trace Wood, loose, wet.	
									Gray fine to coarse subangular GRAVEL, some fine to coarse Sand, wet.	
	2	2-4	1.3	12, 16, 18, 15	34	0.0			Gray medium to coarse angular GRAVEL, little fine to coarse Sand, wet.	
5 / 1100	3	4-6	1.4	18, 23, 14, 13	37	0.0			Reddish-brown fine to coarse angular GRAVEL, little fine to coarse Sand, trace Silt, wet.	Borehole allowed to naturally collapse.
	4	6-10	1.9	12, 15, 16, 18	31	0.0				
				10, 12, 18, 16	30	0.0				
10 / 1095									End of boring at 10.0' bss.	
15 / 1090										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

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Date Start/Finish: 6/30/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Layne Pech
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Float mounted Tripod
Sampling Method: 3"x2' Split Spoons

Northing: 951815.5022
Easting: 928012.4447
Water Depth: 4.0'
Borehole Depth: 5.1' bss
Sediment Surface Elevation: 1102.2' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-208
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1105 / 0										
	1	0-2	1.6	36 25 35 40	60	0.3			Gray fine to coarse SAND, some fine to medium subangular Gravel, wet. Black fine to medium SAND, trace fine subangular Gravel, trace irridescent sheens, black staining, MGP-like odor, trace Organics (wood), wet. Gray fine to coarse SAND, little fine to coarse subangular Gravel, no visable impacts, wet.	
1100	2	2-4	1.1	15 48 46 51	94	0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL, trace Silt, wet.	Borehole allowed to naturally collapse.
5	3	4-5.1	0.7	122 140 100/.1	NA	0.0			Gray fine to medium SAND, some medium to coarse angular Gravel, dense, wet. Refusal at 5.1' bss.	
1095										
10										
1090										
15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 2-4' bss. Archive sample collected from 4-5.1' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/22/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2"x4' Macro Core Barrel w. Acetate Line

Northing: NA
Easting: NA
Water Depth: 2.5'
Borehole Depth: 2.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-208A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.6	NA	NA	0.0			Dark gray fine to medium SAND, some fine to medium angular Gravel, wet.	Borehole allowed to naturally collapse.
										End of boring at 2.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Boring location 15' east of SED-208.
Analytical samples collected from 0-2' bss (Method 8270).

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 7/22/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2"x4' Macro Core Barrel w. Acetate Liner

Northing: NA
Easting: NA
Water Depth: 3.0'
Borehole Depth: 2.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-208B
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	0.6	NA	NA	0.0			Dark gray fine to medium SAND, some fine to medium angular Gravel, wet.	Borehole allowed to naturally collapse.
										End of boring at 2.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Boring location 15' north of SED-208.
Analytical samples collected from 0-2' bss (Method 8270).

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 6/30/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Layne Pech
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Float mounted Tripod
Sampling Method: 3"x2' Split Spoons

Northing: 951786.7114
Easting: 928000.4466
Water Depth: 2.2'
Borehole Depth: 10' bss
Sediment Surface Elevation: 1101.9' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-209
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
1100	1	0-2	1.4	15 18 19 26	37	0.0			Gray fine to coarse SAND and fine to coarse angular GRAVEL, trace Silt, dense, wet.	
	2	2-4	1.1	15 21 28 42	49	0.0				
5	3	4-6	1.0	120 41 22 26	63	0.0			Gray to brown fine to coarse SAND, some medium to coarse angular Gravel, trace Silt, very dense, wet.	Borehole allowed to naturally collapse.
1095	4	6-10	2.9	67 55 73 30	128	0.0			Dark gray fine to coarse SAND, little fine to medium subangular Gravel, wet.	
				124 93 70 112	163	0.0			Gray brown fine to coarse GRAVEL, wet.	
10									End of boring at 10.0' bss.	
1090										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 2-4' bss. Archive sample collected from 4-5.1' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 6/30/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Layne Pech
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Float mounted Tripod
Sampling Method: 3"x2' & 3"x4' Split Spoons

Northing: 951762.9624
Easting: 927975.51
Water Depth: 3.0'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1099.8' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-210
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.0	12, 21, 18, 27	39	0.0			Gray medium to coarse subround GRAVEL, wet. Gray fine to coarse SAND and fine to coarse subangular GRAVEL, wet.	
		2	2-4	1.2	17, 24, 36, 20	60	0.0				
5	-5	3	4-6	1.0	27, 120, 37, 46	157	0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL, very dense, wet.	Borehole allowed to naturally collapse.
		4	6-10	1.0	7, 3, 6, 18, 21, 28, 34, 38	9, 62	0.0, 0.0			Gray fine to coarse SAND and fine to coarse subangular GRAVEL, wet.	
10	-10									End of boring at 10.0' bss.	
15	-15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 6/30/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Layne Pech
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Float mounted Tripod
Sampling Method: 3"x2' & 3"x4' Split Spoons

Northing: 951699.0099
Easting: 927939.4994
Water Depth: 3.7'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1099.9' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-211
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1100	1	0-2	1.0	6 37 24 18	61	0.0			Gray fine to coarse subround GRAVEL, some fine to coarse Sand, wet.	
		2	2-4	1.6	24 28 21 15	49	0.0			Gray fine to coarse subangular GRAVEL, little fine to coarse Sand, dense, wet.	
5	1095	3	4-6	1.1	76 48 85 116	133	0.0			Gray fine to coarse subround to subangular GRAVEL, some Sand, thin Clay lens at 5.0' bss, trace Silt, wet.	Borehole allowed to naturally collapse.
		4	6-10	1.8	16 29 52 78 46 37 37 46	81 74	0.0 0.0			Gray coarse to medium angular GRAVEL, little medium to coarse Sand, wet.	
10	1090									End of boring at 10.0' bss.	
15	1085										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/6/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Float mounted Tripod
Sampling Method: 3"x2' & 3"x4' Split Spoons

Northing: 951655.0175
Easting: 927924.9396
Water Depth: 2.5'
Borehole Depth: 10.0' bss
Sediment Surface Elevation: 1100.8' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-212
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-2	1.0	33 55 32 54	87	0.0			Gray fine to coarse subround GRAVEL, some fine to coarse Sand, wet.	
		2	2-4	1.7	27 27 40 46	67	0.0			Gray fine to coarse subangular GRAVEL and fine to coarse SAND, wet. Gray medium to coarse subround to subangular GRAVEL, little fine to coarse Sand, trace Silt, wet.	
5	-5	3	4-6	1.5	30 29 33 45	62	0.0			Gray fine to coarse angular GRAVEL and fine to coarse SAND, dense, wet.	Borehole allowed to naturally collapse.
		4	6-10	2.4	21 40 45 38 52 60 46 65	85 106	0.0 0.0				
10	-10									End of boring at 10.0' bss.	
15	-15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/22/15
Drilling Company: ARCADIS
Driller's Name: William Stephens & Doug Richmond
Drilling Method: Hand Sampling
Sampling Method: 2"x4' Macro Core Barrel w. Acetate Liner

Northing: 951655.02
Easting: 927924.94
Water Depth: 1.5'
Borehole Depth: 2.0' bss
Sediment Surface Elevation: 1100.8' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-212R
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1100	1	0-2	0.9	NA	NA	0.0			Gray medium to coarse subangular GRAVEL, wet. Gray fine to medium subround GRAVEL, little fine to coarse Sand, loose, wet.	Borehole allowed to naturally collapse.
									End of boring at 2.0' bss.	
5 / 1095										
10 / 1090										
15 / 1085										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Analytical samples collected from 0-2' bss (Method 8270).
Resampled boring location SED-212.

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Date Start/Finish: 7/6/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Float mounted Tripod
Sampling Method: 3"x2' & 3"x4' Split Spoons

Northing: 951569.1505
Easting: 927845.3247
Water Depth: 5.9'
Borehole Depth: 8.0' bss
Sediment Surface Elevation: 1102.2' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-213
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1105										
0	1	0-2	1.0	33 55 32 54	87	0.0			Gray fine to coarse subround GRAVEL, some fine to coarse Sand, wet.	
1100	2	2-4	1.7	27 27 40 46	67	0.0			Gray fine to coarse subangular GRAVEL and fine to coarse SAND, wet. Gray medium to coarse subround to subangular GRAVEL, little fine to coarse Sand, trace Silt, wet.	
5	3	4-6	1.5	30 29 33 45	62	0.0			Gray fine to coarse angular GRAVEL and fine to coarse SAND, dense, wet.	Borehole allowed to naturally collapse.
1095	4	6-10	2.4	21 40 45 38 52 60 46 65	85 106	0.0 0.0				
10									End of boring at 10.0' bss.	
1090										
15										

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Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

Date Start/Finish: 7/22/15
Drilling Company: ARCADIS
Driller's Name: Doug Richmond
Drilling Method: Tripod with 140 lbs. Hammer
Casing Diameter: 2"
Rig Type: Tripod mounted Acker
Sampling Method: 2"x4' Macro Core Barrel w. Acetate Liner

Northing: 951505.9937
Easting: 927980.4987
Water Depth: NA
Borehole Depth: 8.8' bss
Sediment Surface Elevation: 1103' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-214
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1105 / 0										
	1	0-2	0.8	NA	NA	0.4			Gray Silty SAND, some Organics (roots), trace fine to medium Sand, soft, moist.	
									Dark gray-brown fine to medium SAND, trace Organics (shells), faint MGP-like odor, dense, moist.	
1100									Dark gray fine SAND, little Silt, little Organics (wood), strong MGP-like odor, thick black taffy-like tar, wet.	
	2	2-6	1.7	NA	NA	0.8			Gray to dark gray Silty SAND, trace Organics, dense, wet.	Borehole backfilled with Bentonite Chips
5										
	3	6-8.8	2.4	NA	NA	0.5			Gray fine to coarse SAND, trace Silt, trace irridescent sheen, MGP-like odor, wet.	
									Gray Silty SAND, faint MGP-like odor, soft, wet.	
1095									Brown fine to coarse SAND, some medium to coarse angular Gravel, wet.	
									Refusal at 8.8' bss.	
10										
1090										
15										

ARCADIS Design & Consultancy for natural and built assets

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Analytical samples collected from 8- 8.8' bss (analyzed via method 8270).

Date Start/Finish: 7/22/15
Drilling Company: ARCADIS
Driller's Name: William Stephens
Drilling Method: Hand Sampling
Sampling Method: 2"x4' Macro Core Barrel w. Acetate Liner

Northing: NA
Easting: NA
Water Depth: 1.1'
Borehole Depth: 3.0' bss
Sediment Surface Elevation: NA
Descriptions By: William Stephens

Well/Boring ID: SED-214A
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0	1	0-3	1.6	NA	NA	0.0			Dark gray medium to coarse SAND, trace Silt, wet.	
										Brownish-gray fine to coarse angular GRAVEL, some to little fine to coarse Sand, wet.	Borehole allowed to naturally collapse.
										Refusal at 3.0' bss.	
5	-5										
10	-10										
15	-15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon
Analytical samples collected from 0-1' and 1-3' bss (Method 8270).

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Date Start/Finish: 7/6/15
Drilling Company: Parratt-Wolff , Inc.
Driller's Name: Joel Rauscher
Drilling Method: Drive and Wash
Casing Diameter: 4"
Rig Type: Float mounted Tripod
Sampling Method: 3"x2' & 3"x4' Split Spoons

Northing: 951418.3524
Easting: 927996.5794
Water Depth: 5.5'
Borehole Depth: 6.7' bss
Sediment Surface Elevation: 1102.2' AMSL
Descriptions By: William Stephens

Well/Boring ID: SED-215
Client: NYSEG
Location: Cortland-Homer Former MGP
Tioughnioga River

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value *	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
1105										
0	1	0-2	0.8	21, 31, 34, 36	65	0.0			Gray medium to coarse subround to subangular GRAVEL, little fine to coarse Sand, wet.	
1100	2	2-4	0.7	50, 50, 55, 73	105	0.0				Borehole allowed to naturally collapse.
5	3	4-6	0.8	50, 60, 42, 54	102	0.0				
	4	6-6.7	0.4	60, 100/.2		0.0			Gray fine to coarse subangular GRAVEL, little fine to coarse Sand, wet.	
1095									Refusal at 6.7' bss.	
10										
1090										
15										

Remarks: bss = below sediment surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS=Split Spoon

Analytical sample collected from 0-2' bss. Archive sample collected from 2-4' bss.

Samples analyzed using Modified 8270 PAH.

*Samples collected using a 3-inch split spoon and a 300-lbs hammer.

ARCADIS Design & Consultancy for natural and built assets

Project Number: B0013137.0000
Data File: SED-215.dat
Template: G:\Div11\Rockware\Logplot Logs\B0013137
Date: 2/3/2016
Created/Edited by: WDS

ATTACHMENT 3

Supplemental Remedial Investigation

Table 5-19
River Boring Summary
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
Homer, New York

BORING I.D.	LOCATION*	OBSERVATION
RB-1	center of stream. 30 feet away from transect 5A	
0'-2'		top 4" black granular tar with some odor. Grade to gravel.
2'-4'		wet brown sand and gravel
RB-2	near west bank. Approximately 20' from transect 7A	
0'-2'		top 3" black solid coal tar. Grade to gravel and sand.
2'-4'		wet brown sand and gravel
RB-3	downstream. Approximatel 18' from transect 8A	
0'-2'		top 3" black solid coal tar. Grade to gravel and sand.
2'-4'		NA
RB-4	60' downstream of RB-3, 10 feet from west bank.	
0'-2'		wet brown sand and gravel
2'-4'		wet brown sand and gravel
RB-5	20 feet from west bank. Behind MW-18	
0'-2'		wet brown sand and gravel
2'-4'		NA
RB-6	30 feet from west bank. Near transect 16 A	
0'-2'		wet brown sand and gravel
2'-4'		NA
RB-7	near east bank. 15 feet downstream of transect 16C	
0'-2'		wet brown sand and gravel
2'-4'		NA

Table 5-19 continued
River Boring Summary
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
Homer, New York

PHASE 2 SEDIMENT BORINGS ORING I.D. DEPTH	BLOW COUNT	RECOV	PID	LOCATION/LABORATORY SAMLPES	OBSERVATIONS
SED-10				14' from east bank, 300 ' north of bridge	wet fine to coarse SAND & GRAVEL, trace silt/clay & cobbles
0 - 2'	35,28,25,48	8"	48	sample # 10A	
2 - 4'	99,41,34,37	8"			
4 - 6'	52,54,50,71	16"	33	sample # 10B	
6 - 8'	24,34,57,54	12"	36	sample # 10C	
SED-11				center stream, 100' north of bridge	wet brown fine to coarse SAND & GRAVEL, trace silt/clay
0 - 2'		12"		sample # 11A	
2 - 4'	49,56,58,46	14"			
4 - 6'	63,81,93	14"		sample # 11B	
6 - 8'		10"		sample # 11C	
ED-12				mid stream behind Rick & Rich Towing	wet fine to coarse SAND & GRAVEL, trace silt/clay & cobbles
0 - 2'	35,30,47,133	12"	8	sample # 12A	
2 - 4'	65,96,47,58	10"	43.3		
4 - 6'	54,63,47,53	8"	18	sample # 12B	
6 - 8'	20,30,37,50	4"	4.2	sample # 12C	
ED-13				mid stream south edge of storm drain	wet fine to coarse SAND & GRAVEL, trace silt/clay & cobbles
0 - 2'	23,49,73,70	2"	54.8	sample # 13A	
2 - 4'	,133,175,202	4"	16		
4 - 6'	100,53,42,44	12"		sample # 13B	
6 - 8'	17,36,23,35	6"	8	sample # 13C	
ED-14				mid stream, north end of Transmission shop	sheen noticed from up stream of platform
0 - 2'	18,30,36,42	8"	0	sample # 14A	wet brown fine to coarse SAND & GRAVEL, trace silt/clay & cobbles
2 - 4'	53,42,40,42	16"	24		
4 - 6'	57,42,51,80	12"		sample # 14B	
6 - 8'	36,35,40,40	2"		sample # 14C	
SED-15				12' from west bank, middle of tranny shop	wet brown fine to coarse SAND & GRAVEL, trace silt/clay & cobbles
0 - 2'	23,11,12,19	6"	41	sample # 15A	
2 - 4'	51,78,140,68	12"	52		
4 - 6'	49,52,36,150	12"		sample # 15B	
6 - 8'		4"		sample # 15C	
SED-16				10' from east bank,south end tranny shop	wet brown fine to coarse SAND & GRAVEL, trace silt/clay & cobbles
0 - 2'	20,25,30,31	8"	0	sample # 16A	
2 - 4'	39,46,50,65	12"	38		
4 - 6'	91,79,90,89	14"	54	sample # 16B	
6 - 8'	10,41,43,49	6"		sample # 16C	
ED-17				20' from west bank, north end Verizon bldg.	wet brown fine to coarse SAND & GRAVEL, trace silt/clay & cobbles Faint tar like odor & some tar like substance in shallow sample
0 - 2'	26,49,44,56	3"		sample # 17A	
2 - 4'	66,53,43,46	16"			
4 - 6'	93,107,501,150	10"		sample # 17B	
6 - 8'	120,35,25,30			sample # 17C	
SED-18				12' from east bank, north end Verizon garage door	wet brown fine to coarse SAND & GRAVEL, trace silt/clay & cobbles, more silt/clay toward bottom of hole
0 - 2'	18,11,26,27	6"		sample # 18A	
2 - 4'	29,44,54,33	12"			
4 - 6'	196,86,55,55	14"		sample # 18B	
6 - 8'	39,31,30,42	18"		sample # 18C	
ED-19				14' from west bank, south edge Verizon garage do	wet brown fine-coarse SAND & GRAVEL, trace-some cobbles slight tar like odor @ 2 - 4'
0 - 2'	20,7,37,46			sample # 19A	
2 - 4'	106,89,42,49				
4 - 6'	68,130,324,265			sample #19B	
6 - 8'				sample #19C	

Table 5-19 continued
River Boring Summary
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
Homer, New York

PHASE 2 SEDIMENT BORINGS					
BORING ID / DEPTH	BLOW COUNT	RECOV.	PID	LOCATION/LABORATORY SAMLPES	OBSERVATIONS
SED-20				16' from east bank, across from big cotton wood	wet brown fine-coarse SAND & GRAVEL, trace-some silt/clay & cobbles
0 - 2'	10,38,35,47	4"	20	sample # 20A	
2 - 4'	176,87,96,76	18"	13.8		
4 - 6'	175,97,39,68	12"		sample # 20B	
6 - 8'	33,35,45,44	8"		sample #20C	
SED-21				14' form west bank, near MW-18	wet brown fine-coarse SAND & GRAVEL, trace silt/clay & cobbles soils dark and oil stained, but no sheen, faint tar like odor
0 - 2'	23,43,42,37	5"	5.2	sample # 21A	
2 - 4'	37,52,66,101	16"	4.1		
4 - 6'	35,40,39,50	8"	0	sample # 21B	
6 - 8'	48,44,56,48	1"	27	sample #21C	
SED-22				16' from east bank, south end Booth bldg.	wet brown fine-coarse SAND & GRAVEL, trace silt/clay & cobbles soils dark and oil stained, but no sheen, faint tar like odor, slight odor @ 2' - 4'
0 - 2'	240,207,148	6"	0	sample # 22A	
2 - 4'	240,207,148,134	4"	62		
4 - 6'	172,152,91,64	12"	5.1	sample # 22B	
6 - 8'	20,30,23,20	2"	0	sample #22C	
SED-23				30' from west bank, north end motel	wet brown fine-coarse SAND & GRAVEL, trace silt/clay & cobbles
0 - 2'	18,23,26,28	6"	0	sample # 23A	
2 - 4'	183,100,106,147	7"	0	sample # 23B	
4 - 6'	115,132, ,55	12"	0	sample # 23B	
6 - 8'	58,60,42,42	12"	0	sample #23C	
SED-24				20' from west bank, behind motel	wet brown fine-coarse SAND & GRAVEL, trace silt/clay & cobbles
0 - 2'	15,46,47,41	8"	0	sample # 24A	
2 - 4'	70,60,62,35	10"	0		
4 - 6'	98,58,40,38	16"	0	sample # 24B	
6 - 8'	56,62,144,180	8"	0	sample #24C	
SED-25				15' from west bank, near motel dock	wet brown fine-coarse SAND & GRAVEL, some cobbles, trace silt/clay
0 - 2'	24,35,50,32	4"	0		
2 - 4'	31,38,48,35	14"	0	sample # 25A	
4 - 6'	50,54,86,70	8"	0	sample # 25B	
6 - 8'	50,45,39,41	12"	0	sample #25C	
SED-26				mid stream, north end of office products bldg.	wet brown fine-coarse SAND & GRAVEL, trace silt/clay & cobbles, more silt/clay with depth
0 - 2'	17,29,31,31	8"	0	sample # 26A	
2 - 4'	36,26,41,35	6"	0	sample # 26B	
4 - 6'	65,41,23,21	6"	0		
6 - 8'	46,23,21,20	0	0		
SED-27				mid stream, 110' north of bridge	wet brown fine-coarse SAND & GRAVEL, trace-some silt/clay & cobbles
0 - 2'	34,30,36,56	16"	0	sample # 27A	
2 - 4'	38,67,62,63	10"	0	sample # 27B	
4 - 6'	133,57,66,109	12"	0	sample # 27C	
6 - 8'	121,88,67,56	5"	0	sample #27D	
SED-28				7' from west bank, 90' north of bridge	wet brown fine-coarse SAND & GRAVEL, trace-some silt/clay & cobbles
0 - 2'	13,23,62,50	5"	0	sample # 28A	
2 - 4'	75,25,53,41	6"	0		
4 - 6'	91,43,26,28			sample # 28B	
6 - 8'	28,53,52,70	5"	0	sample #28C	
SED-29				5' from west bank, south end of office products bld	0 - 4' wet firm SILT/CLAY & fine-coarse sand + gravel, trace cobbles 4' - 8' wet brown fine-coarse SAND & GRAVEL, trace-some silt/clay & cobbles
0 - 2'	9,12,28,30	8"	0	sample # 29A	
2 - 4'	53,66,55,30	6"	0		
4 - 6'	57,44,42,37	10"	0	sample # 29B	
6 - 8'	35,74,41,50	10"	0	sample #29C	

Table 5-19 continued
River Boring Summary
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
Homer, New York

PHASE 2 SEDIMENT BORINGS					
ORING I.D. / DEPTH	BLOW COUNT	RECOV	PID	LOCATION/LABORATORY SAMLPES	OBSERVATIONS
SED-30				6' from west bank, 18' south of bridge	
0 - 2'	13,17,27,44	4"	24	sample # 30A	wet brown fine - coarse SAND & GRAVEL, trace cobbles silt/clay
2 - 3'	30,189	6"	11	sample # 30B	
SED-31				mid stream	
0 - 2'	30,45,44,74	NR			wet brown fine - coarse SAND & GRAVEL, trace cobbles silt/clay
1.5 - 3'	70,50,75	10"	35	sample # 31B	
ED-32				mid stream, south of island	wet brown fine - coarse SAND & GRAVEL, some silt/clay, trace cobbles
0 - 2'	30,79,63,81	14"	19	sample # 32A	2-3.5' wet brown fine - coarse SAND & GRAVEL, some silt/clay
2 - 3.5'	117,58,55	6"	62	sample # 32B	
ED-33				mid stream	
0 - 2'	27,57,51,63	14"	37	sample # 33A	wet brown fine - coarse SAND & GRAVEL, trace silt/clay
2 - 3'	15,28	7"	48	sample # 33B	2-3" wet brown fine - coarse SAND, some silt/clay, trace gravel
SED-34				mid stream	
0 - 2'	25,36,26,31	14"	39	sample # 34A	wet fine-coarse SAND, some gravel & silt/clay
2 - 3'	16,30	6"	61	sample # 34B	
ED-35				mid stream, 200' north of rapid behind Cort. Co. DO	
0 - 2'	6,6,19,22	6"	56	sample # 35A	wet fine-coarse GRAVEL, some sand, trace silt/clay, yellow rust staining
2 - 3'	30,43	4"	44	sample # 35B	
ED-36				mid stream 80' north of R.R. bridge	
0 - 2'	37,45,50,55	12"	64	sample # 36A	wet fine-coarse SAND & GRAVEL, trace silt/clay
2 - 3'	80,105	10"	27	sample # 36B	
SED-37				70' south of R.R. bridge, @ foot of west bank	
0 - 2'	12,38,138,22	10"	16	sample # 37A	wet fine-coarse GRAVEL, some fine-coarse sand, trace-some silt/clay
2 - 3'	141,209	6"	20	sample # 37B	
ED-38				8' from west bank just south of sheen spotted during probing	
0 - 2'	5,9,8,6	8"	47	sample # 38A	wet fine-coarse GRAVEL, some fine-coarse sand, trace-some silt/clay,
2 - 3'	20,17	8"	14	sample # 38B	sheen a & tar odor @2-3', wood with creosote @4-5'
3 - 5'	88,80,10,28	8"	44	sample # 38C	
ED-39				mid stream, 40' south of SED-38	
0 - 2'	9,18,19,13	NR			wet fine-coarse GRAVEL, trace fine-coarse sand & silt/clay
2 - 3'	37,67	6"		sample # 39B	
ED-40				20' from west bank, south end deposit bank	
0 - 2'	3,20,39,37	12"	27	sample # 40A	wet fine-coarse GRAVEL, some fine-coarse sand, trace silt/clay
2 - 3'	70,87	12"		sample #40B	
SED-41				14' from east bank 1/2 way along deposit bank	
0 - 2'	3,5,8,9	7"		sample # 41A	wet fine-coarse SAND & GRAVEL, trace silt/clay & organic matter
2 - 3'	54,114	11"		sample #41B	
D-42				south of deposit bank	wet fine-coarse SANDL, trace gravel silt/clay & organic matter
0 - 2'	2,4,1,4	4"		sample # 42A	fine-coarse SAND & GRAVEL, some silt/clay & organic matter
2 - 3'	20,40	12"		sample #42B	
D-43				mid stream, 100' north of sed trap	
0 - 2'	1,23,40,40	12"		sample # 43A	fine-coarse GRAVEL, trace-some sand & silt/clay, possible tar @ surface
2 - 3'	55,43	4"		sample # 43B	and @ 2.5' & tar odor
3 - 5'	58,50,41,39	9"		sample # 43C	
D-44				20' north of sed trap, mid stream	
0 - 2'	5,16,126,60	8"		sample # 44A	fine-coarse GRAVEL, trace sand & silt/clay
2 - 3'	191,90	6"		sample #44B	

TABLE 5-20 (Page 1 of 5)
VOLATILE ORGANIC COMPOUNDS (VOCs)
Tioughnioga River Sediment Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
Homer, New York

Analyte (ppb)	SED - 1 Downstream	SED - 2 Downstream	SED - 3 Downstream	SED - 4 Site	SED - 5 Site	SED - 7 Upstream	SED - 8 Upstream	SED - 9 Site (E Bank)
bromomethane	U	U	U	U	U	U	U	U
methylene chloride	3 J	4 J	2 J	3 J	20 J	1 J	0.9 J	1 J
acetone	68 B	77 B	28 JB	45 B	360 B	26 B	9 JB	82 JB
carbon disulfide	U	U	U	2 J	U	6 J	0.4 J	0.7 J
2 butanone	20 JB	16 JB	8 JB	15 JB	64 J	U	15 U	18 J
1,2- dichloroethene (tot)	U	U	U	U	U	U	U	U
trichloroethene	U	U	U	U	7 J	1 J	U	U
tetrachloroethene	U	U	U	1 J	U	8	2 J	2 J
benzene	U	U	U	9 J	170	U	U	U
toluene	U	3 J	U	1 J	17 J	U	U	U
ethylbenzene	U	2 J	U	4 J	780	U	U	U
styrene	U	U	U		U	U	U	U
xylenes (tot)	U	U	U	4 J	0	U	U	U
TOTAL VOC's	91	102	38	84	1418	42	27.3	103.7
TOTAL BTEX	0	5	0	18	967	0	0	0
VOC AVERAGE	30	20	13	9	177	8	5	21

U - Indicates that the compound was analyzed for but not detcted.
J -The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.
B - Indicates the analyte is found in QC blanks.

TABLE 5-20 (Page 2 of 5)
VOLATILE ORGANIC COMPOUNDS (VOCs)
Tioghnioga River Sediment Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
May, 2001

Analyte (ppb)	SED-10A 0-2 FT	SED-10B 2-4 FT	SED-10C 4-6 FT	SED-11A 0-2 FT	SED-11B 2-4 FT	SED-12A 0-2 FT	SED-12B 2-4 FT	SED-13B RE 2-4 FT	SED-13C 4-6 FT	SED-14A 0-2 FT	SED-14B RE 2-4 FT	SED-14C 4-6 FT	SED-15B 2-4 FT	SED-16A 0-2 FT	SED-16B 2-4 FT	SED-17B 2-4 FT	SED-18B 2-4 FT	SED-18C 4-6 FT
Cloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Methylene Chioride	16	17	47	7 B	8 B	7 B	10 B	8 B	6 B	5 JB	8 B	9 B	6 B	9 B	7 B	17	12	12
Acetone	34 B	26 B	34 B	12 B	16 B	12 B	16 B	10 JB	21 B	4 JB	7 JB	14 B	5 JB	6 JB	10 JB	22 B	7 JB	13 B
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
cis-1, 2-Dichloroethene	U	U	1 J	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
trans-1, 2 -Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1, 2- Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
2- Butanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1,1 Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromidichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1, 2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
cis-1, 3- Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Trichloroethene	U	U	8	0.7 J	0.8 J	U	U	U	U	U	U	U	U	U	U	U	U	U
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Benzene	U	U	0.7 J	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
4- Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Toluene	U	U	4 J	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
TOTAL VOCs	50.00	43.00	94.70	19.70	24.80	19.00	26.00	18.00	27.00	9.00	15.00	23.00	11.00	15.00	17.00	39.00	19.00	25.00
AVERAGE VOCs	25.00	21.5	15.78	6.57	8.27	9.50	13.00	9.00	13.50	4.50	7.50	11.50	5.50	7.50	8.50	19.5	9.5	12.5

Notes:
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TABLE 5-20 (Page 3 of 5)
VOLATILE ORGANIC COMPOUNDS (VOCs)
Tioghnioga River Sediment Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
May,2001

Analyte (ppb)	SED-19A 0-2 FT		SED-19B 2-4 FT		SED-20B 2-4 FT		SED-20C 4-6 FT		SED-21B 2-4 FT		SED-21C 4-6 FT		SED-22A 0-2 FT		SED-22B 2-4 FT		SED-22C 4-6 FT		SED-23A 0-2 FT		SED-23B 2-4 FT		SED-23C 4-6 FT		SED-24A 0-2 FT		SED-24B 2-4 FT		SED-24C 4-6 FT		SED-25A 0-2 FT		SED-25B 2-4 FT		SED-25C 4-6 FT	
Cloromethane	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Bromethane	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Vinyl Chloride	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Chloroethane	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Methylene Chloride	20	B	10		6		8		10		8		5	J	11		6		7		7		10		12		12		8		9	B	12		15	
Acetone	72	B	17	B	5	JB	190	B	12	B	4	JB	3	JB	6	JB	7	JB	4	JB	6	JB	10	JB	6	JB	11	B	8	JB	39	B	15	B	4	JB
Carbon Disulfide	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Vinyl Acetate	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
1,1-Dichloroethene	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
1,1-Dichloroethane	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
cis-1, 2-Dichloroethene	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
trans-1, 2 -Dichloroethene	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Chloroform	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
1, 2- Dichloroethane	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
2- Butanone	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
1,1,1 Trichloroethane	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Carbon Tetrachloride	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Bromidichloroethane	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
1, 2-Dichloropropane	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
cis-1, 3- Dichloropropene	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Trichloroethene	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Dibromochloromethane	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
1,1,2-Trichloroethane	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Benzene	10	J	1	J	U		U		3	J	3	J	U		0.6	J	U		U		2	J	U		U		U		U		U		U		U	
trans-1,3-Dichloropropene	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Bromoform	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
4- Methyl-2-Pentanone	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
2-Hexanone	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Tetrachloroethene	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Toluene	3	J	1	J	U		U		1	J	1	J	U		0.8	J	U		0.6	J	0.7	J	0.9	J	U		0.6	J	U		4	J	4	J	0.7	J
1,1,2,2-Tetrachloroethane	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Chlorobenzene	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Ethylbenzene	10	J	1	J	U		U		4	J	5		U		U		U		2	J	5	J	0.6	J	U		U		U		U		U		U	
Styrene	U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U		U	
Xylene	8	J	1	J	U		U		4	J	7		U		U		U		3	J	4	J	U		U		U		U		U		U		U	
TOTAL VOCs	123.00		31.00		11.00		198.00		34.00		28.00		8.00		18.40		13.00		16.60		24.70		21.50		18.00		23.60		16.00		52.00		31.00		19.70	
AVERAGE VOCs	20.5		5.17		5.5		99.00		5.67		4.67		4.00		4.60		6.50		3.32		4.12		5.38		9.00		7.87		8.00		17.33		10.33		6.57	

Notes:
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= Indicates that the analyte is found in QC blanks.

TABLE 5-20 (Page 4 of 5)
VOLATILE ORGANIC COMPOUNDS (VOCs)
Tioghnioga River Sediment Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
May, 2001

Analyte (ppb)	SED-26A 0-2 FT	SED-26B 2-4 FT	SED-27A 0-2 FT	SED-27B 2-4 FT	SED-27C 4-6 FT	SED-28B 2-4 FT	SED-28C 4-5 FT	SED-29A 0-2 FT	SED-29B 2-4 FT	SED-29C 4-6 FT	SED-30B 2-4 FT	SED-32A 0-2 FT	SED-32B 2-3.5 FT	SED-33A 0-2 FT	SED-33B 2-3 FT
Cloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Methylene Chloride	6 B	14 B	13	5	5	6	10 B	5 B	7 B	9 B	38	11	15	13	14
Acetone	5 JB	36 B	5 JB	7 JB	7 JB	15 B	16 B	8 JB	8 JB	30 B	31 B	19 B	4 JB	7 JB	14 B
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
cis-1, 2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	0.9 J	U	U	0.3 J	U
trans-1, 2 -Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1, 2- Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
2- Butanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1,1 Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromidichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1, 2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
cis-1, 3- Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Trichloroethene	U	U	U	U	U	U	U	U	U	U	6	1 J	4 J	3 J	2 J
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Benzene	U	U	U	U	U	U	U	U	U	U	0.4 J	U	U	U	U
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
4- Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	0.3 J	U	U	U	U
Toluene	0.6 J	6	U	U	U	U	1 J	0.6 J	0.9 J	2 J	2 J	U	U	2 J	0.8 J
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
TOTAL VOCs	11.60	56.00	18.00	12.00	12.00	21.00	27.00	13.60	15.90	41.00	78.60	31.00	23.00	25.30	30.80
AVERAGE VOCs	3.87	18.67	9.00	6.00	6.00	10.50	9.00	4.53	5.30	13.67	11.23	10.33	7.67	5.06	7.70

Notes:
U = Indicates that the compound was analyzed for but not detected.

J - The concentration listed is an estimated value, which is less than the specified detection limit but is greater than zero.

3 = Indicates that the analyte is found in QC blanks.

TABLE 5-20 (Page 5 of 5)
VOLATILE ORGANIC COMPOUNDS (VOCs)
Tioghnioga River Sediment Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
May, 2001

Analyte (ppb)	SED-34B 2-3 FT	SED-36A 0-2 FT	SED-36B 2-3 FT	SED-37A 0-2 FT	SED-37B 2-3 FT	SED-38B 2-3 FT	SED-39B 2-3 FT	SED-40A 0-2 FT	SED-40B 2-3 FT	SED-41A 0-2 FT	SED-41B 2-3 FT	SED-42B 2-3 FT	SED-43A 0-2 FT	SED-43C 3-5 FT
Cloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Methylene Chloride	19	12	9	12	10	19	15	4 JB	4 JB	4 JB	2 JB	3 JB	4 JB	4 JB
Acetone	18 B	22 B	5 JB	12 B	3 JB	24 B	32 B	51 B	39 B	14 B	24 B	U	120 B	20 B
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	0.4 J	0.5 J
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U
cis-1, 2-Dichloroethene	U	U	U	U	U	U	U	U	0.6 J	U	U	U	U	U
trans-1, 2 -Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroform	U	U	U	U	U	U	U	4 J	3 J	4 J	6	8	2 J	8
1, 2- Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U
2- Butanone	U	U	U	U	U	3 J	U	U	U	U	U	U	7 J	U
1,1,1 Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromidichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1, 2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U
cis-1, 3- Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Trichloroethene	7	U	U	1 J	U	2 J	2 J	0.7 J	5 J	3 J	0.3 J	4 J	U	0.8 J
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Benzene	0.6 J	U	U	U	U	14	U	U	0.2 J	U	U	U	0.4 J	0.3 J
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U
4- Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U	U	U	U	U	0.3 J	U	0.3 J	0.6 J	0.6 J
Toluene	4 J	U	U	0.5 J	U	24	0.9 J	0.8 J	1 J	5 J	7	U	1 J	0.9 J
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ethylbenzene	U	U	U	U	U	170	U	U	U	U	U	U	6	2 J
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	0.9 J	U
Xylene	U	U	U	U	U	110	U	U	U	U	U	U	2 J	0.6 J
TOTAL VOCs	48.6	34.00	14.00	25.50	13.00	366.00	49.90	60.50	52.80	30.30	39.30	15.30	144.30	37.70
AVERAGE VOCs	9.72	17.00	7.00	6.38	6.50	45.75	12.48	12.10	7.54	5.05	7.86	3.83	13.12	3.77

Notes:
U = Indicates that the compound was analyzed for but not detected.

J - The concentration listed is an estimated value, which is less than the specified detection limit but is greater than zero.

B = Indicates that the analyte is found in QC blanks.

TABLE 5-21 (1 of 5)
SEMI-VOLATILE/POLYCYCLIC AROMATIC HYDROCARBONS
Tioughnioga River Sediment Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
Homer, New York

Analyte (ppb)	SED - 1 Downstream		SED - 2 Downstream		SED - 3 Downstream		SED - 4 Site		SED - 5 Site		SED - 6 Upstream		SED - 7 Upstream		SED - 8 Upstream		SED - 9 Site (E Bank)	
phenol	13	J	29	J		U	22	J		U		U	150	J	360	J	380	J
4 - methylphenol		U		U		U	39	J		U		U		U		U		U
benzoic acid	58	J		U		U		U		U		U		U		U		U
naphthalene ++	32	J	87	J	47	J	530	J	110000			U		U		U		U
2,6 dinitrotoluene		U		U		U		U		U		U		U		U		U
2-methylnaphthalene	18	J	30	J	44	J	55	J	2400	J		U		U		U		U
acenaphthalene	90	J	340	J	280	J	830	J	390	J	110	J	80	J	65	J	76	J
acenaphthene	45	J	420	J	380	J	2200		24000		240	J		U		U		U
dibenzofuran	18	J	28	J	150	J	370	J	7500	J		U		U		U		U
2,4 dinitrotoluene		U		U		U		U		U		U		U		U		U
diethylphthalate	14	J	24	J		U	17	J		U		U		U		U		U
fluorene	48	J	62	J	420	J	1100		11000	J		U		U		U		U
n- nitrosodiphenylamine		U		U		U		U		U		U		U		U		U
phenanthrene	500	J	350	J	2500		3300		20000	J	390	J	460	J	570	J	470	J
anthracene	190	J	220	J	980	J	1900		2200	J	190	J	150	J	170	J	180	J
carbazole	62	J	41	J	110	J	1000		11000	J		U		U		U		U
di-n-butylphthalate	62	JB	70	JB	55	JB	50	JB		U		U		U		UB		U
fluoranthene	910	J	640	J	2500		3700		2000	J	780	J	670	J	900	J	840	
pyrene	990		820	J	3100		4700		3500	J	850	J	840	J	1000		960	
butylbnzylphalate	64	J		U	290	J		U		U		U		U		U		U
benzo(a)anthracene ++	570	J	490	J	1800		3400		1100	J	400	J	410	J	490	J	480	J
chrysene ++	700	J	520	J	1600		3300		1400	J	580	J	550	J	620	J	610	J
bis(2-ethyhexyl) phthalate	310	JB	230	JB	280	JB	720	JB	690	JB		U	470	JB	370	JB	660	JB
di-n-octylphthalate	23	JB	34	JB		U	30	JB		U		U		U		U		U
benzo(b) fluoranthene ++	480	J	340	J	1000		1900		1100	J	370	J	380	J	500	J	380	J
benzo(k) fluoranthene ++	540	J	450	J	1200		2200		1300	J	370	J	410	J	440	J	520	J
benzo (a) pyrene ++	580	J	490	J	1500		2900		1400	J	480	J	480	J	580	J	530	J
indeno (1,2,3 - cd) pyrene ++	360	J	290	J	870	J	1400			U	380	J	400	J	400	J	330	J
dibenzo (a,h) anthracene ++	130	J	100	J	320	J	530	J		U		U		U		U		U
benzo (g,h,i) perylene	360	J	290	J	800	J	1200			U	480	J	540	J	480	J	380	J
TOTAL SVOC's	7167		6395		20226		37393		200980		5620		5990		6945		6796	
SVOC AVERAGE	276		266		919		1496		11822		432		428		496		485	
TOTAL CARCINOGENIC PAH	3392		2767		8337		16160		116300		2580		2630		3030		2850	
TOTAL PAH's	6525		5909		19297		35090		179390		5620		5370		6215		5756	

U - Indicates that the compound was analyzed for but not detected.
J - The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.
B - Indicates the analyte is found in QC blanks.
BOLD ITALICS are Polycyclic Aromatic Hydrocarbons (PAH's).

++ indicates possible or suspected carcinogen

TABLE 5-21 (Page 2 of 5)
SEMI-VOLATILES/POLYCYCLIC AROMATIC HYDROCARGONS (PAHs)
Tioghnioga River Sediment Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
May, 2001

Analyte (ppb)	SED-10A 0-2 FT		SED-10B 2-4 FT		SED-10C 4-6 FT		SED-11A 0-2 FT		SED-11B 2-4 FT		SED-11C 4-6 FT		SED-12A 0-2 FT		SED-12B 2-4 FT		SED-12C 4-6 FT		SED-13A 0-2 FT		SED-13B 2-4 FT		SED-13C 4-6 FT	
naphthalene ++		U		U		U		U		U		U		U		U		U	64	J		U		U
2-methylnaphthalene		U		U		U		U		U		U		U		U		U	150	J		U		U
acenaphthylene	32	J		U		U	17	J		U		U	11	J		U		U	180	J		U		U
acenaphthene		U		U		U	14	J		U		U		U		U		U	600	J		U		U
fluorene	20	J		U		U	30	J		U		U	21	J		U		U	1400	J		U		U
phenanthrene	330	J		U		U	250	JB		U		U	120	JB	14	JB	19	JB	9300	B		U		U
anthracene	130	J		U		U	88	J		U		U	48	J		U		U	3700			U		U
fluoranthene	760			U		U	450			U		U	220	J	12	J	24	J	12000			U		U
pyrene	620			U		U	310	J		U		U	150	J	10	J	18	J	7000			U		U
benzo(a)anthracene ++	340	J		U		U	220	J		U		U	110	J		U		U	5200			U		U
chrysene ++	330	J		U		U	210	J		U		U	110	J		U		U	4300			U		U
benzo(b) fluoranthene ++	300	J		U		U	160	J		U		U	88	J		U		U	3600			U		U
benzo(k) fluoranthene ++	290	J		U		U	220	J		U		U	98	J		U		U	3000			U		U
benzo (a) pyrene ++	360	J		U		U	210	J		U		U	100	J		U		U	3900			U		U
indeno (1,2,3 - cd) pyrene ++	250	J		U		U	110	J		U		U	45	J		U		U	2400			U		U
dibenzo (a,h) anthracene ++	78	J		U		U	45	J		U		U	22	J		U		U	1100	J		U		U
benzo (g,h,i) perylene	280	J		U		U	110	J		U		U	43	J		U		U	2000			U		U
TOTAL PAHs	4120		0		0		2444		0		0		1186		36		61		59894		0		0	

Analyte (ppb)	SED-14A 0-2 FT		SED-14B 2-4 FT		SED-15A 0-2 FT		SED-15B 2-4 FT		SED-15C 4-6 FT		SED-16A 0-2 FT		SED-16B 2-4 FT		SED-16C 4-6 FT		SED-17A 0-2 FT		SED-17B 2-4 FT		SED-17C 4-6 FT	
naphthalene ++		U		U		U		U		U		U		U		U	8500	J	150	J	27	J
2-methylnaphthalene		U		U		U		U		U		U		U		U	3400	J	55	J	U	
acenaphthylene		U		U	15	J		U		U	14	J		U		U	59000	J	490	J	28	J
acenaphthene		U		U		U		U		U	12	J		U		U	70000	J	760	J	43	J
fluorene		U		U		U		U		U	25	J		U		U	150000		1300		40	J
phenanthrene	51	JB		U	110	JB		U		U	200	JB		U	19	JB	640000		5800		220	J
anthracene	18	J		U	35	J		U		U	66	J		U		U	320000		3000		93	J
fluoranthene	110	J		U	140	J		U		U	260	J		U	16	J	570000		4600		180	J
pyrene	86	J	9	J	120	J		U		U	200	J		U	15	J	410000		3800		160	J
benzo(a)anthracene ++	57	J		U	70	J		U		U	140	J		U		U	240000		2100		72	J
chrysene ++	51	J		U	74	J		U		U	130	J		U		U	220000		1700		63	J
benzo(b) fluoranthene ++	50	J		U	62	J		U		U	99	J		U		U	160000		1100		40	J
benzo(k) fluoranthene ++	47	J		U	69	J		U		U	120	J		U		U	140000		1400		48	J
benzo (a) pyrene ++	50	J		U	88	J		U		U	130	J		U		U	220000		1800		53	J
indeno (1,2,3 - cd) pyrene ++	20	J		U	65	J		U		U	70	J		U		U	140000		1100		20	J
dibenzo (a,h) anthracene ++		U		U	29	J		U		U	32	J		U		U	43000	J	340	J	U	
benzo (g,h,i) perylene	17	J		U	69	J		U		U	68	J		U		U	130000		1100		19	J
TOTAL PAHs	557		9		946		0		0		1566		0		50		3523900		30595		1106	

Notes:

U = Indicates that the compound was analyzed for but not detected.

J - The concentration listed is an estimated value, which is less than the specified detection limit but is greater than zero.

B = Indicates that the analyte is found in QC blanks.

++ indicates possible or suspected carcinogen

TABLE 5-21 (3 of 5)
SEMI-VOLATILES/POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)
Tioughnioga River Sediment Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Foremr MGP
May, 2001

Analyte (ppb)	SED-18A 0-2 FT		SED-18B 2-4 FT		SED-18C 4-6 FT		SED-19A 0-2 FT		SED-19B 2-4 FT		SED-19C 4-6 FT		SED-20A 0-2 FT		SED-20B 2-4 FT		SED-20C 4-6 FT		SED-21A 0-2 FT		SED-21B 2-4 FT		SED-21C 4-6 FT	
naphthalene ++	15	J	12	J	11	J	1400	J	12000	J	780	J	70	J	200	J	350	J	2800		450		600	
2-methylnaphthalene	12	J		U		U	990	J	23000		1600		52	J	100	J	99	J	360	J	82	J	99	J
acenaphthylene	55	J		U	14	J	800	J	5600	J	320	J	140	J	32	J	40	J	230	J	71	J	82	J
acenaphthene	41	J	11	J		U	8500		57000		3200		92	J	33	J	57	J	2000		260	J	290	J
fluorene	71	J		U		U	5800		49000		2900		220	J		U		U	900		140	J	150	J
phenanthrene	590		48	J	8	J	15000		140000		8100		1500		34	J	17	J	2800		530		480	
anthracene	190	J	20	J		U	10000		62000		4100		660		16	J		U	1000		120	J	70	J
fluoranthene	640		36	J		U	100000		80000		4100		1800		32	J		U	1900		150	J	21	J
pyrene	710		39	J	8	J	8900		76000		4400		1600		29	J		U	1500		160	J	16	J
benzo(a)anthracene ++	380	J	18	J		U	4900		36000		1900		1000		14	J		U	1100		59	J		U
chrysene ++	330	J	17	J		U	4500		30000		1600		900		15	J		U	990		48	J		U
benzo(b) fluoranthene ++	190	J		U		U	2500		19000		830	J	550			U		U	590		24	J		U
benzo(k) fluoranthene ++	200	J		U		U	3300		23000		1300	J	720			U		U	710		43	J		U
benzo (a) pyrene ++	280	J		U		U	4200		30000		1500		830			U		U	880		45	J		U
indeno (1,2,3 - cd) pyrene ++	200	J		U		U	2600		15000	J	640	J	530			U		U	450		11	J		U
dibenzo (a,h) anthracene ++	71	J		U		U	850	J	4700	J	210	J	200	J		U		U	160	J		U		U
benzo (g,h,i) perylene	210	J		U		U	2400		15000	J	670	J	520			U		U	360	J		U		U
TOTAL PAHs	4185		201		41		176640		677300		38150		11384		505		563		18730		2193		1808	

Analyte (ppb)	SED-22A 0-2 FT		SED-22B 2-4 FT		SED-22C 4-6 FT		SED-23A 0-2 FT		SED-23B 2-4 FT		SED-23C 4-6 FT		SED-24A 0-2 FT		SED-24B 2-4 FT		SED-24C 4-6 FT		SED-25A 0-2 FT		SED-25B 2-4 FT		SED-25C 4-6 FT	
naphthalene ++	66	J	260	J	300	J	1000	J	440		410		46	J	29	J	23	J	U		U		U	
2-methylnaphthalene	54	J	120	J	90	J	680	J	99	J	62	J	21	J	U			U	U		U		U	
acenaphthylene	100	J	240	J	88	J	2900	J	310	J	81	J	290	J	33	J	22	J	U		U		U	
acenaphthene	100	J	240	J	90	J	2900	J	520		290	J	64	J	12	J	8	J	U		U		U	
fluorene	200	J	450			U	3600	J	550		140	J	140	J	10	J		U	U		U		U	
phenanthrene	1200		2300		78	J	19000		2800		510		990		44	J	7	J	28	J	12	J	U	
anthracene	860		1100		39	J	26000		2500		350	J	790		22	J	7	J	31	J	16	J	U	
fluoranthene	1000		1900		20	J	15000		1900		220	J	1500		49	J	13	J	40	J	15	J	U	
pyrene	1200		1800		23	J	19000		2100		210	J	2100		50	J	17	J	44	J	18	J	U	
benzo(a)anthracene ++	670		950			U	10000		1100		79	J	940		22	J		U	22	J	U		U	
chrysene ++	660		850		12	J	10000		1000		78	J	840		20	J		U	20	J	U		U	
benzo(b) fluoranthene ++	330	J	620			U	4800		590		35	J	400		10	J		U	12	J	U		U	
benzo(k) fluoranthene ++	300	J	660			U	6400		690		60	J	620		13	J		U	13	J	U		U	
benzo (a) pyrene ++	480		830			U	8200		800		61	J	700		14	J		U	14	J	U		U	
indeno (1,2,3 - cd) pyrene ++	300	J	480			U	2200	J	290	J	16	J	330	J	5	J		U	U		U		U	
dibenzo (a,h) anthracene ++	110	J	150	J		U	1100	J	97	J		U	120	J	U			U	U		U		U	
benzo (g,h,i) perylene	300	J	490			U	1800	J	320	J	14	J	410		6	J		U	U		U		U	
TOTAL PAHs	7930		13440		740		134580		16106		2616		10301		339		97		224		61		0	

Notes:

U = Indicates that the compound was analyzed for but not detected.

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B = Indicates that the analyte is found in QC blanks.

++ indicates possible or suspected carcinogen

TABLE 5-21 (Page 4 of 5)
SEMI-VOLATILE/POLYCYCLIC AROMATIC HYDROCARGONS (PAHs)
Phase III Tioghnioga River Sediment Analysis Tables
NYSEG Cortland/Homer Former MGP Site
Cortland, New York
May-01

Analyte (ppb)	SED-26A 0-2 FT		SED-26B 2-4 FT		SED-27A 0-2 FT		SED-27B 2-4 FT		SED-27C 4-6 FT		SED-27D 6-8 FT		SED-28A 0-2 FT		SED-28B 2-4 FT		SED-28C 4-6 FT		SED-29A 0-2 FT		SED-29B 2-4 FT		SED-29C 4-6 FT	
naphthalene ++	120	J		U		U		U	U			U	52	J		U		U		U		U		U
2-methylnaphthalene	130	J		U		U		U	U			U	79	J		U		U		U		U		U
acenaphthylene	2500	J	23	J		U		U	6	J		U	170	J		U		U	92	J		U		U
acenaphthene	200	J		U		U		U	U			U	400			U		U	97	J		U		U
fluorene	760	J	14	J		U		U	U			U	300	J		U		U	150	J		U		U
phenanthrene	6700		100	J		U		U	55	J	12	J	2500			U		U	1200		30	J		U
anthracene	3200	J	41	J		U		U	38	J		U	780			U		U	330	J		U		U
fluoranthene	12000		160	J	5	J		U	120	J	15	J	1500			U		U	550		22	J		U
pyrene	20000		170	J		U		U	260	J	19	J	1700			U		U	770		31	J		U
benzo(a)anthracene ++	8900		95	J		U		U	94	J		U	990			U		U	280	J	12	J		U
chrysene ++	8100		81	J		U		U	88	J		U	930			U		U	260	J	9	J		U
benzo(b) fluoranthene ++	4000		44	J		U		U	38	J		U	650			U		U	120	J		U		U
benzo(k) fluoranthene ++	5700		58	J		U		U	54	J		U	670			U		U	170	J		U		U
benzo (a) pyrene ++	6600		59	J		U		U	61	J		U	820			U		U	210	J		U		U
indeno (1,2,3 - cd) pyrene ++	3100	J	24	J		U		U	26	J		U	86	J		U		U	66	J		U		U
dibenzo (a,h) anthracene ++	1200	J		U		U		U	10	J		U	34	J		U		U	22	J		U		U
benzo (g,h,i) perylene	3800		24	J		U		U	31	J		U	68	J		U		U	76	J		U		U
TOTAL PAHs	87010		893		5		0		881		46		11729		0		0		4393		104		0	

Analyte (ppb)	SED-30A 0-2 FT		SED-30B 2-4 FT		SED-31B 1.5-3 FT		SED-32A 0-2 FT		SED-32B 2-3.5 FT		SED-33A 0-2 FT		SED-33B 2-3 FT		SED-34A 0-2 FT		SED-34B 2-3 FT		SED-35A 0-2 FT		SED-35B 2-3 FT	
naphthalene ++	57	J		U		U		U	19	J		U		U		U		U		U	28	J
2-methylnaphthalene	66	J		U		U		U	17	J		U		U		U		U	220	J	14	J
acenaphthylene	430	J	24	J	13	J		U	56	J		U		U		U		U	1600	J	110	J
acenaphthene	310	J	13	J	10	J		U	90	J		U		U		U		U	2400	J	190	J
fluorene	600	J	39	J	21	J	14	J	130	J		U		U		U		U	4800		310	J
phenanthrene	4400		310	J	210	J	110	J	860		21	J	89	J	22	J	15	J	24000		1800	
anthracene	2000		120	J	76	J	45	J	360			U	42	J	12	J		U	12000		450	
fluoranthene	4500		420		320	J	170	J	970		44	J	140	J	29	J	14	J	19000		1700	
pyrene	4300		390		280	J	130	J	930		36	J	130	J	24	J	14	J	19000		1800	
benzo(a)anthracene ++	2800		220	J	150	J	69	J	510		20	J	64	J	12	J		U	9800		900	
chrysene ++	2600		210	J	150	J	67	J	450		18	J	57	J	13	J		U	8900		760	
benzo(b) fluoranthene ++	1500		160	J	100	J	49	J	280	J	16	J	40	J		U		U	4100		510	
benzo(k) fluoranthene ++	2000		200	J	140	J	66	J	440		13	J	46	J		U		U	5900		560	
benzo (a) pyrene ++	2500		220	J	140	J	64	J	440		18	J	52	J		U		U	8000		750	
indeno (1,2,3 - cd) pyrene ++	1100		110	J	63	J	20	J	250	J		U	14	J		U		U	3600	J	380	
dibenzo (a,h) anthracene ++	440	J	46	J	26	J		U	94	J		U		U		U		U	1400	J	140	J
benzo (g,h,i) perylene	860		120	J	65	J	19	J	240	J		U	13	J		U		U	3300	J	380	
TOTAL PAHs	30463		2602		1764		823		6136		186		687		112		43		128020		10782	

Notes:

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++ indicates possible or suspected carcinogen

TABLE 5-21 (5 of 5)
SEMI-VOLATILE/POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)
Tioughnioga River Sediment Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Foremr MGP

Analyte (ppb)	SED-36A 0-2 FT		SED-36B 2-3 FT		SED-37A 0-2 FT		SED-37B 2-3 FT		SED-38A 0-2 FT		SED-38B 2-3 FT		SED-38C 3-5 FT		SED-40A 0-2 FT		SED-40B 2-3 FT		SED-41A 0-2 FT		SED-41B 2-3 FT	
naphthalene ++		U		U	440	J	29	J		U	170	J	900	J		U	46	J	110	J	1100	J
2-methylnaphthalene	41	J		U	340	J	28	J	120	J	280	J	1400	J		U	78	J		U	2600	J
acenaphthylene	340	J	12	J	2600	J	220	J	1600	J	220	J	350	J	440	J	750	J	500	J	3800	J
acenaphthene	61	J		U	5700	J	920		810	J	990		2300		140	J	520	J	300	J	17000	
fluorene	160	J		U	7600		620		690	J	710		1800		130	J	730	J	500	J	15000	J
phenanthrene	1500		90	J	36000		2200		9100		2600		6600		1,600		5,900		4,500		80,000	
anthracene	880		180	J	16000		690		4200		1100		2400		670	J	1600		1800	J	22000	
fluoranthene	4100		200	J	31000		2500		19000		2400		5200		3800		4700		6000		37000	
pyrene	4300		220	J	26000		2200		18000		1700		4400		4600		7000		4600		38000	
benzo(a)anthracene ++	2400		100	J	14000		1200		11000		1200		2500		2600		2900		3500		19000	
chrysene ++	2200		100	J	13000		1000		9700		1200		2400		2400		2800		3200		17000	
benzo(b) fluoranthene ++	1200		53	J	7200		640		4600		890		1200	J	1400	J	1200	J	2500		11000	J
benzo(k) fluoranthene ++	1400		69	J	9800		710		6500		850		1700		2100		1800		3500		13000	J
benzo (a) pyrene ++	2000		84	J	12000		1000		7800		1100		2100		2200		2200		3000		16000	
indeno (1,2,3 - cd) pyrene ++	1000		24	J	6800	J	400		3300		130	J	800	J	310	J	1000	J	330	J	1900	J
dibenzo (a,h) anthracene ++	380	J		U	2400	J	150	J	1400	J	54	J	330	J	130	J	410	J	120	J	650	J
benzo (g,h,i) perylene	930		24	J	6100	J	330	J	2600	J	74	J	590	J	250	J	1000	J	250	J	1400	J
TOTAL PAHs	22892		1156		196980		14837		100420		15668		36970		22770		34634		34710		296450	

Analyte (ppb)	SED-42A 0-2 FT		SED-42B 2-3 FT		SED-43A 0-2 FT		SED-43B 2-3 FT		SED-43C 3-5 FT		SED-44A 0-2 FT		SED-44B 2-3 FT	
naphthalene ++		U		U	89	J	18000	J	280	J		U	14	J
2-methylnaphthalene	52	J	100	J	180	J	25000	J	740	J		U	17	J
acenaphthylene	330	J	860	J	280	J	35000	J	1000	J	68	J	160	J
acenaphthene	410	J	690	J	1300	J	260000		5400		73	J	98	J
fluorene	500	J	1100	J	1300	J	220000		5100		82	J	160	J
phenanthrene	3,500		9,100		6400		1,100,000		26,000		710		1,200	
anthracene	1100		3200		2,200		240000		6500		180	J	440	
fluoranthene	3400		11000		2900		390000		10000		700		1200	
pyrene	2600		8200		2800		420000		10000		680		1800	
benzo(a)anthracene ++	1700		5300		1500		210000		5200		400	J	620	
chrysene ++	1600		4500		1500		180000		4800		380	J	530	
benzo(b) fluoranthene ++	1500		3800		850	J	110000	J	2600	J	390	J	290	J
benzo(k) fluoranthene ++	1800		4600		1100	J	160000		4400		370	J	400	J
benzo (a) pyrene ++	1500		4300		1100	J	170000		4200		370	J	480	
indeno (1,2,3 - cd) pyrene ++	120	J	370	J	92	J	15000	J	340	J	32	J	180	J
dibenzo (a,h) anthracene ++	50	J	140	J		U	5300	J	120	J		U	63	J
benzo (g,h,i) perylene	95	J	260	J	63	J	12000	J	260	J	21	J	210	J
TOTAL PAHs	20257		57520		23654		3570300		86940		4456		7862	

Notes:

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B = Indicates that the analyte is found in QC blanks.

++ indicates possible or suspected carcinogen

TABLE 5-22
INORGANICS
Sediment Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
Homer, New York

Analyte (ppm)	LEL ppm	SEL ppm	SED - 1	SED - 2	SED - 3	SED - 4	SED - 5	SED - 6	SED - 7	SED - 8	SED - 9
Aluminum			14100	17600	8030	10900	13900	13400	8770	13000	12300
Antimony	2	25	3.1 UN	4.9 UN	1.7 UN	3.4 UN	4.2 UN	4.1 UN	1.4 UN	3.5 UN	2.7 * BN
Arsenic	6	33	3.4 B	4.2 B	2.6	2.8 B	3.2 B	2.3 UN	2.4	3.3 B	2.5 B
Barium			162	202	93.1	136	253	234	73.5	144	146
Beryllium			0.55 B	0.7 U	0.38 B	0.49 U	0.59 U	0.58 UN	0.3 B	0.53 B	0.51 B
Cadmium	0.6	9	0.44 U	0.7 U	0.25 U	0.49 U	0.59 U	0.58 UN	0.45 B	0.51 U	0.37 U
Calcium			25800	34200	30000	24100	34900	24900	45900	2180	25700
Chromium	26	110	24	27.4 *	13.2	18.4	22.8	22.3	15.4	22.3	20.4
Cobalt			8.2 B	9.5 B	6.4 B	6 B	8.2 B	7.4 B	5.6 B	7.8 B	7.7 B
Copper	16	110	33.2 *	29.6 *	23.5 *	21.7 *	31.1 *	26.9 *	21.6 *	36.6 *	36.8 *
Iron	20000	40000	20700 *	23100 *	16300	16700	20300 *	20300 *	16300	18600	20300 *
Lead	31	110	59.1 *	53.4 *	47.4 *	44.9 *	57 *	44.5 *	58.9 *	53.9 *	49.5 *
Magnesium			6770	7140	5600	4900	6440	5930	11200	5800	6360
Manganese	460	1100	280	460	204	240	302	283	263	232	249
Mercury	0.15	1.3	0.14	0.25 *	0.17 *	0.23 *	0.37 *	0.14	0.082	0.15	0.12
Nickel	16	50	23.2 *	25.8 * B	18.9 *	17.6 * B	23.4 * B	22 * B	17.2 *	23.7 *	21.8 *
Potassium			1490 B	2020 B	833 B	1100 B	1310 B	1260 B	852 B	1070 B	1220 B
Selenium			2.2 UN	3.5 UN	1.2 N	2.4 UN	3 UN	2.9 UN	1 UN	2.6 N	1.8 UN
Silver	1	2.2	0.44 U	0.7 U	0.25 U	0.49 U	0.59 U	0.58 U	0.2 U	0.51 U	0.37 U
Sodium			175 B	347 B	153 B	322 B	529 B	1140 B	160 B	293 B	316 B
Thallium			4.4 U	7 U	2.5 U	4.9 U	5.9 U	5.8 U	2 U	5.1 U	3.7 U
Vanadium			22 B	26.6 B	13	16.6 B	21.4 B	20.4 B	12.6	19.2 B	18.2 B
Zinc	120	270	190 * E	192 * E	138 * E	146 * E	182 * E	163 * E	168 * E	171 * E	136 * E
R Cyanide			U	U	U	U	U	U	U	U	U
T Cyanide			U	U	U	U	2.11	U	U	U	U
R Sulfide			34.7	62.9	U	126	284	39.3	20.3	U	34.5
TOC			6800	75700	17900	50800	70900	64900	30400	56000	46600

U - Indicates analyte was not detected at method reporting limit.
B - Indicates analyte result between IDL and contract required detection limit (CRDL).
E - Reported value is estimated because of the presence of interface.
N - Spiked sample recovery not within control limits.
LEL - Lowest Effect Level for metals contamination in sediment. Blank cell indicates no screening value for that parameter. (Technical Guidance for Screening Contaminated Sediments, NYSDEC 1999).
SEL - Severe Effect Level for metals contamination in sediment . Blank cell indicates no screening value for that parameter. (Technical Guidance for Screening Contaminated Sediments, NYSDEC 1999).

TABLE 5-23
Total Cyanide, Total Organic Carbon (TOC), & Total Petroleum Hydrocarbons (TPH)
Tioghnioga River Sediment Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
May, 2001

AMPLE I.D.	Percent Solids	Total Cyanide (PPM)	TOC (PPM)	TPH (PPB)
SED-10A	87	U		150000
SED-10B	89	U		U
ED-10C	88	U		U
ED-11A	83	U		58000
SED-11B	90	U		U
ED-11C	92	U		U
ED-12A	88	U		39000
ED-12B	89	U		U
SED-12C	88	U		U
SED-13A	84	U		160000
ED-13B	88	U		U
ED-13C	90	U		U
SED-14A	91	U		U
SED-14B	91	U		U
ED-15A	86	U		97000
ED-15B	92	U		U
ED-15C	88	U		18000
SED-16A	82	U		59000
ED-16B	91	U		U
ED-16C	88	U		U
ED-17A	84.4	U	15000	20000000
SED-17B	87.1	U	33200	U
ED-17C	90.3	U	30600	U
ED-18A	84	U	15900	82000
ED-18B	91.7	U	24000	U
SED-18C	85.8	U	38100	U
ED-19A	59.2	6.69	33200	1100000
ED-19B	88.5	10.8	20000	2000000
ED-19C	89	8.06	18400	22000
SED-20A	89.3	U	7660	57000
SED-20B	88	U	24600	U
ED-20C	92.7	U	33600	U
ED-21A	87.5	U	9870	940000
SED-21B	92.5	1.67	27000	U
SED-21C	93.4	1.3	26600	U
ED-22A	82.2	U	22000	360000
ED-22B	91.3	U	21400	22000
ED-22C	91.7	U	27700	U
SED-23A	83.5	U	8220	320000
ED-23B	85.7	U	16800	79000
ED-23C	89.3	U	20200	U
ED-24A	82.8	U	19900	78000
SED-24B	90.2	U	25800	U
ED-24C	89	U	26300	U

SAMPLE I.D.	Percent Solids	Total Cyanide (PPM)	TOC (PPM)	TPH[1] (PPB)
SED-25A	90.8	U	25400	U
SED-25B	92.1	U	35400	U
SED-25C	91.5	U	43600	U
SED-26A	87.9	U	11300	200000
SED-26B	85.9	U	13500	U
SED-27A	92.8	U	14200	U
SED-27B	91.5	U	9730	U
SED-27C	91.9	U	23100	20000
SED-27D	89.8	U	32400	U
SED-28A	82.5	U	13600	190000
SED-28B	91.3	U	25200	U
SED-28C	82.4	U	22700	U
SED-29A	82.5	U	25900	U
SED-29B	83	U	29500	U
SED-29C	91.6	U	36400	U
SED-30A	87	U		280000
SED-30B	90	U		24000
SED-31B	88	U		U
SED-32A	89	U		U
SED-32B	90	U		31000
SED-33A	91	U		U
SED-33B	87	U		U
SED-34A	89	U		U
SED-34B	89	U		U
SED-35A	87	U		240000
SED-35B	90	U		20000
SED-36A	91	U		310000
SED-36B	90	U		U
SED-37A	91	U		500000
SED-37B	90	U		130000
SED-38A	79	U		350000
SED-38B	88	U		310000
SED-38C	87	U		360000
SED-40A	89	U		12850
SED-40B	88	U		340000
SED-41A	69	U		310000
SED-41B	79	U		1800000
SED-42A	71	U		630000
SED-42B	77	U		360000
SED-43A	91	U		90000
SED-43B	87	U		16000000
SED-43C	93	U		450000
SED-44A	74	U		170000
SED-44B	79	U		160000

ote:
U = Indicates that the compound was analyzed for but not detected.

TABLE 5-24
VOLATILE ORGANIC COMPOUNDS
River Water Samples
Supplemental Remedial Investigation
NYSEG Cortland/Homer Former MGP
Homer, New York

Analyte (ppb)	Health Standard [1] (ppb)	SW-1 Downstream	SW-2 Downstream	SW-3 Downstream	SW-4 Site	SW-5 Site	SW-6 Upstream	SW-7 Upstream	SW-8 Upstream	SW-9 Site East Bank
chloromethane	NA	U	U	U	U	U	U	U	U	U
bromomethane	5	U	U	U	U	U	U	U	U	U
vinyl chloride (G)	0.3	U	U	U	U	U	U	U	U	U
chloroethane (G)	5	U	U	U	U	U	U	U	U	U
acetone (G)	50	2 JB	U	U	U	1 JB	1 JB	U	U	U
methylene chloride	5	0.8 J	0.7 J	U	0.5 J	U	0.4 J	U	U	U
1,1 dichloroethane	5	U	U	U	U	U	U	U	U	U
cis 1,2 dichloroethene	5	U	U	U	U	U	U	U	U	U
2 butanone (G)	50	2 JB	2 JB	U	U	U	2 JB	2 JB	U	U
trichloroethene	5	U	U	U	U	U	U	U	U	U
bromodichloromethane (G)	50	U	U	U	U	U	U	U	U	U
1,1,2 trichloroethane	1	U	U	U	U	U	U	U	U	U
dibromochloromethane (G)	50	U	U	U	U	U	U	U	U	U
benzene	1	U	U	U	U	U	U	U	U	U
toluene	5	U	U	U	U	U	U	U	U	U
ethylbenzene	5	U	U	U	U	U	U	U	U	U
styrene (G)	5	U	U	U	U	U	U	U	U	U
xylenes (tot)	5	U	U	U	U	U	U	U	U	U
TOTAL BTEX		0	0	0	0	0	0	0	0	0
TOTAL VOCS		4.8	2.7	0	0.5	1	3.4	2	0	0

[1] From TOGS (1.1.1) Ambient Water Quality Standards & Guidance Values, NYSDEC June 1998

(G) indicates parameters subject to guidance value, as opposed to water quality standard.

NA indicates parameter not subject to standard.

B indicates parameter was detected in laboratory QC blank.

"*" indicates parameter exceeds NYS water quality standard.

J indicates estimated concentration

ATTACHMENT 3

2019 Pre-Design Investigation Summary Report (Provided Electronically)

Justin Starr
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7014

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017
www.arcadis.com

Subject:
Pre-Design Investigation Summary Report
NYSEG Cortland-Homer Former MGP Site
NYSDEC Site No. 7-12-005

ENVIRONMENT

Date:
January 29, 2019

Contact:
Jason Golubski, P.E.

Phone:
315.671.9437

Email:
jason.golubski@arcadis.com

Our ref:
B0013137.0004 #10

Dear Mr. Starr:

This letter summarizes the pre-design investigation (PDI) activities completed at the New York State Electric & Gas (NYSEG) Cortland-Homer Former Manufactured Gas Plant (MGP) Site (the site) located in Homer, New York. PDI activities were performed as outlined in the May 2017 Draft Remedial Design Work Plan (Draft RDWP) and with NYSDEC approval. PDI activities were generally completed from the Fall of 2017 to the Summer of 2018.

A summary of the PDI activities is presented below.

PDI Task 1 – Field Survey

Paul J. Olszewski, PLS, PLLC conducted a topographic and bathymetric survey in the anticipated remedial areas (and adjacent project support areas) to document ground surface and river bottom elevations. The survey also included site features including but not limited to; NYSEG-owned and private property boundaries, roadway and parking lot elevations, river access points, general dimensions and location of structures (i.e., bridges), trees (greater than 3-inches diameter at breast height [DBH]) and mean high water level (MHWL) (identified as described in PDI Task 3a).

The survey information will be used to generate topographic site maps to facilitate development of hydraulic modeling and preparation of the Remedial Design drawings. Topographic and bathymetric survey information is included as Attachment 1. Note that additional survey efforts may be completed in the Spring 2019 to supplement the data collected to date. The need for additional survey will be assessed as hydraulic modeling is completed and the remedial design is prepared.

PDI Task 2 – River Flow Data Acquisition

Existing river flow data including Federal Emergency Management Agency (FEMA) Flood Insurance Survey (FIS), publicly available DEM and LIDAR data,

and stream gauge data from the United States Geological Survey (USGS) station 01509000 for the Tioughnioga River in Cortland was obtained in March 2017.

The data will be used to develop a hydraulic model of the Tioughnioga River using the United States Army Corps of Engineers' (USACE) Hydraulic Engineering Center – River Analysis System (HEC-RAS). The HEC-RAS model will be used during the preparation of the Remedial Design to evaluate flow diversion capacities and river elevations, required system heights, flood potential, and riverbed scour during remedial construction activities.

PDI Task 3a – Habitat Assessment

Arcadis completed a habitat assessment for in-river, bank, and upland disturbance areas along the West Branch of the Tioughnioga river from October 17 to October 20, 2017. A Habitat Assessment Memo is included as Attachment 2 and a summary of the characterization work performed is detailed below.

Within the anticipated remedial areas of the Tioughnioga River, an inventory of types, sizes, and locations of significant habitat structures was performed in general accordance with the Stream Visual Assessment Protocol (SVAP) from the United States Department of Agriculture (USDA). A vegetation assessment within upland and bank areas included the documentation of all trees greater than 3-inches DBH, dominant canopy, understory (shrub), and vegetative cover. Assessment of trees included a determination of whether physical characteristics (i.e., crevices/hollows, snags, cavities, and exfoliating bark) were present . General bank conditions of vegetative cover and erosion potential were qualitatively assessed. Bank height and slope estimates were performed across multiple transects within the remedial areas. Additionally, the MHWL was determined along the banks of the remedial areas using visual indicators, consistent with the definition from 6 NYCRR Part 608.1.

Habitat assessment information will be used to develop a restoration design for areas disturbed by the remedial activities completed to address impacted river sediment, as well as to support permitting efforts required to facilitate remedial construction.

PDI Task 3b – Wetland Delineation

Delineation of wetlands was not included in the scope of PDI activities presented in the Draft RDWP; however, during habitat assessment activities (described above), Arcadis personnel observed potential wetland areas along the Tioughnioga River that would potentially be disturbed during remedial activities.

Due to the presence of these wetlands, Arcadis completed an Aquatic Resources Delineation Survey on July 10 and 11, 2018. Delineation of aquatic resources (i.e., wetlands) was performed in accordance with the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northeast and Northcentral. An Aquatic Resources Survey Report is included as Attachment 3. A total of 12 wetland areas were identified along the banks of the Tioughnioga River.

In addition to the habitat assessment, the results of the wetland delineation activities will also be used to develop restoration design components and to support permitting activities.

PDI Task 4 - Sediment Probing

Sediment probing was completed along the western bank of the Tioughnioga River on July 3, 2018. Sediment probing transect locations are shown on Figure 1. A sediment probing summary is provided as Table 1 and photographic log is included as Attachment 4.

In general, sediment probing activities produced sheens upon the disturbance of sediments at seven out of 29 probing locations. The locations of sheens observed during 2018 probing activities were consistent with those noted during previous sediment investigation activities.

PDI Task 5 – Upland Soil Borings

Arcadis' drilling subcontractor, Parratt-Wolff, completed soil borings at three locations (PDI-2018-01 to PDI-2018-03, as shown on Figure 2) from September 6, 2018 to September 7, 2018. The location of each soil boring was adjusted based on field conditions (e.g., moved 3 to 5 feet west to avoid the steep riverbank). Prior to drilling, the soil boring locations were cleared using vacuum/manual excavation to 5 feet below ground surface (bgs) and then completed using conventional hollow-stem auger (HSA) drilling techniques. Soil boring logs are included as Attachment 5.

Observed visual impacts were limited to sheens at boring PDI-2018-02 from 21 to 29 feet bgs. Additionally, elevated PID readings were noted from 7 to 11 feet bgs at the same location. Soil samples were collected from each boring location and submitted to SGS Laboratories for analysis for polycyclic aromatic hydrocarbons (PAHs). Analytical results showed PAH concentrations less than 1 milligram per kilogram (mg/kg) at all boring locations. Analytical results are summarized in Table 2. Analytical lab reports are included as Attachment 6 and a data validation report is included as Attachment 7.

Based on the relatively minor degree of observed impacts and low-level PAH concentrations, additional upland remedial activities (beyond those completed during OU-1 remedial construction) are not warranted.

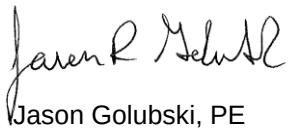
Path Forward

As a follow-up to the July 12, 2018 meeting between NYSDEC, NYSEG, and Arcadis, a summary of the PAH distribution in river sediments will be provided under separate cover. Following NYSDEC's review of this PDI summary, as well as the sediment PAH information, NYSEG respectfully requests a meeting with the NYSDEC to discuss the path forward for the remedial design/remedial construction.

Please do not hesitate to contact Tracy Blazicek at 585.484.6839 or tlblazicek@nyseg.com if you have any questions or require additional information.

Sincerely,

Arcadis of New York, Inc.



Jason Golubski, PE
Senior Environmental Engineer

Copies:
Amen Omorogbe, NYSDEC
Mary Jo Crance, NYSDEC
Tracy Blazicek, NYSEG
Mark Gravelding, PE, Arcadis

Enclosures:

Tables

1 Sediment Probing Summary
2 Subsurface Soil Analytical Results Summary

Figures

1 Sediment Probing Transects
2 Soil Boring Locations

Electronic Attachments

1 Site Survey
2 Habitat Assessment Memo
3 Aquatic Resources Survey Report
4 Sediment Probing Photo Log
5 Soil Boring Logs
6 Analytical Lab Report
7 Data Validation Report

TABLES

Table 1
Sediment Probing Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Transect ID	Edge of Water (EOW)	EOW +5 feet	EOW +10 feet	EOW +15 feet	Comments
T-100					
Water Depth (ft)	0.0	0.6	1.3	1.4	
Probe Depth (ft)	1.1	0.4	0.1	0.1	
Sheen Observed	No	No	No	No	
T-101					Spot probing indicated sheen between T-101 and T-102 approx. 2 feet north and 6 feet perpendicular from bank
Water Depth (ft)	0.0	1.3	1.4	1.5	
Probe Depth (ft)	1.2	0.2	0.3	0.3	
Sheen Observed	No	No	No	No	
T-102					
Water Depth (ft)	0.0	1.3	1.4	NM	
Probe Depth (ft)	0.6	0.1	0.1	NM	
Sheen Observed	No	No	No	NM	
T-103					
Water Depth (ft)	0.0	0.9	1.1	NM	
Probe Depth (ft)	0.4	0.2	0.1	NM	
Sheen Observed	No	No	No	NM	
T-104					
Water Depth (ft)	0.1	1.5	1.6	NM	
Probe Depth (ft)	0.9	0.1	0.2	NM	
Sheen Observed	No	No	No	NM	
T-105					
Water Depth (ft)	0.0	1.3	1.5	NM	
Probe Depth (ft)	0.4	0.1	0.2	NM	
Sheen Observed	No	No	No	NM	
T-106					
Water Depth (ft)	0.2	1.3	1.5	NM	
Probe Depth (ft)	0.3	0.1	0.1	NM	
Sheen Observed	No	No	No	NM	
T-107					Drain pipe located approx. half way between T-107 and T-108 (12 inch galvanized corrugated pipe w/ cast lid, open)
Water Depth (ft)	0.0	1.1	1.2	NM	
Probe Depth (ft)	0.6	0.1	0.2	NM	
Sheen Observed	No	No	No	NM	
T-108					
Water Depth (ft)	0.1	1.1	1.3	NM	
Probe Depth (ft)	0.9	0.1	0.1	NM	
Sheen Observed	No	No	No	NM	
T-109					Outfall located at T-109, concrete (3.5 feet by 4.5 feet)
Water Depth (ft)	0.1	0.6	1.1	NM	
Probe Depth (ft)	0.1	0.1	0.0	NM	
Sheen Observed	No	No	No	NM	
T-110					Slight sheen strings observed
Water Depth (ft)	0.1	1.3	1.3	NM	
Probe Depth (ft)	1.0	0.2	0.2	NM	
Sheen Observed	Yes	No	No	NM	
T-111					
Water Depth (ft)	0.1	1.3	1.6	NM	
Probe Depth (ft)	1.3	0.2	0.2	NM	
Sheen Observed	No	No	No	NM	
T-112					
Water Depth (ft)	0.3	1.4	0.6	NM	
Probe Depth (ft)	0.9	0.1	0.1	NM	
Sheen Observed	No	No	No	NM	
T-113					
Water Depth (ft)	0.3	1.4	1.5	NM	
Probe Depth (ft)	0.4	0.1	0.1	NM	
Sheen Observed	No	No	No	NM	
T-114					
Water Depth (ft)	0.0	1.1	1.3	NM	
Probe Depth (ft)	0.3	0.3	0.1	NM	
Sheen Observed	No	No	No	NM	
T-115					Concrete slab protruding from bank approx. 10 feet upstream from T-115
Water Depth (ft)	0.0	1.4	1.4	NM	
Probe Depth (ft)	0.9	0.2	0.1	NM	
Sheen Observed	No	No	No	NM	
T-116					
Water Depth (ft)	0.0	1.0	1.2	NM	
Probe Depth (ft)	0.1	0.1	0.1	NM	
Sheen Observed	Yes	No	No	NM	

Table 1
Sediment Probing Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Transect ID	Edge of Water (EOW)	EOW +5 feet	EOW +10 feet	EOW +15 feet	Comments
T-117					
Water Depth (ft)	0.1	0.8	1.1	NM	Concrete fill along bank between T-117 and T-118
Probe Depth (ft)	0.2	0.1	0.1	NM	
Sheen Observed	No	No	No	NM	
T-118					
Water Depth (ft)	0.0	0.7	1.4	NM	Sheens observed
Probe Depth (ft)	0.3	0.2	0.1	NM	
Sheen Observed	Yes	No	No	NM	
T-119					
Water Depth (ft)	0.0	1.4	1.5	NM	
Probe Depth (ft)	0.2	0.2	0.1	NM	
Sheen Observed	No	No	No	NM	
T-120					
Water Depth (ft)	0.0	0.8	1.5	NM	
Probe Depth (ft)	0.4	0.1	0.2	NM	
Sheen Observed	No	No	No	NM	
T-121					
Water Depth (ft)	0.1	1.2	1.2	NM	Sheens approx. 2 feet upstream T-122
Probe Depth (ft)	0.2	0.1	0.1	NM	
Sheen Observed	No	No	No	NM	
T-122					
Water Depth (ft)	0.0	1.4	1.5	NM	Significant sheen approx. 2.5 feet (between EOW and EOW +5 feet), petroleum-like odor
Probe Depth (ft)	0.6	0.2	0.2	NM	
Sheen Observed	Yes	Yes	No	NM	
T-123					
Water Depth (ft)	0.0	1.6	1.5	NM	
Probe Depth (ft)	0.8	0.1	0.1	NM	
Sheen Observed	No	No	No	NM	
T-124					
Water Depth (ft)	0.1	1.5	1.7	NM	Significant sheen at EOW +2.5 feet, petroleum-like odor observed
Probe Depth (ft)	1.4	0.3	0.2	NM	
Sheen Observed	Yes	Yes	No	NM	
T-125					
Water Depth (ft)	0.0	1.0	1.2	NM	
Probe Depth (ft)	0.3	0.1	0.1	NM	
Sheen Observed	No	No	No	NM	
T-126					
Water Depth (ft)	0.0	1.1	1.8	NM	
Probe Depth (ft)	0.8	0.4	0.1	NM	
Sheen Observed	No	Yes	No	NM	
T-127					
Water Depth (ft)	0.0	1.0	1.4	NM	
Probe Depth (ft)	0.2	0.2	0.1	NM	
Sheen Observed	No	No	No	NM	
T-128					
Water Depth (ft)	0.1	1.1	1.5	NM	
Probe Depth (ft)	0.2	0.1	0.1	NM	
Sheen Observed	No	No	No	NM	

Acronyms and Abbreviations:
EOW = Edge of Water
ft = feet
NM = Not Measured

Notes:
1. Probing observations completed by Arcadis on July 3, 2018.

Table 2
Subsurface Soil Analytical Results Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Location ID: Sample Depth(feet): Date Collected:	Units	PDI-2018-01 19-23 09/07/18	PDI-2018-02 7-11 09/07/18	PDI-2018-03 13-15 09/06/18
PAHs				
Acenaphthene	mg/kg	0.0495 [0.0604]	0.0521	0.150
Acenaphthylene	mg/kg	0.0196 J [<0.0360]	<0.0350	<0.0400
Anthracene	mg/kg	<0.0380 [<0.0360]	0.0370	0.0338 J
Benzo(a)anthracene	mg/kg	<0.0380 [<0.0360]	<0.0350	<0.0400
Benzo(a)pyrene	mg/kg	<0.0380 [<0.0360]	<0.0350	<0.0400
Benzo(b)fluoranthene	mg/kg	<0.0380 [<0.0360]	<0.0350	<0.0400
Benzo(g,h,i)perylene	mg/kg	<0.0380 [<0.0360]	<0.0350	<0.0400
Benzo(k)fluoranthene	mg/kg	<0.0380 [<0.0360]	<0.0350	<0.0400
Chrysene	mg/kg	<0.0380 [<0.0360]	<0.0350	<0.0400
Dibenzo(a,h)anthracene	mg/kg	<0.0380 [<0.0360]	<0.0350	<0.0400
Fluoranthene	mg/kg	0.0277 J [<0.0360]	<0.0350	0.0238 J
Fluorene	mg/kg	0.0186 J [0.0253 J]	0.0536	0.0703
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0380 [<0.0360]	<0.0350	<0.0400
Naphthalene	mg/kg	0.0607 [0.0750]	0.0824	0.156
Phenanthrene	mg/kg	0.0587 [0.0279 J]	0.0369	0.0652
Pyrene	mg/kg	0.0361 J [<0.0360]	0.0128 J	0.0299 J
Total PAHs	mg/kg	0.271 J [0.189 J]	0.275 J	0.529 J

Acronyms and Abbreviations:

< = Constituent not detected at a concentration above the reported detection limit.
J = Indicates an estimated value.
mg/kg = milligrams per kilogram
PAHs = polycyclic aromatic hydrocarbons
SCOs = Soil Cleanup Objectives

Notes:

1. Samples were collected by Arcadis on the dates indicated.
2. Duplicate samples are identified in brackets [ ].
3. Samples were analyzed by SGS Laboratories (SGS) located in Dayton, New Jersey for PAHs using United States Environmental Protection Agency (USEPA) SW-846 Method 8270D.
4. 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) are from Title 6 of the Official Compilation of Codes, Rules, and Regulations of the State of New York (6 NYCRR) Part 375-6.8(a) and (b), effective December 14, 2006.

FIGURES

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB: K.SARTORI PIC:/PM:/TM:D.CORNELL) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\Ksartori\OneDrive - ARCADIS\BIM 360 Docs\IBERDROLA USA\NYSEG Cortland-Homer Fmr MGP Site\2018\B0013137.0004\01-DWG\PDI-fig-1-SPT.dwg LAYOUT: 1 SAVED: 12/20/2018 1:01 PM PAGESETUP: C-PD2B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/20/2018 1:05 PM BY: SARTORI, KATHERINE

XREFS: PID-X-PB

IMAGES:
HomerNY_2016_500x.jpg
HomerNY_2016_M100x.jpg
HomerNY_2016_N100xa.jpg

LEGEND:

- APPROXIMATE BOUNDARY OF NYSEG–OWNED PROPERTY
- T-100 2018 PROBING TRANSECTS
- SHEEN OBSERVED
- FLOW DIRECTION
- EDGE OF WATER
- OBSERVED SHEEN AREA

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. AERIAL PHOTOGRAPHY OBTAINED FROM Google Earth Pro™ DATED 2016.

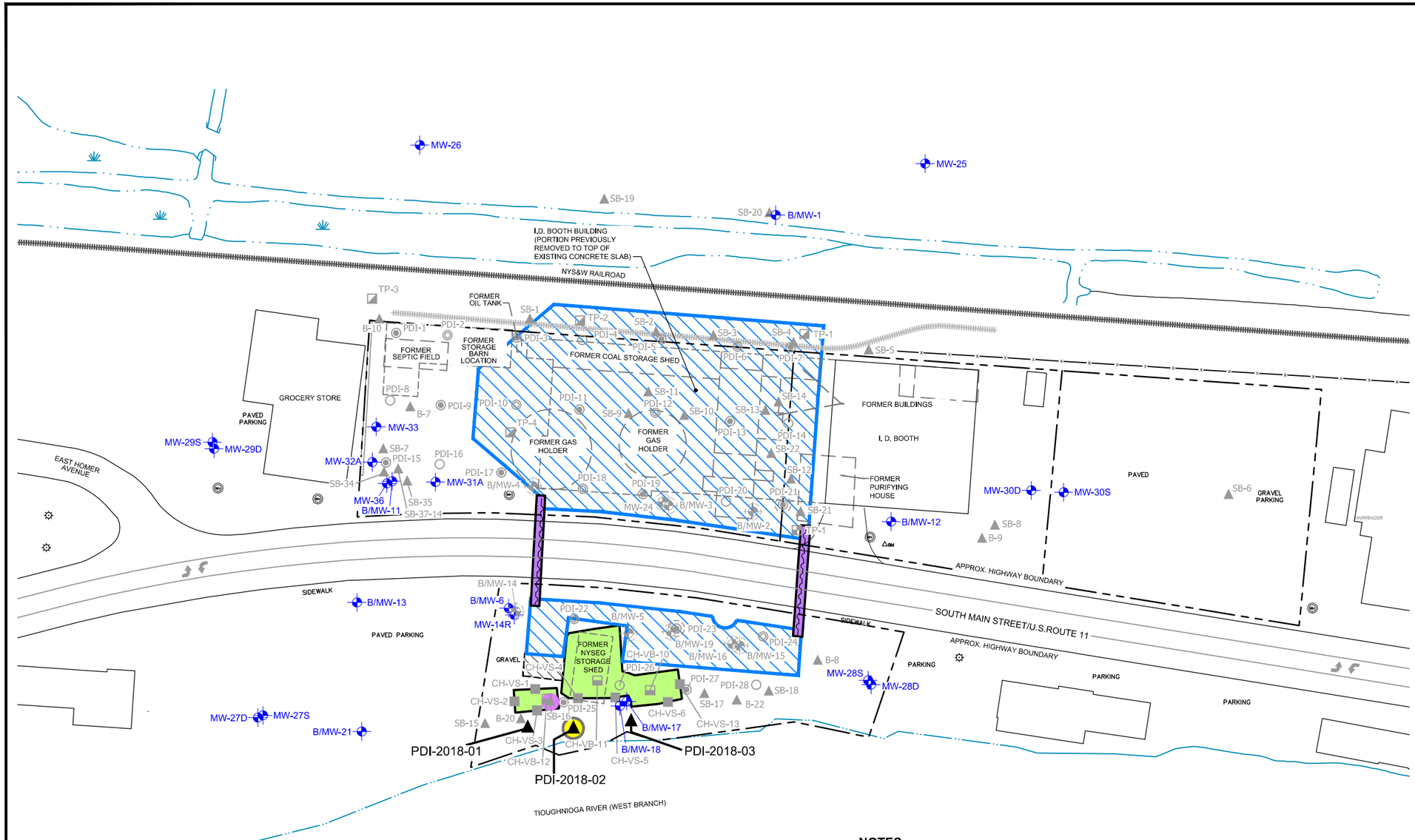
0 80' 160'
GRAPHIC SCALE

NYSEG - HOMER-CORTLAND FORMER MGP
HOMER, NEW YORK
PDI SUMMARY REPORT

SEDIMENT PROBING TRANSECTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1



LEGEND:

- EXISTING MONITORING WELL IN MONITORING NETWORK
- FORMER MONITORING WELL LOCATION (DECOMMISSIONED IN JULY/AUGUST 2012)
- EXISTING MONITORING WELL NOT IN MONITORING NETWORK
- SOIL BORING LOCATION (PRE-2018)
- SOIL BORING LOCATION (2018)
- TEST PIT LOCATION (PRE-SRI)
- TEST PIT LOCATION (SRI)
- SOIL BORING FOR ISS LIMIT SAMPLING (SONIC DRILLING)
- SOIL BORING FOR ISS LIMIT SAMPLING AND WASTE CHARACTERIZATION (SONIC DRILLING)
- SOIL BORING FOR ISS LIMIT SAMPLING (HOLLOW STEM AUGER DRILLING)
- SOIL BORING FOR ISS LIMIT SAMPLING AND WASTE CHARACTERIZATION (HOLLOW STEM AUGER DRILLING)
- REMEDIAL EXCAVATION SIDE WALL DOCUMENTATION SAMPLE LOCATION
- REMEDIAL EXCAVATION BOTTOM DOCUMENTATION SAMPLE LOCATION
- REMOVED/FORMER BUILDINGS
- FORMER MGP STRUCTURE
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE HIGHWAY BOUNDARY
- ISS AREA - EXCAVATED TO AVERAGE DEPTH OF 4 FEET BGS PRIOR TO ISS
- ISS SPOIL PIT EXCAVATED TO AVERAGE DEPTH OF 4 FEET
- VBW TRENCH
- VBW-SSP
- ADDITIONAL PETROLEUM IMPACTED SOIL REMOVAL AREA - EXCAVATED TO AVERAGE DEPTH OF 5 FEET
- VISUALLY NOTED COAL TAR OR COAL
- SHEEN OBSERVED

NOTES:

1. BASEMAP SUPPLIED BY AECOM OF LATHAM, NEW YORK DRAWING NUMBER 3 AT A SCALE OF 1"=60', ENTITLED "NYSEG - REMEDIAL DESIGN FOR FORMER CORTLAND-HOMER MGP SITE" DATED APRIL 16, 2012.
2. BASE MAPPING COMPILED FROM VARIOUS SOURCES INCLUDING NEW YOUR STATE ELECTRIC & GAS (NYSEG) EXISTING PLANIMETRIC AND UTILITY INFORMATION, DIGITIZED INFORMATION FROM NYSDOT RECORD PLANS TITLED RECONSTRUCTION OF ROUTE 11 IN THE TOWN OF CORTLANDVILLE AND VILLAGE OF HOMER - DATED 5-17-02, DIGITIZED AERIAL IMAGERY FROM THE NEW YORK STATE GIS CLEARINGHOUSE, AND FIELD A FIELD SURVEY PERFORMED BY AECOM - DATED MAY 13, 2011.
3. THE LOCATION OF MONITORING WELLS MW-6, -11, -14R, -17, -18, -31, -32 AND -33 WERE SURVEYED ON NOVEMBER 21, 2013 BY NYSEG. THE LOCATION OF MONITORING WELL MW-36 WAS SURVEYED ON JANUARY 30, 2014 BY ARCADIS.
4. PDI SOIL BORING LOCATIONS PDI-2018-01, -02, AND -03 SHOWN WERE OFFSET WEST FROM PROPOSED LOCATIONS AND ARE APPROXIMATE.
5. VBW TRENCH AND SSP LOCATIONS ARE APPROXIMATE.
6. VBW - VERTICAL BARRIER WALL
7. SSP - STEEL SHEET PILE
8. ISS - IN-SITU SOIL SOLIDIFICATION

0 80' 160'

GRAPHIC SCALE

NEW YORK STATE ELECTRIC & GAS CORPORATION
FORMER CORTLAND-HOMER MGP SITE
HOMER, NEW YORK
PDI SUMMARY REPORT

SOIL BORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

CITY:SYRACUSE, NY DIV/GROUP:ENV\IM-DV DB:A. SANCHEZ, R. ALLEN LD: PIC: PM: TM: LYR:(Opt)ON=*;OFF=*REF*
C:\Users\ksarton\OneDrive - ARCADIS\IBIM 360 Docs\IBERDROLA USA\NYSEG Cortland-Homer Fmr MGP Site\2018\B0013137.0004\01-DWG\PDI-fig2-SBL-sheen.dwg LAYOUT: 2 SAVED: 12/20/2018 1:12 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: PDF 11X17 PLOTSTYLETABLE: PLTFULL.CTB
PLOTTED: 12/20/2018 1:13 PM BY: SARTORI, KATHERINE
XREFS:
PDI-X-3
PDI-X-1
PDI-X-LDR
IMAGES:

ATTACHMENT 1

Site Survey

LEGEND

- CONCRETE MONUMENT FOUND
- IRON PIPE FOUND
- IRON ROD FOUND
- IRON ROD SET
- UTILITY POLE
- OVER HEAD WIRE — OHW
- CONTOUR LINE — 878

SURVEY SUBJECT TO ANY STATE OF FACTS AN ACCURATE AND UP TO DATE ABSTRACT OF TITLE WILL SHOW.

THE UNDERSIGNED SURVEYOR HEREBY CERTIFIES THAT THIS IS AN ACCURATE MAP OF AN ACTUAL SURVEY COMPLETED 7-11-2018.

PAUL J. OLSZEWSKI, P.L.S. LICENSE No. 50212

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PAUL JAMES OLSZEWSKI, P.L.S., PLLC
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DATE: JULY 24, 2018 SCALE: 1" = 50 FEET PROJECT No. CORTLANDVILLE87

NORTH AREA TOPOGRAPHY & WETLAND LOCATION

NYSEG - HOMER - CORTLAND FORMER MGP
HOMER, NEW YORK

STATE OF NEW YORK
LICENSED LAND SURVEYOR
PAUL JAMES OLSZEWSKI
050212

TIOUGHNIOGA RIVER

SOUTH MAIN STREET (US RT. 11)

SHORELINE

APPROX. PROPERTY LINE

CONCRETE WALL

BRIDGE

GRAVEL DRIVE

BLACKTOP DRIVE

CONCRETE SIDEWALK

APPROXIMATE PROPERTY LINE

DEED

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DATE: JULY 24, 2018 SCALE: 1" = 40 FEET

PROJECT No. CORTLANDVILLE87

315-488-5552 pjosurvey.com

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NYSEG - HOMER - CORTLAND FORMER MGP
HOMER, NEW YORK

SOUTH AREA TOPOGRAPHY
& WETLAND LOCATION

LEGEND

CONCRETE MONUMENT FOUND
IRON PIPE FOUND
IRON ROD FOUND
IRON ROD SET
UTILITY POLE
OVER HEAD WIRE — OHW
CONTOUR LINE — 878

STATE OF NEW YORK
LICENSED LAND SURVEYOR
PAUL JAMES OLSZEWSKI
050212

TIOUGHNIOGA RIVER
APPROXIMATE PROPERTY LINE
RAILROAD TRACKS
APPROXIMATE PROPERTY LINE
TIOUGHNIOGA RIVER
RAILROAD TRACKS
APPROXIMATE PROPERTY LINE
TIOUGHNIOGA RIVER
SHORELINE
SHORELINE
APPROX. PROPERTY LINE
APPROX. PROPERTY LINE
DEED

ATTACHMENT 2

Habitat Assessment Memo

MEMO

ARCADIS Design & Consultancy for natural and built assets

To:

Tracey Blazicek, NYSEG

Copies:

Jason Vogel, Arcadis
Gary Markiewicz, Arcadis

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017

From:

Jason Golubski

Date:

January 29, 2019

Arcadis Project No.:

B0013137.0003

Subject:

In-River Habitat, Bank and Riparian Corridor, and Upland Disturbance Area Characterization
NYSEG Cortland-Homer Former MGP Site

Arcadis completed pre-design investigation (PDI) activities to address habitat assessments for in-river, bank and riparian corridor, and upland disturbance areas found along the West Branch of the Tioughnioga River. The assessment activities were completed from October 17 to 20, 2017, in accordance with the May 2017 Draft Remedial Design Work Plan (RDWP) for Operable Unit No. 2 (OU-2) of the Cortland-Homer Former Manufactured Gas Plant (MGP) Site and with New York State Department of Environmental Conservation (NYSDEC) approval. The following details a summary of work performed and general findings of the habitat assessment activities.

ASSESSMENT OVERVIEW

Based on the anticipated OU-2 remedial areas, two aquatic habitat areas (Area 1 and Area 2) with surrounding bank areas, along with one upland staging area on the eastern shoreline of Area 2 were identified for characterization, as shown in Figure 1.

For in-river characterization areas, an inventory of types, sizes, and locations of significant habitat structures was performed in general accordance with the Stream Visual Assessment Protocol (SVAP) from the United States Department of Agriculture (USDA).

Within upland and bank areas, vegetation assessment included the documentation of all trees greater than 3 inches diameter breast (DBH), dominant canopy, understory (shrub), and vegetative cover. Tree assessment also included determination of whether physical characteristics (i.e., crevices/hollows, snags, cavities, and exfoliating bark) were present.

General bank conditions of vegetative cover and erosion potential were qualitatively assessed. Bank height and slope estimates were performed across multiple transects within the target areas. Additionally, the mean high-water level (MHWL) was determined along the banks of Areas 1 and 2 using visual indicators, consistent with the definition from NYCRR Part 608 (6 CRR-NY 608.1).

A photo log documenting observed site conditions is included as Attachment 1. Photo locations are provided on Figures 2A and 3A.

In-River Assessment

Within the anticipated remedial areas, habitat characterization was performed to semi-quantitatively assess presence and absence of SVAP variables for aquatic habitats and provide general habitat type characteristics (e.g., water depths, inorganic substrate composition, submerged aquatic vegetation, large woody debris, embeddedness) to aid in the pre-design investigation. Table 1 provides a summary of the main aquatic habitat types observed within the remedial areas, as shown on Figures 2A and 3A. In addition, any significant habitats (e.g., scour pools or functional boulders) were marked and logged with a Trimble unit.

Based on the river's flow conditions during the assessment, several components of the SVAP were not observed or found within the remedial areas; including: functional undercut banks, dense macrophyte beds, large root mats, and significant large boulders. In addition, significant overhanging vegetation that is directly over the river surface was only observed in Area 1 and consisted of several areas with mature willows. However, in Area 2, given the geomorphology of the river and bank heights compared to water surface elevation (i.e., incised channel with high entrenchment ratio), there is partial shading over select areas.

In Area 1, the dominant aquatic habitat types were riffles and runs (see Figure 2A). The dominant substrates found within these habitats were primarily small cobble and gravels. Two small scour pools (approximately 60 to 100 square feet) with maximum water depths of 2 and 2.2 feet, were identified within the downstream riffle habitat. One small backwater area was also observed along the eastern shoreline at the downstream end of the second run habitat section. Sands and fines were primarily limited within the main channel areas; however, were observed in greater frequency as a component of the inorganic substrate along the margins of each habitat type. Embeddedness was variable within this area, as riffle habitats ranged from 5 to 10% and run habitats ranged from 5 to 40%. Higher embeddedness (50 to 60%) were also found within the small backwater area and on the gravel depositional bar, within the Riffle 2 habitat, as well as along the shoreline margins. Submerged aquatic vegetation was observed throughout this area along the near-shore depositional areas and within the fringe emergent wetland habitats. Species included American eelgrass (*Vallisneria americana*), American (common) waterweed (*Elodea canadensis*), arrow arum (*Peltandra virginica*), water lily (*Nympaea* spp.), watermilfoil (*Myriophyllum* spp.), and water-starwort (*Callitriche* spp.). Trace to moderate filamentous algae was found on larger substrates (primarily small cobbles) in the riffle and run habitats. Relic freshwater mussel shells and some live zebra mussel were observed within Area 1. No significant large functional boulders (as individual, clusters, or field) were observed. No significant deep pools, undercut banks, or root mats were observed in this area.

In Area 2, the dominant aquatic habitat type was a deep run, along with a seasonal backwater area with an exposed mudflat (see Figure 3A). Based on flow and water depth, for areas off the main channel thalweg, some portions of this habitat could be considered a pool. However, based on flow, gradient, and substrates, the primary habitat was classified as deep run. The average water depth of the run habitat was approximately 3 feet, with some deeper portions up to 5 feet. The dominant substrates found within the

run habitat was primarily small cobble and gravel and within the backwater area the substrates were primarily fines (silts and fine sands). Embeddedness was moderate with 30% observed in the run and 100% within the backwater, based on the net deposition of silts and fine sands. Several species of aquatic vegetation were observed along the margins of the run habitat, including pondweed (Potamogeton spp.), American (common) waterweed, watermilfoil, and water-starwort. Large woody debris was found in low to moderate quantities throughout Area 2, with the most significant portion found along the western shoreline. In addition, trace filamentous algae was present on larger substrates within the run habitat. Downstream of the proposed remedial removal areas, a manmade wall of boulders (approximately 20 feet long by 10 feet wide) was observed along the western shoreline and submerged within the river. No undercut banks or root mats were observed in this area.

Tree Assessment

Based on site conditions, the riparian corridor included both the bank and upland habitats for tree characterization. Therefore, tree characterization for all live tree species greater than 3 inches (7.6 centimeters) DBH were combined accordingly. Each trunk was flagged and marked using a handheld Trimble unit to aid subsequent surveying. Individual tree locations are shown on Figures 2B and 3B.

Table 2 details the tree species and trunk counts found within each remedial area. In total, 16 species and a total of 783 trunks (greater than 3 inches DBH) were observed within the five areas. The most abundant species by trunk count was box elder, with lesser abundances of black walnut and white willow. Several large (greater than 40 inches DBH) and old cottonwood, black willow, and white willow trees were characterized. The average DBH was 10.5 inches (26.7 centimeters) for all species observed. Based on the tree species observed (primarily with lack of exfoliating bark) and their general health (lack of snags and cavities), there were only five trees (one black locust, one black willow, two box elder, and one white willow) that exhibited large cavities or portions of trees with large bark separation. See Figure 4 for a photo of an example box elder with large trunk cavity.

Figure 4. Box Elder with Large Trunk Cavity

Vegetation Assessment

The vegetation assessment was performed to characterize the bank from water's edge to top of bank for dominant species by canopy, understory, and herbaceous layers in potential disturbance areas. Note that

some portions of the remedial areas that were found to be urbanized or disturbed and natural vegetation characteristics were limited by manmade retaining walls, rip-rap, and bridge trestles.

Table 3 details the dominant vegetative species and qualitative percent cover estimates observed by canopy, understory, and herbaceous layers found within representative habitat types within the remedial areas. Invasive species present consisting of isolated monoculture stands include; Japanese knotweed (*Fallopia japonica/Polygonum cuspidatum*), Reed canary grass (*Phalaris arundinacea*), and Purple Loosestrife (*Lythrum salicaria*). As shown on Figures 2A and 3A, habitat types observed included:

- Armored – consisting of retaining walls, rip-rap, and concrete debris
- Disturbed – consisting of fill and dumped materials in both forested and non-forested bank areas
- Emergent Wetland - consisting of mixed emergent flora species found in near-shore areas
- Herbaceous – either natural or maintained
- Scrub-Shrub – consisting primarily of silky dogwood, common buckthorn, and Tartarian honeysuckle
- Forested – consisting of natural understory and canopy species
- Mud Flat – consisting of herbaceous vegetation
- Floodplain Bench – consisting of natural understory and canopy species

Based on the presence of observed emergent wetlands, additional wetland delineation activities were completed to quantify the extents of the emergent wetlands and to support preparation of the United States Army Corps of Engineers (USACE) and NYSDEC Joint Application for Permit. Additional details on the presence of aquatic resources is provided under separate cover.

The upland staging area located on the eastern shore of Area 2, consisted of primarily forested floodplain. This staging area consisted of a canopy with primarily box elder, cottonwood, and black walnut (65 to 70% cover); shrub layer of common buckthorn, multiflora rose, riverbank grape, staghorn sumac, and Tartarian honeysuckle (75 to 80% cover); and an herbaceous layer of primarily garlic mustard, burdock, and cleavers (80% cover).

Bank Assessment

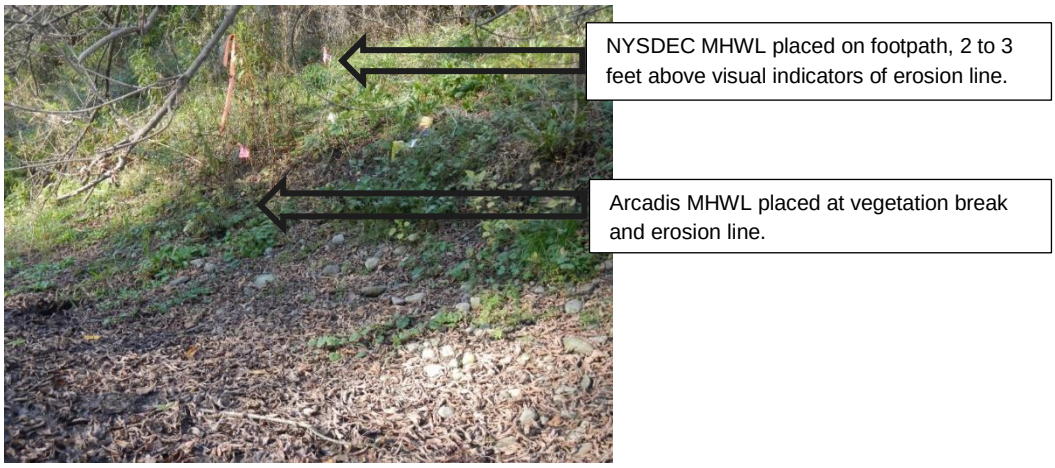
Bank conditions for representative habitat types were noted in the field notes and observed to be primarily stable in most areas. Representative locations evaluated for bank stability pockets of erosion (30 to 40% of bank) were found in areas where various fill materials have been used over time. Bank heights in Area 1 ranged from 2 to 7.7 feet, with slopes of 20 to 30 degrees, and vegetative cover of 30 to 95%. Bank heights in Area 2 ranged from 2.4 to 9.0 feet, with slopes of 20 to 40%, and vegetative cover of 60 to 100%. Bankfull heights in both areas were visually estimated from existing surface water elevations, upon the time of assessment, and ranged from approximately 1.5 to 3.0 feet. A semi-quantitative estimate for bank erosion hazard index (BEHI) was evaluated from representative areas within each of the anticipated OU-2 remedial areas (Table 4), using bank characteristics outlined in Rosgen (1996, 2001). Table 4 presents the results of the BEHI evaluation. Taking in to account metrics such as bank height, slope, vegetation, etc., each of the areas were found to have BEHI ratings of “Low” to “Very High” in Area 1 and “Low” to “High” in Area 2. Overall, in most natural areas that had riparian vegetation and limited human use, bank erosion potential was observed as “Low” to “Moderate”. In both Area 1 and Area 2, several bank

areas indicated “High” to “Very High”, based on existing erosion and disturbance from past flooding and indications of human use and lack of vegetated buffers.

MHWL Assessment

NYSDEC personnel (Mary Jo Crance and Jean Foley) observed the assessment of the MHWL along the western shoreline of Area 1. Per NYSDEC’s request in the field, MHWL was estimated within both Areas 1 and 2 at approximately 50-foot intervals along each shoreline; MHWLs were marked with pin flags to facilitate later survey. Following NYSDEC’s review of MHWL pin flags in Area 1, NYSDEC proceeded to Area 2 and marked representative MHWLs along the eastern shoreline to aid in calibrating Arcadis’ visual estimates. Based on Arcadis’ review of the NYSDEC MHWL pin flags in Area 2, several of flags were well above the visual indicators observed along the banks. An example of the discrepancy along the eastern bank in Area 2 is shown in Figure 5.

Figure 5. MHWL Flag Location Discrepancy



As shown on Figures 2A and 3A, a total of 78 and 57 MHWL points were visually estimated from bank indicators along the western and eastern shorelines of Areas 1 and 2, respectively.

CONCLUSIONS

The determination of the MHWL for Area 1 was performed and agreed upon in the field by NYSDEC oversight. However, for Area 2, potential discrepancies between the Arcadis and NYSDEC visually derived elevations may require additional follow-up to resolve with NYSDEC.

Visual observations of relic freshwater mussel shells and live zebra mussels were noted and NYSDEC collected several relic mussel shells for taxonomic identification. Based on these observations and NYSDEC’s further investigation of potential threatened and endangered mussel species, NYSDEC requested that a mussel survey be completed to identify potential occurrence of state-listed species. A Qualitative Mussel Survey Report was submitted to NYSDEC for review in September 2018 under separate cover.

Enclosures:

Tables

1 River Habitat Summary
2 Tree Summary
3 Vegetative Summary
4 Bank Erosion Hazard Index Summary

Figures

1 Site Plan
2A Area 1 – In-Stream/Bank Habitat Areas and Assessment Points
2B Area 1 – MHWL, Bank Assessment Points, and Tree Survey
3A Area 2 – In-Stream/Bank Habitat Areas and Assessment Points
3B Area 2 – MHWL, Bank Assessment Points, and Tree Survey

Attachment

1 Photo Log

TABLES

Table 1
River Habitat Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Remedial Area / Aquatic Habitat Type[1]	Water Depths (ft)[2]			Inorganic Substrates (%)[3]							Organic Substrates (%)[4]			LWD[5] (ft^2)	SAV Presence[6]	Percent Embeddedness[7]
	Min	Max	Mean	Bedrock	Boulder	Lg. Cobble	Sm. Cobble	Gravel	Sand	Fines	CPOM	FPOM	Marl			
Area 1																
Run 1	0.3	1.4	0.9	0	trace	5	30	45	15	5	20-30	10	5	244	Yes, FA	30 to 40
Riffle 1	0.3	0.9	0.5	0	0	trace	60	30	5	5	10	0	trace	0	No, FA	5 to 10
Run 2	0.5	2.0	1.1	0	0	5	60	25	5	5	20	10	trace	119	Yes, FA	5 to 10
Backwater 1	0.0*	0.8	0.4	0	0	0	0	40	30	30	20	40	trace	0	No	50 to 60
Riffle 2	0.3	0.7 ^	0.4	0	trace	5	30	40	20	5	20	30	10	62	Yes, FA	10 ¥
Run 3	0.7	1.6	1.2	0	0	10	40	30	10	10	30	20	10	28	Yes, FA	20 to 30
Area 2																
Run 1	1.5	5 ₸	3.0	0	trace	5	35	30	15	15	30	20	5	868 ‡	Yes, FA	30
Backwater 1	0.0*	0.6	0.2	0	0	0	0	trace	20	80	30	10	trace	5	Yes, TA	100

Notes:

1. Characterization performed for each of the primary aquatic habitats observed within each target remedial area.
2. Collected with stadia rod in units of feet (and tenths) throughout habitat area. Mean is approximate; per water levels at the time of the study.
* - receded water depth of backwater is essentially zero.
^ - small scour pools found in riffle habitat had maximum water depths of 2 and 2.2 feet.
₸ - the main thalweg of the deep run had depths between 3 and 3.6 feet; a few isolated areas of the thalweg were up to 5 feet deep.
3. Primary inorganic substrates qualitatively assessed by visual observations within each aquatic habitat type.
trace - typically observed as minor component at less than 1%.
4. Organic substrates qualitatively assessed by visual observations within each aquatic habitat type.
CPOM - Coarse particulate organic matter (sticks, wood); FPOM - Fine particulate organic matter (black, very fine leaf litter); Marl - grey, shell fragments
5. LWD - Large woody debris - visually estimated lengths and diameters of functional wood to generate a square footage estimate.
‡ - a bank beaver den was observed within Area 2 that contributed approximately 50% of the total functional LWD.
6. Submerged aquatic vegetation presence and other aquatic algae, macrophytes, and periphyton were characterized for presence/absence.
FA - filamentous algae, present on large substrates within habitat.
7. Embeddedness is qualitatively assessed to the extent of gravels, cobbles, and boulders covered or sunken into mud, sand, or silt of the river bottom.
¥ - a depositional bar along downstream end of riffle habitat along eastern shore indicated higher embeddedness (50 to 60%).
ǂ - characterized on the non-vegetated portion of the gravel bar that may have more frequent inundation.

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
Area 1 Riparian Area - West Bank				
1	White willow	30.4	1	
2	White willow	44.2	1	
3	White willow	21.4	1	
4	American elm	9.7	2	
5	Box elder	9.4	3	
6	Box elder	8.8	3	
7	Box elder	6.7	4	
8	White willow	40.2	5	
9	White willow	16.4	5	
10	White willow	24.6	5	
11	White willow	12.1	5	
12	White willow	21.0	5	
13	White willow	23.0	5	
14	American elm	9.0	6	
15	American elm	6.5	7	
16	American elm	8.6	8	
17	Green ash	4.5	9	
18	White willow	38.5	10	
19	Green ash	5.0	11	
123	White willow	19.0	77	
124	Box elder	10.0	78	
125	Box elder	10.5	78	
126	Sugar maple	15.3	79	
127	Sugar maple	11.8	80	
128	American elm	5.5	81	
129	American elm	7.5	82	
130	Box elder	6.5	83	
131	Box elder	5.0	83	
132	Box elder	7.8	83	
133	Box elder	8.2	83	
134	Green ash	13.5	84	
135	Red maple	8.5	85	
136	Red maple	17.2	85	
137	Red maple	14.5	85	
138	Red maple	5.0	85	
139	Red maple	18.0	85	
140	Red maple	4.5	85	
141	Red maple	4.5	85	
142	Red maple	10.2	85	
143	Red maple	11.0	85	
144	Red maple	5.8	85	
145	Red maple	6.5	85	
146	Red maple	6.8	85	
147	Red maple	5.0	85	
148	Red maple	6.8	85	
149	White willow	10.0	86	
150	White willow	10.0	86	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Tag #	Species	(in) DBH	Tree #	Notes
151	White willow	12.8	87	
152	White willow	10.2	87	
153	White willow	22.0	87	
154	White willow	13.5	87	
155	White willow	15.4	87	
156	Norway maple	7.5	88	
157	Norway maple	7.6	88	
158	Norway maple	6.7	88	
159	Norway maple	5.9	88	
160	Box elder	5.4	89	
161	Box elder	5.0	89	
162	White willow	48.0	90	
163	White willow	30.0	90	
164	White willow	20.0	90	
Area 1 Riparian Area - East Bank				
20	Red maple	7.7	12	
21	Box elder	10.0	13	
22	White willow	14.5	14	
23	White willow	8.5	14	
24	White willow	11.5	14	
25	White willow	8.0	14	
26	White willow	14.5	14	
27	Green ash	17.5	15	
28	Green ash	13.4	16	
29	Box elder	18.8	17	
30	Green ash	15.5	18	
31	Green ash	19.0	19	
32	Green ash	17.5	20	
33	Red Maple	4.4	21	
34	Green ash	19.0	22	
35	Green ash	14.5	23	
36	Red maple	14.1	24	
37	Silver maple	12.0	25	
38	Silver maple	9.5	25	
39	Silver maple	18.0	25	
40	Silver maple	5.0	25	
41	Silver maple	15.5	25	
42	Silver maple	6.5	25	
43	Silver maple	10.2	25	
44	Silver maple	5.8	25	
45	Silver maple	7.7	25	
46	Silver maple	20.2	25	
47	Green ash	8.8	26	
48	White willow	30.5	27	
49	Box elder	5.4	28	
50	Box elder	6.9	29	
51	Black willow	12.7	30	
52	Black willow	11.0	31	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
53	Black willow	10.0	32	
54	Black willow	7.6	33	
55	Box elder	14.3	34	
56	Box elder	6.4	35	
57	Black willow	18.0	36	
58	Box elder	7.0	37	
59	Box elder	8.8	37	
60	Box elder	14.5	37	
61	Box elder	7.6	37	
62	Box elder	8.0	38	
63	Box elder	6.0	39	
64	Box elder	3.5	39	
65	Box elder	4.5	40	
66	Box elder	10.0	41	
67	Box elder	4.0	42	
68	Box elder	9.2	43	
69	Box elder	5.0	44	
70	Black willow	71.0	45	
71	Black willow	26.2	46	
72	Black willow	32.0	47	
73	Black willow	27.5	47	
74	Black willow	30.8	48	
75	Black willow	24.2	49	
76	Black willow	36.1	49	
77	Black willow	27.5	50	Possible roost tree
78	Box elder	8.2	51	
79	Box elder	3.0	52	
80	Box elder	4.2	52	
81	Box elder	3.8	52	
82	Box elder	5.6	52	
83	Box elder	5.4	52	
84	Box elder	5.4	52	
85	Box elder	3.4	53	
86	Box elder	3.5	54	
87	Box elder	8.2	54	
88	Box elder	7.2	55	
89	Box elder	6.2	55	
90	Box elder	3.3	56	
91	Box elder	11.4	57	
92	Box elder	14.8	58	Possible roost tree
93	Box elder	8.5	58	Possible roost tree
94	Box elder	9.5	59	
95	Box elder	9.5	60	
96	Green ash	13.4	61	
97	Box elder	5.5	62	
98	Box elder	5.0	62	
99	White willow	18.3	63	
100	White willow	15.0	64	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Tag #	Species	(in) DBH	Tree #	Notes
101	White willow	20.3	65	
102	White willow	20.0	65	
103	White willow	9.8	65	
104	White willow	11.5	66	
105	Box elder	3.5	67	
106	Box elder	4.5	67	
107	Box elder	4.3	67	
108	Box elder	3.1	68	Downed live tree
109	Box elder	3.4	68	Downed live tree
110	Box elder	3.2	68	Downed live tree
111	White willow	35.0	69	
112	Silver maple	35.8	70	
113	Silver maple	19.0	70	
114	Green ash	7.6	71	
115	Red maple	5.1	72	
116	Box elder	8.0	73	
117	Box elder	3.8	74	
118	Silver maple	11.2	75	
119	Silver maple	4.1	75	
120	White willow	23.5	76	
121	White willow	20.5	76	
122	White willow	23.4	76	
Area 2 Staging Area				
1	Box elder	7.1	1	
2	Box elder	4.5	2	
3	Black walnut	12.8	3	
4	Black walnut	3.8	4	
5	Black locust	6.9	5	
6	Box elder	9.2	6	
7	Box elder	11.5	6	
8	Box elder	4.5	7	
9	Box elder	3.2	8	
10	Staghorn sumac	4.4	9	
11	Box elder	7.5	10	
12	Box elder	9.9	10	
13	American elm	9.6	11	
14	Box elder	5.0	12	
15	Box elder	3.5	13	
16	Box elder	4.1	14	
17	Box elder	9.0	15	
18	Box elder	5.4	15	
19	Box elder	9.1	16	
20	Box elder	12.0	17	
21	Box elder	10.1	17	
22	Box elder	10.7	17	
23	Box elder	10.3	17	
24	Box elder	11.6	17	
25	Black walnut	3.5	18	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
26	Black walnut	5.0	19	
27	Black walnut	5.1	20	
28	Black walnut	3.0	21	
29	Black walnut	3.4	21	
30	Staghorn sumac	3.1	22	
31	Black walnut	3.8	23	
32	Black locust	6.4	24	
33	Black locust	4.4	25	
34	Box elder	3.7	26	
35	Box elder	8.1	27	
36	Box elder	9.9	27	
37	Box elder	4.4	28	
38	Box elder	9.4	29	
39	Box elder	7.2	30	
40	Box elder	10.4	31	
41	Box elder	8.8	31	
42	Box elder	14.9	32	
43	Box elder	6.0	33	
44	Box elder	11.7	33	
45	Cottonwood	11.0	34	
46	Box elder	6.0	35	
47	Box elder	12.5	36	
48	Box elder	10.0	36	
49	Box elder	5.6	37	
50	Box elder	5.3	37	
51	Box elder	15.0	38	
52	Box elder	9.7	38	
53	Box elder	7.8	39	
54	Box elder	4.1	40	
55	Box elder	10.4	40	
56	Black locust	14.2	41	
57	Black locust	13.5	42	
58	Black locust	9.8	43	
59	Black locust	12.4	43	
60	Black locust	5.7	43	
61	Box elder	14.7	44	
62	Box elder	5.4	45	
63	Box elder	8.4	45	
64	Black locust	9.9	46	
65	Box elder	3.9	47	
66	Box elder	10.3	48	
67	Black locust	13.8	49	
68	Box elder	30.5	50	
69	Black locust	4.1	51	
70	Box elder	4.1	52	
71	Box elder	3.7	52	
72	Box elder	6.8	53	
73	Box elder	6.3	54	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
74	Box elder	16.1	55	
75	Box elder	9.2	56	
76	Box elder	14.2	57	
77	Box elder	7.0	57	
78	Box elder	12.6	58	
79	Box elder	14.0	58	
80	Box elder	15.5	59	
81	Box elder	15.9	59	
82	Box elder	8.1	60	
83	Box elder	6.9	60	
84	Box elder	9.5	61	
85	Box elder	15.2	62	
86	Box elder	12.9	63	
87	Black locust	3.5	64	
88	Black walnut	4.1	65	
89	Black walnut	4.6	66	
90	Black locust	8.1	67	
91	Box elder	15.6	68	
92	Box elder	21.8	69	
93	Box elder	17.3	70	
94	Box elder	7.3	71	
95	Box elder	6.1	71	
96	Box elder	13.0	71	
97	Box elder	10.5	71	
98	Box elder	6.4	71	
99	Box elder	17.7	72	
100	Box elder	5.5	73	
101	Box elder	9.1	73	
102	Box elder	15.0	74	
103	Black walnut	5.3	75	
104	Black walnut	9.2	76	
105	Box elder	4.4	77	
106	Box elder	5.4	77	
107	Box elder	4.6	77	
108	Box elder	10.0	78	
109	Box elder	6.6	78	
110	Box elder	13.4	78	
111	Box elder	11.5	79	
112	Box elder	10.0	79	
113	American elm	25.5	80	
114	Box elder	18.2	81	Possible roost tree
115	Box elder	12.8	82	
116	Box elder	15.0	83	
117	Box elder	9.5	84	
118	Box elder	12.2	85	
119	Box elder	7.5	86	
120	Black walnut	5.0	87	
121	Norway maple	4.3	88	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Tag #	Species	(in) DBH	Tree #	Notes
122	Box elder	4.6	89	
123	Box elder	4.3	89	
124	Black walnut	4.1	90	
125	Box elder	3.5	91	
126	Box elder	14.0	92	
127	Box elder	14.5	92	
128	Box elder	5.2	93	
129	Staghorn sumac	5.0	94	
130	Staghorn sumac	5.8	95	
131	Box elder	12.4	96	
132	Box elder	16.4	97	
133	Box elder	12.0	98	
134	Box elder	8.5	98	
135	Box elder	10.6	98	
136	Box elder	14.3	99	
137	Box elder	5.7	100	
138	Box elder	4.2	100	
139	Box elder	4.5	101	
140	Box elder	6.0	101	
141	Box elder	7.5	102	
142	Box elder	5.0	102	
143	Box elder	4.5	102	
144	Staghorn sumac	3.8	103	
145	Staghorn sumac	4.1	104	
146	Staghorn sumac	3.8	105	
147	Staghorn sumac	5.7	106	
148	Box elder	4.5	107	
149	Box elder	6.0	107	
150	Cottonwood	9.9	108	
151	Cottonwood	48.0	108	
152	Box elder	5.0	109	
153	Black walnut	3.1	110	
154	Box elder	7.0	111	
155	Box elder	5.5	111	
156	Box elder	6.2	111	
157	Box elder	4.9	112	
158	Box elder	4.8	112	
159	Box elder	4.4	112	
160	Box elder	15.3	113	
161	Black walnut	9.0	114	
162	Box elder	16.8	115	
163	Box elder	24.0	115	
164	Box elder	10.3	116	
165	Box elder	10.0	116	
166	Box elder	5.5	116	
167	Cottonwood	12.0	117	
168	Cottonwood	14.4	118	
169	Cottonwood	10.0	119	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
170	Cottonwood	12.5	120	
171	Cottonwood	8.9	120	
172	Cottonwood	10.6	121	
173	Cottonwood	9.0	122	
174	Cottonwood	13.0	123	
175	Box elder	13.4	124	
176	Box elder	11.6	124	
177	Box elder	13.2	124	
178	Box elder	6.3	125	
179	Staghorn sumac	3.6	126	
180	Box elder	5.5	127	
181	Box elder	4.3	127	
182	Box elder	4.8	127	
183	Box elder	3.7	128	
184	Box elder	3.9	128	
185	Box elder	12.7	129	
186	Box elder	8.5	129	
187	Box elder	5.7	129	
188	Box elder	6.8	130	
189	Box elder	3.1	131	
190	Box elder	3.8	132	
191	Box elder	6.2	133	
192	Box elder	9.0	134	
193	Box elder	3.2	135	
194	Box elder	8.2	136	
195	Box elder	8.2	137	
196	Box elder	7.2	137	
197	Box elder	14.4	137	
198	Box elder	9.0	137	
199	Box elder	5.2	137	
200	Box elder	12.2	138	
201	Box elder	7.5	138	
202	Box elder	7.6	138	
203	Box elder	8.5	138	
204	Box elder	4.5	138	
205	Box elder	5.8	138	
206	Box elder	3.8	138	
207	Box elder	7.0	138	
208	Box elder	6.2	138	
209	Box elder	6.8	139	
210	Box elder	5.8	140	
211	Box elder	4.5	141	
212	Box elder	11.0	141	
213	Black walnut	4.3	142	
214	Box elder	7.2	143	
215	Box elder	12.0	143	
216	Box elder	4.0	144	
217	Box elder	4.5	144	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
218	Box elder	11.0	144	
219	Box elder	10.0	145	
220	Box elder	9.0	145	
221	Box elder	7.3	145	
222	Box elder	7.6	146	
223	Box elder	8.5	146	
224	Box elder	3.8	147	
225	Box elder	3.5	148	
226	Box elder	6.0	149	
227	Box elder	5.0	149	
228	Box elder	4.0	150	
229	Box elder	5.2	150	
230	Box elder	5.3	150	
231	Box elder	6.0	150	
232	Box elder	7.4	150	
233	Box elder	5.2	150	
234	Box elder	8.0	151	
235	Box elder	8.4	151	
236	Cottonwood	27.0	152	
237	Cottonwood	29.0	152	
238	Cottonwood	25.2	152	
239	Cottonwood	24.5	152	
240	Box elder	6.3	153	
241	Box elder	5.0	154	
242	Box elder	7.4	155	
243	Box elder	7.2	156	
244	Box elder	10.4	157	
245	Box elder	8.3	157	
246	Box elder	4.6	158	
247	Box elder	5.6	159	
248	Box elder	4.3	160	
249	Sweet cherry	5.2	161	
250	Cottonwood	15.6	162	
251	Cottonwood	31.0	162	
252	Box elder	3.5	163	
253	Box elder	7.0	164	
254	Box elder	17.5	165	
255	Box elder	9.3	165	
256	Cottonwood	10.6	166	
257	Box elder	5.5	167	
258	Box elder	5.4	168	
259	Cottonwood	7.9	169	
260	Box elder	6.1	170	
261	Cottonwood	9.7	171	
262	Box elder	3.0	172	
263	Box elder	10.3	173	
264	Box elder	6.0	174	
265	Box elder	5.2	175	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
266	Box elder	9.6	176	
267	Box elder	13.3	176	
268	Cottonwood	8.5	177	
269	Norway maple	6.5	178	
270	Box elder	6.8	179	
271	Cottonwood	12.6	180	
272	Box elder	4.9	181	
273	Cottonwood	12.6	182	
274	Cottonwood	9.1	183	
275	Box elder	3.5	184	
276	Cottonwood	9.7	185	
277	Box elder	5.4	186	
278	Cottonwood	9.0	187	
279	Cottonwood	9.2	188	
280	Cottonwood	9.1	189	
281	Cottonwood	10.6	190	
282	Box elder	11.3	191	
283	Cottonwood	9.7	192	
284	Box elder	7.3	193	
285	Cottonwood	12.2	194	
286	Box elder	15.6	195	
287	Box elder	8.1	196	
288	Box elder	14.0	196	
289	Cottonwood	8.9	197	
290	Box elder	11.2	198	
291	Box elder	12.3	199	
292	Box elder	5.3	200	
293	Box elder	11.4	201	
294	Box elder	3.2	202	
295	Box elder	3.4	203	
296	Box elder	7.4	204	
297	Box elder	13.0	205	
298	Box elder	11.7	206	
299	Box elder	16.7	206	
300	Box elder	4.8	207	
301	Box elder	5.2	208	
302	Box elder	13.4	209	
303	Box elder	11.5	210	
304	Box elder	8.0	211	
305	Box elder	8.6	211	
306	Box elder	5.2	212	
307	Box elder	14.4	213	
308	Box elder	3.5	214	
309	Box elder	13.5	215	
310	Box elder	6.6	216	
311	Box elder	6.1	217	
312	Box elder	15.8	218	
313	Box elder	9.5	219	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
314	Box elder	9.8	219	
315	Box elder	11.0	219	
316	Box elder	6.2	220	
317	Box elder	12.2	221	
318	Box elder	13.4	222	
319	Box elder	7.0	223	
320	Box elder	12.5	223	
321	Box elder	10.6	223	
322	Box elder	5.0	224	
323	Box elder	7.5	225	
324	Box elder	9.3	226	
325	Box elder	8.0	226	
326	Box elder	3.5	227	
327	Box elder	7.5	228	
328	Box elder	5.6	229	
329	Box elder	9.1	229	
330	Box elder	5.4	229	
331	Black walnut	4.7	230	
332	Black walnut	3.3	231	
333	Box elder	5.2	232	
334	Box elder	7.0	233	
335	Box elder	12.0	234	
336	Box elder	3.4	235	
337	Box elder	4.1	235	
338	Box elder	3.5	235	
339	Box elder	3.4	235	
340	Box elder	16.5	236	
341	Box elder	7.2	236	
342	Box elder	4.0	237	
343	Box elder	3.0	237	
344	Box elder	8.0	238	
345	Box elder	9.6	239	
346	Box elder	4.0	240	
347	Box elder	9.7	241	
348	Box elder	7.0	242	
349	Box elder	8.0	243	
350	Box elder	6.7	244	
351	Box elder	6.8	245	
352	Box elder	7.3	246	
353	Box elder	24.1	247	
354	Box elder	8.5	248	
355	White willow	16.5	249	
356	White willow	20.1	249	
357	White willow	17.2	249	
358	White willow	13.0	249	
359	White willow	22.2	249	
360	Box elder	5.4	250	
361	Box elder	4.5	251	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Tag #	Species	(in) DBH	Tree #	Notes
362	White willow	22.1	252	
363	White willow	31.0	252	
364	White willow	14.8	252	
365	White willow	21.8	252	
366	White willow	16.0	252	
367	Cottonwood	12.2	253	
368	Box elder	8.9	254	
369	Box elder	9.3	255	
370	Box elder	9.7	255	
371	Box elder	10.8	256	
372	Box elder	8.0	257	
373	Box elder	10.4	257	
374	Box elder	7.7	257	
375	Box elder	6.8	257	
376	Box elder	5.7	257	
377	Box elder	6.4	257	
378	Box elder	7.5	258	
379	Box elder	6.0	259	
380	Box elder	5.2	259	
381	Box elder	13.8	259	
382	Box elder	10.0	260	
383	Box elder	6.2	261	
384	Box elder	13.3	262	
385	Box elder	3.9	263	
386	Box elder	14.6	264	
387	Box elder	10.9	265	
388	Box elder	14.4	266	
389	Box elder	16.4	267	
390	Box elder	5.1	268	
391	Box elder	8.3	269	
392	Box elder	25.1	269	
393	Box elder	14.6	270	
394	Black walnut	5.5	271	
395	Black walnut	8.3	272	
396	Black walnut	3.1	273	
397	Staghorn sumac	4.0	274	
398	Black walnut	7.4	275	
399	Box elder	4.0	276	
400	Black walnut	8.4	277	
401	Black walnut	6.3	277	
402	Box elder	11.6	278	
403	Green ash	7.6	279	
404	Green ash	6.0	279	
405	Box elder	3.1	280	
406	Staghorn sumac	3.8	281	
407	Box elder	6.9	282	
408	Box elder	5.3	282	
409	Box elder	5.3	282	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
410	Box elder	6.2	282	
411	Box elder	16.2	283	
412	White willow	11.0	284	
413	White willow	20.2	284	
414	White willow	15.5	284	
415	White willow	16.6	284	
416	White willow	17.8	284	
417	White willow	15.8	284	
418	White willow	16.2	284	
419	Box elder	9.7	285	
420	Box elder	3.5	285	
421	Box elder	5.3	285	
422	Box elder	7.0	285	
423	Box elder	4.3	285	
424	Box elder	11.0	286	
425	Cottonwood	13.5	287	
426	Cottonwood	13.3	288	
427	Cottonwood	15.0	289	
428	Box elder	3.5	290	
429	Box elder	4.2	290	
430	Box elder	4.1	290	
431	Box elder	3.8	290	
432	Box elder	4.6	291	
433	Box elder	5.2	291	
434	Black walnut	3.5	292	
435	Staghorn sumac	3.1	293	
436	Box elder	13.4	294	
437	Box elder	9.9	295	
438	Box elder	16.2	295	
439	Black walnut	4.0	296	
440	Box elder	14.1	297	Downed live tree
441	Box elder	8.1	298	Downed live tree
442	Box elder	9.7	298	Downed live tree
443	Box elder	6.4	299	
444	Box elder	5.3	300	
445	Box elder	5.2	300	
446	Box elder	5.0	300	
447	Box elder	5.0	301	
448	Box elder	6.5	301	
449	Box elder	5.0	301	
450	Box elder	4.3	301	
451	Box elder	3.5	301	
452	Box elder	4.0	301	
453	Staghorn sumac	5.0	302	
454	Black walnut	4.1	303	
455	Box elder	22.6	304	
456	Box elder	12.2	304	
457	Box elder	15.7	304	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
458	Box elder	13.2	305	
459	Box elder	10.6	306	
460	Staghorn sumac	4.1	307	
461	Box elder	13.8	308	
462	Box elder	17.4	309	
463	Box elder	13.5	310	
464	American elm	23.2	311	
465	Black walnut	5.2	312	
466	Staghorn sumac	3.5	313	
467	Staghorn sumac	3.8	314	
468	Cottonwood	3.1	315	
469	Red maple	24.2	316	
470	Box elder	9.2	317	
471	Norway maple	4.1	318	
Area 2 Western Riparian Area				
472	Black walnut	10.0	319	
473	Black walnut	8.0	320	
474	Black walnut	23.0	321	
475	Norway maple	8.5	322	
476	Sugar maple	12.2	323	
477	Black cherry	24.4	324	
478	Black walnut	13.5	325	
479	Black walnut	14.6	326	
480	Black walnut	8.0	327	
481	Black walnut	8.2	328	
482	Black walnut	19.2	329	
483	Norway maple	5.5	330	
484	Norway maple	18.0	330	
485	Norway maple	15.5	330	
486	Green ash	14.7	331	
487	Black cherry	25.2	332	
488	Black walnut	18.7	333	
489	Black walnut	4.0	334	
490	Silver maple	13.5	335	
491	Silver maple	18.8	335	
492	Silver maple	18.4	335	
493	Silver maple	25.6	335	
494	Silver maple	28.0	335	
495	Silver maple	30.0	335	
496	Silver maple	15.8	335	
497	Silver maple	7.0	335	
498	Silver maple	9.0	335	
499	Basswood	6.5	336	
500	American elm	10.0	337	
501	Basswood	18.2	338	
502	Basswood	6.5	339	
503	Basswood	4.8	339	
504	Black cherry	14.9	340	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
505	American elm	4.6	341	
506	Box elder	5.2	342	
507	American elm	10.2	343	
508	Norway maple	4.3	344	
509	American elm	17.0	345	
510	American elm	9.5	346	
511	Box elder	5.0	347	
512	Black cherry	11.5	348	
513	Black cherry	19.0	349	
514	Box elder	30.7	350	
515	Box elder	3.5	351	
516	Box elder	4.3	351	
517	Box elder	3.5	351	
518	Black walnut	20.0	352	
519	Box elder	5.3	353	
520	Box elder	14.1	354	
521	Box elder	10.5	355	
522	Norway maple	5.0	356	
523	Black cherry	17.2	357	
524	American elm	9.1	358	
525	Black walnut	5.7	359	
526	American elm	4.3	360	
527	Black walnut	10.4	361	
528	Black walnut	26.4	362	
529	Black cherry	36.5	363	
530	Cottonwood	14.7	364	
531	American elm	6.6	365	
532	Black cherry	22.0	366	
533	Black cherry	9.5	367	
534	Box elder	5.3	368	
535	Box elder	8.1	369	
536	Black walnut	17.1	370	
537	Black walnut	24.4	371	
538	Black cherry	7.5	372	
539	Box elder	12.1	373	
540	Box elder	17.0	374	
541	Black locust	24.1	375	Possible roost tree
542	Black locust	24.2	375	Possible roost tree
543	Norway maple	3.8	376	
544	Black walnut	9.6	377	
545	Black cherry	26.2	378	
546	Red maple	18.1	379	
547	Red maple	18.2	379	
548	Red maple	7.1	379	
549	Red maple	7.2	379	
550	Red maple	19.0	379	
551	Red maple	16.0	379	
552	Red maple	7.8	379	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

ARCADIS Design & Consultancy for natural and built assets

Tag #	Species	(in) DBH	Tree #	Notes
553	Red maple	7.2	379	
554	Black walnut	8.6	380	
555	Black cherry	20.7	381	
556	Black cherry	6.9	382	
557	Black walnut	4.9	383	
558	American elm	5.4	384	
559	Box elder	7.5	385	
560	Box elder	23.5	386	
561	Black walnut	13.2	387	
562	Box elder	10.0	388	
563	Box elder	3.5	388	
564	Box elder	7.1	389	
565	Box elder	6.8	390	
566	Box elder	5.2	390	
567	Box elder	6.0	391	
568	White willow	51.0	392	Possible roost tree
569	Black cherry	16.2	393	
570	American elm	11.4	394	
571	Black cherry	20.2	395	
572	Box elder	6.8	396	
573	Box elder	13.6	397	
574	Box elder	8.4	397	
575	Box elder	5.3	397	
576	Box elder	4.1	398	
577	Silver maple	18.2	399	
578	Silver maple	7.8	399	
579	Silver maple	19.8	399	
580	Silver maple	25.3	399	
581	Silver maple	17.3	399	
582	Black walnut	12.3	400	
583	Black walnut	6.5	401	
584	Black walnut	10.0	401	
585	Black walnut	8.1	402	
586	Box elder	8.4	403	
587	Box elder	8.7	404	
588	Box elder	3.8	405	
589	Box elder	7.6	405	
590	Box elder	4.3	405	
591	Box elder	9.9	406	
592	Box elder	6.6	406	
593	Black locust	17.5	407	
594	Box elder	3.5	408	
595	Box elder	4.5	409	
596	Box elder	12.6	410	
597	Box elder	3.7	411	
598	White willow	40.8	412	
599	Box elder	21.3	413	
600	Box elder	9.5	414	

Table 2
Tree Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Tag #	Species	(in) DBH	Tree #	Notes
601	Box elder	3.4	414	
602	American elm	9.1	415	
603	Black walnut	13.8	416	
604	Black walnut	20.2	417	
605	Box elder	10.9	418	
606	Box elder	10.3	418	
607	Box elder	4.0	419	
608	Box elder	19.7	419	
609	Box elder	20.5	419	
610	Box elder	6.9	420	
611	Staghorn sumac	6.7	421	
612	Black walnut	14.6	422	
613	Box elder	16.5	423	
614	Box elder	9.8	423	
615	Box elder	9.4	423	
616	Box elder	12.1	423	
617	Box elder	9.8	423	
618	Box elder	7.6	424	
619	Box elder	7.5	424	

Acronyms and Abbreviations:

DBH = diameter breast height

in = inches

Table 3
Vegetative Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Habitat Area	Dominant Vegetative Species[1]		
	Canopy	Understory	Herbaceous
Armored	American elm	Common buckthorn	Cleavers
	Green ash	Green ash	Reed canary grass
	White willow	Tartarian honeysuckle	Seedlings of maple, buckthorn
Percent Cover (%)[2]:	40 to 50	70	50 to 60
Disturbed (Non-Forested)			Mixed grasses
			Reed canary grass
			Swamp milkweed
			Teasel
Percent Cover (%)[2]:	0	0	50
Disturbed (Forested) (Type 1)	Black locust	Common buckthorn	Beggar's ticks
	Black walnut	Tartarian honeysuckle	Bull thistle
	Box elder		Garlic mustard
	White willow		Wild lettuce
Percent Cover (%)[2]:	50	30	80
Disturbed (Forested) (Type 2)	Silver maple	American elm	Creeping buttercup
	Black cherry	Riverbank grape	Purple loosestrife
	Black locust	Silky dogwood	Reed canary grass
	Black walnut	Tartarian honeysuckle	Spotted jewelweed
	White willow		Water horehound
Percent Cover (%)[2]:	40	30	80
Emergent Wetland			American bur-reed
			Arrow arum
			Broadleaf cattail
			Purple loosestrife
Percent Cover (%)[2]:	0	0	90 to 100
Herbaceous			Barnyard grass
			Common boneset
			Joe pye weed
			Purple loosestrife
			Reed canary grass
			Swamp milkweed
Percent Cover (%)[2]:	0	0	90 to 100
Scrub-shrub		Common buckthorn	Seedlings of buckthorn
		Silky dogwood	Cleavers
		Tartarian honeysuckle	Curly dock
Percent Cover (%)[2]:	0	70 to 80	20 to 30

Table 3
Vegetative Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Habitat Area	Dominant Vegetative Species[1]		
	Canopy	Understory	Herbaceous
Forested (Natural)	Black locust	Box elder	Bittersweet nightshade
	Box elder	Green ash	Clearweed
		Multiflora rose	Cleavers
		Tartarian honeysuckle	Creeping charlie
			Late goldenrod
			Stinging nettle
			Virginia rye
Percent Cover (%)[2]:	40	70	90 to 100
Mudflat			American bur-reed
			Arrow arum
			Beggar's ticks
			Bittersweet nightshade
			Purple loosestrife
			Reed canary grass
			Virginia rye
Percent Cover (%)[2]:	0	0	25
Floodplain bench	American elm	Box elder saplings	Burdock
	Black walnut	Common buckthorn	Creeping buttercup
	Box elder	Green ash saplings	Curly dock
	Silver maple	Multiflora rose	Forget-me-not
	White willow	Silky dogwood	Reed canary grass
		Tartarian honeysuckle	Water horehound
Percent Cover (%)[2]:	50	20	95

Notes:

1. Common names are provided for dominant vegetative species.
2. Percent cover is based on visual estimates.

Table 4
Bank Erosion Hazard Index Summary
NYSEG - Cortland-Homer Former MGP Site
Homer, New York

Remedial Area	Bank Height [BH] (ft)	Bankfull Height[1] [BFH] (ft)	Ratio BH/BFH	Rating Score	Root Depth [RD] (ft)	Ratio RD/BH	Rating Score	Root Density (%)	Rating Score	Bank Angle (°)	Rating Score	Surface Protection (%)	Rating Score	Material Adjustment	Stratification Adjustment	Total Score	BEHI Rating
Area 1																	
BS-1	3.10	1.7	1.8	7.0	1	0.32	5.7	90	1.5	30	2.4	90	1.5	0	0	18.0	Low
BS-2	4.20	2.1	2.0	7.9	0.33	0.08	8.7	35	5.5	20	1.9	40	5.1	0	0	29.1	Moderate
BS-3	2.00	1.5	1.3	4.6	0.33	0.17	7.6	20	7.2	20	1.9	20	7.2	0	0	28.6	Moderate
BS-4	3.20	2.9	1.1	1.9	0.67	0.21	7.1	95	1.2	20	1.9	95	1.2	0	0	13.3	Low
BS-5	5.50	2.6	2.1	8.0	0.33	0.06	8.9	35	5.5	25	2.2	35	5.5	5	5	40.1	Very High
BS-6	7.70	3.0	2.6	8.7	2	0.26	6.4	75	2.3	25	2.2	75	2.3	0	0	21.9	Moderate
Area 2																	
BS-1	5.30	1.9	2.8	9.0	1.2	0.23	6.8	70	2.7	35	2.7	75	2.3	-5	0	18.5	Low
BS-2	4.90	2.3	2.1	8.0	0.67	0.14	8.0	95	1.2	30	2.4	100	1.0	-5	5	20.7	Moderate
BS-3	9.00	2.7	3.3	10.0	0.33	0.04	10	70	2.7	40	2.9	80	1.9	0	5	32.5	High
BS-4	6.50	2.4	2.7	8.9	0.83	0.13	8.1	75	2.3	25	2.2	80	1.9	0	0	23.4	Moderate
BS-5	2.40	1.8	1.3	4.6	0.67	0.28	6.1	85	1.7	20	1.9	90	1.5	0	0	15.8	Low
BS-6	4.00	2.0	2.0	7.9	0.33	0.08	8.7	70	2.7	25	2.2	90	1.5	5	0	27.9	Moderate
BS-7	3.80	2.4	1.6	6.0	0.33	0.09	8.6	60	3.5	38	2.8	60	3.5	5	0	29.4	Moderate

Acronyms and Abbreviations:

ft - feet

Notes:

1. Bankfull height marking based on visual estimators like scour lines and vegetation changes, which is tied to ordinary high water marks in most cases.
2. Bank characteristics and risk ratings, as detailed in Rosgen (2001):

Table 1. Streambank characteristics used to develop Bank erosion Hazard Index (BEHI)

Adjective Hazard or risk rating categories		Bank Height/ Bankfull Ht	Root Depth/ Bank Height	Root Density %	Bank Angle (Degrees)	Surface Protection%	Totals
VERY LOW	Value	1.0-1.1	1.0-0.9	100-80	0-20	100-80	5-9.5
	Index	1.0-1.9	1.0-1.9	1.0-1.9	1.0-1.9	1.0-1.9	
LOW	Value	1.11-1.19	0.89-0.5	79-55	21-60	79-55	10-19.5
	Index	2.0-3.9	2.0-3.9	2.0-3.9	2.0-3.9	2.0-3.9	
MODERATE	Value	1.2-1.5	0.49-0.3	54-30	61-80	54-30	20-29.5
	Index	4.0-5.9	4.0-5.9	4.0-5.9	4.0-5.9	4.0-5.9	
HIGH	Value	1.6-2.0	0.29-0.15	29-15	81-90	29-15	30-39.5
	Index	6.0-7.9	6.0-7.9	6.0-7.9	6.0-7.9	6.0-7.9	
VERY HIGH	Value	2.1-2.8	0.14-0.05	14-5.0	91-119	14-10	40-45
	Index	8.0-9.0	8.0-9.0	8.0-9.0	8.0-9.0	8.0-9.0	
EXTREME	Value	>2.8	<0.05	<5	>119	<10	46-50
	Index	10	10	10	10	10	

For adjustments in points for specific nature of bank materials and stratification, the following is used:

Bank Materials: Bedrock (very low), Boulders (low), cobble (subtract 10 points unless gravel/sand>50%, then no adjustment), gravel (add 5-10 points depending on % sand), sand (add 10 points), silt/clay (no adjustment).
Stratification: Add 5-10 points depending on the number and position of layers.

FIGURES

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB: K.SARTORI PIC:/PM:/TM:D.CORNELL) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\NY02-Syracuse\2017\20170708\ACT\B0013137\0002\00004\DWG\OU-2-RD-WP\B0013137.0001 NYSEG-Homer.dwg LAYOUT: 4 SAVED: 5/19/2017 6:41 AM PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL-240.CTB PLOTTED: 2/28/2018 3:27 PM BY: BISTROVICH, JOE

XREFS: 13137XPB
IMAGES: 13137X01.tif
HomerNY_2016_500x.jpg
HomerNY_2016_M100x.jpg
HomerNY_2016_N100xa.jpg
HomerNY_2016_S100x.jpg

LEGEND:

- APPROXIMATE BOUNDARY OF NYSEG–OWNED PROPERTY
- 2013 PROBING TRANSECTS
- REMOVAL AREA
- FLOW DIRECTION

NOTES:

1. ALL LOCATIONS APPROXIMATE.
2. AERIAL PHOTOGRAPHY OBTAINED FROM Google Earth Pro™ DATED 2016.
3. HISTORICAL SEDIMENT SAMPLING LOCATIONS FROM FIGURES 5–16 THROUGH 5–19 AND DESCRIPTIONS ON TABLE 5–19 FROM STEARNS AND WHELER COMPANIES 2002 SRI REPORT.

0 350' 700'
GRAPHIC SCALE

NEW YORK

NYSEG - HOMER-CORTLAND FORMER MGP
HOMER, NEW YORK
HABITAT ASSESSMENT CHARACTERIZATION

SITE PLAN

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

City: Div/Group: Created By: Last Saved By: jbistrovich
Project (Project #)
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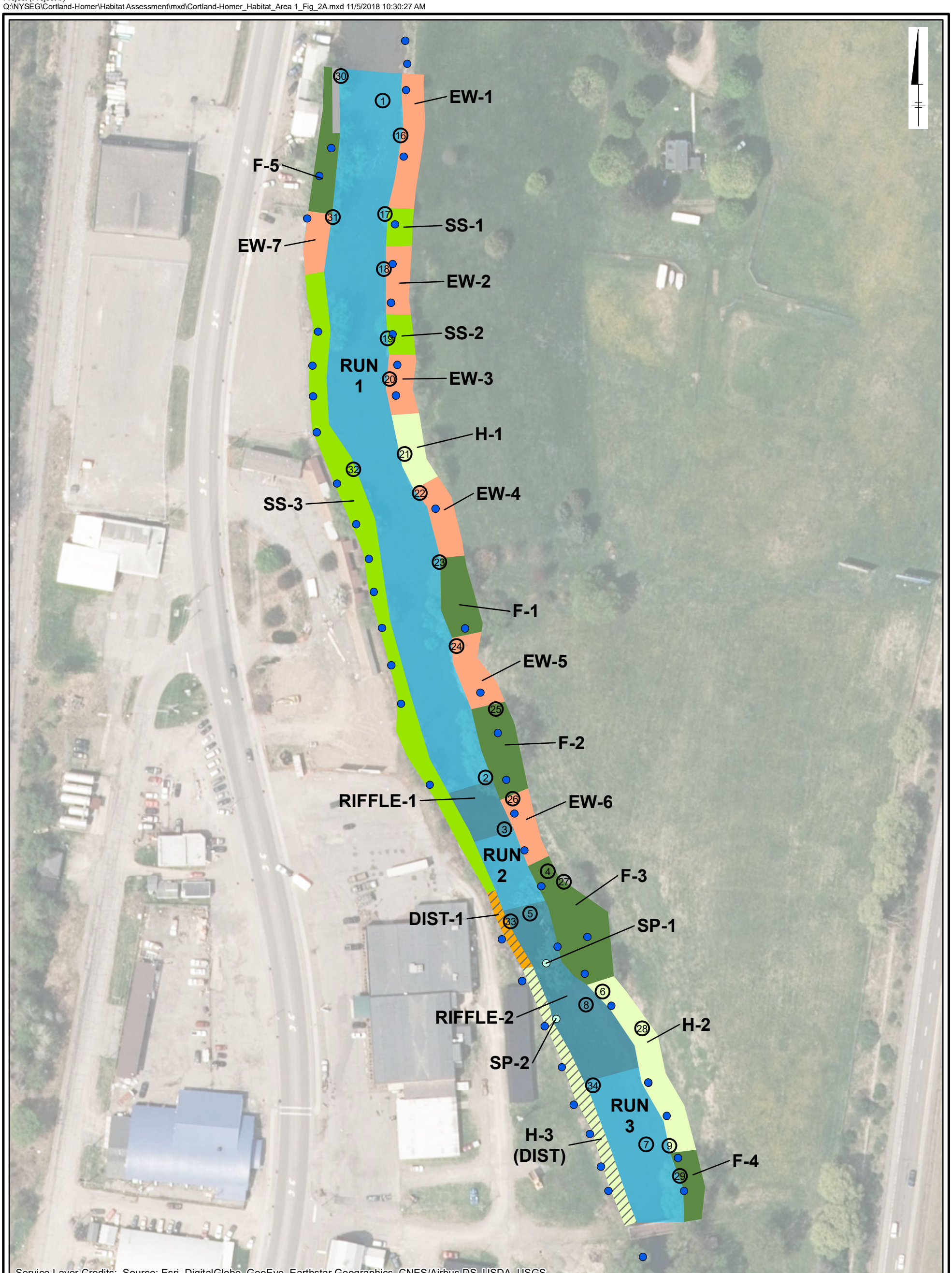

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- RUN
- RIFFLE
- EMERGENT WETLAND
- SCRUB/SHRUB
- HERBACEOUS
- HERBACEOUS (DISTURBED)
- FORESTED
- DISTURBED
- ARMORED BANK
- 12 PHOTO LOCATION
- MEAN HIGH WATER
- SCOUR POOL

0 100 200 Feet
GRAPHIC SCALE

NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

HABITAT ASSESSMENT CHARACTERIZATION

AREA 1 - IN-STREAM/BANK HABITAT AREAS AND ASSESSMENT POINTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2A

City: Div/Group: Created By: Last Saved By: jbistrovich
Project (Project #)
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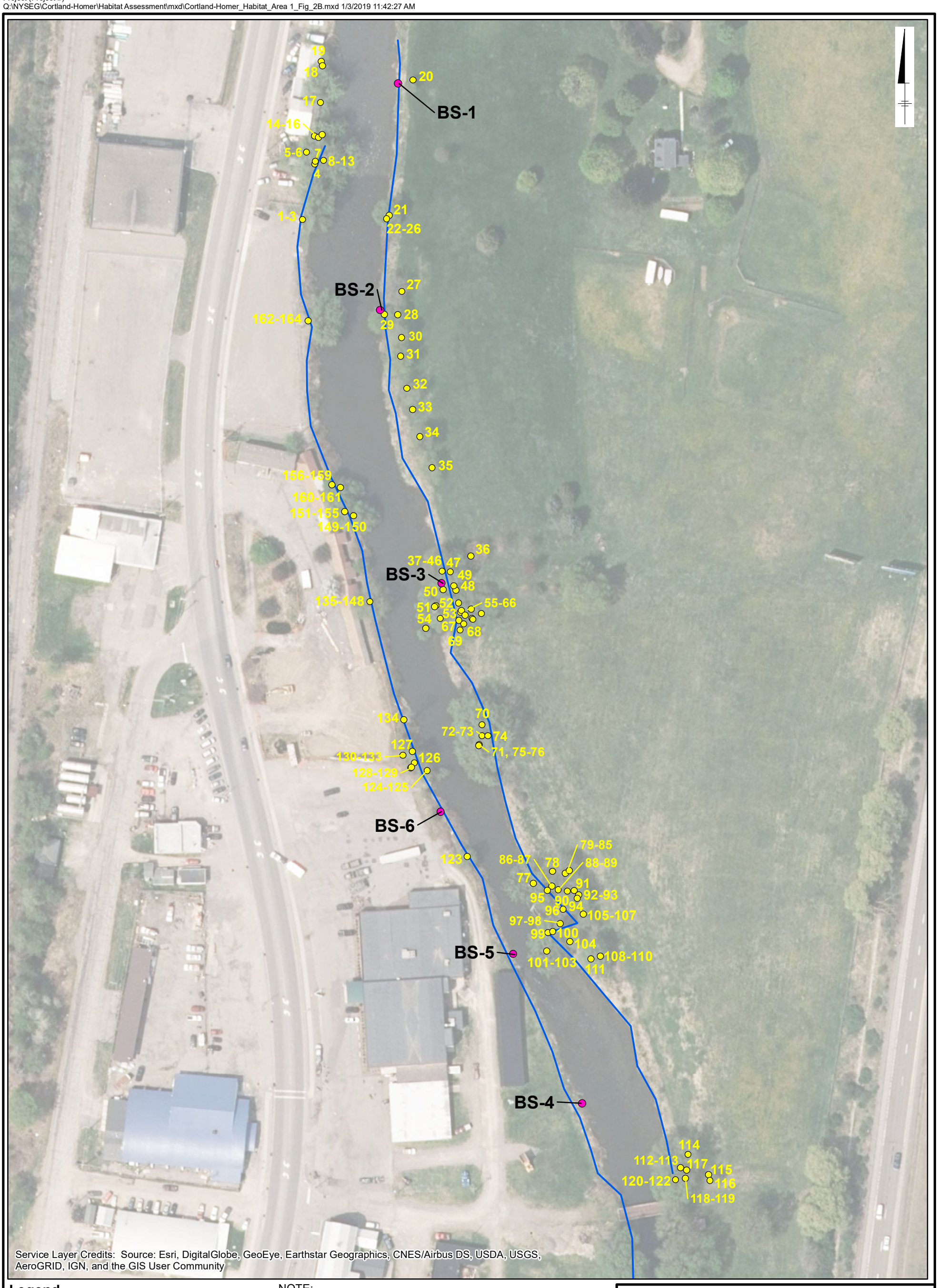


Legend

- MEAN HIGH WATER LEVEL
- BANK SLOPE AREAS
- TREE

GRAPHIC SCALE

NOTE:

1. THE MEAN HIGH WATER LEVEL LINE IS INTERPOLATED FROM INDIVIDUAL FIELD DELINEATED POINTS. FIELD DELINEATED POINTS INCLUDE 44 POINTS ALONG THE WEST SHORELINE AND 45 POINTS ALONG THE EAST SHORELINE AND WERE SURVEYED USING CONVENTIONAL SURVEY TECHNIQUES AND GPS. SPACING OF MEAN HIGH WATER LINE POINTS WAS APPROXIMATELY 50 TO 75 FEET.
2. TREE SURVEY INDICATES LOCATIONS OF TREES WITH GREATER THAN 3 INCHES DIAMETER AT BREAST HEIGHT (DBH) THAT MAY BE POTENTIALLY DISTURBED THROUGH REMEDIAL ACTIONS ALONG BANKS OR WITHIN STAGING AREA.

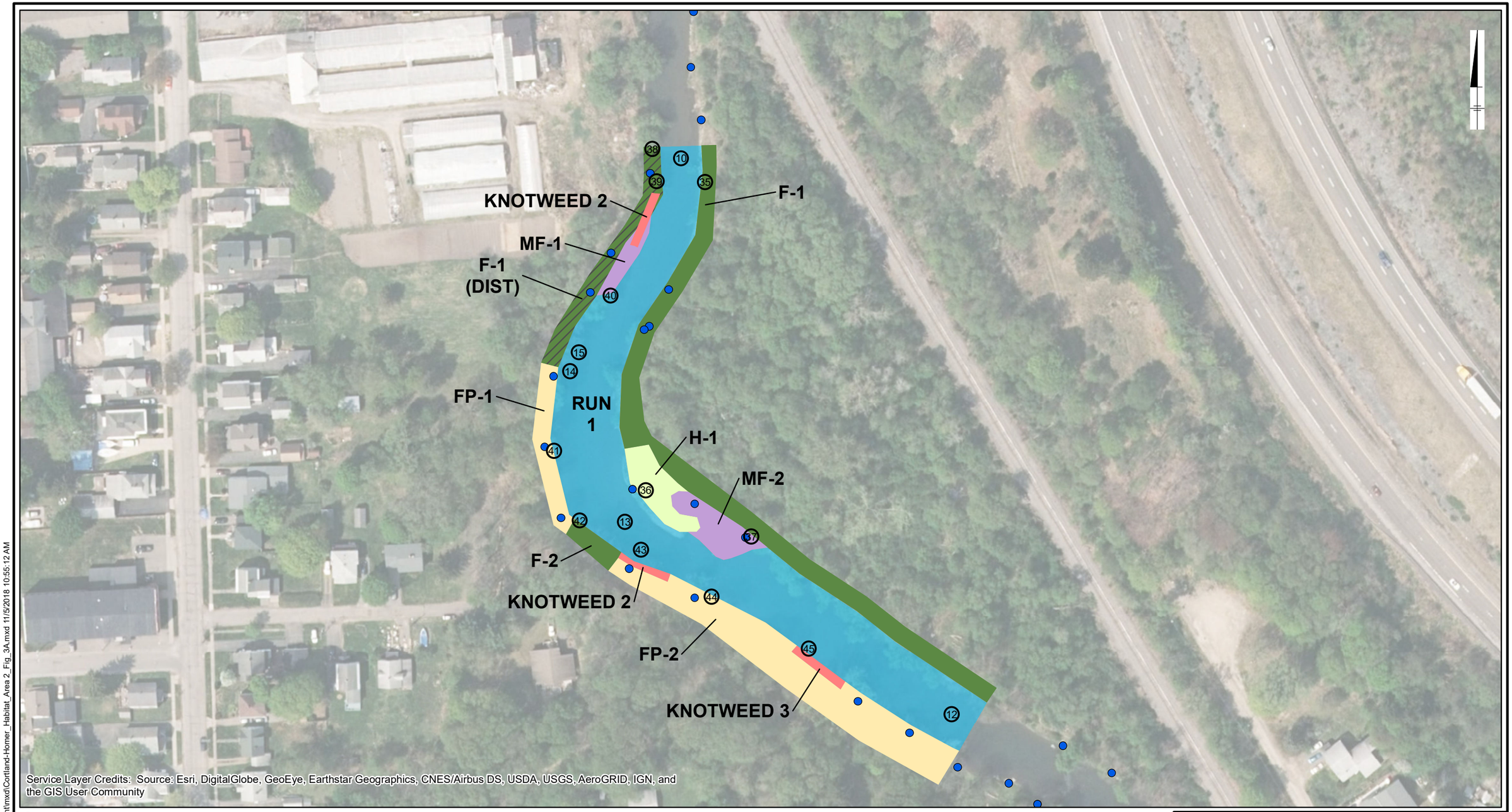
NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

HABITAT ASSESSMENT CHARACTERIZATION

AREA 1 - MHWL, BANK ASSESSMENT POINTS, AND TREE SURVEY

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2B



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- RUN
- HERBACEOUS
- FORESTED
- FORESTED (DISTURBED)
- FLOODPLAIN BENCH
- KNOTWEED
- MUDFLAT
- (12) PHOTO LOCATION
- MEAN HIGH WATER

0 100 200 Feet

GRAPHIC SCALE

NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

HABITAT ASSESSMENT CHARACTERIZATION

AREA 2 - IN-STREAM/BANK HABITAT AREAS AND ASSESSMENT POINTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3A

City: Div/Group: Created By: Last Saved By: jbistrovich
Project (Project #)
Q:\NYSEG\Cortland-Homer\Habitat Assessment\mxd\Cortland-Homer_Habitat_Area 2_Fig_3A.mxd 11/5/2018 10:55:12 AM

BS-3
BS-4
BS-5
BS-2
BS-6
BS-7
BS-1
STAGING AREA

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- MEAN HIGH WATER LEVEL
- BANK SLOPE AREAS
- TREE SURVEY

0 100 200 Feet
GRAPHIC SCALE

NOTES:

1. THE MEAN HIGH WATER LEVEL LINE IS INTERPOLATED FROM INDIVIDUAL FIELD DELINEATED POINTS. FIELD DELINEATED POINTS INCLUDE 44 POINTS ALONG THE WEST SHORELINE AND 45 POINTS ALONG THE EAST SHORELINE AND WERE SURVEYED USING CONVENTIONAL SURVEY TECHNIQUES AND GPS. SPACING OF MEAN HIGH WATER LINE POINTS WAS APPROXIMATELY 50 TO 75 FEET.
2. TREE SURVEY INDICATES LOCATIONS OF TREES WITH GREATER THAN 3 INCHES DIAMETER AT BREAST HEIGHT (DBH) THAT MAY BE POTENTIALLY DISTURBED THROUGH REMEDIAL ACTIONS ALONG BANKS OR WITHIN STAGING AREA.

NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

HABITAT ASSESSMENT CHARACTERIZATION

AREA 2 - IN-STREAM/BANK HABITAT AREAS AND ASSESSMENT POINTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3B

City: Div/Group: Created By: Last Saved By: jbistrovich
Project (Project #)
Q:\NYSEG\Cortland-Homer\Habitat Assessment\mxd\Cortland-Homer_Habitat_Area 2_Fig_3B.mxd 1/3/2019 11:39:54 AM

ATTACHMENT 1

Photograph Log

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 1

Date:
10/20/2017

Description:
Looking South downstream into RUN 1.

Location:
AREA 1 – RUN 1

Photo: 2

Date:
10/20/2017

Description:
Looking South downstream into RIFFLE 1.

Location:
AREA 1 – RIFFLE 1

Photo: 3

Date:
10/20/2017

Description:
Looking South downstream into RUN 2.

Location:
AREA 1 – RUN 2

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 4

Date:
10/20/2017

Description:
Looking North at small backwater area adjacent to RUN 2

Location:
AREA 1 – BACKWATER 1

Photo: 5

Date:
10/20/2017

Description:
Looking South downstream into RIFFLE 2

Location:
AREA 1 – RIFFLE 2

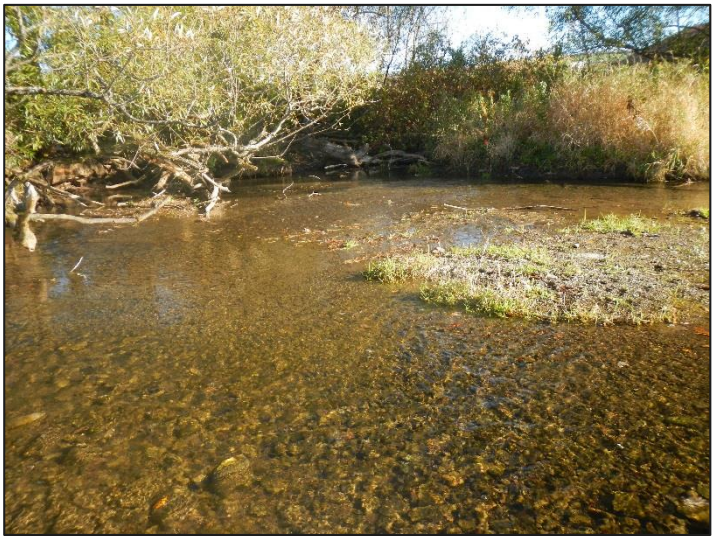


Photo: 6

Date:
10/20/2017

Description:
Looking East towards depositional bar adjacent to RIFFLE 2

Location:
AREA 1 – RIFFLE 2

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 7

Date:
10/20/2017

Description:
Looking South downstream into RUN 3

Location:
AREA-1 – RUN 3

Photo: 8

Date:
10/20/2017

Description:
Looking at relic shells and live zebra mussel on large cobble substrate within RIFFLE 2

Location:
AREA 1 – RIFFLE 2

Photo: 9

Date:
10/20/2017

Description:
Looking at submerged and emergent aquatic vegetation bed along eastern shoreline within RUN 3

Location:
AREA 1 – RUN 3

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

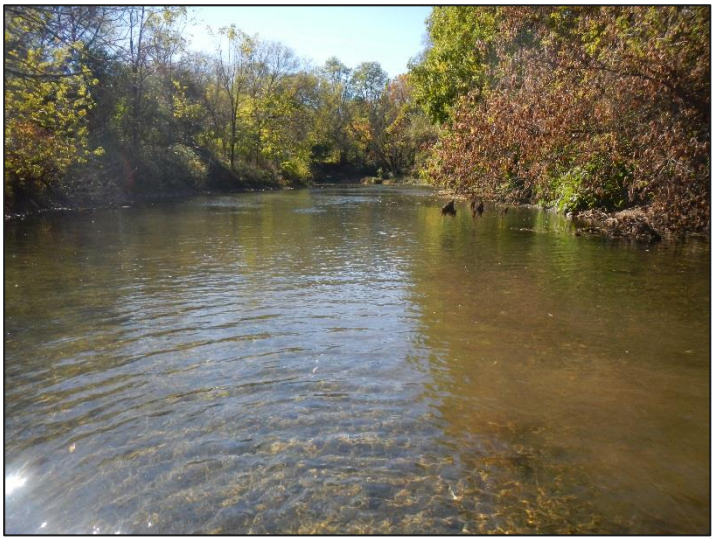


Photo: 10

Date:
10/20/2017

Description:
Looking South downstream into RUN 1

Location:
AREA 2 – RUN 1

Photo: 11

Date:
10/20/2017

Description:
Looking North upstream into seasonal backwater area

Location:
AREA 2 – BACKWATER 1

Photo: 12

Date:
10/20/2017

Description:
Looking West within downstream end of RUN 1 and at large woody debris

Location:
AREA 2 – RUN 1

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

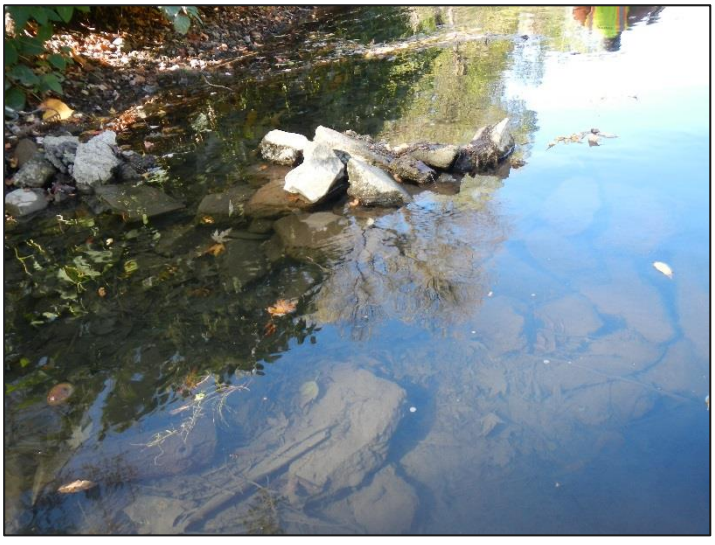


Photo: 13

Date:
10/20/2017

Description:
Looking North into man-made boulder wall along western bank at lower end of RUN 1

Location:
AREA 2 – RUN 1

Photo: 14

Date:
10/20/2017

Description:
Looking at submerged aquatic vegetation bed along western shoreline in middle section of RUN 1

Location:
AREA 2 – RUN 1

Photo: 15

Date:
10/20/2017

Description:
Looking West within middle section of RUN-1 at large bank beaver den

Location:
AREA 2 – RUN 1

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 16

Date:
10/20/2017

Description:
Looking Southeast into EW-1 bank habitat

Location:
AREA 1 – RUN 1

Photo: 17

Date:
10/18/2017

Description:
Looking East into top of SS-1 bank habitat

Location:
AREA 1 – RUN 1

Photo: 18

Date:
10/18/2017

Description:
Looking East into EW-2 bank habitat

Location:
AREA 1 – RUN 1

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 19

Date:
10/18/2017

Description:
Looking East into SS-2 bank habitat

Location:
AREA 1 – RUN 1

Photo: 20

Date:
10/18/2017

Description:
Looking Southeast into EW-3 bank habitat

Location:
AREA 1 – RUN 1

Photo: 21

Date:
10/18/2017

Description:
Looking East into H-1 bank habitat

Location:
AREA 1 – RUN-1

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 22

Date:
10/18/2017

Description:
Looking Southeast into EW-4 bank habitat

Location:
AREA 1 – RUN 1

Photo: 23

Date:
10/18/2017

Description:
Looking East into F-1 bank habitat

Location:
AREA 1 – RUN 1

Photo: 24

Date:
10/18/2017

Description:
Looking East into EW-5 bank habitat

Location:
AREA 1 – RUN-1

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 25

Date:
10/18/2017

Description:
Looking Southeast into F-2 bank habitat

Location:
AREA 1 – RUN 1

Photo: 26

Date:
10/18/2017

Description:
Looking East into EW-6 bank habitat

Location:
AREA 1 – RIFFLE 1

Photo: 27

Date:
10/18/2017

Description:
Looking East into F-3 bank habitat

Location:
AREA 1 – RUN 2

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 28

Date:
10/18/2017

Description:
Looking East into H-2 bank habitat

Location:
AREA 1 – RIFFLE 2

Photo: 29

Date:
10/18/2017

Description:
Looking Southeast into F-4 bank habitat

Location:
AREA 1 – RUN 3

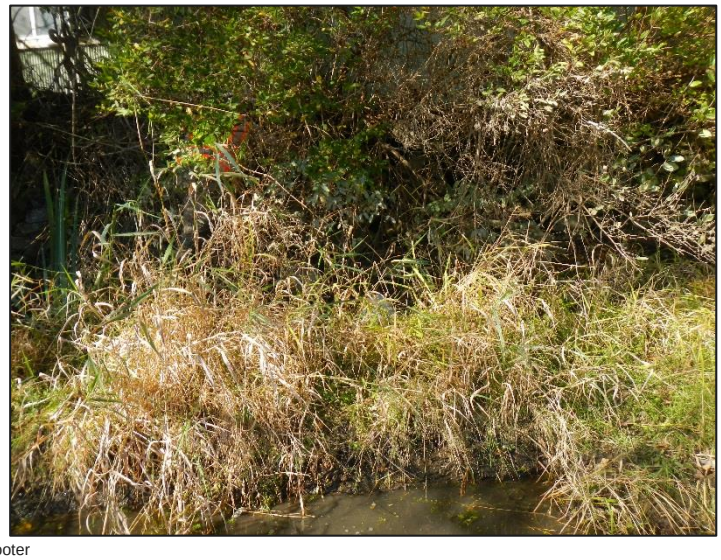


Photo: 30

Date:
10/18/2017

Description:
Looking West into F-5 bank habitat

Location:
AREA 1 – RUN 1

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 31

Date:
10/18/2017

Description:
Looking West into EW-7 bank habitat

Location:
AREA 1 – RUN 1

Photo: 32

Date:
10/18/2017

Description:
Looking West into SS-3 bank habitat

Location:
AREA 1 – RUN 1

Photo: 33

Date:
10/18/2017

Description:
Looking Southwest into DIST-1 bank habitat

Location:
AREA 1 – RIFFLE 2

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 34

Date:
10/18/2017

Description:
Looking South into H-3 (DIST) bank habitat

Location:
AREA 1 – RUN 3

Photo: 35

Date:
10/19/2017

Description:
Looking East into lower bank habitat of F-1

Location:
AREA 2 – RUN 1

Photo: 36

Date:
10/19/2017

Description:
Looking Northeast into H-1 bank habitat

Location:
AREA 2 – RUN 1

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 37

Date:
10/20/2017

Description:
Looking Northwest into MF-2 bank habitat

Location:
AREA 2 – RUN 1

Photo: 38

Date:
10/19/2017

Description:
Looking Southwest into lower bank habitat of F-1 (DIST)

Location:
AREA 2 – RUN 1

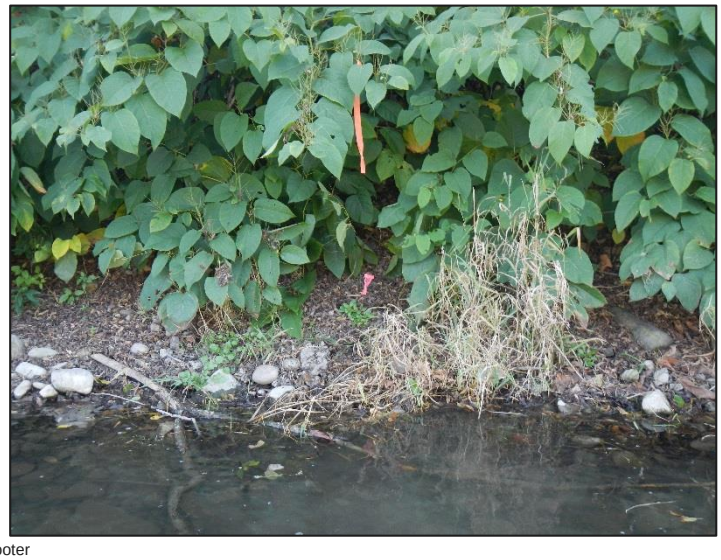


Photo: 39

Date:
10/19/2017

Description:
Looking West into KNOTWEED-1 bank habitat

Location:
AREA 2 – RUN 1

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 40

Date:
10/20/2017

Description:
Looking Northwest into MF-1 bank habitat

Location:
AREA 2 – RUN 1

Photo: 41

Date:
10/19/2017

Description:
Looking Southwest into FP-1 bank habitat

Location:
AREA 2 – RUN 1

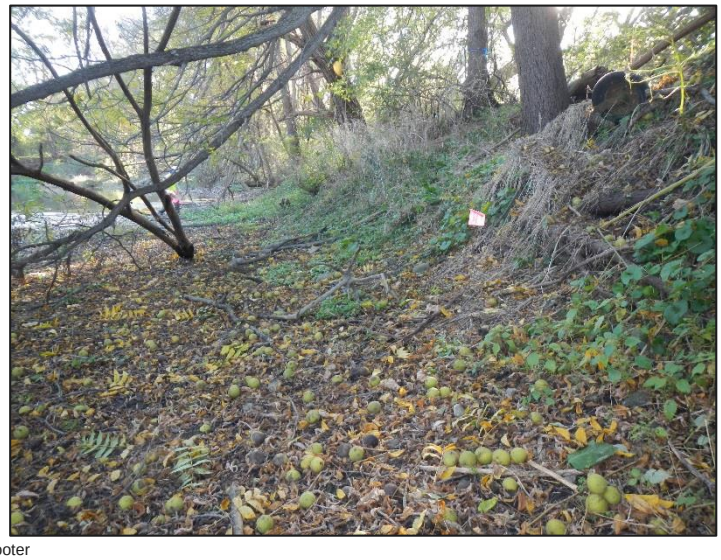


Photo: 42

Date:
10/19/2017

Description:
Looking South into F-2 bank habitat.

Location:
AREA 2 – RUN 1

Project Photographs

New York State Electric and Gas Corporation
Cortland-Homer Former MGP Site
Homer, NY

Photo: 43

Date:
10/19/2017

Description:
Looking South into KNOTWEED-2 bank habitat

Location:
AREA 2 – RUN 1

Photo: 44

Date:
10/19/2017

Description:
Looking Southwest into FP-2 bank habitat

Location:
AREA 2 – RUN 1

Photo: 45

Date:
10/19/2017

Description:
Looking Southwest into KNOTWEED-3 bank habitat.

Location:
AREA 2 – RUN 1

ATTACHMENT 3

Aquatic Resources Survey Report

MEMO

To:

Tracey Blazicek, NYSEG

Copies:

Artie Tompkins, Arcadis
Jason Kokkinos, Arcadis

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From:

Jason Golubski

Date:

January 29, 2019

Arcadis Project No.:

B0013137.0003

Subject:

Aquatic Resources Delineation Survey

NYSEG Cortland-Homer Former MGP Site

Arcadis conducted an aquatic resources delineation survey along the West Branch of the Tioughnioga River from July 10 to 11, 2018, to determine the extent of waters of the United States which include wetlands and other aquatic resources under the jurisdiction of the U.S. Army Corps of Engineers (USACE), and other aquatic resources under the jurisdiction of the New York Department of Environmental Conservation (NYSDEC).

The results and findings of this delineation survey will be used to support the restoration and permitting requirements to support the forthcoming remediation activities that will be regulated under the NYSDEC/USACE Joint Permit Application. The following details a summary of work performed and general findings of the aquatic resources delineation activities.

PROJECT SETTING

The project area consists of two sections of the West Branch of the Tioughnioga River targeted for remediation, which were surveyed along both banks. The aquatic resource delineation areas are shown on Figure 1. The latitude and longitude of the approximate center of each river section are listed below:

- Remedial Area 1 – West Branch Tioughnioga River (North) 42°37’16.65” N 76°10’59.13” W
- Remedial Area 2 – West Branch Tioughnioga River (South) 42°36’38.41” N 76°10’58.14” W

The landforms within the project area generally consist of floodplains with wetland terraces and upland hillslopes. The landscape surrounding the project area are dedicated to agriculture and light residential, urban, and industrial use, with forested areas in undeveloped parcels.

METHODOLOGY OVERVIEW

The project is located within Land Resource Region R - Northern Forage and Forest Region (United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) [USDA, NRCS 2006]). As such, the delineation was conducted in accordance with the Regional Supplement to the USACE Wetland Delineation Manual: Northeast and Northcentral (The Supplement) (USACE 2012). The Supplement is intended to be utilized in association with the USACE Wetlands Delineation Manual (the Manual) (Environmental Laboratory 1987).

The USACE and the Environmental Protection Agency (EPA) jointly define wetlands as:

> "…those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." (Environmental Laboratory, 1987)

From this regulatory definition, a three-parameter approach to identify and delineate wetlands was developed by the USACE. This approach dictates that, except for atypical and disturbed situations, wetlands contain hydrophytic vegetation, hydric soils, and wetland hydrology.

Vegetation Prevalence

A vegetation inventory (Table 1) was compiled and comparisons of different vegetative communities were made using simple qualitative means. The National Wetlands Plant List (Lichvar et al. 2016) was reviewed to determine the presence or absence of vegetative communities indicative of wetlands.

Soil Conditions

The soils were analyzed for indicators of wetland conditions. A hand auger was used to obtain samples of the upper soil horizons to determine if hydric soils were present with the project area.

Munsell® Soil Color Charts (GretagMacbeth 2000) were used to assign standard notations to the samples. All of the soil cores were moist or moistened with a spray bottle prior to analysis in order to assure accurate color readings. In addition to the soils criteria established in the Manual and the Supplement, criteria defined in Field Indicators of Hydric Soils in the United States, Version 7.0 (USDA 2010) were used.

Field-verified soils were compared to NRCS published soil mapping units (Figure 2). Soil mapping units can represent a kind of soil, a combination of soils, or miscellaneous land types. Due to limitations imposed by the small scale of the soil survey maps, it is not unusual for wetlands to be delineated within areas not mapped as hydric (wetland) soils, and areas mapped as hydric soils often are not wetlands. This concept is emphasized on the USDA, NRCS Web Soil Survey website (USDA, NRCS 2011) by the following statement:

> "Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. Enlarged maps do not show small areas of contrasting soils that could have been shown at a more detailed scale."

Wetland Hydrology

Following identification of plant communities and soils, the presence, potential presence, or absence of wetland hydrology was determined for final definition of the upland and wetland boundaries. Hydrology is often the least exact of the three parameters used in defining wetlands. Some indicators of wetland hydrology include drainage patterns, sediment deposition, watermarks, visual observation of saturation and/or inundation, and plant adaptations.

Aquatic resources such as streams were identified and delineated based on the hydrologic regime (perennial or intermittent flow), presence of well-defined beds and banks, flow indicators such as sediment sorting and scouring, and indications of ordinary high-water marks. In all instances where a wetland abutted a stream, the outer wetland boundaries were established, as well as the boundary between the stream and the wetland.

Delineation and Documentation

The delineated wetlands and streams were classified in accordance with the methodology outlined in The Classification of Wetlands and Deepwater Habitats of the United States (USFWS 1979). Wetland Determination Data Forms developed by the USACE for the Supplement were completed at representative areas along the wetland and upland boundary. In addition, data forms were completed within areas that were not associated with wetlands to help describe these areas. These forms are included in Attachment 1.

PROJECT AREA SOILS

The USDA, NRCS Web Soil Survey website identifies 12 soil mapping units (Figure 2) in the project vicinity. Two of the 12 classified soils are listed as hydric soils (2.5% or 6.7 acres of the mapped area).

Hydric soils are defined as soils formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register 1994). As shown on Figure 2, the nearest hydric soils are found to the northeast of Remedial Area 1 and identified by soil map unit 33A (Halsey mucky silt loam) and 34A (Fredon silt loam), both soil units are part of hydric soil group (HSG) B/D. These hydric soils are not present within the anticipated remedial areas of the project.

STUDY AREAS DRAINAGE

The primary aquatic feature is the West Branch of the Tioughnioga River, which flows in a south and southwesterly direction. The West Branch of the Tioughnioga River is part of the Chenango Watershed (02050102) and the Susquehanna River Basin. At the furthest downstream point of the aquatic resource survey, the West Branch of the Tioughnioga River has a bankfull depth of 2.25 feet, width of 45.4 feet, and flow of 457 cubic feet per second (cfs) (USGS 2012).

The West Branch of the Tioughnioga River has a NYSDEC assigned Classification of C (NYSDEC 2018) meaning that it is best used for fishing and is suitable for fish, shellfish, and wildlife propagation and survival. The water is suitable for primary and secondary contact recreation.

WETLANDS AND STREAMS

A desktop review of the project area was completed using the USFWS wetlands mapper (USFWS 2012). The wetland mapper indicated that potential wetlands exist within the anticipated remedial areas (Figures 3A and 3B).

Delineated Aquatic Resource Descriptions

Field activities identified and delineated a total of 12 wetlands (W1-W12) within our anticipated remedial areas. A summary of the wetlands identified and delineated within the project area are included below in Table A, additional details of each delineated wetland are provided in Attachment 2. All delineated wetlands were located on the fringes of the West Branch of the Tioughnioga River and are shown on Figures 4A and 4B, a photo log is provided as Attachment 3.

Palustrine System

The Palustrine System includes all non-tidal wetlands dominated by trees, shrubs, emergent vascular plants, emergent mosses or lichens, and tidal wetlands where the salinity is below 0.5%. Project area wetlands within this system included the following types:

- Palustrine Emergent Persistent (PEM1) – These wetlands are dominated by herbaceous plants that normally remain standing at least until the beginning of the next growing season. All twelve wetlands delineated in this survey were classified with this type of wetland dominant.
- Palustrine Forested (PFO1) – Forested wetlands are characterized by woody vegetation that is six meters tall or taller. In the project area, forested wetlands dominated by broad-leaved deciduous trees were identified and delineated. A portion of W7 had characteristics of this type of wetland but did not dominate the area.
- Palustrine Scrub Shrub (PSS1) – Wetlands dominated by vegetation consisting of woody species less than 20 feet tall. Typical species found in these wetlands would consist of broad-leaved deciduous species such as willows or dogwoods. Portions of W2, W10, W11, and W12 had characteristics of this type of wetland, but did not dominate the area.

Riverine System

The Riverine System includes non-vegetated freshwater habitats that are contained within a channel. The channel, by definition, may be naturally or artificially created, periodically or continuously contains moving water, and/or forms a connecting link between two bodies of standing water. Upland islands or Palustrine wetlands within stream channels are not included, by definition, in the Riverine system. The “Riverine” resources within the project area solely consisted of Riverine, Lower Perennial (R2). This class of streams has relatively high gradients resulting in high water velocity. Water flows in these streams year-round. The substrate is typically rock, primarily cobble and gravel, with occasional patches of sand. The West Branch of the Tioughnioga River was classified as this type of riverine system; habitat boundaries of this resource were acquired during the Habitat Assessment.

Table A: Delineated Wetlands Summary

Resource ID	Location (Figure)	Area (acres)	Wetland Type	Dominant Vegetation	USACE Wetland Determination Data Form
W1	Remedial Area 2 (4B)	0.08	PEM1	Box elder (*Acer nugundo*), Reed Canary Grass (*Phalaris arundinacea),* Rice cutgrass (*Leersia oryzoides)*	DP W1-Wet
W2	Remedial Area 2 (4B)	0.03	PEM1, PSS1	Silky dogwood (*Cornus amomum*), Reed Canary Grass (*Phalaris arundinacea)*	DP W2-Wet
W3	Remedial Area 2 (4B)	0.004	PEM1	Spotted jewelweed (*Impatiens capensis*), Reed Canary Grass (*Phalaris arundinacea)*	DP W3-Wet
W4	Remedial Area 2 (4B)	0.06	PEM1	Spotted jewelweed (*Impatiens capensis*), Reed Canary Grass (*Phalaris arundinacea)*	DP W4-Wet
W5	Remedial Area 2 (4B)	0.02	PEM1	Water forget-me-not (*Myosotis scropioides*), Rice cutgrass (*Leersia oryzoides)*	DP W5-Wet
W6	Remedial Area 2 (4B)	0.01	PEM1	Yellow iris (*Iris pseudacorus*), Water forget-me-not (*Myosotis scropioides*)	DP W6-Wet
W7	Remedial Area 1 (4A)	0.60	PEM1, PFO1	Black willow (*Salix nigra*), Eastern skunk cabbage (*Symplocarpus foetidus*)	DP W7-Wet
W8	Remedial Area 1 (4A)	0.03	PEM1	Spotted jewelweed (*Impatiens capensis*), Reed Canary Grass (*Phalaris arundinacea)*	DP W8-Wet
W9	Remedial Area 1 (4A)	0.001	PEM1	Rice cutgrass (*Leersia oryzoides)*	--
W10	Remedial Area 1 (4A)	0.01	PEM1, PSS1	Silky dogwood (*Cornus amomum*), Reed Canary Grass (*Phalaris arundinacea),* Green arrow arum *(Peltandra virginica)*	DP W10-Wet
W11	Remedial Area 1 (4A)	0.06	PEM1, PSS1	Silky dogwood (*Cornus amomum*), Reed Canary Grass (*Phalaris arundinacea)*	DP W11-Wet
W12	Remedial Area 1 (4A)	0.05	PEM1, PSS1	Silky dogwood (*Cornus amomum*), Reed Canary Grass (*Phalaris arundinacea)*	DP W12-Wet

Uplands

The remaining portion of the project areas are located within areas dominated by upland vegetative communities and assemblages. Much of the land use identified in the immediate upslope of the river channel has upland vegetation and soil characteristics.

Uplands in the northern portion (i.e., Remedial Area 1) of the project area consist of grassy fields and the upland floodplain of the West Branch of the Tioughnioga River. Uplands were generally dominated by an herbaceous community with dominant species that include Common mustard (*Brassica rapa*), Field

pennycress (*Thlapsi arvense*), Nightshade, and Canada goldenrod (*Solidago canadensis*). Details of upland soil conditions can be found in Attachment 1.

Uplands in the southern portion (i.e., Remedial Area 2) of the project area are forested and dominated by a red oak (*Quercus rubra*) overstory. Invasive shrubs including Common buckthorn (*Rhamnus cathartica*) and Tartarian honeysuckle (*Lonicera tatarica L.*) dominate the understory of the forested portion, ranging from approximately 20-30% canopy cover. The herbaceous community of this area mainly consists of ruderal upland species such as Common burdock (*Arctium minus*), Nightshade (*Solanum nigrum*), Mugwort (Artemis vulgaris), and Garlic mustard (*Alliaria petiolata*).

A full list of species observed is included in Table 1.

CONCLUSIONS

This Aquatic Resources Delineation Survey identified and fully delineated wetlands within the anticipated remedial areas. A total of 12 fringe PEM wetlands, consisting of 0.97 acres, were located along the length of the West Branch of the Tioughnioga River within the project area. An assessment of vegetation, soil conditions, and a full survey of the identified wetlands was completed and is presented herein. The information collected as part of this Aquatic Resources Delineation Survey will be used to develop restoration design components for areas disturbed by the forthcoming remedial activities and to support permitting activities.

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Enclosures:

Table

1 Vegetation List

Figures

1 Site Location Map
2 USDA Soils Map
3A NWI Wetlands Map - Area 1
3B NWI Wetlands Map - Area 2
4A Surveyed Aquatic Resources - Area 1
4B Surveyed Aquatic Resources - Area 2

Attachments

3-1 Wetland Determination Forms
3-2 Delineated Wetlands Summary
3-3 Photo Log

TABLE

Table 1
Vegetation List
NYSEG - Cotland-Homer Former MGP Site
Homer, New York

Scientific Name	Common Name	Wetland Indicator Status[1]
Acer negundo	Box Elder	FAC
Acer saccharum	Sugar Maple	FACU
Alliaria petiolata	Garlic Mustard	FACU
Artemisia vulgaris	Common Mugwort	UPL
Articum minus	Common Burdock	FACU
Brassica rapa	Field Mustard	UPL
Convolvulus arvensis	Bindweed	UPL
Cornus amomum	Silky Dogwood	FACW
Dipsacus fullonum	Teasel	FACU
Fallopia japonica	Japanese Knotweed	FACU
Hypericum perforatum	St. John's Wort	UPL
Impatiens capensis	Orange Jewelweed	FACW
Iris pseudacorus	Yellow Iris	OBL
Leersia oryzoides	Rice Cutgrass	OBL
Lonicera tatarica	Tartarian Honeysuckle	FACU
Lysichiton americanus	Skunk Cabbage	OBL
Lythrum salicaria	Purple Loosestrife	OBL
Myosotis scorpioides	Forget-Me-Not	OBL
Parthenocissus quinquefolia	Virginia Creeper	FACU
Peltandra virginica	Arrow Arum	OBL
Phalaris arundinacea	Reed Canary Grass	FACW
Pilea pumila	Canadian Clearweed	FACW
Potentilla simplex	Common Cinquefoil	FACU
Quercus rubra	Red Oak	FACU
Rhamnus cathartica	Common Buckthorn	FAC
Rhus typhina	Staghorn Sumac	UPL
Rubus allegheniensis	Wild Blackberry	FACU
Solanum nigrum	Nightshade	FACU
Solidago canadensis	Canada Goldenrod	FACU
Solidago gigantea	Tall Goldenrod	FACW
Sparganium americanum	Bur-Reed	OBL
Trifolium repens	Red Clover	FACU
Urtica dioica	Stinging Nettle	FAC
Verbena hastata	Blue Vervain	FACW

Notes:

1. Wetland indicator status based on northcentral and northeast region.

Acronyms and Abbreviations:

FAC = Facultative

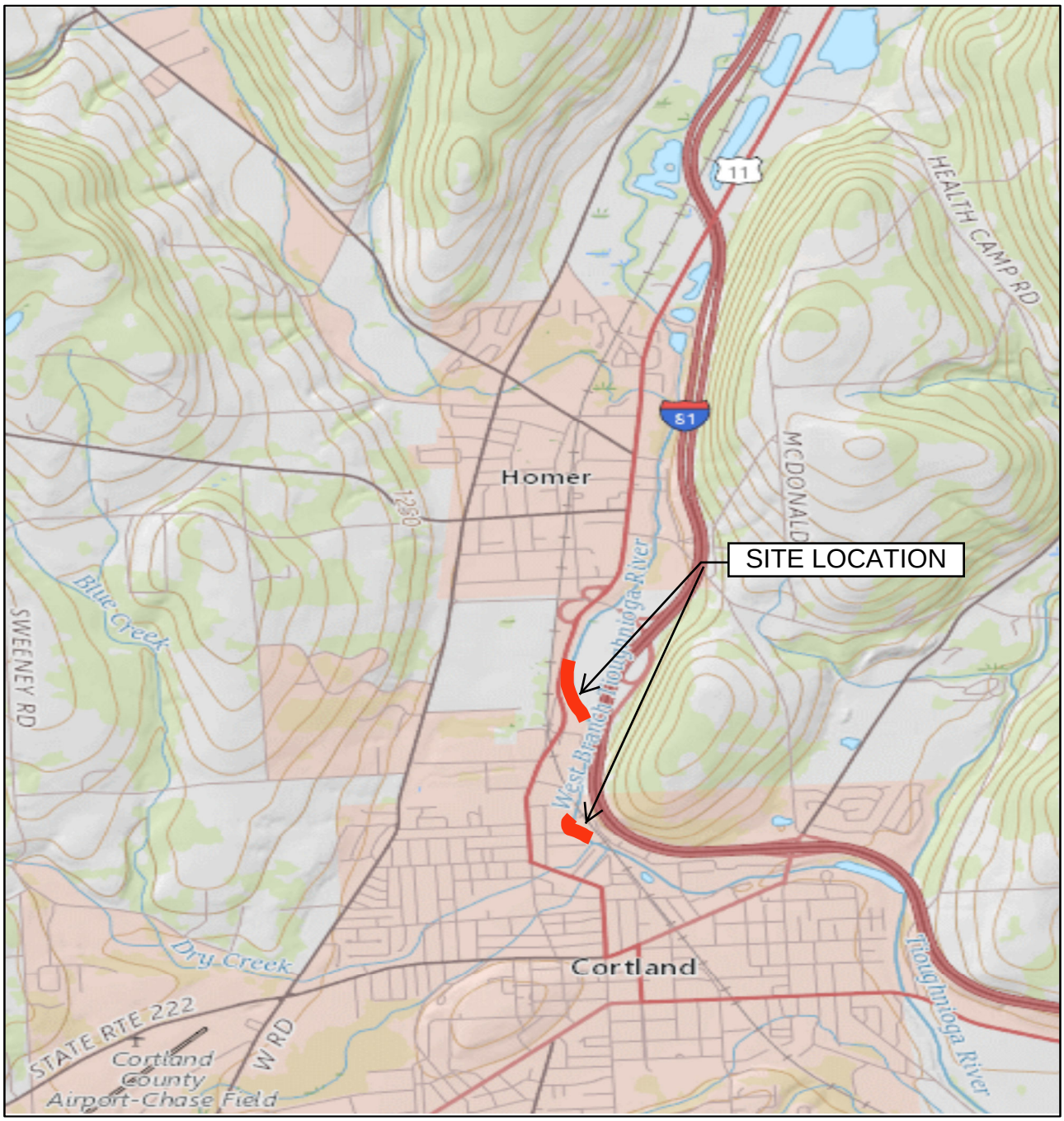
FACU = Facultative Upland

FACW = Facultative Wetland

OBL = Obligate Wetland

UPL = Upland

FIGURES



Miles

0 0.25 0.5 1 1.5 2

AREA LOCATION

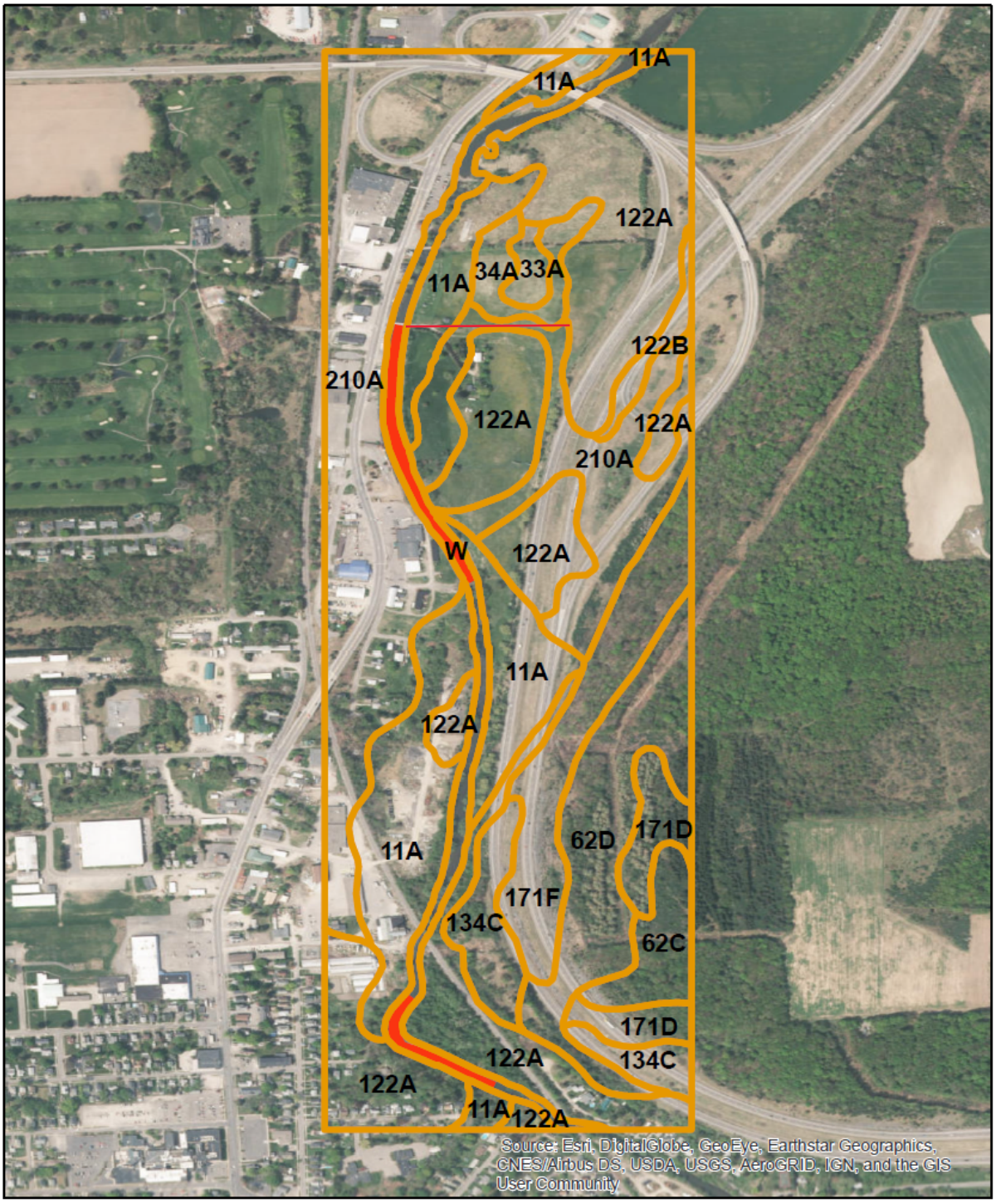
NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

AQUATIC RESOURCES SURVEY REPORT

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1



0 0.050.1 0.2 0.3 0.4 Miles

Key

11A—Hemlock silt loam
33A—Halsey mucky silt loam
34A—Fredon silt loam
62C—Mardin channery silt loam
62D—Mardin channery silt loam
122A—Palmyra gravelly silt loam
122B—Palmyra gravelly silt loam
134C—Bath channery silt loam
171D—Lordstown channery silt loam
171F—Cadosia-Lordstown complex
210A—Phelps gravelly silt loam
W—Water

- Project Location

NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

AQUATIC RESOURCES SURVEY REPORT

USDA SOILS MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2

Miles

0 0.02 0.04 0.08 0.12 0.16

- NWI Wetland (R2UBH)
  - Riverine
  - Lower Perrenial
  - Unconsolidated Bottom
  - Permanently Flooded

- Project Location

NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

AQUATIC RESOURCES SURVEY REPORT

NWI WETLANDS MAP - AREA 1

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3A

Miles

0 0.01 0.02 0.04 0.06 0.08

- NWI Wetland (R2UBH)
  - Riverine
  - Lower Perrenial
  - Unconsolidated Bottom
  - Permanently Flooded

- Project Location

NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

AQUATIC RESOURCES SURVEY REPORT

NWI WETLANDS MAP - AREA 2

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3B

0 55 110 220 330 440 Feet

- Wetlands

NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

AQUATIC RESOURCES SURVEY REPORT

SURVEYED AQUATIC RESOURCES MAP - AREA 1

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4A

Feet
0 55 110 220 330 440

- Wetlands

NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

AQUATIC RESOURCES SURVEY REPORT

SURVEYED AQUATIC RESOURCES MAP - AREA 2

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4B

ATTACHMENT 1

Wetland Determination Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W1-Up

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Upslope Local relief (concave, convex, none): None Slope %: 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42°36'39.642" N Long: 76°10'59.040" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W1-Up

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	50	Yes	FAC
2. *Rhus typhina*	10	No	UPL
3.			
4.			
5.			
6.			
7.			
	60	=Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Lonicera tatarica*	30	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
Herb Stratum (Plot size: 1 m)			
1. *Alliaria petiolata*	40	Yes	FACU
2. *Solanum nigrum*	30	Yes	FACU
3. *Trifolium repens*	5	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75	=Total Cover	
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	105	x 4 =	420
UPL species	10	x 5 =	50
Column Totals:	165 (A)		620 (B)

Prevalence Index = B/A = 3.76

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W1-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/4	100					Loamy/Clayey	Sandy Silty Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W1-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope %: 0-1%

Subregion (LRR or MLRA): LRR R Lat: 42°36'39.642" N Long: 76°10'59.056" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W1-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	30	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 1 m)			
1. *Phalaris arundinacea*	40	Yes	FACW
2. *Urtica dioica*	2	No	FAC
3. *Impatiens capensis*	5	No	FACW
4. *Articum minus*	5	No	FACU
5. *Leersia oryzoides*	40	Yes	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	92	=Total Cover	
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	45	x 2 =	90
FAC species	32	x 3 =	96
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	122 (A)		246 (B)

Prevalence Index = B/A = 2.02

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W1-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	100					Loamy/Clayey	Silty Clay Loam
8-14	10YR 2/1	100					Loamy/Clayey	Silty Clay Loam
14-16	10YR 2/1	98					Loamy/Clayey	Silty Clay Loam
			7.5YR 5/8	2	RM	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 16

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W2-Up

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Upslope Local relief (concave, convex, none): None Slope %: 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42°36'44.721" N Long: 76°10'58.034" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W2-Up

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Lonicera tatarica*	10	Yes	FACU
2. *Rhamnus cathartica*	20	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
Herb Stratum (Plot size: 1 m)			
1. *Hypericum perforatum*	10	No	UPL
2. *Solidago canadensis*	70	Yes	FACU
3. *Plantago major*	15	No	FACU
4. *Potentilla simplex*	2	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	97	=Total Cover	
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	97	x 4 =	388
UPL species	10	x 5 =	50
Column Totals:	127 (A)		498 (B)

Prevalence Index = B/A = 3.92

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W2-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/4	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W2-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope %: 0-1%

Subregion (LRR or MLRA): LRR R Lat: 42°36'44.721" N Long: 76°10'58.222" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W2-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Cornus amomum*	15	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	15 =Total Cover		
Herb Stratum (Plot size: 1 m)			
1. *Dipsacus fullonum*	15	No	FACU
2. *Verbena hastata*	5	No	FACW
3. *Phalaris arundinacea*	60	Yes	FACW
4. *Lysichiton americanus*	10	No	OBL
5. *Impatiens capensis*	10	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	90	x 2 =	180
FAC species	0	x 3 =	0
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	115 (A)		250 (B)

Prevalence Index = B/A = 2.17

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W2-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					Loamy/Clayey	Trace Sand, Fill Material
8-16	10YR 3/2	95					Loamy/Clayey	Trace Sand, Fill Material
			7.5YR 4/6	5				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 16

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W3-Up

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Upslope Local relief (concave, convex, none): None Slope %: 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42°36'35.858" N Long: 76°10'53.913" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W3-Up

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	30	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 1 m)			
1. *Artemisia vulgaris*	70	Yes	UPL
2. *Fallopia japonica*	15	No	FACU
3. *Rubus allegheniensis*	15	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	60	x 4 =	240
UPL species	70	x 5 =	350
Column Totals:	130 (A)		590 (B)

Prevalence Index = B/A = 4.54

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W3-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/4	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W3-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope %: 0-1%

Subregion (LRR or MLRA): LRR R Lat: 42°36'35.939" N Long: 76°10'53.691" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W3-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 1 m)			
1. *Impatiens capensis*	40	Yes	FACW
2. *Phalaris arundinacea*	20	Yes	FACW
3. *Solidago gigantea*	15	No	FACW
4. *Pilea pumila*	5	No	FACW
5. *Lysichiton americanus*	5	No	OBL
6. *Myosotis scorpioides*	10	No	OBL
7.			
8.			
9.			
10.			
11.			
12.			
	95	=Total Cover	
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	80	x 2 =	160
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		175 (B)

Prevalence Index = B/A = 1.84

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W3-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- X Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 2

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W4-Up

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Upslope Local relief (concave, convex, none): None Slope %: 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42°36'39.235" N Long: 76°11'0.860" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W4-Up

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer saccharum*	40	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	40	=Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Lonicera tatarica*	20	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	20	=Total Cover	
Herb Stratum (Plot size: 1 m)			
1. *Alliaria petiolata*	40	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: 5 m)			
1. *Parthenocissus quinquefolia*	60	Yes	FACU
2.			
3.			
4.			
	60	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	160	x 4 =	640
UPL species	0	x 5 =	0
Column Totals:	160 (A)		640 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W4-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/4	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W4-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope %: 0-1%

Subregion (LRR or MLRA): LRR R Lat: 42°36'39.235" N Long: 76°11'0.860" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W4-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 1 m)			
1. *Phalaris arundinacea*	50	Yes	FACW
2. *Impatiens capensis*	50	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		200 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W4-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100					Loamy/Clayey	Stony

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- X Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 4

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W5-Up

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Upslope Local relief (concave, convex, none): None Slope %: 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42°36'42.113" N Long: 76°10'59.518" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W5-Up

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 1 m)			
1. *Fallopia japonica*	100	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W5-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 5/4	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W5-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope %: 0-1%

Subregion (LRR or MLRA): LRR R Lat: 42°36'41.891" N Long: 76°10'59.392" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W5-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 1 m)			
1. *Myosotis scorpioides*	30	Yes	OBL
2. *Leersia oryzoides*	10	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	40 (A)		40 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W5-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	5YR 2.5/1	100					Mucky Loam/Clay	High Organics

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- X Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W6-Up

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Upslope Local relief (concave, convex, none): None Slope %: 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42°36'45.645" N Long: 76°10'58.518" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W6-Up

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Rhamnus cathartica*	25	Yes	FAC
2. *Lonicera tatarica*	15	Yes	FACU
3. *Rubus allegheniensis*	20	Yes	FACU
4.			
5.			
6.			
7.			
	60 =Total Cover		
Herb Stratum (Plot size: 1 m)			
1. *Solidago canadensis*	40	Yes	FACU
2. *Solanum nigrum*	30	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70 =Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	25	x 3 =	75
FACU species	105	x 4 =	420
UPL species	0	x 5 =	0
Column Totals:	130 (A)		495 (B)

Prevalence Index = B/A = 3.81

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W6-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 5/4	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 10 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W6-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope %: 0-1%

Subregion (LRR or MLRA): LRR R Lat: 42°36'45.637" N Long: 76°10'58.533" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W6-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 1 m)			
1. *Iris pseudacorus*	95	Yes	OBL
2. *Myosotis scorpioides*	5	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	100	x 1 =	100
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		100 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W6-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/1	100					Loamy/Clayey	Organics

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 11 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W7-Up

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Field Local relief (concave, convex, none): None Slope %: 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42°37'12.307" N Long: 76°10'56.276" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)
Area is recently mowed, vegetation unable to be identified.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W7-Up

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 1 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	=Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Area recently mowed, vegetation unable to be identified. Appears to be typical upland grassy field (clovers, upland grasses, etc.)

SOIL

Sampling Point W7-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 5/4	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 11 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W7-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope %: 0-1%

Subregion (LRR or MLRA): LRR R Lat: 42°37'12.115" N Long: 76°10'56.793" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0.5
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W7-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 1 m)			
1. *Iris pseudacorus*	70	Yes	OBL
2. *Impatiens capensis*	10	No	FACW
3. *Solidago gigantea*	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85 =Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	15	x 2 =	30
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	85 (A)		100 (B)

Prevalence Index = B/A = 1.18

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W7-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	100					Loamy/Clayey	Silty
8-16	10YR 3/1	98	2.5YR 4/6	2	RM	M	Loamy/Clayey	Silty
16-18	7.5YR 3/1	95	2.5YR 4/8	5	RM	M	Loamy/Clayey	Silty

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 11 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W8-Up

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Upslope Local relief (concave, convex, none): None Slope %: 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42°37'10.415" N Long: 76°10'57.050" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W8-Up

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Rubus allegheniensis*	50	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	50 =Total Cover		
Herb Stratum (Plot size: 1 m)			
1. *Solidago canadensis*	50	Yes	FACU
2. *Solanum nigrum*	35	Yes	FACU
3. *Convolvulus arvensis*	5	No	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 =Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	135	x 4 =	540
UPL species	5	x 5 =	25
Column Totals:	140 (A)		565 (B)

Prevalence Index = B/A = 4.04

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Area recently mowed, vegetation unable to be identified. Appears to be typical upland grassy field (clovers, upland grasses, etc.)

SOIL

Sampling Point W8-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 5/4	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 11 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W8-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope %: 0-1%

Subregion (LRR or MLRA): LRR R Lat: 42°37'12.115" N Long: 76°10'56.793" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0.5
Water Table Present?	Yes X	No ____	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W8-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Cornus amomum*	30	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	30 =Total Cover		
Herb Stratum (Plot size: 1 m)			
1. *Phalaris arundinacea*	70	Yes	FACW
2. *Impatiens capensis*	20	Yes	FACW
3. *Solidago gigantea*	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 =Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	125	x 2 =	250
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	125 (A)		250 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W8-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	100					Loamy/Clayey	Silty
8-16	10YR 3/1	98	2.5YR 4/6	2	RM	M	Loamy/Clayey	Silty
16-18	7.5YR 3/1	95	2.5YR 4/8	5	RM	M	Loamy/Clayey	Silty

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 11 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W9-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope %: 0-1%

Subregion (LRR or MLRA): LRR R Lat: 42°37'10.744" N Long: 76°10'56.450" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 2
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W9-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 1 m)			
1. *Leersia oryzoides*	40	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	40 (A)		40 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W9-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock, Cobbles, Substrate

Depth (inches): 0

Hydric Soil Present? **Yes** ___ **No** ___

Remarks:

Soils not sampled because the wetland was within the channel of the stream. Mostly hard surface (cobbles, etc.) Soils assumed to be hydric.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 11 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W10-Up

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Upslope Local relief (concave, convex, none): None Slope %: 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42°37'11.592" N Long: 76°10'57.728" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W10-Up

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Rubus allegheniensis*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10	=Total Cover	
Herb Stratum (Plot size: 1 m)			
1. *Solidago canadensis*	25	Yes	FACU
2. *Solanum nigrum*	15	Yes	FACU
3. *Convolvulus arvensis*	5	No	UPL
4. *Brassica rapa*	15	Yes	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60	=Total Cover	
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	50	x 4 =	200
UPL species	20	x 5 =	100
Column Totals:	70 (A)		300 (B)

Prevalence Index = B/A = 4.29

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W10-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 5/4	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 11 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W10-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope %: 0-2%

Subregion (LRR or MLRA): LRR R Lat: 42°37'11.592" N Long: 76°10'57.725" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W10-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Cornus amomum*	50	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	50 =Total Cover		
Herb Stratum (Plot size: 1 m)			
1. *Phalaris arundinacea*	60	Yes	FACW
2. *Impatiens capensis*	15	No	FACW
3. *Lythrum salicaria*	10	No	OBL
4. *Peltandra virginica*	20	Yes	OBL
5. *Sparganium americanum*	20	Yes	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	125 =Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	125	x 2 =	250
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	175 (A)		300 (B)

Prevalence Index = B/A = 1.71

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W10-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					Loamy/Clayey	Silty
8-18	10YR 2/1	95	2.5YR 4/6	5	RM	M	Loamy/Clayey	Silty

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 11 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W11-Up

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Upslope Local relief (concave, convex, none): None Slope %: 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42°37'15.772" N Long: 76°10'59.931" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W11-Up

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Rubus allegheniensis*	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	15 =Total Cover		
Herb Stratum (Plot size: 1 m)			
1. *Solidago canadensis*	40	Yes	FACU
2. *Solanum nigrum*	10	No	FACU
3. *Convolvulus arvensis*	2	No	UPL
4. *Brassica rapa*	20	Yes	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	72 =Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1. *Parthenocissus quinquefolia*	25	Yes	FACU
2.			
3.			
4.			
	25 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	90	x 4 =	360
UPL species	22	x 5 =	110
Column Totals:	112 (A)		470 (B)

Prevalence Index = B/A = 4.20

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W11-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/4	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 11 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W11-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope %: 0-2%

Subregion (LRR or MLRA): LRR R Lat: 42°37'15.786" N Long: 76°10'59.925" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 6
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W11-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Cornus amomum*	20	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	20 =Total Cover		
Herb Stratum (Plot size: 1 m)			
1. *Phalaris arundinacea*	70	Yes	FACW
2. *Impatiens capensis*	15	No	FACW
3. *Lythrum salicaria*	10	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 =Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	105	x 2 =	210
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		220 (B)

Prevalence Index = B/A = 1.91

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W11-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					Loamy/Clayey	Silty
8-18	10YR 2/1	95	2.5YR 4/6	5	RM	M	Loamy/Clayey	Silty

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 11 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W12-Up

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Upslope Local relief (concave, convex, none): None Slope %: 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42°37'18.702" N Long: 76°11'0.898" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W12-Up

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Rubus allegheniensis*	30	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
Herb Stratum (Plot size: 1 m)			
1.			
2.			
3.			
4.			UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		=Total Cover	
Woody Vine Stratum (Plot size: 5 m)			
1. *Parthenocissus quinquefolia*	30	Yes	FACU
2.			
3.			
4.			
	30	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	60 (A)		240 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W12-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/4	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NYSEG-Cortland W. Branch Tioughnioga River City/County: Cortland/Cortland Sampling Date: 11 July 18

Applicant/Owner: NYSEG State: NY Sampling Point: W12-Wet

Investigator(s): AT, JK Section, Township, Range: NA

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope %: 0-2%

Subregion (LRR or MLRA): LRR R Lat: 42°37'18.806" N Long: 76°11'0.767" W Datum: WGS 1984

Soil Map Unit Name: Palmyra gravelly silt loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W12-Wet

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)			
1. *Cornus amomum*	10	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	10 =Total Cover		
Herb Stratum (Plot size: 1 m)			
1. *Phalaris arundinacea*	80	Yes	FACW
2. *Impatiens capensis*	10	No	FACW
3. *Lythrum salicaria*	10	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	110 (A)		210 (B)

Prevalence Index = B/A = 1.91

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W12-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					Loamy/Clayey	Silty
8-18	10YR 2/1	95	2.5YR 4/6	5	RM	M	Loamy/Clayey	Silty

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

ATTACHMENT 2

Delineated Wetlands Summary

Delineated Wetlands Summary

Resource W1 (PEM1)

Wetland W1 is located in the southern portion of the project area on the east bank along an inside bend in the river. The soil was saturated to the surface and wetland hydrology indicators of drainage patterns and geomorphic position were observed. Dominant vegetation includes box elder (*Acer negundo*), reed canary grass (*Phalaris arundincea*), and rice cutgrass (*Leersia oryzoides*). Hydric soils are present and detailed on data sheet DP W1-Wet.

Resource W2 (PEM1, PSS1)

Wetland W2 is located in the southern portion of the Project study area on the east bank and just south of the railroad bridge crossing. Portions of this wetland had sufficient cover shrub to be classified as PSS; however, the majority of the area was PEM. The soil was saturated to the surface and wetland hydrology indicators of drainage patterns and geomorphic position were observed. Dominant vegetation includes silky dogwood (*Cornus amomum*) and reed canary grass. Hydric soils are present and detailed on data sheet DP W2-Wet.

Resource W3 (PEM1)

Wetland W3 is located in the southern portion of the Project study area on the west bank at the southern-most part of the Project location. The soil was saturated to the surface and wetland hydrology indicators of drainage patterns and water stained leaves were observed. Dominant vegetation includes spotted jewelweed (*Impatiens capensis*) and reed canary grass. Hydric soils are present and detailed on data sheet DP W3-Wet.

Resource W4 (PEM1)

Wetland W4 is located in the southern portion of the Project study area on the west bank along an outside bend in the river. The soil was saturated to the surface and wetland hydrology indicators of drainage patterns, water stained leaves, drainage patterns, geomorphic position, and microtopographic relief were observed. Dominant vegetation includes spotted jewelweed and reed canary grass. Hydric soils are present and detailed on data sheet DP W4-Wet.

Resource W5 (PEM1)

Wetland W5 is located in the southern portion of the Project study area on the west bank along an outside bend in the river and just north of Resource W4. The soil was saturated to the surface, the water table was within two inches of the surface, and wetland hydrology indicators of a sparsely vegetated concave surface, stunted or stressed plants, geomorphic position, and microtopographic relief were observed. Dominant vegetation includes water forget-me-not (*Myosotis scorpioides*) *and* rice cutgrass. Hydric soils are present and detailed on data sheet DP W5-Wet.

Resource W6 (PEM1)

Wetland W6 is located in the southern portion of the Project study area on the west bank and just south of the railroad bridge crossing. The soil was saturated to the surface, the water table was within two inches of the surface, and wetland hydrology indicators of drift deposits, water stained leaves, geomorphic position,

drainage patterns, and microtopographic relief were observed. Dominant vegetation includes yellow iris (*Iris pseudacorus*) and water forget-me-not. Hydric soils are present and detailed on data sheet DP W6-Wet.

Resource W7 (PEM1, PFO1)

Wetland W7 is located in the northern portion of the Project study area on the east bank. Portions of this wetland are dominated by black willow (*Salix nigra*) and qualify it as a classification of PFO; however, the majority of the area is PEM. Standing water of one-half inch and wetland hydrology indicators of drift deposits, water stained leaves, geomorphic position, and microtopographic relief were observed. Dominant vegetation includes eastern skunk cabbage (*Symplocarpus foetidus*). Hydric soils are present and detailed on data sheet DP W7-Wet.

Resource W8 (PEM1)

Wetland W8 is located in the northern portion of the Project study area on the west bank, just north of a footbridge. The soil was saturated to the surface, the water table was within three inches of the surface, and wetland hydrology indicators of drift deposits, water stained leaves, geomorphic position, and microtopographic relief were observed. Dominant vegetation includes spotted jewelweed and reed canary grass. Hydric soils are present and detailed on data sheet DP W8-Wet.

Resource W9 (PEM1, PSS1)

Wetland W9 is located within the channel of the river of the northern section of the Project study area. The wetland was a particularly shallow area within the stream channel, possibly from a local accumulation of sediment. Standing water of two inches was observed at this location. The sole vegetation growing is rice cutgrass. Hydric soils were not present due to a rock and cobble layer at the surface resulting in shovel refusal.

Resource W10 (PEM1)

Wetland W10 is located in the northern portion of the Project area on the west bank. Portions of this wetland are dominated shrub cover and qualify it as a classification of PSS; however, the majority of the area is PEM. The soil was saturated to the surface and the water table was within four inches of the surface, Dominant vegetation includes silky dogwood, reed canary grass, green arrow arum (*Peltandra virginica*), and American bur-reed (*Sparganium americanum*). Hydric soils are present and detailed on data sheet DP W10-Wet.

Resource W11 (PEM1, PSS1)

Wetland W11 is located in the northern portion of the Project area on the west bank. Portions of this wetland are dominated shrub cover and qualify it as a classification of PSS; however, the majority of the area is PEM. The soil was saturated to the surface and the water table was within six inches of the surface, Dominant vegetation includes silky dogwood and reed canary grass. Hydric soils are present and detailed on data sheet DP W11-Wet.

Resource W12 (PEM1, PSS1)

Wetland W12 is located in the northern portion of the Project area on the west bank. Portions of this wetland are dominated shrub cover and qualify it as a classification of PSS; however, the majority of the area is PEM. The soil was saturated to the surface and the water table was within two inches of the surface,

Dominant vegetation includes silky dogwood and reed canary grass. Hydric soils are present and detailed on data sheet DP W12-Wet.

ATTACHMENT 3

Photograph Log

0 55 110 220 330 440 Feet

● - PHOTO LOCATION

NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

AQUATIC RESOURCES SURVEY REPORT

PHOTO KEY

ARCADIS Design & Consultancy for natural and built assets

APPENDIX
B

Feet

0 55 110 220 330 440

● - PHOTO LOCATION

NYSEG - CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

AQUATIC RESOURCES SURVEY REPORT

PHOTO KEY

ARCADIS Design & Consultancy for natural and built assets

APPENDIX
B

Photo No.	Date
P1	7/10/2018

Direction Photo Taken:

West

Description:

W1-Wet

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P2	7/10/2018

Direction Photo Taken:

East

Description:

W1-Up

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P3	7/10/2018

Direction Photo Taken:

North

Description:

W2-Wet

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P4	7/10/2018

Direction Photo Taken:

East

Description:

W2-Up

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P5	7/10/2018

Direction Photo Taken:

Northwest

Description:

W3-Wet

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P6	7/10/2018

Direction Photo Taken:

Southwest

Description:

W3-Up

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P7	7/10/2018

Direction Photo Taken:

North

Description:

Site conditions; uplands located between railroad tracks and east bank.

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Photo No.	Date
P8	7/10/2018

Direction Photo Taken:

East

Description:

Site conditions; uplands located between railroad tracks and east bank.

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P9	7/10/2018

Direction Photo Taken:

South

Description:

Site conditions; uplands located between railroad tracks and east bank.

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P10	7/10/2018

Direction Photo Taken:

West

Description:

Site conditions; uplands located between railroad tracks and east bank.

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Photo No.	Date
P11	7/10/2018

Direction Photo Taken:

North

Description:

W4-Wet

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Photo No.	Date
P12	7/10/2018

Direction Photo Taken:

West

Description:

W4-Up

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P13	7/10/2018

Direction Photo Taken:

Southwest

Description:

W5-Wet

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P14	7/10/2018

Direction Photo Taken:

West

Description:

W5-Up

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P15	7/10/2018

Direction Photo Taken:

Southwest

Description:

W6-Wet

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P16	7/10/2018

Direction Photo Taken:

Northeast

Description:

W6-Up

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P17	7/11/2018

Direction Photo Taken:

West

Description:

W7-Wet

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P18	7/11/2018

Direction Photo Taken:

East

Description:

W7-Up (Field behind vegetation line)

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P19	7/11/2018

Direction Photo Taken:

Southeast

Description:

W8-Wet

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P20	7/11/2018

Direction Photo Taken:

West

Description:

W8-Up

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P21	7/11/2018

Direction Photo Taken:

East

Description:

W9-Wet

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P22	7/11/2018

Direction Photo Taken:

South

Description:

W10-Wet

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P23	7/11/2018

Direction Photo Taken:

West

Description:

W10-Up

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P24	7/11/2018

Direction Photo Taken:

South

Description:

W11-Wet

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P25	7/11/2018

Direction Photo Taken:

West

Description:

W11-Up

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P26	7/11/2018

Direction Photo Taken:

Southeast

Description:

W12-Wet

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P27	7/11/2018

Direction Photo Taken:

West

Description:

W12-Up

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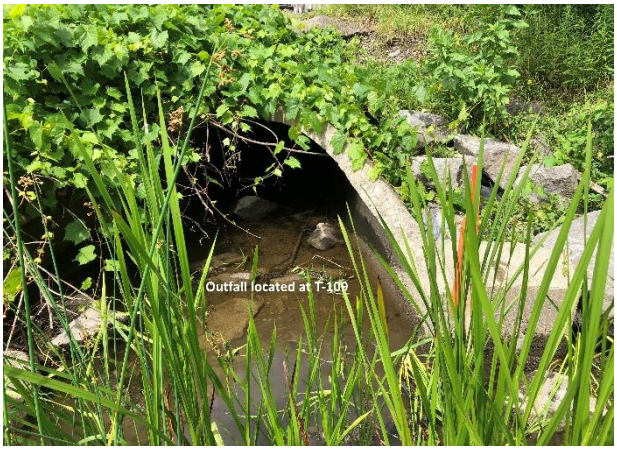
ATTACHMENT 4

Sediment Probing Photo Log

PHOTOGRAPH LOG

NYSEG

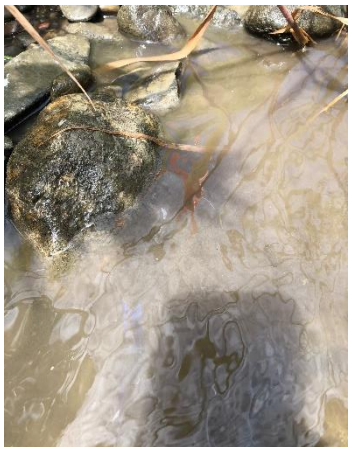


Photograph 1: Outfall located at T-110

Photograph 2: Outfall located at T-110

Photograph 3: T-110

Photograph 4: T-110



Photograph 5: T-110

Photograph 6: T-118

Photograph 7: T-118

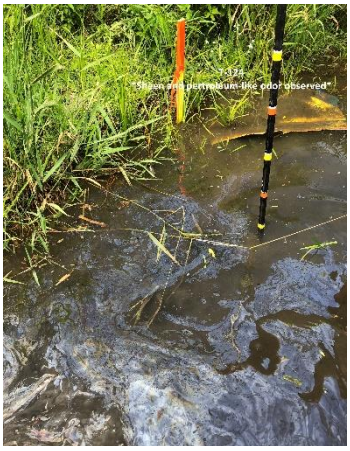
Photograph 8: T-122

Photograph 9: T-122

Photograph 10: T-124

Photograph 11: T-124

Photograph 12: T-124



Photograph 13: T-124

Photograph 14: Outfall between T-107 and T-108

ATTACHMENT 5

Soil Boring Logs

Date Start/Finish: 9/7/18
Drilling Company: Parratt-Wolff
Driller's Name: Joe Percy, Jared Eaves
Drilling Method: HSA
Auger Size: 3 1/4"
Rig Type: Ingersoll Rand A200
Sampling Method: 2" x 2' Split Spoon

Northing: 955371.99
Easting: 927810.80
Casing Elevation: NA

Borehole Depth: 39' bgs
Surface Elevation: 1110.947

Descriptions By: Nicholle Griffith

Well/Boring ID: PDI-2018-01
Client: NYSEG

Location: Cortland-Homer Former MGP

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1110	1	0-5				0.0			Grayish brown fine to coarse SAND, some fine to coarse subangular to subrounded Gravel, little organics (roots), loose, moist.	Grout (0-39' bgs)
5 / 1105	2	5-7	NR	4 3 2 1	5	NR			No Recovery (5-7' bgs).	
	3	7-9	1.0	4 4 15 19	19	0.0			Brown fine to coarse SAND, some fine to medium subangular Gravel, trace Silt, loose, saturated.	
10 / 1100	4	9-11	1.6	11 27 35 20	62	0.0			Brownish gray fine to coarse SAND, little fine subrounded Gravel, tight, saturated. Brown fine to coarse SAND,some fine to medium subangular Gravel, trace Silt, loose, saturated.	
	5	11-13	NR	11 13 14 11	27	NR			No Recovery (11-13' bgs).	
	6	13-15	0.2	22 50/.4		0.0				
15 / 1095				30 22						

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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery;
Analytical samples collected from: 19-23' bgs
Boring location was moved 3' west from original survey.

Client: NYSEG

Well/Boring ID: **PDI-2018-01**

Borehole Depth: 39' bgs

Site Location:
Cortland-Homer Former MGP

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		7	15-17	0.6	28 22	50	0.0			Brown fine to coarse SAND,some fine to medium subangular Gravel, trace Silt, loose, saturated.	
		8	17-19	0.4	17 17 18 20	35	0.0				
20	1090	9	19-21	0.6	27 27 19 18	46	0.0			Gray fine to coarse SAND,pink and gold mottling, some fine to medium subangular Gravel, trace Silt, loose, saturated.	Grout (0-39' bgs)
		10	21-23	1.2	15 18 19 22	37	0.0			Grayish brown medium to coarse SAND, trace fine subangular Gravel, trace Silt, firm, saturated.	
		11	23-25	1.0	38 28 28 22	56	0.0			Gray medium anugular GRAVEL, some fine to coarse Sand (pink mottling), firm, saturated.	
25	1085	12	25-27	0.4	25 25 28 31	53	0.0				
		13	27-29	0.5	28 25 23 22	48	0.0			Multicolored fine to medium angular to subangular GRAVEL, some fine to coarse Sand, little Silt, tight, saturated.	
30	1080	14	29-31	0.5	7 7 14 13	21	0.0			Brown fine SAND, trace Silt, trace medium Sand, tight, saturated.	
		15	31-33	1.5	4 5 9 9	14	0.0			Grayish brown fine SAND, little Silt, tight, saturated.	
		16	33-35	1.0	4 5 9 5	14	0.0			Grayish brown SILTY CLAY.	
35	1075				4 5					Grayish brown fine SAND, little Silt, tight.	

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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery;
Analytical samples collected from: 19-23' bgs
Boring location was moved 3' west from original survey.

Client: NYSEG

Well/Boring ID: **PDI-2018-01**

Borehole Depth: 39' bgs

Site Location:
Cortland-Homer Former MGP

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	17	35-37	1.0	5 6	10	0.0				Grout (0-39' bgs)
	18	37-39	1.4	2 3 4 1	7	0.0			Grayish brown SILTY CLAY, soft with increasing density.	
40 1070									End of boring at 39.0' bgs.	
45 1065										
50 1060										
55 1055										

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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery;
Analytical samples collected from: 19-23' bgs
Boring location was moved 3' west from original survey.

Date Start/Finish: 9/7/18
Drilling Company: Parratt-Wolff
Driller's Name: Joe Percy, Jared Eaves
Drilling Method: HSA
Auger Size: 3 1/4"
Rig Type: Ingersoll Rand A200
Sampling Method: 2" x 2' Split Spoon

Northing: 955406.76
Easting: 927811.49
Casing Elevation: NA

Borehole Depth: 35' bgs
Surface Elevation: 1109.320

Descriptions By: Nicholle Griffith

Well/Boring ID: **PDI-2018-02**
Client: NYSEG

Location: Cortland-Homer Former MGP

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
1110									
0									Grayish brown fine to coarse SAND, some fine to coarse subangular to subrounded Gravel, little Organics (roots), loose, moist.
	1	0-5				0.0			
1105									
5									Gray fine SAND, little Silt, soft, saturated.
	2	5-7	0.6	3 8 13 15	21	0.0			Gray fine to medium SAND AND fine to medium subangular GRAVEL, loose, saturated.
	3	7-9	1.0	9 19 21 19	40	231.9			Slight odor (7.0-7.8' bgs) Tan fine to medium SAND AND fine to medium subangular GRAVEL, loose, saturated, odor.
1100									
10	4	9-11	0.9	21 26 31 29	57	250.1			Black lens (9.4-9.6' bgs) Tan fine to medium SAND AND fine subangular GRAVEL, tight, saturated, slight odor.
	5	11-13	1.5	17 17 21 21	38	9.8			Tan fine to medium subangular GRAVEL, little fine to coarse Sand, loose, saturated, slight odor. Black fine to medium subangular GRAVEL, little fine to coarse Sand, loose, saturated, slight odor.
1095	6	13-15	0.6	38 46 38 26	84	4.7			
15				30 30					Tan/rust colored mottling fine to medium subangular GRAVEL, little fine to coarse Sand, loose, saturated, slight odor.

Well/Boring Construction: Grout (0-35' bgs)

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery;
Analytical samples collected from: 7-11' bgs
Boring was moved 5' west from original survey location.

Client: NYSEG

Well/Boring ID: **PDI-2018-02**

Borehole Depth: 35' bgs

Site Location:
Cortland-Homer Former MGP

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		7	15-17	1.1	21 17	51	0.0				
		8	17-19	1.0	16 14 14 16	28	0.0			Tan fine to medium subangular to subrounded GRAVEL, some fine to coarse Sand, loose, saturated, slight odor.	
	1090	9	19-21	0.6	18 24 26 28	52	1.0				
20		10	21-23	1.8	20 21 23 30	44	86.1			Tan fine to medium subangular to subrounded GRAVEL, some fine to coarse Sand, loose, saturated, strong odor, sheen.	Grout (0-35' bgs)
										Tan fine to medium SAND, tight, saturated, odor.	
	1085	11	23-25	1.0	17 25 30 31	55	61.5			Tan fine to coarse SAND AND fine to medium subangular GRAVEL, little Silt, loose, saturated, odor, sheen.	
25		12	25-27	0.9	36 26 26 26	52	98.8				
		13	27-29	0.9	25 37 22 20	59	3.1			Tan fine to coarse SAND AND fine to medium angular to subangular GRAVEL, little Silt, tight, saturated, slight odor, sheen.	
	1080	14	29-31	NR	8 6 12 8	18	NR			No recovery (29-31' bgs).	
30		15	31-33	1.7	9 8 9 8	17	10.4			Gray SILTY CLAY, little fine Sand, soft, slight odor. Brownish Gray fine SAND, tight, saturated, slight odor. Brownish Gray SILTY CLAY, soft, saturated, slight odor.	
	1075	16	33-35	1.0	5 4 5 4	9	0.2			Grayish brown SILTY CLAY, tight, saturated.	
35										End of boring at 35.0' bgs.	

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery;
Analytical samples collected from: 7-11' bgs
Boring was moved 5' west from original survey location.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 9/6/18
Drilling Company: Parratt-Wolff
Driller's Name: Joe Percy, John Fioramonti
Drilling Method: HSA
Auger Size: 3 1/4"
Rig Type: Ingersoll Rand A200
Sampling Method: 2" x 2' Split Spoon

Northing: 955445.82
Easting: 927806.31
Casing Elevation: NA

Borehole Depth: 35' bgs
Surface Elevation: 1110.513

Descriptions By: Nicholle Griffith

Well/Boring ID: **PDI-2018-03**
Client: NYSEG

Location: Cortland-Homer Former MGP

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 1110	1	0-5				3.5			Grayish brown fine SAND, little Organics (roots), little fine to coarse subangular Gravel, loose, moist.	Grout (0-35' bgs)
5 / 1105	2	5-7	1.0	8, 15, 18, 15	33	0.1			Brownish gray fine SAND, little coarse Sand, little fine to medium subangular Gravel, saturated.	
	3	7-9	0.6	15, 23, 18, 20	41	0.0			Brownish gray fine to coarse SAND AND fine to medium subangular GRAVEL, loose, saturated.	
10 / 1100	4	9-11	0.7	3, 42, 15, 20	57	0.0			Gray medium to coarse SAND, some fine subangular Gravel, loose, saturated.	
	5	11-13	0.9	12, 50/.3		0.0			Gray medium to coarse SAND, some fine subangular Gravel, little fine Sand, loose, saturated.	
	6	13-15	0.3	50/.5		3.9			Brownish gray fine to medium SAND, tight, saturated.	
15 / 1095				2, 15					No Recovery (15-17' bgs).	

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery;
Analytical sample collected from: 13-15' bgs
Boring was moved 3' west from original survey location.

ARCADIS Design & Consultancy for natural and built assets

Client: NYSEG

Well/Boring ID: PDI-2018-03

Borehole Depth: 35' bgs

Site Location:
Cortland-Homer Former MGP

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		7	15-17	NR	30 20	45	NR			No Recovery (15-17' bgs).	
		8	17-19	2.0	23 15 18 50	33	0.0			Muliticolored fine subangular to subrounded GRAVEL, tight, saturated. Gray fine to medium SAND AND fine subangular GRAVEL, loose, saturated.	
20	1090	9	19-21	1.3	10 20 24 20	44	0.2			Multicolored fine to medium SAND, tight, saturated.	Grout (0-35' bgs)
		10	21-23	2.0	20 20 32 28	52	0.0			Multicolored fine to coarse SAND, tight, saturated. Grayish brown fine to coarse SAND AND fine to medium subangular GRAVEL, tight, saturated.	
		11	23-25	1.5	30 30 27 30	57	0.0			Gray fine to medium SAND, tight, saturated.	
25	1085	12	25-27	1.7	10 33 31 20	61	0.0			Grayish brown fine to coarse SAND AND fine to medium subangular GRAVEL, saturated.	
		13	27-29	0.5	15 8 8 9	16	0.0				
30	1080	14	29-31	1.1	4 7 17 12	24	0.0			Gray CLAY, litle fine Sand, dense, saturated.	
		15	31-33	1.2	8 5 8 5	13	0.0			Gray SILTY CLAY, soft, saturated.	
		16	33-35	1.2	4 8 10 35	18	0.0				
35	1075									End of boring at 35.0' bgs.	

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery;
Analytical sample collected from: 13-15' bgs
Boring was moved 3' west from original survey location.

ATTACHMENT 6

Analytical Laboratory Report

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

NYSEG, Homer, NY

SGS Job Number: JC73460

Sampling Dates: 09/06/18 - 09/07/18

Report to:

Arcadis U.S.
6723 Towpath Suite 300
Syracuse, NY 13214
Jason.Golubski@Arcadis.com; Ryan.Clare@Arcadis.com;
Nicholas.Beyrle@Arcadis.com
ATTN: Jason Golubski

Total number of pages in report: **184**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A. Paul Ioannidis
General Manager

Client Service contact: Lauren Sager 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

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EHS.US.CustomerCare@sgs.com

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SGS North America Inc.

Sample Summary

Arcadis

NYSEG, Homer, NY

Job No: JC73460

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC73460-1	09/07/18	00:00	NG	09/08/18	SO	Soil	DUP-090718
JC73460-2	09/06/18	14:57	NG	09/08/18	SO	Soil	PDI-2018-03 (13-15)
JC73460-3	09/07/18	09:45	NG	09/08/18	SO	Soil	PDI-2018-02 (7-11)
JC73460-4	09/07/18	14:30	NG	09/08/18	SO	Soil	PDI-2018-01 (19-23)
JC73460-4D	09/07/18	14:30	NG	09/08/18	SO	Soil Dup/MSD	PDI-2018-01 (19-23) (MSD)
JC73460-4S	09/07/18	14:30	NG	09/08/18	SO	Soil Matrix Spike	PDI-2018-01 (19-23) (MS)

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Arcadis	**Job No**	JC73460
Site:	NYSEG, Homer, NY	**Report Date**	9/21/2018 11:53:40 A

On 09/08/2018, 4 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.1 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC73460 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

MS Semi-volatiles By Method SW846 8270D

Matrix: SO **Batch ID:** OP15037

- All samples were extracted within the recommended method holding time.
- Sample(s) JC73460-4MS, JC73460-4MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

General Chemistry By Method SM2540 G 18TH ED MOD

Matrix: SO **Batch ID:** GN85572

- Sample(s) JC73460-4DUP were used as the QC samples for Solids, Percent.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Summary of Hits

Job Number: JC73460
Account: Arcadis
Project: NYSEG, Homer, NY
Collected: 09/06/18 thru 09/07/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC73460-1	**DUP-090718**					
Acenaphthene		60.4	36	12	ug/kg	SW846 8270D
Fluorene		25.3 J	36	17	ug/kg	SW846 8270D
Naphthalene		75.0	36	10	ug/kg	SW846 8270D
Phenanthrene		27.9 J	36	12	ug/kg	SW846 8270D
JC73460-2	**PDI-2018-03 (13-15)**					
Acenaphthene		150	40	14	ug/kg	SW846 8270D
Anthracene		33.8 J	40	24	ug/kg	SW846 8270D
Fluoranthene		23.8 J	40	18	ug/kg	SW846 8270D
Fluorene		70.3	40	18	ug/kg	SW846 8270D
Naphthalene		156	40	11	ug/kg	SW846 8270D
Phenanthrene		65.2	40	13	ug/kg	SW846 8270D
Pyrene		29.9 J	40	13	ug/kg	SW846 8270D
JC73460-3	**PDI-2018-02 (7-11)**					
Acenaphthene		52.1	35	12	ug/kg	SW846 8270D
Anthracene		37.0	35	22	ug/kg	SW846 8270D
Fluorene		53.6	35	16	ug/kg	SW846 8270D
Naphthalene		82.4	35	9.9	ug/kg	SW846 8270D
Phenanthrene		36.9	35	12	ug/kg	SW846 8270D
Pyrene		12.8 J	35	11	ug/kg	SW846 8270D
JC73460-4	**PDI-2018-01 (19-23)**					
Acenaphthene		49.5	38	13	ug/kg	SW846 8270D
Acenaphthylene		19.6 J	38	19	ug/kg	SW846 8270D
Fluoranthene		27.7 J	38	17	ug/kg	SW846 8270D
Fluorene		18.6 J	38	17	ug/kg	SW846 8270D
Naphthalene		60.7	38	11	ug/kg	SW846 8270D
Phenanthrene		58.7	38	13	ug/kg	SW846 8270D
Pyrene		36.1 J	38	12	ug/kg	SW846 8270D

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID: DUP-090718
Lab Sample ID: JC73460-1
Matrix: SO - Soil
Method: SW846 8270D SW846 3546
Project: NYSEG, Homer, NY

Date Sampled: 09/07/18
Date Received: 09/08/18
Percent Solids: 88.9

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P475571.D	1	09/14/18 09:36	CS	09/13/18 16:20	OP15037	E6P2338
Run #2							

	Initial Weight	Final Volume
Run #1	31.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	60.4	36	12	ug/kg	
208-96-8	Acenaphthylene	ND	36	18	ug/kg	
120-12-7	Anthracene	ND	36	22	ug/kg	
56-55-3	Benzo(a)anthracene	ND	36	10	ug/kg	
50-32-8	Benzo(a)pyrene	ND	36	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	36	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	36	18	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	36	17	ug/kg	
218-01-9	Chrysene	ND	36	11	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	36	16	ug/kg	
206-44-0	Fluoranthene	ND	36	16	ug/kg	
86-73-7	Fluorene	25.3	36	17	ug/kg	J
193-39-5	Indeno(1,2,3-cd)pyrene	ND	36	17	ug/kg	
91-20-3	Naphthalene	75.0	36	10	ug/kg	
85-01-8	Phenanthrene	27.9	36	12	ug/kg	J
129-00-0	Pyrene	ND	36	12	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	68%		26-134%
321-60-8	2-Fluorobiphenyl	72%		39-124%
1718-51-0	Terphenyl-d14	107%		36-134%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID: PDI-2018-03 (13-15)
Lab Sample ID: JC73460-2
Matrix: SO - Soil
Method: SW846 8270D SW846 3546
Project: NYSEG, Homer, NY

Date Sampled: 09/06/18
Date Received: 09/08/18
Percent Solids: 83.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P475565.D	1	09/14/18 07:07	CS	09/13/18 16:20	OP15037	E6P2338
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	150	40	14	ug/kg	
208-96-8	Acenaphthylene	ND	40	20	ug/kg	
120-12-7	Anthracene	33.8	40	24	ug/kg	J
56-55-3	Benzo(a)anthracene	ND	40	11	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	18	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	18	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	40	20	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	19	ug/kg	
218-01-9	Chrysene	ND	40	13	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	18	ug/kg	
206-44-0	Fluoranthene	23.8	40	18	ug/kg	J
86-73-7	Fluorene	70.3	40	18	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	40	19	ug/kg	
91-20-3	Naphthalene	156	40	11	ug/kg	
85-01-8	Phenanthrene	65.2	40	13	ug/kg	
129-00-0	Pyrene	29.9	40	13	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	65%		26-134%
321-60-8	2-Fluorobiphenyl	70%		39-124%
1718-51-0	Terphenyl-d14	101%		36-134%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID:	PDI-2018-02 (7-11)		
Lab Sample ID:	JC73460-3	**Date Sampled:**	09/07/18
Matrix:	SO - Soil	**Date Received:**	09/08/18
Method:	SW846 8270D SW846 3546	**Percent Solids:**	89.5
Project:	NYSEG, Homer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P475566.D	1	09/14/18 07:32	CS	09/13/18 16:20	OP15037	E6P2338
Run #2							

	Initial Weight	Final Volume
Run #1	31.8 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	52.1	35	12	ug/kg	
208-96-8	Acenaphthylene	ND	35	18	ug/kg	
120-12-7	Anthracene	37.0	35	22	ug/kg	
56-55-3	Benzo(a)anthracene	ND	35	9.9	ug/kg	
50-32-8	Benzo(a)pyrene	ND	35	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	35	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	35	18	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	35	16	ug/kg	
218-01-9	Chrysene	ND	35	11	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	35	16	ug/kg	
206-44-0	Fluoranthene	ND	35	16	ug/kg	
86-73-7	Fluorene	53.6	35	16	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	35	16	ug/kg	
91-20-3	Naphthalene	82.4	35	9.9	ug/kg	
85-01-8	Phenanthrene	36.9	35	12	ug/kg	
129-00-0	Pyrene	12.8	35	11	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	66%		26-134%
321-60-8	2-Fluorobiphenyl	68%		39-124%
1718-51-0	Terphenyl-d14	103%		36-134%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID: PDI-2018-01 (19-23)
Lab Sample ID: JC73460-4
Matrix: SO - Soil
Method: SW846 8270D SW846 3546
Project: NYSEG, Homer, NY

Date Sampled: 09/07/18
Date Received: 09/08/18
Percent Solids: 86.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P475564.D	1	09/14/18 06:42	CS	09/13/18 16:20	OP15037	E6P2338
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	49.5	38	13	ug/kg	
208-96-8	Acenaphthylene	19.6	38	19	ug/kg	J
120-12-7	Anthracene	ND	38	23	ug/kg	
56-55-3	Benzo(a)anthracene	ND	38	11	ug/kg	
50-32-8	Benzo(a)pyrene	ND	38	17	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	38	17	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	38	19	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	38	18	ug/kg	
218-01-9	Chrysene	ND	38	12	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	38	17	ug/kg	
206-44-0	Fluoranthene	27.7	38	17	ug/kg	J
86-73-7	Fluorene	18.6	38	17	ug/kg	J
193-39-5	Indeno(1,2,3-cd)pyrene	ND	38	18	ug/kg	
91-20-3	Naphthalene	60.7	38	11	ug/kg	
85-01-8	Phenanthrene	58.7	38	13	ug/kg	
129-00-0	Pyrene	36.1	38	12	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	70%		26-134%
321-60-8	2-Fluorobiphenyl	74%		39-124%
1718-51-0	Terphenyl-d14	106%		36-134%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

SGS

50
SB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

PAGE 1 OF 1

FED-EX Tracking # 810674533380 | Bottle Order Control #
SGS Quote # NWF5_2017_658 | SGS Job # JC73460

Client / Reporting Information

Company Name: Arcadis
Street Address: 110 West Fayette Street, Suite 300
City: Syracuse | State: NY | Zip: 13
Project Contact: Jason Golubski | E-mail:
Phone #: 315-671-9437 | Fax #:
Sampler(s) Name(s): Nicholle Griffith | Phone #: 315-378-8692

Project Information

Project Name: NYSEG - Homer, NY
Street:
City: State:
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (If different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	B8270PAH	V8260TCL20,	AB8270TCL20	HM8, CN	RCRACLAS	SULFUR,BTU	P8082PCB11 (SO)	P8082PCB11LL (AQ)	LAB USE ONLY
1	DUP-090718		9/7/18	-	MRG	SO	1					X				X								
2	PDI-2018-03 (13-15)		9/6/18	1457	MRG	SO	1					X				X								B13
3	PDI-2018-02 (7-11)		9/7/18	0945	MRG	SO	1					X				X								V270
4	PDI-2018-01 (19-23)		9/7/18	1430	MRG	SO	1					X				X								
	PDI-2018-01 (19-23) (MS)		9/7/18	1430	MRG	SO	1					X				X								
	PDI-2018-01 (19-23) (MSD)		9/7/18	1430	MRG	SO	1					X				X								
5	TB					DI	2	2																

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; ~~FB-Field Blank~~; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [x] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other COMMBN

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Report in ug/l, No "J" (UNIVAR62690)
INITIAL ASESSMENT
LABEL VERIFICATION
SYRA
Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		9/7/18 16:32	1	2	9/7/18 17:30	2
3		9/8/18 10:20	3	4		4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	[ ] Intact [ ] Not intact	Preserved where applicable [ ] On Ice [x] Cooler Temp. 3.7°

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.1 5

JC73460: Chain of Custody
Page 1 of 4

SGS Sample Receipt Summary

Job Number: JC73460 **Client:** Arcadis **Project:** NYSEG - Homer, NY

Date / Time Received: 9/8/2018 10:20:00 AM **Delivery Method:** FedEx **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (3.7);

Cooler Temps (Corrected) °C: Cooler 1: (3.1);

Cooler Security	Y	N		Y	N
1. Custody Seals Present:	☑	☐	3. COC Present:	☑	☐
2. Custody Seals Intact:	☑	☐	4. Smpl Dates/Time OK	☑	☐

Cooler Temperature	Y	N
1. Temp criteria achieved:	☑	☐
2. Cooler temp verification:	IR Gun	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	1	

Quality Control Preservation	Y	N	N/A
1. Trip Blank present / cooler:	☑	☐	☐
2. Trip Blank listed on COC:	☐	☑	☐
3. Samples preserved properly:	☑	☐	
4. VOCs headspace free:	☑	☐	☐

Sample Integrity - Documentation	Y	N
1. Sample labels present on bottles:	☑	☐
2. Container labeling complete:	☑	☐
3. Sample container label / COC agree:	☑	☐

Sample Integrity - Condition	Y	N
1. Sample recvd within HT:	☑	☐
2. All containers accounted for:	☑	☐
3. Condition of sample:	Intact	

Sample Integrity - Instructions	Y	N	N/A
1. Analysis requested is clear:	☑	☐	
2. Bottles received for unspecified tests	☐	☑	
3. Sufficient volume recvd for analysis:	☑	☐	
4. Compositing instructions clear:	☐	☐	☑
5. Filtering instructions clear:	☐	☐	☑

Test Strip Lot #s: pH 1-12: 216017 pH 12+: 208717 Other: (Specify)

Comments: -5: Received 2 - 40mL HCL vials for Trip Blank. Added to COC in lab.

SM089-02 Rev. Date 12/1/16

Responded to by: Rocus Peters Response Date: 9/11

-5) proceed as stated

Job Change Order: JC73460

Requested Date:	9/11/2018	**Received Date:**	9/8/2018
Account Name:	Arcadis	**Due Date:**	9/24/2018
Project Description:	NYSEG, Homer, NY	**Deliverable:**	NYASPB
C/O Initiated By:	KD **PM:** DK	**TAT (Days):**	14

==========

Sample #: JC73460-5

Dept:

TAT: 14

TB

Change:
Please cancel sample

==========

Above Changes Per: Client / Jason Golubski **Date/Time:** 9/11/2018 8:39:00 AM

To Client: This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.

JC73460: Chain of Custody
Page 4 of 4

Internal Sample Tracking Chronicle

Arcadis

NYSEG, Homer, NY

Job No: JC73460

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JC73460-1	Collected: 07-SEP-18 00:00 By: NG		Received: 08-SEP-18 By: DG			
DUP-090718						
JC73460-1	SM2540 G 18TH ED MOD	12-SEP-18 15:00	SF			SOL104
JC73460-1	SW846 8270D	14-SEP-18 09:36	CS	13-SEP-18	LJ	B8270PAH
JC73460-2	Collected: 06-SEP-18 14:57 By: NG		Received: 08-SEP-18 By: DG			
PDI-2018-03 (13-15)						
JC73460-2	SM2540 G 18TH ED MOD	12-SEP-18 15:00	SF			SOL104
JC73460-2	SW846 8270D	14-SEP-18 07:07	CS	13-SEP-18	LJ	B8270PAH
JC73460-3	Collected: 07-SEP-18 09:45 By: NG		Received: 08-SEP-18 By: DG			
PDI-2018-02 (7-11)						
JC73460-3	SM2540 G 18TH ED MOD	12-SEP-18 15:00	SF			SOL104
JC73460-3	SW846 8270D	14-SEP-18 07:32	CS	13-SEP-18	LJ	B8270PAH
JC73460-4	Collected: 07-SEP-18 14:30 By: NG		Received: 08-SEP-18 By: DG			
PDI-2018-01 (19-23)						
JC73460-4	SM2540 G 18TH ED MOD	12-SEP-18 15:00	SF			SOL104
JC73460-4	SW846 8270D	14-SEP-18 06:42	CS	13-SEP-18	LJ	B8270PAH

SGS Internal Chain of Custody

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY
Received: 09/08/18

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC73460-1.1	Secured Storage	Todd Shoemaker	09/12/18 11:59	Retrieve from Storage
JC73460-1.1	Todd Shoemaker	Secured Staging Area	09/12/18 11:59	Return to Storage
JC73460-1.1	Secured Staging Area	Sahara Feliciano	09/12/18 12:57	Retrieve from Storage
JC73460-1.1	Sahara Feliciano	Secured Storage	09/12/18 14:26	Return to Storage
JC73460-1.1	Secured Storage	Todd Shoemaker	09/13/18 11:18	Retrieve from Storage
JC73460-1.1	Todd Shoemaker	Secured Staging Area	09/13/18 11:18	Return to Storage
JC73460-1.1	Secured Staging Area	Matthew Stoecklin	09/13/18 12:57	Retrieve from Storage
JC73460-1.1	Matthew Stoecklin	Secured Storage	09/17/18 20:25	Return to Storage
JC73460-1.1.1	Matthew Stoecklin	Organics Prep	09/13/18 14:18	Extract from JC73460-1.1
JC73460-1.1.1	Organics Prep	Luis Jimenez	09/13/18 22:00	Extract from JC73460-1.1
JC73460-1.1.1	Luis Jimenez	Extract Storage	09/13/18 22:00	Return to Storage
JC73460-1.1.1	Extract Storage	Christopher Sowa	09/14/18 05:04	Retrieve from Storage
JC73460-1.1.1	Christopher Sowa	GCMS6P	09/14/18 05:04	Load on Instrument
JC73460-1.1.1	GCMS6P	Angela Rastelli	09/17/18 16:55	Unload from Instrument
JC73460-1.1.1	Angela Rastelli	Extract Freezer	09/17/18 16:55	Return to Storage
JC73460-2.1	Secured Storage	Todd Shoemaker	09/12/18 11:59	Retrieve from Storage
JC73460-2.1	Todd Shoemaker	Secured Staging Area	09/12/18 11:59	Return to Storage
JC73460-2.1	Secured Staging Area	Sahara Feliciano	09/12/18 12:57	Retrieve from Storage
JC73460-2.1	Sahara Feliciano	Secured Storage	09/12/18 14:26	Return to Storage
JC73460-2.1	Secured Storage	Todd Shoemaker	09/13/18 11:18	Retrieve from Storage
JC73460-2.1	Todd Shoemaker	Secured Staging Area	09/13/18 11:18	Return to Storage
JC73460-2.1	Secured Staging Area	Matthew Stoecklin	09/13/18 12:57	Retrieve from Storage
JC73460-2.1	Matthew Stoecklin	Secured Storage	09/17/18 20:25	Return to Storage
JC73460-2.1.1	Matthew Stoecklin	Organics Prep	09/13/18 14:18	Extract from JC73460-2.1
JC73460-2.1.1	Organics Prep	Luis Jimenez	09/13/18 22:00	Extract from JC73460-2.1
JC73460-2.1.1	Luis Jimenez	Extract Storage	09/13/18 22:00	Return to Storage
JC73460-2.1.1	Extract Storage	Christopher Sowa	09/14/18 05:04	Retrieve from Storage
JC73460-2.1.1	Christopher Sowa	GCMS6P	09/14/18 05:04	Load on Instrument
JC73460-2.1.1	GCMS6P	Angela Rastelli	09/17/18 16:55	Unload from Instrument
JC73460-2.1.1	Angela Rastelli	Extract Freezer	09/17/18 16:55	Return to Storage
JC73460-3.1	Secured Storage	Todd Shoemaker	09/12/18 11:59	Retrieve from Storage
JC73460-3.1	Todd Shoemaker	Secured Staging Area	09/12/18 11:59	Return to Storage
JC73460-3.1	Secured Staging Area	Sahara Feliciano	09/12/18 12:57	Retrieve from Storage
JC73460-3.1	Sahara Feliciano	Secured Storage	09/12/18 14:26	Return to Storage
JC73460-3.1	Secured Storage	Todd Shoemaker	09/13/18 11:18	Retrieve from Storage
JC73460-3.1	Todd Shoemaker	Secured Staging Area	09/13/18 11:18	Return to Storage
JC73460-3.1	Secured Staging Area	Matthew Stoecklin	09/13/18 12:57	Retrieve from Storage
JC73460-3.1	Matthew Stoecklin	Secured Storage	09/17/18 20:25	Return to Storage
JC73460-3.1.1	Matthew Stoecklin	Organics Prep	09/13/18 14:18	Extract from JC73460-3.1

SGS Internal Chain of Custody

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY
Received: 09/08/18

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC73460-3.1.1	Organics Prep	Luis Jimenez	09/13/18 22:00	Extract from JC73460-3.1
JC73460-3.1.1	Luis Jimenez	Extract Storage	09/13/18 22:00	Return to Storage
JC73460-3.1.1	Extract Storage	Christopher Sowa	09/14/18 05:04	Retrieve from Storage
JC73460-3.1.1	Christopher Sowa	GCMS6P	09/14/18 05:04	Load on Instrument
JC73460-3.1.1	GCMS6P	Angela Rastelli	09/17/18 16:55	Unload from Instrument
JC73460-3.1.1	Angela Rastelli	Extract Freezer	09/17/18 16:55	Return to Storage
JC73460-4.1	Secured Storage	Todd Shoemaker	09/13/18 11:18	Retrieve from Storage
JC73460-4.1	Todd Shoemaker	Secured Staging Area	09/13/18 11:18	Return to Storage
JC73460-4.1	Secured Staging Area	Matthew Stoecklin	09/13/18 12:57	Retrieve from Storage
JC73460-4.1	Matthew Stoecklin	Secured Storage	09/17/18 20:25	Return to Storage
JC73460-4.1.1	Matthew Stoecklin	Organics Prep	09/13/18 14:18	Extract from JC73460-4.1
JC73460-4.1.1	Organics Prep	Luis Jimenez	09/13/18 22:00	Extract from JC73460-4.1
JC73460-4.1.1	Luis Jimenez	Extract Storage	09/13/18 22:00	Return to Storage
JC73460-4.1.1	Extract Storage	Christopher Sowa	09/14/18 05:04	Retrieve from Storage
JC73460-4.1.1	Christopher Sowa	GCMS6P	09/14/18 05:04	Load on Instrument
JC73460-4.1.1	GCMS6P	Angela Rastelli	09/17/18 16:55	Unload from Instrument
JC73460-4.1.1	Angela Rastelli	Extract Freezer	09/17/18 16:55	Return to Storage
JC73460-4.3	Secured Storage	Todd Shoemaker	09/12/18 11:59	Retrieve from Storage
JC73460-4.3	Todd Shoemaker	Secured Staging Area	09/12/18 11:59	Return to Storage
JC73460-4.3	Secured Staging Area	Sahara Feliciano	09/12/18 12:57	Retrieve from Storage
JC73460-4.3	Sahara Feliciano	Secured Storage	09/12/18 14:26	Return to Storage

MS Semi-volatiles

6

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (DFTPP)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

Method Blank Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP15037-MB1	6P475560.D	1	09/14/18	CS	09/13/18	OP15037	E6P2338

The QC reported here applies to the following samples: **Method:** SW846 8270D

JC73460-1, JC73460-2, JC73460-3, JC73460-4

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	33	11	ug/kg	
208-96-8	Acenaphthylene	ND	33	17	ug/kg	
120-12-7	Anthracene	ND	33	20	ug/kg	
56-55-3	Benzo(a)anthracene	ND	33	9.4	ug/kg	
50-32-8	Benzo(a)pyrene	ND	33	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	33	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	33	17	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	33	16	ug/kg	
218-01-9	Chrysene	ND	33	10	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	33	15	ug/kg	
206-44-0	Fluoranthene	ND	33	15	ug/kg	
86-73-7	Fluorene	ND	33	15	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	33	16	ug/kg	
91-20-3	Naphthalene	ND	33	9.4	ug/kg	
85-01-8	Phenanthrene	ND	33	11	ug/kg	
129-00-0	Pyrene	ND	33	11	ug/kg	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	83%	23-115%
4165-62-2	Phenol-d5	81%	27-114%
118-79-6	2,4,6-Tribromophenol	80%	19-152%
4165-60-0	Nitrobenzene-d5	72%	26-134%
321-60-8	2-Fluorobiphenyl	74%	39-124%
1718-51-0	Terphenyl-d14	107%	36-134%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Semi-Volatile		0	ug/kg	

Blank Spike Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP15037-BS	6P475561.D	1	09/14/18	CS	09/13/18	OP15037	E6P2338

The QC reported here applies to the following samples: **Method:** SW846 8270D

JC73460-1, JC73460-2, JC73460-3, JC73460-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	1670	1500	90	53-119
208-96-8	Acenaphthylene	1670	1460	88	41-125
120-12-7	Anthracene	1670	1630	98	51-120
56-55-3	Benzo(a)anthracene	1670	1580	95	54-118
50-32-8	Benzo(a)pyrene	1670	1680	101	55-121
205-99-2	Benzo(b)fluoranthene	1670	1660	100	57-116
191-24-2	Benzo(g,h,i)perylene	1670	1770	106	40-124
207-08-9	Benzo(k)fluoranthene	1670	1650	99	59-116
218-01-9	Chrysene	1670	1650	99	51-115
53-70-3	Dibenzo(a,h)anthracene	1670	1670	100	48-121
206-44-0	Fluoranthene	1670	1540	92	58-117
86-73-7	Fluorene	1670	1420	85	56-114
193-39-5	Indeno(1,2,3-cd)pyrene	1670	1680	101	49-124
91-20-3	Naphthalene	1670	1490	89	44-116
85-01-8	Phenanthrene	1670	1630	98	53-119
129-00-0	Pyrene	1670	1710	103	54-124

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	89%	23-115%
4165-62-2	Phenol-d5	88%	27-114%
118-79-6	2,4,6-Tribromophenol	93%	19-152%
4165-60-0	Nitrobenzene-d5	78%	26-134%
321-60-8	2-Fluorobiphenyl	83%	39-124%
1718-51-0	Terphenyl-d14	115%	36-134%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP15037-MS	6P475562.D	1	09/14/18	CS	09/13/18	OP15037	E6P2338
OP15037-MSD	6P475563.D	1	09/14/18	CS	09/13/18	OP15037	E6P2338
JC73460-4	6P475564.D	1	09/14/18	CS	09/13/18	OP15037	E6P2338

The QC reported here applies to the following samples: **Method:** SW846 8270D

JC73460-1, JC73460-2, JC73460-3, JC73460-4

CAS No.	Compound	JC73460-4 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	49.5		1860	1510	78	1890	1590	82	5	21-136/34
208-96-8	Acenaphthylene	19.6	J	1860	1470	78	1890	1530	80	4	10-143/36
120-12-7	Anthracene	ND		1860	1620	87	1890	1730	92	7	10-147/39
56-55-3	Benzo(a)anthracene	ND		1860	1580	85	1890	1680	89	6	10-151/41
50-32-8	Benzo(a)pyrene	ND		1860	1670	90	1890	1790	95	7	10-149/40
205-99-2	Benzo(b)fluoranthene	ND		1860	1520	82	1890	1650	87	8	10-147/42
191-24-2	Benzo(g,h,i)perylene	ND		1860	1750	94	1890	1880	100	7	10-150/41
207-08-9	Benzo(k)fluoranthene	ND		1860	1740	93	1890	1860	98	7	12-142/41
218-01-9	Chrysene	ND		1860	1650	88	1890	1740	92	5	10-151/41
53-70-3	Dibenzo(a,h)anthracene	ND		1860	1620	87	1890	1730	92	7	10-152/38
206-44-0	Fluoranthene	27.7	J	1860	1580	83	1890	1670	87	6	10-151/44
86-73-7	Fluorene	18.6	J	1860	1440	76	1890	1490	78	3	19-133/36
193-39-5	Indeno(1,2,3-cd)pyrene	ND		1860	1670	90	1890	1800	95	7	10-148/41
91-20-3	Naphthalene	60.7		1860	1460	75	1890	1550	79	6	10-136/36
85-01-8	Phenanthrene	58.7		1860	1660	86	1890	1730	88	4	11-145/45
129-00-0	Pyrene	36.1	J	1860	1770	93	1890	1860	97	5	11-155/44

CAS No.	Surrogate Recoveries	MS	MSD	JC73460-4	Limits
367-12-4	2-Fluorophenol	76%	78%		23-115%
4165-62-2	Phenol-d5	75%	79%		27-114%
118-79-6	2,4,6-Tribromophenol	83%	86%		19-152%
4165-60-0	Nitrobenzene-d5	66%	69%	70%	26-134%
321-60-8	2-Fluorobiphenyl	73%	75%	74%	39-124%
1718-51-0	Terphenyl-d14	105%	106%	106%	36-134%

* = Outside of Control Limits.

Instrument Performance Check (DFTPP)

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2304-DFTPP
Lab File ID: 6P474906.D
Instrument ID: GCMS6P
Injection Date: 08/12/18
Injection Time: 12:38

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	82074	46.8		Pass
68	Less than 2.0% of mass 69	1557	0.89	(1.69) [a]	Pass
69	Mass 69 relative abundance	92066	52.5		Pass
70	Less than 2.0% of mass 69	237	0.14	(0.26) [a]	Pass
127	40.0 - 60.0% of mass 198	100325	57.2		Pass
197	Less than 1.0% of mass 198	1237	0.70		Pass
198	Base peak, 100% relative abundance	175485	100.0		Pass
199	5.0 - 9.0% of mass 198	10903	6.21		Pass
275	10.0 - 30.0% of mass 198	43593	24.8		Pass
365	1.0 - 100.0% of mass 198	7614	4.34		Pass
441	Present, but less than mass 443	19089	10.9	(86.9) [b]	Pass
442	40.0 - 100.0% of mass 198	128532	73.2		Pass
443	17.0 - 23.0% of mass 442	21963	12.5	(17.1) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
E6P2304-IC2304	6P474907.D	08/12/18	12:51	00:13	Initial cal 100
E6P2304-IC2304	6P474908.D	08/12/18	13:15	00:37	Initial cal 80
E6P2304-ICC2304	6P474909.D	08/12/18	13:45	01:07	Initial cal 50
E6P2304-IC2304	6P474910.D	08/12/18	14:10	01:32	Initial cal 25
E6P2304-IC2304	6P474911.D	08/12/18	14:53	02:15	Initial cal 10
E6P2304-IC2304	6P474912.D	08/12/18	15:17	02:39	Initial cal 5
E6P2304-IC2304	6P474913.D	08/12/18	15:42	03:04	Initial cal 2
E6P2304-IC2304	6P474914.D	08/12/18	16:07	03:29	Initial cal 1
E6P2304-ICV2304	6P474915.D	08/12/18	16:44	04:06	Initial cal verification 50
E6P2304-ICV2304	6P474916.D	08/12/18	17:09	04:31	Initial cal verification 50
E6P2304-ICV2304	6P474917.D	08/12/18	17:34	04:56	Initial cal verification 50

Instrument Performance Check (DFTPP)

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2305-DFTPP
Lab File ID: 6P474920.D
Instrument ID: GCMS6P
Injection Date: 08/12/18
Injection Time: 19:00

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	83344	45.1		Pass
68	Less than 2.0% of mass 69	1405	0.76	(1.50) [a]	Pass
69	Mass 69 relative abundance	93584	50.6		Pass
70	Less than 2.0% of mass 69	325	0.18	(0.35) [a]	Pass
127	40.0 - 60.0% of mass 198	106981	57.8		Pass
197	Less than 1.0% of mass 198	1323	0.72		Pass
198	Base peak, 100% relative abundance	184960	100.0		Pass
199	5.0 - 9.0% of mass 198	12028	6.50		Pass
275	10.0 - 30.0% of mass 198	47210	25.5		Pass
365	1.0 - 100.0% of mass 198	8955	4.84		Pass
441	Present, but less than mass 443	23084	12.5	(81.6) [b]	Pass
442	40.0 - 100.0% of mass 198	145560	78.7		Pass
443	17.0 - 23.0% of mass 442	28302	15.3	(19.4) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
E6P2305-IC2305	6P474921.D	08/12/18	19:28	00:28	Initial cal 100
E6P2305-IC2305	6P474922.D	08/12/18	19:53	00:53	Initial cal 80
E6P2305-ICC2305	6P474923.D	08/12/18	20:18	01:18	Initial cal 50
E6P2305-IC2305	6P474924.D	08/12/18	20:44	01:44	Initial cal 25
E6P2305-IC2305	6P474925.D	08/12/18	21:09	02:09	Initial cal 10
E6P2305-IC2305	6P474926.D	08/12/18	21:34	02:34	Initial cal 5
E6P2305-IC2305	6P474927.D	08/12/18	21:59	02:59	Initial cal 2
E6P2305-IC2305	6P474928.D	08/12/18	22:24	03:24	Initial cal 1
E6P2305-ICV2305	6P474929.D	08/12/18	22:49	03:49	Initial cal verification 50
E6P2305-ICV2305	6P474932.D	08/13/18	00:04	05:04	Initial cal verification 50

Instrument Performance Check (DFTPP)

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2338-DFTPP
Lab File ID: 6P475556.D
Instrument ID: GCMS6P
Injection Date: 09/14/18
Injection Time: 03:23

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	100114	58.9		Pass
68	Less than 2.0% of mass 69	1653	0.97	(1.62) [a]	Pass
69	Mass 69 relative abundance	101984	60.0		Pass
70	Less than 2.0% of mass 69	532	0.31	(0.52) [a]	Pass
127	40.0 - 60.0% of mass 198	101482	59.7		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	170080	100.0		Pass
199	5.0 - 9.0% of mass 198	10962	6.45		Pass
275	10.0 - 30.0% of mass 198	47289	27.8		Pass
365	1.0 - 100.0% of mass 198	5060	2.98		Pass
441	Present, but less than mass 443	20679	12.2	(74.7) [b]	Pass
442	40.0 - 100.0% of mass 198	135408	79.6		Pass
443	17.0 - 23.0% of mass 442	27691	16.3	(20.5) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
E6P2338-CC2304	6P475557.D	09/14/18	03:38	00:15	Continuing cal 25
E6P2338-CC2305	6P475558.D	09/14/18	04:03	00:40	Continuing cal 25
OP15037-MB1	6P475560.D	09/14/18	05:02	01:39	Method Blank
OP15037-BS	6P475561.D	09/14/18	05:27	02:04	Blank Spike
OP15037-MS	6P475562.D	09/14/18	05:52	02:29	Matrix Spike
OP15037-MSD	6P475563.D	09/14/18	06:17	02:54	Matrix Spike Duplicate
JC73460-4	6P475564.D	09/14/18	06:42	03:19	PDI-2018-01 (19-23)
JC73460-2	6P475565.D	09/14/18	07:07	03:44	PDI-2018-03 (13-15)
JC73460-3	6P475566.D	09/14/18	07:32	04:09	PDI-2018-02 (7-11)
ZZZZZZ	6P475567.D	09/14/18	07:57	04:34	(unrelated sample)
ZZZZZZ	6P475568.D	09/14/18	08:21	04:58	(unrelated sample)
ZZZZZZ	6P475569.D	09/14/18	08:46	05:23	(unrelated sample)
ZZZZZZ	6P475570.D	09/14/18	09:11	05:48	(unrelated sample)
JC73460-1	6P475571.D	09/14/18	09:36	06:13	DUP-090718
ZZZZZZ	6P475572.D	09/14/18	10:01	06:38	(unrelated sample)
ZZZZZZ	6P475573.D	09/14/18	10:26	07:03	(unrelated sample)
ZZZZZZ	6P475574.D	09/14/18	10:51	07:28	(unrelated sample)
ZZZZZZ	6P475575.D	09/14/18	11:16	07:53	(unrelated sample)
ZZZZZZ	6P475576.D	09/14/18	11:41	08:18	(unrelated sample)

Instrument Performance Check (DFTPP)

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample:	E6P2338-DFTPP	**Injection Date:**	09/14/18
Lab File ID:	6P475556.D	**Injection Time:**	03:23
Instrument ID:	GCMS6P		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	6P475577.D	09/14/18	12:06	08:43	(unrelated sample)
ZZZZZZ	6P475578.D	09/14/18	12:31	09:08	(unrelated sample)

Internal Standard Area Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Check Std:	E6P2338-CC2304	**Injection Date:**	09/14/18
Lab File ID:	6P475557.D	**Injection Time:**	03:38
Instrument ID:	GCMS6P	**Method:**	SW846 8270D

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT	IS 6 AREA	RT
Check Std	262138	4.33	1082797	5.32	584667	7.01	1001878	8.68	980483	11.83	955179	13.41
Upper Limit [a]	524276	4.83	2165594	5.82	1169334	7.51	2003756	9.18	1960966	12.33	1910358	13.91
Lower Limit [b]	131069	3.83	541399	4.82	292334	6.51	500939	8.18	490242	11.33	477590	12.91

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT	IS 6 AREA	RT
OP15037-MB1	277798	4.33	1126870	5.32	601204	7.01	991128	8.68	858068	11.82	854162	13.41
OP15037-BS	270114	4.33	1072889	5.32	550342	7.01	890233	8.68	823617	11.83	786257	13.41
OP15037-MS	284665	4.33	1113314	5.32	571932	7.01	935842	8.68	848815	11.83	820538	13.41
OP15037-MSD	286113	4.33	1118324	5.32	577581	7.01	942277	8.68	856528	11.83	815532	13.41
JC73460-4	273177	4.33	1109334	5.31	573782	7.01	947694	8.68	831396	11.82	796607	13.41
JC73460-2	300280	4.33	1208936	5.31	612530	7.01	987690	8.68	843851	11.82	844455	13.41
JC73460-3	306634	4.33	1194845	5.31	632026	7.01	1008441	8.68	866284	11.82	845079	13.41
ZZZZZZ	288333	4.33	1118277	5.31	594025	7.01	945262	8.68	807349	11.82	795815	13.41
ZZZZZZ	300830	4.33	1186104	5.31	626481	7.01	998364	8.68	820423	11.82	801561	13.41
ZZZZZZ	295184	4.33	1169663	5.31	610862	7.01	971484	8.68	800687	11.82	772676	13.41
ZZZZZZ	325970	4.33	1278154	5.31	652405	7.01	1008006	8.68	847606	11.83	849778	13.42
JC73460-1	314467	4.33	1236054	5.31	629674	7.01	1007768	8.68	846122	11.82	828351	13.41
ZZZZZZ	321066	4.33	1241395	5.31	628414	7.01	988559	8.68	825389	11.83	822525	13.41
ZZZZZZ	309376	4.33	1230489	5.31	633605	7.01	966619	8.68	795353	11.82	781142	13.41
ZZZZZZ	329649	4.33	1266037	5.31	635834	7.01	965587	8.68	826078	11.83	854759	13.42
ZZZZZZ	338644	4.33	1315260	5.32	650712	7.01	993903	8.68	909797	11.83	986075	13.43
ZZZZZZ	355633	4.33	1356157	5.32	684913	7.01	1029540	8.68	848652	11.83	911210	13.42
ZZZZZZ	305756	4.33	1198477	5.32	597634	7.01	939514	8.68	817027	11.83	856666	13.42
ZZZZZZ	303608	4.33	1203103	5.32	654278	7.01	1081089	8.68	1028044	11.83	1083347	13.42

IS 1 = 1,4-Dichlorobenzene-d4
IS 2 = Naphthalene-d8
IS 3 = Acenaphthene-D10
IS 4 = Phenanthrene-d10
IS 5 = Chrysene-d12
IS 6 = Perylene-d12

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

Surrogate Recovery Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Method: SW846 8270D **Matrix:** SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
JC73460-1	6P475571.D	68	72	107
JC73460-2	6P475565.D	65	70	101
JC73460-3	6P475566.D	66	68	103
JC73460-4	6P475564.D	70	74	106
OP15037-BS	6P475561.D	78	83	115
OP15037-MB1	6P475560.D	72	74	107
OP15037-MS	6P475562.D	66	73	105
OP15037-MSD	6P475563.D	69	75	106

Surrogate Compounds	Recovery Limits
S1 = Nitrobenzene-d5	26-134%
S2 = 2-Fluorobiphenyl	39-124%
S3 = Terphenyl-d14	36-134%

Initial Calibration Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2304-ICC2304
Lab FileID: 6P474909.D

Response Factor Report MS6P

Method : C:\MSDCHEM\1\METHODS\M6P2304.M (RTE Integrator)
Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:39:28 2018
Last Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration

Calibration Files
2 =6p474913.D 5 =6p474912.D 25 =6p474910.D 80 =6p474908.D
100 =6p474907.D 50 =6p474909.D 1 =6p474914.D 10 =6p474911.D

Compound	2	5	25	80	100	50	1	10	Avg	%RSD
1) I 1,4-Dichlorobenzene-d	ISTD									
2) 1,4-Dioxane	0.722	0.665	0.643	0.635	0.622	0.634	0.752	0.666	0.667	6.90
3) Pyridine	1.627	1.591	1.704	1.674	1.603	1.674	1.555	1.810	1.655	4.84
4) N-Nitrosodim	0.995	1.006	0.938	0.962	0.915	0.947	1.029	1.018	0.976	4.23
5) 2-Fluorophen	1.412	1.377	1.376	1.420	1.393	1.374	1.445	1.405	1.400	1.79
6) Indene	2.494	2.544	2.371	2.402	2.396	2.335	2.647	2.500	2.461	4.22
7) Cumene	4.403	4.204	3.930	3.892	3.852	3.881	4.351	4.103	4.077	5.43
8) Phenol-d5	1.814	1.840	1.802	1.838	1.820	1.798	1.805	1.874	1.824	1.41
9) Phenol	2.209	2.259	2.073	2.171	2.115	2.119	2.234	2.219	2.175	3.05
10) Aniline	2.558	2.602	2.357	2.433	2.368	2.393	2.601	2.511	2.478	4.15
11) bis(2-Chloro	1.467	1.522	1.388	1.384	1.361	1.355	1.510	1.446	1.429	4.64
12) 2-Chlorophen	1.509	1.488	1.398	1.438	1.415	1.394	1.542	1.458	1.455	3.71
13) Decane	1.694	1.626	1.534	1.463	1.436	1.477	1.835	1.654	1.590	8.64
14) 1,3-Dichloro	1.654	1.586	1.550	1.568	1.544	1.495	1.655	1.619	1.584	3.55
15) 1,4-Dichloro	1.684	1.693	1.565	1.580	1.578	1.544	1.897	1.617	1.645	7.03
16) Benzyl alcoh	0.963	1.002	0.953	0.984	0.983	0.971	0.938	0.990	0.973	2.16
17) 1,2-Dichloro	1.572	1.522	1.446	1.459	1.459	1.438	1.705	1.497	1.512	5.96
18) Acetophenone	2.485	2.424	2.239	2.252	2.224	2.233	2.523	2.345	2.341	5.22
19) 2-Methylphen	1.441	1.478	1.424	1.450	1.438	1.364	1.621	1.487	1.463	5.06
20) 2,2'-oxybis(	0.502	0.492	0.451	0.459	0.447	0.457	0.581	0.493	0.485	9.08
21) 3&4-Methylph	1.532	1.482	1.451	1.522	1.473	1.469	1.512	1.560	1.500	2.48
22) n-Nitroso-di	1.290	1.273	1.179	1.166	1.159	1.163	1.293	1.284	1.226	5.20
23) Hexachloroet	0.532	0.555	0.538	0.536	0.539	0.525	0.599	0.541	0.546	4.27
24) I Naphthalene-d8	ISTD									
25) Nitrobenzene	0.479	0.454	0.459	0.468	0.453	0.462	0.451	0.455	0.460	2.10
26) Nitrobenzene	0.476	0.482	0.465	0.459	0.446	0.463	0.475	0.472	0.467	2.44
27) Quinoline	0.726	0.743	0.706	0.735	0.705	0.722	0.733	0.725	0.724	1.85
28) Isophorone	0.803	0.792	0.783	0.779	0.766	0.773	0.753	0.769	0.777	2.01
29) 2-Nitropheno	0.149	0.174	0.188	0.198	0.194	0.195	0.143	0.181	0.178	11.91
30) 2,4-Dimethyl	0.400	0.421	0.419	0.424	0.416	0.415	0.401	0.427	0.415	2.43
31) Benzoic acid			0.280	0.331	0.332	0.312		0.242	0.299	12.75
32) bis(2-Chloro	0.418	0.397	0.390	0.387	0.388	0.387	0.427	0.390	0.398	3.91
33) 2,4-Dichloro	0.287	0.293	0.293	0.300	0.300	0.302	0.310	0.296	0.298	2.29
34) 2,6-Dichloro	0.287	0.289	0.290	0.299	0.296	0.296	0.292	0.287	0.292	1.57
35) 1,3,5-Trichl	0.355	0.351	0.326	0.334	0.329	0.337	0.377	0.328	0.342	5.17
36) 1,2,4-Trichl	0.332	0.321	0.309	0.309	0.308	0.313	0.347	0.317	0.319	4.29
37) 1,2,3-Trichl	0.320	0.323	0.311	0.311	0.313	0.305	0.344	0.307	0.317	3.94
38) Naphthalene	1.116	1.142	1.052	1.068	1.067	1.047	1.211	1.078	1.098	5.10
39) 4-Chloroanil	0.479	0.457	0.462	0.467	0.460	0.459	0.481	0.471	0.467	1.97
40) 2,3-Dichloro	0.356	0.383	0.362	0.376	0.376	0.364	0.398	0.359	0.372	3.86
41) Caprolactam	0.160	0.175	0.179	0.186	0.182	0.183	0.170	0.173	0.176	4.85
42) Hexachlorobu	0.201	0.199	0.191	0.196	0.199	0.201	0.213	0.190	0.199	3.62
43) 4-Chloro-3-m	0.328	0.348	0.359	0.368	0.362	0.367	0.358	0.366	0.357	3.77
44) 2-Methylnaph	0.582	0.571	0.563	0.573	0.567	0.569	0.579	0.557	0.570	1.43
45) 1-Methylnaph	0.651	0.646	0.627	0.632	0.635	0.632	0.622	0.625	0.634	1.58

Initial Calibration Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2304-ICC2304
Lab FileID: 6P474909.D

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46) Dimethylnaph 0.616 0.633 0.607 0.619 0.624 0.606 0.570 0.608 0.610   3.11

47) I   Acenaphthene-d10      ----------------ISTD---------------------
48) Hexachlorocy 0.327 0.358 0.393 0.435 0.442 0.418 0.292 0.371 0.379  13.95
49) 2,4,6-Trichl 0.391 0.400 0.388 0.431 0.428 0.414 0.350 0.380 0.398   6.68
50) 2,4,5-Trichl 0.393 0.394 0.421 0.437 0.435 0.431 0.389 0.418 0.415   4.81
51) 2-Fluorobiph 1.524 1.529 1.444 1.480 1.475 1.467 1.542 1.518 1.498   2.35
52) 2-Chloronaph 1.352 1.263 1.248 1.255 1.258 1.239 1.293 1.257 1.271   2.87
53) Biphenyl     1.660 1.641 1.577 1.617 1.589 1.571 1.659 1.614 1.616   2.18
54) 2-Nitroanili 0.414 0.439 0.468 0.485 0.482 0.481 0.387 0.468 0.453   7.96
55) Dimethylphth 1.476 1.467 1.428 1.424 1.431 1.402 1.486 1.457 1.446   2.04
56) Acenaphthyle 1.975 1.994 1.882 1.962 1.924 1.938 1.983 1.972 1.954   1.90
57) 2,6-Dinitrot 0.258 0.281 0.302 0.324 0.318 0.311 0.252 0.317 0.295   9.57
58) 3-Nitroanili 0.318 0.355 0.363 0.377 0.377 0.374 0.267 0.367 0.350  11.02
59) Acenaphthene 1.300 1.271 1.235 1.257 1.256 1.232 1.345 1.252 1.268   2.95
60) 2,4-Dinitrop 0.051 0.078 0.134 0.175 0.181 0.165       0.108 0.127  39.50
         ----- Quadratic regression -----               Coefficient =  0.9995
              Response Ratio = -0.01946 + 0.15277 *A + 0.00654 *A^2

61) 4-Nitropheno 0.205 0.240 0.268 0.284 0.294 0.278       0.260 0.261  11.64
62) Dibenzofuran 1.801 1.801 1.707 1.772 1.755 1.734 1.849 1.782 1.775   2.48
63) 2,4-Dinitrot 0.306 0.401 0.429 0.469 0.462 0.442 0.293 0.422 0.403  16.75
         ----- Quadratic regression -----               Coefficient =  0.9996
              Response Ratio = -0.00639 + 0.44014 *A + 0.01129 *A^2

64) 2,3,4,6-Tetr 0.312 0.316 0.352 0.373 0.378 0.367 0.302 0.338 0.342   8.72
65) Diethylphtha 1.436 1.488 1.430 1.465 1.468 1.430 1.440 1.462 1.452   1.48
66) Fluorene     1.410 1.417 1.401 1.477 1.474 1.464 1.404 1.437 1.435   2.23
67) 4-Chlorophen 0.685 0.664 0.634 0.674 0.676 0.647 0.678 0.662 0.665   2.58
68) 4-Nitroanili 0.322 0.343 0.378 0.367 0.370 0.396 0.286 0.393 0.357  10.61

69) I   Phenanthrene-d10      ----------------ISTD---------------------
70) 4,6-Dinitro- 0.048 0.072 0.122 0.144 0.145 0.135       0.099 0.109  34.68
         ----- Quadratic regression -----               Coefficient =  0.9997
              Response Ratio = -0.00732 + 0.13344 *A + 0.00613 *A^2

71) n-Nitrosodip 0.533 0.568 0.558 0.565 0.565 0.571 0.541 0.558 0.558   2.40
72) 1,2-Diphenyl 0.954 0.965 0.931 0.919 0.919 0.946 0.914 0.933 0.935   1.97
73) 2,4,6-Tribro 0.098 0.118 0.123 0.135 0.137 0.130 0.101 0.117 0.120  12.00
74) 4-Bromopheny 0.195 0.217 0.213 0.227 0.225 0.220 0.215 0.206 0.215   4.84
75) Hexachlorobe 0.267 0.270 0.254 0.268 0.269 0.263 0.263 0.252 0.263   2.59
76) Pentachlorop 0.120 0.146 0.166 0.186 0.192 0.178       0.149 0.162  15.86
         ----- Quadratic regression -----               Coefficient =  1.0000
              Response Ratio = -0.00655 + 0.16538 *A + 0.00563 *A^2

77) Phenanthrene 1.103 1.112 1.049 1.050 1.079 1.072 1.091 1.042 1.075   2.44
78) Anthracene   1.082 1.079 1.051 1.076 1.092 1.084 1.030 1.047 1.068   2.06
79) Carbazole    1.019 1.066 1.031 1.023 1.052 1.058 0.970 1.027 1.031   2.92
80) Di-n-butylph 1.211 1.263 1.296 1.321 1.351 1.361 1.117 1.270 1.274   6.28
81) Fluoranthene 1.091 1.167 1.184 1.215 1.207 1.193 1.089 1.127 1.159   4.36
82) Octadecane   0.542 0.566 0.582 0.555 0.568 0.575 0.512 0.565 0.558   4.00

83) I   Chrysene-d12          ----------------ISTD---------------------
84) Pyrene       1.173 1.209 1.134 1.173 1.147 1.169 1.176 1.192 1.172   1.99
85) Terphenyl-d1 0.774 0.797 0.759 0.819 0.805 0.803 0.779 0.806 0.793   2.54
86) Butylbenzylp 0.447 0.513 0.546 0.567 0.560 0.573 0.421 0.555 0.523  11.09
87) Benzo[a]anth 1.102 1.150 1.120 1.207 1.196 1.135 1.220 1.135 1.158   3.79
88) 3,3'-Dichlor 0.331 0.387 0.405 0.480 0.481 0.442       0.396 0.417  12.95
89) Chrysene     1.101 1.100 1.017 1.085 1.083 1.032 1.090 1.054 1.070   2.99
90) bis(2-Ethylh 0.581 0.691 0.724 0.741 0.736 0.745 0.559 0.714 0.686  10.79
```

Initial Calibration Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2304-ICC2304
Lab FileID: 6P474909.D

```
 91) I   Perylene-d12          ----------------ISTD---------------------
 92) Di-n-octylph 0.882 1.125 1.282 1.372 1.380 1.392 0.796 1.236 1.183  19.56
          ----- Quadratic regression -----                Coefficient =  0.9998
               Response Ratio = -0.03022 + 1.38550 *A + 0.00292 *A^2

 93) Benzo[b]fluo 1.071 1.128 1.163 1.309 1.380 1.227 1.111 1.162 1.194   8.80
 94) Benzo[k]fluo 0.963 1.050 0.969 1.078 1.071 1.065 0.988 0.990 1.022   4.77
 95) Benzo[a]pyre 0.851 0.992 0.951 1.029 1.073 1.011 0.840 0.947 0.962   8.60
 96) Indeno[1,2,3 0.968 1.085 1.106 1.260 1.298 1.246 0.983 1.109 1.132  11.03
 97) Dibenz(a,h)a 0.694 0.786 0.817 0.914 0.959 0.901 0.657 0.791 0.815  13.02
 98) Dibenz[a,h]a 0.831 0.961 0.953 1.129 1.167 1.034 0.879 0.948 0.988  11.74
 99) 7,12-Dimethy 0.458 0.510 0.536 0.617 0.626 0.595 0.435 0.523 0.537  13.24
100) Benzo[g,h,i] 0.842 0.877 0.852 0.959 0.968 0.927 0.839 0.857 0.890   5.97

 ------------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

           M6P2304.M         Mon Aug 13 10:32:16 2018   ACLIMS
```

Initial Calibration Verification

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2304-ICV2304
Lab FileID: 6P474915.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\E6P2304\6p474915.D Vial: 10
Acq On : 12 Aug 2018 4:44 pm Operator: christc2
Sample : icv2304-50 Inst : MS6P
Misc : op8717,e6p2304,1000,,,1,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M6P2304.M (RTE Integrator)
Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:39:28 2018
Last Update : Sun Aug 12 17:39:28 2018
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	132	0.00	4.52
2	t	1,4-Dioxane	0.667	0.646	3.1	134	-0.01	2.02
3	t	Pyridine	1.655	1.677	-1.3	132	-0.04	2.34
4	t	N-Nitrosodimethylamine	0.976	0.983	-0.7	137	-0.01	2.32
5	S	2-Fluorophenol	1.400	1.438	-2.7	138	0.00	3.53
8	S	Phenol-d5	1.824	1.851	-1.5	136	0.01	4.26
10		Aniline	2.478	2.031	18.0	112	0.00	4.28
11	t	bis(2-Chloroethyl)ether	1.429	1.463	-2.4	143	0.00	4.33
14	t	1,3-Dichlorobenzene	1.584	1.499	5.4	132	0.00	4.48
15	t	1,4-Dichlorobenzene	1.645	1.544	6.1	132	0.00	4.53
16	t	Benzyl alcohol	0.973	1.050	-7.9	143	0.00	4.63
17	t	1,2-Dichlorobenzene	1.512	1.445	4.4	133	0.00	4.65
18	t	Acetophenone	2.341	2.158	7.8	128	0.00	4.83
20	t	2,2'-oxybis(1-Chloropropa	0.485	0.500	-3.1	144	0.00	4.73
22	t	n-Nitroso-di-n-propylamin	1.226	1.135	7.4	129	0.00	4.83
23	t	Hexachloroethane	0.546	0.536	1.8	135	0.00	4.91
24	I	Naphthalene-d8	1.000	1.000	0.0	135	0.00	5.54
25	S	Nitrobenzene-d5	0.460	0.456	0.9	133	0.00	4.94
26	t	Nitrobenzene	0.467	0.440	5.8	128	0.00	4.96
28	t	Isophorone	0.777	0.806	-3.7	141	0.00	5.15
32	t	bis(2-Chloroethoxy)methan	0.398	0.436	-9.5	152	0.00	5.33
36	t	1,2,4-Trichlorobenzene	0.319	0.306	4.1	132	0.00	5.49
38	t	Naphthalene	1.098	1.035	5.7	133	0.00	5.56
39	t	4-Chloroaniline	0.467	0.410	12.2	120	0.01	5.61
41	t	Caprolactam	0.176	0.167	5.1	123	0.00	5.92
42	t	Hexachlorobutadiene	0.199	0.195	2.0	131	0.00	5.68
44	t	2-Methylnaphthalene	0.570	0.581	-1.9	138	0.00	6.20
45	t	1-Methylnaphthalene	0.634	0.578	8.8	123	0.00	6.29
47	I	Acenaphthene-d10	1.000	1.000	0.0	131	0.01	7.27
51	S	2-Fluorobiphenyl	1.498	1.521	-1.5	136	0.01	6.56
52	t	2-Chloronaphthalene	1.271	1.346	-5.9	143	0.01	6.68
53	t	Biphenyl	1.616	1.538	4.8	129	0.01	6.67
54	t	2-Nitroaniline	0.453	0.543	-19.9	148	0.02	6.79
55	t	Dimethylphthalate	1.446	1.444	0.1	135	0.01	6.99
56	t	Acenaphthylene	1.954	1.827	6.5	124	0.01	7.12
57	t	2,6-Dinitrotoluene	0.295	0.326	-10.5	138	0.01	7.05
58	t	3-Nitroaniline	0.350	0.355	-1.4	125	0.02	7.23
59	t	Acenaphthene	1.268	1.177	7.2	126	0.00	7.30
62	t	Dibenzofuran	1.775	1.751	1.4	133	0.01	7.50

Initial Calibration Verification

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2304-ICV2304
Lab FileID: 6P474915.D

				True	Calc.	% Drift			
63	t	2,4-Dinitrotoluene		50.000	50.456	-0.9	135	0.01	7.48
				AvgRF	CCRF	% Dev			
65	t	Diethylphthalate		1.452	1.464	-0.8	134	0.02	7.78
66	t	Fluorene		1.435	1.437	-0.1	129	0.00	7.88
67	t	4-Chlorophenyl-phenylethe		0.665	0.675	-1.5	137	0.00	7.89
68	t	4-Nitroaniline		0.357	0.342	4.2	114	0.02	7.91
69	I	Phenanthrene-d10		1.000	1.000	0.0	137	0.01	8.96
71	t	n-Nitrosodiphenylamine		0.558	0.639	-14.5	153	0.01	8.02
72	t	1,2-Diphenylhydrazine		0.935	0.912	2.5	132	0.01	8.07
73	S	2,4,6-Tribromophenol		0.120	0.131	-9.2	139	0.00	8.15
74	t	4-Bromophenyl-phenylether		0.215	0.218	-1.4	136	0.00	8.45
75	t	Hexachlorobenzene		0.263	0.261	0.8	136	0.01	8.52
77	t	Phenanthrene		1.075	1.056	1.8	135	0.01	8.98
78	t	Anthracene		1.068	1.054	1.3	133	0.01	9.04
79	t	Carbazole		1.031	1.026	0.5	133	0.01	9.24
80	t	Di-n-butylphthalate		1.274	1.302	-2.2	131	0.01	9.71
81	t	Fluoranthene		1.159	1.179	-1.7	136	0.01	10.39
83	I	Chrysene-d12		1.000	1.000	0.0	137	0.01	12.12
84	t	Pyrene		1.172	1.122	4.3	131	0.01	10.66
85	S	Terphenyl-d14		0.793	0.815	-2.8	139	0.00	10.88
86	t	Butylbenzylphthalate		0.523	0.554	-5.9	132	0.00	11.50
87	t	Benzo[a]anthracene		1.158	1.137	1.8	137	0.00	12.11
88	t	3,3'-Dichlorobenzidine		0.417	0.422	-1.2	131	0.01	12.10
89	t	Chrysene		1.070	1.002	6.4	133	0.02	12.15
90	t	bis(2-Ethylhexyl)phthalat		0.686	0.707	-3.1	130	0.01	12.22
91	I	Perylene-d12		1.000	1.000	0.0	121	0.00	13.71
				True	Calc.	% Drift			
92	t	Di-n-octylphthalate		50.000	55.079	-10.2	131	0.00	12.96
				AvgRF	CCRF	% Dev			
93	t	Benzo[b]fluoranthene		1.194	1.346	-12.7	132	0.02	13.32
94	t	Benzo[k]fluoranthene		1.022	1.101	-7.7	125	0.02	13.35
95	t	Benzo[a]pyrene		0.962	1.174	-22.0	140	0.01	13.65
96	t	Indeno[1,2,3-cd]pyrene		1.132	1.389	-22.7	135	0.02	14.81
97	t	Dibenz(a,h)acridine		0.815	0.983	-20.6	132	0.07	14.61
98	t	Dibenz[a,h]anthracene		0.988	1.167	-18.1	136	0.02	14.83
100	t	Benzo[g,h,i]perylene		0.890	1.123	-26.2	146	0.03	15.11

(#) = Out of Range SPCC's out = 0 CCC's out = 0

6p474909.D M6P2304.M Mon Aug 13 10:32:30 2018 ACLIMS

Initial Calibration Verification

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2304-ICV2304
Lab FileID: 6P474916.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\E6P2304\6p474916.D Vial: 11
Acq On : 12 Aug 2018 5:09 pm Operator: christc2
Sample : icv2304-50 Inst : MS6P
Misc : op8717,e6p2304,1000,,,1,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M6P2304.M (RTE Integrator)
Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:39:28 2018
Last Update : Sun Aug 12 17:39:28 2018
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	123	0.00	4.52
6	t	Indene	2.461	2.597	-5.5	136	0.00	4.71
7	t	Cumene	4.077	3.754	7.9	119	0.00	3.93
13	t	Decane	1.590	1.426	10.3	118	0.00	4.41
24	I	Naphthalene-d8	1.000	1.000	0.0	122	0.00	5.54
27	t	Quinoline	0.724	0.677	6.5	115	0.00	5.85
40	t	2,3-Dichloroaniline	0.372	0.307	17.5	103	0.00	6.47
46	t	Dimethylnaphthalene	0.610	0.564	7.5	114	0.00	6.82
47	I	Acenaphthene-d10	1.000	1.000	0.0	115	0.00	7.26
48	t	Hexachlorocyclopentadiene	0.379	0.413	-9.0	115	0.00	6.36
69	I	Phenanthrene-d10	1.000	1.000	0.0	109	0.00	8.95
82	t	Octadecane	0.558	0.576	-3.2	110	0.00	8.90
91	I	Perylene-d12	1.000	1.000	0.0	97	0.00	13.71
99	t	7,12-Dimethylbenz(a)anthr	0.537	0.528	1.7	86	0.00	13.31

(#) = Out of Range SPCC's out = 0 CCC's out = 0
6p474909.D M6P2304.M Mon Aug 13 10:32:32 2018 ACLIMS

Initial Calibration Verification

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2304-ICV2304
Lab FileID: 6P474917.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\E6P2304\6p474917.D Vial: 12
Acq On : 12 Aug 2018 5:34 pm Operator: christc2
Sample : icv2304-50 Inst : MS6P
Misc : op8717,e6p2304,1000,,,1,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M6P2304.M (RTE Integrator)
Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:39:28 2018
Last Update : Sun Aug 12 17:39:28 2018
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	139	0.00	4.52
9	t	Phenol	2.175	1.955	10.1	128	0.01	4.27
12	t	2-Chlorophenol	1.455	1.470	-1.0	147	0.00	4.37
19	t	2-Methylphenol	1.463	1.460	0.2	149	0.00	4.71
21	t	3&4-Methylphenol	1.500	1.515	-1.0	143	0.00	4.83
24	I	Naphthalene-d8	1.000	1.000	0.0	138	0.00	5.54
29	t	2-Nitrophenol	0.178	0.193	-8.4	136	0.00	5.22
30	t	2,4-Dimethylphenol	0.415	0.424	-2.2	141	0.00	5.25
31	t	Benzoic acid	0.299	0.285	4.7	126	0.08	5.36
33	t	2,4-Dichlorophenol	0.298	0.301	-1.0	137	0.00	5.41
34	t	2,6-Dichlorophenol	0.292	0.306	-4.8	143	0.00	5.61
43	t	4-Chloro-3-methylphenol	0.357	0.360	-0.8	135	0.00	6.05
47	I	Acenaphthene-d10	1.000	1.000	0.0	145	0.00	7.26
49	t	2,4,6-Trichlorophenol	0.398	0.390	2.0	136	0.00	6.47
50	t	2,4,5-Trichlorophenol	0.415	0.411	1.0	138	0.00	6.51
		---------- True Calc. % Drift ----------						
60	t	2,4-Dinitrophenol	50.000	43.207	13.6	126	0.00	7.33
		---------- AvgRF CCRF % Dev ----------						
61	t	4-Nitrophenol	0.261	0.247	5.4	128	0.01	7.42
64		2,3,4,6-Tetrachlorophenol	0.342	0.323	5.6	127	0.00	7.63
69	I	Phenanthrene-d10	1.000	1.000	0.0	129	0.00	8.95
		---------- True Calc. % Drift ----------						
70	t	4,6-Dinitro-2-methylpheno	50.000	49.120	1.8	127	0.00	7.93
		---------- True Calc. % Drift ----------						
76	t	Pentachlorophenol	50.000	57.156	-14.3	145	0.00	8.74

(#) = Out of Range SPCC's out = 0 CCC's out = 0
6p474909.D M6P2304.M Mon Aug 13 10:32:34 2018 ACLIMS

Initial Calibration Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2305-ICC2305
Lab FileID: 6P474923.D

Response Factor Report MS6P

Method : C:\MSDCHEM\1\METHODS\M6P2305.M (RTE Integrator)
Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:42:25 2018
Last Update : Mon Aug 13 11:42:25 2018
Response via : Initial Calibration

Calibration Files
2 =6p474927.D 5 =6p474926.D 25 =6p474924.D 80 =6p474922.D
100 =6p474921.D 50 =6p474923.D 1 =6p474928.D 10 =6p474925.D

Compound	2	5	25	80	100	50	1	10	Avg %RSD
101) 1,4-Dichlorobenzene-d	ISTD								
102) Benzaldehyde	1.135	1.262	1.019	0.983	0.958	1.027	1.213	1.040	1.080 10.27
103) Acenaphthene-d10a	ISTD								
104) 1,2,4,5-Tetr	0.597	0.653	0.551	0.551	0.536	0.537	0.681	0.562	0.584 9.46
105) Phenanthrene-d10a	ISTD								
106) 1-chloroocta	0.354	0.382	0.360	0.348	0.335	0.352	0.277	0.362	0.346 9.02
107) o-terphenyl	0.622	0.661	0.591	0.609	0.617	0.580	0.610	0.579	0.608 4.38
108) Atrazine	0.094	0.099	0.104	0.105	0.108	0.103	0.097	0.099	0.101 4.57
109) I Chrysene-d12a	ISTD								
110) benzidine	0.059	0.078	0.204	0.292	0.301	0.274	0.046	0.111	0.171 63.95

----- Quadratic regression ----- Coefficient = 0.9982
Response Ratio = -0.01841 + 0.24436 *A + 0.02657 *A^2

111) I Naphthalene-d8a	ISTD								
112) Hydroquinone	0.224	0.324	0.339	0.369	0.364	0.368	0.305	0.328	15.78
113) Phenanthrene-d10b	ISTD								
114) Pentachloron	0.031	0.039	0.043	0.049	0.049	0.045	0.039	0.042#	15.54

(#) = Out of Range ### Number of calibration levels exceeded format ###

M6P2304.M Mon Aug 13 11:49:37 2018 ACLIMS

Initial Calibration Verification

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2305-ICV2305
Lab FileID: 6P474929.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\E6P2305\6p474929.D Vial: 10
Acq On : 12 Aug 2018 10:49 pm Operator: christc2
Sample : icv2305-50 Inst : MS6P
Misc : op8717,e6p2305,1000,,,1,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M6P2304.M (RTE Integrator)
Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:42:25 2018
Last Update : Mon Aug 13 11:42:25 2018
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
101	1,4-Dichlorobenzene-d4a	1.000	1.000	0.0	86	0.00	4.52
102	Benzaldehyde	1.080	1.224	-13.3	103	0.00	4.20
103	Acenaphthene-d10a	1.000	1.000	0.0	87	0.00	7.27
104	1,2,4,5-Tetrachlorobenzen	0.584	0.534	8.6	87	0.00	6.36
105	Phenanthrene-d10a	1.000	1.000	0.0	85	0.00	8.95
108	Atrazine	0.101	0.106	-5.0	87	0.01	8.66
113	Phenanthrene-d10b	1.000	1.000	0.0	85	0.00	8.95
114	Pentachloronitrobenzene	0.042	0.043#	-2.4	81	0.00	8.76

(#) = Out of Range SPCC's out = 0 CCC's out = 0
6p474923a.D M6P2304.M Mon Aug 13 11:49:51 2018 ACLIMS

Initial Calibration Verification

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2305-ICV2305
Lab FileID: 6P474932.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\E6P2305\6p474932.D Vial: 13
Acq On : 13 Aug 2018 12:04 am Operator: christc2
Sample : icv2305-50 Inst : MS6P
Misc : op8717,e6p2305,1000,,,1,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M6P2304.M (RTE Integrator)
Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:42:25 2018
Last Update : Mon Aug 13 11:42:25 2018
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
111 I	Naphthalene-d8a	1.000	1.000	0.0	105	0.00	5.54
112 T	Hydroquinone	0.328	0.301	8.2	86	0.01	5.90

(#) = Out of Range SPCC's out = 0 CCC's out = 0
6p474923a.D M6P2304.M Mon Aug 13 11:50:55 2018 ACLIMS

Continuing Calibration Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2338-CC2304
Lab FileID: 6P475557.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\E6P2338\6p475557.D Vial: 2
Acq On : 14 Sep 2018 3:38 am Operator: chriss2
Sample : cc2304-25 Inst : MS6P
Misc : op8717,e6p2338,1000,,,1,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M6P2304.M (RTE Integrator)
Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
Last Update : Wed Aug 29 14:38:26 2018
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	93	-0.05	4.33
2	t	1,4-Dioxane	0.667	0.649	2.7	94	-0.06	1.77
3	t	Pyridine	1.655	1.642	0.8	90	-0.07	2.11
4	t	N-Nitrosodimethylamine	0.976	0.948	2.9	94	-0.07	2.07
5	S	2-Fluorophenol	1.400	1.418	-1.3	96	-0.08	3.34
6	t	Indene	2.461	2.635	-7.1	104	-0.05	4.52
7	t	Cumene	4.077	3.909	4.1	93	-0.08	3.72
8	S	Phenol-d5	1.824	1.865	-2.2	97	-0.04	4.08
9	t	Phenol	2.175	2.197	-1.0	99	-0.05	4.09
10		Aniline	2.478	2.587	-4.4	102	-0.06	4.09
11	t	bis(2-Chloroethyl)ether	1.429	1.420	0.6	95	-0.05	4.14
12	t	2-Chlorophenol	1.455	1.565	-7.6	105	-0.06	4.17
13	t	Decane	1.590	1.898	-19.4	116	-0.06	4.22
14	t	1,3-Dichlorobenzene	1.584	1.601	-1.1	96	-0.05	4.29
15	t	1,4-Dichlorobenzene	1.645	1.694	-3.0	101	-0.05	4.34
16	t	Benzyl alcohol	0.973	0.924	5.0	91	-0.04	4.44
17	t	1,2-Dichlorobenzene	1.512	1.542	-2.0	100	-0.05	4.45
18	t	Acetophenone	2.341	2.266	3.2	95	-0.04	4.63
19	t	2-Methylphenol	1.463	1.500	-2.5	98	-0.05	4.53
20	t	2,2'-oxybis(1-Chloropropa	0.485	0.479	1.2	99	-0.04	4.54
21	t	3&4-Methylphenol	1.500	1.545	-3.0	99	-0.06	4.64
22	t	n-Nitroso-di-n-propylamin	1.226	1.253	-2.2	99	-0.04	4.63
23	t	Hexachloroethane	0.546	0.533	2.4	93	-0.06	4.70
24	I	Naphthalene-d8	1.000	1.000	0.0	98	-0.06	5.32
25	S	Nitrobenzene-d5	0.460	0.416	9.6	89	-0.06	4.74
26	t	Nitrobenzene	0.467	0.426	8.8	90	-0.06	4.76
27	t	Quinoline	0.724	0.762	-5.2	106	-0.06	5.63
28	t	Isophorone	0.777	0.726	6.6	91	-0.06	4.94
29	t	2-Nitrophenol	0.178	0.197	-10.7	103	-0.06	5.01
30	t	2,4-Dimethylphenol	0.415	0.384	7.5	90	-0.06	5.06
31	t	Benzoic acid	0.299	0.301	-0.7	105	-0.06	5.16
32	t	bis(2-Chloroethoxy)methan	0.398	0.394	1.0	99	-0.05	5.12
33	t	2,4-Dichlorophenol	0.298	0.278	6.7	93	-0.06	5.21
34	t	2,6-Dichlorophenol	0.292	0.288	1.4	97	-0.07	5.39
35		1,3,5-Trichlorobenzene	0.342	0.335	2.0	101	-0.07	5.01
36	t	1,2,4-Trichlorobenzene	0.319	0.309	3.1	98	-0.07	5.27
37		1,2,3-Trichlorobenzene	0.317	0.308	2.8	97	-0.06	5.46
38	t	Naphthalene	1.098	1.138	-3.6	106	-0.06	5.33
39	t	4-Chloroaniline	0.467	0.487	-4.3	103	-0.05	5.39
40	t	2,3-Dichloroaniline	0.372	0.365	1.9	99	-0.05	6.23
41	t	Caprolactam	0.176	0.180	-2.3	99	-0.05	5.70

Continuing Calibration Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2338-CC2304
Lab FileID: 6P475557.D

42	t	Hexachlorobutadiene	0.199	0.160	19.6	82	-0.06	5.45
43	t	4-Chloro-3-methylphenol	0.357	0.354	0.8	97	-0.07	5.84
44	t	2-Methylnaphthalene	0.570	0.587	-3.0	102	-0.06	5.96
45	t	1-Methylnaphthalene	0.634	0.657	-3.6	103	-0.06	6.05
46	t	Dimethylnaphthalene	0.610	0.665	-9.0	107	-0.05	6.58
47	I	Acenaphthene-d10	1.000	1.000	0.0	99	-0.08	7.01
48	t	Hexachlorocyclopentadiene	0.379	0.326	14.0	82	-0.09	6.12
49	t	2,4,6-Trichlorophenol	0.398	0.382	4.0	98	-0.07	6.24
50	t	2,4,5-Trichlorophenol	0.415	0.420	-1.2	99	-0.07	6.28
51	S	2-Fluorobiphenyl	1.498	1.470	1.9	101	-0.08	6.32
52	t	2-Chloronaphthalene	1.271	1.192	6.2	95	-0.08	6.43
53	t	Biphenyl	1.616	1.648	-2.0	104	-0.08	6.42
54	t	2-Nitroaniline	0.453	0.450	0.7	96	-0.07	6.54
55	t	Dimethylphthalate	1.446	1.348	6.8	94	-0.07	6.75
56	t	Acenaphthylene	1.954	1.964	-0.5	104	-0.08	6.86
57	t	2,6-Dinitrotoluene	0.295	0.305	-3.4	100	-0.06	6.81
58	t	3-Nitroaniline	0.350	0.375	-7.1	103	-0.06	6.98
59	t	Acenaphthene	1.268	1.262	0.5	102	-0.08	7.05
		----------	True	Calc.	% Drift		----------	
60	t	2,4-Dinitrophenol	50.000	60.066	-20.1#	133	-0.07	7.09
		----------	AvgRF	CCRF	% Dev		----------	
61	t	4-Nitrophenol	0.261	0.208	20.3#	77	-0.06	7.20
62	t	Dibenzofuran	1.775	1.721	3.0	100	-0.07	7.23
		----------	True	Calc.	% Drift		----------	
63	t	2,4-Dinitrotoluene	25.000	23.994	4.0	97	-0.06	7.24
		----------	AvgRF	CCRF	% Dev		----------	
64		2,3,4,6-Tetrachlorophenol	0.342	0.325	5.0	92	-0.07	7.38
65	t	Diethylphthalate	1.452	1.327	8.6	92	0.05	7.52
66	t	Fluorene	1.435	1.420	1.0	101	-0.07	7.61
67	t	4-Chlorophenyl-phenylethe	0.665	0.652	2.0	102	-0.07	7.63
68	t	4-Nitroaniline	0.357	0.361	-1.1	95	-0.04	7.66
69	I	Phenanthrene-d10	1.000	1.000	0.0	96	-0.08	8.68
		----------	True	Calc.	% Drift		----------	
70	t	4,6-Dinitro-2-methylpheno	25.000	29.533	-18.1	119	-0.07	7.69
		----------	AvgRF	CCRF	% Dev		----------	
71	t	n-Nitrosodiphenylamine	0.558	0.600	-7.5	103	-0.09	7.76
72	t	1,2-Diphenylhydrazine	0.935	0.919	1.7	95	-0.09	7.81
73	S	2,4,6-Tribromophenol	0.120	0.114	5.0	89	-0.09	7.89
74	t	4-Bromophenyl-phenylether	0.215	0.216	-0.5	98	-0.09	8.18
75	t	Hexachlorobenzene	0.263	0.241	8.4	91	-0.09	8.24
		----------	True	Calc.	% Drift		----------	
76	t	Pentachlorophenol	50.000	46.360	7.3	89	-0.07	8.49
		----------	AvgRF	CCRF	% Dev		----------	
77	t	Phenanthrene	1.075	1.135	-5.6	104	-0.08	8.70
78	t	Anthracene	1.068	1.189	-11.3	109	-0.08	8.77
79	t	Carbazole	1.031	1.099	-6.6	102	-0.07	8.97
80	t	Di-n-butylphthalate	1.274	1.326	-4.1	98	-0.06	9.44
81	t	Fluoranthene	1.159	1.219	-5.2	99	-0.06	10.11
82	t	Octadecane	0.558	0.667	-19.5	110	-0.07	8.65

Continuing Calibration Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2338-CC2304
Lab FileID: 6P475557.D

83	I	Chrysene-d12	1.000	1.000	0.0	89	-0.09	11.83
84	t	Pyrene	1.172	1.327	-13.2	104	-0.10	10.37
85	S	Terphenyl-d14	0.793	0.884	-11.5	103	-0.10	10.60
86	t	Butylbenzylphthalate	0.523	0.585	-11.9	95	-0.09	11.22
87	t	Benzo[a]anthracene	1.158	1.204	-4.0	95	-0.09	11.82
88	t	3,3'-Dichlorobenzidine	0.417	0.442	-6.0	97	-0.07	11.82
89	t	Chrysene	1.070	1.181	-10.4	103	-0.08	11.86
90	t	bis(2-Ethylhexyl)phthalat	0.686	0.783	-14.1	96	-0.07	11.95
91	I	Perylene-d12	1.000	1.000	0.0	91	-0.09	13.41
			True	Calc.	% Drift			
92	t	Di-n-octylphthalate	25.000	25.406	-1.6	96	-0.08	12.68
			AvgRF	CCRF	% Dev			
93	t	Benzo[b]fluoranthene	1.194	1.253	-4.9	98	-0.09	13.02
94	t	Benzo[k]fluoranthene	1.022	1.188	-16.2	111	-0.08	13.05
95	t	Benzo[a]pyrene	0.962	1.104	-14.8	105	-0.09	13.35
96	t	Indeno[1,2,3-cd]pyrene	1.132	1.311	-15.8	108	-0.13	14.44
97	t	Dibenz(a,h)acridine	0.815	0.949	-16.4	105	-0.11	14.21
98	t	Dibenz[a,h]anthracene	0.988	1.137	-15.1	108	-0.13	14.46
99	t	7,12-Dimethylbenz(a)anthr	0.537	0.592	-10.2	100	-0.09	13.02
100	t	Benzo[g,h,i]perylene	0.890	1.052	-18.2	112	-0.15	14.71

(#) = Out of Range SPCC's out = 0 CCC's out = 0
6p475286a.D M6P2304.M Fri Sep 14 11:53:22 2018 ACLIMS

Continuing Calibration Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: E6P2338-CC2305
Lab FileID: 6P475558.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\E6P2338\6p475558.D Vial: 3
Acq On : 14 Sep 2018 4:03 am Operator: chriss2
Sample : cc2305-25 Inst : MS6P
Misc : op8717,e6p2338,1000,,,1,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M6P2304.M (RTE Integrator)
Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
Last Update : Wed Aug 29 14:38:26 2018
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
101		1,4-Dichlorobenzene-d4a	1.000	1.000	0.0	115	-0.05	4.33
102		Benzaldehyde	1.080	1.153	-6.8	130	-0.07	4.00
103		Acenaphthene-d10a	1.000	1.000	0.0	108	-0.08	7.01
104		1,2,4,5-Tetrachlorobenzen	0.584	0.602	-3.1	118	-0.09	6.12
105		Phenanthrene-d10a	1.000	1.000	0.0	113	-0.09	8.68
106	S	1-chlorooctadecane	0.346	0.404	-16.8	127	-0.05	10.07
107	S	o-terphenyl	0.608	0.607	0.2	116	-0.08	9.16
108		Atrazine	0.101	0.116	-14.9	127	-0.06	8.41
109	I	Chrysene-d12a	1.000	1.000	0.0	128	-0.09	11.83
110	T	benzidine	0.677	0.600	11.4	110	-0.08	10.30
111	I	Naphthalene-d8a	1.000	1.000	0.0	112	-0.06	5.32
112	T	Hydroquinone	0.328	0.336	-2.4	111	-0.03	5.70
113		Phenanthrene-d10b	1.000	1.000	0.0	113	-0.09	8.68
114		Pentachloronitrobenzene	0.042	0.042#	0.0	112	-0.08	8.50

(#) = Out of Range SPCC's out = 0 CCC's out = 0
6p475286a.D M6P2304.M Fri Sep 14 11:55:48 2018 ACLIMS

MS Semi-volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475571.D
Acq On : 14 Sep 2018 9:36 am
Operator : chriss2
Sample : jc73460-1
Misc : op15037,e6p2338,31.1,,,1,1
ALS Vial : 16 Sample Multiplier: 1

Quant Time: Sep 14 12:35:38 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

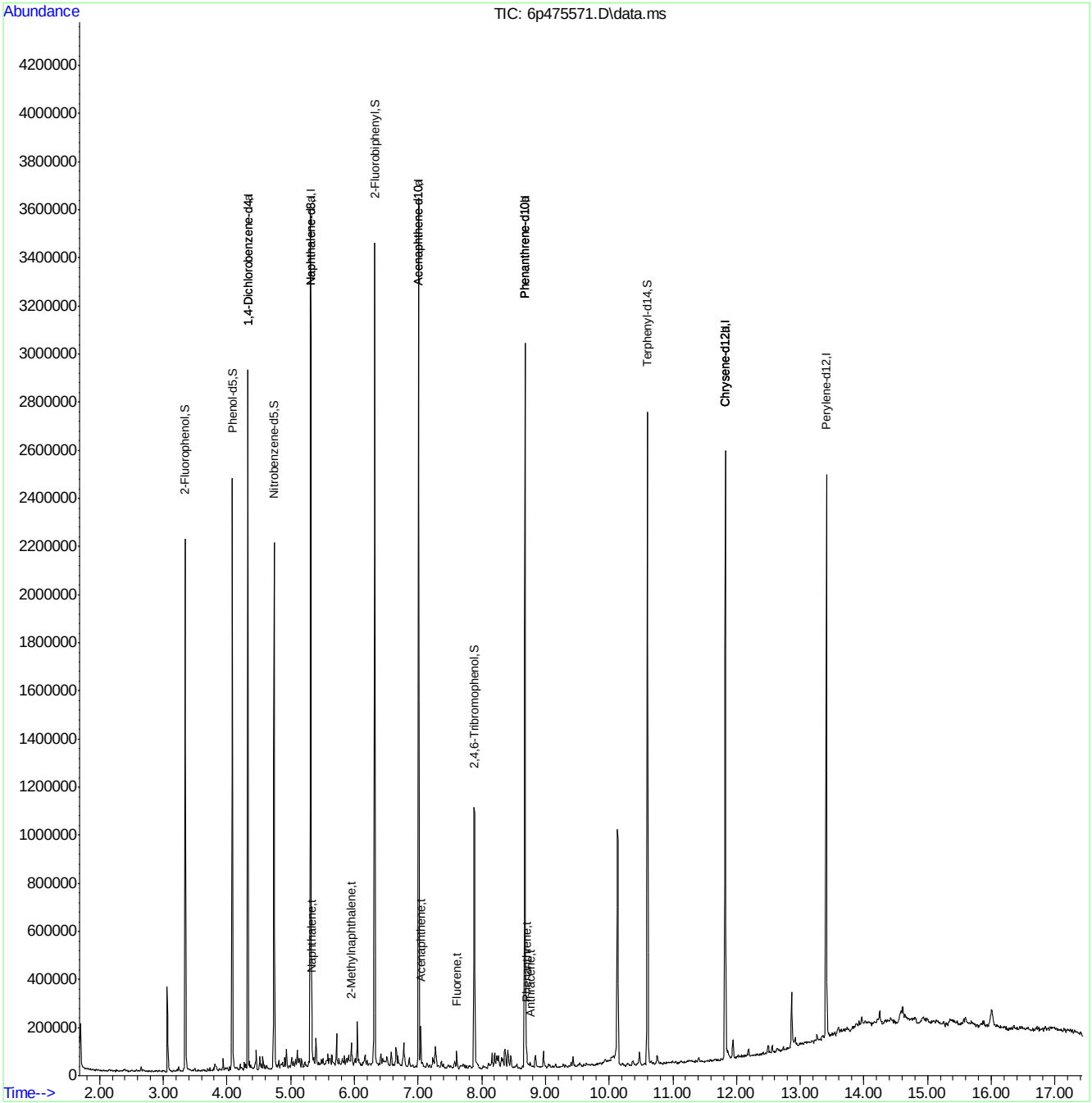
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.329	152	314467	40.00	ppm	-0.05
24) Naphthalene-d8	5.313	136	1236054	40.00	ppm	-0.07
47) Acenaphthene-d10	7.009	164	629674	40.00	ppm	-0.08
69) Phenanthrene-d10	8.678	188	1007768	40.00	ppm	-0.09
83) Chrysene-d12	11.823	240	846122	40.00	ppm	-0.09
91) Perylene-d12	13.411	264	828351	40.00	ppm	-0.09
101) 1,4-Dichlorobenzene-d4a	4.329	152	314467	40.00	ppm	-0.05
103) Acenaphthene-d10a	7.009	164	629674	40.00	ppm	-0.08
105) Phenanthrene-d10a	8.678	188	1007768	40.00	ppm	-0.09
109) Chrysene-d12a	11.823	240	846122	40.00	ppm	-0.09
111) Naphthalene-d8a	5.313	136	1236054	40.00	ppm	-0.07
113) Phenanthrene-d10b	8.678	188	1007768	40.00	ppm	-0.09
115) Chrysene-d12b	11.823	240	846611	40.00	ppm	-0.09
System Monitoring Compounds						
5) 2-Fluorophenol	3.345	112	420714	38.21	ppm	-0.07
Spiked Amount 50.000			Recovery = 76.42%			
8) Phenol-d5	4.083	99	527077	36.75	ppm	-0.04
Spiked Amount 50.000			Recovery = 73.50%			
25) Nitrobenzene-d5	4.741	82	482515	33.93	ppm	-0.06
Spiked Amount 50.000			Recovery = 67.86%			
51) 2-Fluorobiphenyl	6.319	172	850451	36.08	ppm	-0.08
Spiked Amount 50.000			Recovery = 72.16%			
73) 2,4,6-Tribromophenol	7.886	330	118889	39.39	ppm	-0.09
Spiked Amount 50.000			Recovery = 78.78%			
85) Terphenyl-d14	10.603	244	893319	53.27	ppm	-0.10
Spiked Amount 50.000			Recovery = 106.54%			
106) 1-chlorooctadecane	0.000	57	0d	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
38) Naphthalene	5.335	128	70303	2.07	ppm	99
44) 2-Methylnaphthalene	5.955	141	13921	0.79	ppm	100
59) Acenaphthene	7.041	153	33328	1.67	ppm	91
66) Fluorene	7.608	166	15794	0.70	ppm	98
77) Phenanthrene	8.704	178	20915	0.77	ppm	94
78) Anthracene	8.763	178	7994	0.30	ppm	96

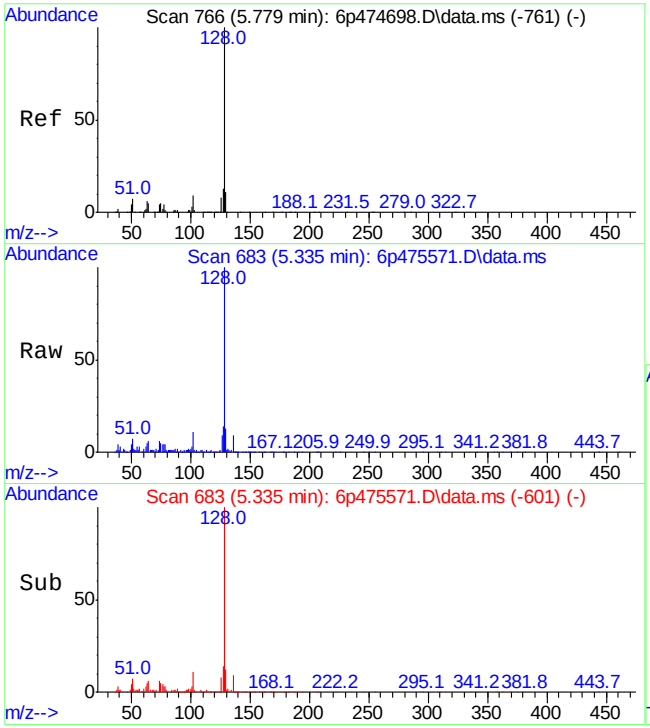
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475571.D
Acq On : 14 Sep 2018 9:36 am
Operator : chriss2
Sample : jc73460-1
Misc : op15037,e6p2338,31.1,,,1,1
ALS Vial : 16 Sample Multiplier: 1

Quant Time: Sep 14 12:35:38 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

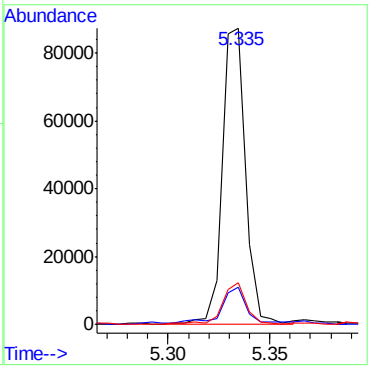


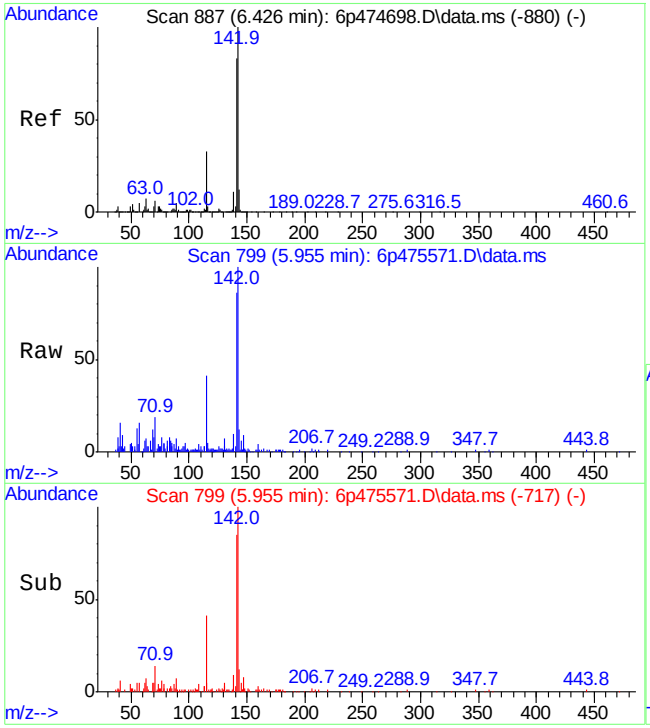


#38
Naphthalene
Concen: 2.07 ppm
RT: 5.335 min Scan# 683
Delta R.T. -0.064 min
Lab File: 6p475571.D
Acq: 14 Sep 2018 9:36 am

Tgt Ion:128 Resp: 70303

Ion	Ratio	Lower	Upper
128	100		
129	12.0	0.0	41.1
127	13.3	0.0	43.1

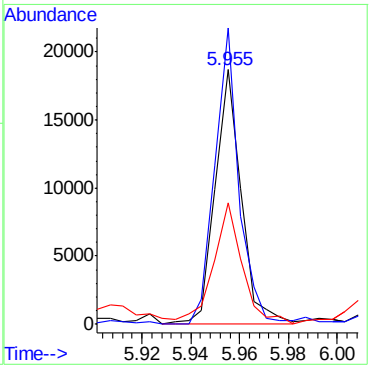


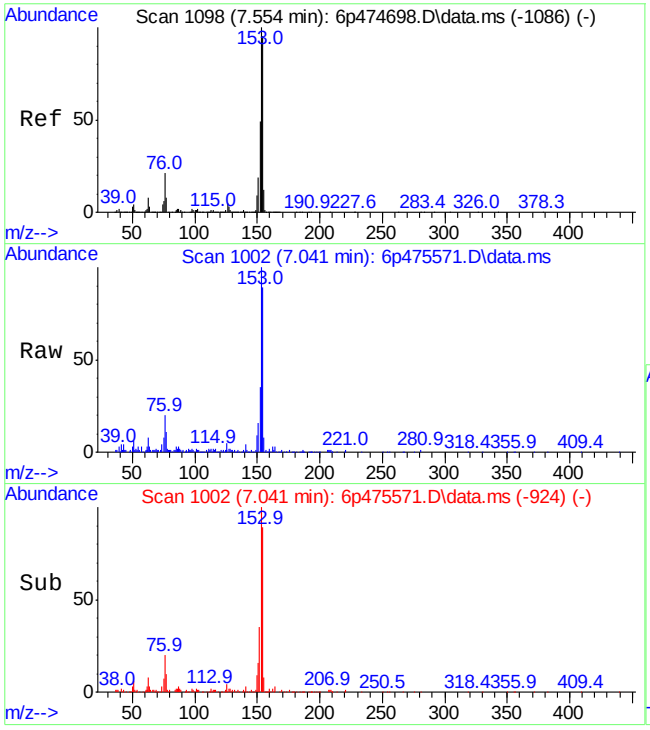


#44
2-Methylnaphthalene
Concen: 0.79 ppm
RT: 5.955 min Scan# 799
Delta R.T. -0.062 min
Lab File: 6p475571.D
Acq: 14 Sep 2018 9:36 am

Tgt Ion:141 Resp: 13921

Ion	Ratio	Lower	Upper
141	100		
142	116.5	86.8	146.8
115	47.0	16.8	76.8

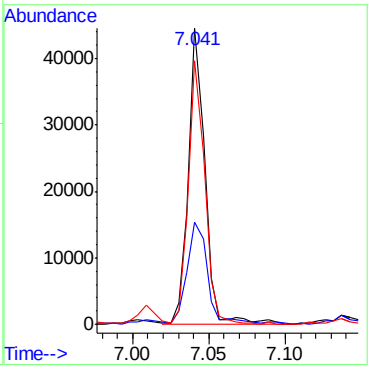


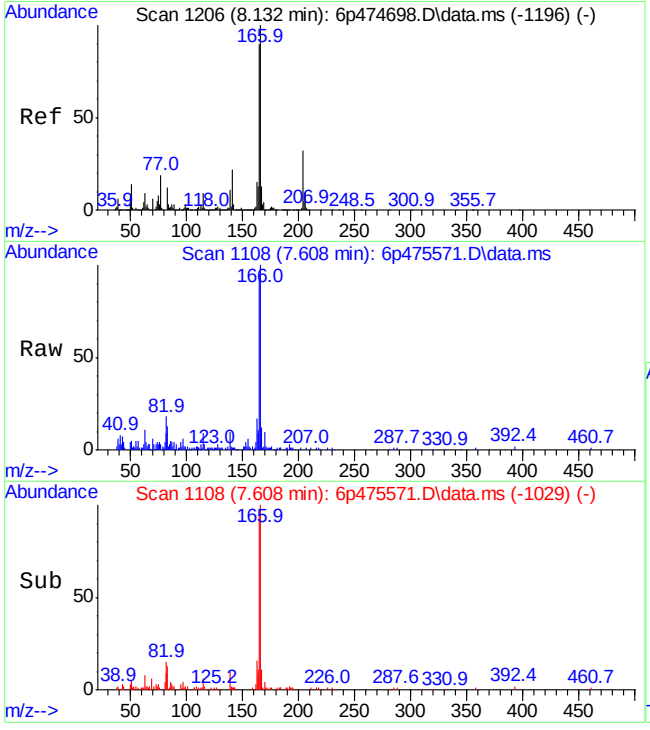


#59
Acenaphthene
Concen: 1.67 ppm
RT: 7.041 min Scan# 1002
Delta R.T. -0.085 min
Lab File: 6p475571.D
Acq: 14 Sep 2018 9:36 am

Tgt Ion:153 Resp: 33328

Ion	Ratio	Lower	Upper
153	100		
152	34.3	15.9	75.9
154	88.5	63.7	123.7

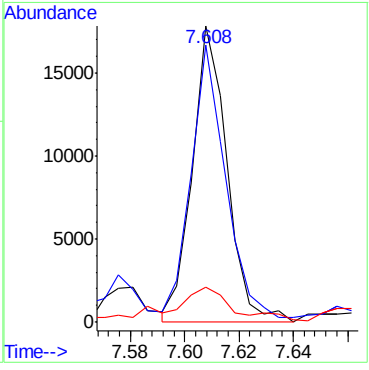


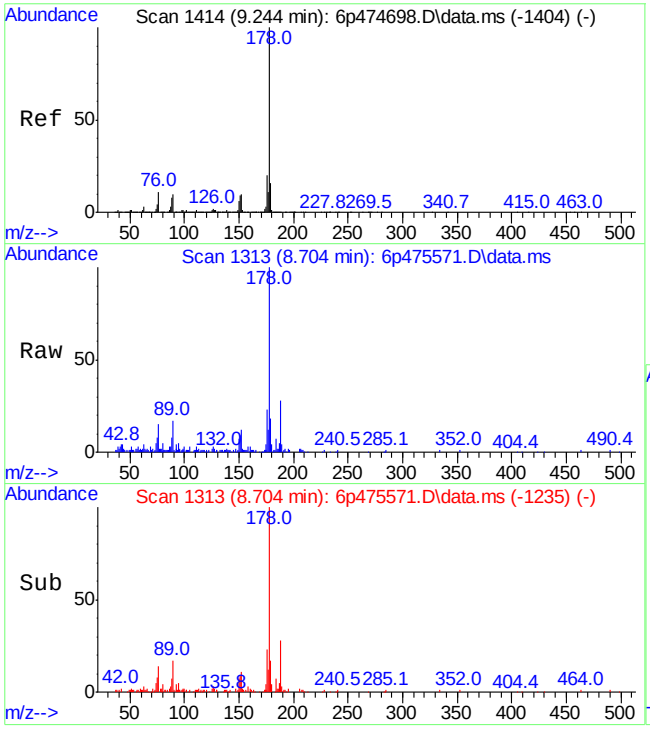


#66
Fluorene
Concen: 0.70 ppm
RT: 7.608 min Scan# 1108
Delta R.T. -0.077 min
Lab File: 6p475571.D
Acq: 14 Sep 2018 9:36 am

Tgt Ion:166 Resp: 15794

Ion	Ratio	Lower	Upper
166	100		
165	92.4	61.9	121.9
167	10.6	0.0	43.9

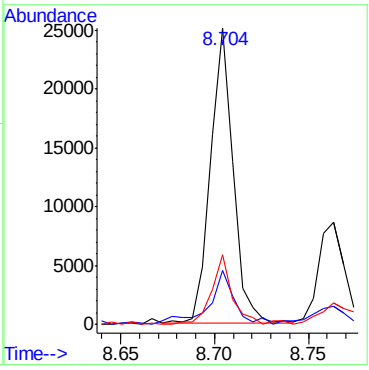


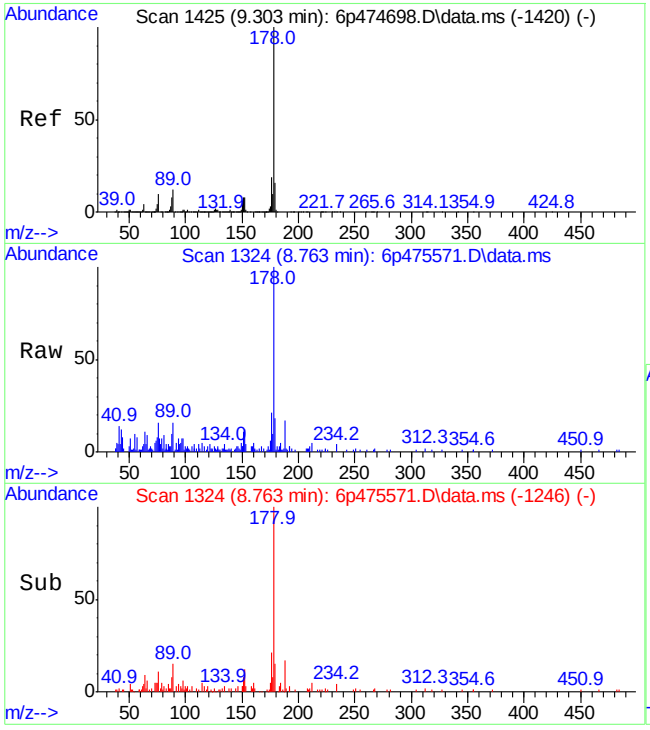


#77
Phenanthrene
Concen: 0.77 ppm
RT: 8.704 min Scan# 1313
Delta R.T. -0.085 min
Lab File: 6p475571.D
Acq: 14 Sep 2018 9:36 am

Tgt Ion:178 Resp: 20915

Ion	Ratio	Lower	Upper
178	100		
179	17.0	0.0	45.2
176	23.5	0.0	50.0

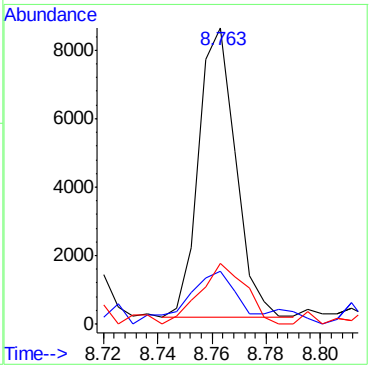




#78
Anthracene
Concen: 0.30 ppm
RT: 8.763 min Scan# 1324
Delta R.T. -0.084 min
Lab File: 6p475571.D
Acq: 14 Sep 2018 9:36 am

Tgt Ion:178 Resp: 7994

Ion	Ratio	Lower	Upper
178	100		
179	14.7	0.0	45.5
176	21.2	0.0	48.8



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475565.D
Acq On : 14 Sep 2018 7:07 am
Operator : chriss2
Sample : jc73460-2
Misc : op15037,e6p2338,30.1,,,1,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Sep 17 16:17:39 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

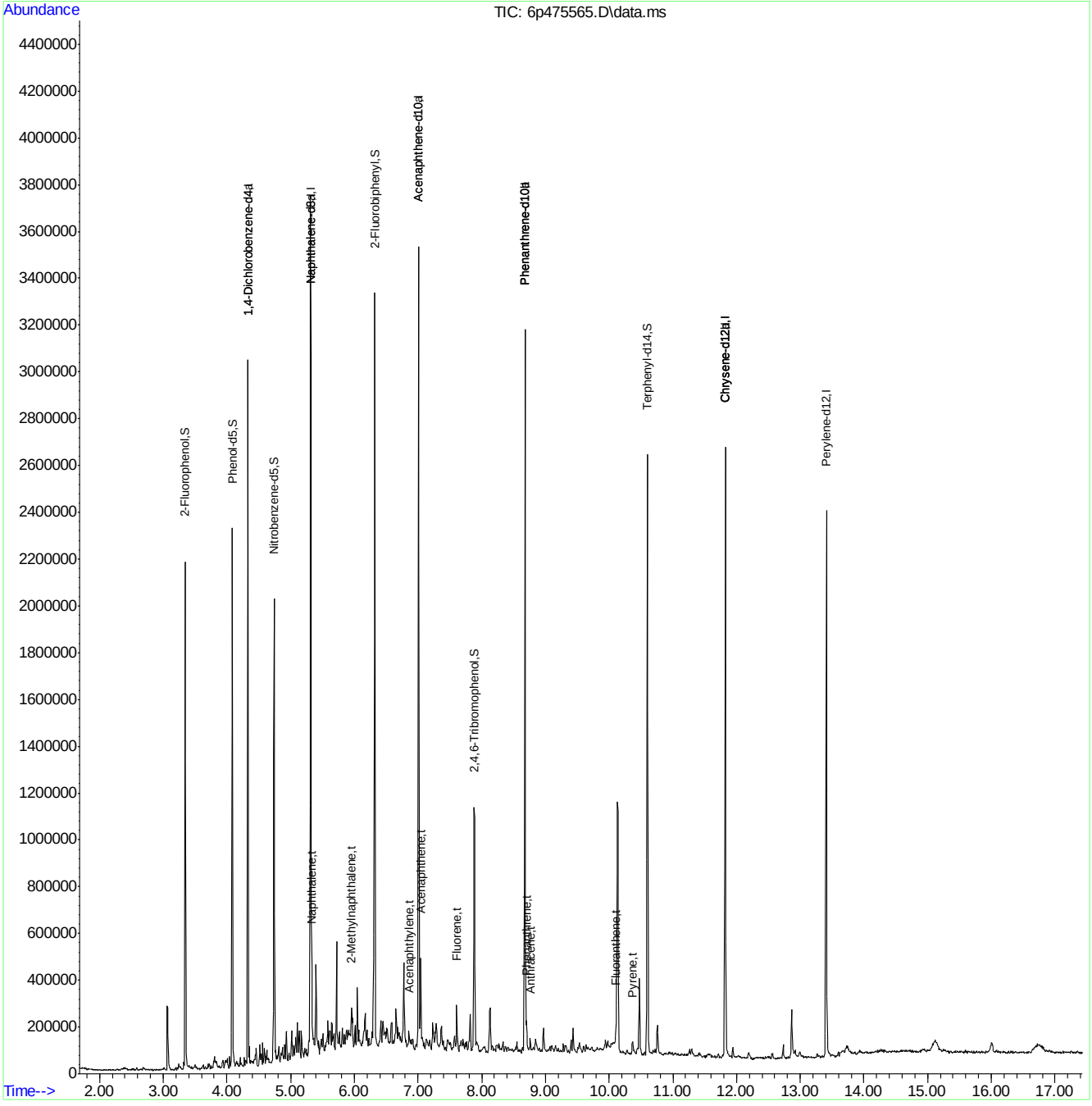
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.329	152	300280	40.00	ppm	-0.05
24) Naphthalene-d8	5.313	136	1208936	40.00	ppm	-0.07
47) Acenaphthene-d10	7.009	164	612530	40.00	ppm	-0.08
69) Phenanthrene-d10	8.677	188	987690	40.00	ppm	-0.09
83) Chrysene-d12	11.822	240	843851	40.00	ppm	-0.09
91) Perylene-d12	13.411	264	844455	40.00	ppm	-0.09
101) 1,4-Dichlorobenzene-d4a	4.329	152	300280	40.00	ppm	-0.05
103) Acenaphthene-d10a	7.009	164	612530	40.00	ppm	-0.08
105) Phenanthrene-d10a	8.677	188	987690	40.00	ppm	-0.09
109) Chrysene-d12a	11.822	240	843851	40.00	ppm	-0.09
111) Naphthalene-d8a	5.313	136	1208936	40.00	ppm	-0.07
113) Phenanthrene-d10b	8.677	188	987690	40.00	ppm	-0.09
115) Chrysene-d12b	11.822	240	843740	40.00	ppm	-0.09
System Monitoring Compounds						
5) 2-Fluorophenol	3.345	112	402686	38.31	ppm	-0.07
Spiked Amount 50.000			Recovery = 76.62%			
8) Phenol-d5	4.083	99	502816	36.72	ppm	-0.04
Spiked Amount 50.000			Recovery = 73.44%			
25) Nitrobenzene-d5	4.741	82	449616	32.33	ppm	-0.06
Spiked Amount 50.000			Recovery = 64.66%			
51) 2-Fluorobiphenyl	6.319	172	803394	35.03	ppm	-0.08
Spiked Amount 50.000			Recovery = 70.06%			
73) 2,4,6-Tribromophenol	7.886	330	113165	38.25	ppm	-0.09
Spiked Amount 50.000			Recovery = 76.50%			
85) Terphenyl-d14	10.603	244	848375	50.73	ppm	-0.10
Spiked Amount 50.000			Recovery = 101.46%			
106) 1-chlorooctadecane	0.000	57	0d	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
38) Naphthalene	5.335	128	129874	3.91	ppm	98
44) 2-Methylnaphthalene	5.955	141	23607	1.37	ppm	98
56) Acenaphthylene	6.854	152	7607	0.25	ppm	77
59) Acenaphthene	7.041	153	73287	3.77	ppm	94
66) Fluorene	7.608	166	38847	1.77	ppm	91
77) Phenanthrene	8.704	178	43470	1.64	ppm	95
78) Anthracene	8.763	178	22384	0.85	ppm	96
81) Fluoranthene	10.106	202	17136	0.60	ppm	93
84) Pyrene	10.368	202	18577	0.75	ppm	91

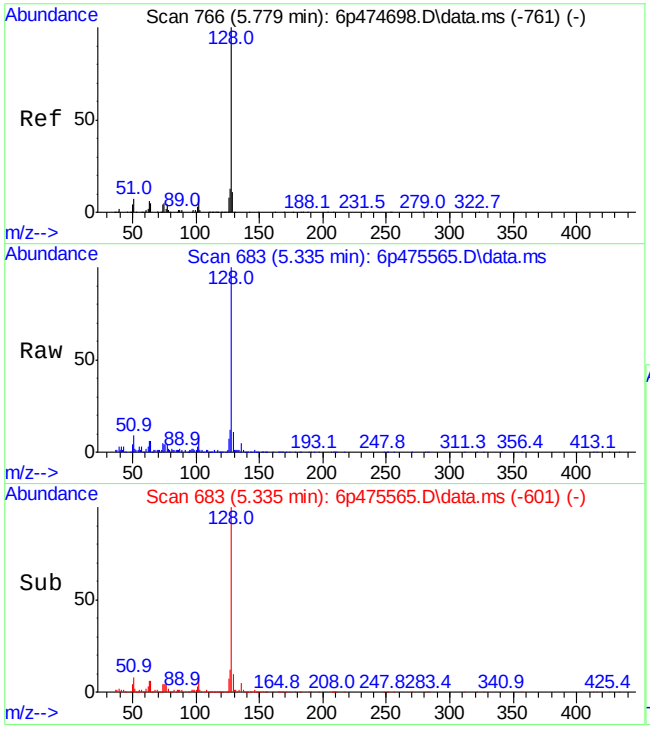
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475565.D
Acq On : 14 Sep 2018 7:07 am
Operator : chriss2
Sample : jc73460-2
Misc : op15037,e6p2338,30.1,,,1,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Sep 17 16:17:39 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

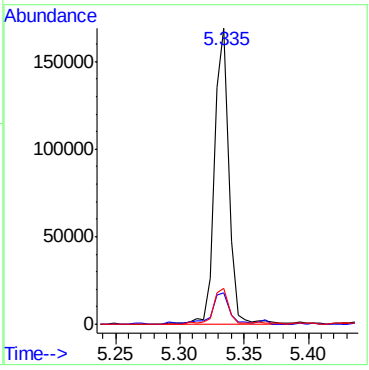


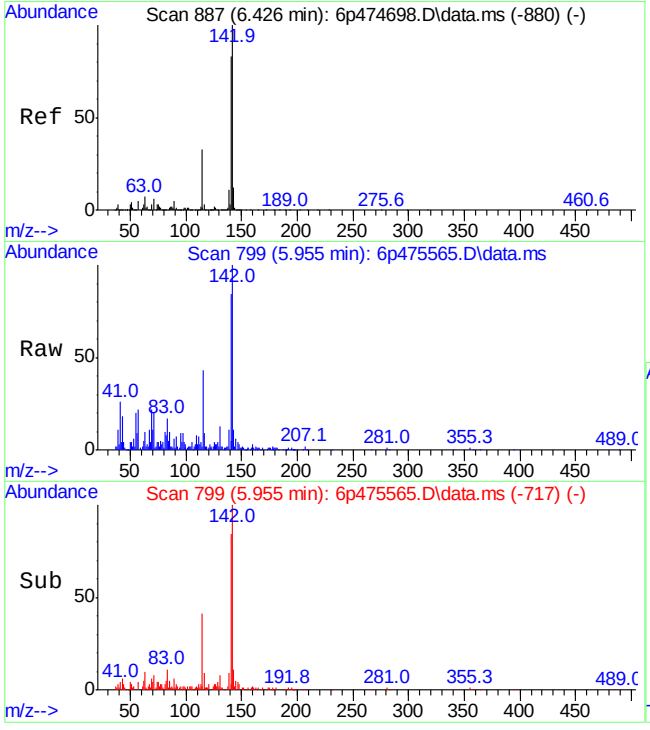


#38
Naphthalene
Concen: 3.91 ppm
RT: 5.335 min Scan# 683
Delta R.T. -0.064 min
Lab File: 6p475565.D
Acq: 14 Sep 2018 7:07 am

Tgt Ion:128 Resp: 129874

Ion	Ratio	Lower	Upper
128	100		
129	10.5	0.0	41.1
127	12.1	0.0	43.1

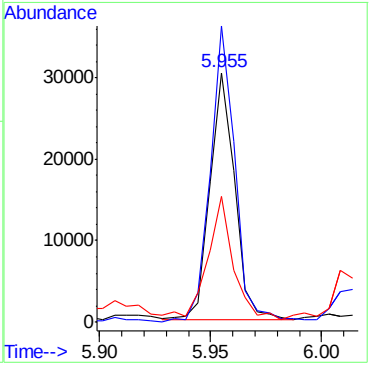


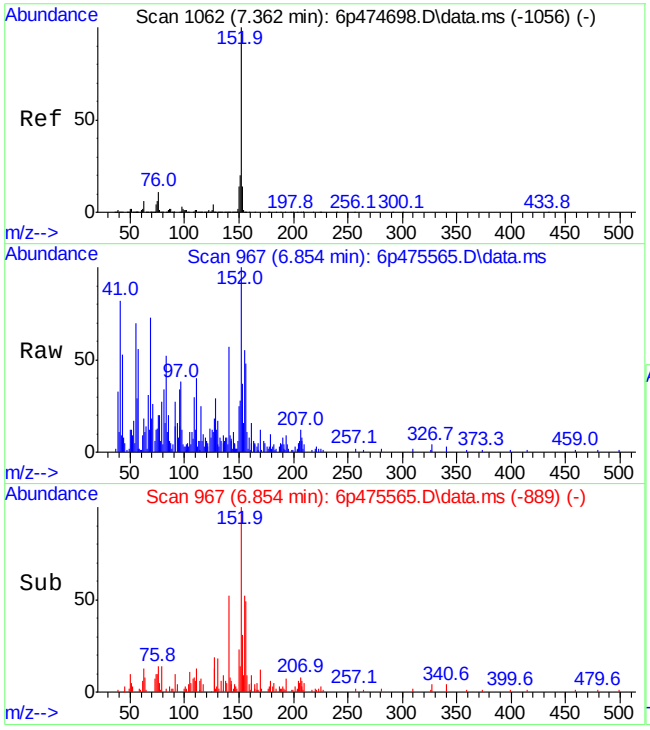


#44
2-Methylnaphthalene
Concen: 1.37 ppm
RT: 5.955 min Scan# 799
Delta R.T. -0.062 min
Lab File: 6p475565.D
Acq: 14 Sep 2018 7:07 am

Tgt Ion:141 Resp: 23607

Ion	Ratio	Lower	Upper
141	100		
142	118.7	86.8	146.8
115	48.4	16.8	76.8

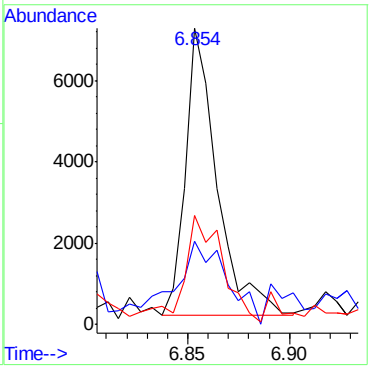


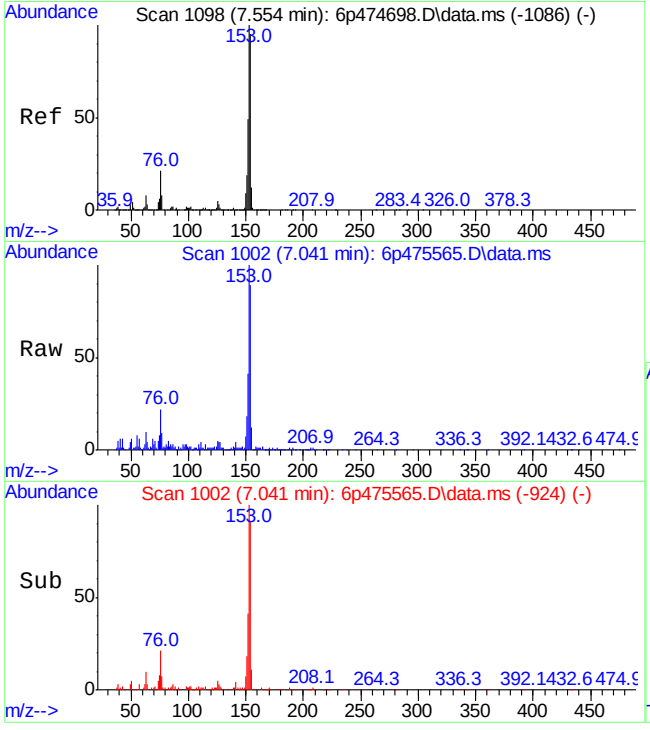


#56
Acenaphthylene
Concen: 0.25 ppm
RT: 6.854 min Scan# 967
Delta R.T. -0.084 min
Lab File: 6p475565.D
Acq: 14 Sep 2018 7:07 am

Tgt Ion:152 Resp: 7607

Ion	Ratio	Lower	Upper
152	100		
151	17.8	0.0	50.2
153	32.7	0.0	43.1

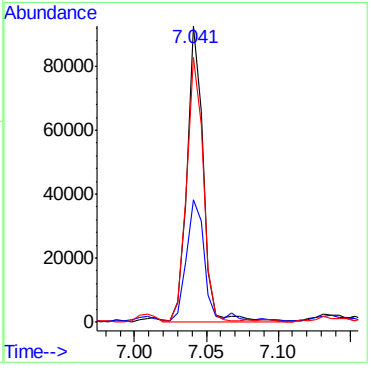


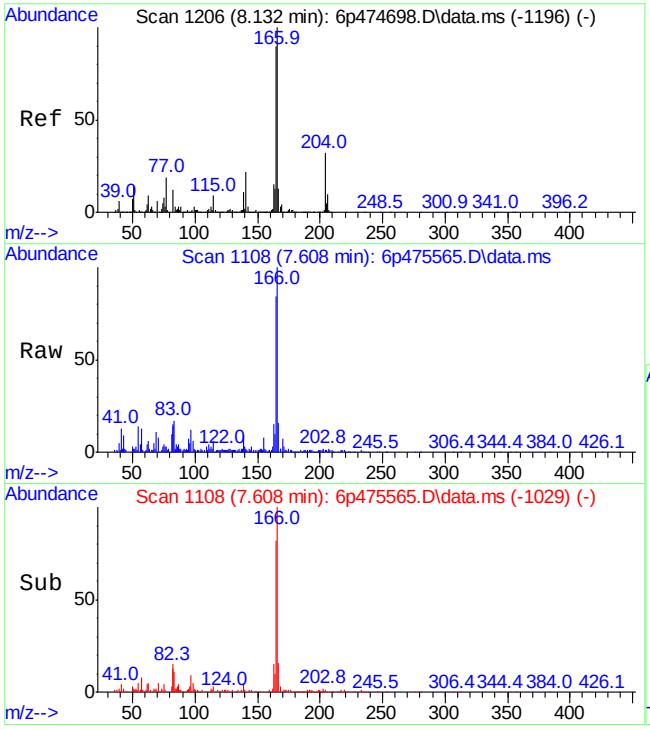


#59
Acenaphthene
Concen: 3.77 ppm
RT: 7.041 min Scan# 1002
Delta R.T. -0.085 min
Lab File: 6p475565.D
Acq: 14 Sep 2018 7:07 am

Tgt Ion:153 Resp: 73287

Ion	Ratio	Lower	Upper
153	100		
152	40.8	15.9	75.9
154	89.5	63.7	123.7

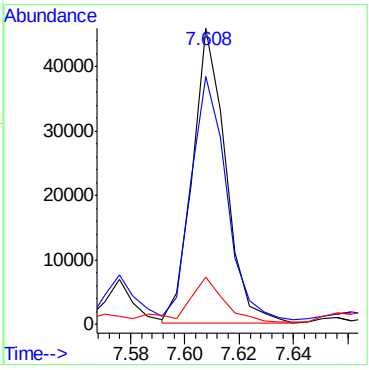


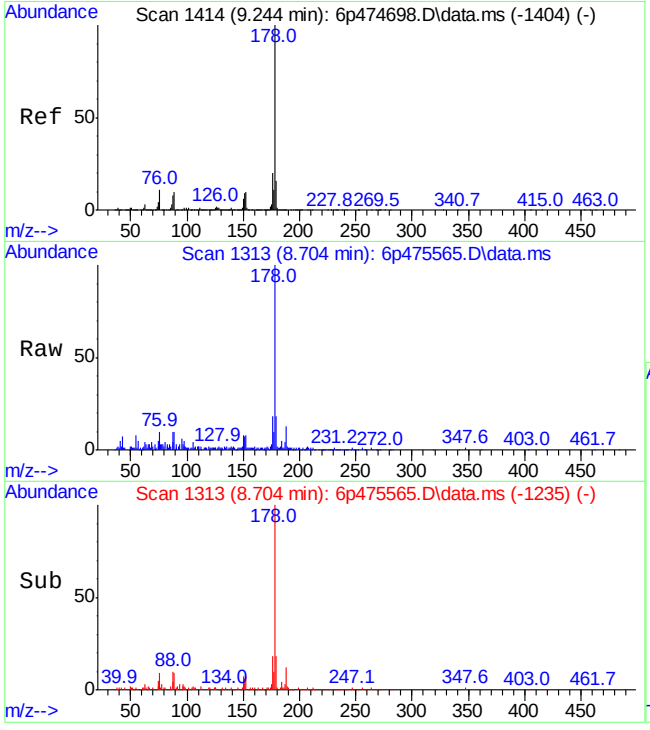


#66
Fluorene
Concen: 1.77 ppm
RT: 7.608 min Scan# 1108
Delta R.T. -0.077 min
Lab File: 6p475565.D
Acq: 14 Sep 2018 7:07 am

Tgt Ion:166 Resp: 38847

Ion	Ratio	Lower	Upper
166	100		
165	82.3	61.9	121.9
167	14.2	0.0	43.9

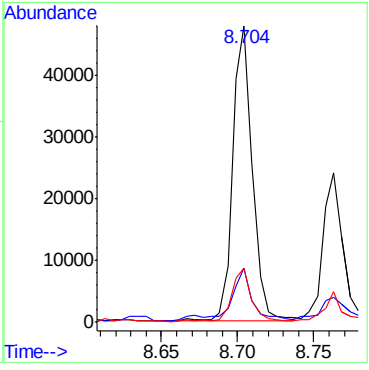


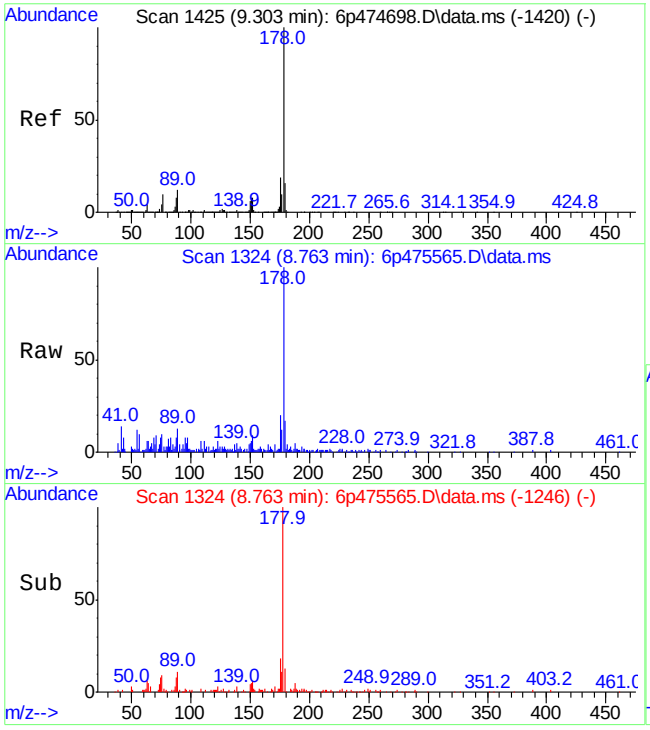


#77
Phenanthrene
Concen: 1.64 ppm
RT: 8.704 min Scan# 1313
Delta R.T. -0.085 min
Lab File: 6p475565.D
Acq: 14 Sep 2018 7:07 am

Tgt Ion:178 Resp: 43470

Ion	Ratio	Lower	Upper
178	100		
179	17.8	0.0	45.2
176	17.8	0.0	50.0

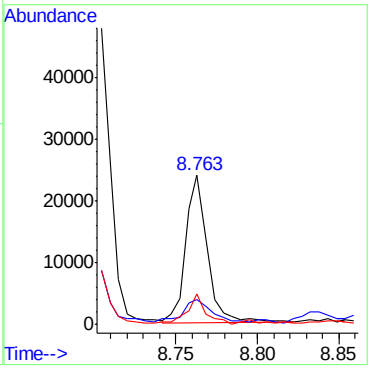


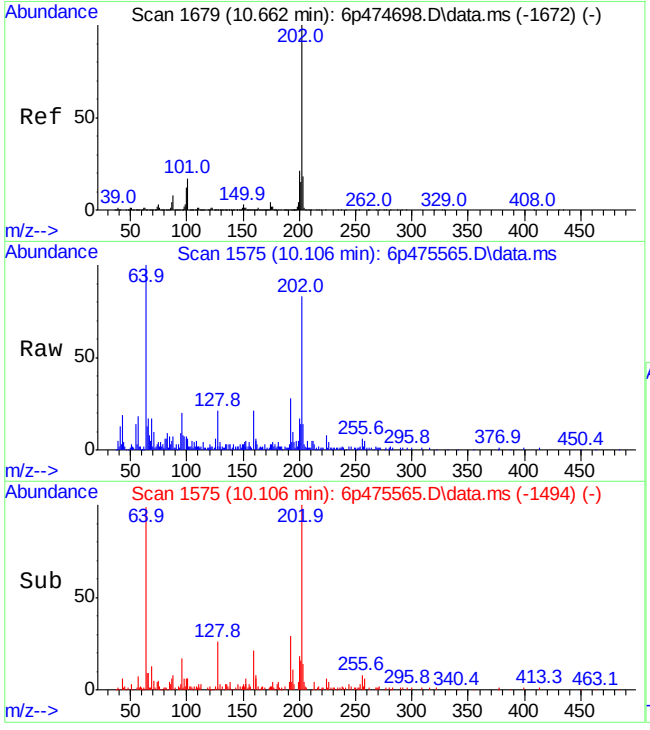


#78
Anthracene
Concen: 0.85 ppm
RT: 8.763 min Scan# 1324
Delta R.T. -0.084 min
Lab File: 6p475565.D
Acq: 14 Sep 2018 7:07 am

Tgt Ion:178 Resp: 22384

Ion	Ratio	Lower	Upper
178	100		
179	13.0	0.0	45.5
176	19.6	0.0	48.8

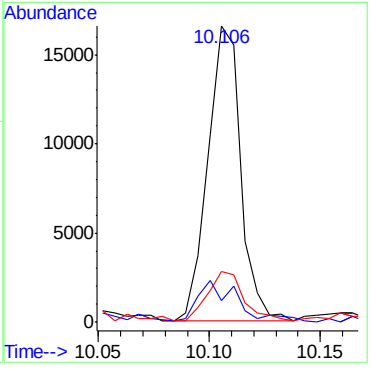


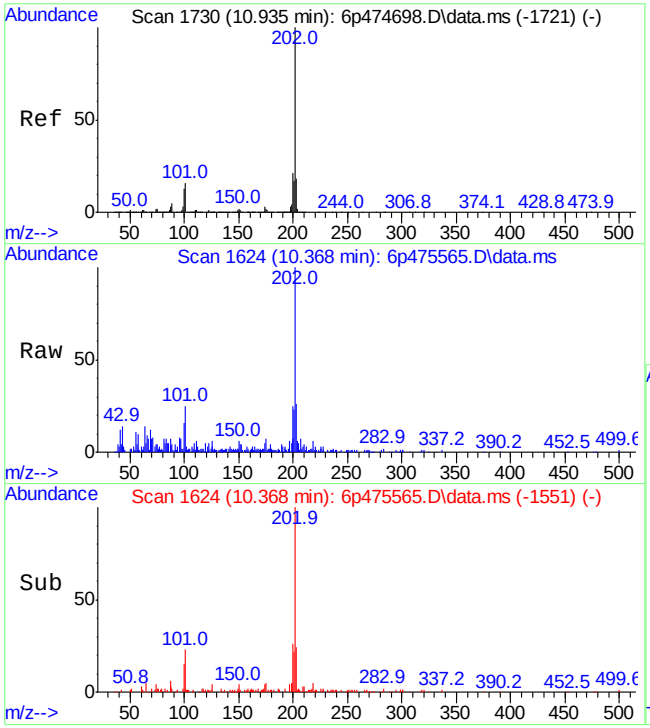


#81
Fluoranthene
Concen: 0.60 ppm
RT: 10.106 min Scan# 1575
Delta R.T. -0.067 min
Lab File: 6p475565.D
Acq: 14 Sep 2018 7:07 am

Tgt Ion:202 Resp: 17136

Ion	Ratio	Lower	Upper
202	100		
101	6.1	0.0	41.3
203	16.0	0.0	47.3

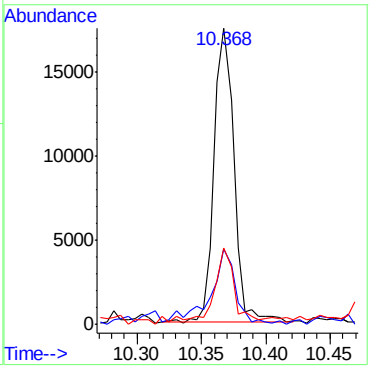




#84
Pyrene
Concen: 0.75 ppm
RT: 10.368 min Scan# 1624
Delta R.T. -0.110 min
Lab File: 6p475565.D
Acq: 14 Sep 2018 7:07 am

Tgt Ion:202 Resp: 18577

Ion	Ratio	Lower	Upper
202	100		
200	24.5	0.0	51.6
203	23.9	0.0	48.6



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475566.D
Acq On : 14 Sep 2018 7:32 am
Operator : chriss2
Sample : jc73460-3
Misc : op15037,e6p2338,31.8,,,1,1
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Sep 14 12:27:20 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

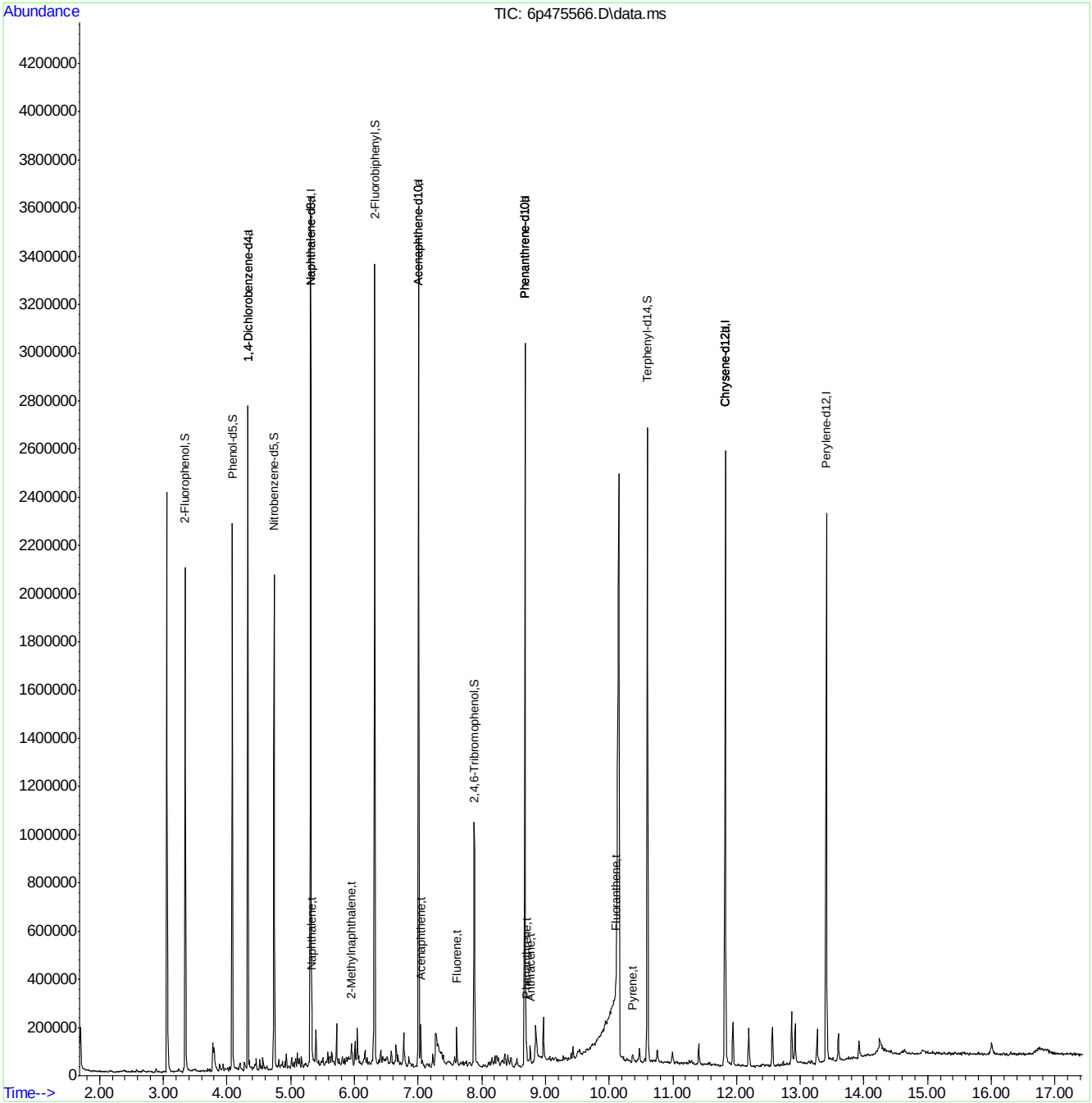
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.329	152	306634	40.00	ppm	-0.05
24) Naphthalene-d8	5.313	136	1194845	40.00	ppm	-0.07
47) Acenaphthene-d10	7.009	164	632026	40.00	ppm	-0.08
69) Phenanthrene-d10	8.677	188	1008441	40.00	ppm	-0.09
83) Chrysene-d12	11.822	240	866284	40.00	ppm	-0.09
91) Perylene-d12	13.411	264	845079	40.00	ppm	-0.09
101) 1,4-Dichlorobenzene-d4a	4.329	152	306634	40.00	ppm	-0.05
103) Acenaphthene-d10a	7.009	164	632026	40.00	ppm	-0.08
105) Phenanthrene-d10a	8.677	188	1008441	40.00	ppm	-0.09
109) Chrysene-d12a	11.822	240	866284	40.00	ppm	-0.09
111) Naphthalene-d8a	5.313	136	1194845	40.00	ppm	-0.07
113) Phenanthrene-d10b	8.677	188	1008441	40.00	ppm	-0.09
115) Chrysene-d12b	11.822	240	866170	40.00	ppm	-0.09
System Monitoring Compounds						
5) 2-Fluorophenol	3.345	112	390986	36.42	ppm	-0.07
Spiked Amount 50.000			Recovery = 72.84%			
8) Phenol-d5	4.083	99	503373	36.00	ppm	-0.04
Spiked Amount 50.000			Recovery = 72.00%			
25) Nitrobenzene-d5	4.741	82	455975	33.17	ppm	-0.06
Spiked Amount 50.000			Recovery = 66.34%			
51) 2-Fluorobiphenyl	6.319	172	805252	34.03	ppm	-0.08
Spiked Amount 50.000			Recovery = 68.06%			
73) 2,4,6-Tribromophenol	7.886	330	112744	37.33	ppm	-0.09
Spiked Amount 50.000			Recovery = 74.66%			
85) Terphenyl-d14	10.603	244	884855	51.54	ppm	-0.10
Spiked Amount 50.000			Recovery = 103.08%			
106) 1-chlorooctadecane	0.000	57	0d	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
38) Naphthalene	5.335	128	76903	2.35	ppm	98
44) 2-Methylnaphthalene	5.955	141	14289	0.84	ppm	96
59) Acenaphthene	7.041	153	29688	1.48	ppm	95
66) Fluorene	7.608	166	34600	1.53	ppm	94
77) Phenanthrene	8.704	178	28461	1.05	ppm	93
78) Anthracene	8.763	178	28320	1.05	ppm	93
81) Fluoranthene	10.111	202	9336	0.32	ppm	90
84) Pyrene	10.368	202	9245	0.36	ppm	91

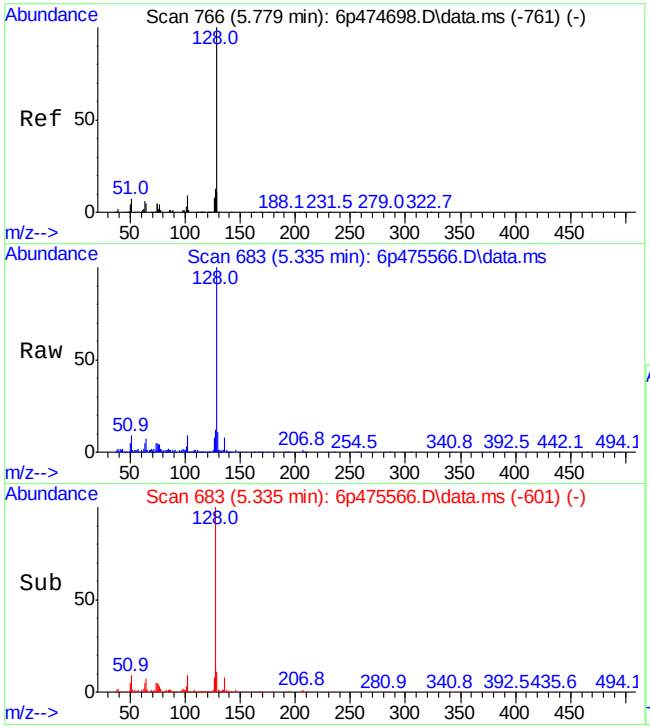
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475566.D
Acq On : 14 Sep 2018 7:32 am
Operator : chriss2
Sample : jc73460-3
Misc : op15037,e6p2338,31.8,,,1,1
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Sep 14 12:27:20 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

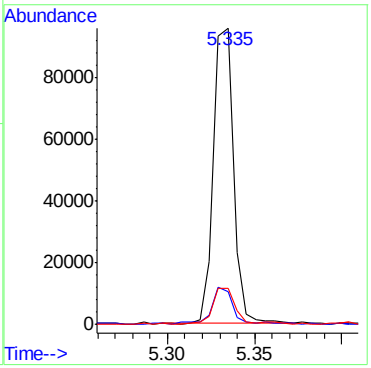


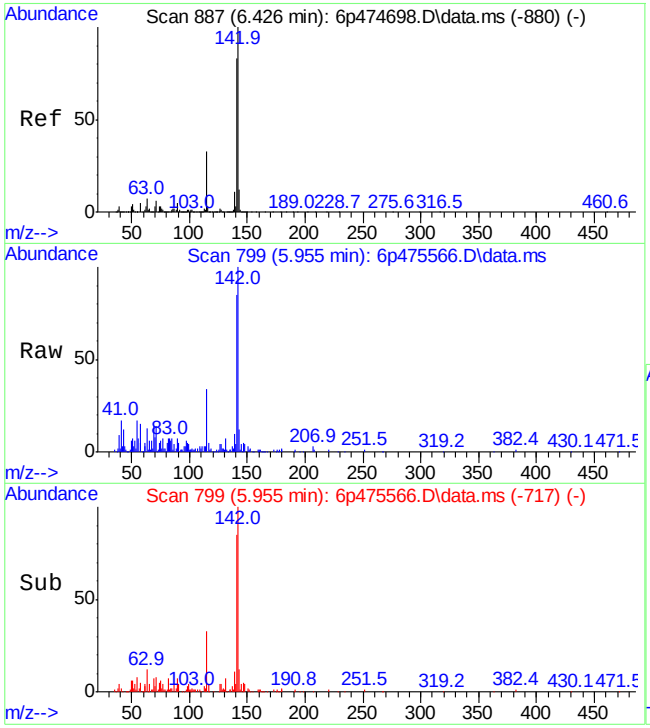


#38
Naphthalene
Concen: 2.35 ppm
RT: 5.335 min Scan# 683
Delta R.T. -0.064 min
Lab File: 6p475566.D
Acq: 14 Sep 2018 7:32 am

Tgt Ion:128 Resp: 76903

Ion	Ratio	Lower	Upper
128	100		
129	10.6	0.0	41.1
127	11.9	0.0	43.1

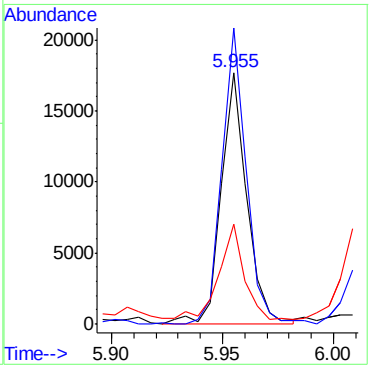


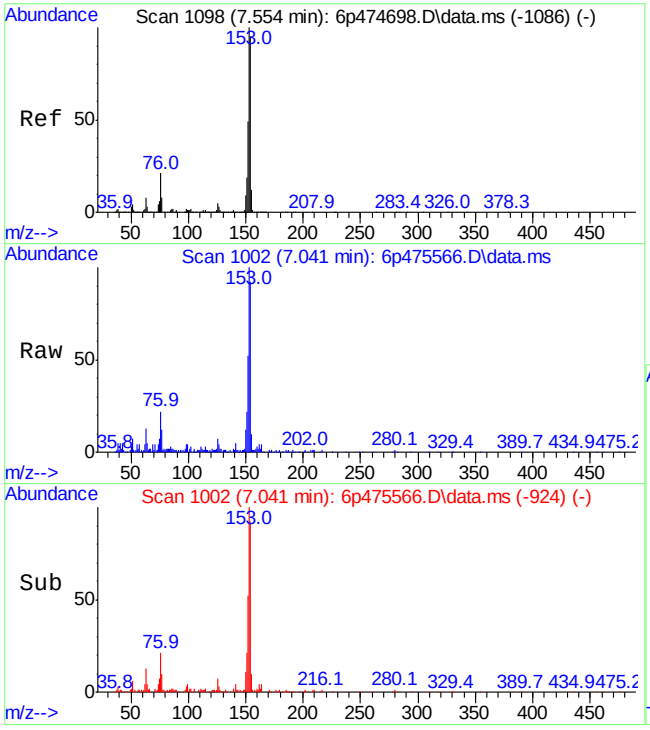


#44
2-Methylnaphthalene
Concen: 0.84 ppm
RT: 5.955 min Scan# 799
Delta R.T. -0.062 min
Lab File: 6p475566.D
Acq: 14 Sep 2018 7:32 am

Tgt Ion:141 Resp: 14289

Ion	Ratio	Lower	Upper
141	100		
142	117.6	86.8	146.8
115	37.9	16.8	76.8

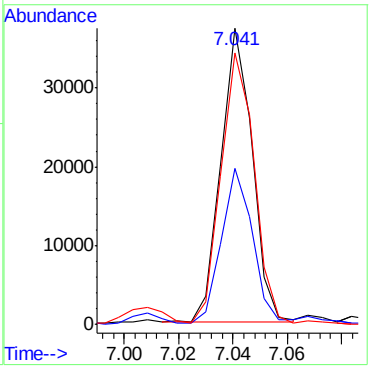


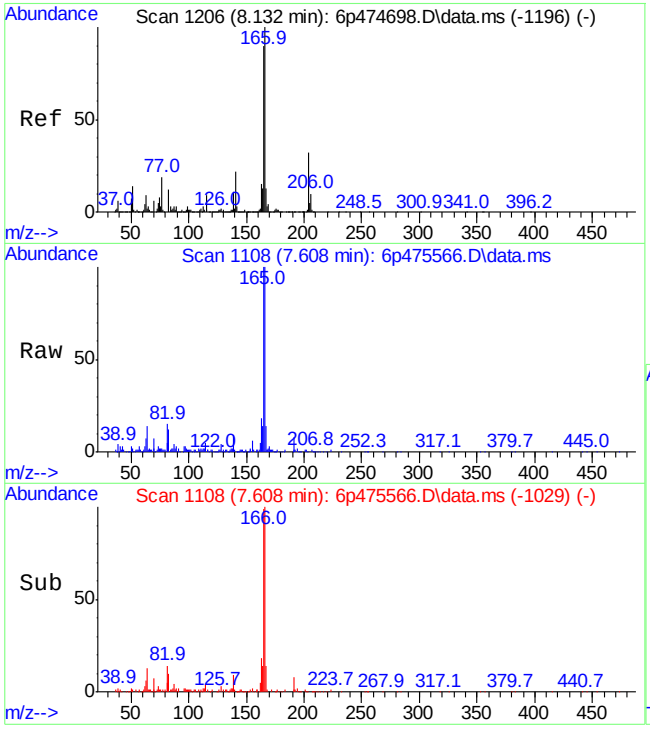


#59
Acenaphthene
Concen: 1.48 ppm
RT: 7.041 min Scan# 1002
Delta R.T. -0.085 min
Lab File: 6p475566.D
Acq: 14 Sep 2018 7:32 am

Tgt Ion:153 Resp: 29688

Ion	Ratio	Lower	Upper
153	100		
152	51.4	15.9	75.9
154	90.4	63.7	123.7

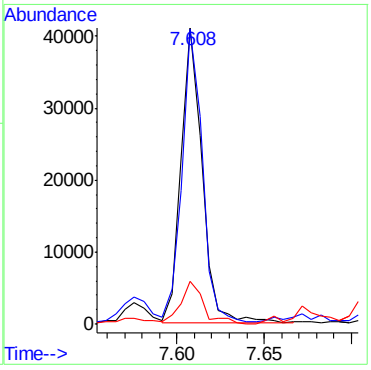


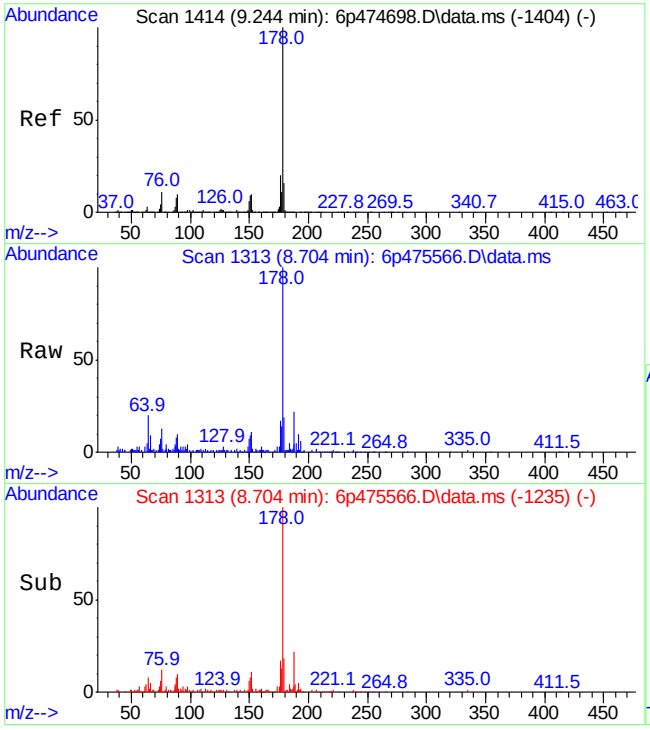


#66
Fluorene
Concen: 1.53 ppm
RT: 7.608 min Scan# 1108
Delta R.T. -0.077 min
Lab File: 6p475566.D
Acq: 14 Sep 2018 7:32 am

Tgt Ion:166 Resp: 34600

Ion	Ratio	Lower	Upper
166	100		
165	98.4	61.9	121.9
167	12.9	0.0	43.9

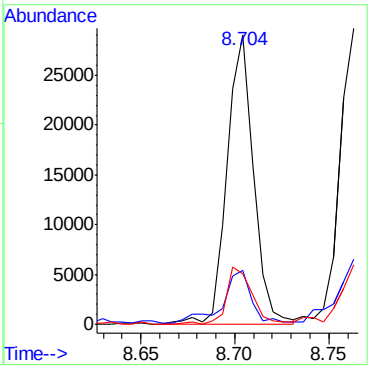


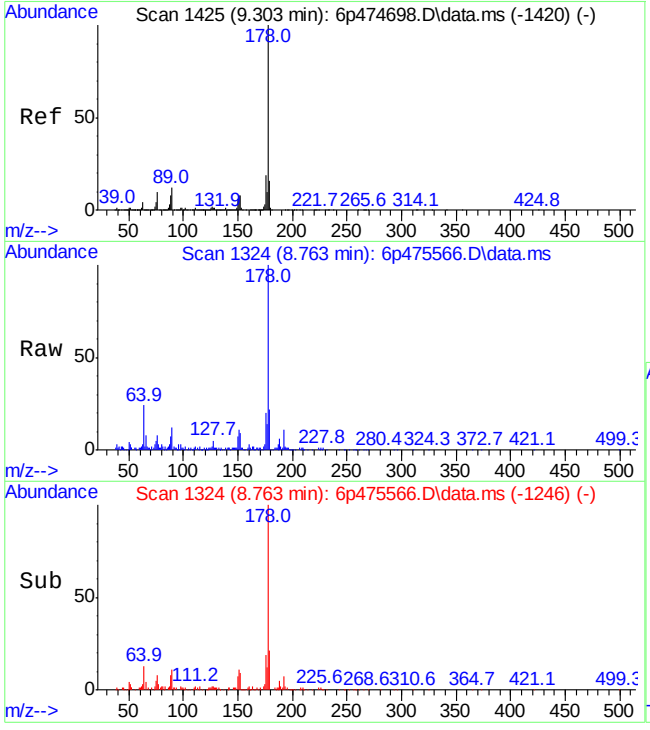


#77
Phenanthrene
Concen: 1.05 ppm
RT: 8.704 min Scan# 1313
Delta R.T. -0.085 min
Lab File: 6p475566.D
Acq: 14 Sep 2018 7:32 am

Tgt Ion:178 Resp: 28461

Ion	Ratio	Lower	Upper
178	100		
179	18.2	0.0	45.2
176	17.2	0.0	50.0

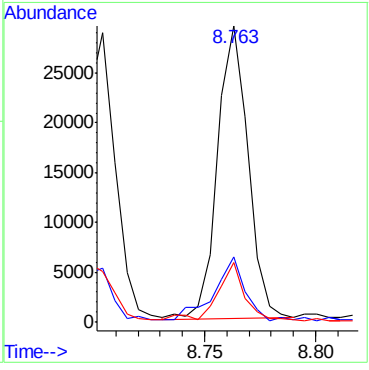


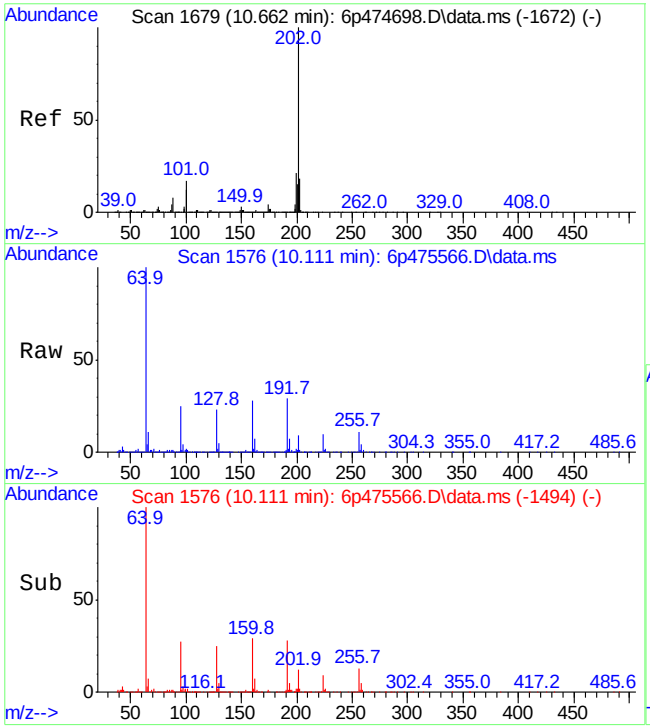


#78
Anthracene
Concen: 1.05 ppm
RT: 8.763 min Scan# 1324
Delta R.T. -0.084 min
Lab File: 6p475566.D
Acq: 14 Sep 2018 7:32 am

Tgt Ion:178 Resp: 28320

Ion	Ratio	Lower	Upper
178	100		
179	21.6	0.0	45.5
176	19.4	0.0	48.8

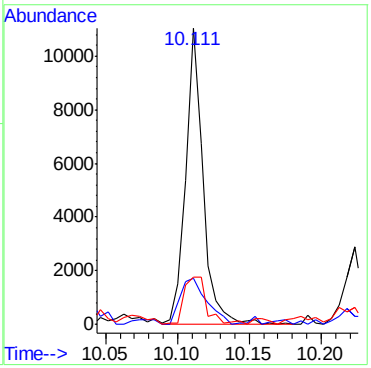


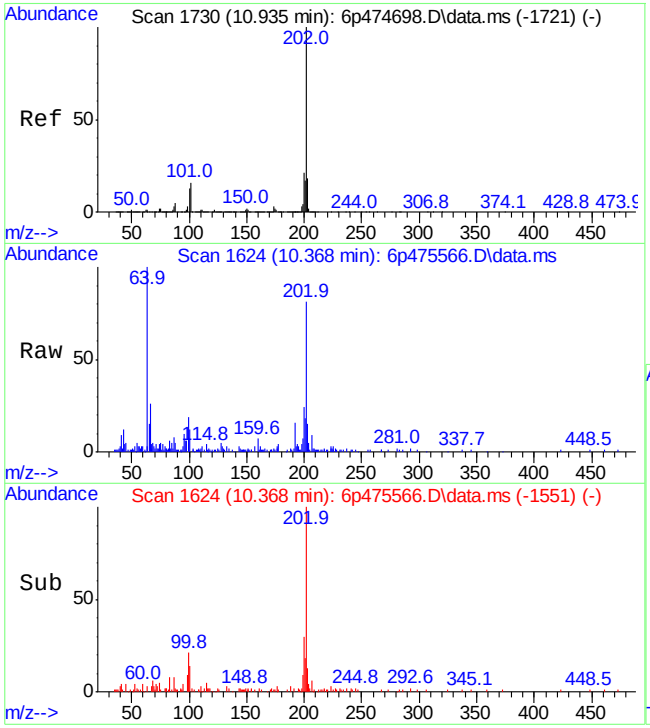


#81
Fluoranthene
Concen: 0.32 ppm
RT: 10.111 min Scan# 1576
Delta R.T. -0.062 min
Lab File: 6p475566.D
Acq: 14 Sep 2018 7:32 am

Tgt Ion:202 Resp: 9336

Ion	Ratio	Lower	Upper
202	100		
101	15.8	0.0	41.3
203	13.7	0.0	47.3

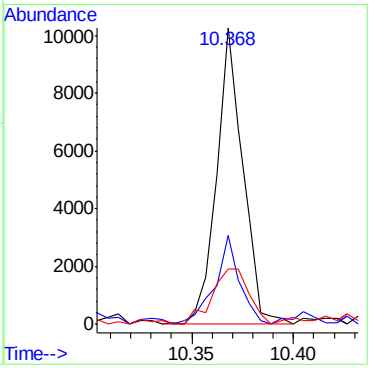




#84
Pyrene
Concen: 0.36 ppm
RT: 10.368 min Scan# 1624
Delta R.T. -0.110 min
Lab File: 6p475566.D
Acq: 14 Sep 2018 7:32 am

Tgt Ion:202 Resp: 9245

Ion	Ratio	Lower	Upper
202	100		
200	28.6	0.0	51.6
203	17.2	0.0	48.6



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475564.D
Acq On : 14 Sep 2018 6:42 am
Operator : chriss2
Sample : jc73460-4
Misc : op15037,e6p2338,30.4,,,1,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Sep 14 12:04:15 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

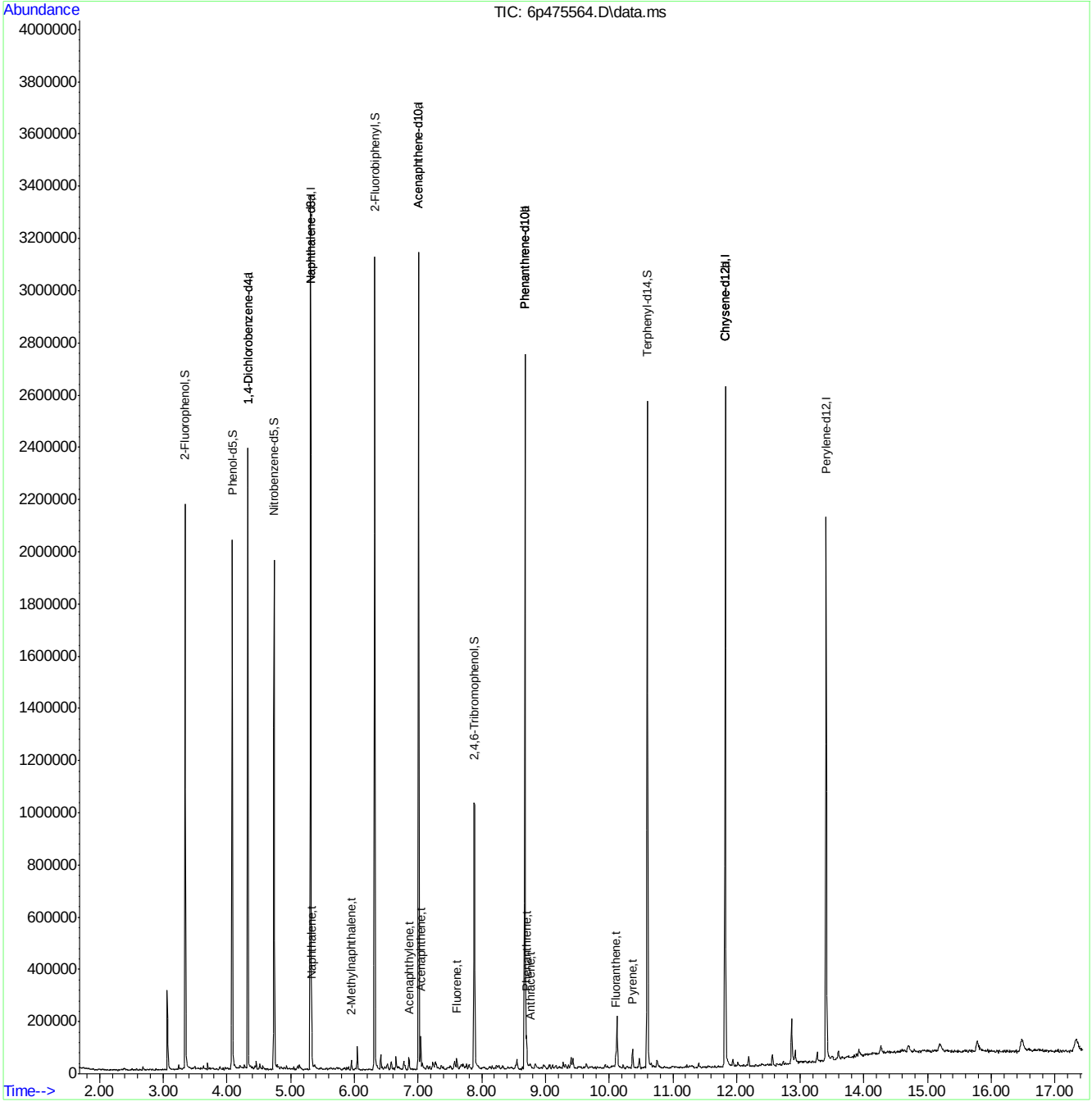
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.329	152	273177	40.00	ppm	-0.05
24) Naphthalene-d8	5.313	136	1109334	40.00	ppm	-0.07
47) Acenaphthene-d10	7.009	164	573782	40.00	ppm	-0.08
69) Phenanthrene-d10	8.677	188	947694	40.00	ppm	-0.09
83) Chrysene-d12	11.822	240	831396	40.00	ppm	-0.09
91) Perylene-d12	13.411	264	796607	40.00	ppm	-0.09
101) 1,4-Dichlorobenzene-d4a	4.329	152	273177	40.00	ppm	-0.05
103) Acenaphthene-d10a	7.009	164	573782	40.00	ppm	-0.08
105) Phenanthrene-d10a	8.677	188	947694	40.00	ppm	-0.09
109) Chrysene-d12a	11.822	240	831396	40.00	ppm	-0.09
111) Naphthalene-d8a	5.313	136	1109334	40.00	ppm	-0.07
113) Phenanthrene-d10b	8.677	188	947694	40.00	ppm	-0.09
115) Chrysene-d12b	11.822	240	831396	40.00	ppm	-0.09
System Monitoring Compounds						
5) 2-Fluorophenol	3.345	112	395276	41.33	ppm	-0.07
Spiked Amount 50.000			Recovery = 82.66%			
8) Phenol-d5	4.083	99	486216	39.03	ppm	-0.04
Spiked Amount 50.000			Recovery = 78.06%			
25) Nitrobenzene-d5	4.741	82	443981	34.79	ppm	-0.06
Spiked Amount 50.000			Recovery = 69.58%			
51) 2-Fluorobiphenyl	6.319	172	794166	36.97	ppm	-0.08
Spiked Amount 50.000			Recovery = 73.94%			
73) 2,4,6-Tribromophenol	7.886	330	112863	39.76	ppm	-0.09
Spiked Amount 50.000			Recovery = 79.52%			
85) Terphenyl-d14	10.603	244	870044	52.80	ppm	-0.10
Spiked Amount 50.000			Recovery = 105.60%			
106) 1-chlorooctadecane	0.000	57	0d	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
38) Naphthalene	5.329	128	48567	1.60	ppm	98
44) 2-Methylnaphthalene	5.955	141	6465	0.41	ppm	96
56) Acenaphthylene	6.854	152	14477	0.52	ppm	94
59) Acenaphthene	7.041	153	23665	1.30	ppm	98
66) Fluorene	7.608	166	10098	0.49	ppm	79
77) Phenanthrene	8.704	178	39323	1.54	ppm	96
78) Anthracene	8.763	178	7476	0.30	ppm	97
81) Fluoranthene	10.106	202	20030	0.73	ppm	89
84) Pyrene	10.368	202	23106	0.95	ppm	95

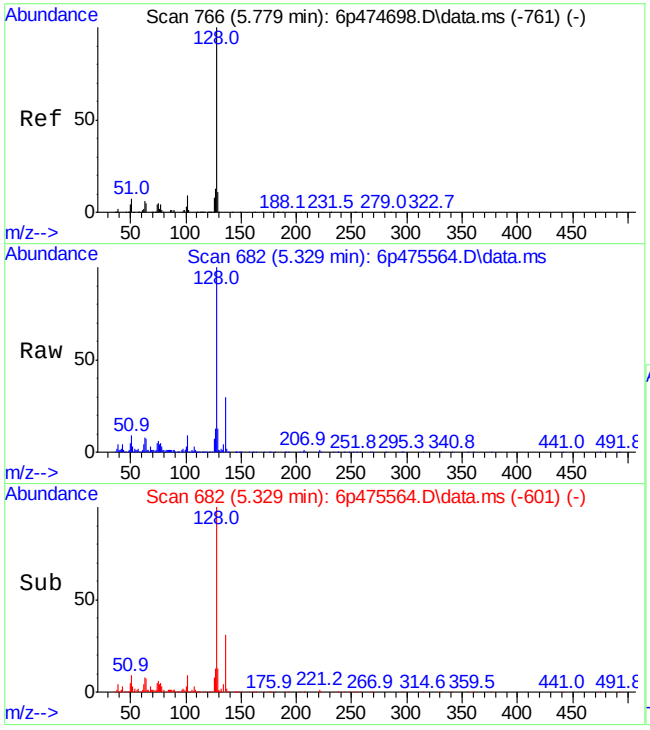
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475564.D
Acq On : 14 Sep 2018 6:42 am
Operator : chriss2
Sample : jc73460-4
Misc : op15037,e6p2338,30.4,,,1,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Sep 14 12:04:15 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

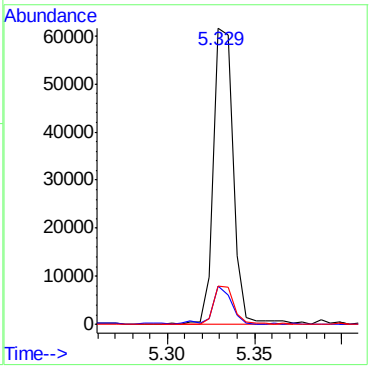


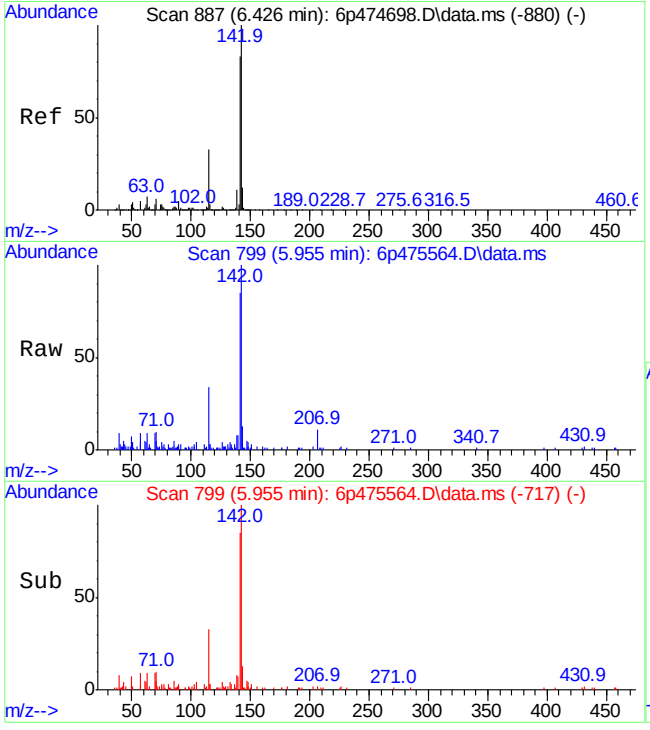


#38
Naphthalene
Concen: 1.60 ppm
RT: 5.329 min Scan# 682
Delta R.T. -0.069 min
Lab File: 6p475564.D
Acq: 14 Sep 2018 6:42 am

Tgt Ion:128 Resp: 48567

Ion	Ratio	Lower	Upper
128	100		
129	12.7	0.0	41.1
127	13.1	0.0	43.1

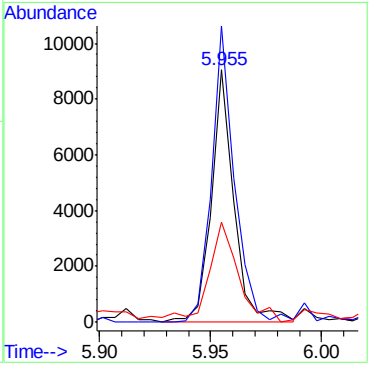


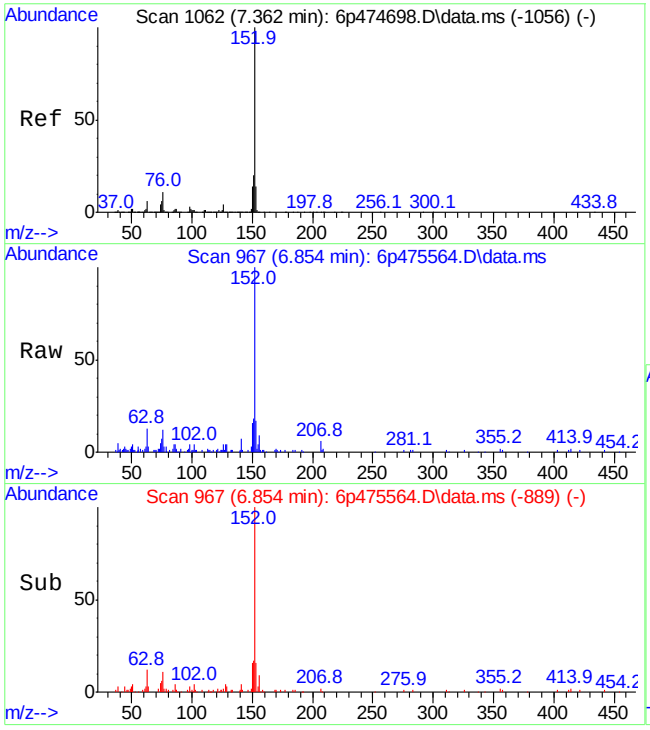


#44
2-Methylnaphthalene
Concen: 0.41 ppm
RT: 5.955 min Scan# 799
Delta R.T. -0.062 min
Lab File: 6p475564.D
Acq: 14 Sep 2018 6:42 am

Tgt Ion:141 Resp: 6465

Ion	Ratio	Lower	Upper
141	100		
142	117.5	86.8	146.8
115	38.3	16.8	76.8

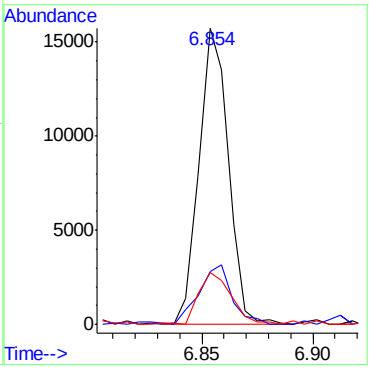


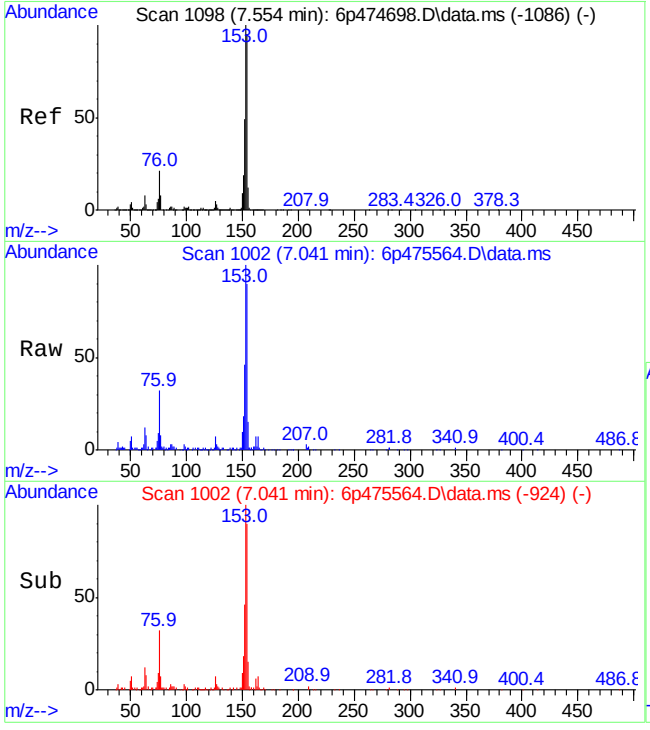


#56
Acenaphthylene
Concen: 0.52 ppm
RT: 6.854 min Scan# 967
Delta R.T. -0.084 min
Lab File: 6p475564.D
Acq: 14 Sep 2018 6:42 am

Tgt Ion:152 Resp: 14477

Ion	Ratio	Lower	Upper
152	100		
151	17.8	0.0	50.2
153	16.5	0.0	43.1

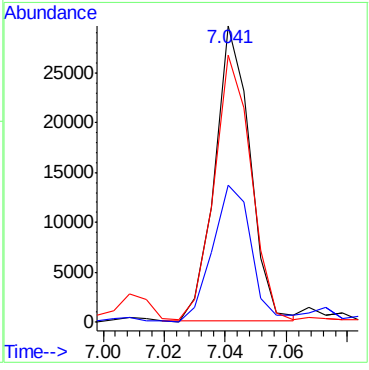


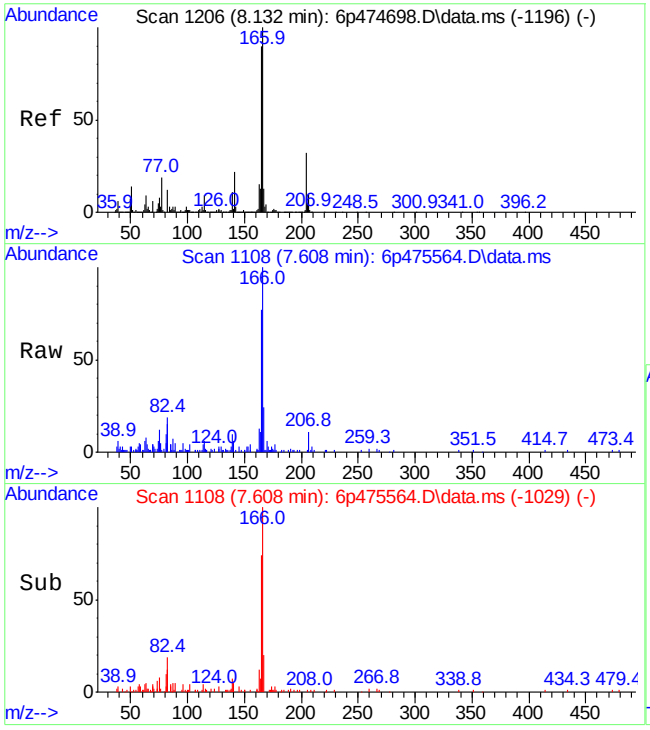


#59
Acenaphthene
Concen: 1.30 ppm
RT: 7.041 min Scan# 1002
Delta R.T. -0.085 min
Lab File: 6p475564.D
Acq: 14 Sep 2018 6:42 am

Tgt Ion:153 Resp: 23665

Ion	Ratio	Lower	Upper
153	100		
152	45.6	15.9	75.9
154	90.5	63.7	123.7

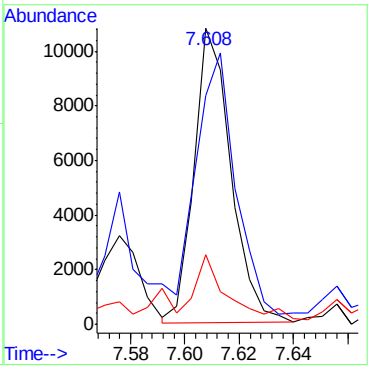


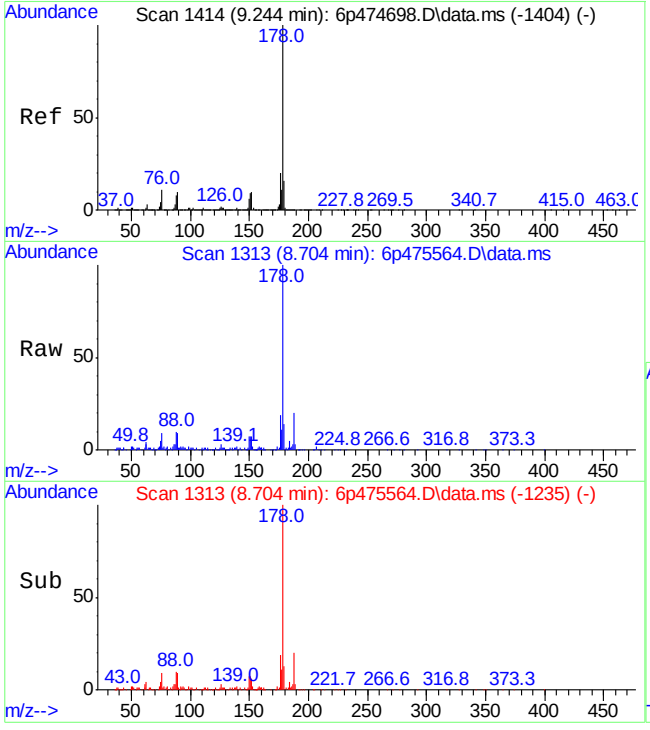


#66
Fluorene
Concen: 0.49 ppm
RT: 7.608 min Scan# 1108
Delta R.T. -0.077 min
Lab File: 6p475564.D
Acq: 14 Sep 2018 6:42 am

Tgt Ion:166 Resp: 10098

Ion	Ratio	Lower	Upper
166	100		
165	69.4	61.9	121.9
167	16.9	0.0	43.9

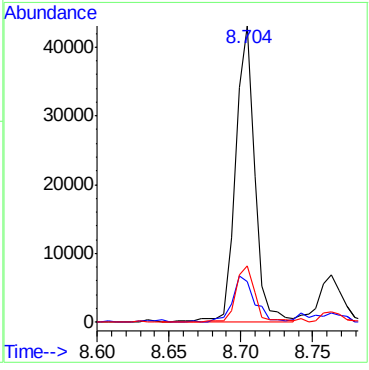


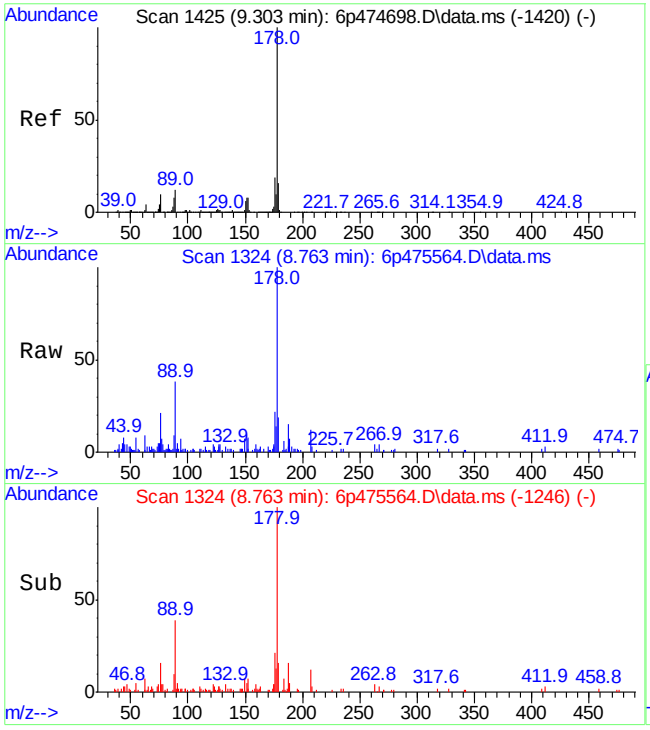


#77
Phenanthrene
Concen: 1.54 ppm
RT: 8.704 min Scan# 1313
Delta R.T. -0.085 min
Lab File: 6p475564.D
Acq: 14 Sep 2018 6:42 am

Tgt Ion:178 Resp: 39323

Ion	Ratio	Lower	Upper
178	100		
179	12.8	0.0	45.2
176	18.9	0.0	50.0

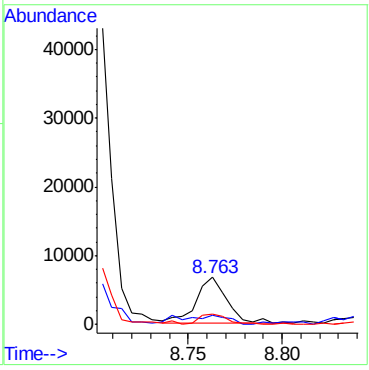


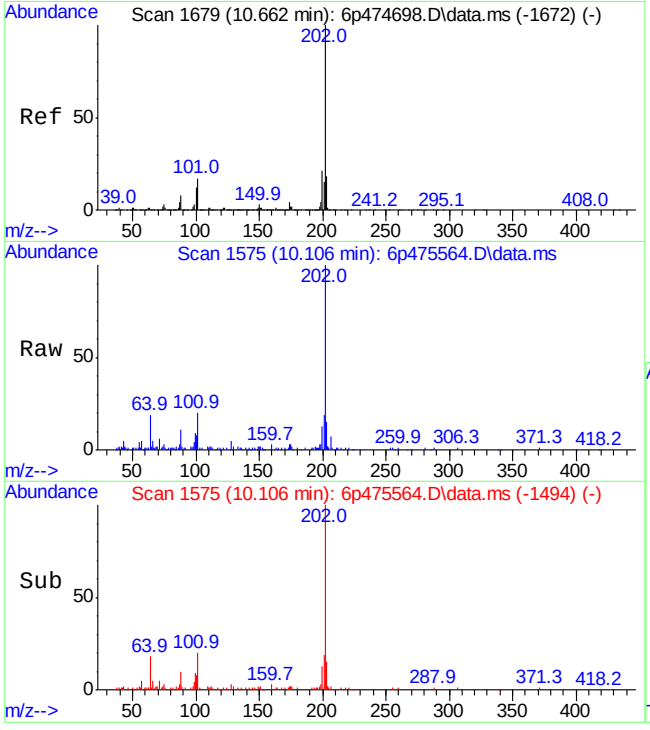


#78
Anthracene
Concen: 0.30 ppm
RT: 8.763 min Scan# 1324
Delta R.T. -0.084 min
Lab File: 6p475564.D
Acq: 14 Sep 2018 6:42 am

Tgt Ion:178 Resp: 7476

Ion	Ratio	Lower	Upper
178	100		
179	15.3	0.0	45.5
176	21.4	0.0	48.8

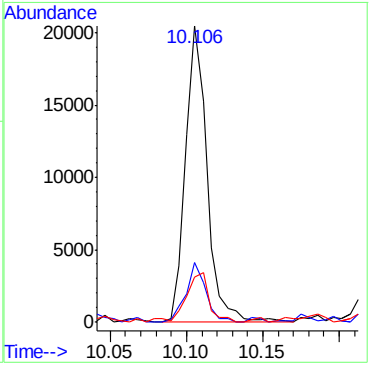


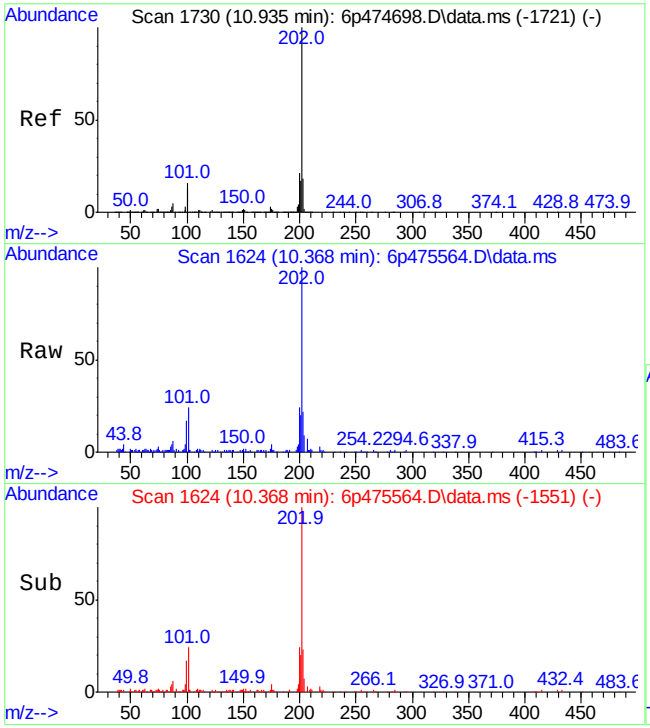


#81
Fluoranthene
Concen: 0.73 ppm
RT: 10.106 min Scan# 1575
Delta R.T. -0.067 min
Lab File: 6p475564.D
Acq: 14 Sep 2018 6:42 am

Tgt Ion:202 Resp: 20030

Ion	Ratio	Lower	Upper
202	100		
101	19.8	0.0	41.3
203	15.9	0.0	47.3

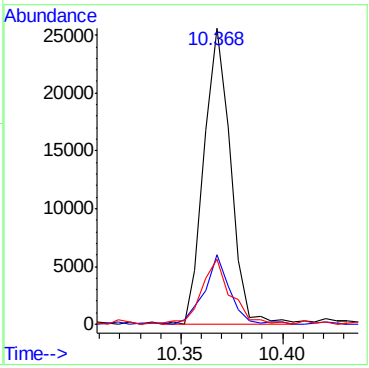




#84
Pyrene
Concen: 0.95 ppm
RT: 10.368 min Scan# 1624
Delta R.T. -0.110 min
Lab File: 6p475564.D
Acq: 14 Sep 2018 6:42 am

Tgt Ion:202 Resp: 23106

Ion	Ratio	Lower	Upper
202	100		
200	23.6	0.0	51.6
203	21.6	0.0	48.6



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475560.D
Acq On : 14 Sep 2018 5:02 am
Operator : chriss2
Sample : op15037-mb1
Misc : op15037,e6p2338,30.0,,,1,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Sep 14 11:58:16 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

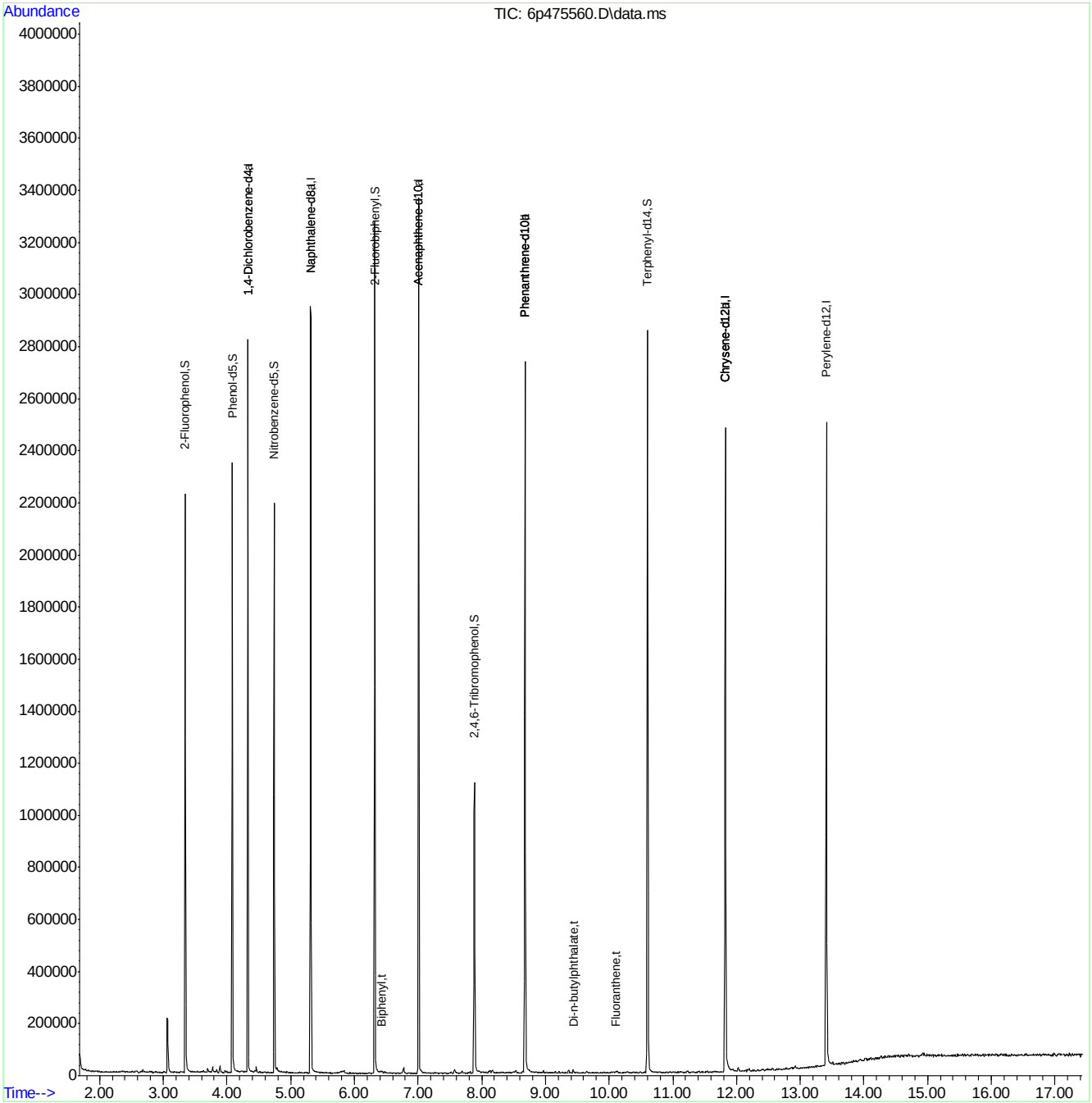
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.329	152	277798	40.00	ppm	-0.05
24) Naphthalene-d8	5.319	136	1126870	40.00	ppm	-0.06
47) Acenaphthene-d10	7.009	164	601204	40.00	ppm	-0.08
69) Phenanthrene-d10	8.678	188	991128	40.00	ppm	-0.09
83) Chrysene-d12	11.823	240	858068	40.00	ppm	-0.09
91) Perylene-d12	13.411	264	854162	40.00	ppm	-0.09
101) 1,4-Dichlorobenzene-d4a	4.329	152	277798	40.00	ppm	-0.05
103) Acenaphthene-d10a	7.009	164	601204	40.00	ppm	-0.08
105) Phenanthrene-d10a	8.678	188	991128	40.00	ppm	-0.09
109) Chrysene-d12a	11.823	240	858068	40.00	ppm	-0.09
111) Naphthalene-d8a	5.319	136	1126870	40.00	ppm	-0.06
113) Phenanthrene-d10b	8.678	188	991128	40.00	ppm	-0.09
115) Chrysene-d12b	11.823	240	857913	40.00	ppm	-0.09
System Monitoring Compounds						
5) 2-Fluorophenol	3.345	112	403209	41.46	ppm	-0.07
Spiked Amount 50.000			Recovery = 82.92%			
8) Phenol-d5	4.083	99	510171	40.27	ppm	-0.04
Spiked Amount 50.000			Recovery = 80.54%			
25) Nitrobenzene-d5	4.741	82	464551	35.84	ppm	-0.06
Spiked Amount 50.000			Recovery = 71.68%			
51) 2-Fluorobiphenyl	6.319	172	827656	36.77	ppm	-0.08
Spiked Amount 50.000			Recovery = 73.54%			
73) 2,4,6-Tribromophenol	7.886	330	118456	39.90	ppm	-0.09
Spiked Amount 50.000			Recovery = 79.80%			
85) Terphenyl-d14	10.603	244	910008	53.51	ppm	-0.10
Spiked Amount 50.000			Recovery = 107.02%			
106) 1-chlorooctadecane	0.000	57	0d	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
53) Biphenyl	6.420	154	1615	0.07	ppm	76
80) Di-n-butylphthalate	9.437	149	2255	0.07	ppm	78
81) Fluoranthene	10.111	202	1131	0.04	ppm	63

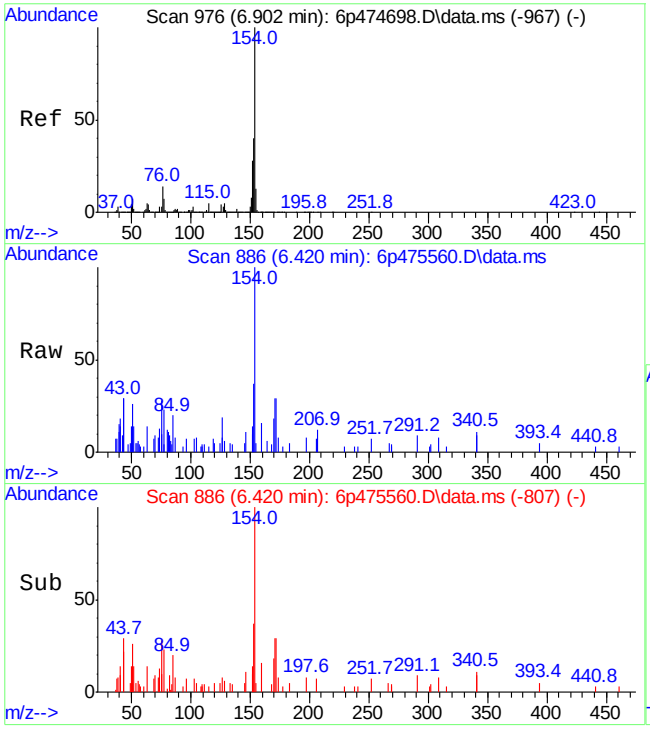
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475560.D
Acq On : 14 Sep 2018 5:02 am
Operator : chriss2
Sample : op15037-mb1
Misc : op15037,e6p2338,30.0,,,1,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Sep 14 11:58:16 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

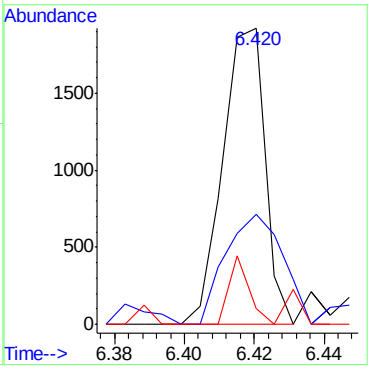


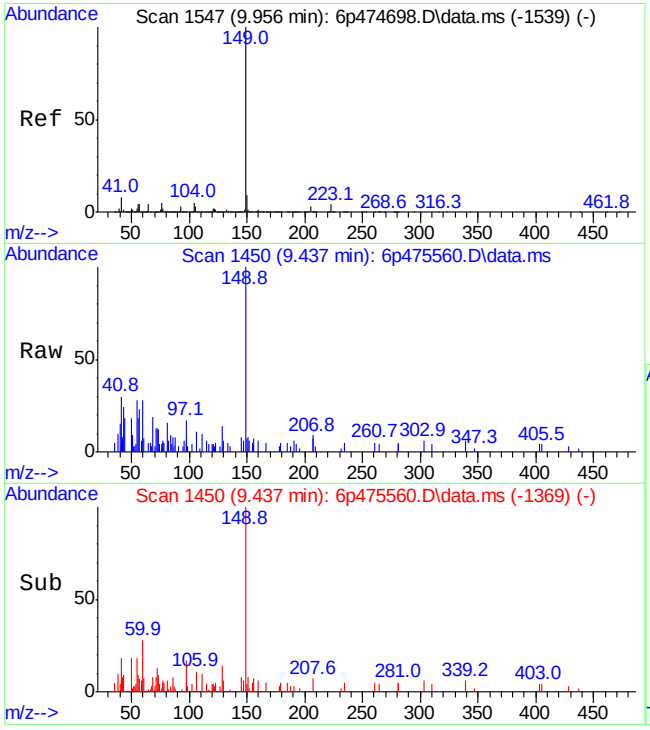


#53
Biphenyl
Concen: 0.07 ppm
RT: 6.420 min Scan# 886
Delta R.T. -0.078 min
Lab File: 6p475560.D
Acq: 14 Sep 2018 5:02 am

Tgt Ion:154 Resp: 1615

Ion	Ratio	Lower	Upper
154	100		
153	26.3	9.9	69.9
155	0.0	0.0	42.7

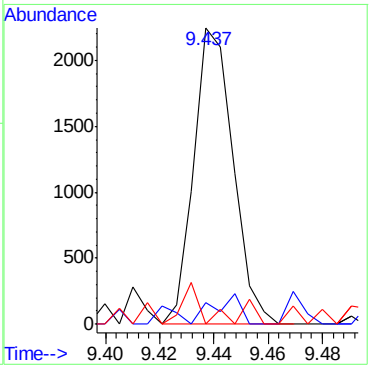


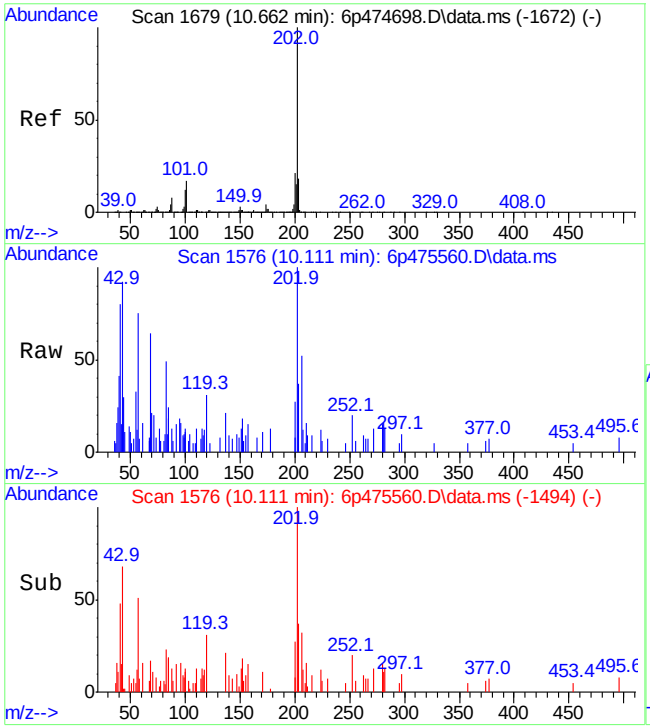


#80
Di-n-butylphthalate
Concen: 0.07 ppm
RT: 9.437 min Scan# 1450
Delta R.T. -0.065 min
Lab File: 6p475560.D
Acq: 14 Sep 2018 5:02 am

Tgt Ion:149 Resp: 2255

Ion	Ratio	Lower	Upper
149	100		
150	0.0	0.0	39.0
104	0.0	0.0	36.3

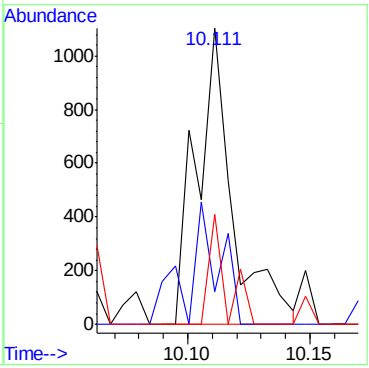




#81
Fluoranthene
Concen: 0.04 ppm
RT: 10.111 min Scan# 1576
Delta R.T. -0.062 min
Lab File: 6p475560.D
Acq: 14 Sep 2018 5:02 am

Tgt Ion:202 Resp: 1131

Ion	Ratio	Lower	Upper
202	100		
101	3.8	0.0	41.3
203	38.1	0.0	47.3



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475561.D
Acq On : 14 Sep 2018 5:27 am
Operator : chriss2
Sample : op15037-bs
Misc : op15037,e6p2338,30.0,,,1,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Sep 14 11:59:50 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) 1,4-Dichlorobenzene-d4	4.329	152	270114	40.00	ppm		-0.05
24) Naphthalene-d8	5.319	136	1072889	40.00	ppm		-0.06
47) Acenaphthene-d10	7.014	164	550342	40.00	ppm		-0.07
69) Phenanthrene-d10	8.683	188	890233	40.00	ppm		-0.08
83) Chrysene-d12	11.828	240	823617	40.00	ppm		-0.09
91) Perylene-d12	13.411	264	786257	40.00	ppm		-0.09
101) 1,4-Dichlorobenzene-d4a	4.329	152	270114	40.00	ppm		-0.05
103) Acenaphthene-d10a	7.014	164	550342	40.00	ppm		-0.07
105) Phenanthrene-d10a	8.683	188	890233	40.00	ppm		-0.08
109) Chrysene-d12a	11.828	240	823617	40.00	ppm		-0.09
111) Naphthalene-d8a	5.319	136	1072889	40.00	ppm		-0.06
113) Phenanthrene-d10b	8.683	188	890233	40.00	ppm		-0.08
115) Chrysene-d12b	11.828	240	823683	40.00	ppm		-0.09
System Monitoring Compounds							
5) 2-Fluorophenol	3.345	112	423113	44.74	ppm		-0.07
Spiked Amount 50.000			Recovery = 89.48%				
8) Phenol-d5	4.083	99	540323	43.87	ppm		-0.04
Spiked Amount 50.000			Recovery = 87.74%				
25) Nitrobenzene-d5	4.741	82	484149	39.23	ppm		-0.06
Spiked Amount 50.000			Recovery = 78.46%				
51) 2-Fluorobiphenyl	6.319	172	851917	41.35	ppm		-0.08
Spiked Amount 50.000			Recovery = 82.70%				
73) 2,4,6-Tribromophenol	7.886	330	124559	46.72	ppm		-0.09
Spiked Amount 50.000			Recovery = 93.44%				
85) Terphenyl-d14	10.603	244	936118	57.35	ppm		-0.10
Spiked Amount 50.000			Recovery = 114.70%				
106) 1-chlorooctadecane	0.000	57	0d	0.00	ppm		
107) o-terphenyl	0.000	230	0	0.00	ppm		
Target Compounds							Qvalue
2) 1,4-Dioxane	1.799	88	120179	26.67	ppm		96
3) Pyridine	2.131	79	414753	37.12	ppm		93
4) N-Nitrosodimethylamine	2.093	74	221247	33.56	ppm		87
6) Indene	4.516	116	801116	48.20	ppm		96
7) Cumene	3.730	105	1012396	36.77	ppm		97
9) Phenol	4.094	94	595750	40.56	ppm	#	58
10) Aniline	4.088	93	548582	32.79	ppm		82
11) bis(2-Chloroethyl)ether	4.142	93	425815	44.13	ppm		95
12) 2-Chlorophenol	4.179	128	445304	45.32	ppm		98
13) Decane	4.222	43	474660	44.21	ppm		91
14) 1,3-Dichlorobenzene	4.286	146	448013	41.89	ppm		96
15) 1,4-Dichlorobenzene	4.340	146	458543	41.29	ppm		96
16) Benzyl alcohol	4.441	108	293837	44.72	ppm		91
17) 1,2-Dichlorobenzene	4.452	146	437718	42.86	ppm		99
18) Acetophenone	4.629	105	620622	39.27	ppm		78
19) 2-Methylphenol	4.532	108	415165	42.03	ppm		96
20) 2,2'-oxybis(1-Chloropr...	4.538	121	140103	42.76	ppm	#	66
21) 3&4-Methylphenol	4.650	108	427894	42.24	ppm		99

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475561.D
Acq On : 14 Sep 2018 5:27 am
Operator : chriss2
Sample : op15037-bs
Misc : op15037,e6p2338,30.0,,,1,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Sep 14 11:59:50 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
22) n-Nitroso-di-n-propyla...	4.639	70	334131	40.36	ppm		92
23) Hexachloroethane	4.704	201	140790	38.21	ppm		93
26) Nitrobenzene	4.757	77	478921	38.20	ppm		92
27) Quinoline	5.634	129	857925	44.16	ppm		96
28) Isophorone	4.944	82	830441	39.84	ppm		94
29) 2-Nitrophenol	5.008	139	228798	48.02	ppm		83
30) 2,4-Dimethylphenol	5.057	107	418653	37.57	ppm		89
31) Benzoic acid	5.174	105	386782	48.18	ppm		97
32) bis(2-Chloroethoxy)met...	5.126	93	474910	44.50	ppm		99
33) 2,4-Dichlorophenol	5.212	162	327817	41.04	ppm		97
34) 2,6-Dichlorophenol	5.399	162	321247	41.03	ppm		98
36) 1,2,4-Trichlorobenzene	5.271	180	355856	41.55	ppm		94
38) Naphthalene	5.335	128	1315182	44.67	ppm		99
39) 4-Chloroaniline	5.388	127	338939	27.06	ppm		99
40) 2,3-Dichloroaniline	6.233	161	355971	35.70	ppm		98
41) Caprolactam	5.714	55	200524	42.49	ppm		97
42) Hexachlorobutadiene	5.452	225	196060	36.80	ppm		98
43) 4-Chloro-3-methylphenol	5.843	107	390515	40.81	ppm		98
44) 2-Methylnaphthalene	5.955	141	700588	45.81	ppm		97
45) 1-Methylnaphthalene	6.051	141	674927	39.69	ppm		96
46) Dimethylnaphthalene	6.581	156	732558	44.75	ppm		92
48) Hexachlorocyclopentadiene	6.121	237	405747	77.73	ppm		96
49) 2,4,6-Trichlorophenol	6.244	196	235290	43.00	ppm		99
50) 2,4,5-Trichlorophenol	6.281	196	242544	42.52	ppm		93
52) 2-Chloronaphthalene	6.431	162	720070	41.19	ppm		98
53) Biphenyl	6.420	154	981448	44.14	ppm		99
54) 2-Nitroaniline	6.549	65	273634	43.91	ppm		97
55) Dimethylphthalate	6.747	163	819440	41.18	ppm		99
56) Acenaphthylene	6.859	152	1179307	43.87	ppm		99
57) 2,6-Dinitrotoluene	6.806	165	184687	45.44	ppm		81
58) 3-Nitroaniline	6.982	138	155354	32.30	ppm		98
59) Acenaphthene	7.046	153	785263	45.00	ppm		99
60) 2,4-Dinitrophenol	7.100	184	233902	104.66	ppm	#	46
61) 4-Nitrophenol	7.201	109	122267	34.01	ppm	#	56
62) Dibenzofuran	7.233	168	1041601	42.65	ppm		90
63) 2,4-Dinitrotoluene	7.239	165	249164	40.67	ppm		85
64) 2,3,4,6-Tetrachlorophenol	7.383	232	188970	40.13	ppm		96
65) Diethylphthalate	7.528	149	801514	40.11	ppm		99
66) Fluorene	7.613	166	840582	42.56	ppm		98
67) 4-Chlorophenyl-phenyle...	7.629	204	391690	42.82	ppm		86
68) 4-Nitroaniline	7.656	138	204725	41.71	ppm		85
70) 4,6-Dinitro-2-methylph...	7.699	198	156743	51.88	ppm		87
71) n-Nitrosodiphenylamine	7.768	169	587515	47.35	ppm		96
72) 1,2-Diphenylhydrazine	7.806	77	949454	45.62	ppm		98
74) 4-Bromophenyl-phenylether	8.180	248	225078	47.11	ppm		98
75) Hexachlorobenzene	8.244	284	250151	42.70	ppm		92
76) Pentachlorophenol	8.485	266	166387	45.06	ppm		94
77) Phenanthrene	8.710	178	1167371	48.80	ppm		97
78) Anthracene	8.769	178	1162317	48.91	ppm		97
79) Carbazole	8.972	167	1099575	47.93	ppm		98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475561.D
Acq On : 14 Sep 2018 5:27 am
Operator : chriss2
Sample : op15037-bs
Misc : op15037,e6p2338,30.0,,,1,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Sep 14 11:59:50 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

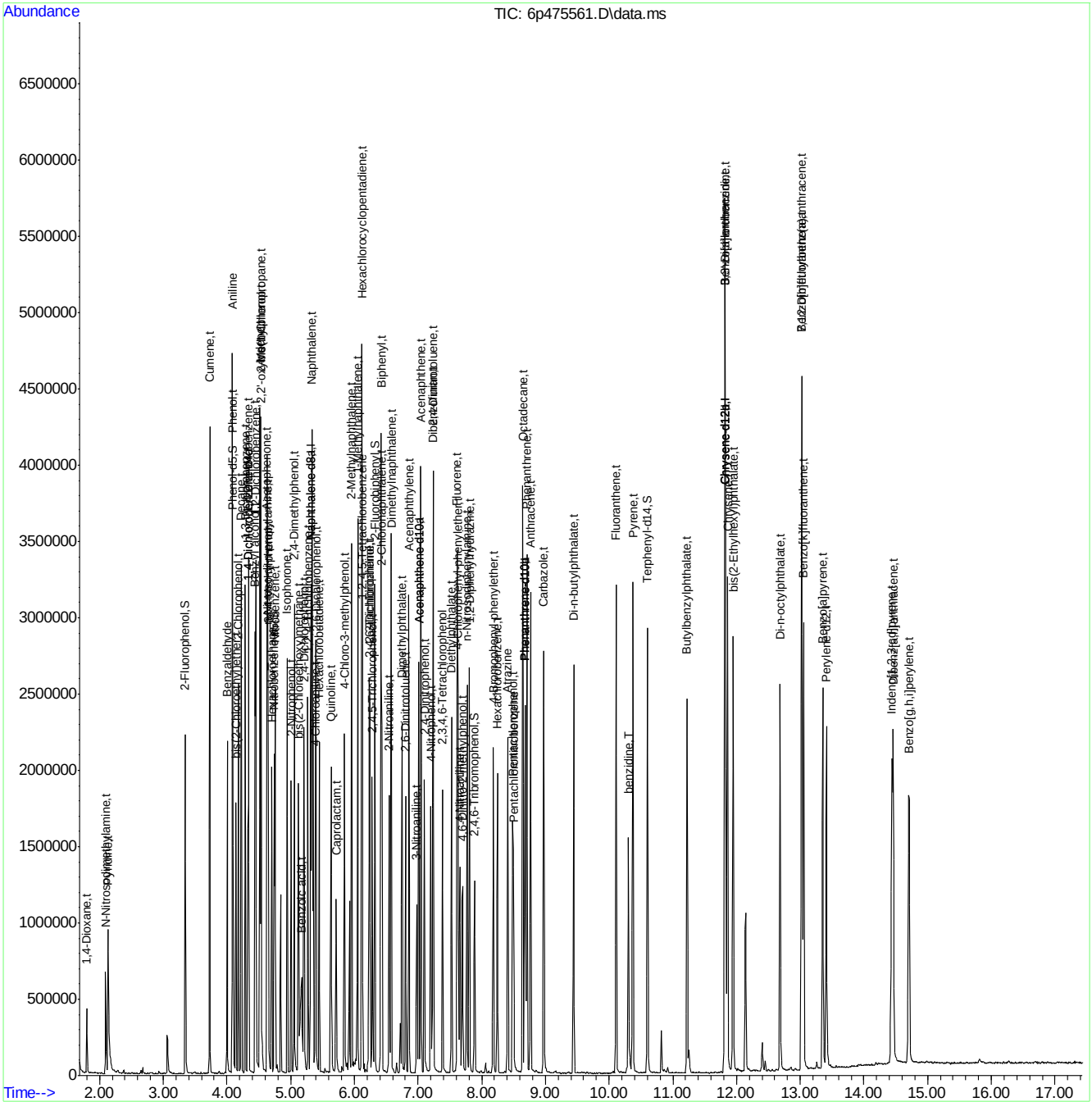
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
80) Di-n-butylphthalate	9.442	149	1309868	46.21	ppm	98
81) Fluoranthene	10.111	202	1195433	46.35	ppm	94
82) Octadecane	8.646	57	683602	55.02	ppm	95
84) Pyrene	10.373	202	1238914	51.36	ppm	95
86) Butylbenzylphthalate	11.224	149	550748	51.16	ppm	97
87) Benzo[a]anthracene	11.817	228	1127080	47.26	ppm	100
88) 3,3'-Dichlorobenzidine	11.817	252	524787	61.07	ppm	96
89) Chrysene	11.860	228	1088726	49.40	ppm	97
90) bis(2-Ethylhexyl)phtha...	11.946	149	757124	53.58	ppm	98
92) Di-n-octylphthalate	12.684	149	1215737	45.40	ppm	96
93) Benzo[b]fluoranthene	13.026	252	1167622	49.75	ppm	92
94) Benzo[k]fluoranthene	13.053	252	993837	49.49	ppm	94
95) Benzo[a]pyrene	13.352	252	954626	50.50	ppm	95
96) Indeno[1,2,3-cd]pyrene	14.438	276	1123265	50.50	ppm	90
98) Dibenz[a,h]anthracene	14.459	278	970550	49.98	ppm	94
99) 7,12-Dimethylbenz(a)an...	13.026	256	527835	49.96	ppm	94
100) Benzo[g,h,i]perylene	14.711	276	931091	53.21	ppm	93
102) Benzaldehyde	4.003	105	301673	41.38	ppm	91
104) 1,2,4,5-Tetrachloroben...	6.126	216	354099	44.10	ppm	97
108) Atrazine	8.410	215	126906	56.41	ppm	86
110) benzidine	10.304	184	582087	41.75	ppm	98
114) Pentachloronitrobenzene	8.501	295	42237	45.05	ppm	92

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475561.D
Acq On : 14 Sep 2018 5:27 am
Operator : chriss2
Sample : op15037-bs
Misc : op15037,e6p2338,30.0,,,1,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Sep 14 11:59:50 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475562.D
Acq On : 14 Sep 2018 5:52 am
Operator : chriss2
Sample : op15037-ms
Misc : op15037,e6p2338,31.0,,,1,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Sep 14 12:00:59 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) 1,4-Dichlorobenzene-d4	4.329	152	284665	40.00	ppm		-0.05
24) Naphthalene-d8	5.319	136	1113314	40.00	ppm		-0.06
47) Acenaphthene-d10	7.014	164	571932	40.00	ppm		-0.07
69) Phenanthrene-d10	8.683	188	935842	40.00	ppm		-0.08
83) Chrysene-d12	11.828	240	848815	40.00	ppm		-0.09
91) Perylene-d12	13.411	264	820538	40.00	ppm		-0.09
101) 1,4-Dichlorobenzene-d4a	4.329	152	284665	40.00	ppm		-0.05
103) Acenaphthene-d10a	7.014	164	571932	40.00	ppm		-0.07
105) Phenanthrene-d10a	8.683	188	935842	40.00	ppm		-0.08
109) Chrysene-d12a	11.828	240	848815	40.00	ppm		-0.09
111) Naphthalene-d8a	5.319	136	1113314	40.00	ppm		-0.06
113) Phenanthrene-d10b	8.683	188	935842	40.00	ppm		-0.08
115) Chrysene-d12b	11.828	240	848815	40.00	ppm		-0.09
System Monitoring Compounds							
5) 2-Fluorophenol	3.345	112	376657	37.79	ppm		-0.07
Spiked Amount 50.000			Recovery = 75.58%				
8) Phenol-d5	4.083	99	484226	37.30	ppm		-0.04
Spiked Amount 50.000			Recovery = 74.60%				
25) Nitrobenzene-d5	4.741	82	425395	33.21	ppm		-0.06
Spiked Amount 50.000			Recovery = 66.42%				
51) 2-Fluorobiphenyl	6.319	172	778836	36.37	ppm		-0.08
Spiked Amount 50.000			Recovery = 72.74%				
73) 2,4,6-Tribromophenol	7.886	330	116409	41.53	ppm		-0.09
Spiked Amount 50.000			Recovery = 83.06%				
85) Terphenyl-d14	10.603	244	883046	52.49	ppm		-0.10
Spiked Amount 50.000			Recovery = 104.98%				
106) 1-chlorooctadecane	0.000	57	0d	0.00	ppm		
107) o-terphenyl	0.000	230	0	0.00	ppm		
Target Compounds							Qvalue
2) 1,4-Dioxane	1.799	88	106544	22.43	ppm		97
3) Pyridine	2.131	79	383065	32.53	ppm		97
4) N-Nitrosodimethylamine	2.093	74	199162	28.67	ppm		82
6) Indene	4.516	116	725617	41.43	ppm		96
7) Cumene	3.730	105	876634	30.21	ppm		97
9) Phenol	4.094	94	531273	34.32	ppm	#	55
10) Aniline	4.088	93	508721	28.85	ppm		77
11) bis(2-Chloroethyl)ether	4.142	93	381232	37.49	ppm		96
12) 2-Chlorophenol	4.179	128	398229	38.46	ppm		98
13) Decane	4.222	43	402892	35.61	ppm		88
14) 1,3-Dichlorobenzene	4.286	146	393310	34.90	ppm		99
15) 1,4-Dichlorobenzene	4.340	146	397567	33.97	ppm		99
16) Benzyl alcohol	4.441	108	261159	37.71	ppm		86
17) 1,2-Dichlorobenzene	4.452	146	377736	35.10	ppm		98
18) Acetophenone	4.629	105	554465	33.29	ppm	#	76
19) 2-Methylphenol	4.532	108	367465	35.30	ppm		98
20) 2,2'-oxybis(1-Chloropr...	4.538	121	128444	37.20	ppm	#	83
21) 3&4-Methylphenol	4.645	108	382889	35.87	ppm		97

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475562.D
Acq On : 14 Sep 2018 5:52 am
Operator : chriss2
Sample : op15037-ms
Misc : op15037,e6p2338,31.0,,,1,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Sep 14 12:00:59 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
22) n-Nitroso-di-n-propyla...	4.634	70	302942	34.73	ppm		90
23) Hexachloroethane	4.703	201	124213	31.99	ppm		94
26) Nitrobenzene	4.757	77	423558	32.56	ppm		93
27) Quinoline	5.629	129	789813	39.18	ppm		98
28) Isophorone	4.944	82	746565	34.52	ppm		95
29) 2-Nitrophenol	5.008	139	198738	40.19	ppm		76
30) 2,4-Dimethylphenol	5.056	107	403326	34.88	ppm		87
31) Benzoic acid	5.153	105	193506	23.23	ppm		96
32) bis(2-Chloroethoxy)met...	5.121	93	413062	37.30	ppm		98
33) 2,4-Dichlorophenol	5.212	162	288340	34.79	ppm		96
34) 2,6-Dichlorophenol	5.399	162	291976	35.94	ppm		98
36) 1,2,4-Trichlorobenzene	5.270	180	314282	35.36	ppm		95
38) Naphthalene	5.335	128	1194788	39.11	ppm		99
39) 4-Chloroaniline	5.388	127	336323	25.88	ppm		99
40) 2,3-Dichloroaniline	6.233	161	338311	32.69	ppm		99
41) Caprolactam	5.704	55	175142	35.77	ppm		96
42) Hexachlorobutadiene	5.452	225	169538	30.67	ppm		98
43) 4-Chloro-3-methylphenol	5.843	107	358466	36.10	ppm		97
44) 2-Methylnaphthalene	5.955	141	648748	40.88	ppm		97
45) 1-Methylnaphthalene	6.051	141	610423	34.60	ppm		98
46) Dimethylnaphthalene	6.575	156	660190	38.86	ppm		97
48) Hexachlorocyclopentadiene	6.115	237	337882	62.29	ppm		93
49) 2,4,6-Trichlorophenol	6.244	196	218647	38.45	ppm		98
50) 2,4,5-Trichlorophenol	6.281	196	222897	37.60	ppm		97
52) 2-Chloronaphthalene	6.431	162	653867	35.99	ppm		99
53) Biphenyl	6.420	154	919480	39.79	ppm		98
54) 2-Nitroaniline	6.549	65	247952	38.28	ppm		92
55) Dimethylphthalate	6.747	163	740353	35.80	ppm		99
56) Acenaphthylene	6.859	152	1100960	39.41	ppm		98
57) 2,6-Dinitrotoluene	6.805	165	173019	40.96	ppm		82
58) 3-Nitroaniline	6.982	138	157679	31.55	ppm		99
59) Acenaphthene	7.046	153	734648	40.51	ppm		97
60) 2,4-Dinitrophenol	7.100	184	148168	67.98	ppm		81
61) 4-Nitrophenol	7.201	109	100771	26.97	ppm	#	72
62) Dibenzofuran	7.233	168	982270	38.70	ppm		88
63) 2,4-Dinitrotoluene	7.239	165	230774	36.40	ppm		95
64) 2,3,4,6-Tetrachlorophenol	7.383	232	176152	36.00	ppm		94
65) Diethylphthalate	7.527	149	739417	35.61	ppm		96
66) Fluorene	7.613	166	790793	38.53	ppm		99
67) 4-Chlorophenyl-phenyle...	7.629	204	362049	38.09	ppm		84
68) 4-Nitroaniline	7.656	138	188323	36.92	ppm		85
70) 4,6-Dinitro-2-methylph...	7.699	198	125032	40.37	ppm	#	54
71) n-Nitrosodiphenylamine	7.768	169	542122	41.56	ppm		94
72) 1,2-Diphenylhydrazine	7.806	77	863089	39.45	ppm		98
74) 4-Bromophenyl-phenylether	8.180	248	202778	40.37	ppm		98
75) Hexachlorobenzene	8.244	284	228800	37.15	ppm		94
76) Pentachlorophenol	8.485	266	157804	40.94	ppm		93
77) Phenanthrene	8.710	178	1120814	44.57	ppm		97
78) Anthracene	8.768	178	1088353	43.56	ppm		98
79) Carbazole	8.972	167	1037507	43.02	ppm		97

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475562.D
Acq On : 14 Sep 2018 5:52 am
Operator : chriss2
Sample : op15037-ms
Misc : op15037,e6p2338,31.0,,,1,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Sep 14 12:00:59 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

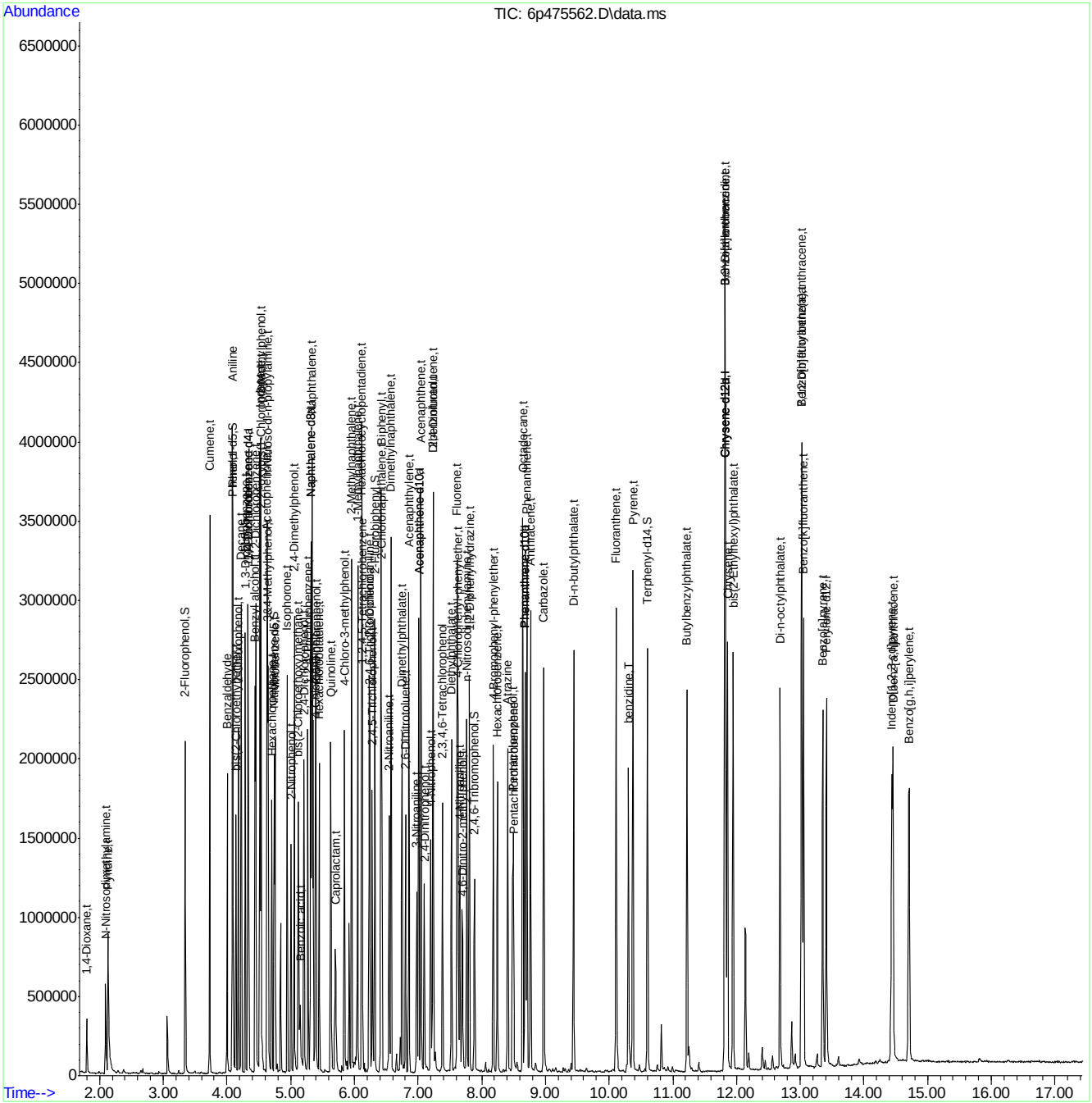
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
80) Di-n-butylphthalate	9.442	149	1226754	41.16	ppm	99
81) Fluoranthene	10.111	202	1146639	42.29	ppm	94
82) Octadecane	8.645	57	625405	47.88	ppm	96
84) Pyrene	10.373	202	1177767	47.37	ppm	97
86) Butylbenzylphthalate	11.223	149	518872	46.77	ppm	96
87) Benzo[a]anthracene	11.817	228	1039416	42.29	ppm	98
88) 3,3'-Dichlorobenzidine	11.817	252	505600	57.09	ppm	94
89) Chrysene	11.860	228	1002573	44.14	ppm	97
90) bis(2-Ethylhexyl)phtha...	11.945	149	691571	47.49	ppm	98
92) Di-n-octylphthalate	12.684	149	1141811	40.96	ppm	97
93) Benzo[b]fluoranthene	13.026	252	1001044	40.87	ppm	94
94) Benzo[k]fluoranthene	13.053	252	977373	46.64	ppm	95
95) Benzo[a]pyrene	13.352	252	881972	44.70	ppm	95
96) Indeno[1,2,3-cd]pyrene	14.438	276	1038932	44.75	ppm	90
98) Dibenz[a,h]anthracene	14.459	278	882649	43.56	ppm	94
99) 7,12-Dimethylbenz(a)an...	13.026	256	471194	42.74	ppm	95
100) Benzo[g,h,i]perylene	14.711	276	857068	46.93	ppm	95
102) Benzaldehyde	4.003	105	267673	34.84	ppm	91
104) 1,2,4,5-Tetrachloroben...	6.126	216	313964	37.62	ppm	95
108) Atrazine	8.410	215	119065	50.35	ppm	89
110) benzidine	10.303	184	719911	50.10	ppm	98
114) Pentachloronitrobenzene	8.501	295	40158	40.75	ppm	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475562.D
Acq On : 14 Sep 2018 5:52 am
Operator : chriss2
Sample : op15037-ms
Misc : op15037,e6p2338,31.0,,,1,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Sep 14 12:00:59 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration



Manual Integrations APPROVED (compounds with "m" flag)
Nancy Ma
09/14/18 12:46

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475563.D
Acq On : 14 Sep 2018 6:17 am
Operator : chriss2
Sample : op15037-msd
Misc : op15037,e6p2338,30.6,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Sep 14 12:02:34 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) 1,4-Dichlorobenzene-d4	4.329	152	286113	40.00	ppm		-0.05
24) Naphthalene-d8	5.319	136	1118324	40.00	ppm		-0.06
47) Acenaphthene-d10	7.009	164	577581	40.00	ppm		-0.08
69) Phenanthrene-d10	8.683	188	942277	40.00	ppm		-0.08
83) Chrysene-d12	11.828	240	856528	40.00	ppm		-0.09
91) Perylene-d12	13.411	264	815532	40.00	ppm		-0.09
101) 1,4-Dichlorobenzene-d4a	4.329	152	286113	40.00	ppm		-0.05
103) Acenaphthene-d10a	7.009	164	577581	40.00	ppm		-0.08
105) Phenanthrene-d10a	8.683	188	942277	40.00	ppm		-0.08
109) Chrysene-d12a	11.828	240	856528	40.00	ppm		-0.09
111) Naphthalene-d8a	5.319	136	1118324	40.00	ppm		-0.06
113) Phenanthrene-d10b	8.683	188	942277	40.00	ppm		-0.08
115) Chrysene-d12b	11.828	240	855320	40.00	ppm		-0.09
System Monitoring Compounds							
5) 2-Fluorophenol	3.345	112	390686	39.00	ppm		-0.07
Spiked Amount 50.000			Recovery =	78.00%			
8) Phenol-d5	4.083	99	515542	39.51	ppm		-0.04
Spiked Amount 50.000			Recovery =	79.02%			
25) Nitrobenzene-d5	4.741	82	444139	34.52	ppm		-0.06
Spiked Amount 50.000			Recovery =	69.04%			
51) 2-Fluorobiphenyl	6.319	172	808960	37.41	ppm		-0.08
Spiked Amount 50.000			Recovery =	74.82%			
73) 2,4,6-Tribromophenol	7.886	330	120781	42.80	ppm		-0.09
Spiked Amount 50.000			Recovery =	85.60%			
85) Terphenyl-d14	10.603	244	902656	53.18	ppm		-0.10
Spiked Amount 50.000			Recovery =	106.36%			
106) 1-chlorooctadecane	0.000	57	0d	0.00	ppm		
107) o-terphenyl	0.000	230	0	0.00	ppm		
Target Compounds							Qvalue
2) 1,4-Dioxane	1.799	88	111944	23.45	ppm		97
3) Pyridine	2.136	79	345396	29.18	ppm		96
4) N-Nitrosodimethylamine	2.099	74	219806	31.48	ppm		83
6) Indene	4.516	116	757375	43.02	ppm		95
7) Cumene	3.730	105	936736	32.12	ppm		97
9) Phenol	4.094	94	582094	37.42	ppm	#	54
10) Aniline	4.088	93	549415	31.00	ppm		78
11) bis(2-Chloroethyl)ether	4.142	93	391380	38.29	ppm		95
12) 2-Chlorophenol	4.179	128	419746	40.33	ppm		95
13) Decane	4.222	43	435610	38.30	ppm		89
14) 1,3-Dichlorobenzene	4.286	146	411790	36.35	ppm		97
15) 1,4-Dichlorobenzene	4.340	146	426360	36.24	ppm		99
16) Benzyl alcohol	4.441	108	271727	39.04	ppm		90
17) 1,2-Dichlorobenzene	4.452	146	402094	37.17	ppm		99
18) Acetophenone	4.629	105	583370	34.85	ppm		78
19) 2-Methylphenol	4.532	108	400136	38.24	ppm		99
20) 2,2'-oxybis(1-Chloropr...	4.538	121	133633	38.51	ppm	#	85
21) 3&4-Methylphenol	4.645	108	412852	38.48	ppm		99

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475563.D
Acq On : 14 Sep 2018 6:17 am
Operator : chriss2
Sample : op15037-msd
Misc : op15037,e6p2338,30.6,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Sep 14 12:02:34 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
22) n-Nitroso-di-n-propyla...	4.634	70	317376	36.20	ppm		89
23) Hexachloroethane	4.704	201	131216	33.62	ppm		94
26) Nitrobenzene	4.757	77	444378	34.01	ppm		91
27) Quinoline	5.629	129	841430	41.55	ppm		96
28) Isophorone	4.944	82	777578	35.79	ppm		94
29) 2-Nitrophenol	5.008	139	214115	43.11	ppm		72
30) 2,4-Dimethylphenol	5.057	107	427367	36.79	ppm		90
31) Benzoic acid	5.142	105	122507m	14.64	ppm		
32) bis(2-Chloroethoxy)met...	5.121	93	445833	40.08	ppm		97
33) 2,4-Dichlorophenol	5.212	162	307247	36.90	ppm		95
34) 2,6-Dichlorophenol	5.399	162	310959	38.10	ppm		100
36) 1,2,4-Trichlorobenzene	5.270	180	325843	36.50	ppm		96
38) Naphthalene	5.335	128	1259333	41.03	ppm		99
39) 4-Chloroaniline	5.388	127	371840	28.48	ppm		99
40) 2,3-Dichloroaniline	6.233	161	360756	34.71	ppm		99
41) Caprolactam	5.704	55	181196	36.84	ppm		96
42) Hexachlorobutadiene	5.452	225	179783	32.37	ppm		99
43) 4-Chloro-3-methylphenol	5.843	107	365196	36.61	ppm		97
44) 2-Methylnaphthalene	5.955	141	667213	41.86	ppm		98
45) 1-Methylnaphthalene	6.051	141	643906	36.33	ppm		96
46) Dimethylnaphthalene	6.576	156	699087	40.97	ppm		95
48) Hexachlorocyclopentadiene	6.116	237	361870	66.06	ppm		97
49) 2,4,6-Trichlorophenol	6.244	196	224271	39.06	ppm		97
50) 2,4,5-Trichlorophenol	6.281	196	240645	40.19	ppm		100
52) 2-Chloronaphthalene	6.431	162	694977	37.88	ppm		97
53) Biphenyl	6.420	154	953645	40.87	ppm		99
54) 2-Nitroaniline	6.549	65	258481	39.52	ppm		93
55) Dimethylphthalate	6.747	163	791361	37.89	ppm		99
56) Acenaphthylene	6.859	152	1145147	40.59	ppm		99
57) 2,6-Dinitrotoluene	6.806	165	178161	41.76	ppm		84
58) 3-Nitroaniline	6.982	138	168049	33.29	ppm		96
59) Acenaphthene	7.046	153	772421	42.18	ppm		98
60) 2,4-Dinitrophenol	7.094	184	134265	61.87	ppm		90
61) 4-Nitrophenol	7.201	109	106345	28.19	ppm	#	68
62) Dibenzofuran	7.233	168	1015985	39.64	ppm		91
63) 2,4-Dinitrotoluene	7.239	165	242636	37.84	ppm		100
64) 2,3,4,6-Tetrachlorophenol	7.383	232	182075	36.84	ppm		95
65) Diethylphthalate	7.528	149	785410	37.45	ppm		99
66) Fluorene	7.613	166	816569	39.40	ppm		99
67) 4-Chlorophenyl-phenyle...	7.629	204	376520	39.22	ppm		87
68) 4-Nitroaniline	7.656	138	197382	38.32	ppm		86
70) 4,6-Dinitro-2-methylph...	7.699	198	126358	40.51	ppm		85
71) n-Nitrosodiphenylamine	7.768	169	570255	43.42	ppm		97
72) 1,2-Diphenylhydrazine	7.806	77	906433	41.15	ppm		97
74) 4-Bromophenyl-phenylether	8.180	248	217566	43.02	ppm		97
75) Hexachlorobenzene	8.244	284	234653	37.85	ppm		96
76) Pentachlorophenol	8.485	266	157320	40.56	ppm		93
77) Phenanthrene	8.710	178	1162714	45.92	ppm		98
78) Anthracene	8.768	178	1154869	45.91	ppm		97
79) Carbazole	8.972	167	1095164	45.10	ppm		98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475563.D
Acq On : 14 Sep 2018 6:17 am
Operator : chriss2
Sample : op15037-msd
Misc : op15037,e6p2338,30.6,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Sep 14 12:02:34 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

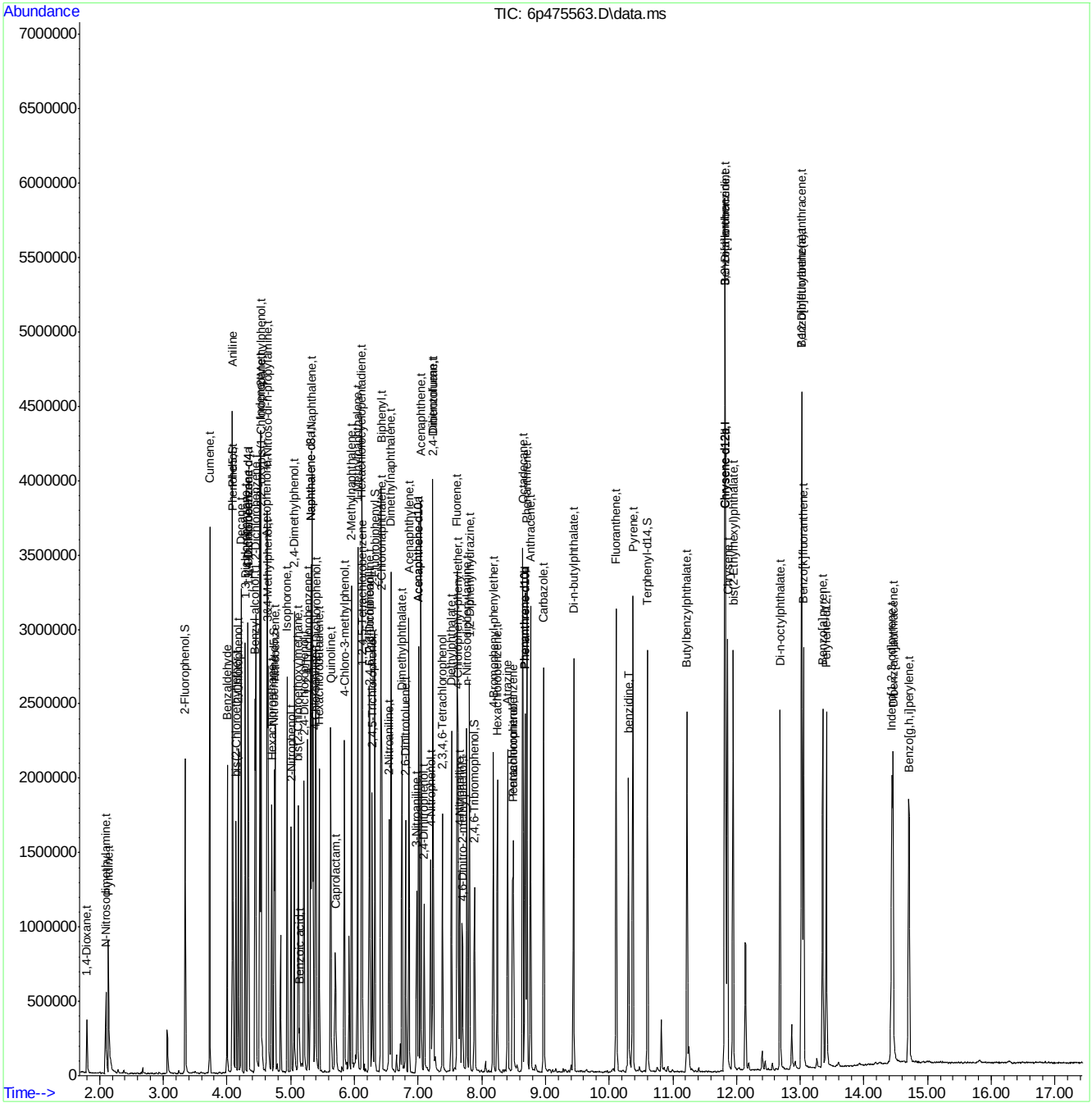
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
80) Di-n-butylphthalate	9.442	149	1308915	43.62	ppm	98
81) Fluoranthene	10.111	202	1203476	44.08	ppm	94
82) Octadecane	8.645	57	656429	49.92	ppm	95
84) Pyrene	10.373	202	1236698	49.30	ppm	96
86) Butylbenzylphthalate	11.224	149	538901	48.14	ppm	99
87) Benzo[a]anthracene	11.817	228	1102397	44.45	ppm	99
88) 3,3'-Dichlorobenzidine	11.817	252	569182	63.70	ppm	96
89) Chrysene	11.860	228	1058025	46.16	ppm	95
90) bis(2-Ethylhexyl)phtha...	11.946	149	740097	50.36	ppm	98
92) Di-n-octylphthalate	12.684	149	1188718	42.86	ppm	97
93) Benzo[b]fluoranthene	13.026	252	1062238	43.64	ppm	93
94) Benzo[k]fluoranthene	13.053	252	1024680	49.20	ppm	95
95) Benzo[a]pyrene	13.352	252	928895	47.37	ppm	95
96) Indeno[1,2,3-cd]pyrene	14.438	276	1097427	47.56	ppm	89
98) Dibenz[a,h]anthracene	14.459	278	920321	45.70	ppm	92
99) 7,12-Dimethylbenz(a)an...	13.026	256	506418	46.22	ppm	98
100) Benzo[g,h,i]perylene	14.711	276	903050	49.76	ppm	95
102) Benzaldehyde	4.003	105	274884	35.60	ppm	93
104) 1,2,4,5-Tetrachloroben...	6.126	216	331416	39.33	ppm	98
108) Atrazine	8.410	215	124189	52.15	ppm	92
110) benzidine	10.304	184	762803	52.61	ppm	97
114) Pentachloronitrobenzene	8.496	295	41209	41.53	ppm	94

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475563.D
Acq On : 14 Sep 2018 6:17 am
Operator : chriss2
Sample : op15037-msd
Misc : op15037,e6p2338,30.6,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Sep 14 12:02:34 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration



Manual Integration Approval Summary

Sample Number: OP15037-MSD
Lab FileID: 6P475563.D
Injection Time: 09/14/18 06:17

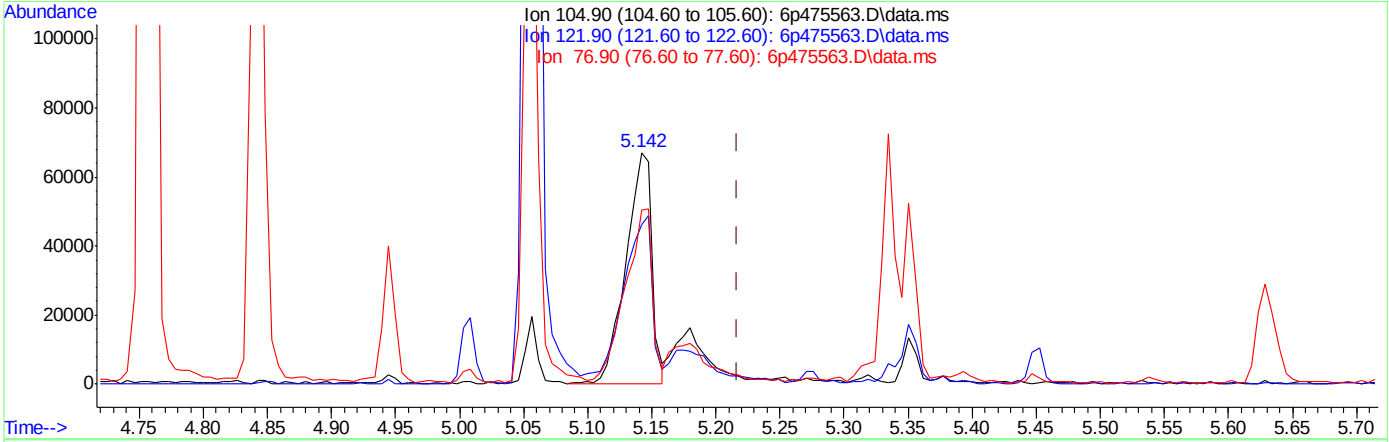
Method: SW846 8270D
Analyst approved: 09/14/18 12:23 Dipa Patel
Supervisor approved: 09/14/18 12:46 Nancy Ma

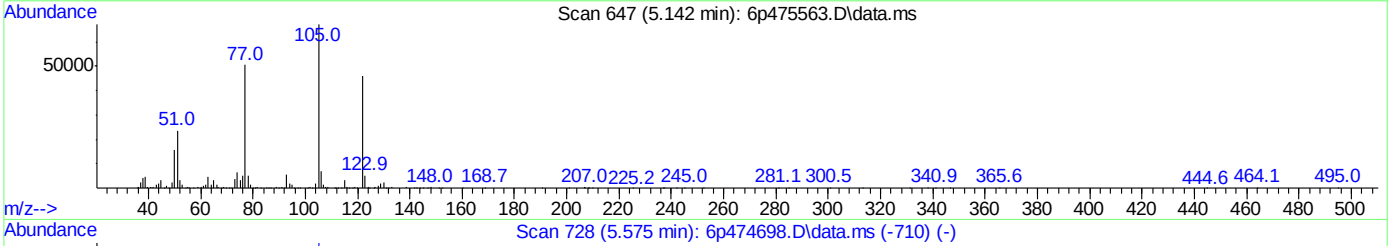
Parameter	CAS	Sig#	R.T. (min.)	Reason
Benzoic acid	65-85-0		5.14	Poor instrument integration

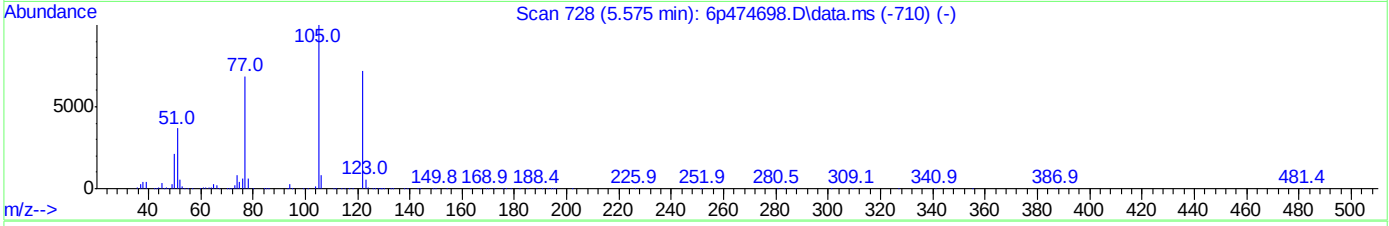
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475563.D
Acq On : 14 Sep 2018 6:17 am
Operator : chriss2
Sample : op15037-msd
Misc : op15037,e6p2338,30.6,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Sep 14 06:35:02 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration







TIC: 6p475563.D\data.ms

(31) Benzoic acid (t)

5.142min (-0.075) 11.33ppm

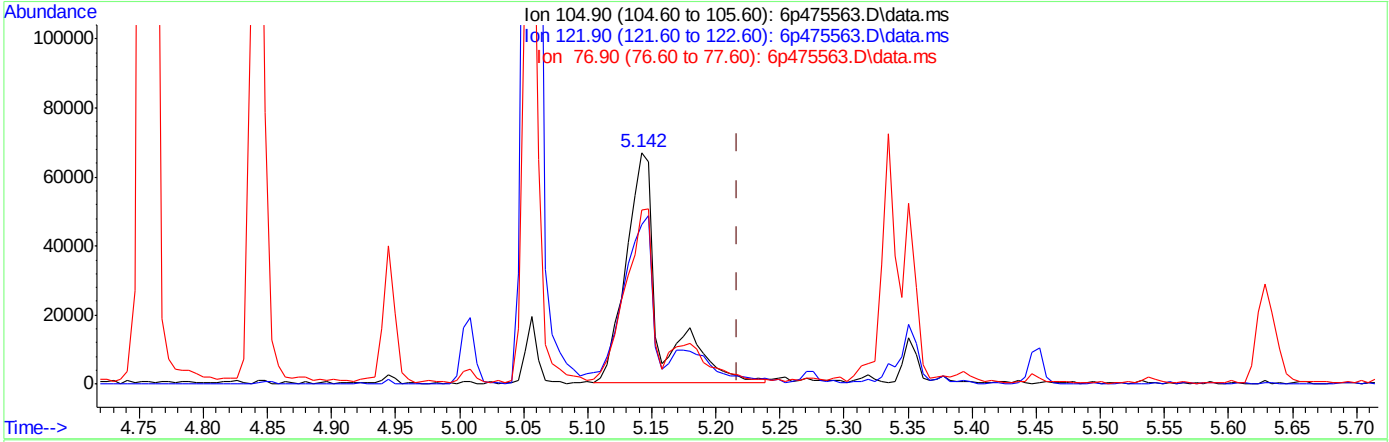
response 94805

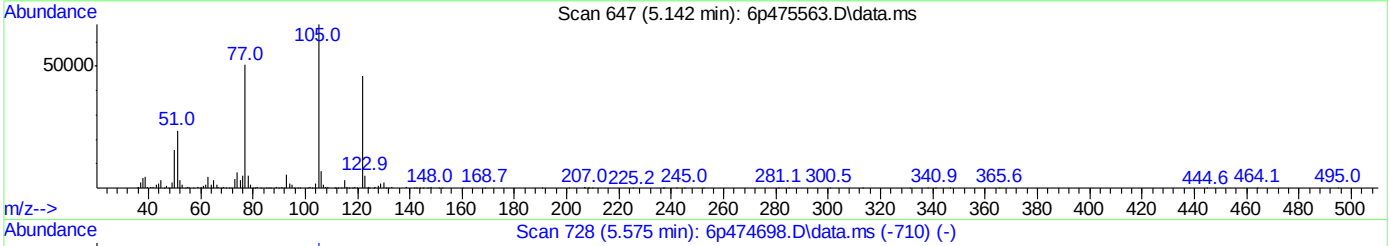
Ion	Exp%	Act%
104.90	100	100
121.90	68.80	63.95
76.90	78.50	73.49
0.00	0.00	0.00

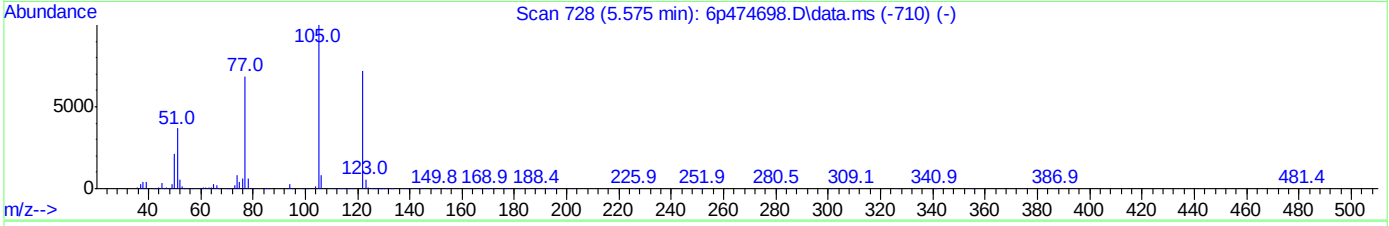
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475563.D
Acq On : 14 Sep 2018 6:17 am
Operator : chriss2
Sample : op15037-msd
Misc : op15037,e6p2338,30.6,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Sep 14 06:35:02 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration







TIC: 6p475563.D\data.ms

(31) Benzoic acid (t)

5.142min (-0.075) 14.64ppm m

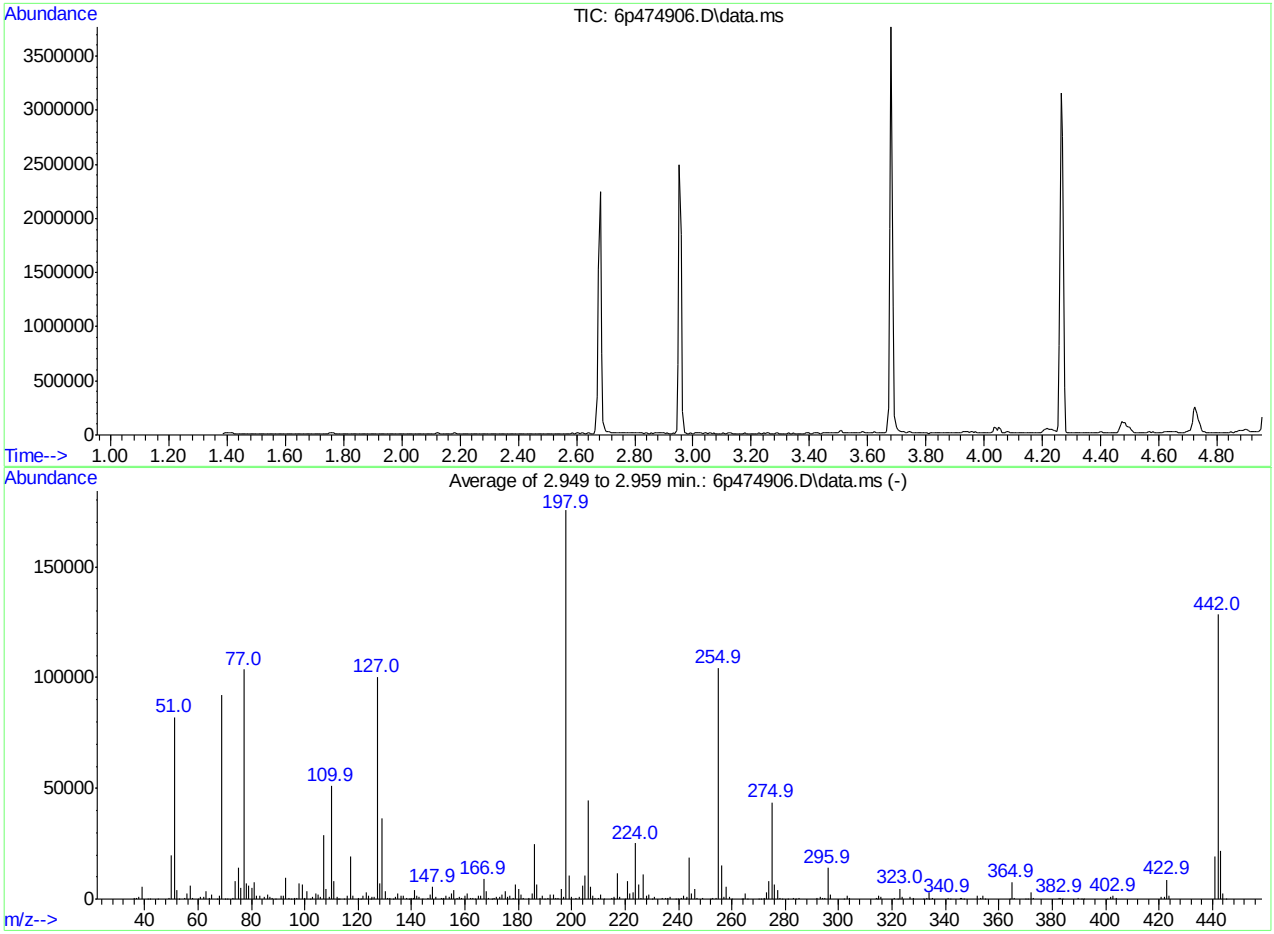
response 122507

Ion	Exp%	Act%
104.90	100	100
121.90	68.80	68.82
76.90	78.50	75.16
0.00	0.00	0.00

DFTPP

Data File : C:\msdchem\1\DATA\E6P2304\6p474906.D Vial: 1
Acq On : 12 Aug 2018 12:38 pm Operator: christc2
Sample : dftpp Inst : MS6P
Misc : op8717,e6p2304,1000,,,1,1 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um



AutoFind: Scans 293, 294, 295; Background Corrected with Scan 289

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	30	60	46.8	82074	PASS
68	69	0.00	2	1.7	1557	PASS
69	198	0.00	100	52.5	92066	PASS
70	69	0.00	2	0.3	237	PASS
127	198	40	60	57.2	100325	PASS
197	198	0.00	1	0.7	1237	PASS
198	198	100	100	100.0	175485	PASS
199	198	5	9	6.2	10903	PASS
275	198	10	30	24.8	43593	PASS
365	198	1	100	4.3	7614	PASS
441	443	0.10	100	86.9	19089	PASS
442	198	40	100	73.2	128532	PASS
443	442	17	23	17.1	21963	PASS

6p474906.D DFTPP6P.M Sun Aug 12 16:57:45 2018 ACLIMS

Average of 2.949 to 2.959 min.: 6p474906.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
35.85	446	52.90	182	67.00	67	78.95	6078
36.95	505	54.95	310	68.00	1557	79.95	5120
37.90	994	55.95	2359	68.90	92066	80.95	7388
39.00	5494	57.00	5854	69.95	237	81.95	1650
41.00	198	57.85	318	71.00	100	82.90	1494
41.95	80	59.90	247	72.95	598	84.95	1118
44.90	117	60.90	993	74.00	8175	85.95	1891
49.00	318	61.95	1281	74.95	13988	86.95	1002
50.00	19940	63.00	3697	76.00	5075	87.90	322
51.00	82074	64.00	586	77.00	103581	89.00	186
52.00	4012	65.00	2063	78.00	7201	90.90	1447

Average of 2.949 to 2.959 min.: 6p474906.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
91.95	1709	102.90	1141	113.00	201	124.95	983
92.90	9659	103.95	2350	114.80	133	126.10	779
94.00	718	104.90	2224	115.90	1406	127.00	100325
94.90	39	105.95	827	116.95	19182	127.95	7245
96.00	577	107.00	28827	117.95	1444	128.95	36637
96.95	323	107.95	4674	119.95	373	129.95	3360
97.95	7025	109.05	811	120.80	130	130.95	766
98.95	6458	109.90	50938	121.90	1682	131.95	281
99.95	677	110.95	8232	122.90	3106	132.90	216
100.90	3365	111.90	1104	123.90	1297	133.90	1219
101.90	180	112.60	103	124.80	221	134.90	2675

Average of 2.949 to 2.959 min.: 6p474906.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
136.00	1383	146.90	2178	157.90	909	168.95	764
136.95	1570	147.90	5433	158.90	621	170.00	123
138.05	332	148.95	1072	159.95	1352	170.90	410
138.90	138	150.95	568	160.90	2320	171.85	950
139.80	488	151.70	231	162.00	448	172.90	1048
140.80	552	152.00	391	163.00	279	173.95	1956
140.95	3825	152.90	1532	163.90	213	174.95	3557
141.90	1641	153.90	1191	164.95	1525	176.05	1095
142.85	1084	154.95	2658	165.90	1364	176.95	1498
143.90	264	155.95	4096	166.95	8993	177.95	525
145.90	561	156.95	751	168.00	3748	178.90	6769

Average of 2.949 to 2.959 min.: 6p474906.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
179.95	4717	191.90	2091	204.00	6240	215.95	881
180.90	2101	192.95	2216	205.00	10654	216.90	11708
181.95	331	193.85	377	206.00	44713	218.00	1203
183.90	432	194.75	335	207.00	5506	219.90	106
185.00	2743	195.90	4409	207.90	1635	220.95	8185
186.00	25001	196.90	1237	208.85	415	221.80	2374
187.00	6703	197.90	175485	209.85	718	222.90	2925
187.95	648	198.90	10903	210.95	1889	224.00	25260
189.00	1333	199.95	896	211.90	104	224.95	6703
189.80	135	201.45	643	214.90	518	225.90	722
190.85	613	202.95	1043	215.80	114	226.90	11255

Average of 2.949 to 2.959 min.: 6p474906.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
227.80	200	240.95	558	253.95	583	269.90	146
227.95	1480	241.95	1292	254.95	104538	270.80	110
228.90	2196	242.70	128	256.00	15073	271.95	423
229.90	230	242.95	1226	256.90	1035	272.90	3309

230.85	800	244.00	18585	257.90	5738	273.95	8343
233.90	477	245.00	2483	258.95	1025	274.95	43593
234.95	690	245.95	4623	259.95	267	275.95	6618
235.85	479	246.95	771	263.80	135	276.95	3959
236.95	1146	248.90	585	264.00	183	277.95	606
238.90	235	251.90	136	264.90	2405	278.90	107
239.80	104	252.95	387	265.80	77	280.90	119

Average of 2.949 to 2.959 min.: 6p474906.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
282.90	440	304.00	473	331.95	256	353.00	766
284.00	122	313.90	632	332.95	478	354.00	1659
284.95	733	314.70	111	333.80	147	354.90	216
292.00	301	314.95	1530	333.95	2902	364.00	134
292.95	929	315.90	816	334.95	733	364.90	7614
293.85	305	320.90	465	340.90	698	365.90	726
294.85	331	322.00	119	341.90	110	369.90	135
295.90	14113	323.00	4589	345.80	417	370.80	186
296.90	2131	323.95	835	346.00	533	372.00	3006
301.90	243	326.80	896	346.90	115	372.95	672
303.00	1727	327.95	531	352.00	1476	382.70	278

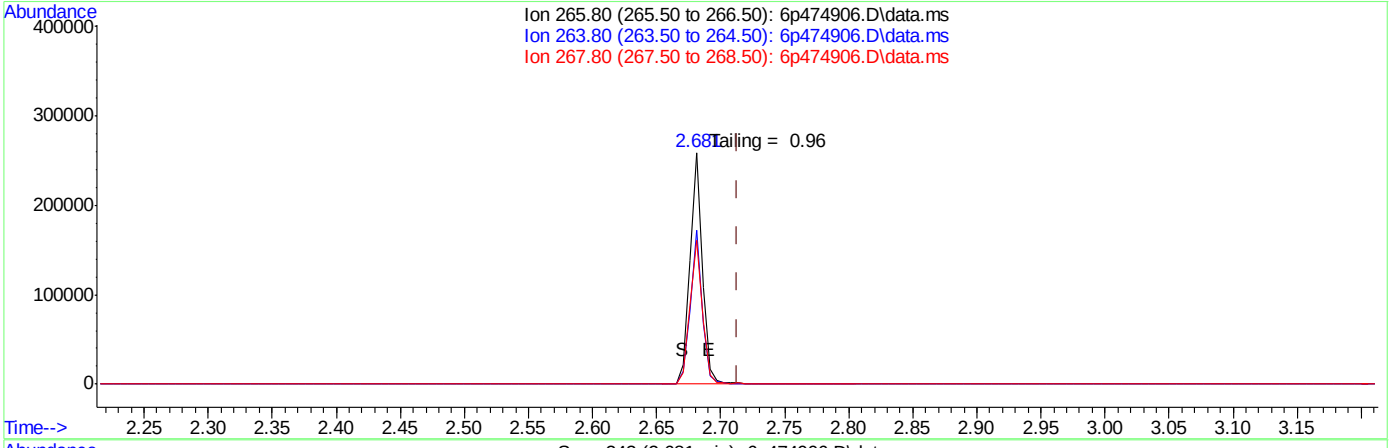
Average of 2.949 to 2.959 min.: 6p474906.D\data.ms
dftpp
Modified:subtracted

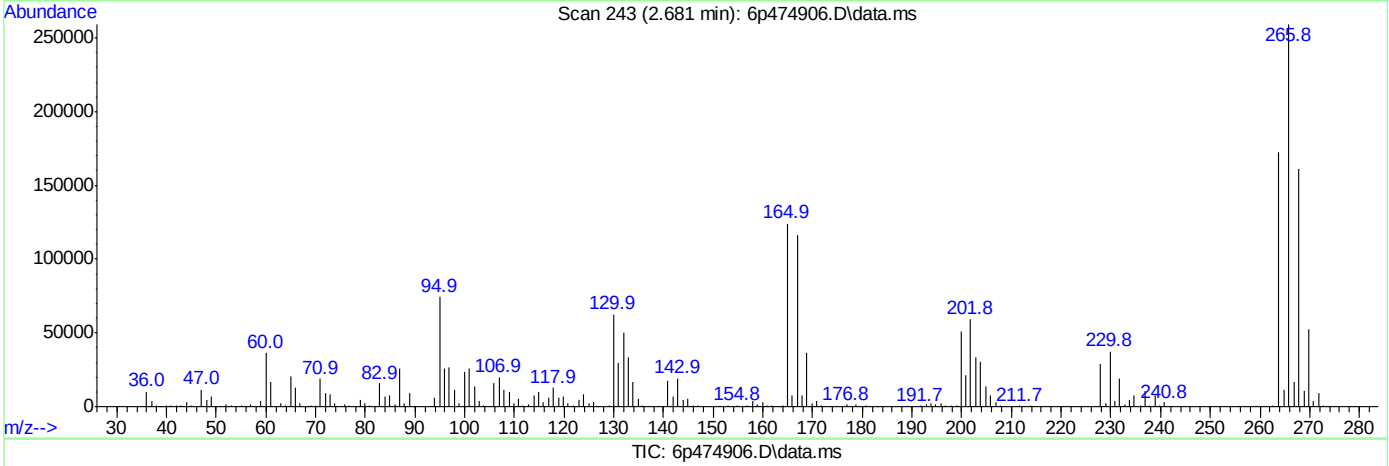
m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
382.95	759	422.95	8653				
384.00	130	423.90	1706				
389.80	313	441.00	19089				
391.00	181	442.00	128532				
391.85	263	443.00	21963				
400.80	193	443.95	2346				
401.90	1168	445.00	134				
402.90	1437						
403.90	524						
420.85	1227						
421.90	969						

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474906.D
Acq On : 12 Aug 2018 12:38 pm
Operator : christc2
Sample : dftpp
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 12 12:43:54 2018
Quant Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M
Quant Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um
QLast Update : Fri Jul 27 18:43:37 2018
Response via : Initial Calibration





TIC: 6p474906.D\data.ms

(1) Pentachlorophenol (t)

2.681min (-0.032) 0.00ppb

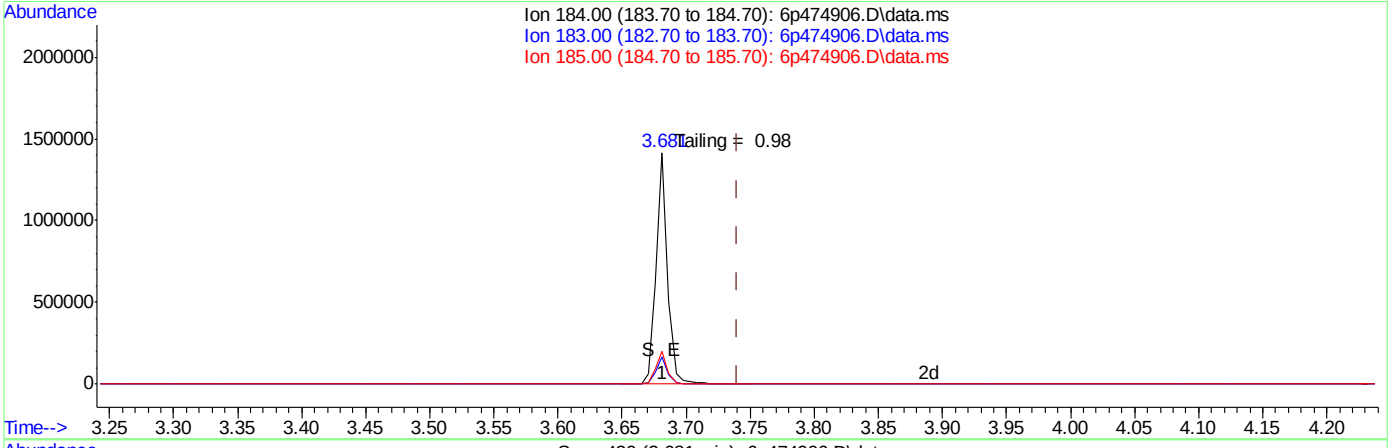
response 179566

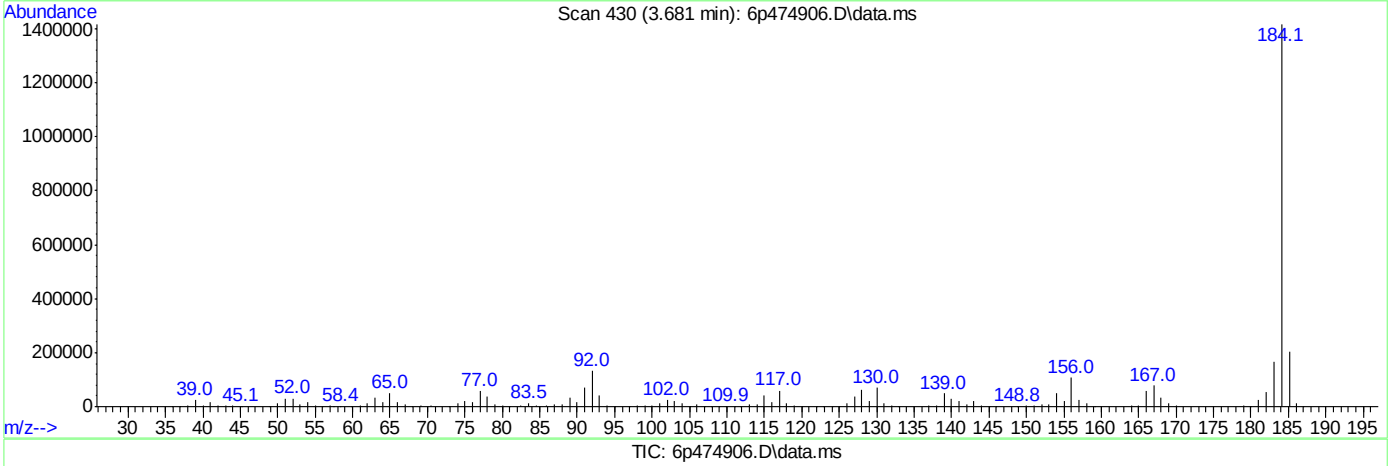
Ion	Exp%	Act%
265.80	100	100
263.80	63.20	66.42
267.80	63.00	62.19
0.00	0.00	0.00

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474906.D
Acq On : 12 Aug 2018 12:38 pm
Operator : christc2
Sample : dftpp
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 12 12:43:54 2018
Quant Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M
Quant Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um
QLast Update : Fri Jul 27 18:43:37 2018
Response via : Initial Calibration





TIC: 6p474906.D\data.ms

(2) Benzidine (t)

3.681min (-0.059) 0.00ppb

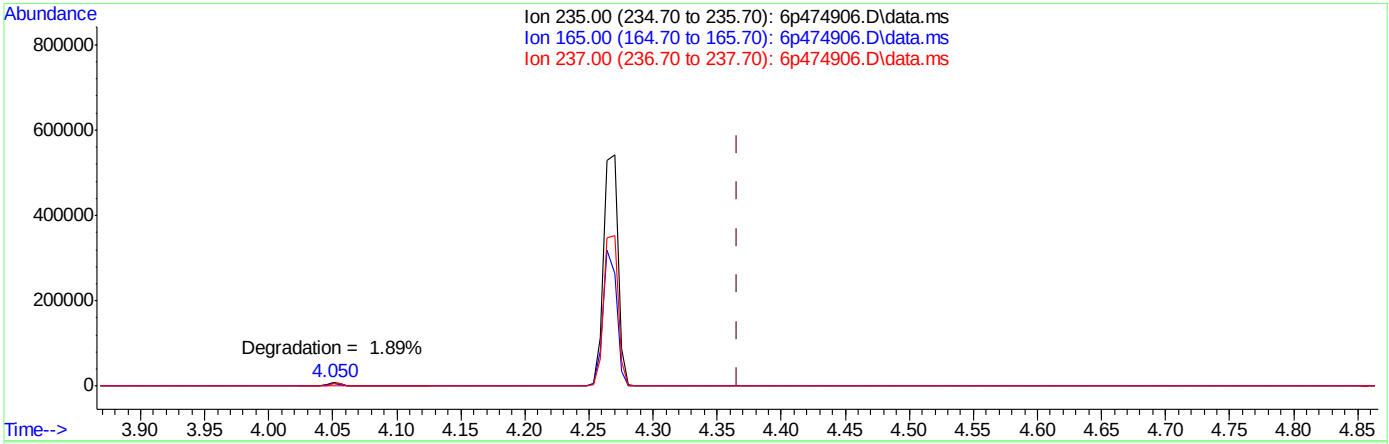
response 888218

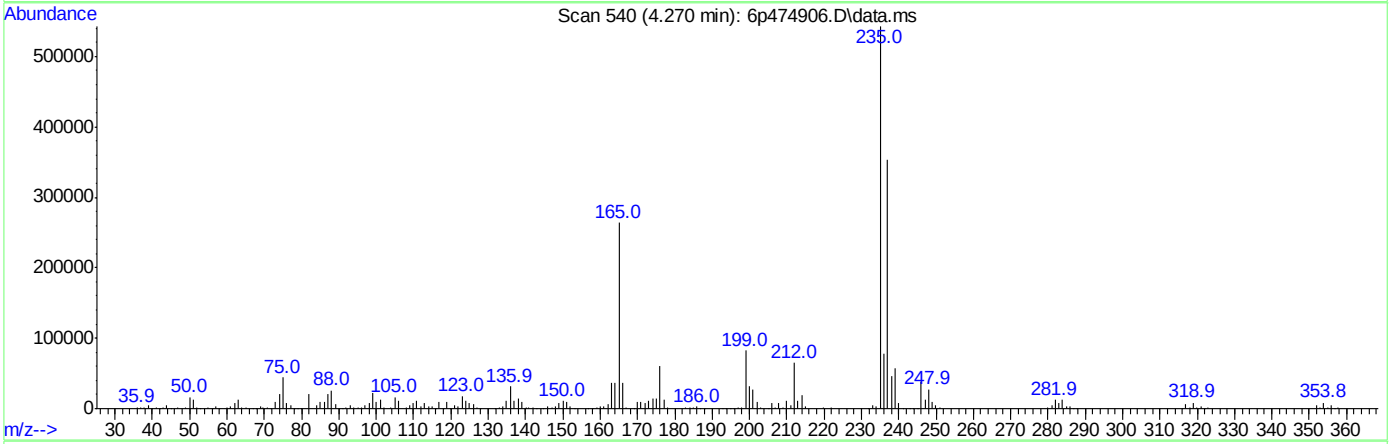
Ion	Exp%	Act%
184.00	100	100
183.00	11.40	11.84
185.00	14.50	14.33
0.00	0.00	0.00

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474906.D
Acq On : 12 Aug 2018 12:38 pm
Operator : christc2
Sample : dftpp
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 12 12:43:54 2018
Quant Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M
Quant Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um
QLast Update : Fri Jul 27 18:43:37 2018
Response via : Initial Calibration





TIC: 6p474906.D\data.ms

(3) PP-DDT (t)

4.270min (-0.096) 0.00ppb

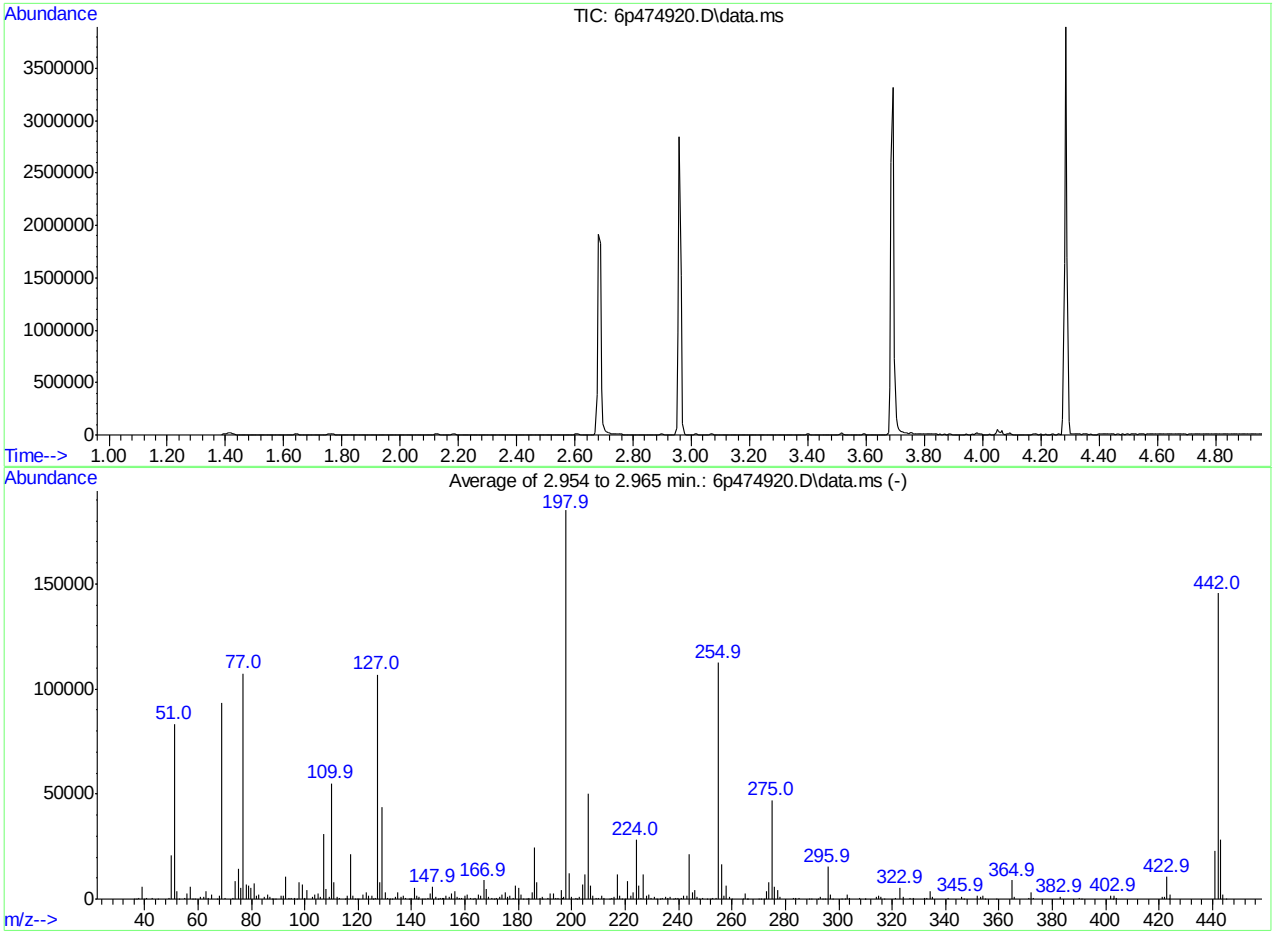
response 411283

Ion	Exp%	Act%
235.00	100	100
165.00	44.80	55.14
237.00	61.80	64.83
0.00	0.00	0.00

DFTPP

Data File : C:\msdchem\1\DATA\E6P2305\6p474920.D Vial: 1
Acq On : 12 Aug 2018 7:00 pm Operator: christc2
Sample : dftpp Inst : MS6P
Misc : op8717,e6p2305,1000,,,1,1 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um



AutoFind: Scans 294, 295, 296; Background Corrected with Scan 290

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	30	60	45.1	83344	PASS
68	69	0.00	2	1.5	1405	PASS
69	198	0.00	100	50.6	93584	PASS
70	69	0.00	2	0.3	325	PASS
127	198	40	60	57.8	106981	PASS
197	198	0.00	1	0.7	1323	PASS
198	198	100	100	100.0	184960	PASS
199	198	5	9	6.5	12028	PASS
275	198	10	30	25.5	47210	PASS
365	198	1	100	4.8	8955	PASS
441	443	0.10	100	81.6	23084	PASS
442	198	40	100	78.7	145560	PASS
443	442	17	23	19.4	28302	PASS

6p474920.D DFTPP6P.M Mon Aug 13 11:10:05 2018 ACLIMS

Average of 2.954 to 2.965 min.: 6p474920.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
35.90	111	52.00	3995	65.00	2036	78.95	6558
37.00	106	53.00	134	67.00	108	79.90	5445
37.95	817	55.00	761	67.90	1405	80.95	7397
39.00	6036	55.90	2438	68.90	93584	81.95	1480
39.95	11	56.90	5843	69.90	325	82.90	2131
40.90	381	57.90	146	72.90	394	84.95	1192
42.95	502	58.90	111	74.00	8758	85.90	2056
44.80	133	60.95	990	74.95	14373	86.90	963
48.90	425	61.95	1309	76.00	5187	87.80	137
50.00	20747	63.00	3744	77.00	107256	88.00	116
51.00	83344	64.00	456	78.00	6882	88.90	167

Average of 2.954 to 2.965 min.: 6p474920.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
90.90	1441	102.90	1168	115.00	114	124.90	1363
91.95	1736	103.90	2143	115.80	403	125.70	100
92.90	10574	104.95	2424	116.00	1440	126.20	615
94.00	776	105.90	858	116.95	21230	127.00	106981
94.95	321	106.90	31088	117.95	1875	128.00	7910
95.95	395	107.90	4868	118.90	123	128.90	43848
96.90	175	109.05	841	119.80	146	129.95	3388
97.90	8006	109.90	55072	120.00	190	130.90	671
98.95	7036	110.95	8063	121.90	2176	132.00	239
99.85	568	111.95	1072	123.00	3231	132.80	162
100.90	4267	112.90	312	123.95	1359	133.85	1223

Average of 2.954 to 2.965 min.: 6p474920.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
134.95	3182	145.00	217	153.90	1039	164.90	1964
135.95	1098	145.90	698	154.95	2927	165.95	1545
136.90	1757	146.95	2491	156.00	4001	166.95	9054
137.75	390	147.90	5800	156.90	1057	167.95	4758
139.00	111	148.90	1218	157.90	778	168.90	952
139.90	380	150.00	202	158.90	562	170.00	330
140.90	5269	150.90	632	159.95	1459	171.00	176
141.90	1688	151.40	229	161.00	2365	171.90	630
142.50	171	151.60	288	161.95	758	173.00	1206
142.90	967	151.90	305	162.90	230	173.95	2110
143.90	198	152.90	1496	163.85	297	174.95	3402

Average of 2.954 to 2.965 min.: 6p474920.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
175.90	903	187.00	7926	197.00	1323	207.90	1556
176.90	1624	188.00	721	197.90	184960	208.90	462
177.95	780	188.80	277	198.90	12028	209.90	683
178.90	6501	188.95	1256	199.90	1173	211.00	1838
179.95	5230	190.85	544	201.40	713	211.85	334
180.90	2142	191.95	2445	202.00	170	214.10	101
181.90	247	193.00	2474	202.95	1133	214.85	566
183.00	104	194.00	657	204.00	7002	215.90	932
183.85	526	194.85	342	204.95	11676	216.90	11904
184.95	2995	195.95	4385	206.00	50082	218.00	1789
186.00	24799	196.60	810	207.00	6288	218.80	107

Average of 2.954 to 2.965 min.: 6p474920.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
220.20	162	230.95	1105	241.95	1357	253.85	595
221.00	8773	231.90	279	242.95	1704	254.95	112482
221.90	1808	233.10	112	244.00	21499	255.95	16668
222.95	3085	233.85	680	245.00	3068	256.90	1419

224.00	28134	234.95	983	245.95	4375	257.95	6470
225.00	6566	235.95	403	246.85	1068	258.95	1094
225.90	780	236.90	1164	247.90	174	259.90	108
226.90	11887	238.00	160	248.90	758	263.90	111
227.90	1574	238.95	366	250.80	134	264.95	2608
228.95	2303	239.85	400	251.70	108	265.65	256
229.85	421	240.85	431	252.90	508	265.90	167

Average of 2.954 to 2.965 min.: 6p474920.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
270.00	143	285.00	587	302.10	162	322.95	5168
270.80	131	288.90	166	302.95	2388	323.95	920
271.90	188	289.90	178	303.90	417	326.85	789
272.90	3625	292.05	249	307.90	374	327.95	473
273.95	8121	292.90	977	309.70	118	332.00	466
275.00	47210	293.95	247	309.90	109	332.95	437
276.00	5990	294.80	115	313.95	1035	334.00	3721
276.90	4135	295.95	15369	314.85	1723	334.95	1020
277.95	899	297.00	2385	315.90	1102	340.90	528
282.85	541	297.80	103	316.90	175	345.85	1089
283.90	293	301.00	226	321.00	419	346.90	147

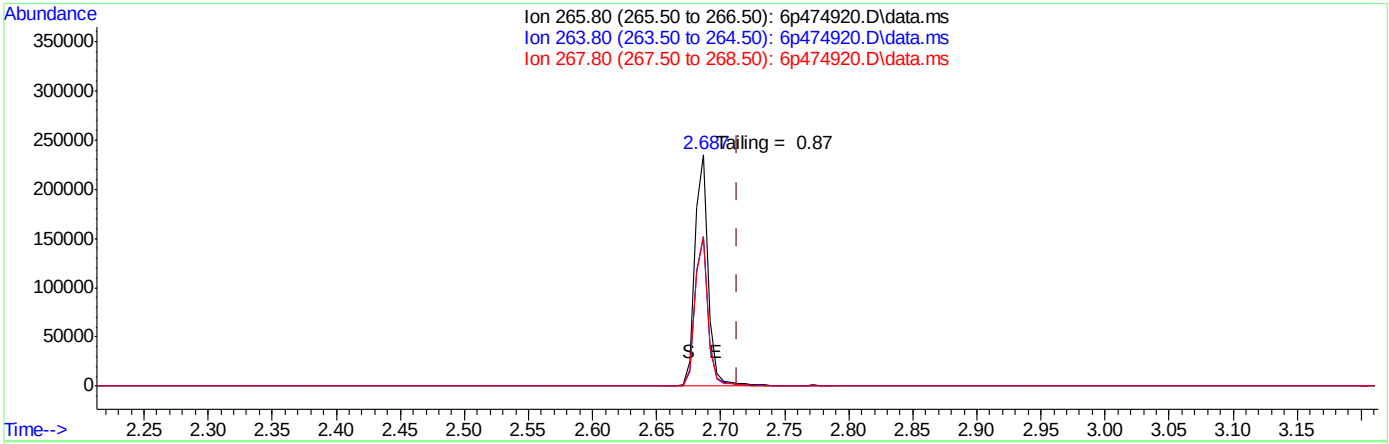
Average of 2.954 to 2.965 min.: 6p474920.D\data.ms
dftpp
Modified:subtracted

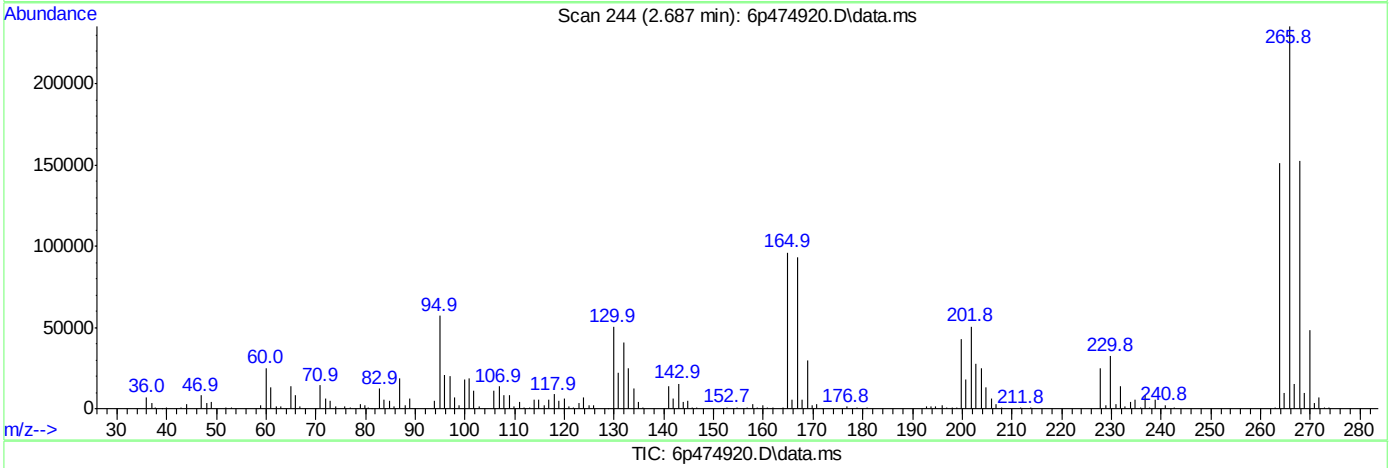
m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
351.95	1887	389.90	428	441.00	23084		
353.00	1142	390.80	139	442.00	145560		
353.90	1857	401.90	1386	443.00	28302		
354.90	112	402.80	114	444.00	2370		
359.00	105	402.95	1589	444.90	101		
364.90	8955	403.95	471				
365.90	1085	420.95	1268				
370.95	432	421.90	1248				
372.00	3233	422.95	10439				
372.90	668	423.80	115				
382.90	839	423.95	1910				

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474920.D
Acq On : 12 Aug 2018 7:00 pm
Operator : christc2
Sample : dftpp
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 12 19:05:54 2018
Quant Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M
Quant Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um
QLast Update : Fri Jul 27 18:43:37 2018
Response via : Initial Calibration





TIC: 6p474920.D\data.ms

(1) Pentachlorophenol (t)

2.687min (-0.027) 0.00ppb

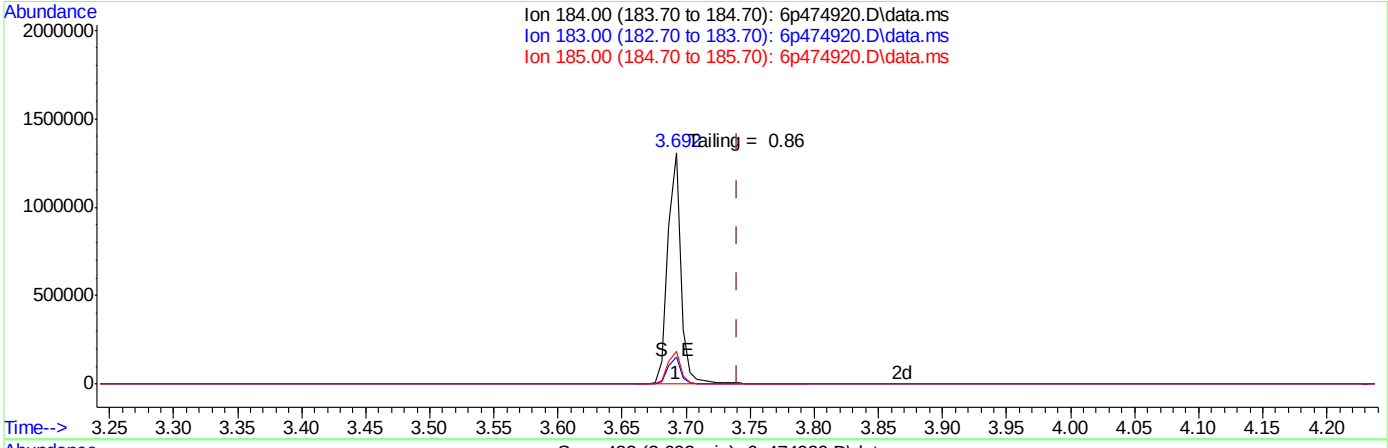
response 174857

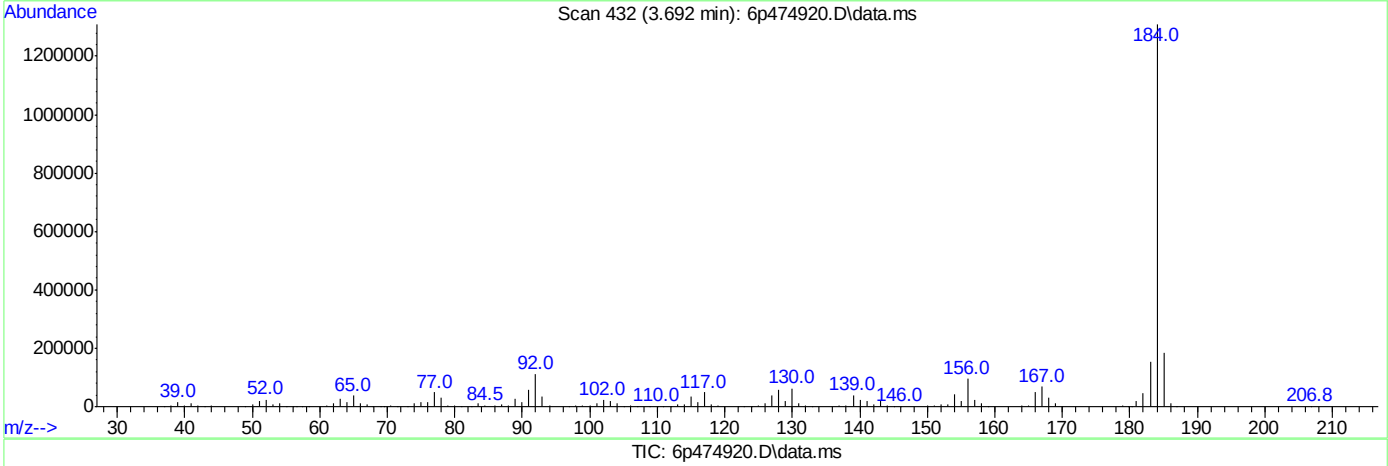
Ion	Exp%	Act%
265.80	100	100
263.80	63.20	64.32
267.80	63.00	64.68
0.00	0.00	0.00

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474920.D
Acq On : 12 Aug 2018 7:00 pm
Operator : christc2
Sample : dftpp
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 12 19:05:54 2018
Quant Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M
Quant Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um
QLast Update : Fri Jul 27 18:43:37 2018
Response via : Initial Calibration





TIC: 6p474920.D\data.ms

(2) Benzidine (t)

3.692min (-0.048) 0.00ppb

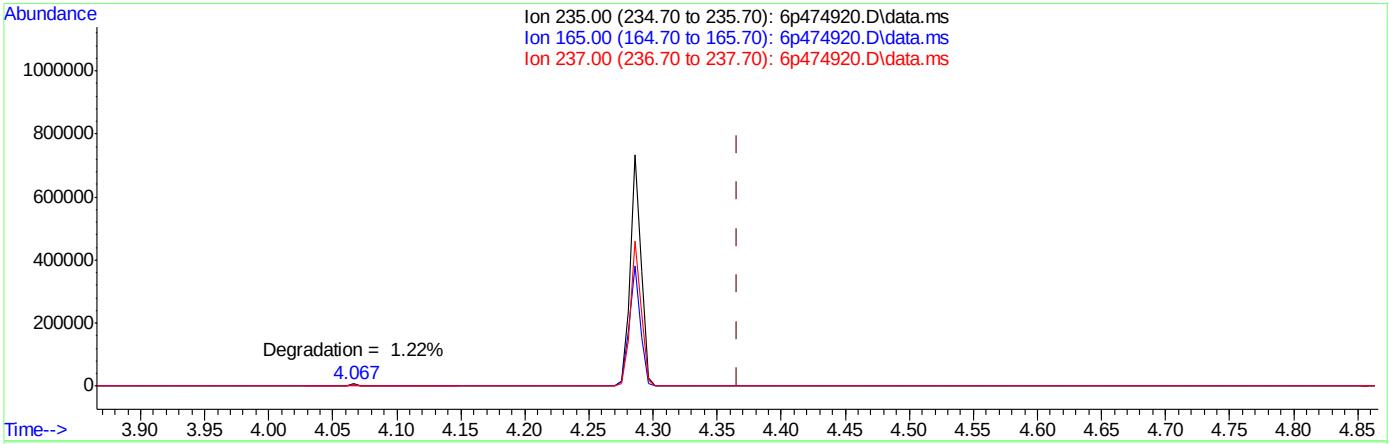
response 916737

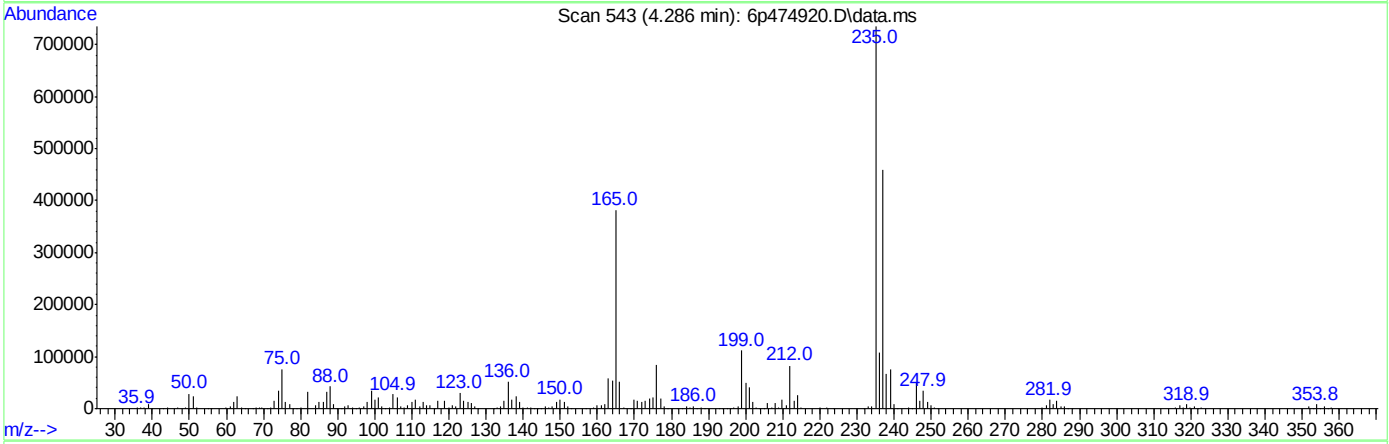
Ion	Exp%	Act%
184.00	100	100
183.00	11.40	11.88
185.00	14.50	14.02
0.00	0.00	0.00

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474920.D
Acq On : 12 Aug 2018 7:00 pm
Operator : christc2
Sample : dftpp
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 12 19:05:54 2018
Quant Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M
Quant Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um
QLast Update : Fri Jul 27 18:43:37 2018
Response via : Initial Calibration





TIC: 6p474920.D\data.ms

(3) PP-DDT (t)

4.286min (-0.080) 0.00ppb

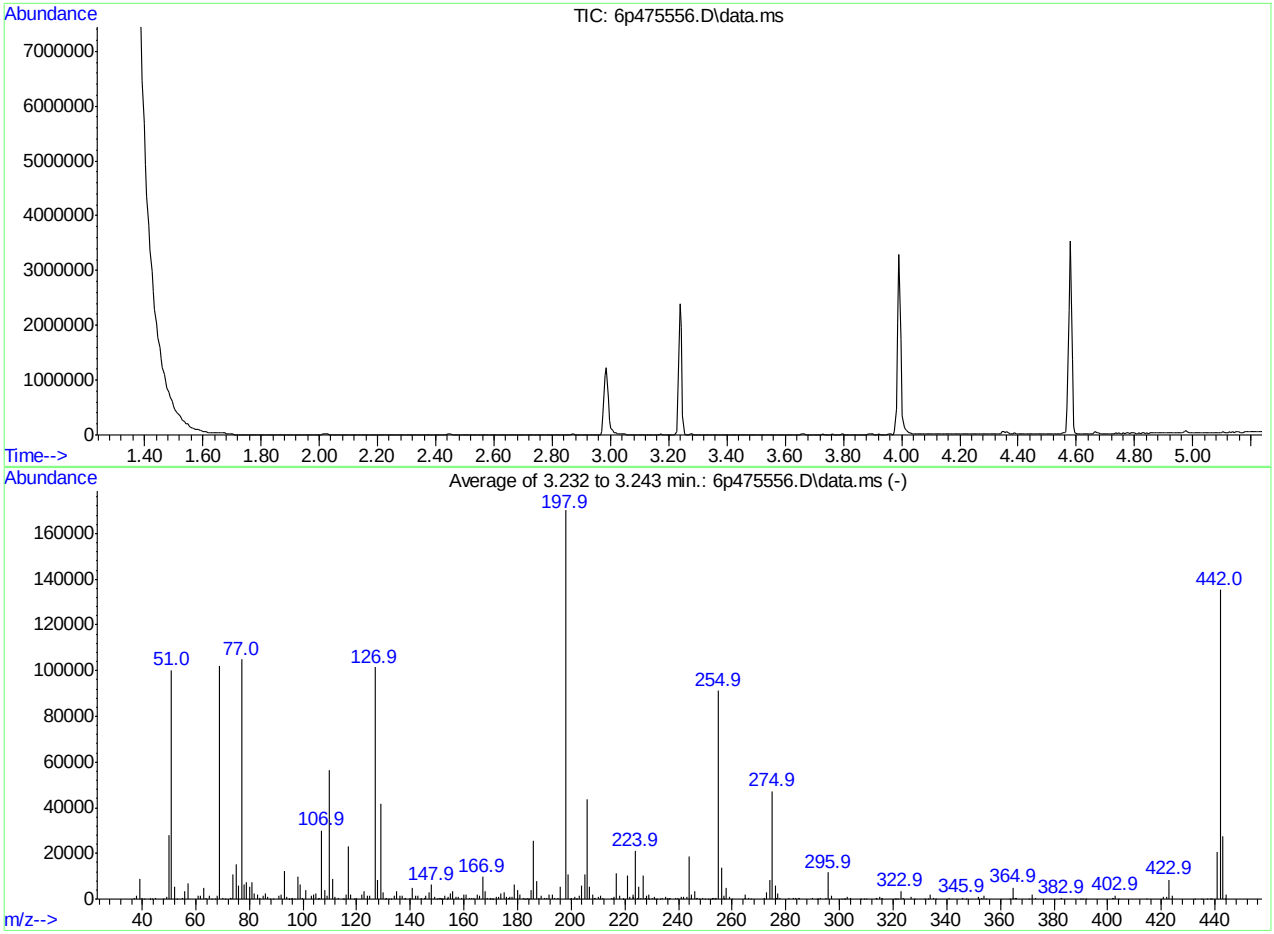
response 443597

Ion	Exp%	Act%
235.00	100	100
165.00	44.80	53.17
237.00	61.80	62.12
0.00	0.00	0.00

DFTPP

Data File : C:\msdchem\1\DATA\E6P2338\6p475556.D Vial: 1
Acq On : 14 Sep 2018 3:23 am Operator: chriss2
Sample : dftpp Inst : MS6P
Misc : op8717,e6p2338,1000,,,1,1 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um



AutoFind: Scans 346, 347, 348; Background Corrected with Scan 342

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	30	60	58.9	100114	PASS
68	69	0.00	2	1.6	1653	PASS
69	198	0.00	100	60.0	101984	PASS
70	69	0.00	2	0.5	532	PASS
127	198	40	60	59.7	101482	PASS
197	198	0.00	1	0.0	0	PASS
198	198	100	100	100.0	170080	PASS
199	198	5	9	6.4	10962	PASS
275	198	10	30	27.8	47289	PASS
365	198	1	100	3.0	5060	PASS
441	443	0.10	100	74.7	20679	PASS
442	198	40	100	79.6	135408	PASS
443	442	17	23	20.5	27691	PASS

6p475556.D DFTPP6P.M Fri Sep 14 11:50:20 2018 ACLIMS

Average of 3.232 to 3.243 min.: 6p475556.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
36.85	579	49.90	27816	64.95	1696	76.00	5897
37.95	1481	50.95	100114	65.90	117	77.00	104797
38.95	8617	51.90	5353	67.20	228	77.95	6375
39.85	443	52.80	106	67.95	1653	78.85	7165
41.00	162	54.95	661	68.90	101984	79.90	5468
42.70	125	55.90	3269	69.90	532	80.90	7506
42.90	122	56.90	7010	70.90	102	81.90	2247
43.80	184	60.95	1388	72.80	544	82.95	1951
44.85	395	61.85	1474	72.90	718	83.95	386
48.10	114	62.95	4916	73.95	10869	84.90	1580
48.95	1056	63.90	684	74.90	15082	85.85	2688

Average of 3.232 to 3.243 min.: 6p475556.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
86.90	966	96.90	130	107.90	3937	118.90	134
87.70	195	97.90	9784	108.95	1489	119.90	366
89.00	245	98.95	6176	109.90	56568	121.85	2192
90.90	1635	99.90	735	110.90	8893	122.90	3528
91.90	1897	100.90	3865	111.95	852	123.95	1449
92.90	12213	102.90	1715	113.00	331	124.80	1575
93.85	875	103.85	2164	114.70	182	126.90	101482
94.70	145	104.85	2608	115.00	183	127.90	8133
94.90	114	105.60	172	115.85	1871	128.90	41618
95.70	224	105.90	614	116.90	23305	129.95	3024
95.95	564	106.90	29975	117.90	1741	130.80	141

Average of 3.232 to 3.243 min.: 6p475556.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
130.95	573	141.95	1645	151.50	159	159.75	2008
132.00	261	142.85	1389	151.70	170	160.95	2042
132.70	189	143.95	310	152.10	142	161.90	375
133.90	1465	145.10	292	152.95	1696	162.95	275
134.95	3407	145.90	1408	153.70	139	163.85	418
135.90	1372	146.90	3183	153.95	1100	164.90	1966
136.85	1392	147.90	6223	154.95	2315	165.90	1596
137.70	188	148.90	1064	155.95	3437	166.95	9722
138.15	329	149.80	190	156.90	871	167.90	3513
139.85	607	150.80	446	157.95	1168	168.90	588
140.90	5100	151.00	266	158.95	415	169.60	113

Average of 3.232 to 3.243 min.: 6p475556.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
169.85	366	177.95	773	185.95	25705	197.90	170080
170.50	199	178.85	6189	186.95	7666	198.85	10962
170.90	218	179.80	512	187.95	429	199.70	167
171.85	802	179.95	3764	188.90	1463	200.00	705
172.90	1033	180.90	2118	189.85	430	200.75	262
173.90	2281	182.00	324	190.95	748	201.30	870
174.95	3117	182.70	117	191.85	2041	201.90	133
175.80	268	182.90	138	192.90	1985	202.10	216
175.95	1017	183.75	474	193.95	544	202.85	1252
176.80	384	184.00	208	194.95	487	203.95	5717
176.95	1221	184.95	3880	195.90	5616	204.95	10641

Average of 3.232 to 3.243 min.: 6p475556.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
206.00	43909	216.00	846	225.00	5322	232.90	164
206.90	5509	216.90	11107	225.95	743	233.80	629
207.95	1970	217.85	1343	226.90	10343	235.00	787
208.70	330	219.10	100	227.80	268	235.85	667

209.00	358	219.40	100	227.95	1402	236.60	232
210.15	927	220.90	10363	228.80	238	236.95	732
210.40	185	221.85	1186	229.00	2007	239.00	319
210.95	1690	222.90	1786	229.95	500	239.80	386
211.95	430	223.10	889	230.80	183	240.85	801
214.90	550	223.90	21065	231.00	1190	241.95	1117
215.70	215	224.80	638	232.00	102	243.00	1073

Average of 3.232 to 3.243 min.: 6p475556.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
243.95	18517	252.85	360	264.80	279	277.80	601
244.80	331	253.10	291	264.95	2067	281.00	445
244.95	2116	253.50	137	265.90	667	282.70	310
245.85	3477	254.00	391	266.80	104	283.00	314
246.70	369	254.90	91197	271.80	319	283.85	355
246.90	426	255.90	13592	272.90	3011	284.90	464
247.90	105	256.70	109	273.95	8218	285.10	308
248.90	643	257.05	1268	274.90	47289	289.95	291
249.80	107	257.85	5027	275.95	5989	291.60	120
251.00	219	259.00	788	276.60	319	292.00	115
252.10	107	260.00	102	276.90	2696	292.80	705

Average of 3.232 to 3.243 min.: 6p475556.D\data.ms
dftpp
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
294.75	328	313.60	195	327.90	254	353.00	748
295.90	11696	313.80	321	331.60	153	353.95	1374
296.95	1612	314.90	1240	332.80	124	354.90	169
300.90	173	315.80	116	333.95	1901	363.60	116
301.80	124	315.95	721	334.95	494	364.70	293
302.10	115	320.70	221	335.70	196	364.90	5060
302.90	898	321.00	252	340.85	502	365.70	367
303.95	269	321.80	225	345.85	545	365.90	432
307.70	143	322.95	3613	347.00	116	370.70	116
309.00	104	323.85	574	351.70	109	372.00	1955
310.10	148	326.85	806	351.90	1068	372.95	595

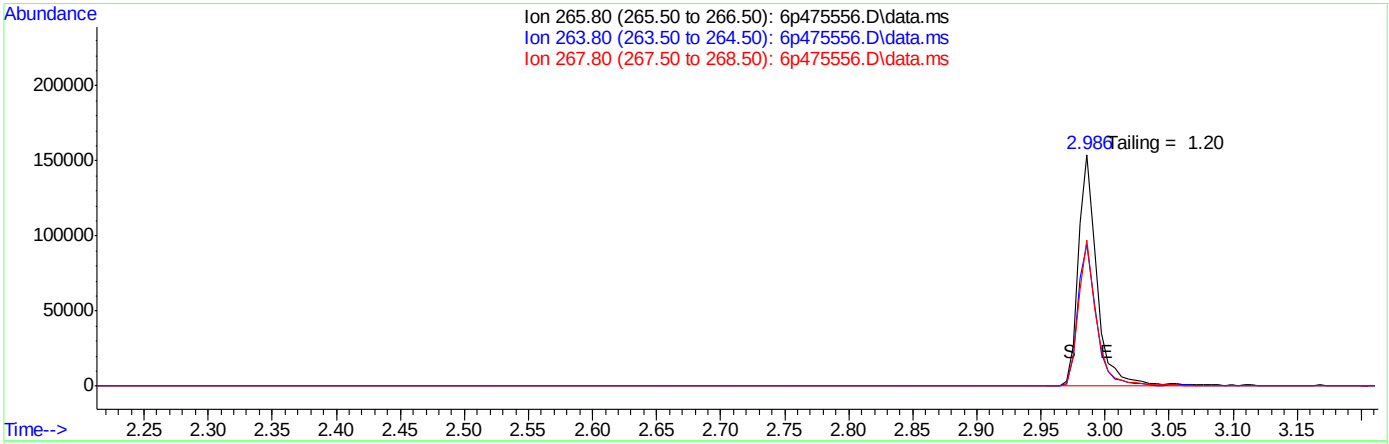
Average of 3.232 to 3.243 min.: 6p475556.D\data.ms
dftpp
Modified:subtracted

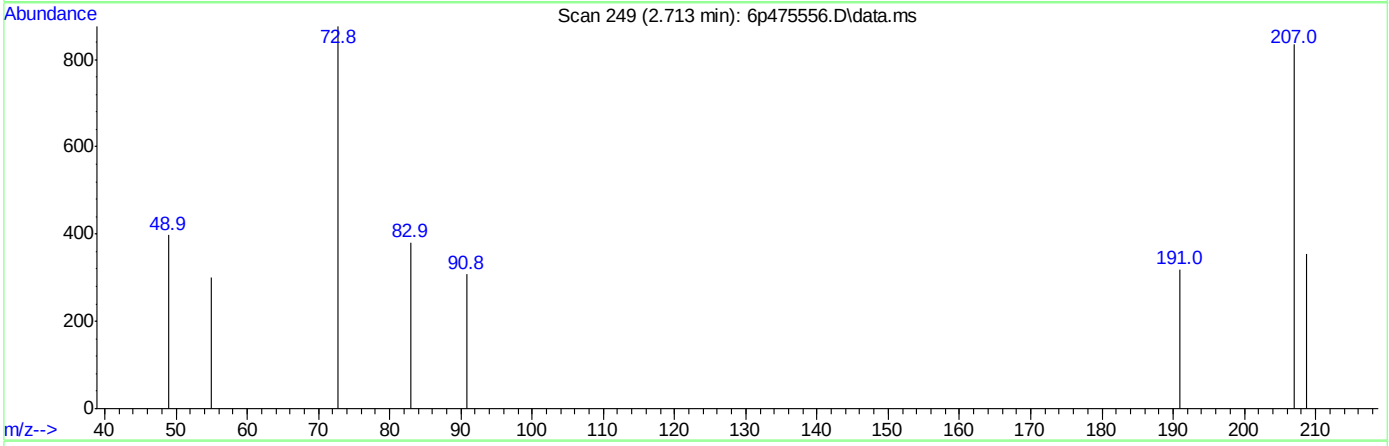
m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
382.85	388	422.95	8403	444.00	2178		
389.90	102	423.95	1695				
390.85	250	432.50	112				
391.90	113	435.00	112				
401.90	438	437.00	221				
402.10	414	438.20	138				
402.95	1550	438.90	174				
403.90	152	441.00	20679				
414.50	107	442.00	135408				
420.85	833	443.00	27691				
421.90	1109	443.60	256				

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475556.D
Acq On : 14 Sep 2018 3:23 am
Operator : chriss2
Sample : dftpp
Misc : op8717,e6p2338,1000,,,1,1
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 14 03:29:01 2018
Quant Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M
Quant Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um
QLast Update : Fri Jul 27 18:43:37 2018
Response via : Initial Calibration





TIC: 6p475556.D\data.ms

(1) Pentachlorophenol (t)

2.713min (-2.713) 0.00ppb

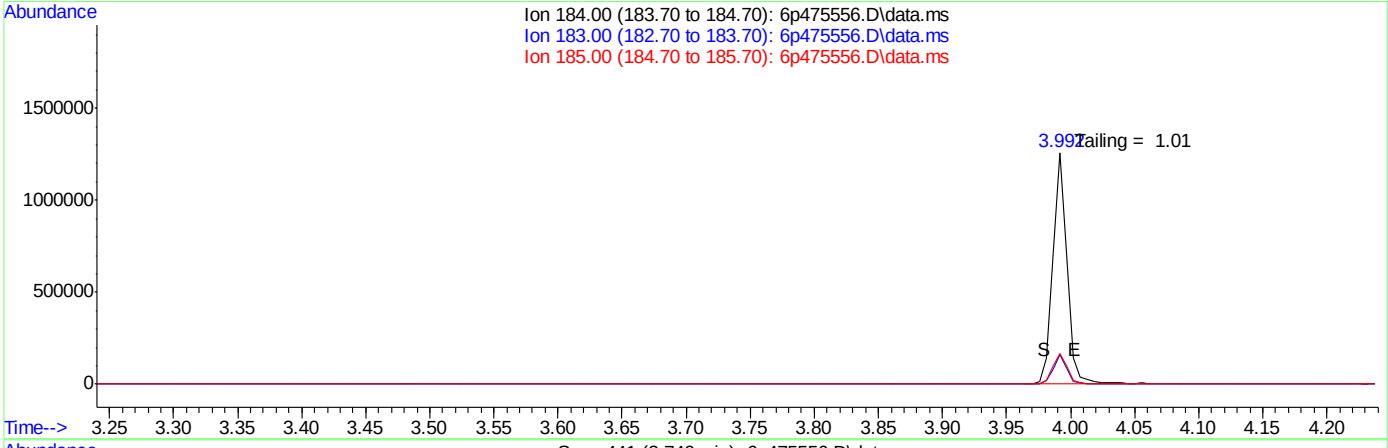
response 0

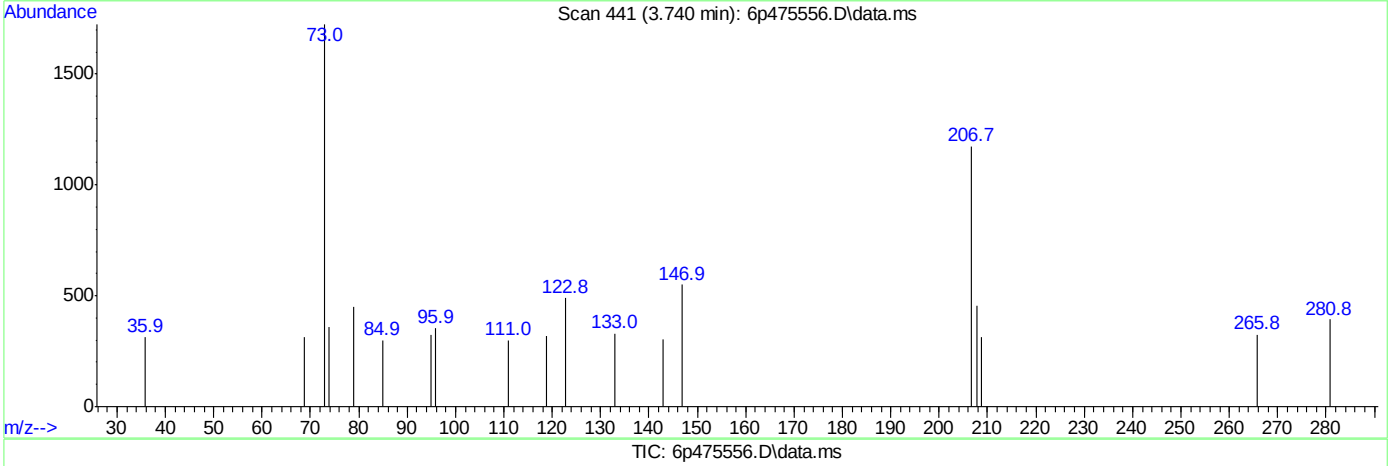
Ion	Exp%	Act%
265.80	100	0.00
263.80	63.20	0.00#
267.80	63.00	0.00#
0.00	0.00	0.00

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475556.D
Acq On : 14 Sep 2018 3:23 am
Operator : chriss2
Sample : dftpp
Misc : op8717,e6p2338,1000,,,1,1
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 14 03:29:01 2018
Quant Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M
Quant Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um
QLast Update : Fri Jul 27 18:43:37 2018
Response via : Initial Calibration





TIC: 6p475556.D\data.ms

(2) Benzidine (t)

3.740min (-3.740) 0.00ppb

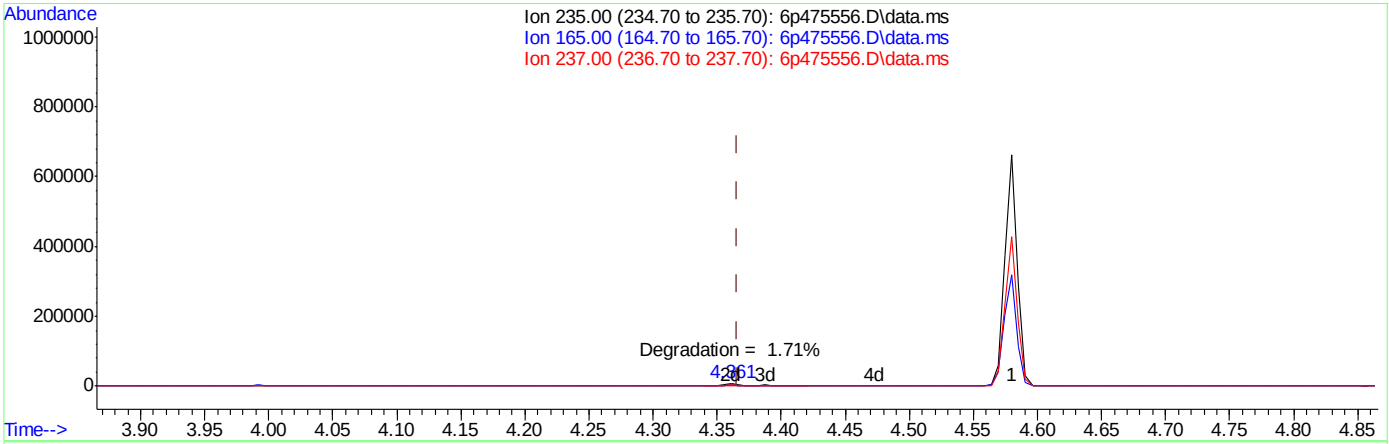
response 0

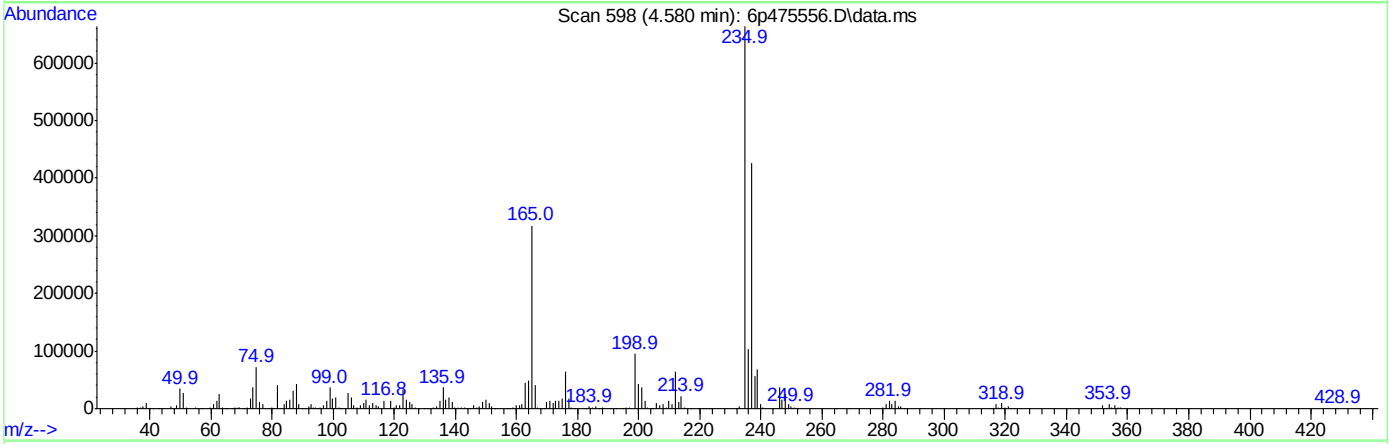
Ion	Exp%	Act%
184.00	100	0.00
183.00	11.40	0.00
185.00	14.50	0.00
0.00	0.00	0.00

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475556.D
Acq On : 14 Sep 2018 3:23 am
Operator : chriss2
Sample : dftpp
Misc : op8717,e6p2338,1000,,,1,1
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Sep 14 03:29:01 2018
Quant Method : C:\MSDCHEM\1\METHODS\DFTPP6P.M
Quant Title : Semi Volatile GC/MS, ZB-5 15m x .25mm x .25um
QLast Update : Fri Jul 27 18:43:37 2018
Response via : Initial Calibration





TIC: 6p475556.D\data.ms

(3) PP-DDT (t)

4.580min (+0.214) 0.00ppb

response 455840

Ion	Exp%	Act%
235.00	100	100
165.00	44.80	48.82
237.00	61.80	63.85
0.00	0.00	0.00

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474907.D
Acq On : 12 Aug 2018 12:51 pm
Operator : christc2
Sample : ic2304-100
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 12 17:06:52 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:04:36 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) 1,4-Dichlorobenzene-d4	4.522	152	238354	40.00	ppm		-0.19
24) Naphthalene-d8	5.538	136	951828	40.00	ppm		-0.22
47) Acenaphthene-d10	7.266	164	502371	40.00	ppm		-0.25
69) Phenanthrene-d10	8.950	188	910529	40.00	ppm		-0.27
83) Chrysene-d12	12.117	240	993416	40.00	ppm		-0.28
91) Perylene-d12	13.711	264	901212	40.00	ppm		-0.28
101) 1,4-Dichlorobenzene-d4a	4.522	152	238354	40.00	ppm		-0.19
103) Acenaphthene-d10a	7.266	164	502371	40.00	ppm		-0.25
105) Phenanthrene-d10a	8.950	188	910529	40.00	ppm		-0.26
109) Chrysene-d12a	12.117	240	993416	40.00	ppm		-0.27
111) Naphthalene-d8a	5.538	136	951828	40.00	ppm		-0.22
113) Phenanthrene-d10b	8.950	188	910529	40.00	ppm		-0.26
115) Chrysene-d12b	12.117	240	993392	40.00	ppm		-0.27
System Monitoring Compounds							
5) 2-Fluorophenol	3.532	112	830277	97.36	ppm		-0.18
Spiked Amount 50.000			Recovery =	194.72%			
8) Phenol-d5	4.265	99	1084748	99.56	ppm		-0.17
Spiked Amount 50.000			Recovery =	199.12%			
25) Nitrobenzene-d5	4.944	82	1077177	121.91	ppm		-0.20
Spiked Amount 50.000			Recovery =	243.82%			
51) 2-Fluorobiphenyl	6.565	172	1852915	90.82	ppm		-0.24
Spiked Amount 50.000			Recovery =	181.64%			
73) 2,4,6-Tribromophenol	8.153	330	311284	136.36	ppm		-0.25
Spiked Amount 50.000			Recovery =	272.72%			
85) Terphenyl-d14	10.881	244	1999810	87.61	ppm		-0.27
Spiked Amount 50.000			Recovery =	175.22%			
106) 1-chlorooctadecane	0.000	57	0	0.00	ppm		
107) o-terphenyl	0.000	230	0	0.00	ppm		
Target Compounds							Qvalue
2) 1,4-Dioxane	2.013	88	370503	91.30	ppm		98
3) Pyridine	2.339	79	955174	92.31	ppm		97
4) N-Nitrosodimethylamine	2.318	74	545257	92.11	ppm	#	95
6) Indene	4.714	116	1427666	92.22	ppm		98
7) Cumene	3.928	105	2295517	100.28	ppm		95
9) Phenol	4.276	94	1260443	97.86	ppm	#	49
10) Aniline	4.281	93	1410949	106.62	ppm		97
11) bis(2-Chloroethyl)ether	4.329	93	810883	95.80	ppm		90
12) 2-Chlorophenol	4.367	128	843097	92.55	ppm		88
13) Decane	4.415	43	855880	84.89	ppm		87
14) 1,3-Dichlorobenzene	4.479	146	920093	87.83	ppm		98
15) 1,4-Dichlorobenzene	4.532	146	940061	88.93	ppm		98
16) Benzyl alcohol	4.629	108	585843	99.19	ppm		87
17) 1,2-Dichlorobenzene	4.650	146	869302	87.09	ppm		98
18) Acetophenone	4.832	105	1325275	102.55	ppm		93
19) 2-Methylphenol	4.720	108	856730	104.90	ppm		99
20) 2,2'-oxybis(1-Chloropr...	4.730	121	266333	91.84	ppm		98
21) 3&4-Methylphenol	4.837	108	877859	103.32	ppm		98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474907.D
Acq On : 12 Aug 2018 12:51 pm
Operator : christc2
Sample : ic2304-100
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 12 17:06:52 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:04:36 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
22) n-Nitroso-di-n-propyla...	4.837	70	690434	103.90	ppm		93
23) Hexachloroethane	4.912	201	320960	109.26	ppm		86
26) Nitrobenzene	4.960	77	1062276	112.86	ppm		91
27) Quinoline	5.864	129	1677754	88.90	ppm		95
28) Isophorone	5.158	82	1822239	108.22	ppm		96
29) 2-Nitrophenol	5.217	139	461840	116.79	ppm		88
30) 2,4-Dimethylphenol	5.260	107	991040	126.87	ppm		87
31) Benzoic acid	5.388	105	789554	150.86	ppm		91
32) bis(2-Chloroethoxy)met...	5.335	93	922272	99.06	ppm		98
33) 2,4-Dichlorophenol	5.420	162	713808	102.12	ppm		95
34) 2,6-Dichlorophenol	5.618	162	703220	101.53	ppm		99
35) 1,3,5-Trichlorobenzene	5.228	180	782104	93.15	ppm		95
36) 1,2,4-Trichlorobenzene	5.490	180	731784	91.64	ppm		96
37) 1,2,3-Trichlorobenzene	5.688	180	745555	95.25	ppm		94
38) Naphthalene	5.559	128	2538856	91.32	ppm		100
39) 4-Chloroaniline	5.607	127	1094603	95.90	ppm		93
40) 2,3-Dichloroaniline	6.474	161	895189	101.10	ppm		99
41) Caprolactam	5.944	55	433819	103.87	ppm		92
42) Hexachlorobutadiene	5.677	225	473211	118.60	ppm		97
43) 4-Chloro-3-methylphenol	6.057	107	861510	113.67	ppm		81
44) 2-Methylnaphthalene	6.196	141	1349853	86.04	ppm		97
45) 1-Methylnaphthalene	6.292	141	1511020	91.77	ppm		96
46) Dimethylnaphthalene	6.827	156	1485149	89.59	ppm		96
48) Hexachlorocyclopentadiene	6.362	237	1109782	311.18	ppm		99
49) 2,4,6-Trichlorophenol	6.479	196	537381	110.60	ppm		96
50) 2,4,5-Trichlorophenol	6.517	196	546112	106.54	ppm		99
52) 2-Chloronaphthalene	6.683	162	1579998	90.07	ppm		98
53) Biphenyl	6.667	154	1995537	81.49	ppm		99
54) 2-Nitroaniline	6.790	65	605114	128.13	ppm		82
55) Dimethylphthalate	6.993	163	1796652	95.49	ppm		99
56) Acenaphthylene	7.116	152	2415962	83.31	ppm		99
57) 2,6-Dinitrotoluene	7.052	165	399638	131.86	ppm		95
58) 3-Nitroaniline	7.228	138	473282	104.46	ppm		77
59) Acenaphthene	7.303	153	1576916	82.51	ppm		98
60) 2,4-Dinitrophenol	7.340	184	454426	371.99	ppm	#	62
61) 4-Nitrophenol	7.426	109	369380	150.84	ppm	#	64
62) Dibenzofuran	7.496	168	2204185	88.75	ppm		96
63) 2,4-Dinitrotoluene	7.490	165	580073	144.94	ppm		84
64) 2,3,4,6-Tetrachlorophenol	7.635	232	474599	118.64	ppm		98
65) Diethylphthalate	7.779	149	1843495	96.76	ppm		98
66) Fluorene	7.875	166	1851415	93.37	ppm		97
67) 4-Chlorophenyl-phenyle...	7.886	204	848810	98.21	ppm		95
68) 4-Nitroaniline	7.918	138	464472	96.55	ppm	#	73
70) 4,6-Dinitro-2-methylph...	7.950	198	329909	201.04	ppm		94
71) n-Nitrosodiphenylamine	8.025	169	1287142	90.04	ppm		96
72) 1,2-Diphenylhydrazine	8.068	77	2092553	102.17	ppm		95
74) 4-Bromophenyl-phenylether	8.448	248	513050	105.39	ppm		98
75) Hexachlorobenzene	8.517	284	611324	110.59	ppm		91
76) Pentachlorophenol	8.747	266	874688	278.07	ppm		97
77) Phenanthrene	8.982	178	2457278	88.63	ppm		99

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474907.D
Acq On : 12 Aug 2018 12:51 pm
Operator : christc2
Sample : ic2304-100
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 12 17:06:52 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:04:36 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration

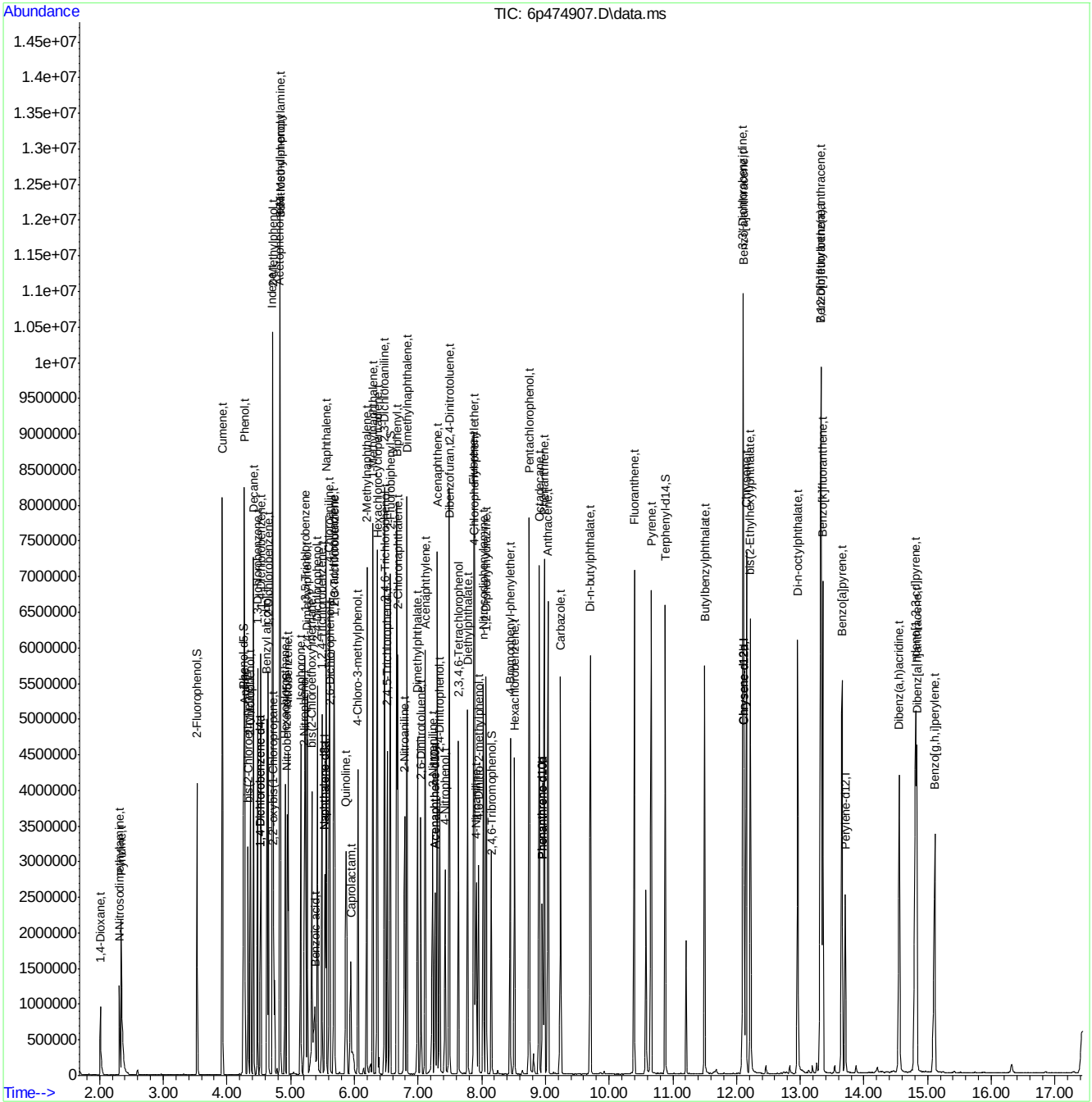
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
78) Anthracene	9.041	178	2486532	90.89	ppm	98
79) Carbazole	9.245	167	2394976	92.16	ppm	98
80) Di-n-butylphthalate	9.705	149	3075434	103.84	ppm	99
81) Fluoranthene	10.395	202	2747049	102.00	ppm	96
82) Octadecane	8.902	57	1292825	97.62	ppm	94
84) Pyrene	10.662	202	2848271	81.82	ppm	99
86) Butylbenzylphthalate	11.502	149	1389956	93.22	ppm	98
87) Benzo[a]anthracene	12.106	228	2971381	93.17	ppm	99
88) 3,3'-Dichlorobenzidine	12.101	252	1194018	118.21	ppm	97
89) Chrysene	12.154	228	2690699	85.37	ppm	97
90) bis(2-Ethylhexyl)phtha...	12.218	149	1827937	94.79	ppm	99
92) Di-n-octylphthalate	12.962	149	3109670	103.20	ppm	98
93) Benzo[b]fluoranthene	13.326	252	3108825	105.90	ppm	97
94) Benzo[k]fluoranthene	13.358	252	2412922	89.69	ppm	97
95) Benzo[a]pyrene	13.657	252	2418231	97.60	ppm	95
96) Indeno[1,2,3-cd]pyrene	14.812	276	2923436	95.03	ppm	85
97) Dibenz(a,h)acridine	14.556	279	2161037	97.45	ppm	98
98) Dibenz[a,h]anthracene	14.834	278	2629902	97.68	ppm	93
99) 7,12-Dimethylbenz(a)an...	13.326	256	1410850	123.81	ppm	98
100) Benzo[g,h,i]perylene	15.112	276	2181425	88.27	ppm	93

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474907.D
Acq On : 12 Aug 2018 12:51 pm
Operator : christc2
Sample : ic2304-100
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 12 17:06:52 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:04:36 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474908.D
Acq On : 12 Aug 2018 1:15 pm
Operator : christc2
Sample : ic2304-80
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Aug 12 17:08:57 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:05:14 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	258152	40.00	ppm	-0.19
24) Naphthalene-d8	5.538	136	1021976	40.00	ppm	-0.22
47) Acenaphthene-d10	7.266	164	547338	40.00	ppm	-0.25
69) Phenanthrene-d10	8.950	188	993795	40.00	ppm	-0.27
83) Chrysene-d12	12.117	240	1056359	40.00	ppm	-0.28
91) Perylene-d12	13.711	264	983168	40.00	ppm	-0.28
101) 1,4-Dichlorobenzene-d4a	4.522	152	258152	40.00	ppm	-0.19
103) Acenaphthene-d10a	7.266	164	547338	40.00	ppm	-0.25
105) Phenanthrene-d10a	8.950	188	993795	40.00	ppm	-0.26
109) Chrysene-d12a	12.117	240	1056359	40.00	ppm	-0.27
111) Naphthalene-d8a	5.538	136	1021976	40.00	ppm	-0.22
113) Phenanthrene-d10b	8.950	188	993795	40.00	ppm	-0.26
115) Chrysene-d12b	12.117	240	1056359	40.00	ppm	-0.27
System Monitoring Compounds						
5) 2-Fluorophenol	3.532	112	733206	79.38	ppm	-0.18
Spiked Amount 50.000			Recovery =	158.76%		
8) Phenol-d5	4.260	99	949176	80.44	ppm	-0.18
Spiked Amount 50.000			Recovery =	160.88%		
25) Nitrobenzene-d5	4.944	82	957073	100.88	ppm	-0.20
Spiked Amount 50.000			Recovery =	201.76%		
51) 2-Fluorobiphenyl	6.565	172	1620581	72.91	ppm	-0.24
Spiked Amount 50.000			Recovery =	145.82%		
73) 2,4,6-Tribromophenol	8.148	330	267878	107.52	ppm	-0.26
Spiked Amount 50.000			Recovery =	215.04%		
85) Terphenyl-d14	10.881	244	1730631	71.30	ppm	-0.27
Spiked Amount 50.000			Recovery =	142.60%		
106) 1-chlorooctadecane	0.000	57	0	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
2) 1,4-Dioxane	2.013	88	328030	74.64	ppm	99
3) Pyridine	2.345	79	864450	77.14	ppm	97
4) N-Nitrosodimethylamine	2.313	74	496770	77.48	ppm #	93
6) Indene	4.714	116	1240053	73.96	ppm	97
7) Cumene	3.928	105	2009314	81.05	ppm	94
9) Phenol	4.270	94	1120892	80.35	ppm	75
10) Aniline	4.281	93	1256120	87.64	ppm	99
11) bis(2-Chloroethyl)ether	4.329	93	714408	77.93	ppm	95
12) 2-Chlorophenol	4.367	128	742419	75.24	ppm	89
13) Decane	4.415	43	755282	69.17	ppm	90
14) 1,3-Dichlorobenzene	4.479	146	809672	71.36	ppm	99
15) 1,4-Dichlorobenzene	4.532	146	815717	71.25	ppm	99
16) Benzyl alcohol	4.629	108	508079	79.43	ppm	85
17) 1,2-Dichlorobenzene	4.650	146	753136	69.67	ppm	98
18) Acetophenone	4.832	105	1162464	83.05	ppm	98
19) 2-Methylphenol	4.720	108	748663	84.64	ppm	97
20) 2,2'-oxybis(1-Chloropr...	4.730	121	237144	75.50	ppm	96
21) 3&4-Methylphenol	4.837	108	785665	85.38	ppm	98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474908.D
Acq On : 12 Aug 2018 1:15 pm
Operator : christc2
Sample : ic2304-80
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Aug 12 17:08:57 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:05:14 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration

	Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
22)	n-Nitroso-di-n-propyla...	4.837	70	601946	83.63	ppm		93
23)	Hexachloroethane	4.912	201	276598	86.94	ppm		86
26)	Nitrobenzene	4.960	77	938132	92.83	ppm		92
27)	Quinoline	5.870	129	1502625	74.16	ppm		95
28)	Isophorone	5.153	82	1591891	88.05	ppm		94
29)	2-Nitrophenol	5.217	139	403695	95.08	ppm		79
30)	2,4-Dimethylphenol	5.254	107	867473	103.43	ppm		86
31)	Benzoic acid	5.377	105	675989	120.30	ppm		90
32)	bis(2-Chloroethoxy)met...	5.335	93	790947	79.12	ppm		99
33)	2,4-Dichlorophenol	5.420	162	614033	81.81	ppm		97
34)	2,6-Dichlorophenol	5.618	162	612160	82.32	ppm		98
35)	1,3,5-Trichlorobenzene	5.228	180	683691	75.84	ppm		98
36)	1,2,4-Trichlorobenzene	5.490	180	632192	73.74	ppm		98
37)	1,2,3-Trichlorobenzene	5.688	180	635626	75.63	ppm		97
38)	Naphthalene	5.559	128	2183716	73.15	ppm		100
39)	4-Chloroaniline	5.607	127	955291	77.95	ppm		93
40)	2,3-Dichloroaniline	6.469	161	769499	80.94	ppm		94
41)	Caprolactam	5.939	55	379955	84.73	ppm		94
42)	Hexachlorobutadiene	5.677	225	401149	93.64	ppm		97
43)	4-Chloro-3-methylphenol	6.057	107	751664	92.37	ppm		88
44)	2-Methylnaphthalene	6.196	141	1171129	69.52	ppm		96
45)	1-Methylnaphthalene	6.292	141	1292231	73.09	ppm		96
46)	Dimethylnaphthalene	6.827	156	1265930	71.12	ppm		94
48)	Hexachlorocyclopentadiene	6.362	237	952688	245.18	ppm		99
49)	2,4,6-Trichlorophenol	6.479	196	471402	89.05	ppm		97
50)	2,4,5-Trichlorophenol	6.517	196	477980	85.58	ppm		98
52)	2-Chloronaphthalene	6.677	162	1373809	71.88	ppm		97
53)	Biphenyl	6.661	154	1769903	66.34	ppm		99
54)	2-Nitroaniline	6.789	65	530678	103.14	ppm		87
55)	Dimethylphthalate	6.993	163	1558830	76.04	ppm		98
56)	Acenaphthylene	7.110	152	2147575	67.97	ppm		100
57)	2,6-Dinitrotoluene	7.046	165	354395	107.33	ppm		91
58)	3-Nitroaniline	7.228	138	412201	83.50	ppm		85
59)	Acenaphthene	7.303	153	1376120	66.08	ppm		98
60)	2,4-Dinitrophenol	7.340	184	382622	287.48	ppm	#	63
61)	4-Nitrophenol	7.426	109	310606	116.42	ppm	#	66
62)	Dibenzofuran	7.496	168	1939479	71.68	ppm		98
63)	2,4-Dinitrotoluene	7.485	165	513725	117.81	ppm		83
64)	2,3,4,6-Tetrachlorophenol	7.635	232	408478	93.72	ppm		99
65)	Diethylphthalate	7.779	149	1603796	77.26	ppm		98
66)	Fluorene	7.875	166	1616755	74.84	ppm		97
67)	4-Chlorophenyl-phenyle...	7.886	204	737289	78.30	ppm		94
68)	4-Nitroaniline	7.913	138	402119	76.73	ppm	#	72
70)	4,6-Dinitro-2-methylph...	7.945	198	286285	159.84	ppm		87
71)	n-Nitrosodiphenylamine	8.025	169	1122661	71.96	ppm		99
72)	1,2-Diphenylhydrazine	8.068	77	1826559	81.71	ppm		96
74)	4-Bromophenyl-phenylether	8.448	248	450237	84.73	ppm		94
75)	Hexachlorobenzene	8.512	284	531902	88.16	ppm		98
76)	Pentachlorophenol	8.747	266	740875	215.80	ppm		98
77)	Phenanthrene	8.982	178	2087548	68.99	ppm		99

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474908.D
Acq On : 12 Aug 2018 1:15 pm
Operator : christc2
Sample : ic2304-80
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Aug 12 17:08:57 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:05:14 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration

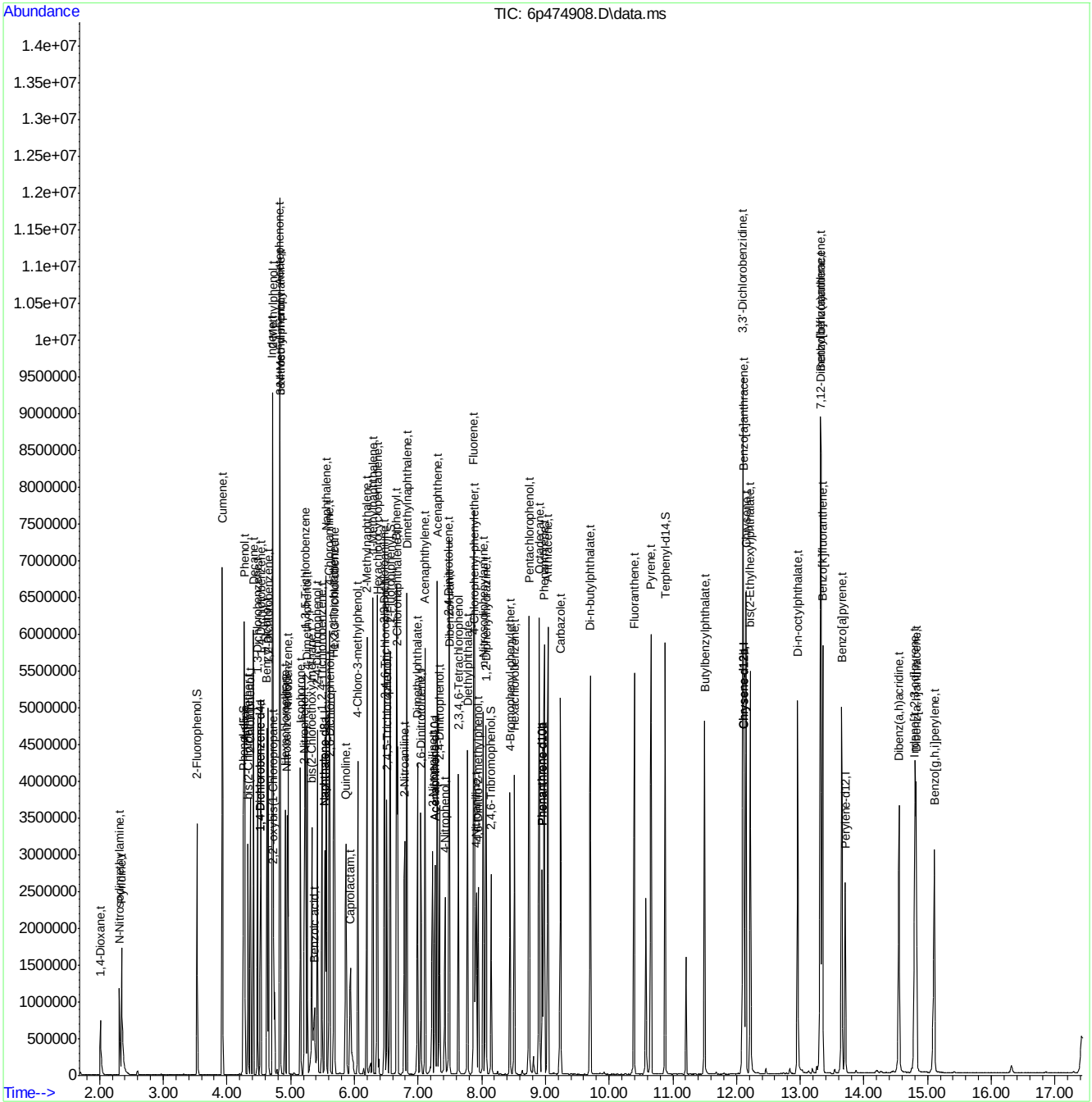
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
78) Anthracene	9.041	178	2139629	71.65	ppm	98
79) Carbazole	9.239	167	2033859	71.71	ppm	99
80) Di-n-butylphthalate	9.704	149	2626529	81.25	ppm	99
81) Fluoranthene	10.394	202	2414745	82.15	ppm	92
82) Octadecane	8.902	57	1102812	76.29	ppm	93
84) Pyrene	10.657	202	2477560	66.93	ppm	99
86) Butylbenzylphthalate	11.502	149	1197978	75.56	ppm	99
87) Benzo[a]anthracene	12.106	228	2550503	75.21	ppm	99
88) 3,3'-Dichlorobenzidine	12.101	252	1014052	94.41	ppm	96
89) Chrysene	12.149	228	2292695	68.40	ppm	96
90) bis(2-Ethylhexyl)phtha...	12.218	149	1565145	76.33	ppm	98
92) Di-n-octylphthalate	12.962	149	2698643	82.09	ppm	97
93) Benzo[b]fluoranthene	13.320	252	2574287	80.38	ppm	97
94) Benzo[k]fluoranthene	13.352	252	2118975	72.20	ppm	98
95) Benzo[a]pyrene	13.652	252	2023614	74.87	ppm	96
96) Indeno[1,2,3-cd]pyrene	14.802	276	2477432	73.82	ppm	87
97) Dibenz(a,h)acridine	14.550	279	1796549	74.26	ppm	99
98) Dibenz[a,h]anthracene	14.829	278	2219676	75.57	ppm	92
99) 7,12-Dimethylbenz(a)an...	13.326	256	1212959	97.57	ppm	97
100) Benzo[g,h,i]perylene	15.107	276	1885737	69.94	ppm	93

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474908.D
Acq On : 12 Aug 2018 1:15 pm
Operator : christc2
Sample : ic2304-80
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Aug 12 17:08:57 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:05:14 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474909.D
Acq On : 12 Aug 2018 1:45 pm
Operator : christc2
Sample : ic2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Aug 12 17:10:54 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:05:14 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	270980	40.00	ppm	-0.19
24) Naphthalene-d8	5.538	136	1056030	40.00	ppm	-0.22
47) Acenaphthene-d10	7.266	164	560788	40.00	ppm	-0.25
69) Phenanthrene-d10	8.950	188	1004819	40.00	ppm	-0.27
83) Chrysene-d12	12.117	240	1068160	40.00	ppm	-0.28
91) Perylene-d12	13.705	264	984222	40.00	ppm	-0.29
101) 1,4-Dichlorobenzene-d4a	4.522	152	270980	40.00	ppm	-0.19
103) Acenaphthene-d10a	7.266	164	560788	40.00	ppm	-0.25
105) Phenanthrene-d10a	8.950	188	1004819	40.00	ppm	-0.26
109) Chrysene-d12a	12.117	240	1068160	40.00	ppm	-0.27
111) Naphthalene-d8a	5.538	136	1056030	40.00	ppm	-0.22
113) Phenanthrene-d10b	8.950	188	1004819	40.00	ppm	-0.26
115) Chrysene-d12b	12.117	240	1068160	40.00	ppm	-0.27
System Monitoring Compounds						
5) 2-Fluorophenol	3.527	112	465511	48.01	ppm	-0.19
Spiked Amount 50.000			Recovery =	96.02%		
8) Phenol-d5	4.254	99	609150	49.18	ppm	-0.18
Spiked Amount 50.000			Recovery =	98.36%		
25) Nitrobenzene-d5	4.944	82	610479	62.27	ppm	-0.20
Spiked Amount 50.000			Recovery =	124.54%		
51) 2-Fluorobiphenyl	6.560	172	1028395	45.16	ppm	-0.24
Spiked Amount 50.000			Recovery =	90.32%		
73) 2,4,6-Tribromophenol	8.148	330	162701	64.59	ppm	-0.26
Spiked Amount 50.000			Recovery =	129.18%		
85) Terphenyl-d14	10.881	244	1071598	43.66	ppm	-0.27
Spiked Amount 50.000			Recovery =	87.32%		
106) 1-chlorooctadecane	0.000	57	0	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
2) 1,4-Dioxane	2.013	88	214785	46.56	ppm	96
3) Pyridine	2.345	79	567068	48.21	ppm	98
4) N-Nitrosodimethylamine	2.313	74	320911	47.69	ppm #	94
6) Indene	4.714	116	791089	44.95	ppm	97
7) Cumene	3.928	105	1314678	50.52	ppm	95
9) Phenol	4.265	94	717747	49.02	ppm	87
10) Aniline	4.276	93	810409	53.87	ppm	96
11) bis(2-Chloroethyl)ether	4.329	93	458880	47.68	ppm	95
12) 2-Chlorophenol	4.367	128	472081	45.58	ppm	93
13) Decane	4.415	43	500188	43.64	ppm	91
14) 1,3-Dichlorobenzene	4.479	146	506254	42.51	ppm	98
15) 1,4-Dichlorobenzene	4.532	146	522843	43.51	ppm	99
16) Benzyl alcohol	4.623	108	328885	48.98	ppm	85
17) 1,2-Dichlorobenzene	4.650	146	486955	42.91	ppm	96
18) Acetophenone	4.827	105	756435	51.49	ppm	96
19) 2-Methylphenol	4.714	108	461973	49.75	ppm	96
20) 2,2'-oxybis(1-Chloropr...	4.730	121	154938	46.99	ppm	99
21) 3&4-Methylphenol	4.832	108	497511	51.50	ppm	99

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474909.D
Acq On : 12 Aug 2018 1:45 pm
Operator : christc2
Sample : ic2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Aug 12 17:10:54 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:05:14 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration

	Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
22)	n-Nitroso-di-n-propyla...	4.832	70	394075	52.16	ppm		93
23)	Hexachloroethane	4.912	201	177873	53.26	ppm		84
26)	Nitrobenzene	4.960	77	611239	58.53	ppm		99
27)	Quinoline	5.859	129	952791	45.51	ppm		95
28)	Isophorone	5.148	82	1020742	54.64	ppm		94
29)	2-Nitrophenol	5.217	139	257040	58.59	ppm		91
30)	2,4-Dimethylphenol	5.255	107	548226	63.26	ppm		90
31)	Benzoic acid	5.356	105	411677	70.90	ppm		89
32)	bis(2-Chloroethoxy)met...	5.329	93	511360	49.51	ppm		100
33)	2,4-Dichlorophenol	5.415	162	398126	51.33	ppm		95
34)	2,6-Dichlorophenol	5.613	162	390188	50.78	ppm		99
35)	1,3,5-Trichlorobenzene	5.228	180	444359	47.70	ppm		95
36)	1,2,4-Trichlorobenzene	5.490	180	412871	46.60	ppm		98
37)	1,2,3-Trichlorobenzene	5.688	180	402733	46.37	ppm		99
38)	Naphthalene	5.554	128	1382209	44.81	ppm		100
39)	4-Chloroaniline	5.602	127	605376	47.80	ppm		91
40)	2,3-Dichloroaniline	6.469	161	480699	48.93	ppm		98
41)	Caprolactam	5.923	55	241515	52.12	ppm		96
42)	Hexachlorobutadiene	5.677	225	265094	59.88	ppm		94
43)	4-Chloro-3-methylphenol	6.051	107	484251	57.59	ppm		85
44)	2-Methylnaphthalene	6.191	141	750532	43.12	ppm		95
45)	1-Methylnaphthalene	6.287	141	834343	45.67	ppm		94
46)	Dimethylnaphthalene	6.822	156	799947	43.49	ppm		93
48)	Hexachlorocyclopentadiene	6.356	237	585872	147.16	ppm		96
49)	2,4,6-Trichlorophenol	6.474	196	289878	53.44	ppm		99
50)	2,4,5-Trichlorophenol	6.511	196	302060	52.79	ppm		99
52)	2-Chloronaphthalene	6.677	162	868649	44.36	ppm		98
53)	Biphenyl	6.661	154	1100983	40.28	ppm		100
54)	2-Nitroaniline	6.784	65	337060	63.94	ppm		85
55)	Dimethylphthalate	6.987	163	982554	46.78	ppm		99
56)	Acenaphthylene	7.111	152	1358305	41.96	ppm		99
57)	2,6-Dinitrotoluene	7.041	165	218105	64.47	ppm		81
58)	3-Nitroaniline	7.223	138	262194	51.84	ppm		86
59)	Acenaphthene	7.298	153	863612	40.48	ppm		98
60)	2,4-Dinitrophenol	7.335	184	231665	169.89	ppm	#	65
61)	4-Nitrophenol	7.415	109	195097	71.37	ppm	#	69
62)	Dibenzofuran	7.490	168	1215631	43.85	ppm		97
63)	2,4-Dinitrotoluene	7.480	165	309596	69.30	ppm		82
64)	2,3,4,6-Tetrachlorophenol	7.635	232	257401	57.64	ppm		95
65)	Diethylphthalate	7.774	149	1002216	47.12	ppm		99
66)	Fluorene	7.875	166	1025906	46.35	ppm		98
67)	4-Chlorophenyl-phenyle...	7.886	204	453250	46.98	ppm		98
68)	4-Nitroaniline	7.902	138	277832	51.74	ppm	#	73
70)	4,6-Dinitro-2-methylph...	7.940	198	169271	93.47	ppm		88
71)	n-Nitrosodiphenylamine	8.020	169	716962	45.45	ppm		96
72)	1,2-Diphenylhydrazine	8.063	77	1188391	52.58	ppm		94
74)	4-Bromophenyl-phenylether	8.442	248	276127	51.40	ppm		95
75)	Hexachlorobenzene	8.512	284	330547	54.19	ppm		96
76)	Pentachlorophenol	8.742	266	446120	128.52	ppm		96
77)	Phenanthrene	8.977	178	1346061	44.00	ppm		100

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474909.D
Acq On : 12 Aug 2018 1:45 pm
Operator : christc2
Sample : ic2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Aug 12 17:10:54 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:05:14 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration

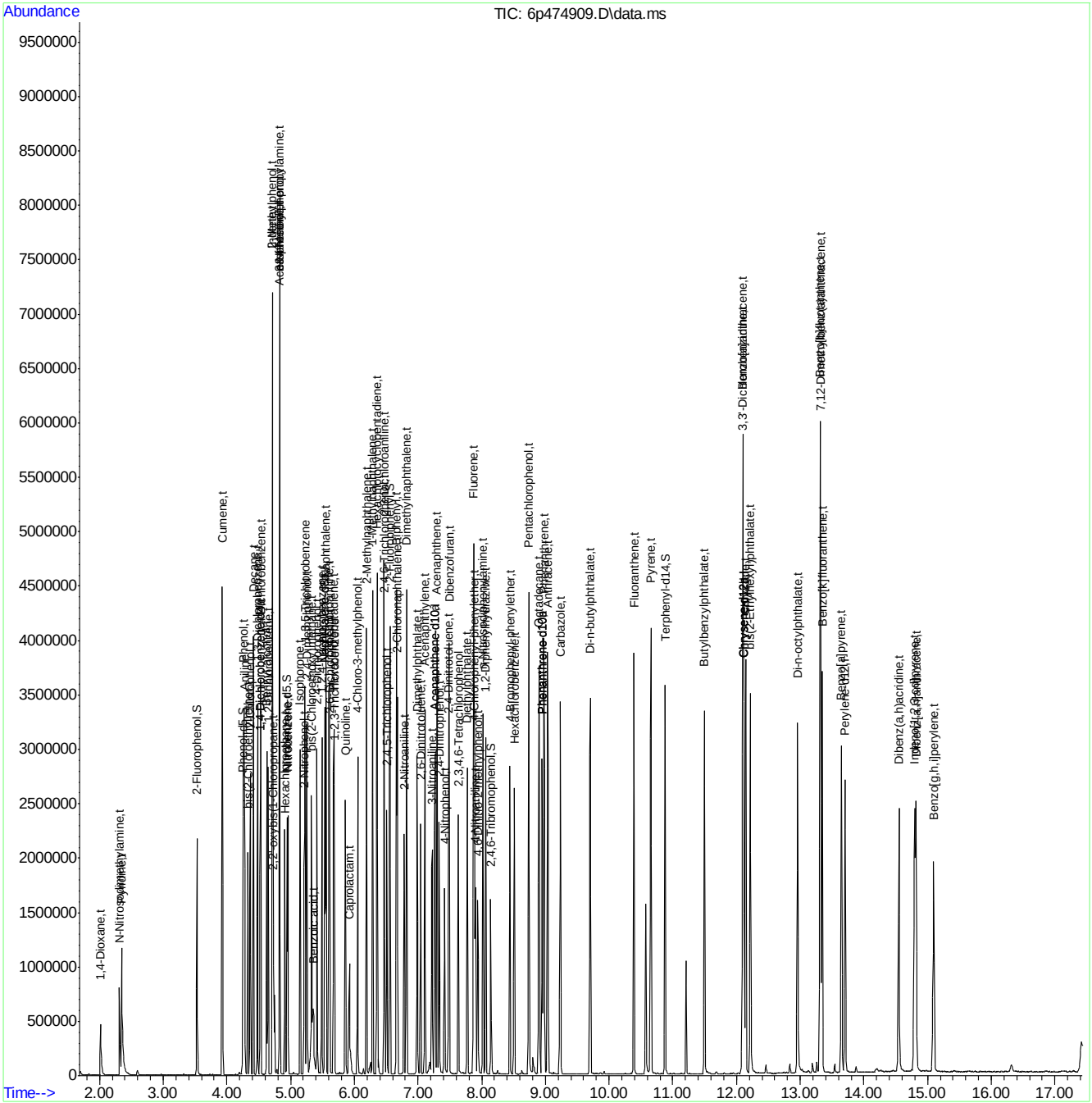
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
78) Anthracene	9.036	178	1361451	45.09	ppm	99
79) Carbazole	9.234	167	1329274	46.35	ppm	98
80) Di-n-butylphthalate	9.705	149	1709079	52.29	ppm	98
81) Fluoranthene	10.389	202	1497900	50.40	ppm	94
82) Octadecane	8.897	57	722499	49.43	ppm	96
84) Pyrene	10.657	202	1560737	41.70	ppm	100
86) Butylbenzylphthalate	11.496	149	765203	47.73	ppm	94
87) Benzo[a]anthracene	12.101	228	1516004	44.21	ppm	99
88) 3,3'-Dichlorobenzidine	12.095	252	589905	54.32	ppm	98
89) Chrysene	12.144	228	1378193	40.67	ppm	98
90) bis(2-Ethylhexyl)phtha...	12.218	149	994539	47.96	ppm	100
92) Di-n-octylphthalate	12.957	149	1712558	52.04	ppm	99
93) Benzo[b]fluoranthene	13.315	252	1509532	47.08	ppm	96
94) Benzo[k]fluoranthene	13.347	252	1310069	44.59	ppm	98
95) Benzo[a]pyrene	13.647	252	1243736	45.97	ppm	97
96) Indeno[1,2,3-cd]pyrene	14.796	276	1532351	45.61	ppm	85
97) Dibenz(a,h)acridine	14.550	279	1108065	45.76	ppm	96
98) Dibenz[a,h]anthracene	14.818	278	1272697	43.28	ppm	95
99) 7,12-Dimethylbenz(a)an...	13.320	256	732492	58.86	ppm	100
100) Benzo[g,h,i]perylene	15.101	276	1140090	42.24	ppm	89

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474909.D
Acq On : 12 Aug 2018 1:45 pm
Operator : christc2
Sample : ic2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Aug 12 17:10:54 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:05:14 2018
QLast Update : Sun Aug 12 17:05:14 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474910.D
Acq On : 12 Aug 2018 2:10 pm
Operator : christc2
Sample : ic2304-25
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Aug 12 17:16:40 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:13:11 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	280774	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1104943	40.00	ppm	0.00
47) Acenaphthene-d10	7.266	164	587967	40.00	ppm	0.00
69) Phenanthrene-d10	8.950	188	1043634	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1105094	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1052390	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	280774	40.00	ppm	0.00
103) Acenaphthene-d10a	7.266	164	587967	40.00	ppm	0.00
105) Phenanthrene-d10a	8.950	188	1043634	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1105094	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1104943	40.00	ppm	0.00
113) Phenanthrene-d10b	8.950	188	1043634	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1105017	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	3.527	112	241524	24.04	ppm	0.00
Spiked Amount 50.000			Recovery = 48.08%			
8) Phenol-d5	4.254	99	316203	24.64	ppm	0.00
Spiked Amount 50.000			Recovery = 49.28%			
25) Nitrobenzene-d5	4.939	82	316941	30.90	ppm	0.00
Spiked Amount 50.000			Recovery = 61.80%			
51) 2-Fluorobiphenyl	6.559	172	530789	22.23	ppm	0.00
Spiked Amount 50.000			Recovery = 44.46%			
73) 2,4,6-Tribromophenol	8.143	330	80243	30.67	ppm	0.00
Spiked Amount 50.000			Recovery = 61.34%			
85) Terphenyl-d14	10.876	244	524059	20.64	ppm	0.00
Spiked Amount 50.000			Recovery = 41.28%			
106) 1-chlorooctadecane	0.000	57	0d	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
2) 1,4-Dioxane	2.019	88	112923	23.62	ppm	100
3) Pyridine	2.345	79	298950	24.53	ppm	100
4) N-Nitrosodimethylamine	2.313	74	164606	23.61	ppm	100
6) Indene	4.714	116	416139	22.82	ppm	100
7) Cumene	3.928	105	689645	25.58	ppm	100
9) Phenol	4.265	94	363772	23.98	ppm	100
10) Aniline	4.276	93	413671	26.54	ppm	100
11) bis(2-Chloroethyl)ether	4.324	93	243593	24.43	ppm	100
12) 2-Chlorophenol	4.367	128	245293	22.86	ppm	100
13) Decane	4.415	43	269136	22.66	ppm	100
14) 1,3-Dichlorobenzene	4.479	146	272010	22.04	ppm	100
15) 1,4-Dichlorobenzene	4.532	146	274638	22.06	ppm	100
16) Benzyl alcohol	4.623	108	167233	24.04	ppm	100
17) 1,2-Dichlorobenzene	4.650	146	253679	21.58	ppm	100
18) Acetophenone	4.827	105	392836	25.81	ppm	100
19) 2-Methylphenol	4.714	108	249868	25.97	ppm	100
20) 2,2'-oxybis(1-Chloropr...	4.730	121	79123	23.16	ppm	100
21) 3&4-Methylphenol	4.827	108	254575	25.43	ppm	100

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474910.D
Acq On : 12 Aug 2018 2:10 pm
Operator : christc2
Sample : ic2304-25
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Aug 12 17:16:40 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:13:11 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
22) n-Nitroso-di-n-propyla...	4.827	70	206870	26.43	ppm	100
23) Hexachloroethane	4.912	201	94372	27.27	ppm	100
26) Nitrobenzene	4.955	77	321317	29.41	ppm	100
27) Quinoline	5.853	129	487280	22.24	ppm	100
28) Isophorone	5.147	82	540871	27.67	ppm	100
29) 2-Nitrophenol	5.212	139	129791	28.27	ppm	100
30) 2,4-Dimethylphenol	5.249	107	289557	31.93	ppm	100
31) Benzoic acid	5.335	105	193373	31.83	ppm	100
32) bis(2-Chloroethoxy)met...	5.329	93	269213	24.91	ppm	100
33) 2,4-Dichlorophenol	5.415	162	202411	24.94	ppm	100
34) 2,6-Dichlorophenol	5.613	162	200382	24.92	ppm	100
35) 1,3,5-Trichlorobenzene	5.228	180	224947	23.08	ppm	100
36) 1,2,4-Trichlorobenzene	5.490	180	213054	22.98	ppm	100
37) 1,2,3-Trichlorobenzene	5.682	180	214885	23.65	ppm	100
38) Naphthalene	5.554	128	726692	22.52	ppm	100
39) 4-Chloroaniline	5.602	127	319210	24.09	ppm	100
40) 2,3-Dichloroaniline	6.469	161	249810	24.30	ppm	100
41) Caprolactam	5.902	55	123694	25.51	ppm	100
42) Hexachlorobutadiene	5.672	225	131635	28.42	ppm	100
43) 4-Chloro-3-methylphenol	6.046	107	247622	28.14	ppm	100
44) 2-Methylnaphthalene	6.190	141	388870	21.35	ppm	100
45) 1-Methylnaphthalene	6.287	141	433240	22.67	ppm	100
46) Dimethylnaphthalene	6.822	156	419116	21.78	ppm	100
48) Hexachlorocyclopentadiene	6.356	237	288570	69.13	ppm	100
49) 2,4,6-Trichlorophenol	6.474	196	142646	25.08	ppm	100
50) 2,4,5-Trichlorophenol	6.506	196	154778	25.80	ppm	100
52) 2-Chloronaphthalene	6.672	162	458736	22.34	ppm	100
53) Biphenyl	6.656	154	579690	20.23	ppm	100
54) 2-Nitroaniline	6.779	65	171857	31.09	ppm	100
55) Dimethylphthalate	6.982	163	524794	23.83	ppm	100
56) Acenaphthylene	7.105	152	691771	20.38	ppm	100
57) 2,6-Dinitrotoluene	7.041	165	111151	31.34	ppm	100
58) 3-Nitroaniline	7.217	138	133216	25.12	ppm	100
59) Acenaphthene	7.298	153	453872	20.29	ppm	100
60) 2,4-Dinitrophenol	7.330	184	98456	68.86	ppm	100
61) 4-Nitrophenol	7.410	109	98460	34.35	ppm	100
62) Dibenzofuran	7.490	168	627226	21.58	ppm	100
63) 2,4-Dinitrotoluene	7.479	165	157511	33.63	ppm	100
64) 2,3,4,6-Tetrachlorophenol	7.629	232	129427	27.64	ppm	100
65) Diethylphthalate	7.774	149	525475	23.57	ppm	100
66) Fluorene	7.870	166	514848	22.18	ppm	100
67) 4-Chlorophenyl-phenyle...	7.881	204	232983	23.03	ppm	100
68) 4-Nitroaniline	7.897	138	138775	24.65	ppm	100
70) 4,6-Dinitro-2-methylph...	7.934	198	79801	42.43	ppm	100
71) n-Nitrosodiphenylamine	8.014	169	364273	22.23	ppm	100
72) 1,2-Diphenylhydrazine	8.062	77	607320	25.87	ppm	100
74) 4-Bromophenyl-phenylether	8.442	248	138707	24.86	ppm	100
75) Hexachlorobenzene	8.506	284	165362	26.10	ppm	100
76) Pentachlorophenol	8.736	266	216160	59.96	ppm	100
77) Phenanthrene	8.977	178	684113	21.53	ppm	100

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474910.D
Acq On : 12 Aug 2018 2:10 pm
Operator : christc2
Sample : ic2304-25
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Aug 12 17:16:40 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:13:11 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

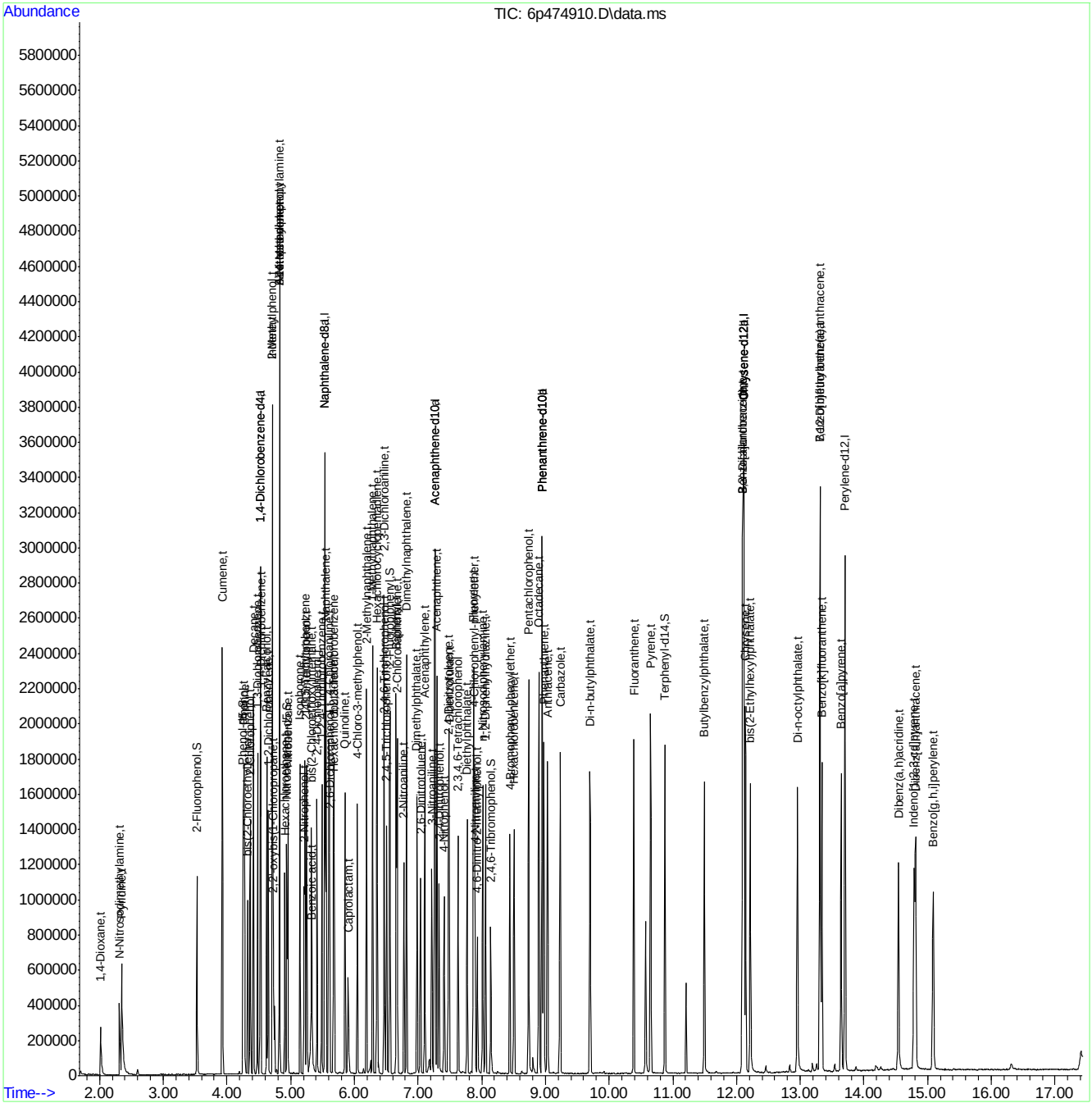
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
78) Anthracene	9.036	178	685710	21.87	ppm	100
79) Carbazole	9.234	167	672206	22.57	ppm	100
80) Di-n-butylphthalate	9.699	149	845143	24.90	ppm	100
81) Fluoranthene	10.389	202	772370	25.02	ppm	100
82) Octadecane	8.897	57	379882	25.03	ppm	100
84) Pyrene	10.651	202	783499	20.23	ppm	100
86) Butylbenzylphthalate	11.496	149	376934	22.72	ppm	100
87) Benzo[a]anthracene	12.101	228	773785	21.81	ppm	100
88) 3,3'-Dichlorobenzidine	12.095	252	279535	24.88	ppm	100
89) Chrysene	12.138	228	702490	20.04	ppm	100
90) bis(2-Ethylhexyl)phtha...	12.218	149	500052	23.31	ppm	100
92) Di-n-octylphthalate	12.956	149	843028	23.96	ppm	100
93) Benzo[b]fluoranthene	13.309	252	764936	22.31	ppm	100
94) Benzo[k]fluoranthene	13.342	252	637407	20.29	ppm	100
95) Benzo[a]pyrene	13.641	252	625341	21.61	ppm	100
96) Indeno[1,2,3-cd]pyrene	14.786	276	727148	20.24	ppm	100
97) Dibenz(a,h)acridine	14.545	279	537426	20.75	ppm	100
98) Dibenz[a,h]anthracene	14.812	278	626598	19.93	ppm	100
99) 7,12-Dimethylbenz(a)an...	13.309	256	352417	26.48	ppm	100
100) Benzo[g,h,i]perylene	15.085	276	560644	19.43	ppm	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474910.D
Acq On : 12 Aug 2018 2:10 pm
Operator : christc2
Sample : ic2304-25
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Aug 12 17:16:40 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:13:11 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474911.D
Acq On : 12 Aug 2018 2:53 pm
Operator : christc2
Sample : ic2304-10
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Aug 12 17:18:18 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	289823	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1185361	40.00	ppm	0.00
47) Acenaphthene-d10	7.265	164	611358	40.00	ppm	0.00
69) Phenanthrene-d10	8.950	188	1132626	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1131624	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1089190	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	289823	40.00	ppm	0.00
103) Acenaphthene-d10a	7.265	164	611358	40.00	ppm	0.00
105) Phenanthrene-d10a	8.950	188	1132626	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1131624	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1185361	40.00	ppm	0.00
113) Phenanthrene-d10b	8.950	188	1132626	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1131624	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	3.527	112	101788	9.82	ppm	0.00
Spiked Amount 50.000			Recovery =	19.64%		
8) Phenol-d5	4.254	99	135808	10.25	ppm	0.00
Spiked Amount 50.000			Recovery =	20.50%		
25) Nitrobenzene-d5	4.939	82	134752	12.25	ppm	0.00
Spiked Amount 50.000			Recovery =	24.50%		
51) 2-Fluorobiphenyl	6.559	172	231982	9.34	ppm	0.00
Spiked Amount 50.000			Recovery =	18.68%		
73) 2,4,6-Tribromophenol	8.143	330	33139	11.67	ppm	0.00
Spiked Amount 50.000			Recovery =	23.34%		
85) Terphenyl-d14	10.876	244	227983	8.77	ppm	0.00
Spiked Amount 50.000			Recovery =	17.54%		
106) 1-chlorooctadecane	0.000	57	0	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
2) 1,4-Dioxane	2.018	88	48244	9.78	ppm	84
3) Pyridine	2.355	79	131160	10.43	ppm	97
4) N-Nitrosodimethylamine	2.318	74	73740	10.24	ppm	99
6) Indene	4.714	116	181126	9.62	ppm	97
7) Cumene	3.928	105	297252	10.68	ppm	99
9) Phenol	4.259	94	160748	10.26	ppm	97
10) Aniline	4.276	93	181964	11.31	ppm	96
11) bis(2-Chloroethyl)ether	4.324	93	104742	10.18	ppm	98
12) 2-Chlorophenol	4.361	128	105624	9.54	ppm	91
13) Decane	4.415	43	119876	9.78	ppm	97
14) 1,3-Dichlorobenzene	4.479	146	117305	9.21	ppm	99
15) 1,4-Dichlorobenzene	4.532	146	117151	9.11	ppm	95
16) Benzyl alcohol	4.623	108	71731	9.99	ppm	93
17) 1,2-Dichlorobenzene	4.645	146	108478	8.94	ppm	100
18) Acetophenone	4.821	105	169914	10.81	ppm	95
19) 2-Methylphenol	4.709	108	107744	10.85	ppm	99
20) 2,2'-oxybis(1-Chloropr...	4.730	121	35701	10.12	ppm #	81
21) 3&4-Methylphenol	4.826	108	113058	10.94	ppm	99

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474911.D
Acq On : 12 Aug 2018 2:53 pm
Operator : christc2
Sample : ic2304-10
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Aug 12 17:18:18 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
22) n-Nitroso-di-n-propyla...	4.826	70	93032	11.51	ppm	95
23) Hexachloroethane	4.907	201	39217	10.98	ppm	83
26) Nitrobenzene	4.955	77	139819	11.93	ppm	96
27) Quinoline	5.848	129	214893	9.14	ppm	99
28) Isophorone	5.147	82	227902	10.87	ppm	99
29) 2-Nitrophenol	5.212	139	53681	10.90	ppm	96
30) 2,4-Dimethylphenol	5.249	107	126518	13.01	ppm	99
31) Benzoic acid	5.313	105	71784	11.01	ppm	94
32) bis(2-Chloroethoxy)met...	5.324	93	115453	9.96	ppm	99
33) 2,4-Dichlorophenol	5.415	162	87804	10.09	ppm	95
34) 2,6-Dichlorophenol	5.607	162	85021	9.86	ppm	98
35) 1,3,5-Trichlorobenzene	5.228	180	97241	9.30	ppm	93
36) 1,2,4-Trichlorobenzene	5.490	180	93900	9.44	ppm	95
37) 1,2,3-Trichlorobenzene	5.682	180	90901	9.33	ppm	97
38) Naphthalene	5.554	128	319313	9.22	ppm	99
39) 4-Chloroaniline	5.597	127	139650	9.82	ppm	96
40) 2,3-Dichloroaniline	6.468	161	106451	9.65	ppm	96
41) Caprolactam	5.885	55	51122	9.83	ppm	97
42) Hexachlorobutadiene	5.672	225	56175	11.31	ppm	96
43) 4-Chloro-3-methylphenol	6.046	107	108314	11.48	ppm	99
44) 2-Methylnaphthalene	6.190	141	165069	8.45	ppm	99
45) 1-Methylnaphthalene	6.287	141	185324	9.04	ppm	98
46) Dimethylnaphthalene	6.821	156	180214	8.73	ppm	99
48) Hexachlorocyclopentadiene	6.356	237	113363	26.12	ppm	95
49) 2,4,6-Trichlorophenol	6.468	196	58083	9.82	ppm	99
50) 2,4,5-Trichlorophenol	6.501	196	63887	10.24	ppm	97
52) 2-Chloronaphthalene	6.672	162	192091	9.00	ppm	97
53) Biphenyl	6.656	154	246702	8.28	ppm	100
54) 2-Nitroaniline	6.779	65	71560	12.45	ppm	97
55) Dimethylphthalate	6.982	163	222760	9.73	ppm	98
56) Acenaphthylene	7.105	152	301411	8.54	ppm	98
57) 2,6-Dinitrotoluene	7.035	165	48496	13.15	ppm	98
58) 3-Nitroaniline	7.217	138	56076	10.17	ppm	96
59) Acenaphthene	7.298	153	191314	8.23	ppm	98
60) 2,4-Dinitrophenol	7.330	184	32970	22.18	ppm	78
61) 4-Nitrophenol	7.404	109	39785	13.35	ppm	95
62) Dibenzofuran	7.485	168	272366	9.01	ppm	97
63) 2,4-Dinitrotoluene	7.474	165	64494	13.24	ppm	100
64) 2,3,4,6-Tetrachlorophenol	7.629	232	51716	10.62	ppm	96
65) Diethylphthalate	7.768	149	223446	9.64	ppm	99
66) Fluorene	7.870	166	219628	9.10	ppm	100
67) 4-Chlorophenyl-phenyle...	7.880	204	101192	9.62	ppm	99
68) 4-Nitroaniline	7.891	138	60001	10.25	ppm	95
70) 4,6-Dinitro-2-methylph...	7.934	198	28090	13.76	ppm	97
71) n-Nitrosodiphenylamine	8.014	169	158034	8.89	ppm	98
72) 1,2-Diphenylhydrazine	8.062	77	264053	10.36	ppm	98
74) 4-Bromophenyl-phenylether	8.442	248	58281	9.62	ppm	99
75) Hexachlorobenzene	8.506	284	71439	10.39	ppm	97
76) Pentachlorophenol	8.736	266	84286	21.54	ppm	94
77) Phenanthrene	8.972	178	295146	8.56	ppm	99

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474911.D
Acq On : 12 Aug 2018 2:53 pm
Operator : christc2
Sample : ic2304-10
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Aug 12 17:18:18 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

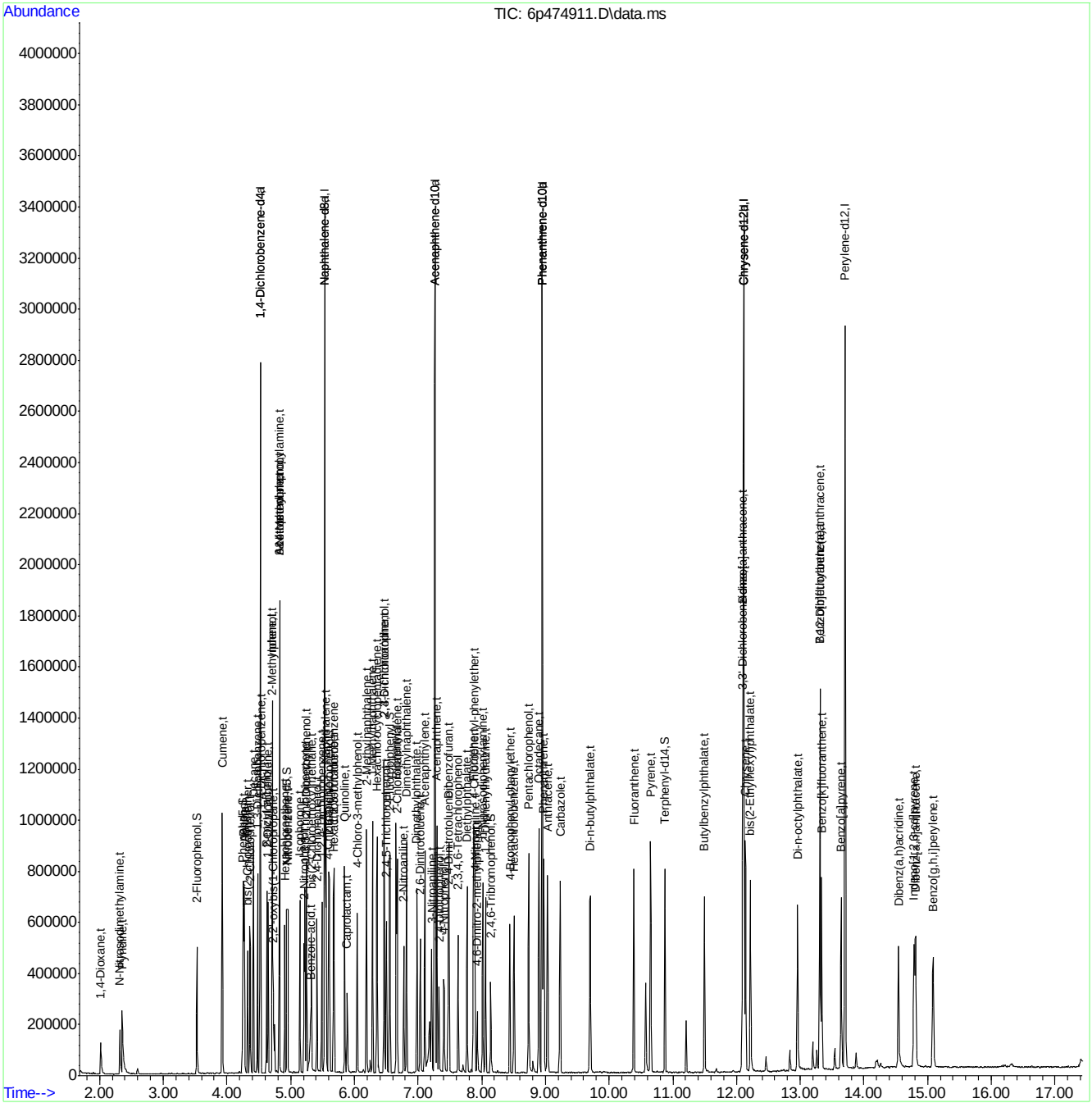
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
78) Anthracene	9.036	178	296492	8.71	ppm	98
79) Carbazole	9.234	167	290914	9.00	ppm	99
80) Di-n-butylphthalate	9.704	149	359472	9.76	ppm	98
81) Fluoranthene	10.389	202	318996	9.52	ppm	99
82) Octadecane	8.897	57	160034	9.71	ppm	99
84) Pyrene	10.651	202	337144	8.50	ppm	98
86) Butylbenzylphthalate	11.496	149	157131	9.25	ppm	97
87) Benzo[a]anthracene	12.101	228	321184	8.84	ppm	98
88) 3,3'-Dichlorobenzidine	12.095	252	112016	9.74	ppm	98
89) Chrysene	12.138	228	298172	8.30	ppm	98
90) bis(2-Ethylhexyl)phtha...	12.218	149	201876	9.19	ppm	98
92) Di-n-octylphthalate	12.956	149	336592	9.24	ppm	99
93) Benzo[b]fluoranthene	13.309	252	316364	8.92	ppm	99
94) Benzo[k]fluoranthene	13.336	252	269543	8.29	ppm	97
95) Benzo[a]pyrene	13.641	252	258001	8.62	ppm	99
96) Indeno[1,2,3-cd]pyrene	14.786	276	302011	8.12	ppm	95
97) Dibenz(a,h)acridine	14.545	279	215452	8.04	ppm	99
98) Dibenz[a,h]anthracene	14.812	278	258034	7.93	ppm	99
99) 7,12-Dimethylbenz(a)an...	13.309	256	142383	10.34	ppm	98
100) Benzo[g,h,i]perylene	15.085	276	233335	7.81	ppm	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474911.D
Acq On : 12 Aug 2018 2:53 pm
Operator : christc2
Sample : ic2304-10
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Aug 12 17:18:18 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration



M6P2304.M Sun Aug 12 17:18:28 2018 ACLIMS Page: 4

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474912.D
Acq On : 12 Aug 2018 3:17 pm
Operator : christc2
Sample : ic2304-5
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Aug 12 17:20:03 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	300385	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1187173	40.00	ppm	0.00
47) Acenaphthene-d10	7.260	164	630928	40.00	ppm	0.00
69) Phenanthrene-d10	8.945	188	1109640	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1141478	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1101594	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	300385	40.00	ppm	0.00
103) Acenaphthene-d10a	7.260	164	630928	40.00	ppm	0.00
105) Phenanthrene-d10a	8.945	188	1109640	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1141478	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1187173	40.00	ppm	0.00
113) Phenanthrene-d10b	8.945	188	1109640	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1141478	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	3.527	112	51695	4.81	ppm	0.00
Spiked Amount 50.000			Recovery	=	9.62%	
8) Phenol-d5	4.254	99	69102	5.03	ppm	0.00
Spiked Amount 50.000			Recovery	=	10.06%	
25) Nitrobenzene-d5	4.939	82	67348	6.11	ppm	0.00
Spiked Amount 50.000			Recovery	=	12.22%	
51) 2-Fluorobiphenyl	6.554	172	120600	4.71	ppm	0.00
Spiked Amount 50.000			Recovery	=	9.42%	
73) 2,4,6-Tribromophenol	8.143	330	16383	5.89	ppm	0.00
Spiked Amount 50.000			Recovery	=	11.78%	
85) Terphenyl-d14	10.876	244	113755	4.34	ppm	0.00
Spiked Amount 50.000			Recovery	=	8.68%	
106) 1-chlorooctadecane	0.000	57	0	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
2) 1,4-Dioxane	2.024	88	24974	4.88	ppm	87
3) Pyridine	2.361	79	59734	4.58	ppm	94
4) N-Nitrosodimethylamine	2.318	74	37757	5.06	ppm	96
6) Indene	4.714	116	95505	4.90	ppm	96
7) Cumene	3.928	105	157842	5.47	ppm	98
9) Phenol	4.260	94	84837	5.23	ppm	98
10) Aniline	4.276	93	97716	5.86	ppm	96
11) bis(2-Chloroethyl)ether	4.324	93	57135	5.36	ppm	95
12) 2-Chlorophenol	4.367	128	55853	4.86	ppm	93
13) Decane	4.415	43	61071	4.81	ppm	100
14) 1,3-Dichlorobenzene	4.479	146	59535	4.51	ppm	98
15) 1,4-Dichlorobenzene	4.532	146	63586	4.77	ppm	96
16) Benzyl alcohol	4.623	108	37634	5.06	ppm	89
17) 1,2-Dichlorobenzene	4.650	146	57165	4.54	ppm	95
18) Acetophenone	4.821	105	91014	5.59	ppm	90
19) 2-Methylphenol	4.709	108	55506	5.39	ppm	97
20) 2,2'-oxybis(1-Chloropr...	4.730	121	18469	5.05	ppm #	87
21) 3&4-Methylphenol	4.827	108	55656	5.20	ppm	99

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474912.D
Acq On : 12 Aug 2018 3:17 pm
Operator : christc2
Sample : ic2304-5
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Aug 12 17:20:03 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
22) n-Nitroso-di-n-propyla...	4.827	70	47791	5.71	ppm		96
23) Hexachloroethane	4.912	201	20842	5.63	ppm		91
26) Nitrobenzene	4.955	77	71567	6.10	ppm		97
27) Quinoline	5.848	129	110217	4.68	ppm		99
28) Isophorone	5.148	82	117490	5.59	ppm		99
29) 2-Nitrophenol	5.212	139	25852	5.24	ppm		92
30) 2,4-Dimethylphenol	5.249	107	62424	6.41	ppm		97
31) Benzoic acid	5.297	105	28718	4.40	ppm		93
32) bis(2-Chloroethoxy)met...	5.324	93	58952	5.08	ppm		97
33) 2,4-Dichlorophenol	5.415	162	43552	5.00	ppm		92
34) 2,6-Dichlorophenol	5.608	162	42921	4.97	ppm		94
35) 1,3,5-Trichlorobenzene	5.228	180	52089	4.97	ppm		99
36) 1,2,4-Trichlorobenzene	5.490	180	47652	4.78	ppm		94
37) 1,2,3-Trichlorobenzene	5.682	180	47954	4.91	ppm		95
38) Naphthalene	5.554	128	169501	4.89	ppm		98
39) 4-Chloroaniline	5.597	127	67782	4.76	ppm		92
40) 2,3-Dichloroaniline	6.463	161	56770	5.14	ppm		95
41) Caprolactam	5.886	55	25913	4.97	ppm		97
42) Hexachlorobutadiene	5.672	225	29506	5.93	ppm		97
43) 4-Chloro-3-methylphenol	6.041	107	51582	5.46	ppm		98
44) 2-Methylnaphthalene	6.191	141	84715	4.33	ppm		95
45) 1-Methylnaphthalene	6.287	141	95814	4.67	ppm		99
46) Dimethylnaphthalene	6.816	156	93968	4.54	ppm		98
48) Hexachlorocyclopentadiene	6.356	237	56420	12.60	ppm		96
49) 2,4,6-Trichlorophenol	6.469	196	31520	5.17	ppm		93
50) 2,4,5-Trichlorophenol	6.501	196	31100	4.83	ppm		91
52) 2-Chloronaphthalene	6.672	162	99590	4.52	ppm		95
53) Biphenyl	6.656	154	129395	4.21	ppm		99
54) 2-Nitroaniline	6.774	65	34661	5.84	ppm		94
55) Dimethylphthalate	6.982	163	115705	4.90	ppm		99
56) Acenaphthylene	7.105	152	157276	4.32	ppm		96
57) 2,6-Dinitrotoluene	7.036	165	22135	5.82	ppm		92
58) 3-Nitroaniline	7.212	138	27995	4.92	ppm		99
59) Acenaphthene	7.298	153	100221	4.18	ppm		97
60) 2,4-Dinitrophenol	7.330	184	12329	8.04	ppm	#	33
61) 4-Nitrophenol	7.405	109	18903	6.15	ppm		94
62) Dibenzofuran	7.485	168	142028	4.55	ppm		95
63) 2,4-Dinitrotoluene	7.474	165	31646	6.30	ppm		86
64) 2,3,4,6-Tetrachlorophenol	7.629	232	24895	4.95	ppm		94
65) Diethylphthalate	7.768	149	117384	4.91	ppm		99
66) Fluorene	7.870	166	111730	4.49	ppm		99
67) 4-Chlorophenyl-phenyle...	7.881	204	52362	4.82	ppm		92
68) 4-Nitroaniline	7.886	138	27027	4.47	ppm		95
70) 4,6-Dinitro-2-methylph...	7.929	198	9924	4.96	ppm		92
71) n-Nitrosodiphenylamine	8.014	169	78786	4.52	ppm		97
72) 1,2-Diphenylhydrazine	8.057	77	133882	5.36	ppm		95
74) 4-Bromophenyl-phenylether	8.437	248	30098	5.07	ppm		91
75) Hexachlorobenzene	8.506	284	37461	5.56	ppm		93
76) Pentachlorophenol	8.736	266	40549	10.58	ppm		95
77) Phenanthrene	8.972	178	154198	4.56	ppm		98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474912.D
Acq On : 12 Aug 2018 3:17 pm
Operator : christc2
Sample : ic2304-5
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Aug 12 17:20:03 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

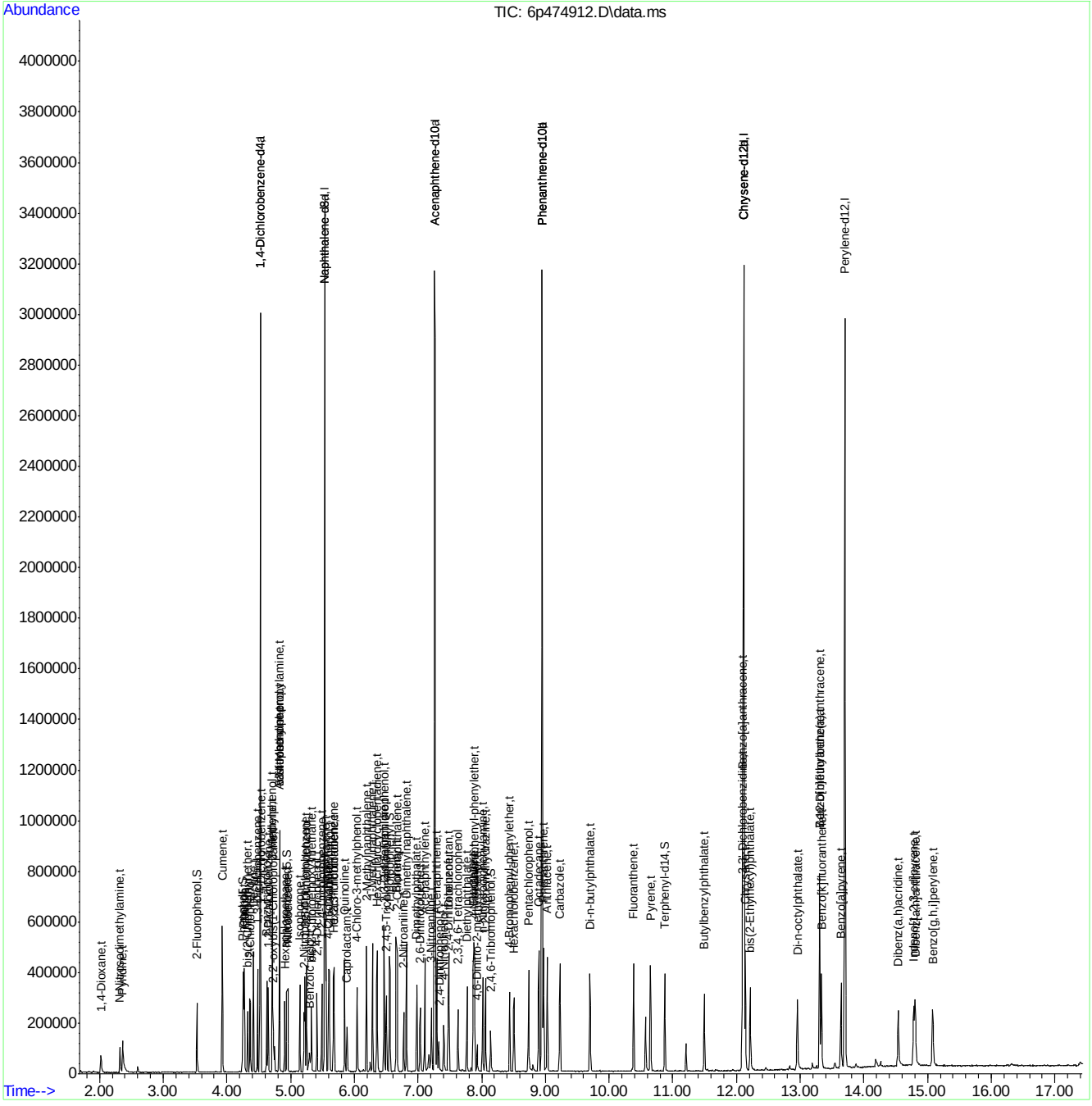
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
78) Anthracene	9.031	178	149712	4.49	ppm	99
79) Carbazole	9.229	167	147823	4.67	ppm	99
80) Di-n-butylphthalate	9.699	149	175176	4.85	ppm	98
81) Fluoranthene	10.384	202	161914	4.93	ppm	98
82) Octadecane	8.897	57	78557	4.87	ppm	97
84) Pyrene	10.651	202	172446	4.31	ppm	96
86) Butylbenzylphthalate	11.496	149	73202	4.27	ppm	95
87) Benzo[a]anthracene	12.095	228	164068	4.48	ppm	98
88) 3,3'-Dichlorobenzidine	12.090	252	55198	4.76	ppm	93
89) Chrysene	12.138	228	156984	4.33	ppm	95
90) bis(2-Ethylhexyl)phtha...	12.218	149	98639	4.45	ppm	92
92) Di-n-octylphthalate	12.957	149	154954	4.21	ppm	99
93) Benzo[b]fluoranthene	13.304	252	155390	4.33	ppm	97
94) Benzo[k]fluoranthene	13.331	252	144565	4.40	ppm	96
95) Benzo[a]pyrene	13.641	252	136615	4.51	ppm	99
96) Indeno[1,2,3-cd]pyrene	14.780	276	149345	3.97	ppm	98
97) Dibenz(a,h)acridine	14.540	279	108227	3.99	ppm	100
98) Dibenz[a,h]anthracene	14.807	278	132376	4.02	ppm	98
99) 7,12-Dimethylbenz(a)an...	13.304	256	70252	5.04	ppm	97
100) Benzo[g,h,i]perylene	15.080	276	120776	4.00	ppm	97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474912.D
Acq On : 12 Aug 2018 3:17 pm
Operator : christc2
Sample : ic2304-5
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Aug 12 17:20:03 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474913.D
Acq On : 12 Aug 2018 3:42 pm
Operator : christc2
Sample : ic2304-2
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Aug 12 17:21:45 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	289842	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1174635	40.00	ppm	0.00
47) Acenaphthene-d10	7.260	164	616796	40.00	ppm	0.00
69) Phenanthrene-d10	8.945	188	1111409	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1131512	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1125300	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	289842	40.00	ppm	0.00
103) Acenaphthene-d10a	7.260	164	616796	40.00	ppm	0.00
105) Phenanthrene-d10a	8.945	188	1111409	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1131512	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1174635	40.00	ppm	0.00
113) Phenanthrene-d10b	8.945	188	1111409	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1131512	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	3.527	112	20464	1.97	ppm	0.00
Spiked Amount 50.000			Recovery =	3.94%		
8) Phenol-d5	4.249	99	26285	1.98	ppm	0.00
Spiked Amount 50.000			Recovery =	3.96%		
25) Nitrobenzene-d5	4.939	82	28156	2.58	ppm	0.00
Spiked Amount 50.000			Recovery =	5.16%		
51) 2-Fluorobiphenyl	6.554	172	46994	1.88	ppm	0.00
Spiked Amount 50.000			Recovery =	3.76%		
73) 2,4,6-Tribromophenol	8.143	330	5467	1.96	ppm	0.00
Spiked Amount 50.000			Recovery =	3.92%		
85) Terphenyl-d14	10.876	244	43807	1.68	ppm	0.00
Spiked Amount 50.000			Recovery =	3.36%		
106) 1-chlorooctadecane	0.000	57	0	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
2) 1,4-Dioxane	2.024	88	10464	2.12	ppm	91
3) Pyridine	2.371	79	23583	1.87	ppm	97
4) N-Nitrosodimethylamine	2.323	74	14414	2.00	ppm	94
6) Indene	4.714	116	36143	1.92	ppm	98
7) Cumene	3.928	105	63806	2.29	ppm	99
9) Phenol	4.259	94	32017	2.04	ppm	98
10) Aniline	4.275	93	37065	2.30	ppm	96
11) bis(2-Chloroethyl)ether	4.324	93	21260	2.07	ppm	99
12) 2-Chlorophenol	4.366	128	21873	1.97	ppm	95
13) Decane	4.415	43	24551	2.00	ppm	99
14) 1,3-Dichlorobenzene	4.479	146	23968	1.88	ppm	99
15) 1,4-Dichlorobenzene	4.532	146	24401	1.90	ppm	93
16) Benzyl alcohol	4.623	108	13959	1.94	ppm	95
17) 1,2-Dichlorobenzene	4.650	146	22781	1.88	ppm	97
18) Acetophenone	4.821	105	36013	2.29	ppm	89
19) 2-Methylphenol	4.709	108	20884	2.10	ppm	100
20) 2,2'-oxybis(1-Chloropr...	4.730	121	7268	2.06	ppm #	90
21) 3&4-Methylphenol	4.826	108	22201	2.15	ppm	98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474913.D
Acq On : 12 Aug 2018 3:42 pm
Operator : christc2
Sample : ic2304-2
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Aug 12 17:21:45 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
22) n-Nitroso-di-n-propyla...	4.826	70	18692	2.31	ppm	96
23) Hexachloroethane	4.912	201	7711	2.16	ppm	96
26) Nitrobenzene	4.955	77	27976	2.41	ppm	95
27) Quinoline	5.848	129	42635	1.83	ppm	96
28) Isophorone	5.147	82	47137	2.27	ppm	98
29) 2-Nitrophenol	5.212	139	8744	1.79	ppm	89
30) 2,4-Dimethylphenol	5.249	107	23491	2.44	ppm	97
31) Benzoic acid	5.286	105	10346	1.60	ppm	93
32) bis(2-Chloroethoxy)met...	5.324	93	24521	2.13	ppm	94
33) 2,4-Dichlorophenol	5.415	162	16883	1.96	ppm	94
34) 2,6-Dichlorophenol	5.607	162	16840	1.97	ppm	97
35) 1,3,5-Trichlorobenzene	5.228	180	20821	2.01	ppm	90
36) 1,2,4-Trichlorobenzene	5.490	180	19479	1.98	ppm	98
37) 1,2,3-Trichlorobenzene	5.682	180	18771	1.94	ppm	97
38) Naphthalene	5.554	128	65561	1.91	ppm	97
39) 4-Chloroaniline	5.597	127	28124	2.00	ppm	94
40) 2,3-Dichloroaniline	6.468	161	20890	1.91	ppm	97
41) Caprolactam	5.880	55	9372	1.82	ppm	92
42) Hexachlorobutadiene	5.671	225	11831	2.40	ppm	93
43) 4-Chloro-3-methylphenol	6.041	107	19242	2.06	ppm	90
44) 2-Methylnaphthalene	6.190	141	34175	1.77	ppm	99
45) 1-Methylnaphthalene	6.287	141	38261	1.88	ppm	97
46) Dimethylnaphthalene	6.821	156	36152	1.77	ppm	94
48) Hexachlorocyclopentadiene	6.356	237	20178	4.61	ppm	93
49) 2,4,6-Trichlorophenol	6.468	196	12064	2.02	ppm	84
50) 2,4,5-Trichlorophenol	6.501	196	12106	1.92	ppm	96
52) 2-Chloronaphthalene	6.672	162	41702	1.94	ppm	95
53) Biphenyl	6.656	154	51205	1.70	ppm	98
54) 2-Nitroaniline	6.773	65	12754	2.20	ppm	90
55) Dimethylphthalate	6.982	163	45519	1.97	ppm	99
56) Acenaphthylene	7.105	152	60907	1.71	ppm	99
57) 2,6-Dinitrotoluene	7.035	165	7958	2.14	ppm	96
58) 3-Nitroaniline	7.212	138	9795	1.76	ppm	87
59) Acenaphthene	7.297	153	40077	1.71	ppm	95
60) 2,4-Dinitrophenol	7.324	184	3155	2.10	ppm	74
61) 4-Nitrophenol	7.404	109	6323	2.10	ppm	92
62) Dibenzofuran	7.485	168	55556	1.82	ppm	94
63) 2,4-Dinitrotoluene	7.474	165	9442	1.92	ppm	91
64) 2,3,4,6-Tetrachlorophenol	7.629	232	9621	1.96	ppm	98
65) Diethylphthalate	7.763	149	44290	1.89	ppm	96
66) Fluorene	7.870	166	43490	1.79	ppm	95
67) 4-Chlorophenyl-phenyle...	7.880	204	21123	1.99	ppm	97
68) 4-Nitroaniline	7.886	138	9930	1.68	ppm	93
70) 4,6-Dinitro-2-methylph...	7.929	198	2654	1.33	ppm	87
71) n-Nitrosodiphenylamine	8.014	169	29644	1.70	ppm	94
72) 1,2-Diphenylhydrazine	8.057	77	53026	2.12	ppm	95
74) 4-Bromophenyl-phenylether	8.442	248	10837	1.82	ppm	81
75) Hexachlorobenzene	8.506	284	14860	2.20	ppm	94
76) Pentachlorophenol	8.736	266	13294	3.46	ppm	92
77) Phenanthrene	8.972	178	61314	1.81	ppm	98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474913.D
Acq On : 12 Aug 2018 3:42 pm
Operator : christc2
Sample : ic2304-2
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Aug 12 17:21:45 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

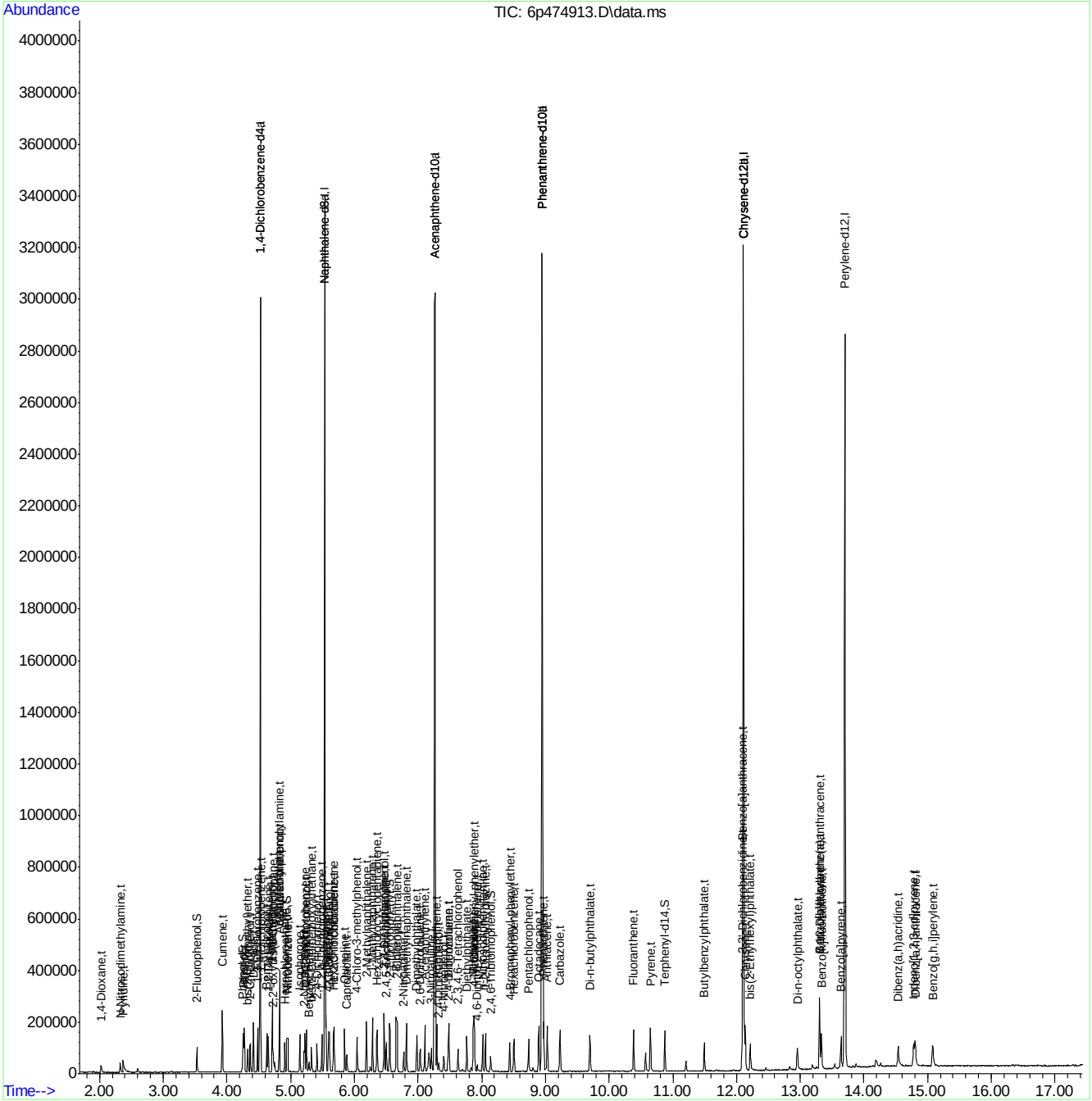
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
78) Anthracene	9.030	178	60134	1.80	ppm	99
79) Carbazole	9.228	167	56624	1.79	ppm	99
80) Di-n-butylphthalate	9.699	149	67320	1.86	ppm	99
81) Fluoranthene	10.384	202	60606	1.84	ppm	98
82) Octadecane	8.897	57	30127	1.86	ppm	96
84) Pyrene	10.651	202	66386	1.67	ppm	99
86) Butylbenzylphthalate	11.491	149	25309	1.49	ppm	93
87) Benzo[a]anthracene	12.095	228	62324	1.72	ppm	97
88) 3,3'-Dichlorobenzidine	12.090	252	18731	1.63	ppm	95
89) Chrysene	12.138	228	62305	1.74	ppm	98
90) bis(2-Ethylhexyl)phtha...	12.218	149	32857	1.50	ppm	98
92) Di-n-octylphthalate	12.956	149	49649	1.32	ppm	97
93) Benzo[b]fluoranthene	13.304	252	60263	1.64	ppm	99
94) Benzo[k]fluoranthene	13.331	252	54178	1.61	ppm	98
95) Benzo[a]pyrene	13.641	252	47862	1.55	ppm	98
96) Indeno[1,2,3-cd]pyrene	14.780	276	54456	1.42	ppm	93
97) Dibenz(a,h)acridine	14.540	279	39058	1.41	ppm	93
98) Dibenz[a,h]anthracene	14.807	278	46758	1.39	ppm	98
99) 7,12-Dimethylbenz(a)an...	13.304	256	25742	1.81	ppm	97
100) Benzo[g,h,i]perylene	15.080	276	47382	1.54	ppm	97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474913.D
Acq On : 12 Aug 2018 3:42 pm
Operator : christc2
Sample : ic2304-2
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Aug 12 17:21:45 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474914.D
Acq On : 12 Aug 2018 4:07 pm
Operator : christc2
Sample : ic2304-1
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 12 17:22:06 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	285125	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1159144	40.00	ppm	0.00
47) Acenaphthene-d10	7.260	164	603409	40.00	ppm	0.00
69) Phenanthrene-d10	8.945	188	1114433	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1103584	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1081517	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	285125	40.00	ppm	0.00
103) Acenaphthene-d10a	7.260	164	603409	40.00	ppm	0.00
105) Phenanthrene-d10a	8.945	188	1114433	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1103584	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1159144	40.00	ppm	0.00
113) Phenanthrene-d10b	8.945	188	1114433	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1103584	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	3.527	112	10301	1.01	ppm	0.00
Spiked Amount 50.000			Recovery =	2.02%		
8) Phenol-d5	4.249	99	12868	0.99	ppm	0.00
Spiked Amount 50.000			Recovery =	1.98%		
25) Nitrobenzene-d5	4.939	82	13067	1.21	ppm	0.00
Spiked Amount 50.000			Recovery =	2.42%		
51) 2-Fluorobiphenyl	6.554	172	23268	0.95	ppm	0.00
Spiked Amount 50.000			Recovery =	1.90%		
73) 2,4,6-Tribromophenol	8.143	330	2809	1.01	ppm	0.00
Spiked Amount 50.000			Recovery =	2.02%		
85) Terphenyl-d14	10.876	244	21485	0.85	ppm	0.00
Spiked Amount 50.000			Recovery =	1.70%		
106) 1-chlorooctadecane	0.000	57	0	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
2) 1,4-Dioxane	2.029	88	5357	1.10	ppm	# 60
3) Pyridine	2.382	79	11082	0.90	ppm	94
4) N-Nitrosodimethylamine	2.329	74	7336	1.04	ppm	92
6) Indene	4.714	116	18868	1.02	ppm	96
7) Cumene	3.928	105	31015	1.13	ppm	98
9) Phenol	4.260	94	15925	1.03	ppm	99
10) Aniline	4.276	93	18539	1.17	ppm	90
11) bis(2-Chloroethyl)ether	4.324	93	10766	1.06	ppm	95
12) 2-Chlorophenol	4.367	128	10989	1.01	ppm	94
13) Decane	4.415	43	13078	1.08	ppm	97
14) 1,3-Dichlorobenzene	4.479	146	11796	0.94	ppm	98
15) 1,4-Dichlorobenzene	4.532	146	13523	1.07	ppm	97
16) Benzyl alcohol	4.623	108	6687	0.95	ppm	96
17) 1,2-Dichlorobenzene	4.650	146	12156	1.02	ppm	97
18) Acetophenone	4.821	105	17983	1.16	ppm	89
19) 2-Methylphenol	4.709	108	11552	1.18	ppm	88
20) 2,2'-oxybis(1-Chloropr...	4.725	121	4140	1.19	ppm	# 58
21) 3&4-Methylphenol	4.827	108	10775	1.06	ppm	97

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474914.D
Acq On : 12 Aug 2018 4:07 pm
Operator : christc2
Sample : ic2304-1
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 12 17:22:06 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
22) n-Nitroso-di-n-propyla...	4.827	70	9219	1.16	ppm	92
23) Hexachloroethane	4.912	201	4272	1.22	ppm	93
26) Nitrobenzene	4.955	77	13757	1.20	ppm	88
27) Quinoline	5.848	129	21231	0.92	ppm	97
28) Isophorone	5.147	82	21810	1.06	ppm	98
29) 2-Nitrophenol	5.212	139	4136	0.86	ppm	94
30) 2,4-Dimethylphenol	5.249	107	11611	1.22	ppm	88
31) Benzoic acid	5.281	105	4815	0.76	ppm	96
32) bis(2-Chloroethoxy)met...	5.324	93	12369	1.09	ppm	91
33) 2,4-Dichlorophenol	5.410	162	8985	1.06	ppm	81
34) 2,6-Dichlorophenol	5.607	162	8450	1.00	ppm	95
35) 1,3,5-Trichlorobenzene	5.228	180	10929	1.07	ppm	91
36) 1,2,4-Trichlorobenzene	5.490	180	10050	1.03	ppm	97
37) 1,2,3-Trichlorobenzene	5.682	180	9961	1.04	ppm	94
38) Naphthalene	5.554	128	35089	1.04	ppm	96
39) 4-Chloroaniline	5.597	127	13932	1.00	ppm	94
40) 2,3-Dichloroaniline	6.463	161	11543	1.07	ppm	96
41) Caprolactam	5.880	55	4940	0.97	ppm	88
42) Hexachlorobutadiene	5.672	225	6162	1.27	ppm	95
43) 4-Chloro-3-methylphenol	6.041	107	10382	1.12	ppm	86
44) 2-Methylnaphthalene	6.190	141	16789	0.88	ppm	95
45) 1-Methylnaphthalene	6.287	141	18037	0.90	ppm	95
46) Dimethylnaphthalene	6.816	156	16506	0.82	ppm	98
48) Hexachlorocyclopentadiene	6.356	237	8805	2.06	ppm	95
49) 2,4,6-Trichlorophenol	6.469	196	5284	0.91	ppm	90
50) 2,4,5-Trichlorophenol	6.501	196	5862	0.95	ppm	91
52) 2-Chloronaphthalene	6.672	162	19500	0.93	ppm	96
53) Biphenyl	6.656	154	25029	0.85	ppm	95
54) 2-Nitroaniline	6.773	65	5843	1.03	ppm	79
55) Dimethylphthalate	6.982	163	22423	0.99	ppm	98
56) Acenaphthylene	7.105	152	29920	0.86	ppm	97
57) 2,6-Dinitrotoluene	7.036	165	3801	1.04	ppm	89
58) 3-Nitroaniline	7.212	138	4030	0.74	ppm	91
59) Acenaphthene	7.298	153	20286	0.88	ppm	93
60) 2,4-Dinitrophenol	7.324	184	1096	0.75	ppm	70
61) 4-Nitrophenol	7.405	109	2793	0.95	ppm	96
62) Dibenzofuran	7.485	168	27887	0.93	ppm	96
63) 2,4-Dinitrotoluene	7.474	165	4418	0.92	ppm	98
64) 2,3,4,6-Tetrachlorophenol	7.629	232	4550	0.95	ppm	83
65) Diethylphthalate	7.763	149	21724	0.95	ppm	97
66) Fluorene	7.870	166	21177	0.89	ppm	94
67) 4-Chlorophenyl-phenyle...	7.881	204	10222	0.98	ppm	98
68) 4-Nitroaniline	7.886	138	4309	0.75	ppm	82
70) 4,6-Dinitro-2-methylph...	7.929	198	1114	0.55	ppm	92
71) n-Nitrosodiphenylamine	8.014	169	15075	0.86	ppm	96
72) 1,2-Diphenylhydrazine	8.057	77	25463	1.02	ppm	96
74) 4-Bromophenyl-phenylether	8.442	248	5999	1.01	ppm	95
75) Hexachlorobenzene	8.506	284	7328	1.08	ppm	94
76) Pentachlorophenol	8.736	266	5825	1.51	ppm	91
77) Phenanthrene	8.972	178	30399	0.90	ppm	98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474914.D
Acq On : 12 Aug 2018 4:07 pm
Operator : christc2
Sample : ic2304-1
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 12 17:22:06 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration

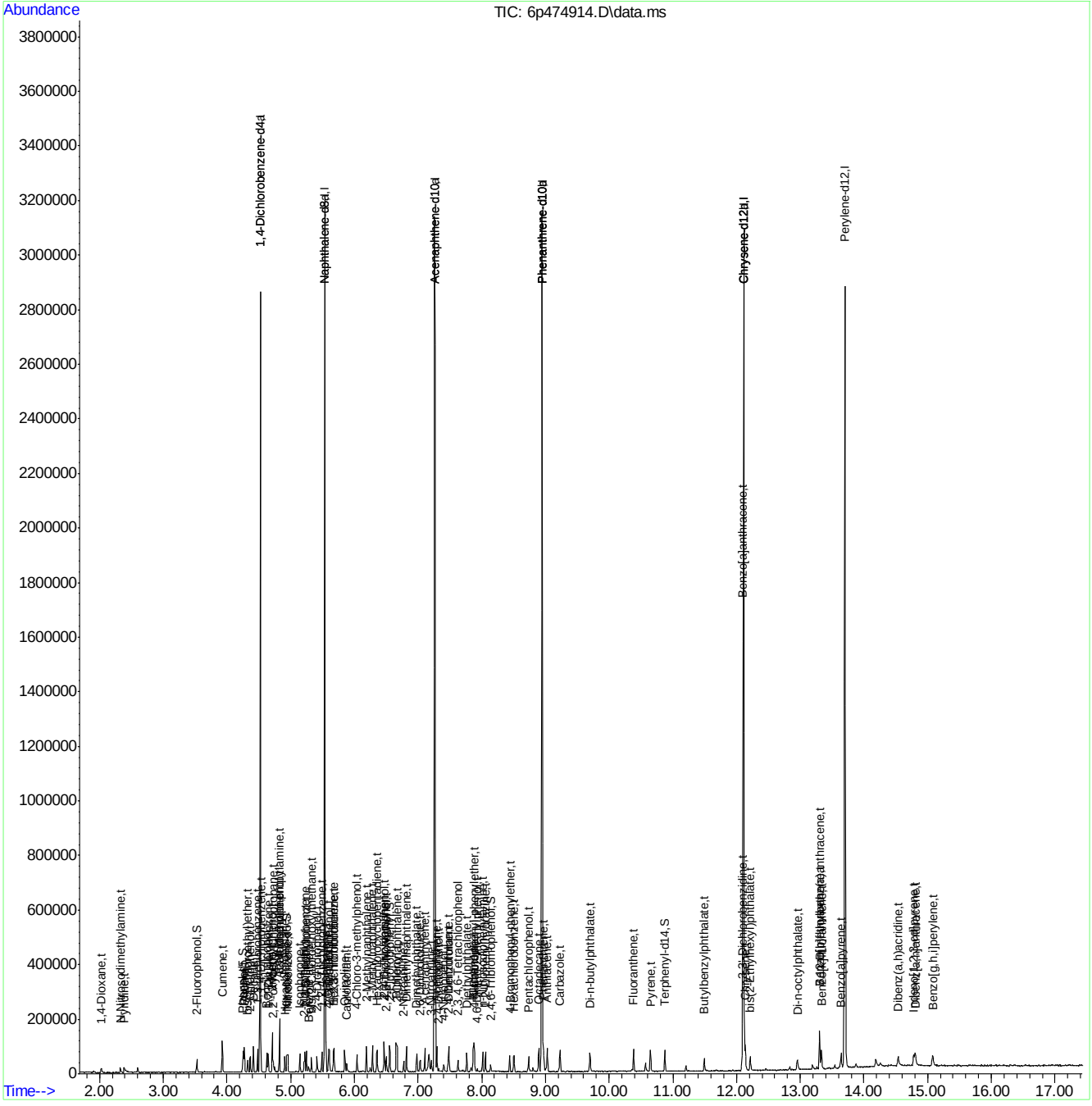
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
78) Anthracene	9.031	178	28700	0.86	ppm	96
79) Carbazole	9.228	167	27027	0.85	ppm	96
80) Di-n-butylphthalate	9.699	149	31132	0.86	ppm	95
81) Fluoranthene	10.384	202	30336	0.92	ppm	98
82) Octadecane	8.897	57	14262	0.88	ppm	91
84) Pyrene	10.651	202	32440	0.84	ppm	95
86) Butylbenzylphthalate	11.496	149	11622	0.70	ppm	91
87) Benzo[a]anthracene	12.101	228	33670	0.95	ppm	98
88) 3,3'-Dichlorobenzidine	12.090	252	8784	0.78	ppm	90
89) Chrysene	12.138	228	30068	0.86	ppm	97
90) bis(2-Ethylhexyl)phtha...	12.213	149	15426	0.72	ppm	97
92) Di-n-octylphthalate	12.956	149	21509	0.59	ppm	97
93) Benzo[b]fluoranthene	13.304	252	30033	0.85	ppm	99
94) Benzo[k]fluoranthene	13.331	252	26705	0.83	ppm	90
95) Benzo[a]pyrene	13.641	252	22705	0.76	ppm	88
96) Indeno[1,2,3-cd]pyrene	14.786	276	26589	0.72	ppm	86
97) Dibenz(a,h)acridine	14.534	279	17768	0.67	ppm	98
98) Dibenz[a,h]anthracene	14.807	278	23778	0.74	ppm	91
99) 7,12-Dimethylbenz(a)an...	13.304	256	11753	0.86	ppm	93
100) Benzo[g,h,i]perylene	15.080	276	22689	0.77	ppm	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474914.D
Acq On : 12 Aug 2018 4:07 pm
Operator : christc2
Sample : ic2304-1
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 12 17:22:06 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:15:12 2018
QLast Update : Sun Aug 12 17:15:12 2018
Response via : Initial Calibration



Manual Integrations APPROVED (compounds with "m" flag)
Nina Pandya
08/14/18 10:36

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474915.D
Acq On : 12 Aug 2018 4:44 pm
Operator : christc2
Sample : icv2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 12 17:42:42 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:29:43 2018
QLast Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.521	152	357834	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1423764	40.00	ppm	0.00
47) Acenaphthene-d10	7.271	164	736664	40.00	ppm	0.01
69) Phenanthrene-d10	8.956	188	1378056	40.00	ppm	0.01
83) Chrysene-d12	12.122	240	1461036	40.00	ppm	0.01
91) Perylene-d12	13.710	264	1187498	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.521	152	357834	40.00	ppm	0.00
103) Acenaphthene-d10a	7.271	164	736664	40.00	ppm	0.01
105) Phenanthrene-d10a	8.956	188	1378056	40.00	ppm	0.01
109) Chrysene-d12a	12.122	240	1461036	40.00	ppm	0.01
111) Naphthalene-d8a	5.538	136	1423764	40.00	ppm	0.00
113) Phenanthrene-d10b	8.956	188	1378056	40.00	ppm	0.01
115) Chrysene-d12b	12.122	240	1461295	40.00	ppm	0.01
System Monitoring Compounds						
5) 2-Fluorophenol	3.532	112	643168	51.34	ppm	0.00
Spiked Amount 50.000			Recovery = 102.68%			
8) Phenol-d5	4.259	99	828015	50.74	ppm	0.01
Spiked Amount 50.000			Recovery = 101.48%			
25) Nitrobenzene-d5	4.944	82	811535	49.55	ppm	0.00
Spiked Amount 50.000			Recovery = 99.10%			
51) 2-Fluorobiphenyl	6.565	172	1400485	50.78	ppm	0.01
Spiked Amount 50.000			Recovery = 101.56%			
73) 2,4,6-Tribromophenol	8.148	330	226213	54.81	ppm	0.00
Spiked Amount 50.000			Recovery = 109.62%			
85) Terphenyl-d14	10.881	244	1487845	51.38	ppm	0.00
Spiked Amount 50.000			Recovery = 102.76%			
106) 1-chlorooctadecane	0.000	57	0d	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
2) 1,4-Dioxane	2.018	88	288826	48.38	ppm	93
3) Pyridine	2.345	79	749946	50.66	ppm	97
4) N-Nitrosodimethylamine	2.318	74	439575	50.33	ppm	96
9) Phenol	4.270	94	914088	46.98	ppm	91
10) Aniline	4.281	93	908500	40.99	ppm	95
11) bis(2-Chloroethyl)ether	4.329	93	654564	51.20	ppm	96
12) 2-Chlorophenol	4.366	128	619115	47.56	ppm	96
14) 1,3-Dichlorobenzene	4.479	146	670499	47.32	ppm	96
15) 1,4-Dichlorobenzene	4.532	146	690588	46.94	ppm	100
16) Benzyl alcohol	4.628	108	469792	53.97	ppm	93
17) 1,2-Dichlorobenzene	4.650	146	646372	47.78	ppm	99
18) Acetophenone	4.826	105	965252	46.10	ppm	86
19) 2-Methylphenol	4.714	108	623209	47.62	ppm	98
20) 2,2'-oxybis(1-Chloropr...	4.730	121	223833	51.57	ppm #	88
21) 3&4-Methylphenol	4.832	108	646443	48.17	ppm	91
22) n-Nitroso-di-n-propyla...	4.832	70	507502	46.28	ppm	96
23) Hexachloroethane	4.912	201	239761	49.12	ppm	97
26) Nitrobenzene	4.960	77	783692	47.11	ppm	97

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474915.D
Acq On : 12 Aug 2018 4:44 pm
Operator : christc2
Sample : icv2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 12 17:42:42 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:29:43 2018
QLast Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
28) Isophorone	5.153	82	1434909	51.87	ppm	99
29) 2-Nitrophenol	5.217	139	319550	50.53	ppm	88
30) 2,4-Dimethylphenol	5.254	107	560101	37.88	ppm	95
32) bis(2-Chloroethoxy)met...	5.329	93	775420	54.75	ppm	98
33) 2,4-Dichlorophenol	5.420	162	516823	48.76	ppm	97
34) 2,6-Dichlorophenol	5.613	162	491408	47.30	ppm	97
36) 1,2,4-Trichlorobenzene	5.490	180	545088	47.96	ppm	94
38) Naphthalene	5.559	128	1841544	47.13	ppm	100
39) 4-Chloroaniline	5.607	127	728921	43.85	ppm	97
41) Caprolactam	5.923	55	296457	47.34	ppm	98
42) Hexachlorobutadiene	5.677	225	347566	49.16	ppm	96
43) 4-Chloro-3-methylphenol	6.057	107	629635	49.58	ppm	96
44) 2-Methylnaphthalene	6.196	141	1033465	50.93	ppm	98
45) 1-Methylnaphthalene	6.292	141	1029086	45.61	ppm	100
48) Hexachlorocyclopentadiene	6.356	237	243165	34.80	ppm	91
49) 2,4,6-Trichlorophenol	6.474	196	346877	47.36	ppm	97
50) 2,4,5-Trichlorophenol	6.511	196	380652	49.85	ppm	94
52) 2-Chloronaphthalene	6.682	162	1239486	52.97	ppm	98
53) Biphenyl	6.666	154	1415827	47.57	ppm	99
54) 2-Nitroaniline	6.789	65	500449	59.99	ppm	91
55) Dimethylphthalate	6.993	163	1329288	49.90	ppm	99
56) Acenaphthylene	7.116	152	1682638	46.76	ppm	100
57) 2,6-Dinitrotoluene	7.046	165	300521	55.23	ppm	99
58) 3-Nitroaniline	7.228	138	327329	50.84	ppm	97
59) Acenaphthene	7.303	153	1083903	46.40	ppm	98
60) 2,4-Dinitrophenol	7.335	184	140203	52.03	ppm	99
61) 4-Nitrophenol	7.420	109	244869	50.88	ppm	98
62) Dibenzofuran	7.495	168	1612801	49.33	ppm	91
63) 2,4-Dinitrotoluene	7.485	165	417516	50.46	ppm	96
64) 2,3,4,6-Tetrachlorophenol	7.634	232	321980	51.08	ppm	96
65) Diethylphthalate	7.779	149	1347943	50.39	ppm	98
66) Fluorene	7.875	166	1322852	50.04	ppm	100
67) 4-Chlorophenyl-phenyle...	7.886	204	621994	50.80	ppm	91
68) 4-Nitroaniline	7.907	138	315354	48.00	ppm	96
70) 4,6-Dinitro-2-methylph...	7.945	198	198365	43.20	ppm	96
71) n-Nitrosodiphenylamine	8.025	169	1100277	57.28	ppm	98
72) 1,2-Diphenylhydrazine	8.068	77	1571117	48.77	ppm	99
74) 4-Bromophenyl-phenylether	8.447	248	375205	50.73	ppm	92
75) Hexachlorobenzene	8.517	284	449380	49.56	ppm	79
76) Pentachlorophenol	8.742	266	257509	45.05	ppm	95
77) Phenanthrene	8.982	178	1819622	49.14	ppm	99
78) Anthracene	9.041	178	1814768	49.33	ppm	99
79) Carbazole	9.239	167	1767613	49.77	ppm	98
80) Di-n-butylphthalate	9.710	149	2242048	51.09	ppm	99
81) Fluoranthene	10.394	202	2031252	50.87	ppm	99
84) Pyrene	10.662	202	2049210	47.89	ppm	99
86) Butylbenzylphthalate	11.501	149	1012646	53.03	ppm	98
87) Benzo[a]anthracene	12.106	228	2075826	49.06	ppm	100
88) 3,3'-Dichlorobenzidine	12.101	252	770222	50.53	ppm	96
89) Chrysene	12.154	228	1829233	46.79	ppm	97

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474915.D
Acq On : 12 Aug 2018 4:44 pm
Operator : christc2
Sample : icv2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 12 17:42:42 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:29:43 2018
QLast Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration

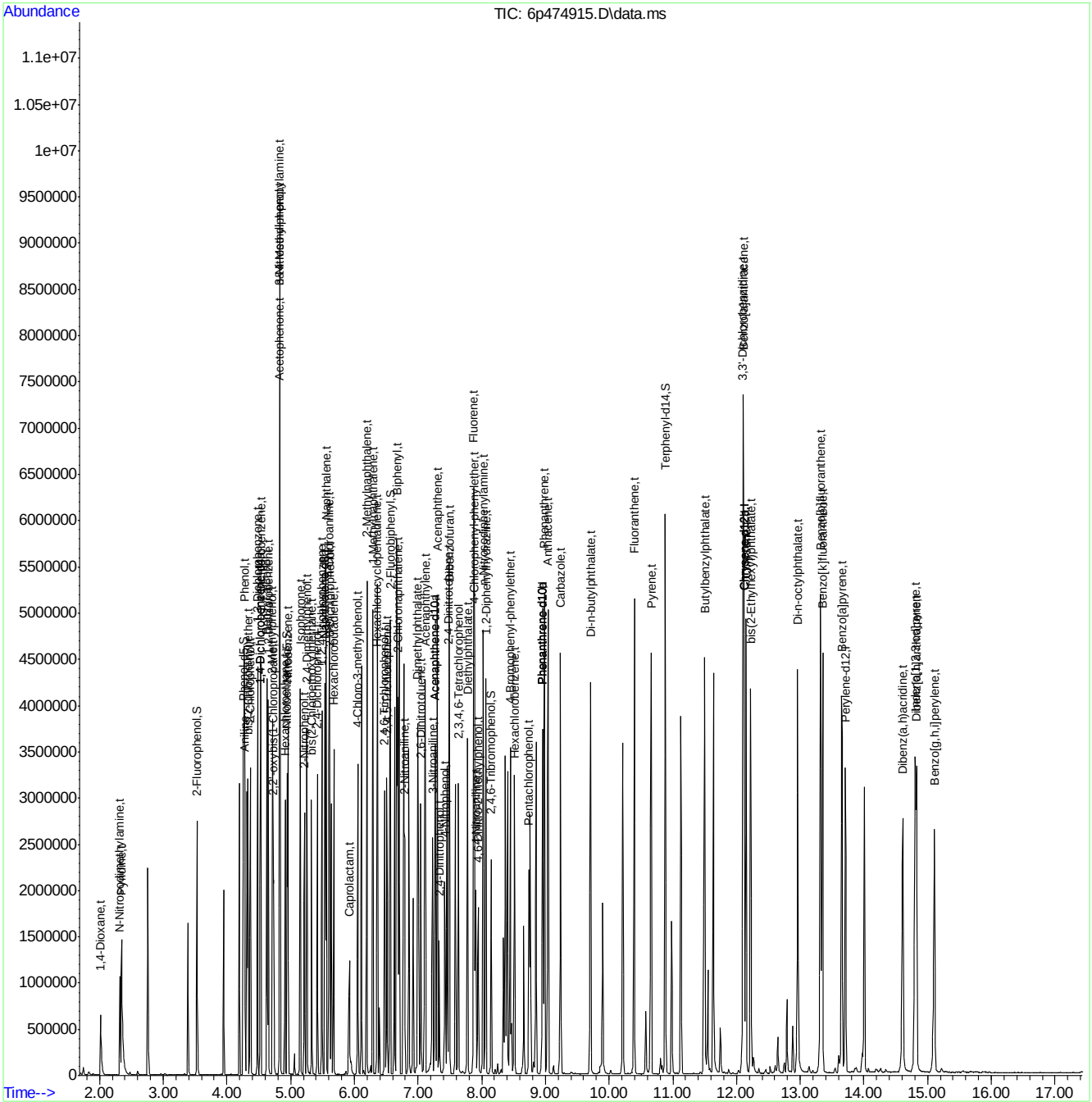
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
90) bis(2-Ethylhexyl)phtha...	12.224	149	1291509	51.52	ppm	99
92) Di-n-octylphthalate	12.962	149	2236219	55.08	ppm	99
93) Benzo[b]fluoranthene	13.320	252	1998661	56.39	ppm	99
94) Benzo[k]fluoranthene	13.352	252	1633673m	53.87	ppm	
95) Benzo[a]pyrene	13.652	252	1742676	61.03	ppm	99
96) Indeno[1,2,3-cd]pyrene	14.807	276	2061525	61.36	ppm	96
97) Dibenz(a,h)acridine	14.609	279	1459773	60.34	ppm	97
98) Dibenz[a,h]anthracene	14.828	278	1731962	59.06	ppm	99
100) Benzo[g,h,i]perylene	15.106	276	1667549	63.10	ppm	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474915.D
Acq On : 12 Aug 2018 4:44 pm
Operator : christc2
Sample : icv2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 12 17:42:42 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:29:43 2018
QLast Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration



Manual Integration Approval Summary

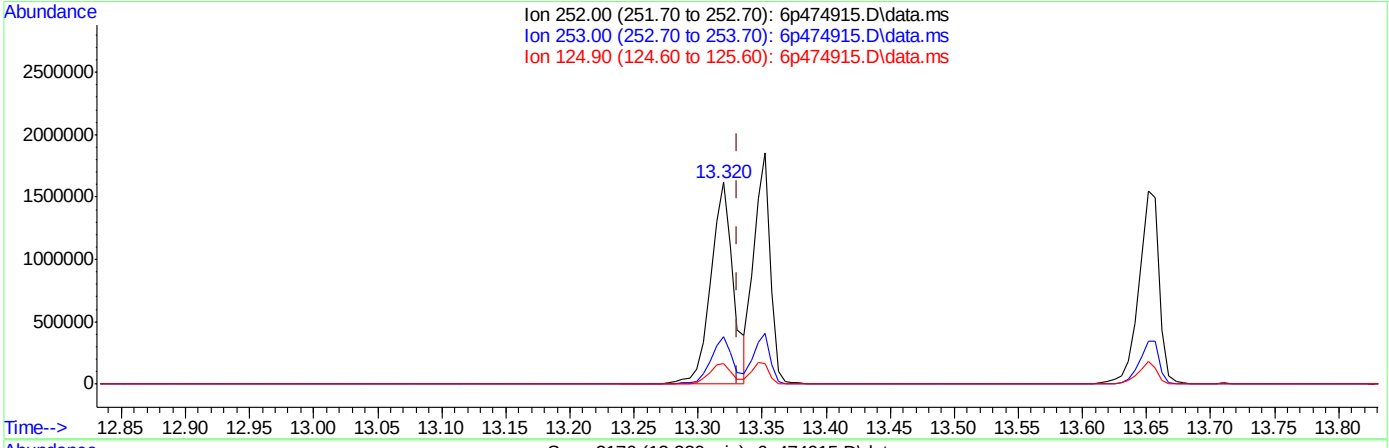
Sample Number:	E6P2304-ICV2304	**Method:**	SW846 8270D
Lab FileID:	6P474915.D	**Analyst approved:**	08/13/18 10:57 Kristi Schollenberger
Injection Time:	08/12/18 16:44	**Supervisor approved:**	08/14/18 10:36 Nina Pandya

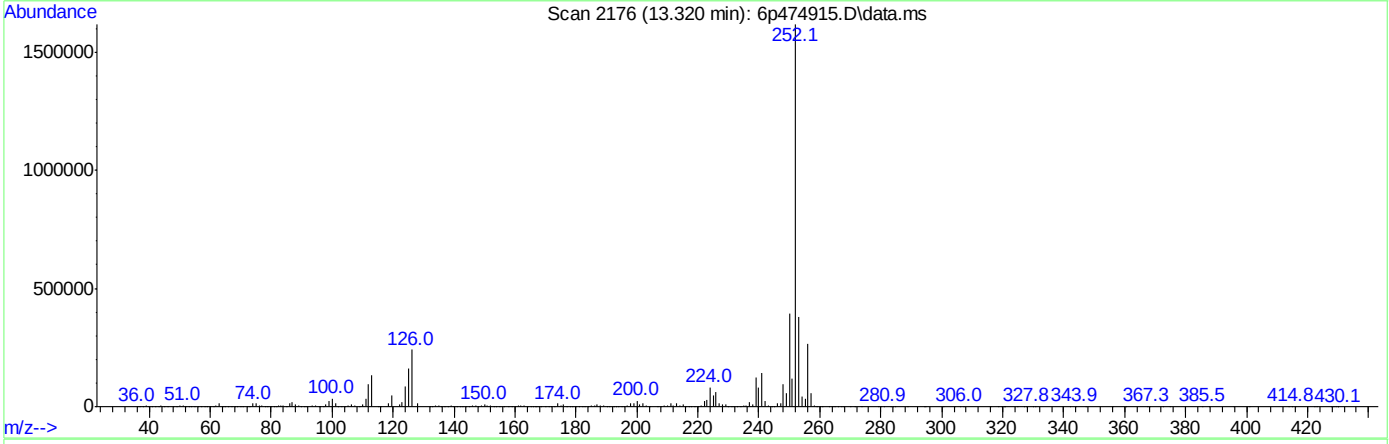
Parameter	CAS	Sig#	R.T. (min.)	Reason
Benzo(k)fluoranthene	207-08-9		13.35	Poor instrument integration

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474915.D
Acq On : 12 Aug 2018 4:44 pm
Operator : christc2
Sample : icv2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 12 17:39:31 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:29:43 2018
QLast Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration





TIC: 6p474915.D\data.ms

(94) Benzo[k]fluoranthene (t)

13.320min (-0.011) 65.90ppm

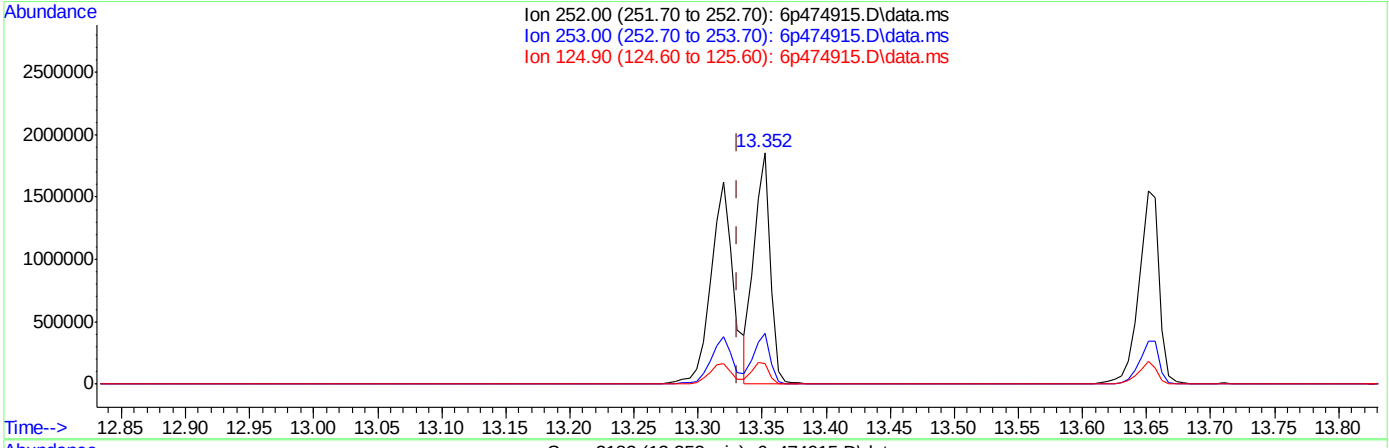
response 1998661

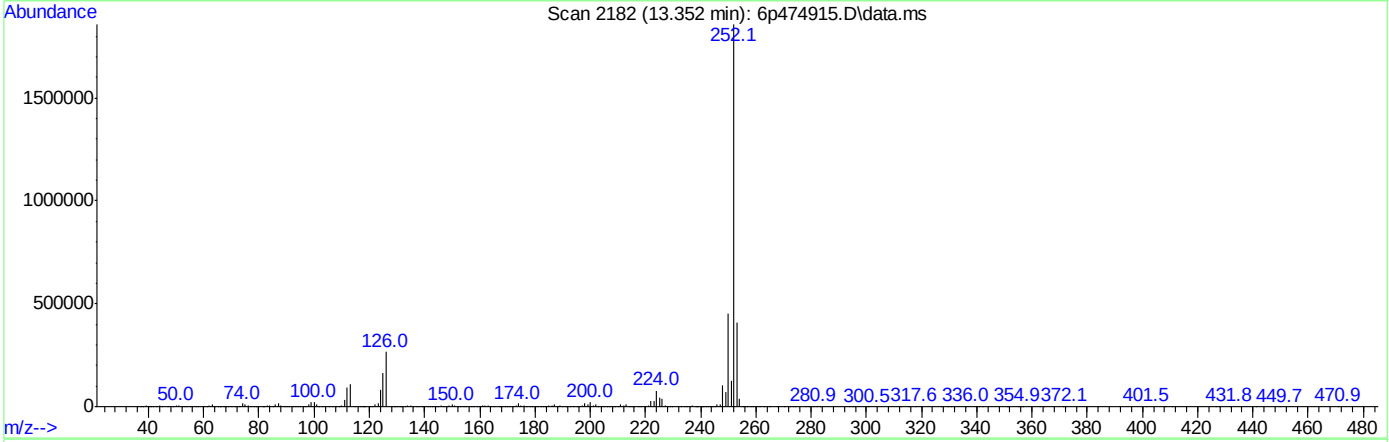
Ion	Exp%	Act%
252.00	100	100
253.00	22.60	23.66
124.90	9.10	9.90
0.00	0.00	0.00

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474915.D
Acq On : 12 Aug 2018 4:44 pm
Operator : christc2
Sample : icv2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 12 17:39:31 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:29:43 2018
QLast Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration





TIC: 6p474915.D\data.ms

(94) Benzo[k]fluoranthene (t)

13.352min (+0.021) 53.87ppm m

response 1633673

Ion	Exp%	Act%
252.00	100	100
253.00	22.60	22.10
124.90	9.10	8.74
0.00	0.00	0.00

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474916.D
Acq On : 12 Aug 2018 5:09 pm
Operator : christc2
Sample : icv2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Aug 13 10:06:21 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:39:28 2018
QLast Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration

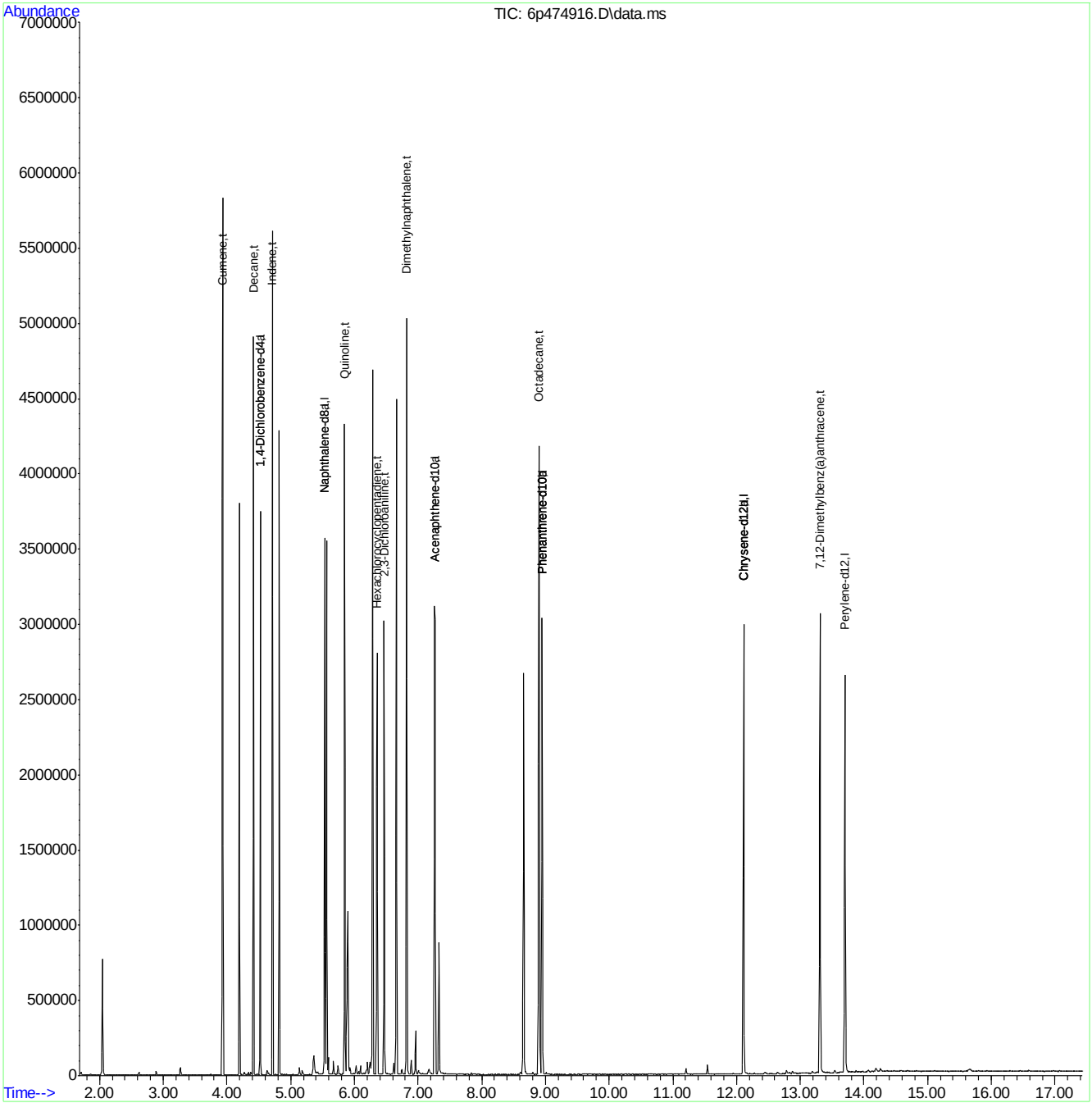
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.521	152	332160	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1290934	40.00	ppm	0.00
47) Acenaphthene-d10	7.260	164	644512	40.00	ppm	0.00
69) Phenanthrene-d10	8.950	188	1099297	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1058223	40.00	ppm	0.00
91) Perylene-d12	13.705	264	952637	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.521	152	332160	40.00	ppm	0.00
103) Acenaphthene-d10a	7.260	164	644512	40.00	ppm	0.00
105) Phenanthrene-d10a	8.950	188	1099297	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1058223	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1290934	40.00	ppm	0.00
113) Phenanthrene-d10b	8.950	188	1099297	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1058223	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
8) Phenol-d5	0.000	99	0d	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
51) 2-Fluorobiphenyl	0.000	172	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
85) Terphenyl-d14	0.000	244	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
106) 1-chlorooctadecane	0.000	57	0	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
6) Indene	4.714	116	1078479	52.77	ppm	98
7) Cumene	3.933	105	1558657	46.04	ppm	99
13) Decane	4.415	43	592061	44.84	ppm	100
27) Quinoline	5.848	129	1093006	46.76	ppm	100
40) 2,3-Dichloroaniline	6.468	161	495981	41.34	ppm	99
46) Dimethylnaphthalene	6.821	156	910144	46.20	ppm	96
48) Hexachlorocyclopentadiene	6.356	237	332558	54.40	ppm	95
82) Octadecane	8.897	57	791555	51.59	ppm	96
99) 7,12-Dimethylbenz(a)an...	13.309	256	628252	49.08	ppm	97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474916.D
Acq On : 12 Aug 2018 5:09 pm
Operator : christc2
Sample : icv2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Aug 13 10:06:21 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:39:28 2018
QLast Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474917.D
Acq On : 12 Aug 2018 5:34 pm
Operator : christc2
Sample : icv2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Aug 13 10:17:14 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:39:28 2018
QLast Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) 1,4-Dichlorobenzene-d4	4.522	152	376519	40.00	ppm		0.00
24) Naphthalene-d8	5.538	136	1456361	40.00	ppm		0.00
47) Acenaphthene-d10	7.260	164	811416	40.00	ppm		0.00
69) Phenanthrene-d10	8.950	188	1296783	40.00	ppm		0.00
83) Chrysene-d12	12.111	240	1180595	40.00	ppm		0.00
91) Perylene-d12	13.705	264	1086214	40.00	ppm		0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	376519	40.00	ppm		0.00
103) Acenaphthene-d10a	7.260	164	811416	40.00	ppm		0.00
105) Phenanthrene-d10a	8.950	188	1296783	40.00	ppm		0.00
109) Chrysene-d12a	12.111	240	1180595	40.00	ppm		0.00
111) Naphthalene-d8a	5.538	136	1456361	40.00	ppm		0.00
113) Phenanthrene-d10b	8.950	188	1296783	40.00	ppm		0.00
115) Chrysene-d12b	12.111	240	1180595	40.00	ppm		0.00
System Monitoring Compounds							
5) 2-Fluorophenol	0.000	112	0	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
8) Phenol-d5	0.000	99	0d	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
25) Nitrobenzene-d5	0.000	82	0d	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
51) 2-Fluorobiphenyl	0.000	172	0d	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
85) Terphenyl-d14	0.000	244	0	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
106) 1-chlorooctadecane	0.000	57	0d	0.00	ppm		
107) o-terphenyl	0.000	230	0	0.00	ppm		
Target Compounds							Qvalue
9) Phenol	4.270	94	919974	44.94	ppm		95
12) 2-Chlorophenol	4.367	128	691912	50.52	ppm		98
19) 2-Methylphenol	4.714	108	687263	49.91	ppm		98
21) 3&4-Methylphenol	4.832	108	713097	50.50	ppm		100
29) 2-Nitrophenol	5.217	139	350538	54.19	ppm		80
30) 2,4-Dimethylphenol	5.255	107	772453	51.07	ppm		93
31) Benzoic acid	5.362	105	519655	47.68	ppm		97
33) 2,4-Dichlorophenol	5.415	162	547134	50.46	ppm		98
34) 2,6-Dichlorophenol	5.613	162	556584	52.37	ppm		98
43) 4-Chloro-3-methylphenol	6.046	107	655298	50.45	ppm		96
49) 2,4,6-Trichlorophenol	6.474	196	395175	48.99	ppm		96
50) 2,4,5-Trichlorophenol	6.506	196	416581	49.53	ppm		94
60) 2,4-Dinitrophenol	7.330	184	124300	43.21	ppm	#	92
61) 4-Nitrophenol	7.415	109	250629	47.28	ppm		97
64) 2,3,4,6-Tetrachlorophenol	7.629	232	327418	47.16	ppm		96
70) 4,6-Dinitro-2-methylph...	7.934	198	214994	49.12	ppm		98
76) Pentachlorophenol	8.736	266	312872	57.16	ppm		96

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474917.D
Acq On : 12 Aug 2018 5:34 pm
Operator : christc2
Sample : icv2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Aug 13 10:17:14 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:39:28 2018
QLast Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration

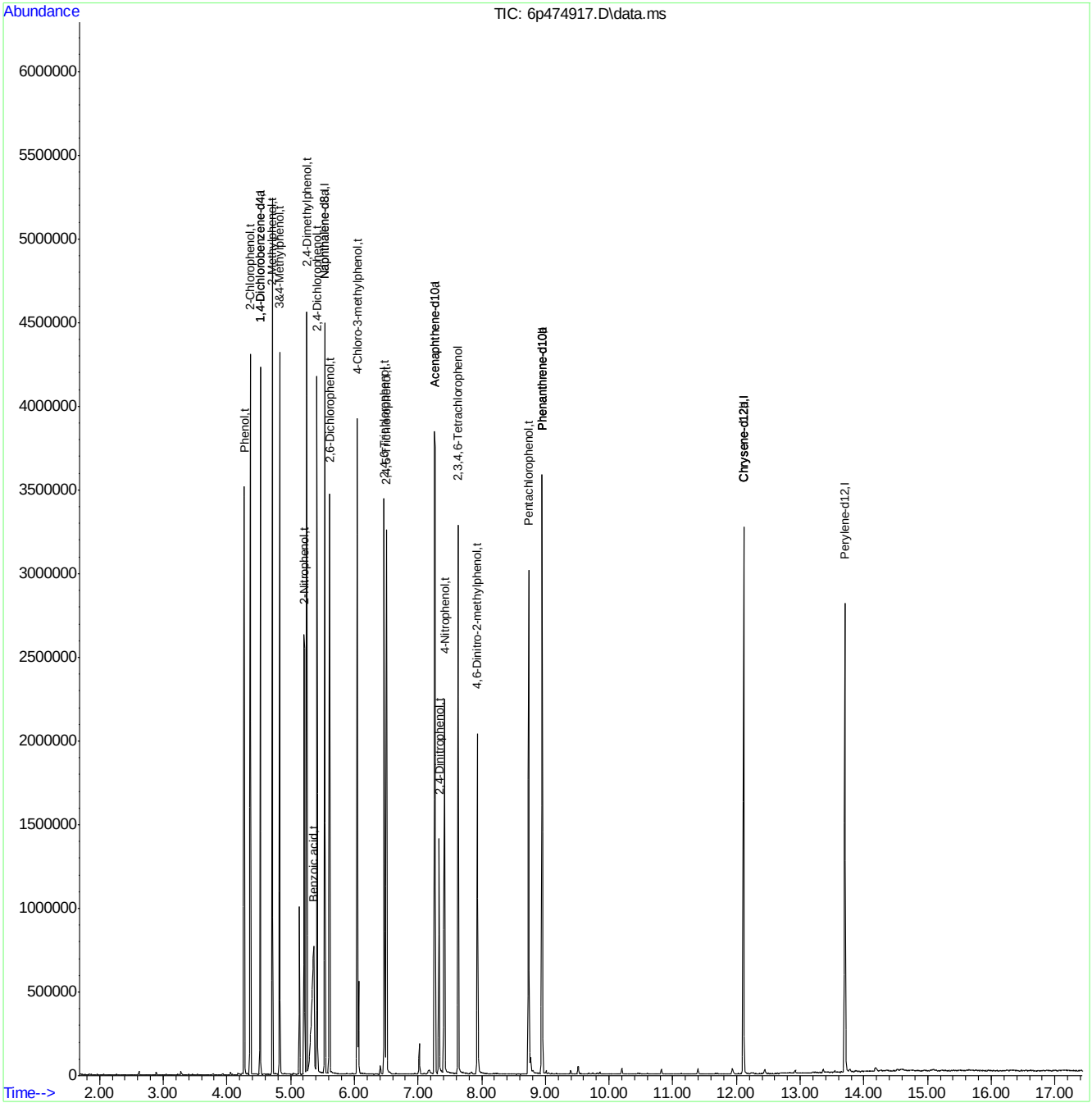
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2304\
Data File : 6p474917.D
Acq On : 12 Aug 2018 5:34 pm
Operator : christc2
Sample : icv2304-50
Misc : op8717,e6p2304,1000,,,1,1
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Aug 13 10:17:14 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuSun Aug 12 17:39:28 2018
QLast Update : Sun Aug 12 17:39:28 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474921.D
Acq On : 12 Aug 2018 7:28 pm
Operator : christc2
Sample : ic2305-100
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 13 11:15:02 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:11:27 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration

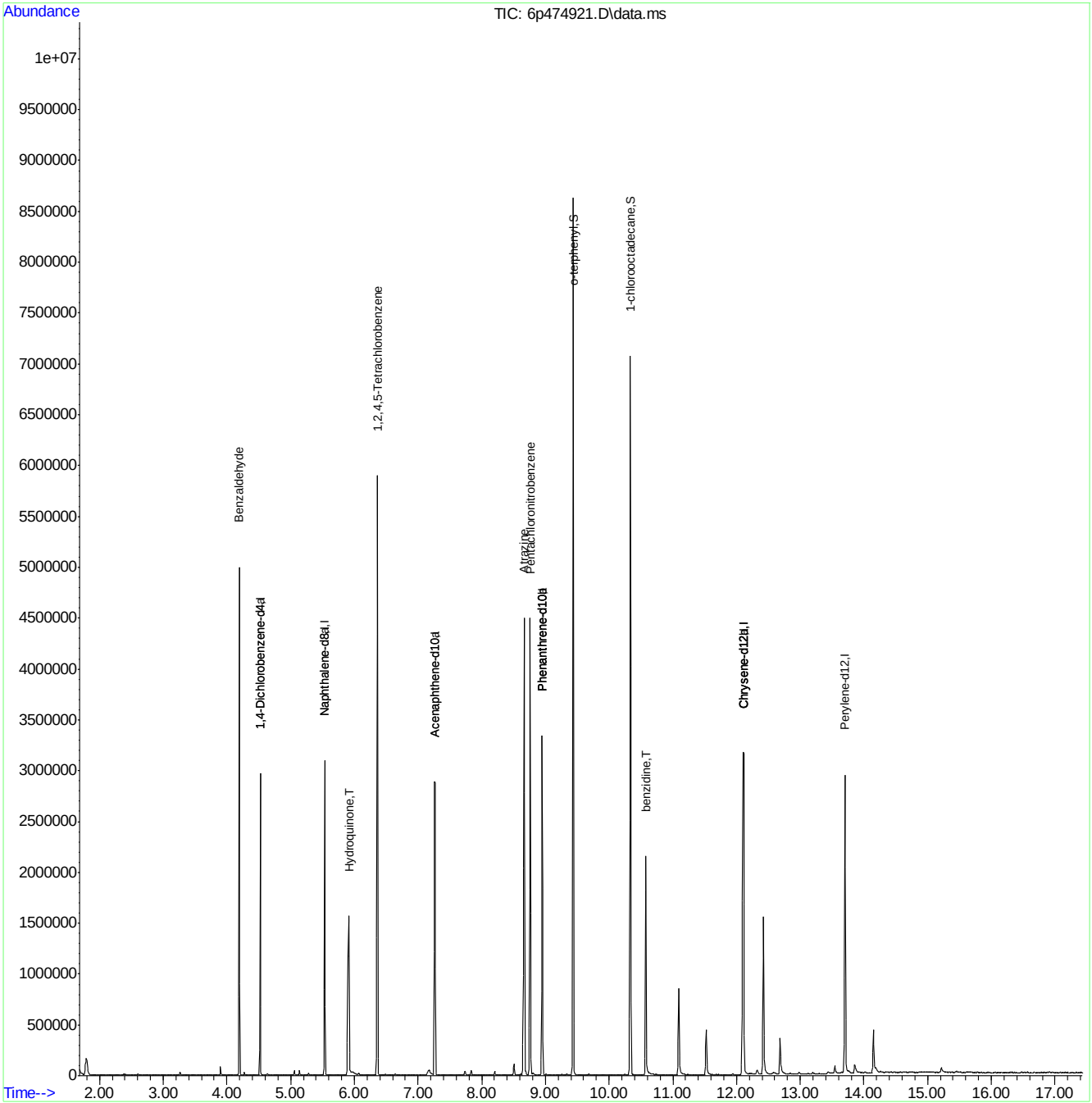
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	291331	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1139107	40.00	ppm	0.00
47) Acenaphthene-d10	7.266	164	596853	40.00	ppm	0.00
69) Phenanthrene-d10	8.950	188	1058080	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1031459	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1032708	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	291331	40.00	ppm	0.00
103) Acenaphthene-d10a	7.266	164	596853	40.00	ppm	0.00
105) Phenanthrene-d10a	8.950	188	1058080	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1031459	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1139107	40.00	ppm	0.00
113) Phenanthrene-d10b	8.950	188	1058080	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1031459	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
8) Phenol-d5	0.000	99	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
51) 2-Fluorobiphenyl	0.000	172	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
85) Terphenyl-d14	0.000	244	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
106) 1-chlorooctadecane	10.336	57	885640	100.00	ppm	0.00
107) o-terphenyl	9.437	230	1631404	99.93	ppm	0.00
Target Compounds						Qvalue
102) Benzaldehyde	4.195	105	697693	100.00	ppm	96
104) 1,2,4,5-Tetrachloroben...	6.362	216	800310	100.00	ppm	99
108) Atrazine	8.667	215	285119	100.08	ppm	89
110) benzidine	10.576	184	775712	100.80	ppm	99
112) Hydroquinone	5.918	110	1037994	100.00	ppm	91
114) Pentachloronitrobenzene	8.763	295	130654	99.99	ppm	93

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474921.D
Acq On : 12 Aug 2018 7:28 pm
Operator : christc2
Sample : ic2305-100
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 13 11:15:02 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:11:27 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474922.D
Acq On : 12 Aug 2018 7:53 pm
Operator : christc2
Sample : ic2305-80
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Aug 13 11:15:45 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration

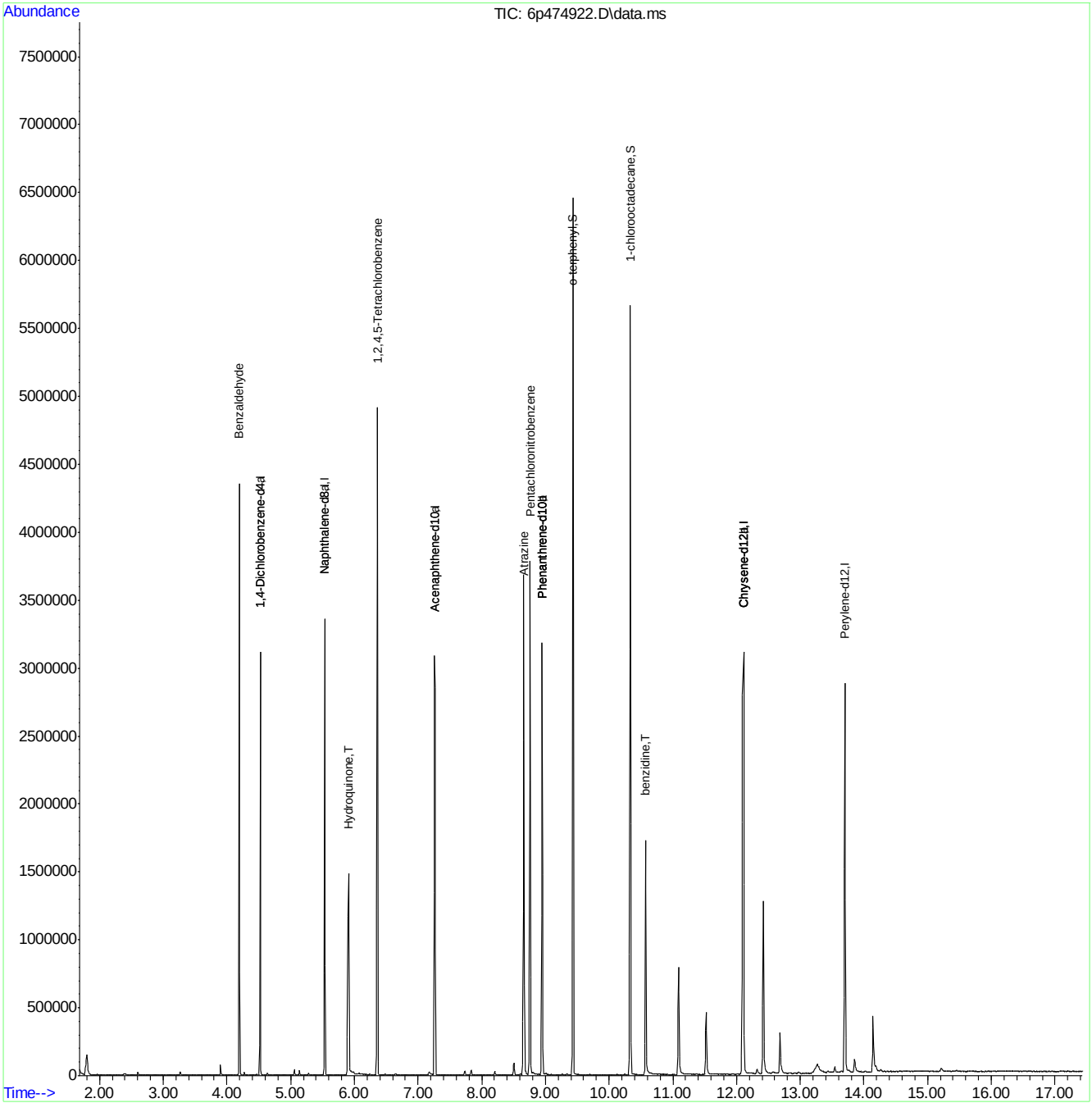
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	301470	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1163608	40.00	ppm	0.00
47) Acenaphthene-d10	7.260	164	603343	40.00	ppm	0.00
69) Phenanthrene-d10	8.950	188	1086268	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1046516	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1086149	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	301470	40.00	ppm	0.00
103) Acenaphthene-d10a	7.260	164	603343	40.00	ppm	0.00
105) Phenanthrene-d10a	8.950	188	1086268	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1046516	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1163608	40.00	ppm	0.00
113) Phenanthrene-d10b	8.950	188	1086268	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1046516	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
8) Phenol-d5	0.000	99	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
51) 2-Fluorobiphenyl	0.000	172	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
85) Terphenyl-d14	0.000	244	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
106) 1-chlorooctadecane	10.330	57	756038	83.15	ppm	0.00
107) o-terphenyl	9.432	230	1322535	78.91	ppm	0.00
Target Compounds						Qvalue
102) Benzaldehyde	4.195	105	592678	82.09	ppm	95
104) 1,2,4,5-Tetrachloroben...	6.361	216	665234	82.23	ppm	99
108) Atrazine	8.667	215	229110	78.34	ppm	90
110) benzidine	10.571	184	610340	78.17	ppm	99
112) Hydroquinone	5.912	110	858038	80.92	ppm	91
114) Pentachloronitrobenzene	8.758	295	106638	79.49	ppm	94

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474922.D
Acq On : 12 Aug 2018 7:53 pm
Operator : christc2
Sample : ic2305-80
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Aug 13 11:15:45 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474923.D
Acq On : 12 Aug 2018 8:18 pm
Operator : christc2
Sample : ic2305-50
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Aug 13 11:16:37 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration

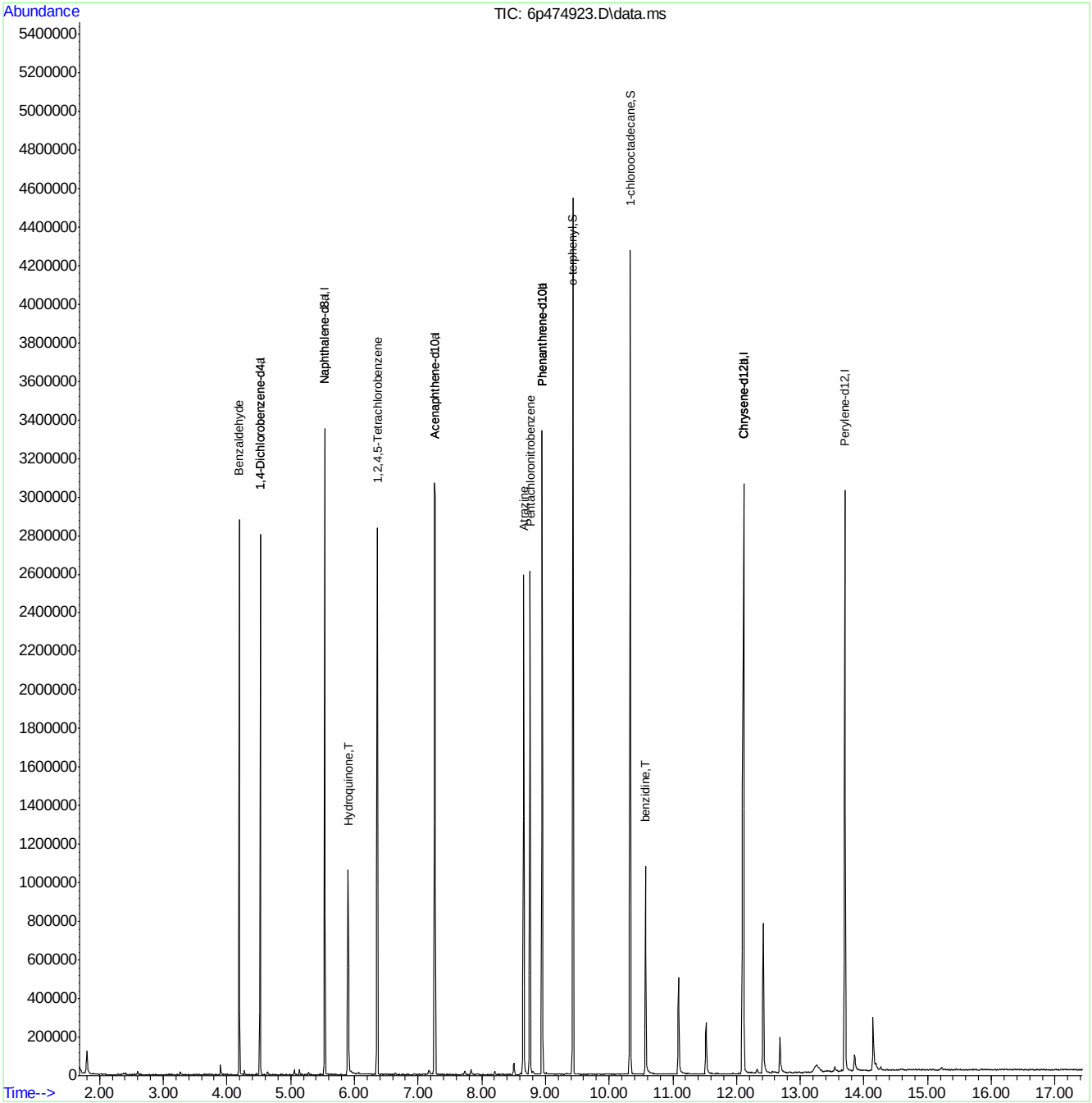
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	297614	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1178965	40.00	ppm	0.00
47) Acenaphthene-d10	7.260	164	613899	40.00	ppm	0.00
69) Phenanthrene-d10	8.950	188	1157847	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1109479	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1132972	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	297614	40.00	ppm	0.00
103) Acenaphthene-d10a	7.260	164	613899	40.00	ppm	0.00
105) Phenanthrene-d10a	8.950	188	1157847	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1109479	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1178965	40.00	ppm	0.00
113) Phenanthrene-d10b	8.950	188	1157847	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1109479	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
8) Phenol-d5	0.000	99	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
51) 2-Fluorobiphenyl	0.000	172	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
85) Terphenyl-d14	0.000	244	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
106) 1-chlorooctadecane	10.330	57	508787	52.50	ppm	0.00
107) o-terphenyl	9.432	230	839653	47.00	ppm	0.00
Target Compounds						Qvalue
102) Benzaldehyde	4.190	105	382237	53.63	ppm	90
104) 1,2,4,5-Tetrachloroben...	6.362	216	412131	50.07	ppm	98
108) Atrazine	8.661	215	148760	47.72	ppm	90
110) benzidine	10.571	184	379986	45.90	ppm	99
112) Hydroquinone	5.902	110	541925	50.44	ppm	90
114) Pentachloronitrobenzene	8.758	295	64452	45.07	ppm	97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474923.D
Acq On : 12 Aug 2018 8:18 pm
Operator : christc2
Sample : ic2305-50
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Aug 13 11:16:37 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474924.D
Acq On : 12 Aug 2018 8:44 pm
Operator : christc2
Sample : ic2305-25
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Aug 13 11:21:05 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration

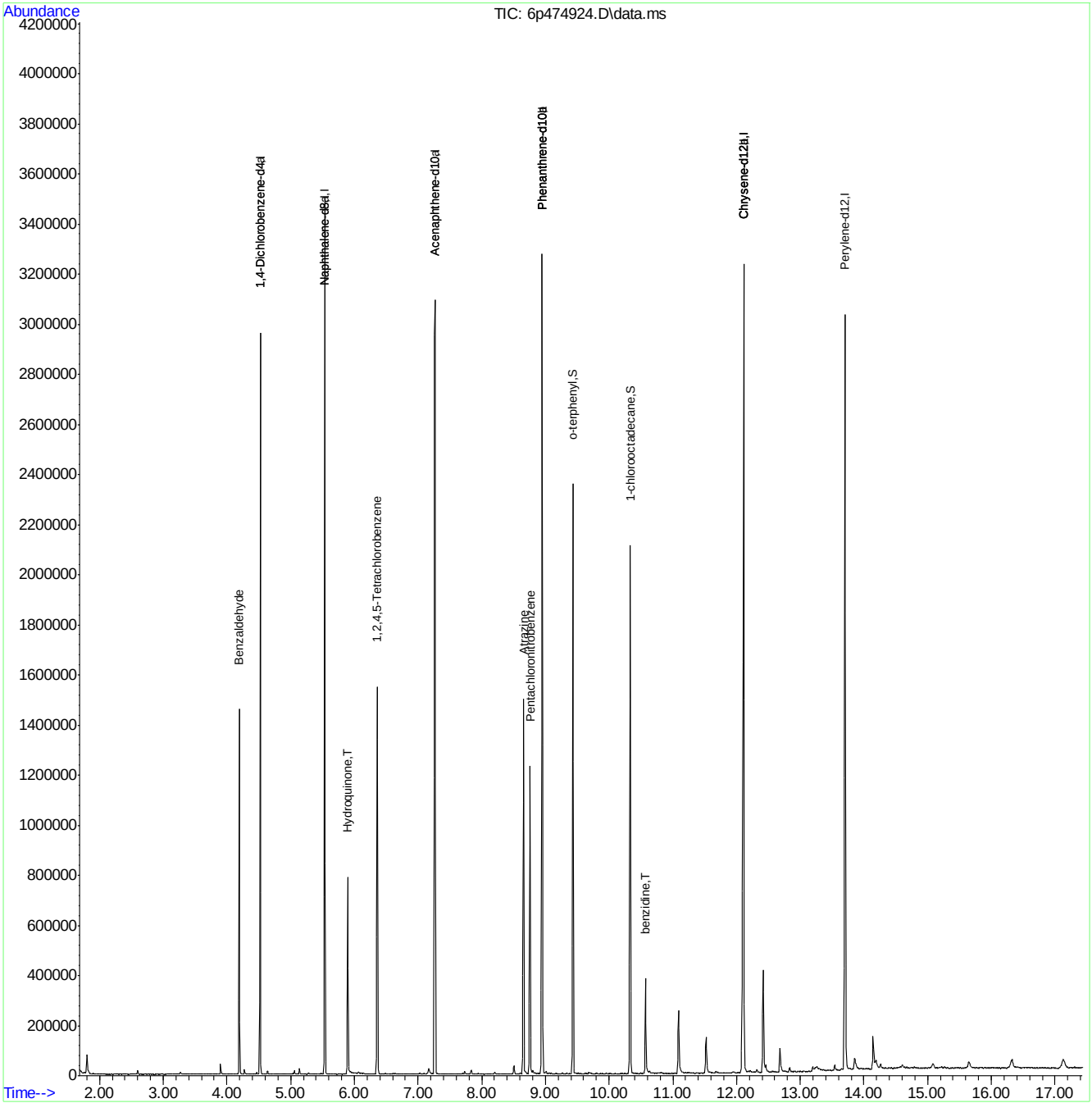
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	297483	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1196592	40.00	ppm	0.00
47) Acenaphthene-d10	7.265	164	620428	40.00	ppm	0.00
69) Phenanthrene-d10	8.950	188	1131084	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1119534	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1099860	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	297483	40.00	ppm	0.00
103) Acenaphthene-d10a	7.265	164	620428	40.00	ppm	0.00
105) Phenanthrene-d10a	8.950	188	1131084	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1119534	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1196592	40.00	ppm	0.00
113) Phenanthrene-d10b	8.950	188	1131084	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1119552	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
8) Phenol-d5	0.000	99	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
51) 2-Fluorobiphenyl	0.000	172	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
85) Terphenyl-d14	0.000	244	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
106) 1-chlorooctadecane	10.330	57	254821	26.92	ppm	0.00
107) o-terphenyl	9.432	230	417587	23.93	ppm	0.00
Target Compounds						Qvalue
102) Benzaldehyde	4.190	105	189373	26.58	ppm	89
104) 1,2,4,5-Tetrachloroben...	6.356	216	213785	25.70	ppm	96
108) Atrazine	8.656	215	73238	24.05	ppm	82
110) benzidine	10.571	184	142700	17.08	ppm	99
112) Hydroquinone	5.896	110	253453	23.24	ppm	91
114) Pentachloronitrobenzene	8.758	295	30397	21.76	ppm	96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474924.D
Acq On : 12 Aug 2018 8:44 pm
Operator : christc2
Sample : ic2305-25
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Aug 13 11:21:05 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474925.D
Acq On : 12 Aug 2018 9:09 pm
Operator : christc2
Sample : ic2305-10
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Aug 13 11:21:46 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration

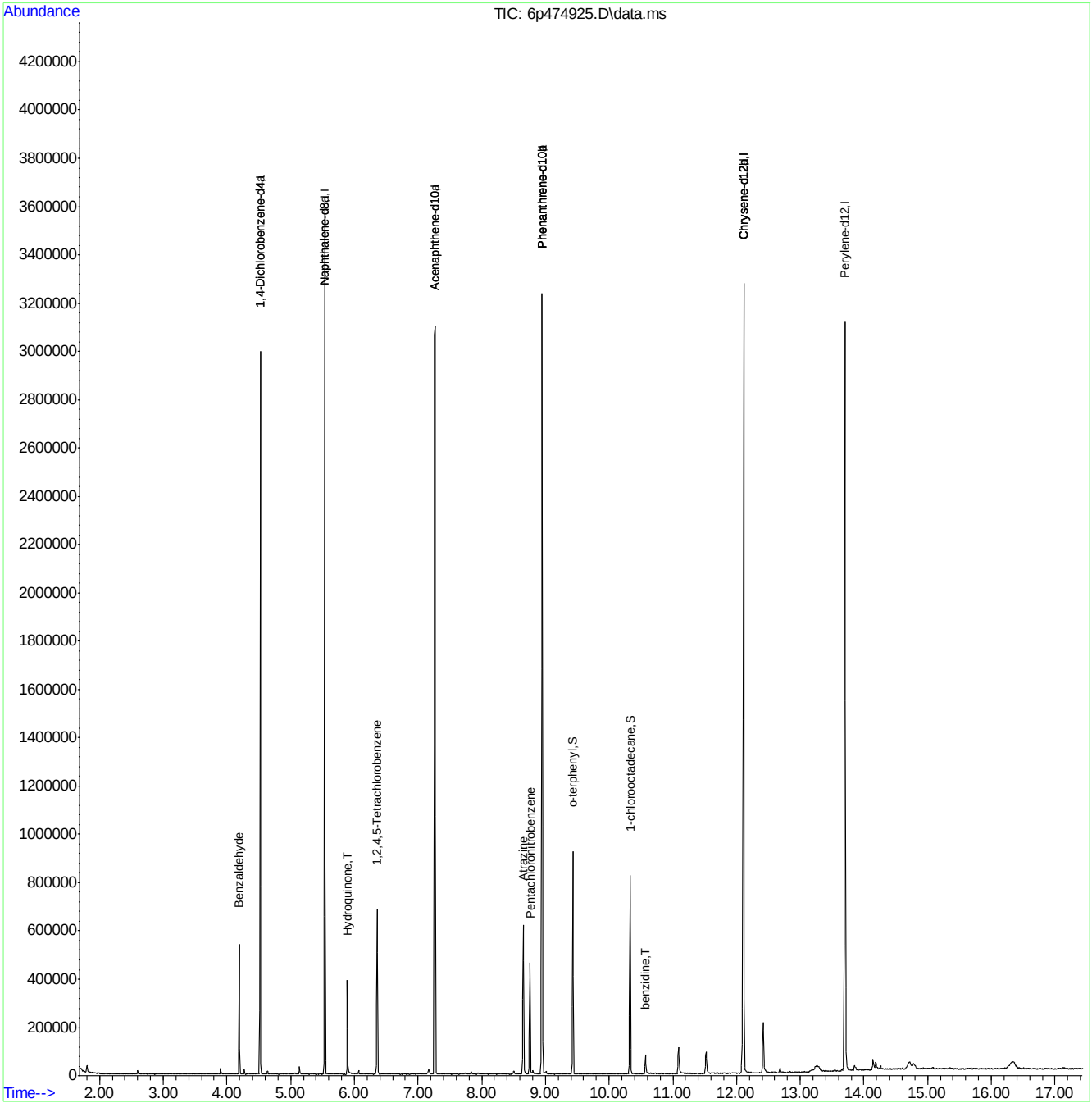
Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) 1,4-Dichlorobenzene-d4	4.522	152	296626	40.00	ppm		0.00
24) Naphthalene-d8	5.538	136	1205248	40.00	ppm		0.00
47) Acenaphthene-d10	7.260	164	639158	40.00	ppm		0.00
69) Phenanthrene-d10	8.945	188	1147263	40.00	ppm		0.00
83) Chrysene-d12	12.111	240	1152821	40.00	ppm		0.00
91) Perylene-d12	13.705	264	1137580	40.00	ppm		0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	296626	40.00	ppm		0.00
103) Acenaphthene-d10a	7.260	164	639158	40.00	ppm		0.00
105) Phenanthrene-d10a	8.945	188	1147263	40.00	ppm		0.00
109) Chrysene-d12a	12.111	240	1152821	40.00	ppm		0.00
111) Naphthalene-d8a	5.538	136	1205248	40.00	ppm		0.00
113) Phenanthrene-d10b	8.945	188	1147263	40.00	ppm		0.00
115) Chrysene-d12b	12.111	240	1152821	40.00	ppm		0.00
System Monitoring Compounds							
5) 2-Fluorophenol	0.000	112	0	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
8) Phenol-d5	0.000	99	0	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
51) 2-Fluorobiphenyl	0.000	172	0	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
85) Terphenyl-d14	0.000	244	0	0.00	ppm		
Spiked Amount 50.000			Recovery =	0.00%			
106) 1-chlorooctadecane	10.330	57	103878	10.82	ppm		0.00
107) o-terphenyl	9.432	230	165982	9.38	ppm		0.00
Target Compounds							Qvalue
102) Benzaldehyde	4.195	105	77118	10.86	ppm		95
104) 1,2,4,5-Tetrachloroben...	6.356	216	89857	10.48	ppm		97
108) Atrazine	8.651	215	28394	9.19	ppm	#	74
110) benzidine	10.571	184	32002	3.72	ppm		98
112) Hydroquinone	5.891	110	92020	8.38	ppm		94
114) Pentachloronitrobenzene	8.758	295	11153	7.87	ppm		96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474925.D
Acq On : 12 Aug 2018 9:09 pm
Operator : christc2
Sample : ic2305-10
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Aug 13 11:21:46 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474926.D
Acq On : 12 Aug 2018 9:34 pm
Operator : christc2
Sample : ic2305-5
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Aug 13 11:22:25 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration

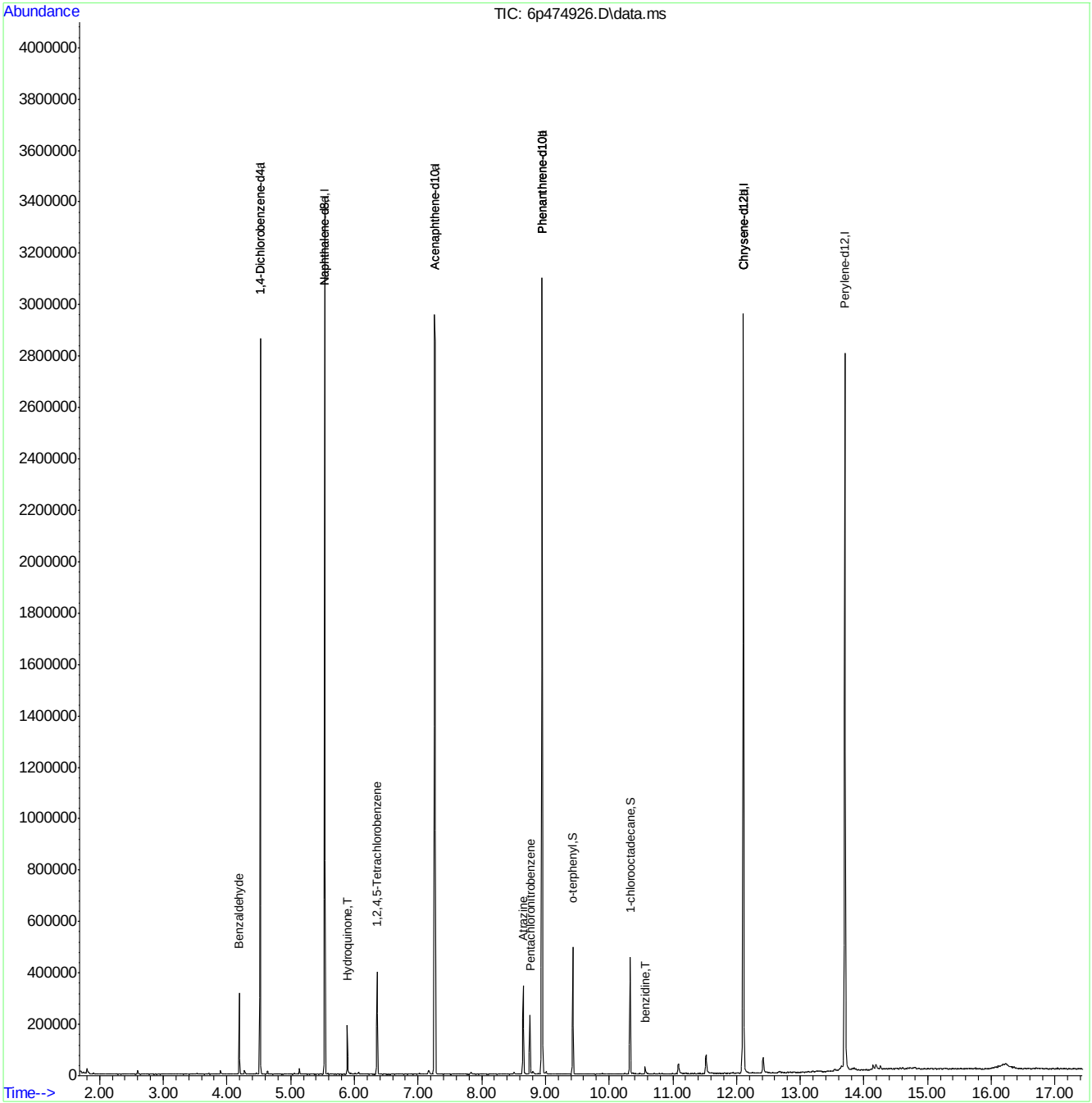
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	290355	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1161242	40.00	ppm	0.00
47) Acenaphthene-d10	7.260	164	589107	40.00	ppm	0.00
69) Phenanthrene-d10	8.945	188	1090075	40.00	ppm	0.00
83) Chrysene-d12	12.106	240	1055346	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1043683	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	290355	40.00	ppm	0.00
103) Acenaphthene-d10a	7.260	164	589107	40.00	ppm	0.00
105) Phenanthrene-d10a	8.945	188	1090075	40.00	ppm	0.00
109) Chrysene-d12a	12.106	240	1055346	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1161242	40.00	ppm	0.00
113) Phenanthrene-d10b	8.945	188	1090075	40.00	ppm	0.00
115) Chrysene-d12b	12.106	240	1055346	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
8) Phenol-d5	0.000	99	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
51) 2-Fluorobiphenyl	0.000	172	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
85) Terphenyl-d14	0.000	244	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
106) 1-chlorooctadecane	10.330	57	52104	5.71	ppm	0.00
107) o-terphenyl	9.432	230	90010	5.35	ppm	0.00
Target Compounds						Qvalue
102) Benzaldehyde	4.190	105	45787	6.58	ppm	92
104) 1,2,4,5-Tetrachloroben...	6.356	216	48101	6.09	ppm	98
108) Atrazine	8.651	215	13506	4.60	ppm #	66
110) benzidine	10.566	184	10279	1.31	ppm	98
112) Hydroquinone	5.891	110	47009	4.44	ppm	94
114) Pentachloronitrobenzene	8.758	295	5352	3.98	ppm	96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474926.D
Acq On : 12 Aug 2018 9:34 pm
Operator : christc2
Sample : ic2305-5
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Aug 13 11:22:25 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474927.D
Acq On : 12 Aug 2018 9:59 pm
Operator : christc2
Sample : ic2305-2
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Aug 13 11:23:00 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration

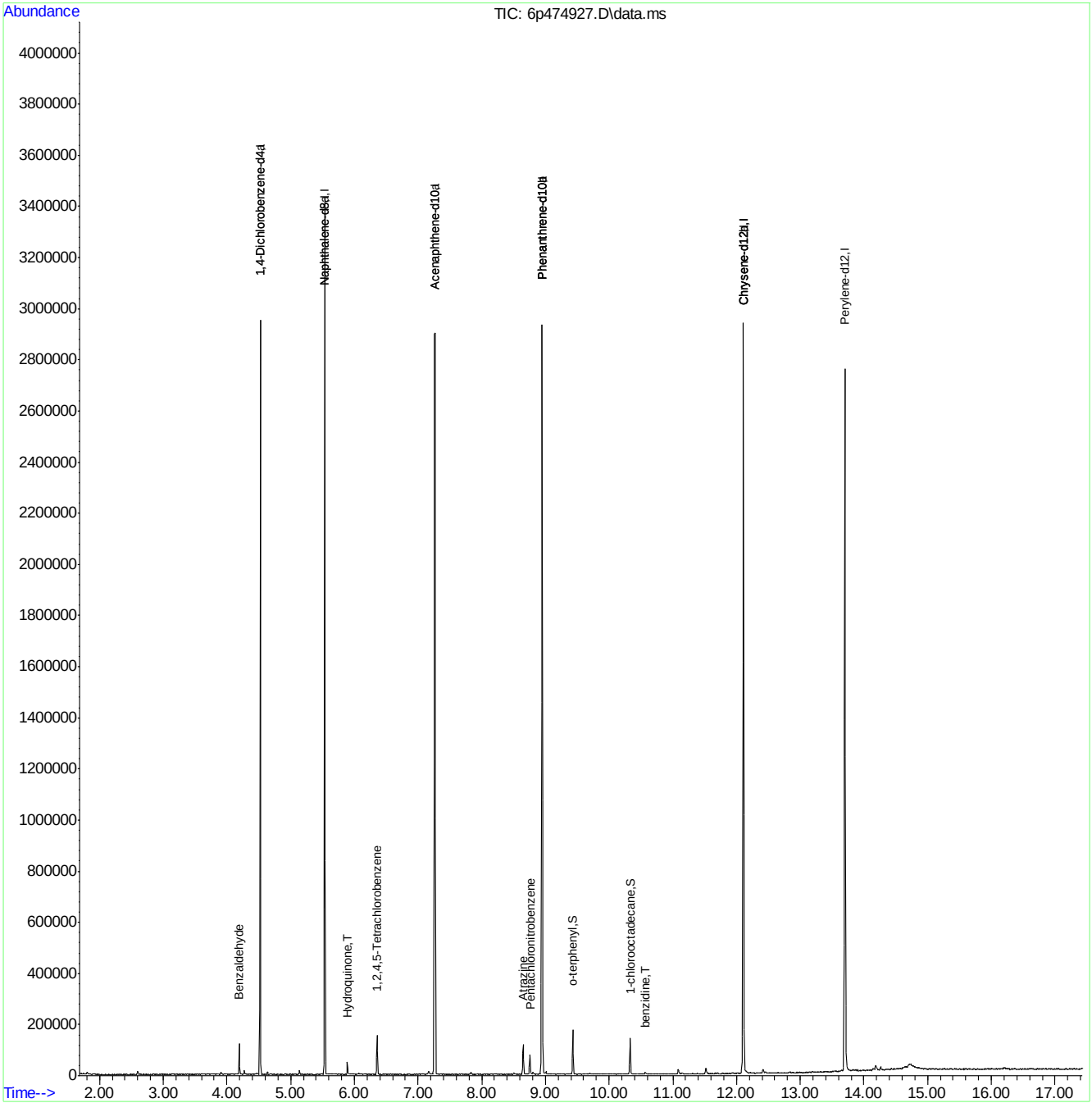
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	293979	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1150907	40.00	ppm	0.00
47) Acenaphthene-d10	7.260	164	585955	40.00	ppm	0.00
69) Phenanthrene-d10	8.950	188	1071260	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1051554	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1019752	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	293979	40.00	ppm	0.00
103) Acenaphthene-d10a	7.260	164	585955	40.00	ppm	0.00
105) Phenanthrene-d10a	8.950	188	1071260	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1051554	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1150907	40.00	ppm	0.00
113) Phenanthrene-d10b	8.950	188	1071260	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1051554	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
8) Phenol-d5	0.000	99	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
51) 2-Fluorobiphenyl	0.000	172	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
85) Terphenyl-d14	0.000	244	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
106) 1-chlorooctadecane	10.330	57	18936	2.11	ppm	0.00
107) o-terphenyl	9.432	230	33310	2.02	ppm	0.00
Target Compounds						Qvalue
102) Benzaldehyde	4.195	105	16689	2.37	ppm	88
104) 1,2,4,5-Tetrachloroben...	6.356	216	17484	2.23	ppm	96
108) Atrazine	8.651	215	5034	1.75	ppm	83
110) benzidine	10.571	184	3125	0.40	ppm	75
112) Hydroquinone	5.891	110	12888	1.23	ppm	86
114) Pentachloronitrobenzene	8.758	295	1644	1.24	ppm	94

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474927.D
Acq On : 12 Aug 2018 9:59 pm
Operator : christc2
Sample : ic2305-2
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Aug 13 11:23:00 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474928.D
Acq On : 12 Aug 2018 10:24 pm
Operator : christc2
Sample : ic2305-1
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 13 11:28:55 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration

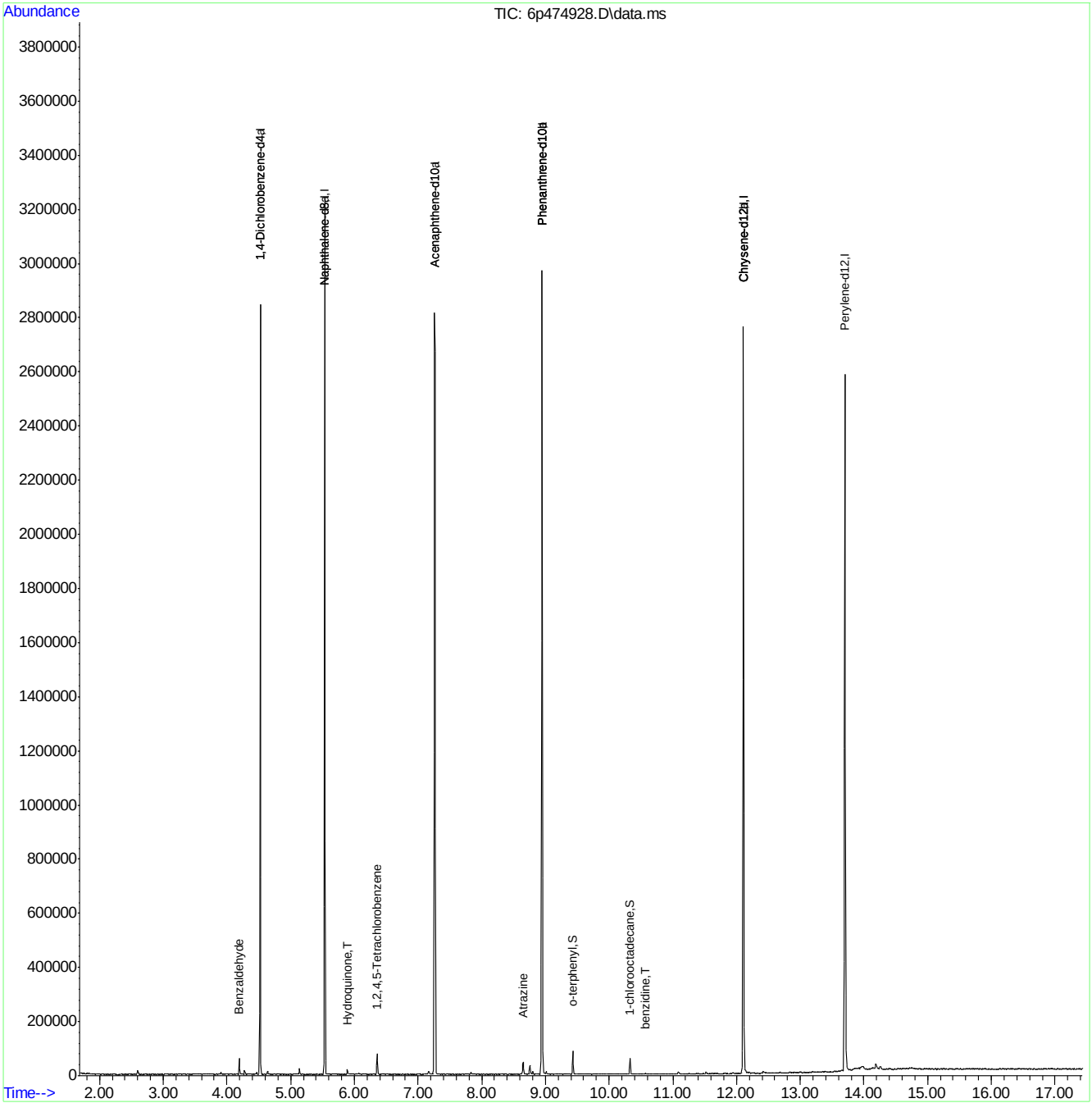
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.522	152	273139	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1079423	40.00	ppm	0.00
47) Acenaphthene-d10	7.260	164	549446	40.00	ppm	0.00
69) Phenanthrene-d10	8.945	188	996256	40.00	ppm	0.00
83) Chrysene-d12	12.106	240	978079	40.00	ppm	0.00
91) Perylene-d12	13.705	264	942215	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.522	152	273139	40.00	ppm	0.00
103) Acenaphthene-d10a	7.260	164	549446	40.00	ppm	0.00
105) Phenanthrene-d10a	8.945	188	996256	40.00	ppm	0.00
109) Chrysene-d12a	12.106	240	978079	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1079423	40.00	ppm	0.00
113) Phenanthrene-d10b	8.945	188	996256	40.00	ppm	0.00
115) Chrysene-d12b	12.106	240	978079	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
8) Phenol-d5	0.000	99	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
51) 2-Fluorobiphenyl	0.000	172	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
85) Terphenyl-d14	0.000	244	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
106) 1-chlorooctadecane	10.325	57	6890	0.83	ppm	-0.01
107) o-terphenyl	9.432	230	15185	0.99	ppm	0.00
Target Compounds						Qvalue
102) Benzaldehyde	4.195	105	8281	1.27	ppm	95
104) 1,2,4,5-Tetrachloroben...	6.356	216	9348	1.27	ppm	94
108) Atrazine	8.651	215	2414	0.90	ppm #	80
110) benzidine	10.571	184	1132	0.16	ppm	92
112) Hydroquinone	5.891	110	4857	0.49	ppm	94

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474928.D
Acq On : 12 Aug 2018 10:24 pm
Operator : christc2
Sample : ic2305-1
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 13 11:28:55 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:14:21 2018
QLast Update : Mon Aug 13 11:14:21 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474929.D
Acq On : 12 Aug 2018 10:49 pm
Operator : christc2
Sample : icv2305-50
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 13 11:40:32 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:36:04 2018
QLast Update : Mon Aug 13 11:36:04 2018
Response via : Initial Calibration

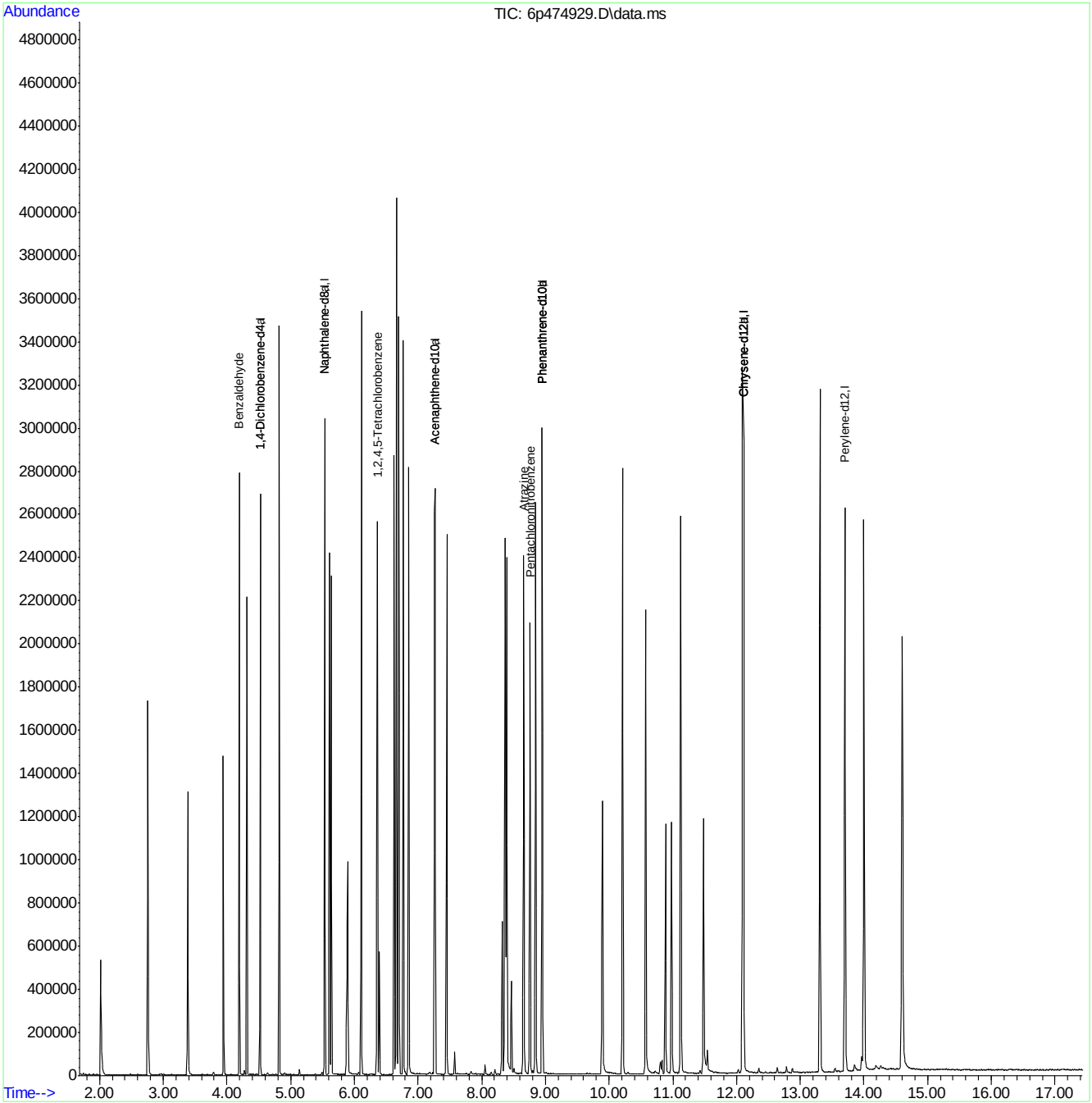
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.521	152	256497	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1045580	40.00	ppm	0.00
47) Acenaphthene-d10	7.265	164	536227	40.00	ppm	0.00
69) Phenanthrene-d10	8.950	188	984350	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1019577	40.00	ppm	0.00
91) Perylene-d12	13.705	264	981982	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.521	152	256497	40.00	ppm	0.00
103) Acenaphthene-d10a	7.265	164	536227	40.00	ppm	0.00
105) Phenanthrene-d10a	8.950	188	984350	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1019577	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1045580	40.00	ppm	0.00
113) Phenanthrene-d10b	8.950	188	984350	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1019577	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
8) Phenol-d5	0.000	99	0d	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
51) 2-Fluorobiphenyl	0.000	172	0d	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
85) Terphenyl-d14	0.000	244	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
106) 1-chlorooctadecane	0.000	57	0	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
102) Benzaldehyde	4.195	105	392348	56.68	ppm	92
104) 1,2,4,5-Tetrachloroben...	6.361	216	357856	45.74	ppm	99
108) Atrazine	8.661	215	130031	52.27	ppm	93
114) Pentachloronitrobenzene	8.758	295	52497	50.64	ppm	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474929.D
Acq On : 12 Aug 2018 10:49 pm
Operator : christc2
Sample : icv2305-50
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 13 11:40:32 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:36:04 2018
QLast Update : Mon Aug 13 11:36:04 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474932.D
Acq On : 13 Aug 2018 12:04 am
Operator : christc2
Sample : icv2305-50
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Aug 13 11:43:03 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:42:25 2018
QLast Update : Mon Aug 13 11:42:25 2018
Response via : Initial Calibration

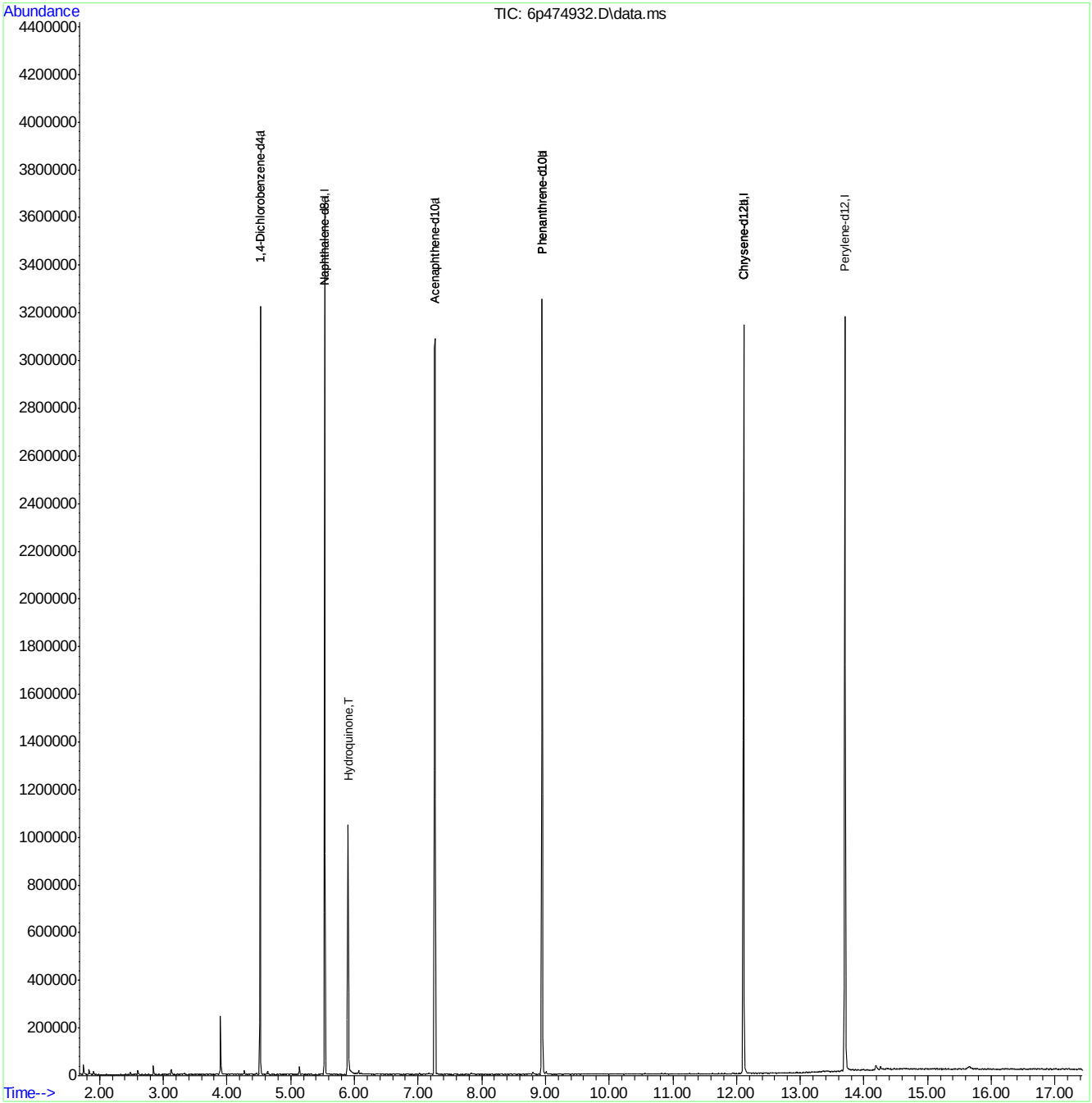
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.521	152	315835	40.00	ppm	0.00
24) Naphthalene-d8	5.538	136	1241170	40.00	ppm	0.00
47) Acenaphthene-d10	7.260	164	636025	40.00	ppm	0.00
69) Phenanthrene-d10	8.950	188	1152170	40.00	ppm	0.00
83) Chrysene-d12	12.111	240	1129888	40.00	ppm	0.00
91) Perylene-d12	13.705	264	1116569	40.00	ppm	0.00
101) 1,4-Dichlorobenzene-d4a	4.521	152	315835	40.00	ppm	0.00
103) Acenaphthene-d10a	7.260	164	636025	40.00	ppm	0.00
105) Phenanthrene-d10a	8.950	188	1152170	40.00	ppm	0.00
109) Chrysene-d12a	12.111	240	1129888	40.00	ppm	0.00
111) Naphthalene-d8a	5.538	136	1241170	40.00	ppm	0.00
113) Phenanthrene-d10b	8.950	188	1152170	40.00	ppm	0.00
115) Chrysene-d12b	12.111	240	1129827	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
8) Phenol-d5	0.000	99	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
51) 2-Fluorobiphenyl	0.000	172	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
85) Terphenyl-d14	0.000	244	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
106) 1-chlorooctadecane	0.000	57	0	0.00	ppm	
107) o-terphenyl	0.000	230	0	0.00	ppm	
Target Compounds						Qvalue
112) Hydroquinone	5.901	110	466931	45.94	ppm	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2305\
Data File : 6p474932.D
Acq On : 13 Aug 2018 12:04 am
Operator : christc2
Sample : icv2305-50
Misc : op8717,e6p2305,1000,,,1,1
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Aug 13 11:43:03 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuMon Aug 13 11:42:25 2018
QLast Update : Mon Aug 13 11:42:25 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475557.D
Acq On : 14 Sep 2018 3:38 am
Operator : chriss2
Sample : cc2304-25
Misc : op8717,e6p2338,1000,,,1,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Sep 14 11:52:38 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) 1,4-Dichlorobenzene-d4	4.329	152	262138	40.00	ppm		-0.05
24) Naphthalene-d8	5.319	136	1082797	40.00	ppm		-0.06
47) Acenaphthene-d10	7.009	164	584667	40.00	ppm		-0.08
69) Phenanthrene-d10	8.683	188	1001878	40.00	ppm		-0.08
83) Chrysene-d12	11.828	240	980483	40.00	ppm		-0.09
91) Perylene-d12	13.411	264	955179	40.00	ppm		-0.09
101) 1,4-Dichlorobenzene-d4a	4.329	152	262138	40.00	ppm		-0.05
103) Acenaphthene-d10a	7.009	164	584667	40.00	ppm		-0.08
105) Phenanthrene-d10a	8.683	188	1001878	40.00	ppm		-0.08
109) Chrysene-d12a	11.828	240	980483	40.00	ppm		-0.09
111) Naphthalene-d8a	5.319	136	1082797	40.00	ppm		-0.06
113) Phenanthrene-d10b	8.683	188	1001878	40.00	ppm		-0.08
115) Chrysene-d12b	11.828	240	980483	40.00	ppm		-0.09
System Monitoring Compounds							
5) 2-Fluorophenol	3.340	112	232258	25.31	ppm		-0.08
Spiked Amount 50.000			Recovery = 50.62%				
8) Phenol-d5	4.083	99	305620	25.57	ppm		-0.04
Spiked Amount 50.000			Recovery = 51.14%				
25) Nitrobenzene-d5	4.741	82	281253	22.58	ppm		-0.06
Spiked Amount 50.000			Recovery = 45.16%				
51) 2-Fluorobiphenyl	6.319	172	536983	24.53	ppm		-0.08
Spiked Amount 50.000			Recovery = 49.06%				
73) 2,4,6-Tribromophenol	7.886	330	71450	23.81	ppm		-0.09
Spiked Amount 50.000			Recovery = 47.62%				
85) Terphenyl-d14	10.603	244	541685	27.88	ppm		-0.10
Spiked Amount 50.000			Recovery = 55.76%				
106) 1-chlorooctadecane	0.000	57	0	0.00	ppm		
107) o-terphenyl	0.000	230	0	0.00	ppm		
Target Compounds							Qvalue
2) 1,4-Dioxane	1.773	88	106332	24.31	ppm		96
3) Pyridine	2.115	79	268979	24.80	ppm		97
4) N-Nitrosodimethylamine	2.072	74	155330	24.28	ppm		87
6) Indene	4.516	116	431717	26.77	ppm		97
7) Cumene	3.725	105	640417	23.97	ppm		98
9) Phenol	4.094	94	360023	25.26	ppm	#	55
10) Aniline	4.088	93	423817	26.10	ppm		56
11) bis(2-Chloroethyl)ether	4.137	93	232593	24.84	ppm		98
12) 2-Chlorophenol	4.174	128	256485	26.90	ppm		95
13) Decane	4.222	43	310946	29.84	ppm		90
14) 1,3-Dichlorobenzene	4.286	146	262237	25.27	ppm		97
15) 1,4-Dichlorobenzene	4.340	146	277535	25.75	ppm		99
16) Benzyl alcohol	4.441	108	151413	23.74	ppm		87
17) 1,2-Dichlorobenzene	4.452	146	252705	25.50	ppm		99
18) Acetophenone	4.629	105	371291	24.21	ppm		80
19) 2-Methylphenol	4.532	108	245748	25.63	ppm		95
20) 2,2'-oxybis(1-Chloropr...	4.538	121	78472	24.68	ppm	#	86
21) 3&4-Methylphenol	4.645	108	253087	25.74	ppm		99

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475557.D
Acq On : 14 Sep 2018 3:38 am
Operator : chriss2
Sample : cc2304-25
Misc : op8717,e6p2338,1000,,,1,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Sep 14 11:52:38 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
22) n-Nitroso-di-n-propyla...	4.634	70	205342	25.56	ppm		92
23) Hexachloroethane	4.704	201	87334	24.42	ppm		96
26) Nitrobenzene	4.757	77	288623	22.81	ppm		89
27) Quinoline	5.629	129	515353	26.29	ppm		99
28) Isophorone	4.944	82	491202	23.35	ppm		93
29) 2-Nitrophenol	5.008	139	133271	27.71	ppm		80
30) 2,4-Dimethylphenol	5.057	107	260068	23.12	ppm		88
31) Benzoic acid	5.158	105	203554	25.12	ppm		97
32) bis(2-Chloroethoxy)met...	5.121	93	266329	24.73	ppm		98
33) 2,4-Dichlorophenol	5.212	162	188469	23.38	ppm		95
34) 2,6-Dichlorophenol	5.394	162	195103	24.69	ppm		94
35) 1,3,5-Trichlorobenzene	5.014	180	226808	24.50	ppm		95
36) 1,2,4-Trichlorobenzene	5.271	180	209432	24.23	ppm		96
37) 1,2,3-Trichlorobenzene	5.463	180	208164	24.28	ppm		96
38) Naphthalene	5.335	128	770175	25.92	ppm		99
39) 4-Chloroaniline	5.388	127	329672	26.08	ppm		98
40) 2,3-Dichloroaniline	6.233	161	247084	24.55	ppm		98
41) Caprolactam	5.704	55	122113	25.64	ppm		96
42) Hexachlorobutadiene	5.452	225	107986	20.08	ppm		99
43) 4-Chloro-3-methylphenol	5.838	107	239519	24.80	ppm		100
44) 2-Methylnaphthalene	5.955	141	397135	25.73	ppm		96
45) 1-Methylnaphthalene	6.051	141	444490	25.90	ppm		95
46) Dimethylnaphthalene	6.576	156	449882	27.23	ppm		95
48) Hexachlorocyclopentadiene	6.116	237	237915	42.90	ppm		97
49) 2,4,6-Trichlorophenol	6.244	196	139571	24.01	ppm		99
50) 2,4,5-Trichlorophenol	6.281	196	153591	25.34	ppm		94
52) 2-Chloronaphthalene	6.431	162	435690	23.46	ppm		98
53) Biphenyl	6.415	154	602089	25.49	ppm		97
54) 2-Nitroaniline	6.544	65	164522	24.85	ppm		97
55) Dimethylphthalate	6.747	163	492420	23.29	ppm		98
56) Acenaphthylene	6.859	152	717611	25.13	ppm		99
57) 2,6-Dinitrotoluene	6.806	165	111545	25.83	ppm		83
58) 3-Nitroaniline	6.982	138	137011	26.81	ppm		92
59) Acenaphthene	7.046	153	461249	24.88	ppm		97
60) 2,4-Dinitrophenol	7.094	184	131372	60.07	ppm		91
61) 4-Nitrophenol	7.201	109	76163	19.94	ppm	#	64
62) Dibenzofuran	7.233	168	628957	24.24	ppm		92
63) 2,4-Dinitrotoluene	7.239	165	152996	23.99	ppm		97
64) 2,3,4,6-Tetrachlorophenol	7.383	232	118820	23.75	ppm		94
65) Diethylphthalate	7.522	149	485037	22.85	ppm		98
66) Fluorene	7.613	166	518876	24.73	ppm		98
67) 4-Chlorophenyl-phenyle...	7.629	204	238099	24.50	ppm		85
68) 4-Nitroaniline	7.656	138	131961	25.31	ppm		81
70) 4,6-Dinitro-2-methylph...	7.693	198	94725	29.53	ppm		95
71) n-Nitrosodiphenylamine	7.763	169	375499	26.89	ppm		98
72) 1,2-Diphenylhydrazine	7.806	77	575187	24.56	ppm		99
74) 4-Bromophenyl-phenylether	8.180	248	135338	25.17	ppm		95
75) Hexachlorobenzene	8.244	284	150991	22.90	ppm		95
76) Pentachlorophenol	8.485	266	193059	46.36	ppm		97
77) Phenanthrene	8.704	178	710581	26.39	ppm		97

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475557.D
Acq On : 14 Sep 2018 3:38 am
Operator : chriss2
Sample : cc2304-25
Misc : op8717,e6p2338,1000,,,1,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Sep 14 11:52:38 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

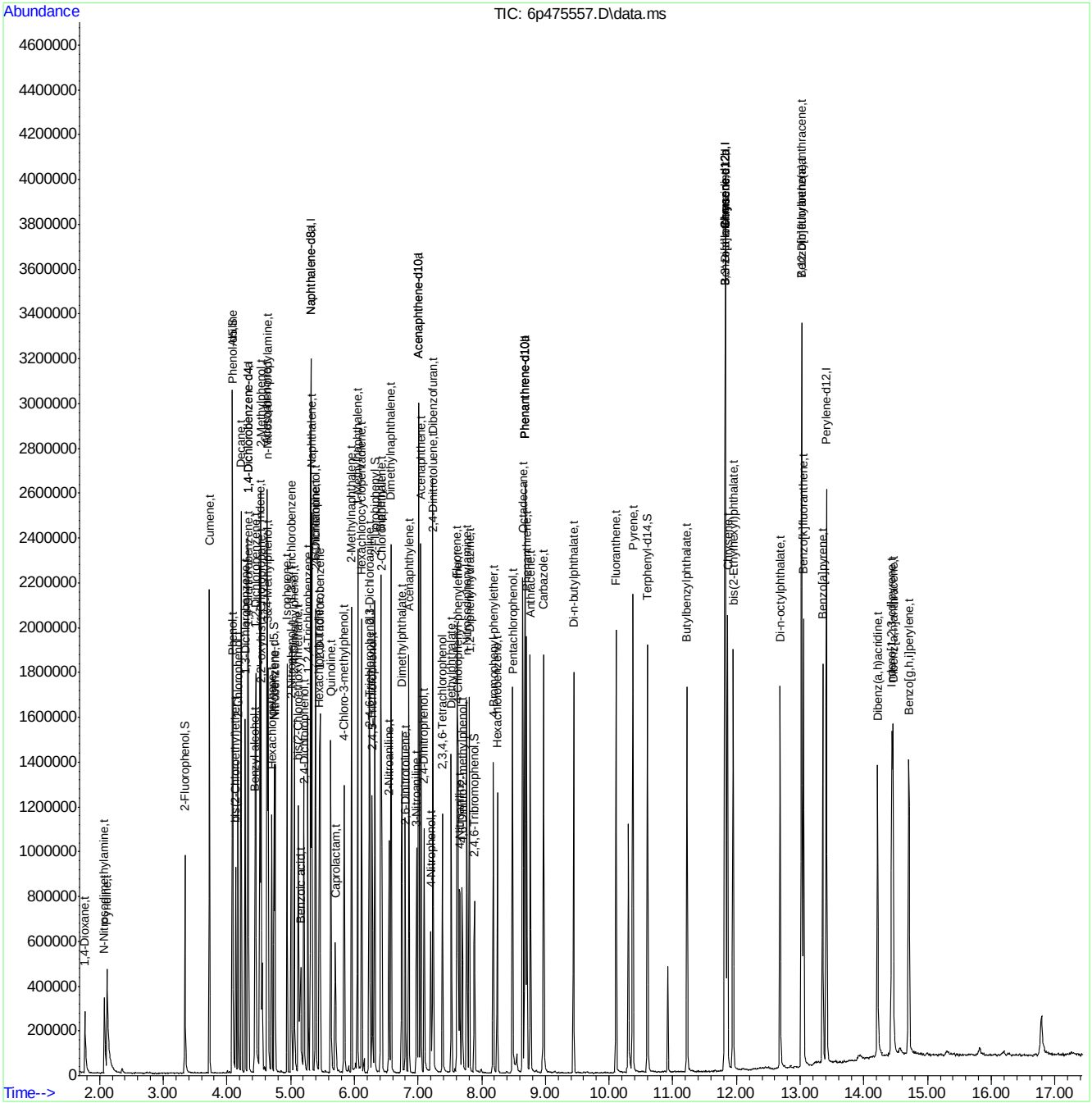
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
78) Anthracene	8.769	178	744492	27.84	ppm	97
79) Carbazole	8.972	167	688102	26.65	ppm	98
80) Di-n-butylphthalate	9.442	149	830211	26.02	ppm	99
81) Fluoranthene	10.111	202	763331	26.30	ppm	95
82) Octadecane	8.646	57	417829	29.88	ppm	95
84) Pyrene	10.373	202	813025	28.31	ppm	97
86) Butylbenzylphthalate	11.224	149	358218	27.95	ppm	98
87) Benzo[a]anthracene	11.817	228	738040	25.99	ppm	100
88) 3,3'-Dichlorobenzidine	11.817	252	271075	26.50	ppm	95
89) Chrysene	11.860	228	723900	27.59	ppm	97
90) bis(2-Ethylhexyl)phtha...	11.946	149	480093	28.54	ppm	99
92) Di-n-octylphthalate	12.684	149	812830	25.41	ppm	96
93) Benzo[b]fluoranthene	13.021	252	748243	26.25	ppm	92
94) Benzo[k]fluoranthene	13.053	252	709196	29.07	ppm	96
95) Benzo[a]pyrene	13.352	252	658867	28.69	ppm	97
96) Indeno[1,2,3-cd]pyrene	14.438	276	782848	28.97	ppm	90
97) Dibenz(a,h)acridine	14.213	279	566420	29.11	ppm	97
98) Dibenz[a,h]anthracene	14.460	278	678538	28.77	ppm	93
99) 7,12-Dimethylbenz(a)an...	13.021	256	353316	27.53	ppm	98
100) Benzo[g,h,i]perylene	14.706	276	628289	29.56	ppm	90

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475557.D
Acq On : 14 Sep 2018 3:38 am
Operator : chriss2
Sample : cc2304-25
Misc : op8717,e6p2338,1000,,,1,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Sep 14 11:52:38 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475558.D
Acq On : 14 Sep 2018 4:03 am
Operator : chriss2
Sample : cc2305-25
Misc : op8717,e6p2338,1000,,,1,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Sep 14 11:55:36 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration

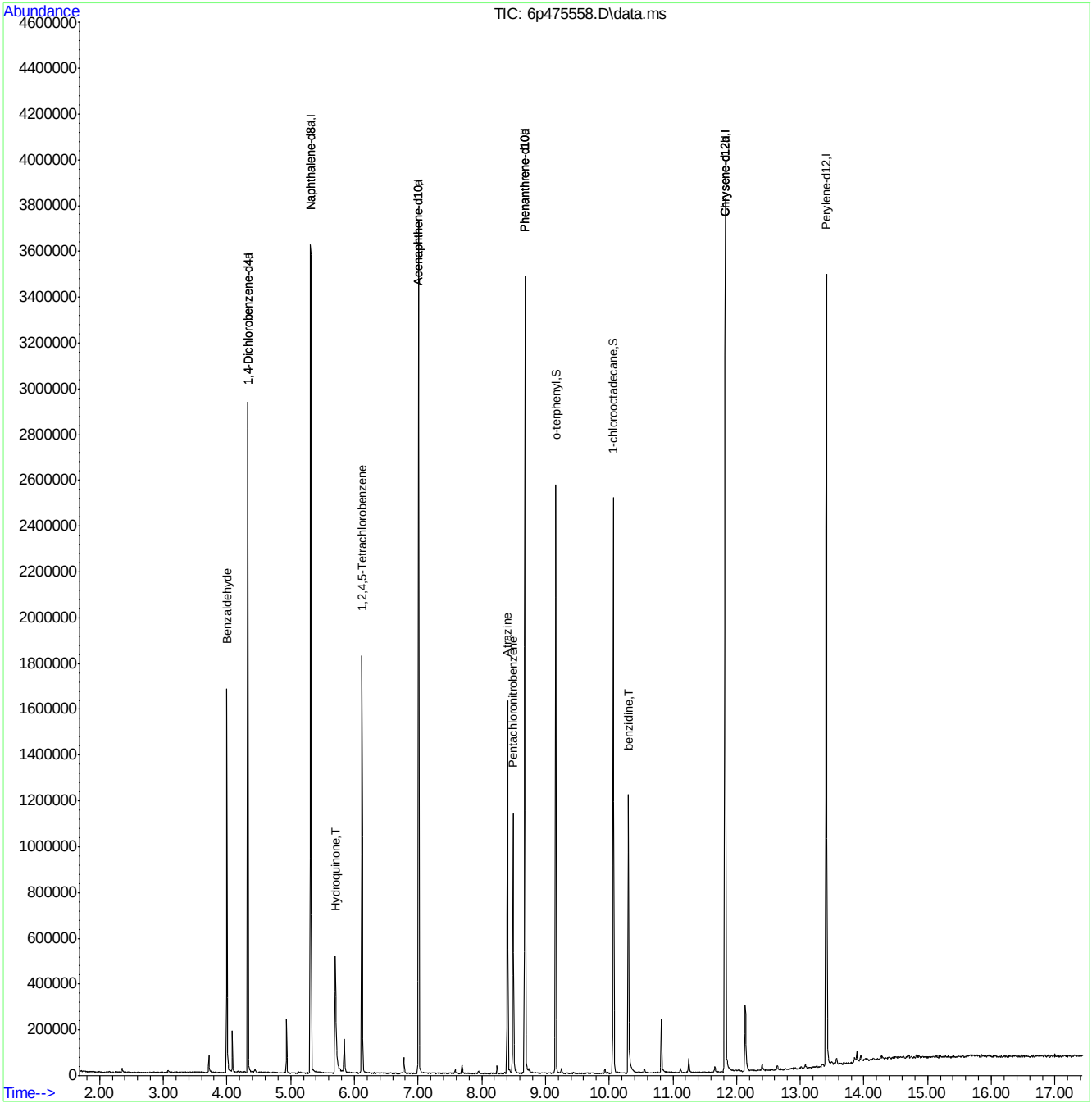
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.329	152	342934	40.00	ppm	-0.05
24) Naphthalene-d8	5.319	136	1342233	40.00	ppm	-0.06
47) Acenaphthene-d10	7.009	164	671442	40.00	ppm	-0.08
69) Phenanthrene-d10	8.677	188	1278500	40.00	ppm	-0.09
83) Chrysene-d12	11.828	240	1242166	40.00	ppm	-0.09
91) Perylene-d12	13.411	264	1304375	40.00	ppm	-0.09
101) 1,4-Dichlorobenzene-d4a	4.329	152	342934	40.00	ppm	-0.05
103) Acenaphthene-d10a	7.009	164	671442	40.00	ppm	-0.08
105) Phenanthrene-d10a	8.677	188	1278500	40.00	ppm	-0.09
109) Chrysene-d12a	11.828	240	1242166	40.00	ppm	-0.09
111) Naphthalene-d8a	5.319	136	1342233	40.00	ppm	-0.06
113) Phenanthrene-d10b	8.677	188	1278500	40.00	ppm	-0.09
115) Chrysene-d12b	11.828	240	1242631	40.00	ppm	-0.09
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
8) Phenol-d5	0.000	99	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
25) Nitrobenzene-d5	0.000	82	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
51) 2-Fluorobiphenyl	0.000	172	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
85) Terphenyl-d14	0.000	244	0	0.00	ppm	
Spiked Amount 50.000			Recovery =	0.00%		
106) 1-chlorooctadecane	10.068	57	323171	29.21	ppm	-0.05
107) o-terphenyl	9.164	230	485232	24.95	ppm	-0.08
Target Compounds						Qvalue
102) Benzaldehyde	3.997	105	247083	26.70	ppm	95
104) 1,2,4,5-Tetrachloroben...	6.121	216	252814	25.81	ppm	96
108) Atrazine	8.410	215	92710	28.70	ppm	94
110) benzidine	10.303	184	465604	22.14	ppm	97
112) Hydroquinone	5.698	110	281687	25.63	ppm	91
114) Pentachloronitrobenzene	8.496	295	33946	25.21	ppm	91

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E6P2338\
Data File : 6p475558.D
Acq On : 14 Sep 2018 4:03 am
Operator : chriss2
Sample : cc2305-25
Misc : op8717,e6p2338,1000,,,1,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Sep 14 11:55:36 2018
Quant Method : C:\MSDCHEM\1\METHODS\M6P2304.M
Quant Title : Semi Volatile GC/MS,zb-5msi 30m x .25mm x .25MoTuWed Aug 29 14:38:26 2018
QLast Update : Wed Aug 29 14:38:26 2018
Response via : Initial Calibration



GCMS Semi Volatile Run Log

Instrument ID: GCMS6P

Standard / Reagent	Lot #	Concentration	Standard / Reagent	Lot #	Concentration
dftpp	sv182451-29	50ppm	DCM-Fisher	189589	---
			ISTD	dr. e 351634	4000ppm

Column	i5silms30mx.25mmx.25u	Initial Calib Date	7/27/18	Sequence Loaded By:	w bayoumi	Quant Method/s	M6P2292
Batch ID	E6P2304	Analysis Date	8/12/2018	Data Processed By:	kristis	Injection Volume	1.0ul
Approved By:	NINAP	Approved Date	4/2018 11:27:26 A				

☑ SW846 8270 D
☑ EPA 625

Data File		Sample ID	OP Batch ID	Test	MTX	A L S	Dil	L+	Surr OK?	IS OK?	Data OK?	Comment
6P	474906	DFTPP				1					ok	12:38pm
6P	474907	IC2304-100				2					ok	sv82957-106a
6P	474908	IC2304-80				3					ok	sv182457-106b
6P	474909	IC2304-50				4					ok	sv182457-106c
6P	474910	IC2304-25				5					ok	sv182457-106d
6P	474911	IC2304-10				6					ok	sv182457-106d
6P	474912	IC2304-5				7					ok	sv182457-106g
6P	474913	IC2304-2				8					ok	sv182457-106h
6P	474914	IC2304-1				9					ok	sv182457-106i
6P	474915	ICV2304-50		625.1		10					ok	sv182451-79b

GCMS Semi Volatile Run Log

Data File		Sample ID	OP Batch ID	Test	MTX	A L S	Dil	L+	Surr OK?	IS OK?	Data OK?	Comment
6P	474916	ICV2304-50		bna2		11					ok	op182231-67
6P	474917	ICV2304-50		acid		12					ok	op18215879 5:34pm
6P	474918	ICV2304-50		abn surr		13					not needed	op182231-89
6P	474019	ICV2304-50		bn1		14					not needed	op182158132

GCMS Semi Volatile Run Log

Instrument ID: GCMS6P

Standard / Reagent	Lot #	Concentration	Standard / Reagent	Lot #	Concentration
dftpp	sv182451-29	50ppm	tcl42	sv18-2451-92i	1 ppm
tcl42	sv18-2451-92a	100 ppm	tcl42 2nd source	sv18-2451-69a	50 ppm
tcl42	sv18-2451-92b	80 ppm	bnzdne 3 rd source	sv18-2451-58	50 ppm
tcl42	sv18-2451-92c	50 ppm	pcnbnz 2nd source	sv18-2451-79p	50 ppm
tcl42	sv18-2451-92d	25 ppm	hq 2nd source	op18-2158-42	50 ppm
tcl42	sv18-2451-92e	10 ppm			
tcl42	sv18-2451-92g	5 ppm	istd	dr. e351634	4000 ppm
tcl42	sv18-2451-92h	2 ppm	dcm/fisher	1488589	

Column	i5silms30mx.25mmx.25u	Initial Calib Date	8/12/18	Sequence Loaded By:	w bayoumi	Quant Method/s	M6P2304
Batch ID	E6P2305	Analysis Date	8/12/2018	Data Processed By:	kristis	Injection Volume	1.0ul
Approved By:	NINAP	Approved Date	4/2018 11:27:44 A				

☐ SW846 8270 D
☐ EPA 625

Data File		Sample ID	OP Batch ID	Test	MTX	ALS	Dil	L+	Surr OK?	IS OK?	Data OK?	Comment
6P	474920	DFTPP				1					OK	
6P	474921	IC2305-100				2					OK	
6P	474922	IC2305-80				3					OK	
6P	474923	IC2305-50				4					OK	
6P	474924	IC2305-25				5					OK	
6P	474925	IC2305-10				6					OK	
6P	474926	IC2305-5				7					OK	
6P	474927	IC2305-2				8					OK	
6P	474928	IC2305-1				9					OK	
6P	474929	ICV2305-50		tcl42 2nd source		10					ok	

GCMS Semi Volatile Run Log

Data File		Sample ID	OP Batch ID	Test	MTX	A L S	Dil	L+	Surr OK?	IS OK?	Data OK?	Comment
6P	474930	ICV2305-50		benzidine 3rd source		11					not needed	
6P	474931	ICV2305-50		pcnbnz 2nd source		12					not needed	
6P	474932	ICV2305-50		hq 2nd source		13					ok	

GCMS Semi Volatile Run Log

Instrument ID: GCMS6P

Standard / Reagent	Lot #	Concentration	Standard / Reagent	Lot #	Concentration
dftpp	sv18-2451-112	50ppm			
BNA	sv182490-24p	25ppm			
TCL42	sv182451-85f	25ppm			
bna verif	sv182451-117k	5ppm			
			istd	A0138779	4000 ppm
			dcm/fisher	185827	---

Column	i5silms30mx.25mmx.25u	Initial Calib Date	8/12/18	Sequence Loaded By:	chriss2	Quant Method/s	M6P2304
Batch ID	E6P2338	Analysis Date	9/14/2018	Data Processed By:		Injection Volume	1.0ul
Approved By:	KRISTIS	Approved Date	0/2018 11:25:34 A				

☑ SW846 8270 D
☐ EPA 625

Data File		Sample ID	OP Batch ID	Test	MTX	ALS	Dil	L+	Surr OK?	IS OK?	Data OK?	Comment
6P	75556	DFTPP				1					ok	3:23am
6P	75557	CC2304-25				2					ok	
6P	75558	CC2305-25				3					ok	
6P	75559	BNA VERIF-5PPM				4					ok	
	75560	OP15037-MB1	OP15037	AB8270RCP,AB8270TCL20,AB8270TCL20+,B8270PAH	SO	5		X	x	x	ok	
	75561	OP15037-BS	OP15037	AB8270RCP,AB8270TCL20,AB8270TCL20+,B8270PAH	SO	6		X	x	x	ok	
	75562	OP15037-MS	OP15037	AB8270RCP,AB8270TCL20,AB8270TCL20+,B8270PAH	SO	7		X	x	x	ok	
	75563	OP15037-MSD	OP15037	AB8270RCP,AB8270TCL20,AB8270TCL20+,B8270PAH	SO	8		X	x	x	ok	
6P	75564	JC73460-4	OP15037	B8270PAH	SO	9			x	x	ok	
6P	75565	JC73460-2	OP15037	B8270PAH	SO	10			x	x	ok	

GCMS Semi Volatile Run Log

Data File		Sample ID	OP Batch ID	Test	MTX	ALS	Dil	L+	Surr OK?	IS OK?	Data OK?	Comment
6P	75566	JC73460-3	OP15037	B8270PAH	SO	11			x	x	ok	
6P	75567	JC73659-3A	OP15037	AB8270TCL20	SO	12			x	x	ok	
6P	75568	JC73635-3	OP15037	AB8270RCP	SO	13			x	x	ok	
6P	75569	JC73635-5	OP15037	AB8270RCP	SO	14			x	x	ok	
6P	75570	JC73635-4	OP15037	AB8270RCP	SO	15			x	x	ok	
6P	75571	JC73460-1	OP15037	B8270PAH	SO	16			x	x	ok	
6P	75572	JC73635-6	OP15037	AB8270RCP	SO	17			x	x	ok	
6P	75573	JC72905-1R	OP15037	AB8270TCL20+	SO	18		X	x	x	ok	
6P	75574	JC73659-1A	OP15037	AB8270TCL20	SO	19			x	x	ok	
6P	75575	JC73659-2A	OP15037	AB8270TCL20	SO	20			x	x	ok	
6P	75576	JC73577-1A	OP15037	AB8270TCL20+	SO	21		X	x	x	ok	
6P	75577	JC72905-2R	OP15037	AB8270TCL20+	SO	22		X	x	x	ok	
6P	75578	JC73598-1	OP15037	AB8270TCL20+	SO	23	5	X	x	x	ok	diluted for viscosity f.v. 10 12.31pm

8-2212

LOGBOOK ID:

ABN Extraction Log - Solids

Date started: 9-13-18 Time started: 16 20
Date finished: 9-13-18 Time finished: 20 10

Extract Method (CHECK OFF "√" /DO NOT CIRCLE):
Microwave SW3546 X Sonication SW3550C _____
Waste Dil. SW3580A _____ Soxhlet SW3540C _____

BATCH # MS 15037	RACK# R46
Weighed by:	MS
Extracted by:	MS
Concentrated by:	MS
Final Vol. Top-up:	LJ MS
Vialed by:	LJ MS
Supervisor Review:	afw KA 9/13/18

Special Client Spike Instructions					
QC ID# for Special Spike	Amt to Spike	Spike ID	Lot #	Conc.	Amt. Spiked

WITNESS SIGN: SPIKE SIGN:
Manager/Supervisor/Team Lead Approval:

SPECIAL PROCESSING INSTRUCTIONS
Rx Reason:
Spiking:
Weights/Volumes:
Required MS/MSD: JC73460-4
Final Volume:
Other:

	Sample #	Analysis Type	Sample Bottle #	Sample Description	Sample Wet Wt. (g) Oil (g) Liq (mL)	Decant Y	Decant N	Sonicator ID	Microwave ID	Final Extract Color	Final Extract Vol(mL)	GPC Cleanup	Comments
	MB1	ABN		Sand	30.0				15	Clear	1.0		
	BS1			Sand	30.0				15	yellow	1.0		
	JC73460-4MS		1	gravel	31.0		/		15	Yellow	1.0		
	MSD		1	gravel	30.6		/		15	Yellow	1.0		
	BS												
	MS												
	MSD												
	BS												
	MS												
	MSD												
1	JC73598-1	ABN	1	clay	17.5		/		15	grey	16.0		*
2	JC73659-1A		1	Soil	31.1		/		15	Brown	1.0		
3	-2A		1	Soil	30.5		/		15	Brown	1.0		
4	-3A		1	Soil	30.1		/		15	Yellow	1.0		
5	JC73577-1A		3	Sand	31.5		/		15	Brown	1.0		
6	JC73635-3		1	clay	30.7		/		15	Yellow	1.0		
7	-4		1	clay	30.7		/		15	Yellow	1.0		
8	-5		1	clay	31.7		/		15	Yellow	1.0		
9	-6		1	clay	30.7		/		15	Brown	1.0		
10	JC72905-1R		1	Soil	30.5		/		15	Yellow	1.0		
11	-2R		1	Soil	30.6		/		15	Brown	1.0		
12	JC73460-1		1	gravel	31.1		/		15	Yellow	1.0		
13	-2		1	Gravel	30.1		/		15	Yellow	1.0		
14	-3		1	gravel	31.8		/		15	Yellow	1.0		
15	-4		1	Gravel	30.4		/		15	Yellow	1.0		
16													
17													
18													
19													
20													

Comments: QC Samples (MS, MSD, LINK and/or DUP, Link) Confirmed by:
* limited volume, Sample would not concentrate to 1ml

Equipment/ Range	ID	Observed Temp (°C)	Correction Factor (°C)	Corrected Temp (°C)	Pressure/ Flowrate
Buchi (65-71°C)	10	74.3	1.0	753	ok
Buchi Chiller	M1	10.0	-	10.0	Ok
Waterbath (70-80°C)					
Waterbath Chiller (GPM)					
NEVAP (32-38°C, LPM)	2	34.7	0.1	34.8	10
Balance	B30	N/A	N/A	N/A	N/A

SURROGATE	LOT #	CONC (ppm)	AMT (mL)
ABN	182231122	50	1.0
ABN DOD SIM			
WITNESS SIGN:	LJ	SPIKE SIGN: MS	

MATRIX SPIKE	LOT #	CONC (ppm)	AMT (mL)
Acid	182231103	50	Acid: 1.0
Acid (for SIM)			A(SIM):
Base #1	182231124	50	1.0
Base #2	182158173	50	1.0
Aniline	182231175	50	1.0
BSIM			
WITNESS SIGN:	LJ	SPIKE SIGN: MS	

SOLVENT	LOT #	BRAND	AMT (mL)
1:1 METH CHLOR/ ACETONE	185094 / 182576	Fisher	30
METH CHLOR	185095	Fisher	VAR

REAGENT	LOT #	BAKE BATCH #	BRAND
HYDROMATRIX	6112475	9-12-18	Agilent
SODIUM SULFATE	179119	9-12-18	Fisher
FILTER PAPER	11082017	-	Fisher

MATRIX	LOT #	BAKE BATCH #	BRAND
SAND	TAK170712024	8-8-18	Fisher

SGS
Form: OP019A-10
Rev Date: 8/2/17

99

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Job Number: JC73460
Account: BBLNYS Arcadis
Project: NYSEG, Homer, NY

Sample: JC73460-1 **Analyzed:** 12-SEP-18 by SF **Method:** SM2540 G 18TH ED MOD
ClientID: DUP-090718

Wet Weight (Total)	30.62	g
Tare Weight	23.48	g
Dry Weight (Total)	29.83	g
Solids, Percent	88.9	%

Sample: JC73460-2 **Analyzed:** 12-SEP-18 by SF **Method:** SM2540 G 18TH ED MOD
ClientID: PDI-2018-03 (13-15)

Wet Weight (Total)	31.61	g
Tare Weight	24.68	g
Dry Weight (Total)	30.47	g
Solids, Percent	83.5	%

Sample: JC73460-3 **Analyzed:** 12-SEP-18 by SF **Method:** SM2540 G 18TH ED MOD
ClientID: PDI-2018-02 (7-11)

Wet Weight (Total)	33.08	g
Tare Weight	23.93	g
Dry Weight (Total)	32.12	g
Solids, Percent	89.5	%

Sample: JC73460-4 **Analyzed:** 12-SEP-18 by SF **Method:** SM2540 G 18TH ED MOD
ClientID: PDI-2018-01 (19-23)

Wet Weight (Total)	34.17	g
Tare Weight	26.63	g
Dry Weight (Total)	33.15	g
Solids, Percent	86.5	%

ATTACHMENT 7

Data Validation Report

ARCADIS Design & Consultancy for natural and built assets

NYSEG – Cortland-Homer Site

DATA USABILITY SUMMARY REPORT

Homer, New York

Semivolatile Analysis

SDG #JC73460

Analyses Performed By:
SGS Laboratories
Dayton, New Jersey

Report #30886R
Review Level: Tier III
Project: B0013137.0004.00006

SUMMARY

This data usability summary report (DUSR) summarizes the review of Sample Delivery Group (SDG) # JC73460 for samples collected in association with the NYSEG Cortland-Homer Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	HERB PEST PCB	MET	MISC
JC73460	DUP-090718-ACTD-JC73460SO	JC73460-1	Soil	9/7/2018	PDI-2018-01 (19-23)-ACTD-JC73460SO		X			
	PDI-2018-03 (13-15)-ACTD-JC73460SO	JC73460-2	Soil	9/6/2018			X			
	PDI-2018-02 (7-11)-ACTD-JC73460SO	JC73460-3	Soil	9/7/2018			X			
	PDI-2018-01 (19-23)-ACTD-JC73460SO	JC73460-4	Soil	9/7/2018			X			

Note:

1. Matrix spike/matrix spike duplicate was performed on sample location PDI-2018-01 (19-23)-ACTD-JC73460SO.

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United Stated Environmental Protection Agency (USEPA) SW-846 Method 8270D. Data were reviewed in accordance with USEPA Region II SOPs and USEPA National Functional Guidelines of October 1999 and applicable Region II SOPs. USEPA NFGs and Region II SOPs were followed for qualification purposes.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

SEMIVOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270D	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the SVOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

8. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices and 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
PDI-2018-01 (19-23)-ACTD-JC73460SO / DUP-090718-ACTD-JC73460SO	Acenaphthene	49.5	60.4	AC
	Acenaphthylene	19.6 J	36 U	
	Fluoranthene	27.7 J	36 U	
	Fluorene	18.6 J	25.3 J	
	Naphthalene	60.7	75.0	
	Phenanthrene	58.7	27.9 J	
	Pyrene	36.1	36 U	

Notes:
AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

SVOCs: SW-846 8270		Reported		Performance Acceptable		Not Required
		No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)						
D.	Quantitation transcriptions/calculations		X		X	
E.	Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

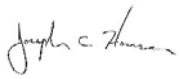
SAMPLE COMPLIANCE REPORT

Sample Delivery Group (SDG)	Sampling Date	Protocol	Sample ID	Matrix	Compliancy[1]					Noncompliance
					VOC	SVOC	PCB	MET	MISC	
JC73460	9/7/2018	USEPA/ SW846	DUP-090718-ACTD-JC73460SO	Soil	--	Yes	--	--	--	
	9/6/2018	USEPA/ SW846	PDI-2018-03 (13-15)-ACTD-JC73460SO	Soil	--	Yes	--	--	--	
	9/7/2018	USEPA/ SW846	PDI-2018-02 (7-11)-ACTD-JC73460SO	Soil	--	Yes	--	--	--	
	9/7/2018	USEPA/ SW846	PDI-2018-01 (19-23)-ACTD-JC73460SO	Soil	--	Yes	--	--	--	

Note:

1 Samples which are compliant with no added validation qualifiers are listed as "yes". Samples which are non-compliant or which have added qualifiers are listed as "no". A "no" designation does not necessarily indicate that the data have been rejected or are otherwise unusable.

VALIDATION PERFORMED BY: Joseph C. Houser

SIGNATURE: 

DATE: October 16, 2018

PEER REVIEW: Jeffrey L. Davin

DATE: October 19, 2018

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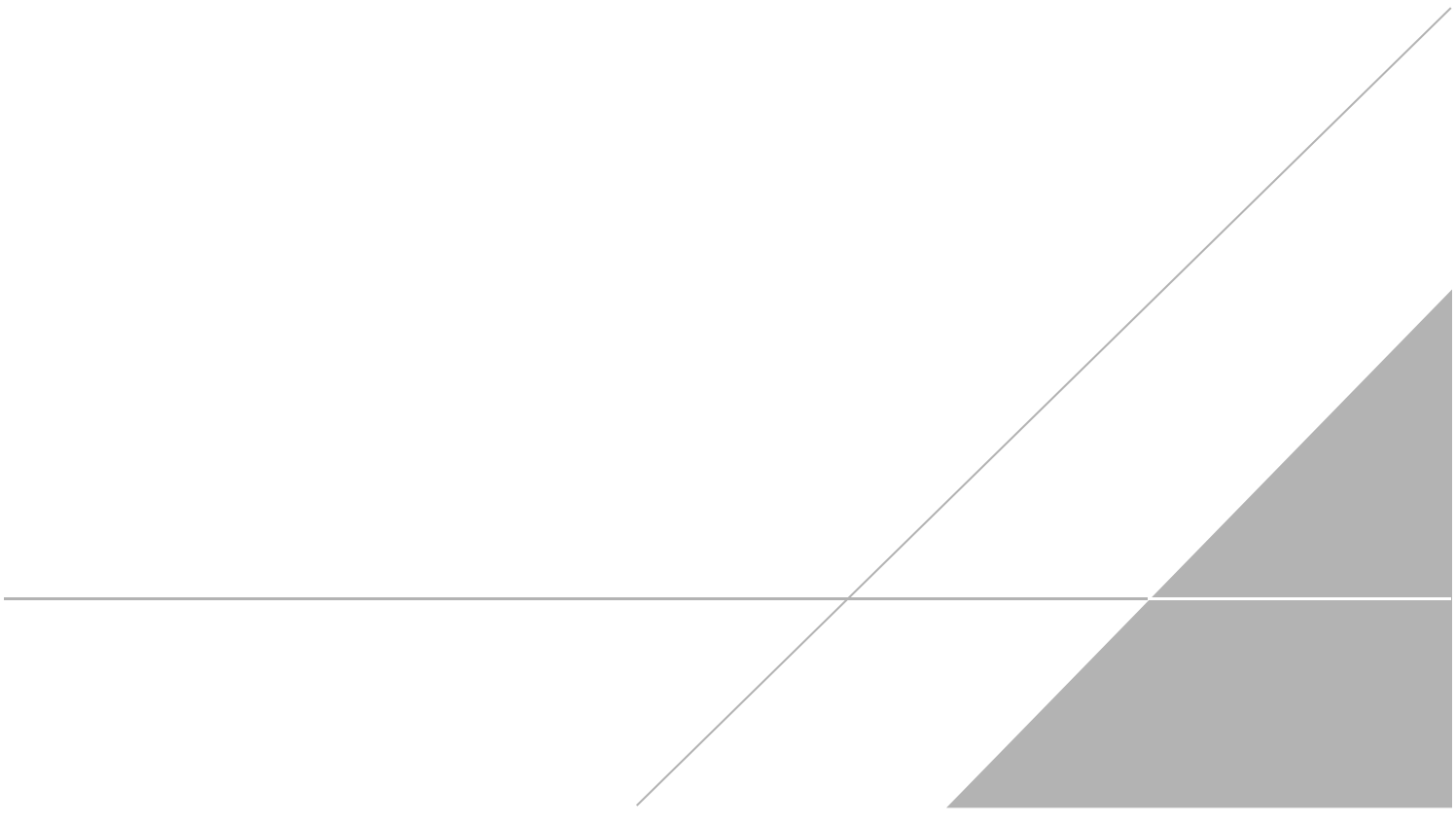
CORRECTED SAMPLE ANALYSIS DATA SHEETS



SGS North America Inc.

Report of Analysis

Client Sample ID: DUP-090718
Lab Sample ID: JC73460-1
Matrix: SO - Soil
Method: SW846 8270D SW846 3546
Project: NYSEG, Homer, NY

Date Sampled: 09/07/18
Date Received: 09/08/18
Percent Solids: 88.9

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P475571.D	1	09/14/18 09:36	CS	09/13/18 16:20	OP15037	E6P2338
Run #2							

	Initial Weight	Final Volume
Run #1	31.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	60.4	36	12	ug/kg	
208-96-8	Acenaphthylene	ND	36	18	ug/kg	
120-12-7	Anthracene	ND	36	22	ug/kg	
56-55-3	Benzo(a)anthracene	ND	36	10	ug/kg	
50-32-8	Benzo(a)pyrene	ND	36	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	36	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	36	18	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	36	17	ug/kg	
218-01-9	Chrysene	ND	36	11	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	36	16	ug/kg	
206-44-0	Fluoranthene	ND	36	16	ug/kg	
86-73-7	Fluorene	25.3	36	17	ug/kg	J
193-39-5	Indeno(1,2,3-cd)pyrene	ND	36	17	ug/kg	
91-20-3	Naphthalene	75.0	36	10	ug/kg	
85-01-8	Phenanthrene	27.9	36	12	ug/kg	J
129-00-0	Pyrene	ND	36	12	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	68%		26-134%
321-60-8	2-Fluorobiphenyl	72%		39-124%
1718-51-0	Terphenyl-d14	107%		36-134%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID: PDI-2018-03 (13-15)
Lab Sample ID: JC73460-2
Matrix: SO - Soil
Method: SW846 8270D SW846 3546
Project: NYSEG, Homer, NY

Date Sampled: 09/06/18
Date Received: 09/08/18
Percent Solids: 83.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P475565.D	1	09/14/18 07:07	CS	09/13/18 16:20	OP15037	E6P2338
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	150	40	14	ug/kg	
208-96-8	Acenaphthylene	ND	40	20	ug/kg	
120-12-7	Anthracene	33.8	40	24	ug/kg	J
56-55-3	Benzo(a)anthracene	ND	40	11	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	18	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	18	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	40	20	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	19	ug/kg	
218-01-9	Chrysene	ND	40	13	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	18	ug/kg	
206-44-0	Fluoranthene	23.8	40	18	ug/kg	J
86-73-7	Fluorene	70.3	40	18	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	40	19	ug/kg	
91-20-3	Naphthalene	156	40	11	ug/kg	
85-01-8	Phenanthrene	65.2	40	13	ug/kg	
129-00-0	Pyrene	29.9	40	13	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	65%		26-134%
321-60-8	2-Fluorobiphenyl	70%		39-124%
1718-51-0	Terphenyl-d14	101%		36-134%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID:	PDI-2018-02 (7-11)		
Lab Sample ID:	JC73460-3	**Date Sampled:**	09/07/18
Matrix:	SO - Soil	**Date Received:**	09/08/18
Method:	SW846 8270D SW846 3546	**Percent Solids:**	89.5
Project:	NYSEG, Homer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P475566.D	1	09/14/18 07:32	CS	09/13/18 16:20	OP15037	E6P2338
Run #2							

	Initial Weight	Final Volume
Run #1	31.8 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	52.1	35	12	ug/kg	
208-96-8	Acenaphthylene	ND	35	18	ug/kg	
120-12-7	Anthracene	37.0	35	22	ug/kg	
56-55-3	Benzo(a)anthracene	ND	35	9.9	ug/kg	
50-32-8	Benzo(a)pyrene	ND	35	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	35	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	35	18	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	35	16	ug/kg	
218-01-9	Chrysene	ND	35	11	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	35	16	ug/kg	
206-44-0	Fluoranthene	ND	35	16	ug/kg	
86-73-7	Fluorene	53.6	35	16	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	35	16	ug/kg	
91-20-3	Naphthalene	82.4	35	9.9	ug/kg	
85-01-8	Phenanthrene	36.9	35	12	ug/kg	
129-00-0	Pyrene	12.8	35	11	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	66%		26-134%
321-60-8	2-Fluorobiphenyl	68%		39-124%
1718-51-0	Terphenyl-d14	103%		36-134%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID: PDI-2018-01 (19-23)
Lab Sample ID: JC73460-4
Matrix: SO - Soil
Method: SW846 8270D SW846 3546
Project: NYSEG, Homer, NY

Date Sampled: 09/07/18
Date Received: 09/08/18
Percent Solids: 86.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P475564.D	1	09/14/18 06:42	CS	09/13/18 16:20	OP15037	E6P2338
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	49.5	38	13	ug/kg	
208-96-8	Acenaphthylene	19.6	38	19	ug/kg	J
120-12-7	Anthracene	ND	38	23	ug/kg	
56-55-3	Benzo(a)anthracene	ND	38	11	ug/kg	
50-32-8	Benzo(a)pyrene	ND	38	17	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	38	17	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	38	19	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	38	18	ug/kg	
218-01-9	Chrysene	ND	38	12	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	38	17	ug/kg	
206-44-0	Fluoranthene	27.7	38	17	ug/kg	J
86-73-7	Fluorene	18.6	38	17	ug/kg	J
193-39-5	Indeno(1,2,3-cd)pyrene	ND	38	18	ug/kg	
91-20-3	Naphthalene	60.7	38	11	ug/kg	
85-01-8	Phenanthrene	58.7	38	13	ug/kg	
129-00-0	Pyrene	36.1	38	12	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	70%		26-134%
321-60-8	2-Fluorobiphenyl	74%		39-124%
1718-51-0	Terphenyl-d14	106%		36-134%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

PAGE 1 OF 1

FED-EX Tracking # 810674533380 | Bottle Order Control #
SGS Quote # NWF5_2017_658 | SGS Job # JC73460

Client / Reporting Information

Company Name: Arcadis
Street Address: 110 West Fayette Street, Suite 300
City: Syracuse | State: NY | Zip: 13
Project Contact: Jason Golubski | E-mail:
Phone #: 315-671-9437 | Fax #:
Sampler(s) Name(s): Nicholle Griffith | Phone #: 315-378-8692

Project Information

Project Name: NYSEG - Homer, NY
Street:
City: State:
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (If different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	B8270PAH	V8260TCL20,	AB8270TCL20	HM8, CN	RCRACLAS	SULFUR,BTU	P8082PCB11 (SO)	P8082PCB11LL (AQ)	LAB USE ONLY
1	DUP-090718		9/7/18	-	MRG	SO	1					X				X								
2	PDI-2018-03 (13-15)		9/6/18	1457	MRG	SO	1					X				X								B13
3	PDI-2018-02 (7-11)		9/7/18	0945	MRG	SO	1					X				X								V270
4	PDI-2018-01 (19-23)		9/7/18	1430	MRG	SO	1					X				X								
	PDI-2018-01 (19-23) (MS)		9/7/18	1430	MRG	SO	1					X				X								
	PDI-2018-01 (19-23) (MSD)		9/7/18	1430	MRG	SO	1					X				X								
5	TB					DI	2	2																

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; ~~FB-Field Blank~~; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [x] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other COMMBN

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Report in ug/l, No "J" (UNIVAR62690)
INITIAL ASESSMENT
LABEL VERIFICATION
SYRA
Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		9/7/18 16:32	1	2	9/7/18 17:30	2
3		9/8/18 10:20	3	4		4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	[ ] Intact [ ] Not intact	Preserved where applicable [ ] On Ice [x] Cooler Temp. 3.7°

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.1 5

JC73460: Chain of Custody
Page 1 of 4

ATTACHMENT 4

2019 Supplemental Pre-Design Investigation Summary

MEMO

To:

Tracy Blazicek, NYSEG

Copies:

Mark Gravelding, Arcadis
Joe Bistrovich, Arcadis
Jason Vogel, Arcadis

From:

Jason Golubski, Arcadis

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017

Date:

December 18, 2019

Arcadis Project No.:

30003486

Subject:

NYSEG Cortland-Homer Former MGP Site
2019 Supplemental Pre-Design Investigation

This memorandum presents a summary of the Supplemental Pre-Design Investigation (PDI) activities conducted at the NYSEG Cortland-Homer Former Manufactured Gas Plant (MGP) Site in 2019. The supplement PDI activities were completed in support of preparing the remedial design for Tioughnioga River sediment excavation and restoration, and generally consisted of the following.

- Hydraulic Model Cross-Section Velocity/Discharge Survey
- Supplemental Wetland Delineation
- Supplemental Tree Survey
- Mean High-Water Line (MHWL) Evaluation
- Crane Road Investigation

A summary of each of the 2019 supplement PDI activities is provided in the following subsections. Data/ information obtained as part of the completed PDI activities has been incorporated into the remedial design, as appropriate.

Hydraulic Model Cross-Section Velocity/Discharge Survey

As the hydraulic site model was developed, Arcadis found that the modeled river elevation for a 1.5- to 2.0-year storm is approximately 1 to 2 feet higher than MHWL delineated in the field. Additionally, when comparing the United States Geological Survey (USGS) StreamStats and Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) data, the two sources report significantly

different flows for a given storm event. Also, the USGS gauging station located in Homer, New York (upstream of the project site) ceased recording daily mean flows in 1986 and the next closest gauging station is located in Cortland, New York, which is located downstream of the confluent of the eastern and western branches of the Tioughnioga River.

Therefore, a river cross-section velocity and discharge survey was completed on April 30, 2019 at representative transect locations in each of the removal areas (i.e., Area 1 and Area 2) to improve calibration of the Hydrologic Engineering Center-River Analysis System (HEC-RAS) model for the West Branch of the Tioughnioga River. Velocity/discharge measurements were taken in accordance with the USGS Techniques and Methods book 3, Chapter A8, Discharge Measurements at Gauging Stations. During the survey, USGS Stream Gauge 01509000 located downstream of the confluence of the East and West Branch of the Tioughnioga river was monitored and remained steady at 847 cubic feet per second (cfs) throughout the survey at both transect locations. Velocity/discharge measurements were incorporated into the HEC-RAS model to evaluate the potential for flooding to occur during remedial activities. Velocity/discharge data obtained for Area 1 and Area 2 is presented in Tables 1 and 2, respectively.

Velocity measurements were collected at Transect 29a (located just upstream of the downstream bridge in Area 1) and at Transect 43a (located just upstream of the confluence of the West Branch of the Tioughnioga River and Dry creek in Area 2), as shown on Figure 1. Topographic survey was completed at the additional transect locations (shown on Figure 1) to improve calibration of the HEC-RAS model.

Supplemental Wetland Delineation

Wetland delineation activities completed in 2018 focused on review of habitat characteristics within limits of the Tioughnioga River. As the remedial design includes construction of a temporary access road located above the top of bank in the area immediately east of the Tioughnioga River, a supplemental wetland delineation survey was completed in this area on August 7, 2019.

One wetland was identified and delineated within the subject area, as shown on Figure 2. The wetland is a depressional area best classified as a Palustrine, emergent, persistent, seasonally flooded wetland. The dominate vegetation was reed canary grass (*Phalaris arundinacea*) and the wetland is routinely maintained (mowed) by the property owner. Wetland hydrology appears to collect within the wetland depression during spring runoff and flooding events, which likely persists for the early part of the growing season.

Wetland soils were examined at three locations shown on Figure 2. Wetland sample data point (DP-1WET) was examined to a depth of 12-inches and consisted of a silty clay loam with redox concentrations present throughout the soil matrix. Soils were saturated to a depth of six inches below the surface, but no surface water was present. A clay layer is present approximately 12-inches below the surface appears to form a perched water table within the wetland for portions of the growing season. The soils exhibited a Munsell color notation of 5YR 4/1 (dark gray) with 2.5YR 3/4 dark olive brown mottles. Upland sample data points DP-2UP and DP-3UP featured dry soil with no redox features or mottles and lacked both hydric soil and wetland hydrology indicators. The upland vegetation cover consisted of clover (*Trifolium sp.*) and golden road (*Solidago sp.*). Both upland sample points are routinely mowed so identification to the species level was not possible.

Wetland field data sheets are included as Attachment 1 and photographs of representative locations are included as Attachment 2.

Supplemental Tree Survey

The initial tree survey for the site was conducted as part of the habitat assessment completed in October 2017. Based on the anticipated limits of the temporary access road, a supplemental tree survey was completed at Area 1 on August 21, 2019 to document live tree species greater than 3 inches diameter at breast height (DBH) in potential additional disturbance areas. Trees were surveyed using a Trimble Geo 7X Handheld GPS Unit.

A total of 10 tree species and 112 trunks were observed. The most abundant species was box elder with lesser abundances of silver maple and white willow. Average DBH for all species observed was 13.7 inches. No trees were observed to have large cavities or portions with large bark separations. Surveyed tree locations are shown on Figure 2 and tree species and DBH are included in Table 3.

Mean High Water Line Evaluation

During the October 2017 habitat assessment, NYSDEC representatives were present at the site when Arcadis was delineating the MHWL in Area 1; NYSDEC and Arcadis agreed upon the delineation of the MHWL in this area. NYSDEC proceeded to Area 2 while Arcadis continued work in Area 1. Upon arriving in Area 2, Arcadis found that NYSDEC delineated the MHWL notability higher on the bank (based on indicators), compared to Area 1. Arcadis proceeded to delineate the MHWL in Area 2 at an elevation lower on the bank, and consistent with the indicators observed in Area 1.

To resolve the discrepancy in the observed MHWL at Area 2, NYSEG, NYSDEC (Ms. Jean Foley), and Arcadis conducted a site walk on October 15, 2019 to review site conditions. The MHWL, as agreed upon by NYSDEC and Arcadis, was staked at eight locations along the eastern bank of Area 2. Staked locations were subsequently surveyed by Paul James Olszewski, PLS, PLLC on October 18, 2019. For comparison, the MHWL delineated in 2017, and the 2019 staked locations and the corresponding revised MHWL, are shown on Figure 3.

Crane Road Investigation

To support the design the temporary access road (crane road) to be constructed above the top of bank in the areas immediately east of the Tioughnioga River, additional geotechnical information was obtained during the week of October 28, 2019. A total of 15 geotechnical borings were completed at the Area 1 and Area 2 locations shown on Figures 4 and 5, using a tripod-mounted hammer, to a depth of approximately 8 feet below grade. Blow-counts were collected while drilling the borings and recovered samples were examined to determine the soil's geologic composition. A summary of the blow-count and observed soil conditions is presented in Table 4.

Enclosures:

Tables

1 Hydraulic Model Cross Section Velocity/Discharge Survey (Area 1)
2 Hydraulic Model Cross Section Velocity/Discharge Survey (Area 2)
3 2019 Supplemental Tree Survey
4 Geotechnical Boring Summary

Figures

1 River Transect Locations
2 Supplemental Tree Survey and Wetland Delineation
3 Area 2 – 2019 Mean High-Water Line Survey
4 Area 1 – Geotechnical Boring Locations
5 Area 2 – Geotechnical Boring Locations

Attachments

1 Wetland Determination Data Forms
2 Photo Log

TABLES

Table 1
Hydraulic Model Cross Section Velocity/Discharge Survey (Area 1)
NYSEG
Cortland-Homer Former MGP Site
Homer, New York

Area 1 - T-29a (Upstream of Bridge)						
Position	Lateral Distance (ft)	Vertical Distance (ft)[3]	Water Depth (ft)	Velocity (ft/sec)[4]		
				0.2	0.6	0.8
LTOB[5]	0.0	0.33	--	--	--	--
LB1	7.5	3.40	--	--	--	--
LB2	21.4	3.60	--	--	--	--
LEOW	22.4	4.20	0.00	--	--	--
1	25.1	4.95	0.95	--	0.98	--
2	27.8	5.30	1.35	--	1.55	--
3	30.5	5.50	1.55	--	1.65	--
4	33.2	6.00	2.00	--	1.88	--
5	35.9	6.40	2.35	--	2.07	--
6	38.6	6.75	2.75	1.73	--	2.24
7	41.3	6.70	2.70	1.75	--	2.28
8	44.0	6.60	2.60	1.62	--	2.36
9	46.7	6.40	2.45	--	2.30	--
10	49.4	6.30	2.30	--	2.26	--
11	52.1	6.25	2.25	--	2.42	--
12	54.8	6.30	2.30	--	2.48	--
13	57.5	6.15	2.15	--	2.48	--
14	60.2	6.10	2.10	--	2.52	--
15	62.9	6.30	2.30	--	2.35	--
16	65.6	6.20	2.15	--	2.19	--
17	68.3	6.15	2.05	--	1.74	--
18	71.0	5.95	1.85	--	1.62	--
19	73.7	5.65	1.55	--	0.95	--
20	76.4	5.00	0.80	--	0.12	--
REOW	78.6	4.25	--	--	--	--
RB1	80.5	2.90	--	--	--	--
RB2	83.1	0.65	--	--	--	--
RTOB	85.0	0.00	--	--	--	--

Acronyms and Abbreviations:

ft = feet
ft/sec = feet per second
LTOB = left top of bank
LB1 = left bank level 1
LB2 = left bank level 2
LEOW = left bank edge of water
REOW = right bank edge of water
RB1 = right bank level 1
RB2 = right bank level 2
RTOB = right top of bank

Notes:

1. Velocity/discharge measurements taken by Arcadis on April 30, 2019.
2. United States Geological Survey (USGS) Stream Gauge 01509000 Tioughnioga River at Cortland, NY flow = 847 cubic feet per second.
3. Vertical distance is approximately a level line datum from top of bank down to channel bed to relate measures.
4. Per USGS Techniques and Methods Book 3, Chapter 8, Discharge Measurements at Gauging Stations, collect two point method at 0.2 and 0.8 total water depth for > 2.5 feet; collect one point at 0.6 total water depth for depths 0.3 to 2.5 feet. No velocity recorded for depths below 0.3 feet.
5. TOB Datum is approximately 4 inches up from bank surface to level out with RTOB.

Table 2
Hydraulic Model Cross Section Velocity/Discharge Survey (Area 2)
NYSEG
Cortland-Homer Former MGP Site
Homer, New York

Area 2 - T-43a (Upstream of Tributary)						
Position	Lateral Distance (ft)	Vertical Distance (ft)[1]	Water Depth (ft)	Velocity (ft/sec)[4]		
				0.2	0.6	0.8
LTOB[5]	0.0	0.50	--	--	--	--
LB1	2.0	1.40	--	--	--	--
LB2	4.1	2.50	--	--	--	--
LEOW	5.2	3.75	--	--	--	--
1	8.2	4.70	1.50	--	0.61	--
2	11.2	5.30	2.15	--	0.65	--
3	14.2	5.95	2.75	0.75	--	1.02
4	17.2	6.45	3.30	0.93	--	1.09
5	20.2	6.80	3.60	1.02	--	1.2
6	23.2	7.20	4.10	0.98	--	1.23
7	26.2	7.45	4.20	0.95	--	1.32
8	29.2	7.55	4.35	1.15	--	1.25
9	32.2	7.50	4.30	1.14	--	1.38
10	35.2	7.20	4.10	1.28	--	1.52
11	38.2	7.00	3.85	1.2	--	1.59
12	41.2	6.85	3.65	1.13	--	1.64
13	44.2	6.55	3.40	1.52	--	1.66
14	47.2	6.55	3.30	0.53	--	1.73
15	50.2	6.15	2.95	1.28	--	1.58
16	53.2	5.75	2.50	--	1.47	--
17	56.2	5.35	2.10	--	1.30	--
18	59.2	4.85	1.65	--	1.28	--
19	62.2	4.55	1.35	--	1.02	--
20	65.2	4.15	0.85	--	1.07	--
21	68.2	3.85	0.50	--	0.68	--
REOW	70.0	3.80	--	--	--	--
RB1	80.6	3.30	--	--	--	--
RB2	84.4	2.35	--	--	--	--
RB3	86.8	1.20	--	--	--	--
RTOB	88.2	0.00	--	--	--	--

Acronyms and Abbreviations:

ft = feet
ft/sec = feet per second
LTOB = left top of bank
LB1 = left bank level 1
LB2 = left bank level 2
LEOW = left bank edge of water
REOW = right bank edge of water
RB1 = right bank level 1
RB2 = right bank level 2
RB3 = right bank level 3
RTOB = right top of bank

Notes:

1. Velocity/discharge measurements taken by Arcadis on April 30, 2019.

2. United States Geological Survey (USGS) Stream Gauge 01509000 Tioughnioga River at Cortland, NY flow = 847 cubic feet per second.

3. Vertical distance is approximately a level line datum from top of bank down to channel bed to relate measures.

4. Per USGS Techniques and Methods Book 3, Chapter 8, Discharge measurements at Gauging Stations, collect two point method at 0.2 and 0.8 total water depth for > 2.5 feet; collect one point at 0.6 total water depth for depths 0.3 to 2.5 feet. No velocity recorded for depths below 0.3 feet.

5. TOB Datum is approximately 6 inches up from bank surface to level out with RTOB.

Table 3
2019 Supplemental Tree Survey
NYSEG
Cortland-Homer Former MGP Site
Homer, New York

Tree Location #	Species	DBH (inches)
West Shore; Below bridge		
T1-2	Box Elder	6.9
		8.2
T3-10	White Willow	36.0
		30.6
		27.4
		34.0
		27.2
		31.5
		28.0
		25.2
T11	Silver Maple	24.4
T12	Silver Maple	15.9
T13	Silver Maple	8.9
T14	Silver Maple	16.5
T15-17	Red Maple	5
		10.5
		8
T18	Red Maple	7.7
T19	Red Maple	12.0
T20	Red Maple	13.4
T21-22	Box Elder	6.1
		4.9
T23-24	Box Elder	5.7
		4.9
T25-27	Box Elder	6.6
		5.8
		6.6
T28	Box Elder	11.3
T29	Box Elder	6.6
T30	Box Elder	6.4
T31	Box Elder	12.4
T32	Box Elder	3.9
T33-38	White Willow	17.5
		19.5
		23
		23.5
		21.3
		21.4
T39	Box Elder	3.4
T40	Box Elder	5.0
T41-44	Box Elder	7.6
		12.7
		15.2
		12.2
T45	Box Elder	7.2
T46-47	Box Elder	5.7
		4.9
East Shore; Below bridge		
T48-50	Box Elder	14.5, 13.2, 13.4
T51	Box Elder	8.4

Table 3
2019 Supplemental Tree Survey
NYSEG
Cortland-Homer Former MGP Site
Homer, New York

Tree Location #	Species	DBH (inches)
T52	Box Elder	12.5
T53-54	Box Elder	7.9, 11.3
T55-56	Box Elder	13.0, 11.2
T57	Box Elder	15.7
T58	Box Elder	9.8
T59	Box Elder	19.0
T60	Box Elder	16.1
T61	Box Elder	9.5
T62	Pignut Hickory	11.0
T63-64	Box Elder	13.5, 15.0
T65	Silver Maple	21.8
T66	Box Elder	9.8
T67	Box Elder	12.5
T68	Silver Maple	16.0
T69	Box Elder	14.5
T70	Box Elder	7.2
T71	Box Elder	14.8
T72	Box Elder	4.5
T73-74	Box Elder	3.3, 3.9
T75	White Willow	48.5
T76	White Willow	25.2
T77	White Willow	32.0
T78	Box Elder	3.1
T79	Silver Maple	19.9
T80	Norway Maple	10.9
T81	Silver Maple	25.0
T82	White Willow	18.5
T83	Box Elder	4.8
T84	White Willow	19.9
T85-86	Silver Maple	4.6, 4.0
T87	Box Elder	4.2
T88	Box Elder	15.5
T89-90	Box Elder	6.2, 5.6
T91	Box Elder	7.2
T92-94	White Willow	22.2, 20.5, 20.5
West Shore for Laydown/Processing Area		
T95-106	Silver Maple	11.2, 11.0, 5.2, 9.0, 5.2, 5.0, 17.5, 18.2, 14.0, 9.5, 17.5, 8.8
T107	Crab Apple	25.2
T108	Maple Hybrid (Crimson)	17.2
T109	Norway Maple	19.5
T110	Shellbark Hickory	12.5
T111	Red Maple	10.5
T112	Flowering Dogwood/Cherry	12.5

Acronyms and Abbreviations:

DBH = diameter at breast height.

Notes:

1. Supplemental Tree Survey conducted by Arcadis on August 21, 2019.

Table 4
Geotechnical Boring Summary
NYSEG
Cortland-Homer Former MGP Site
Homer, New York

	Depth (in)	Blow Counts	N_{value}	Recovery (in)	Water Table (ft bgs)	Description
Area 1						
Boring A1-1 (10/31/2019)	0-6	8	9	15	2.0	0-15" Brown SILT, little organics, trace fine sand, moist, stiff
	6-12	3				
	12-18	6				
	18-24	7				
	24-30	12	36	12		24-30" Light grey CLAY, little fine sand, wet, firm. 30-36" Greyish brown fine subangular to subrounded GRAVEL, some fine to medium sand, wet, dense
	30-36	18				
	36-42	18				
	42-48	25				
	48-54	8	46	14		48-62" Greyish brown medium to fine SAND, some medium to fine subangular to subrounded gravel, coarse sand, wet, dense
	54-60	16				
	60-66	30				
	66-72	38				
	72-78	9	79	18		72-90" SAA
	78-84	24				
	84-90	55				
	90-96	29				
Boring A1-2 (10/31/2019)	0-6	5	15	8	2.0	0-8" Light brown SILT, trace organics, very fine sand, moist, stiff
	6-12	7				
	12-18	8				
	18-24	9				
	24-30	7	33	9		24-28" Olive brown fine SAND, little clay, wet, soft. 28-33" Olive brown fine to medium GRAVEL, some medium to fine sand, wet, dense
	30-36	14				
	36-42	19				
	42-48	13				
	48-54	12	62	17		48-65" Brown fine to medium subangular to subrounded GRAVEL and fine to medium SAND, trace clay, wet, very dense
	54-60	20				
	60-66	42				
	66-72	33				
	72-78	18	64	12		72-84" Greyish brown fine to medium subangular to subrounded GRAVEL, some medium to fine sand, little coarse sand, wet, very dense
	78-84	27				
	84-90	37				
	90-96	33				
Boring A1-3 (10/31/2019)	0-6	4	22	15	2.3	0-12" Brown SILT, trace organics, moist, medium firm. 12-15" Olive brown SILT, some clay, trace very fine sand, moist, very stiff
	6-12	5				
	12-18	17				
	18-24	21				
	24-30	27	68	0		No Recovery
	30-36	29				
	36-42	39				
	42-48	28				
	48-54	19	52	16		48-64" Greyish brown fine SAND, some medium sand, medium to fine subangular to subrounded gravel, little coarse sand, wet, very dense
	54-60	27				
	60-66	25				
	66-72	24				
	72-78	18	84	12		72-84" Greyish brown medium to fine SAND, some medium to fine subangular to subrounded gravel, little coarse sand, very dense, wet
	78-84	46				
	84-90	38				
	90-96	24				
Boring A1-4 (10/31/2019)	0-6	7	22	6	2.0	0-6" Brown SILT, little clay, trace organics, very fine sand, moist, very stiff
	6-12	11				
	12-18	11				
	18-24	9				
	24-30	8	30	9		24-33" Greyish brown fine to medium subangular to subrounded GRAVEL, some fine to medium sand, little coarse sand, wet, medium dense
	30-36	9				
	36-42	21				
	42-48	25				
	48-54	29	59	20		48-69" Greyish brown medium to fine SAND and medium to fine GRAVEL, some coarse sand, wet, very dense
	54-60	30				
	60-66	29				
	66-72	42				
	72-78	11	38	16		72-88" Greyish brown medium to fine SAND, dense
	78-84	17				
	84-90	21				
	90-96	29				

Table 4
Geotechnical Boring Summary
NYSEG
Cortland-Homer Former MGP Site
Homer, New York

	Depth (in)	Blow Counts	N_{value}	Recovery (in)	Water Table (ft bgs)	Description
Boring A1-5 (10/31/2019)	0-6	7	11	7	2.3	0-7" Brown SILT, trace organics, fine sand and clay, moist, stiff
	6-12	6				
	12-18	5				
	18-24	5				
	24-30	16	65	11		24-27" SAA. 27-35" Greyish brown fine to medium SAND, some medium to fine subangular gravel, little sand, wet, very dense
	30-36	31				
	36-42	34				
	42-48	30				
	48-54	16	52	12		48-60" greyish brown medium to fine SAND, some medium to fine subangular to subround gravel, little coarse sand, wet, very dense
	54-60	21				
	60-66	31				
	66-72	30				
	72-78	17	40	15		72-87" SAA
	78-84	21				
	84-90	19				
	90-96	23				
Boring A1-6 (10/30/2019)	0-6	7	14	6	4.0	0-6" Brown SILT, little organics, trace clay, moist, stiff
	6-12	7				
	12-18	7				
	18-24	5				
	24-30	4	26	14		24-33" Olive brown CLAY, some silt, little fine sand, trace organics, moist to wet, stiff. 33-38" gray brown medium SAND little to some fine to medium subangular to subrounded gravel, wet, loose
	30-36	7				
	36-42	19				
	42-48	9				
	48-54	18	45	18		48-66" Greyish brown fine SAND, some medium to fine subangular to subrounded gravel, little medium sand, wet, dense
	54-60	21				
	60-66	24				
	66-72	14				
	72-78	14	31	12		72-84" Brown fine subangular GRAVEL, some fine sand, little medium sand, medium subangular to subrounded gravel, wet, dense
	78-84	15				
	84-90	16				
	90-96	12				
Boring A1-7 (10/28/2019)	0-6	7	30	9	2.3	0-9" brown SILT, little clay, organics, moist, very stiff
	6-12	13				
	12-18	17				
	18-24	15				
	24-30	6	31	13		24-28" SAA, 28-37 Light greyish brown fine SAND, moist, little silt, moist to wet, trace subangular gravel
	30-36	14				
	36-42	17				
	42-48	12				
	48-54	38	44	14		48-60" SILT with some gravel, 60-72" GRAVEL with little silt, saturated throughout
	54-60	25				
	60-66	19				
	66-72	16				
	72-78	17	29	12		72-96" Brown medium to find subangular, subrounded GRAVEL, little coarse to medium sand, loose, wet
	78-84	18				
	84-90	11				
	90-96	16				
Boring A1-8 (10/28/2019)	0-6	5	10	14	2.8	0-14" Brown SILT, little clay, trace organics, moist, stiff
	6-12	5				
	12-18	5				
	18-24	8				
	24-30	6	72	15		24-30" SAA, 30-41" Brown to greyish brown medium to fine SAND, some medium to fine subangular to subrounded gravel little coarse sand, moist, loose
	30-36	36				
	36-42	36				
	42-48	17				
	48-54	32	22	18		48-66" Brown coarse to fine, angular to subangular GRAVEL, little fine to medium sand, wet loose
	54-60	10				
	60-66	12				
	66-72	12				
	72-78	11	38	14		Brown fine to medium subrounded GRAVEL, with little to some fine to medium sand, loose, wet
	78-84	19				
	84-90	19				
	90-96	24				

Table 4
Geotechnical Boring Summary
NYSEG
Cortland-Homer Former MGP Site
Homer, New York

	Depth (in)	Blow Counts	N_{value}	Recovery (in)	Water Table (ft bgs)	Description
Boring A1-9 (10/28/2019)	0-6	7	28	13	3.1	0-13" Dark brown to brown SILT, little fine to medium subround gravel, fine sand, trace organics, clay, moist, very stiff
	6-12	12				
	12-18	16				
	18-24	11				
	24-30	8	28	6		24-30" Brown SILT, little very fine sand, trace clay, organics, moist, very stiff
	30-36	11				
	36-42	17				
	42-48	20				
	48-54	35	41	9		48-57" Brown medium to fine SAND, little fine to medium subangular gravel, trace silt, organics, moist becoming wet, hard
	54-60	25				
	60-66	16				
	66-72	18				
	72-78	15	38	12		72-84" Brown firm subrounded to subangular GRAVEL, little fine to medium sand, wet, loose
	78-84	17				
	84-90	21				
	90-96	26				
Area 2						
Boring A2-1 (10/30/2019)	0-6	12	91	10	7.8	0-10" dark brown SILT, little to some fine sand, little medium to find angular to subangular gravel, trace organics, moist, hard, rock in shoe
	6-12	51				
	12-18	40				
	18-24	28				
	24-30	48	94	13		24-31" Brown fine SAND, some medium to fine subangular to subrounded gravel, little medium sand, trace silt, moist becoming wet @~30" bgs, very dense
	30-36	51				
	36-42	43				
	42-48	10				
	48-54	9	21	13		48-55" Dark greyish brown SILT, little organics, trace fine subrounded gravel, very fine sand, moist, stiff
	54-60	10				
	60-66	11				
	66-72	21				
	72-78	8	37	0		No Recovery
	78-84	9				
	84-90	28				
	90-96	23				
	96-102	15	53	8		96-104" grey medium to fine subangular to subrounded GRAVEL, some find sand, little medium sand, wet, very dense
	102-108	22				
	108-114	31				
	114-120	24				
Boring A2-2 (10/29/2019)	0-6	5	25	11	--	0-11" Brown SILT, little medium subangular gravel, medium to fine sand, organics, moist, very stiff
	6-12	9				
	12-18	16				
	18-24	55				
	24-30	42	51	8		24-32" Olive brown SILT, some very fine sand, trace clay, organics, moist, hard
	30-36	30				
	36-42	21				
	42-48	28				
	48-54	19	58	0		No Recovery
	54-60	21				
	60-66	37				
	66-72	67				
	72-78	44	98	13		66-79" Brown fine SAND, little fine to medium subrounded to subangular Gravel, moist, very dense
	78-84	50				
	84-90	48				
	90-96	38				
	96-102	85	159	24		96-112" SAA stiff, moist. 112-120" grey fine SAND, little fine subangular to subrounded gravel, dry, hard
	102-108	73				
	108-114	86				
	114-120	94				

Table 4
Geotechnical Boring Summary
NYSEG
Cortland-Homer Former MGP Site
Homer, New York

	Depth (in)	Blow Counts	N_{value}	Recovery (in)	Water Table (ft bgs)	Description
Boring A2-3 (10/29/2019)	0-6	4	20	12	--	0-12" Brown SILT, little to some fine to very fine sand, organics, moist, very stiff
	6-12	6				
	12-18	14				
	18-24	30				
	24-30	36	74	13		24-37" Olive brown to brown SILT, some very fine sand, trace clay, organics, moist, hard
	30-36	41				
	36-42	33				
	42-48	11				
	48-54	9	16	6		48-54" dark greyish brown to dark brown SILT, little organics, trace fine subrounded gravel, very fine sand, moist, very stiff
	54-60	8				
	60-66	8				
	66-72	11				
	72-78	8	44	8		72-80" Brown, fine, SAND little medium subangular to subrounded gravel, wet, dense
	78-84	17				
	84-90	27				
	90-96	36				
	96-102	42	106	10		96-106" Grey, fine SAND, little to some subangular to subrounded gravel wet to moist, stiff
	102-108	49				
	108-114	57				
	114-120	44				
Boring A2-4 (10/30/2019)	0-6	7	22	13	--	0-6" SILT, little clay, trace organics, very fine sand, moist, stiff
	6-12	11				
	12-18	11				
	18-24	9				
	24-30	8	30	10		24-33" Greyish brown fine to medium subangular to subrounded GRAVEL, some fine to medium sand, little coarse sand, wet, medium dense
	30-36	9				
	36-42	21				
	42-48	25				
	48-54	29	59	10		48-54" SAA 54-58" Grey fine to medium SAND, little to some medium to fine subangular gravel, moist, loose
	54-60	30				
	60-66	29				
	66-72	42				
	72-78	11	38	18		72-88" greyish brown medium to fine subangular to subrouded GRAVEL, some medium to fine sand, little coarse sand, wet, dense
	78-84	17				
	84-90	21				
	90-96	29				
Boring A2-5 (10/30/2019)	0-6	7	15	12		0-6" Brown SILT, little organics, trace fine sand, moist, medium firm, . 6-12" greyish brown fine SAND some medium to fine subangular gravel, moist, stiff
	6-12	7				
	12-18	8				
	18-24	12				
	24-30	5	10	10		24-34" Greyish brown fine to medium SAND, some medium to fine subangular to subrounded gravel, moist, loose
	30-36	6				
	36-42	4				
	42-48	12				
	48-54	3	7	7		48-55" Greyish brown SILT, some very fine sand, little fine sand ,t race fine subrounded gravel, moist, stiff, crumbles easily
	54-60	3				
	60-66	4				
	66-72	6				
	72-78	10	44	11		72-83" Brown to greyish brown medium subangular GRAVEL, some to little fine to medium sand, trace subangular to subrounded gravel, moist, dense
	78-84	10				
	84-90	34				
	90-96	57				
	96-102	48	109	12		96-99" SAA. 99-108" Greyish brown fine SAND, some medium to fine subangular to subrounded gravel, medium sand coarse sand, wet, very dense
	102-108	54				
	108-114	55				
	114-120	40				

Table 4
Geotechnical Boring Summary
NYSEG
Cortland-Homer Former MGP Site
Homer, New York

	Depth (in)	Blow Counts	N_{value}	Recovery (in)	Water Table (ft bgs)	Description
Boring A2-6 (10/30/2019)	0-6	4	10	9		0-9" Brown to dark greyish brown SIILT, little organics, trace medium subangular to subrounded gravel, clay, moist, stiff
	6-12	5				
	12-18	5				
	18-24	10				
	24-30	14	25	8		24-32" Greyish brown fine SAND, little fine to medium subangular to subrounded gravel, moist, medium dense
	30-36	15				
	36-42	10				
	42-48	12				
	48-54	13	24	10		48-58" Orangish brown to brown fine SAND, little fine to medium subangular to subrounded gravel, trace silt moist to dry, medium dense
	54-60	12				
	60-66	12				
	66-72	10				
	72-78	14	38	13		72-82"" SAA. 82-85" Grey fine SAND, some medium subrounded gravel, little medium sand, moist, medium dense
	78-84	15				
	84-90	23				
	90-96	51				
	96-102	28	146	22		96-118" Brown medium to fine SAND, little medium to fine subangular to subrounded gravel, trace silt, moist, very dense
	102-108	51				
	108-114	95				
	114-120	53				

Note:
1. Soil borings completed by Arcadis on the dates indicated using a tripod-mounted 140-lb hammer.

FIGURES

C:\Users\bdeclercq\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2019\B0013137.0008\01-DWG\2019 PDI Memo_Fig 1_River Transect Locations.dwg SAVED: 10/23/2019 10:06 AM BY: DECLERCQ, BRIAN

XREFS: IMAGES:
2019 PDI Memo_Fig 1_Drawing Areas 1&2 Aerial.tif

LEGEND:

- APPROXIMATE BOUNDARY OF NYSEG–OWNED PROPERTY
- 2013 PROBING TRANSECTS
- 2019 RIVER MODEL TRANSECTS
- FLOW DIRECTION

NOTES:

1. ALL LOCATIONS APPROXIMATE.

0 350' 700'
GRAPHIC SCALE

NYSEG
CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK
2019 SUPPLEMENTAL PDI MEMO

RIVER TRANSECT LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

City:IM/DV Div/Group: SYR Created By: JRAPP Last Saved By: jbistrovich
Z:\GISProjects_ENV\NYSEG\Cortland-Homer\Habitat Assessment\mxd\SiteFeatures.mxd 11/15/2019 12:20:12 PM

LEGEND:

- TREE LOCATION
- STRUCTURE - WATER FOUNTAIN
- WETLAND DATA POINT
- AGRICULTURAL DITCH
- AREA A WETLAND

0 100 200 Feet

GRAPHIC SCALE

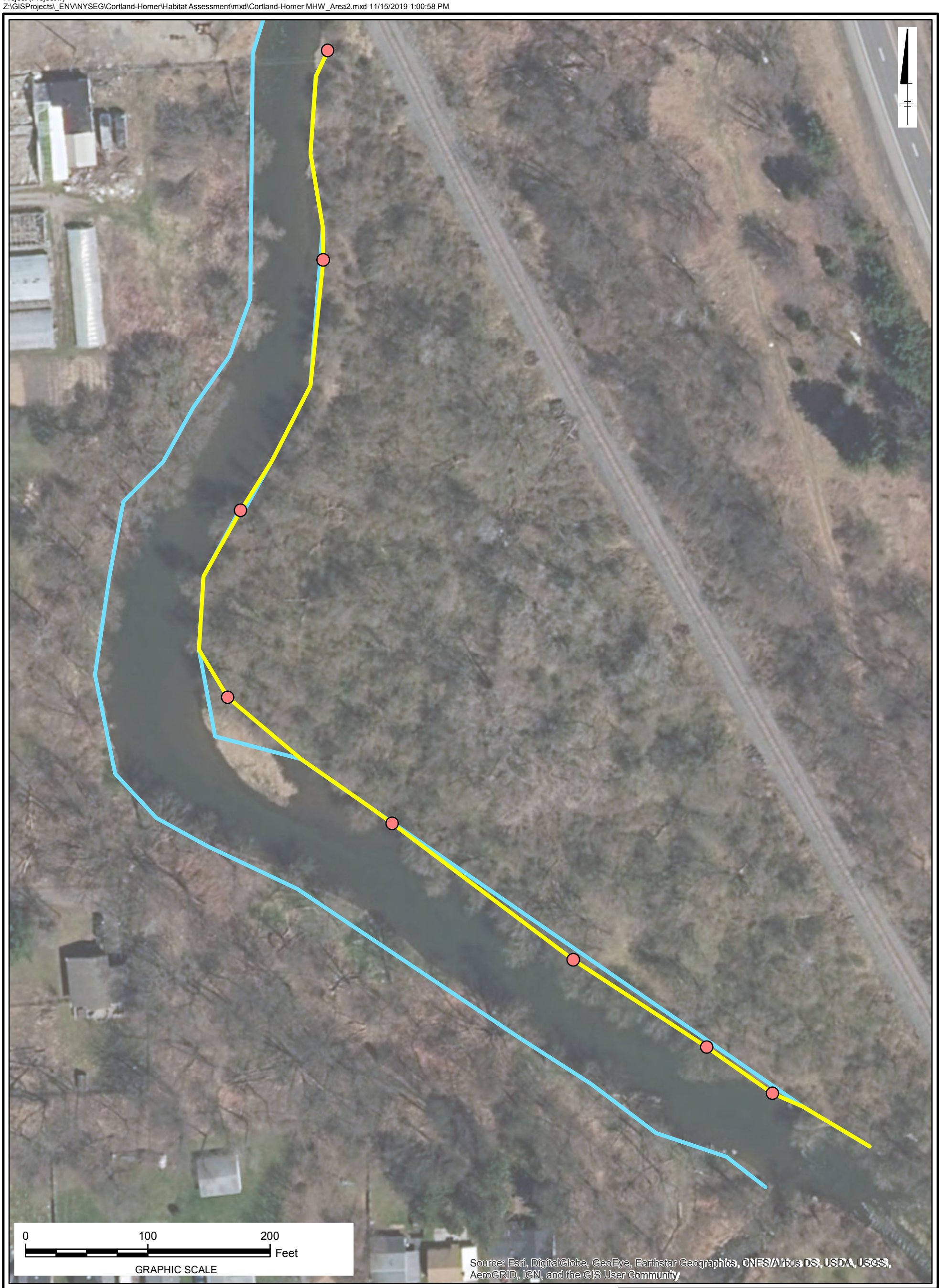
NYSEG
CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK
2019 SUPPLEMENTAL PDI MEMO

SUPPLEMENTAL TREE SURVEY AND WETLAND DELINEATION

ARCADIS

FIGURE
2

City: Div/Group: Created By: Last Saved By: jbistrovich
Project (Project #)
Z:\GISProjects_ENV\NYSEG\Cortland-Homer\Habitat Assessment\mxd\Cortland-Homer MHW_Area2.mxd 11/15/2019 1:00:58 PM



Legend

- MHW POINTS - SURVEYED OCTOBER 2019
- REVISED MHWL
- MHWL - SURVEYED 2017

NOTE:

1. MEAN HIGH WATER POINTS WERE STAKED IN THE FIELD WITH NYSDEC PERSONNEL AND SURVEYED ON OCTOBER 18, 2019.

2. REVISED MEAN HIGH WATER LINE DRAWN USING SURVEY POINT FROM 2017 AND 2019 MEAN HIGH WATER IDENTIFICATION.

NYSEG
CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

AREA 2 - 2019 MEAN HIGH WATER LINE SURVEY

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3

City: Div/Group: Created By: Last Saved By: jbistrovich
Project (Project #)
Z:\GISProjects_ENV\NYSEG\Cortland-Homer\Basemapping\mxd\Cortland-Homer Area1_GeotechInv.mxd 11/15/2019 12:49:47 PM

Legend

- CRANE ROAD SOIL BORING LOCATIONS

NOTE:

1. CRANE ROAD SOIL BORING LOCATIONS COMPLETED TO A DEPTH OF 8-10 FEET USING TRIPOD AND SPLIT SPOON SAMPLER.

NYSEG
CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

AREA 1 - GEOTECHNICAL INVESTIGATION LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4

City: Div/Group: Created By: Last Saved By: jbistrovich
Project (Project #)
Z:\GISProjects_ENV\NYSEG\Cortland-Homer\Basemapping\mxd\Cortland-Homer Area2_GeotechInv.mxd 11/15/2019 12:48:24 PM

Legend

- CRANE ROAD SOIL BORING LOCATIONS

NOTE:

1. CRANE ROAD SOIL BORING LOCATIONS COMPLETED TO A DEPTH OF 8-10 FEET USING TRIPOD AND SPLIT SPOON SAMPLER.

NYSEG
CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

AREA 2 - GEOTECHNICAL INVESTIGATION LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5

ATTACHMENT 1

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Cortland-Homer City/County: Cortland Sampling Date: 8/7/19

Applicant/Owner: State: NY Sampling Point: DP-1 (A-1)

Investigator(s): Artie Tompkins/ Shane Matuskovic Section, Township, Range: Homer

Landform (hillside, terrace, etc.): Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): LRR R, MLRA 140 Lat: 42.6199 Long: -76.1820 Datum:

Soil Map Unit Name: Hemlock Silt Loam, 0-3% Slopes, Occasionally Flooded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation x, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area**		
Hydric Soil Present?	Yes x	No	**within a Wetland?**	**Yes** X	**No**
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:	DP-1	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes x	No	Depth (inches): > 6

Wetland Hydrology Present? **Yes** X **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-1 (A-1)

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 5-ft)			
1. *Phalaris arundinacea*	80	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	80	x 2 =	160
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		160 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

_X_ 2 - Dominance Test is >50%

_X_ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _X_ No ___

Remarks: (Include photo numbers here or on a separate sheet.)
Manicured mowed field

SOIL

Sampling Point: DP-1 (A-1)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	5YR 4/1	100					Loamy/Clayey	Silt Clay Loam
3-12	5YR 4/1	95	2.5YR 3/4	5	C	M	Loamy/Clayey	Silt Clay Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx) Saturated soil on surface then dries out.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Cortland- Homer City/County: Cortland Sampling Date: 8/7/19

Applicant/Owner: State: NY Sampling Point: DP-2

Investigator(s): Artie Tompkins/ Shane Matuskovic Section, Township, Range: Homer

Landform (hillside, terrace, etc.): Local relief (concave, convex, none): none Slope (%):

Subregion (LRR or MLRA): LRR R, MLRA 140 Lat: 42.6195 Long: -76.1819 Datum:

Soil Map Unit Name: Hemlock Silt Loam, 0-3% slopes, Occasionally Flooded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area**		
Hydric Soil Present?	Yes	No X	**within a Wetland?**	**Yes**	**No X**
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches): > 6 inches
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? **Yes** **No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-2

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		

Herb Stratum (Plot size: 5)			
1. *Mowed Lawn*	100	Yes	
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 =Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5YR 3/2	100					Loamy/Clayey	Silt Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Stone

Depth (inches): 6

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx) Refusal at 6 inches

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Cortland- Homer City/County: Cortland Sampling Date: 8/7/19

Applicant/Owner: State: NY Sampling Point: DP-3

Investigator(s): Artie Tompkins/Shane Matuskovic Section, Township, Range: Chesterfield

Landform (hillside, terrace, etc.): Local relief (concave, convex, none): Slope (%):

Subregion (LRR or MLRA): LRR R, MLRA 140 Lat: 42.6195 Long: -76.1819 Datum:

Soil Map Unit Name: Hemlock Silt Loam, 0-3% Slopes, Occasionally Flooded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area**		
Hydric Soil Present?	Yes	No X	**within a Wetland?**	**Yes**	**No X**
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:		

Remarks: (Explain alternative procedures here or in a separate report.)
Area is routinely mowed and maintained.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches): > 8 Inches
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? **Yes** **No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-3

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size:)			
1. *Solidago sp.*	25	Yes	
2. *Trifolium sp.*	25	Yes	
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)
manicured, mowed field

SOIL

Sampling Point: DP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/3						Loamy/Clayey	Silt Clay Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** x

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

ATTACHMENT 2

Photo Log

Photo No.	Date
P1	8/7/19

Direction Photo Taken:

North Northwest

Description:

P-1

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P2	8/7/19

Direction Photo Taken:

South southeast

Description:

P-2

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P3	8/7/19

Direction Photo Taken:

North

Description:

P-3

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P4	8/7/19

Direction Photo Taken:

South

Description:

P-4

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P5	8/7/19

Direction Photo Taken:

North Northwest

Description:

P-5

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P6	8/7/19

Direction Photo Taken:

South Southeast

Description:

P-6

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P7	8/7/19

Direction Photo Taken:

South Southeast

Description:

P-7

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P8	8/7/19

Direction Photo Taken:

N/A

Description:

DP-1 Wetland Soil

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P9	8/7/19

Direction Photo Taken:

N/A

Description:

DP-2 Upland

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P10	8/7/19

Direction Photo Taken:

N/A

Description:

DP-3 Upland

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P11	8/21/2019

Direction Photo Taken:

Northwest

Description:

Center of Water Fountain Structure in Western Shoreline Floodplain

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P12	8/21/2019

Direction Photo Taken:

Northwest

Description:

Southeastern Edge of Water Fountain Structure in Western Shoreline Floodplain

ARCADIS Design & Consultancy for natural and built assets

Photo No.	Date
P13	8/21/2019

Direction Photo Taken:

Northwest

Description:

Eastern Edge of Water Fountain Structure in Western Shoreline Floodplain

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ATTACHMENT 5

Hydraulic Assessment Report

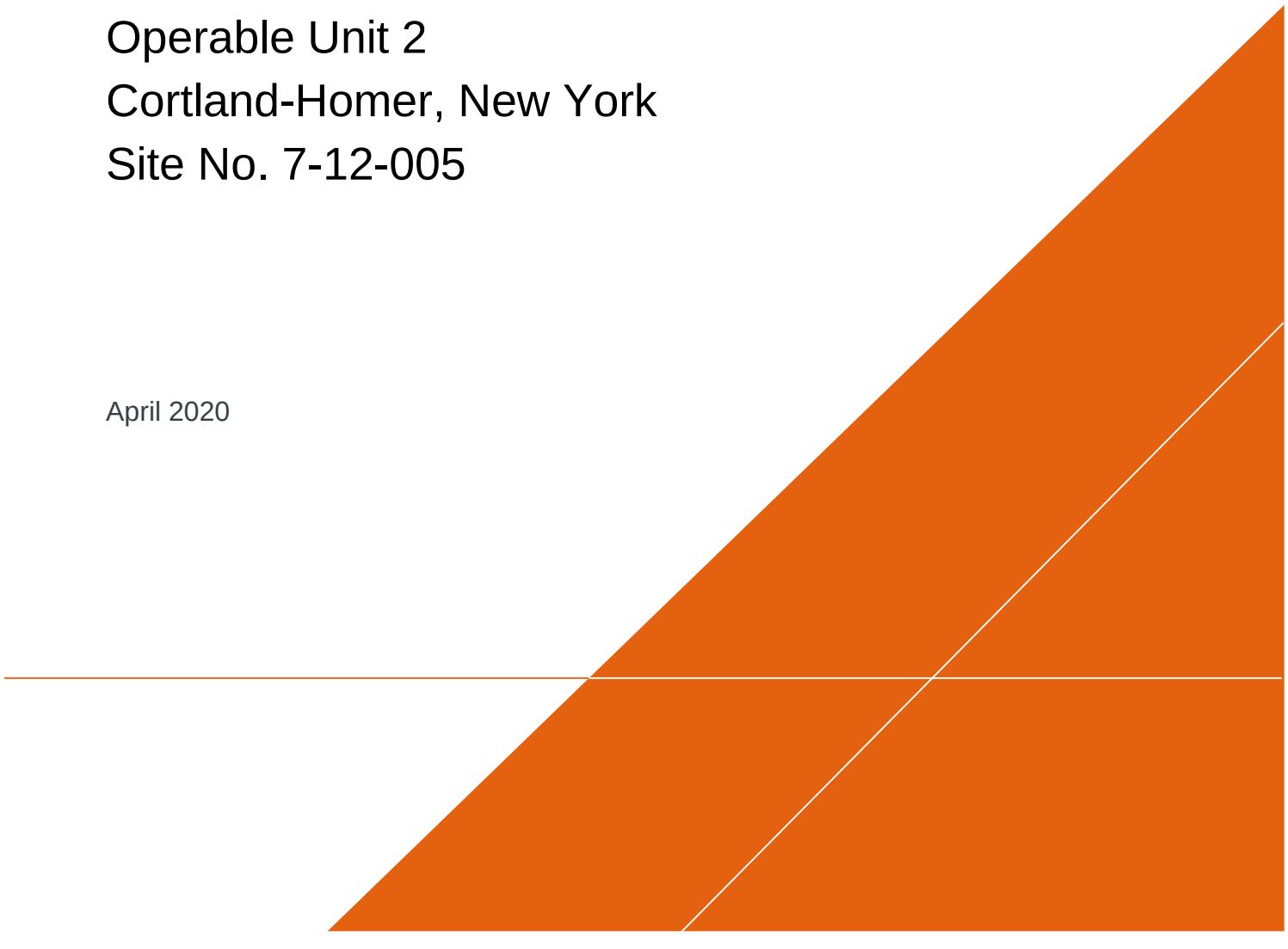
ARCADIS Design & Consultancy for natural and built assets

NYSEG

HYDRAULIC ASSESSMENT REPORT

Cortland-Homer Former MGP Site
Operable Unit 2
Cortland-Homer, New York
Site No. 7-12-005

April 2020



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3 Model Results 4
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1 INTRODUCTION

This Hydraulic Assessment Report provides information related to the Hydrologic Engineering Center's River Analysis System (HEC-RAS) model developed to evaluate the hydraulic characteristics of the temporary river bypass systems (i.e., temporary river crossings, bypass channels, headwater dams, and backwater dams, and scour protection measures) to be constructed as part of the remedial construction activities for Operable Unit 2 (OU-2) of the New York State Electric & Gas (NYSEG) Cortland-Homer Former Manufactured Gas Plant (MGP) site located in Homer, New York (Site No. 7-12-005). The following sections describe the objectives of the HEC-RAS model, the modeling input parameters and data sources, and the model results.

The primary objectives of the HEC-RAS model are as follows:

- Determine the approximate maximum bypass capacity of each phase of work (i.e., Areas 1 and 2) based on the sheet pile diversion design (i.e., maximum sheet pile height of 4 to 6 feet) and the approximate frequency at which the maximum bypass capacity is expected to be exceeded during the construction window.
- Evaluate scour potential under maximum bypass conditions, for each phase of work.
- Evaluate potential impacts to flood levels/limits during construction.

2 MODELING INPUT PARAMETERS AND DATA SOURCES

The HEC-RAS models used for the evaluation of the OU-2 river bypass systems were developed using the following data sources:

- Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) 36023CV000A – Cortland County dated March 2, 2010 (FEMA 2010a)
- FEMA Flood Insurance Rate Map (FIRM) number 36023C0231D dated March 2, 2010 (FEMA 2010b)
- USGS StreamStats Report generated for point 42.62300°N, 76.18328°W dated November 5, 2018 (USGS 2018)
- Bare-earth LiDAR elevation data of Cortland County, NY, as collected by Earth Data, LLC in 2005, in support of DHS-FEMA's Floodplain Mapping Program for NYS DEC
- Ground survey of the river channel and below-water bathymetry, as collected by Paul James Olszewski, PLS, PLLC.

The 1.5-year, 2-year, and 5-year peak discharges (based on full years of record) were obtained from the USGS StreamStats website (USGS 2018). The 10-year, 50-year, and 100-year peak discharges were obtained from the FEMA FIS (FEMA 2010a). The 25-year peak discharge was not listed in the FIS but was interpolated using the 10-, 50-, and 100-year values.

HEC-RAS model runs were conducted under the following steady-state flow conditions (Q):

- Q = [maximum bypass capacity] (varies; represents the maximum estimated flow that can be passed through the bypass channel during each sub-phase of work while maintaining a minimum modeled freeboard of at least 0.3 feet below the top of sheet pile to account for potential differences between actual and modeled conditions)
- Q = 1,120 cfs (1.5-year full-year design flow for the West Branch Tioughnioga River; used to establish "channel-forming" velocities associated with pre-construction [existing] river conditions; these channel-forming velocities are compared to bypass channel velocities for the scour evaluation)
- Q = 1,340 cfs, 1,880 cfs, 4,000 cfs, 5,000 cfs, 5,700 cfs, 6,600 cfs (2-year, 5-year, 10-year, 25-year, 50-year, and 100-year, respectively, full-year design flows for the West Branch Tioughnioga River; used to compare potential flooding impacts to structures within the floodplain if under existing and during-construction conditions). Note that because these flows are based on full-year periods of record, the probabilities of these flood conditions occurring during the limited construction window – i.e., May through October – are reduced)

To determine the number of times flow limits were exceeded, USGS stream gage data was used from two gaging sites:

- Station 01508803 West Branch Tioughnioga River at Homer NY
- Station 01509000 Tioughnioga River at Cortland NY

Station 01508803 is located roughly one mile upstream of the start of the area of interest on the West Branch of the Tioughnioga River. Station 01508803 is no longer active and only has historical data

available from 1966 to 1992. Station 01509000 is currently active and is located on the Main Branch of the Tioughnioga River approximately 0.4 miles downstream of the confluence of the East and West Branches of the Tioughnioga River. To find the correlation between flows at each gauge station, both sets of peak streamflow data from the same years (1967 through 1992) were processed using USGS PeakFQ software to determine flows for each given recurrence interval (1-year through 500 year). These flows were plotted against each other to obtain a polynomial best fit curve that uses measured flows at gauging station 01509000 to predict estimated flows at gauging station 01508803. Estimated flows at gauging station 01508803 (i.e., flows that would pass through the work areas on the West Branch of the Tioughnioga River) were used to predict the potential for overtopping the river bypass system at each work area.

3 MODEL RESULTS

The following subsections summarize the results of the various model runs completed to evaluate the following:

- Maximum bypass capacity and overtopping frequency
- Scour potential
- Flooding potential

3.1 Maximum Bypass Capacity Model Runs (Q = varies)

Bypass channels for OU-2 (Cells 1A-1D, 1B-1C, 2A-2D, and 2B-2C) have been evaluated for maximum bypass capacity. These model runs include the temporary river crossings that will be placed in the bypass channel to access work areas. The temporary river crossing in Area 1 will be a full width crossing to allow access to both sides of the river throughout the duration of work within Area 1. The temporary river crossing in Area 2 will be a half-width crossing installed in Cell 2A to allow access to the western half of the river during remedial excavation. While this crossing may not be in place during work in Cell 2A, it was retained in the model for both sides of the river as a more conservative approach. Each cell (Cells 1A, 1B, 1C, 1D for Area 1; Cells 2A, 2B, 2C, 2D for Area 2) will be excavated/backfilled individually, with an interim sheet pile dam serving as the headwater or backwater dam, depending on the cell location. However, for simplicity and conservatism, the bypasses were modeled (1) as a single bypass per side and (2) per area with the interim dam located in the middle of the dewatered cell.

3.1.1 Hydraulic Modelling of Cells 1A and 1D

The maximum bypass capacity for remediation of Cells 1A-1D was determined assuming a sheet pile height of approximately 4 feet along most of the sheet pile alignment. During remediation of Cells 1A-1D, river flow will be diverted to the west side of the river. The estimated maximum bypass capacity for the remediation of Cells 1A-1D is approximately 200 cfs. This capacity is dictated by the water surface elevation at the existing bridge near RS 40+86.

Using the correlation described above, the corresponding Main Branch flow for a West Branch flow equivalent to 200 cfs is estimated to be approximately 1,300 cfs. Based on an evaluation of the historic mean daily river flows, for the years 2001 through 2018, the Main Branch flow of 1,300 cfs was exceeded, on average, approximately 7.3 days per year during the construction window (i.e. approximately 4% of the 184-day construction window). During this period of record, 2006 had the greatest number of exceedances, comprising 45 days during the 184-day construction window, with 21 of those exceedances occurring during the month of October.

3.1.2 Hydraulic Modelling of Cells 1B and 1C

The centerline sheet pile alignment and sheet pile heights for remediation of Cells 1B-1C are assumed to be the same as for Cells 1A-1D. During remediation of Cells 1B-1C, river flow will be diverted to the east side of the river. The estimated maximum bypass capacity for the remediation of Cells 1B-1C is also

approximately 200 cfs. This capacity is dictated by the water surface elevation at the existing bridge near RS 40+86.

3.1.3 Hydraulic Modelling of Cells 2A and 2D

The river bypass system for Area 2 will be installed similar to Area 1. The bypass channel for Cells 2A-2D will be located on the west side of the river. The maximum bypass capacity for remediation of Cells 2A-2D was determined assuming a sheet pile height of approximately 6 feet along the sheet pile alignment and is estimated to be approximately 350 cfs. This is dictated by the water surface elevation cresting closest to the minimum freeboard near RS 12+24 (immediately upstream of the temporary crossing).

Using the correlation described above, the corresponding Main Branch flow for a West Branch flow equivalent to 350 cfs is estimated to be approximately 2,011 cfs. Based on an evaluation of the historic mean daily river flows for the years 2001 through 2018, the Main Branch flow of 2,011 cfs was exceeded, on average, approximately 3.1 days per year during the construction window (i.e. approximately 1.7% of the 184-day construction window).

3.1.4 Hydraulic Modelling of Cells 2B and 2C

The centerline sheet pile alignment and sheet pile heights for remediation of Cells 2B-2C are assumed to be the same as for Cells 2A-2D. The maximum bypass capacity for remediation of Cells 2B-2C was determined assuming a sheet pile height of approximately 6 feet along the sheet pile alignment. The bypass channel for Cell 2B and 2C will be located on the east side of the river, which will require installation of a temporary river crossing across the bypass channel to access the material staging area on the east side of the river. The estimated maximum bypass capacity for the remediation of Cells 2B-2C is also approximately 350 cfs. This is dictated by the water surface elevation cresting closest to the minimum freeboard near RS 12+24 (immediately upstream of the temporary crossing).

3.2 Scour Potential Model Runs (Q = varies)

Bypass channels for OU-2 (Cells 1A-1D, 1B-1C, 2A-2D, and 2B-2C) have been evaluated for scour potential under maximum bypass conditions to determine the need for additional scour protection. Based on observations during the 2017 habitat assessment and 2018 mussel survey, the existing riverbed material has an estimated D_{50} of approximately 0.09-inches (2.2 mm).

Because these bypass channels will extend through portions of the riverbed where detailed bed-material gradation information is not currently available, scour potential has been evaluated by comparing predicted flow velocities under maximum bypass conditions to the 1.5-year “channel-forming discharge” velocities experienced under pre-construction conditions (i.e., velocities resulting from a 1.5-year return-interval flow of 1,120 cfs). The channel-forming discharge is the theoretical discharge that, if maintained indefinitely, would produce the same channel geometry as the natural long-term hydrograph (USACE 2000). This discharge has been found to correspond to an annual flood recurrence interval of approximately 1 to 2.5 years, with the 1.5-year flood being the representative mean for many streams (Leopold 1994). Consequently, if bypass velocities under maximum bypass conditions exceed the channel-forming discharge velocities, then additional scour protection may be warranted.

3.2.1 Cells 1A and 1D Scour Potential

The bypass channel for remediation of Cells 1A-1D is located from approximately RS 39+42 (backwater dam) to RS 55+71 (headwater dam)[1]. The interim dam located at RS 48+43 divides Cell 1A (upstream) from Cell 1D (downstream); however, this interim dam does not affect the results of this scour analysis, as the interim dam is located on the "dry" side of the centerline sheeting.

As shown on Figure 1, at a flow rate of approximately 200 cfs (shown as a solid blue line), the predicted discharge velocity throughout the entire Cell 1A-1D bypass system is less than the existing channel-forming discharge velocity (shown as a dashed black line) with the exception of the area surrounding RS 39+26 (i.e., immediately downstream of backwater dam). However, the bypass velocity is within approximately 3% of the channel forming velocity and is not anticipated to create a concern for scour under maximum bypass conditions.

3.2.2 Cells 1B and 1C Scour Potential

The remediation of Cells 1B-1C will utilize the same centerline sheet pile diversion alignment as constructed for Cells 1A-1D. As indicated above, the interim dam at RS 48+43 does not affect the results of this scour analysis.

As shown on Figure 1, at a flow rate of approximately 200 cfs (shown as a dashed green line), the predicted discharge velocity throughout the entire Cell 1B-1C bypass system is less than the existing channel-forming discharge velocity (shown as a dashed black line) with the exception of the area surrounding RS 39+26. Similar to Cell 1A-1D bypass system, the bypass velocity is within approximately 3% of the channel forming velocity and is not anticipated to create a concern for scour under maximum bypass conditions.

3.2.3 Cells 2A and 2D Scour Potential

The bypass channel for remediation of Cells 2A-2D is located from approximately RS 6+08 (backwater dam) to RS 15+31 (headwater dam). The interim dam located at RS 12+48 divides Cell 2A (upstream) from Cell 2D (downstream); however, this interim dam does not affect the results of this scour analysis, as the interim dam is located on the "dry" side of the centerline sheeting.

As shown on Figure 2, existing channel-forming discharge velocities (shown as a dashed black line) are exceeded in the bypass channel under maximum bypass conditions (i.e., 350 cfs; shown as the solid blue line) in several locations along the bypass area. The minimum median stone sizes (i.e., D_{50}) required to resist scouring in these areas were determined in accordance with HEC-11 stone-sizing procedures as follows:

$$D_{50} = 0.001 * Va^3 / (davg^{1/2} * K^{3/2})$$

D_{50} = median stone diameter (feet)
Va = average channel velocity (fps)
davg = average water depth (feet) (davg = Flow Area / Flow Top Width)
K = bank angle correction term (K = 1.0 for riverbed)

[1] The Main Channel Distance indicated in Figure 1 is approximately equivalent to RS.

The existing riverbed material has an estimated D_{50} smaller than the required median stone sizes indicated in Table 1. As such, imported material (meeting the minimum size requirements) should be placed to protect the riverbed from further scour.

Table 1. Area 2A-2D Minimum Stone Size for Scour Protection

Area	Design Bypass Capacity (cfs)	Channel-Forming Velocity Exceedance Location	Average Bypass Channel Velocity (fps)	Flow Area (ft2)	Flow Top Width (ft)	Average Water Depth (ft)	Required Median Stone Size (D50)	
							(ft)	(in)
2A/2D	350	10+03	3.52	99.48	28.79	3.46	0.02	0.3
2A/2D	350	8+97	2.74	127.87	33.27	3.84	0.01	0.1
2A/2D	350	6+25	2.93	119.43	40.11	2.98	0.02	0.2
2A/2D	350	6+15	2.98	117.58	39.86	2.95	0.02	0.2
2A/2D	350	5+98	3.03	115.37	41.50	2.78	0.02	0.2
2A/2D	350	5+89	3.2	109.54	77.61	1.41	0.03	0.3

3.2.4 Cells 2B and 2C Scour Potential

The remediation of Cells 2B-2C will utilize the same sheet pile diversion alignment as constructed for Cells 2A-2D. As indicated above, the interim dam at RS 12+48 does not affect this scour analysis. The minimum median stone sizes (i.e., D_{50}) required at Cells 2B-2C was determined as indicated above for Cells 2A-2D. Similar to Cells 2A and 2D, the existing riverbed material has an estimated D_{50} smaller than the approximate median stone sizes indicated in Table 2. As such, imported material of at least the diameter(s) indicated in the table above should be placed to protect the riverbed from further scour.

Table 2. Area 2B-2C Minimum Stone Size for Scour Protection

Area	Design Bypass Capacity (cfs)	Channel-Forming Velocity Exceedance Location	Average Bypass Channel Velocity (fps)	Flow Area (ft2)	Flow Top Width (ft)	Average Water Depth (ft)	Required Median Stone Size (D50)	
							(ft)	(in)
2B/2C	350	10+03	3.17	110.44	66.11	1.67	0.03	0.3
2B/2C	350	6+25	2.98	117.55	38.41	3.06	0.02	0.2
2B/2C	350	6+15	3.06	114.47	37.39	3.06	0.02	0.2
2B/2C	350	5+98	3.17	110.35	35.92	3.07	0.02	0.2
2B/2C	350	5+89	3.12	113.83	77.62	1.47	0.03	0.3

3.3 Flooding Potential Evaluation

Due to the obstruction of flow created by the temporary river bypass system, flooding limits will be affected during construction. The approximate extents of the flood limits for the 2-, 5-, 10-, 25-, 50, and 100-year storm events were evaluated under existing and proposed (i.e., during construction) conditions to determine potential impacts to existing flooding limits during construction. Nearby structures were reviewed to evaluate the potential for flooding impacts to nearby structures during construction that would not otherwise occur under existing conditions.

During construction, the 10-year flood is predicted to inundate the building located at 216 South Main Street (near RS 52+38), which does not otherwise under existing conditions (see Figure 3). This potential change in flood levels is attributed to the presence of the temporary river crossing. At RS 52+38, the modeled 10-year flood elevation is anticipated to increase from approximately 1114.98’ under existing conditions, to approximately 1115.48’ during construction. The building’s lowest adjacent grade elevation is approximately 1115.0’. Therefore, during remedial construction, flood protection measures should be considered to continue to protect the structure from inundation during the 10-year flood event. However, because the structure is predicted to flood under existing conditions during larger events, additional protection beyond the 10-year flood (plus an adequate measure of freeboard), is unnecessary.

4 REFERENCES

FEMA. 2010a. Flood Insurance Study (FIS) 36023CV000A – Cortland County dated March 2, 2010.

FEMA. 2010b. Flood Insurance Rate Map (FIRM) number 36023C0231D dated March 2, 2010.

USGS. 2018. StreamStats Report generated for point 42.62300°N, 76.18328°W dated November 5, 2018

Leopold. 1994. A View of the River. Harvard University Press, Cambridge.

USACE. 2000. Channel-Forming Discharge. ERDC/CHL CHETN-VIII-5.

FIGURES

FIGURE 1: AREA 1 BYPASS CHANNEL SCOUR VELOCITY COMPARISON

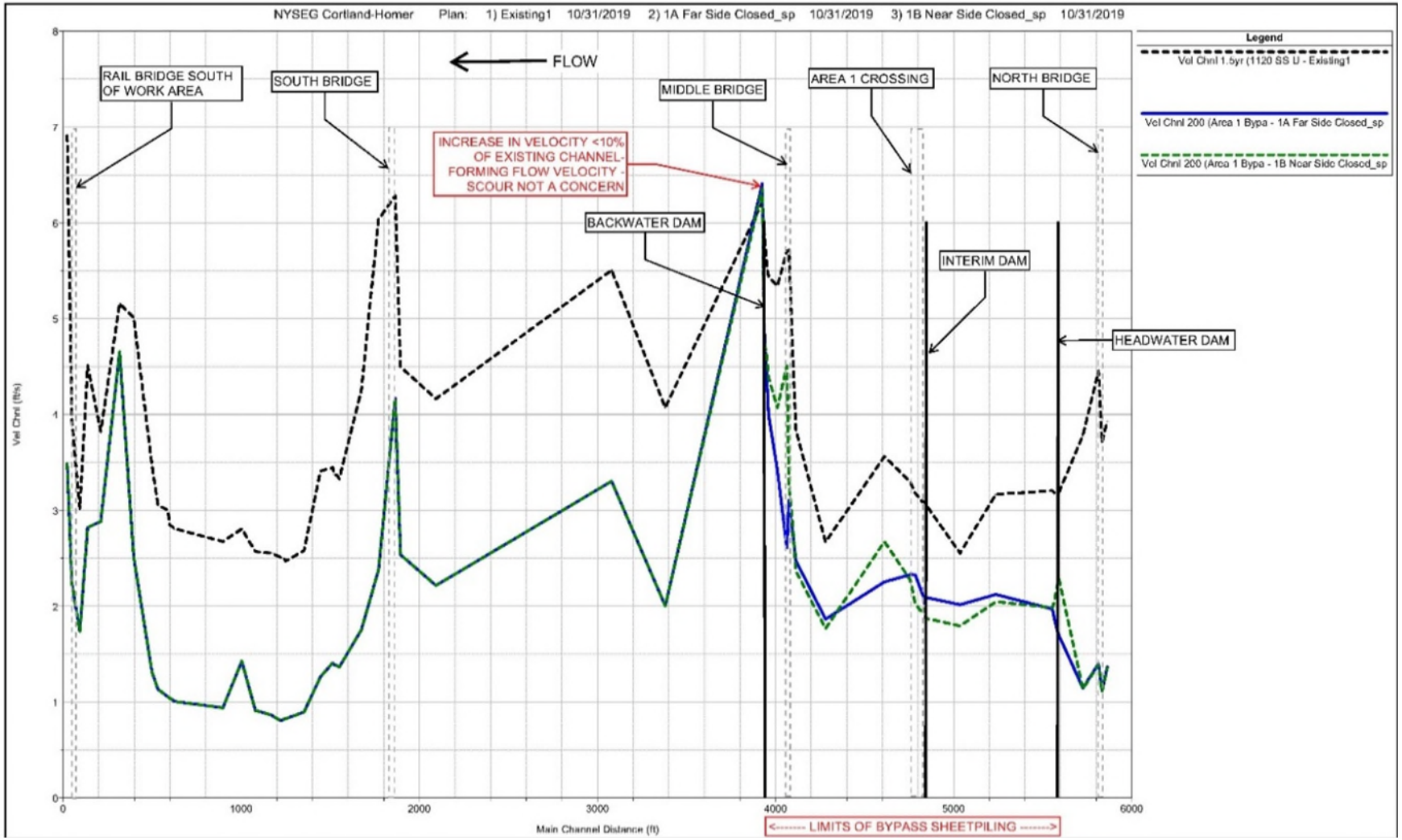
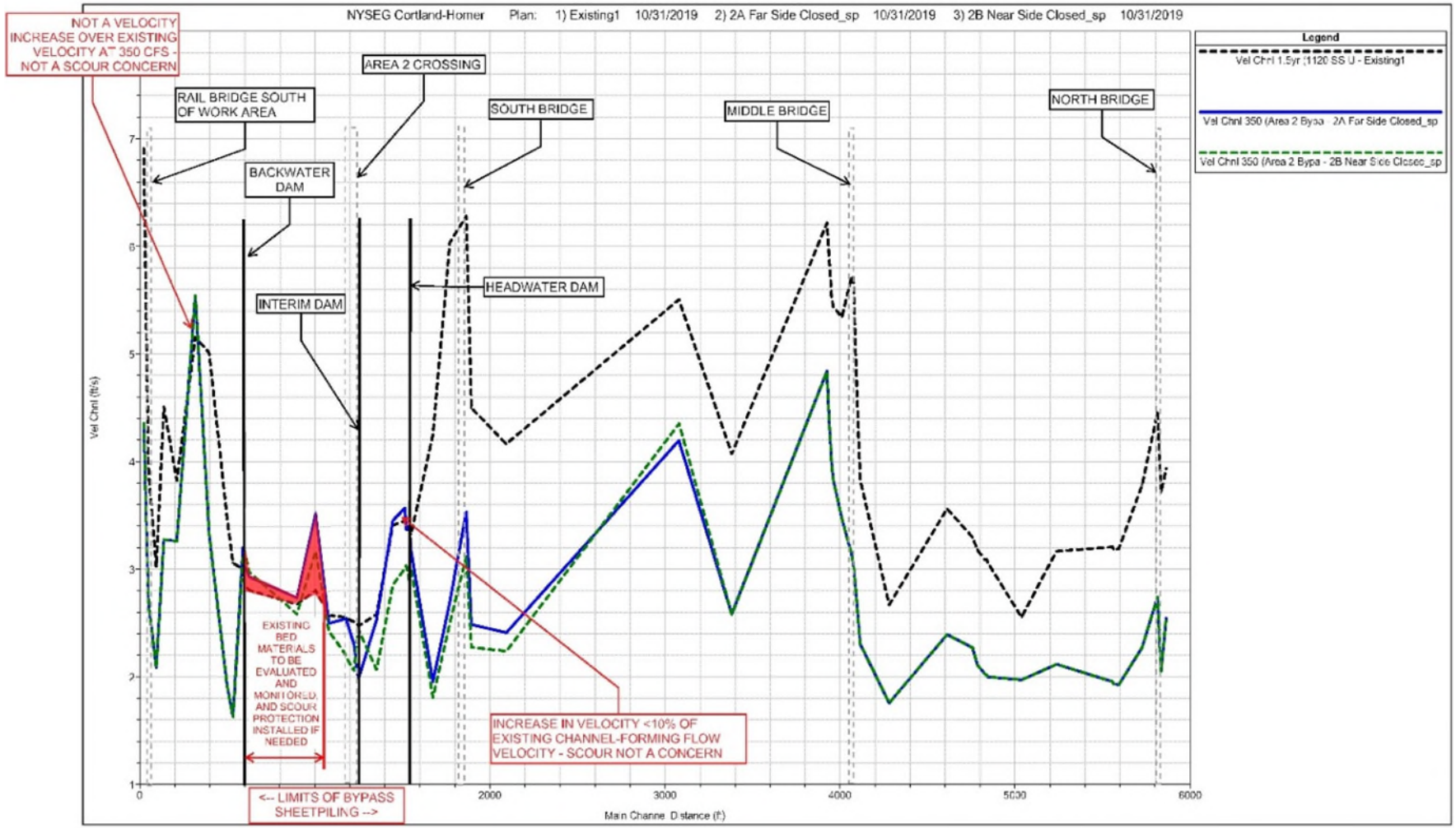
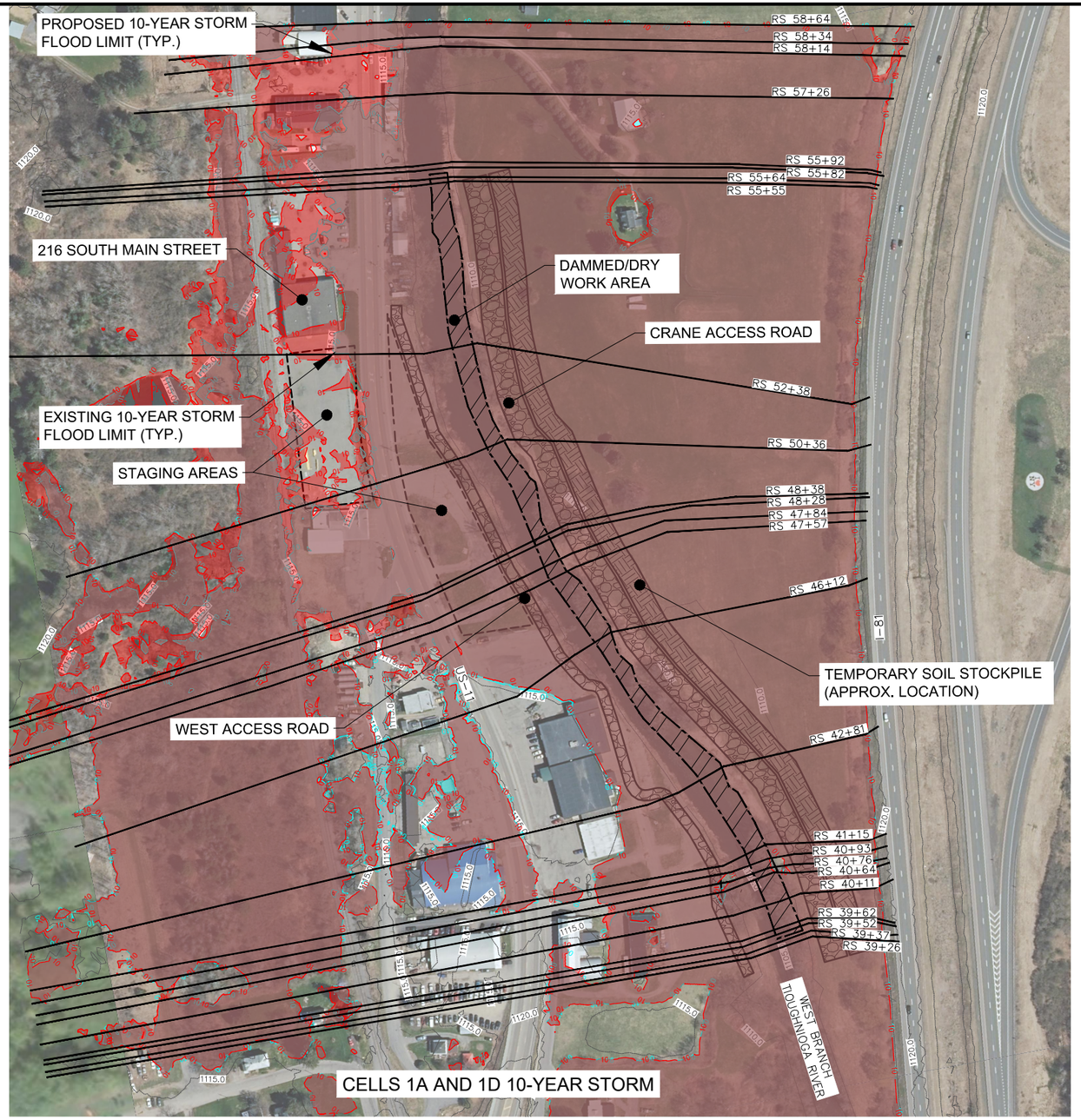


FIGURE 2: AREA 2 BYPASS CHANNEL SCOUR VELOCITY COMPARISON





LEGEND:

- 1112.0 EXISTING GRADE CONTOUR (5' INTERVAL)
- HEC-RAS CROSS-SECTION & RIVER STATION
- PROPOSED DAMMED/DRY WORK AREA
- PROPOSED ACCESS ROAD
- PROPOSED TEMPORARY SOIL STOCKPILE
- PROPOSED STAGING AREA

LEGEND:

- 10 / 10 EXISTING/PROPOSED 10-YEAR FLOOD LIMIT
- FLOOD LIMIT IN BOTH EXISTING AND PROPOSED CONDITIONS

0 125 250 FEET

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. AERIAL PHOTOGRAPHY OBTAINED FROM NYS ORTHOIMAGERY DATED 2018.
3. STORM YEAR REFERS TO THE RETURN INTERVAL (E.G., A 10-YEAR STORM IS A STORM EVENT WITH A 10 YEAR RETURN INTERVAL, OR A 10% CHANCE OF BEING EXCEEDED IN A GIVEN YEAR).
4. THE FLOOD LIMITS WERE DEVELOPED BASED ON THE NYSEG CORTLAND-HOMER HEC-RAS HYDRAULIC MODEL.

NYSEG - CORTLAND-HOMER FORMER MGP
HOMER, NEW YORK
WEST BRANCH TIOUGHNIOGA RIVER SEDIMENTS

FLOODING POTENTIAL FEATURE MAP CELLS 1A AND 1D

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FIGURE 3

XREFS:
X-Ref: Existing Grade Contours 2019-07-01
Title Block_Flooding Potential_Portrait