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NYSEG

Remedial Action Design

Madison Avenue Former Manufactured Gas Plan Site

Elmira, New York

September 2011

ARCADIS

Certification

I, Margaret Carrillo-Sheridan, certify that I am currently a New York State registered professional engineer and that this *Remedial Action Design* 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) and that all activities were preformed in full accordance with the 1) the March 2008 Record of Decission; 2) the NYSDEC-approved *Remedial Design Work Plan* and *Preliminary (50%) Remedial Design Report*; and 3) the procedures outlined in the *DER-10 Technical Guidance for Site Investigation and Remediation*.

Signature

9/16/2011

Date

Remedial Action Design

Madison Avenue Former Manufactured Gas Plan Site

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NYSEG

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September 2011

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Supplemental Information Attachment (on CD – not part of Contract Documents)

1. Introduction

This *Draft Remedial Action Design* (Remedial Action Design) describes remedial activities associated with the NYSEG Madison Avenue Former Manufactured Gas Plant (MGP) site located in Elmira, New York (site). The New York State Department of Environmental Conservation (NYSDEC)-selected remedy was presented in the March 2008 Record of Decision (ROD) (NYSDEC, 2008). NYSEG will implement the selected remedy pursuant to an Order on Consent (Number D0-0002-9309) between the NYSDEC and NYSEG. Activities identified in this Remedial Action Design will be performed under the approval and oversight of NYSDEC and New York State Department of Health (NYSDOH). This Remedial Action Design, the associated Design Drawings, Technical Specifications, and supporting documents are collectively referred to as the Contract Documents.

1.1 Background

This section presents a summary of site background information, including a description of the site and site history.

1.1.1 Site Location and Description

The site is located in the City of Elmira (Elmira), Chemung County, New York. Elmira is located on the floor of a glacially carved valley, flanked on the east and west by steep bedrock hills rising greater than 500 feet above the valley floor. Surface topography within the city itself is largely flat, located in the 500-year floodplain of the Chemung River, which flows west to east through the city before flowing toward the southeast and its junction with the Susquehanna River.

The site occupies most of the city block bounded by East Clinton Street, Madison Avenue and East Fifth Street (also known as Judson Street). The site is approximately 1,500 feet west of Newtown Creek; a tributary to the Chemung River located approximately 3,000 feet south of the site. The site is largely flat-lying, with a small topographic rise in the eastern corner, near the intersection of East Fifth and Oak Streets. NYSEG currently owns the property that was occupied by the former MGP operations, with the exception of a storage yard located on the northern portion of the site adjacent to East Fifth Street, which is currently owned by I.D. Booth, Inc. (I.D. Booth), an industrial supply wholesaler. I.D. Booth also owns the parcel immediately west of the former MGP site. NYSEG also maintains an electrical substation on the property east of I.D. Booth's storage yard. The parcel immediately south of the site is

owned by Trayer Products, Inc. (Trayer), a metal-parts manufacturer. A site plan is included as Figure 1. Land use in the surrounding area is mixed, with industrial and commercial operations immediately south and west, a public park to the northeast and residential properties within 1,000 feet of the site in all directions.

There are no known groundwater extraction wells or groundwater usage within a 1 mile radius of the site; all businesses and residences near the site are supplied by city water. A municipal water supply well field is located on Sullivan Street more than 1 mile north and hydraulically upgradient of the site.

1.1.2 Site History

The MGP was built between 1865 and 1869 along the Junction Canal (canal), a waterway connecting the Chemung and North Branch Canals. The original southern site boundary was the canal, which was used to transport coal. The canal was backfilled and replaced by a railroad in the late 1800s. The MGP operated for approximately 80 years (circa 1865 to 1947) using coal, oil and water to produce gas. The MGP initially produced coal gas, then water (or blue) gas and finally carbureted water gas. With plant closure in 1947, most of the aboveground MGP structures were dismantled. The last remaining MGP structure, the former gas house, was demolished by NYSEG during an interim remedial measure (IRM) completed in 2004.

After 1947, NYSEG used the entire site as a service center for its electric and gas crews. Activities at the site included storage of various utility supplies, such as wire, insulators, line hardware, treated wood poles, cross-arms and oil-filled electrical equipment and minor equipment maintenance (performed in the Transformer Repair Building).

NYSEG ceased active use of the site in 1975, when it moved operations to their current service center located in Horseheads, New York. The former Transformer Repair Building continued to be used for storage of various supplies, but was not used for equipment maintenance. The western portion of the site, including all of the remaining buildings, was sold to I.D. Booth in 1977. I.D. Booth uses several of the old buildings as warehouses in support of operations across Madison Avenue to the west. NYSEG retained ownership of the eastern portion of the site where an electrical substation and a storage yard is maintained. In 2003, NYSEG re-acquired the portion of the property where the primary MGP operations were located from I.D. Booth (western portion) and transferred ownership of the storage yard (located to the west of the substation) to I.D. Booth.

1.2 Site Characterization

During the remedial investigation phase of the project, the site was the subject of seven environmental investigations and other studies starting in 1986 and culminating in 2006 with the completion of a Supplemental Remedial Investigation (SRI). During these investigations, approximately 84 soil borings were drilled, 29 monitoring wells and 23 temporary piezometers/wells were installed, 61 test pits were excavated and hundreds of samples of environmental media were collected and analyzed. The comprehensive results of the remedial investigation activities are presented in the *Supplemental Remedial Investigation Report* (SRI Report) (ARCADIS, 2007) and summarized in the *Feasibility Study Report* (FS Report) (ARCADIS, 2008a).

Subsequent to the remedial investigation phase of the project, and consistent with the ROD (NYSDEC, 2008), a pre-design investigation (PDI) was conducted in 2008 and 2009 to further define the visual extent of heavily impacted soil in support of developing this remedial design for the NYSDEC-selected remedy. Definitions for visual characterization of soil were developed with the NYSDEC and presented in a Memorandum of Understanding (MOU), dated July 7, 2009; the MOU was subsequently approved by the NYSDEC. A total of 135 soil borings were completed during Phase I (October 6 through November 6, 2008) and Phase II (June 22 through July 10, 2009) of the PDI. The soil borings were completed to a variety of depths required to delineate the horizontal and vertical extent of soil containing visual evidence of heavy impacts within the treatment areas proposed in the *Remedial Design Work Plan* (ARCADIS, 2008b). A detailed description of the PDI activities and results was presented in the NYSDEC-approved *PDI Summary Report* (ARCADIS, 2010a).

The *Supplemental Information Package* included with this Remedial Action Design includes the following:

- SRI Report (ARCADIS, 2007).
- FS Report (ARCADIS, 2008a).
- *PDI Summary Report* (ARCADIS, 2010a).

Note the *Supplemental Information Package* is provided for information only and is not part of the Contract Documents. The Remediation Contractor shall be responsible for verifying all existing conditions.

1.2.1 Geology

Investigations have identified five principal geologic units beneath the site, consisting of (in increasing depth):

- Fill and an assortment of man-made structures (including potential obstructions greater than 6 inches in size), originating during the site's industrial history. The fill varies in thickness from approximately 3 feet in the western portion of the site to up to 15 feet in the eastern portion of the site.

- Alluvial sequence of silt and clay with sand stringers and peat. The alluvial silt and clay is only present on the western portion of the site at depths ranging from 3 to 13 feet below grade and at thicknesses of 5 to 10 feet.

- Outwash deposit of sand and gravel with few discontinuous interspersed fine sand, silt and clay lenses deposited by melt-water rivers during glacial recession. The sand and gravel is present throughout the site and is generally encountered at depths ranging from 3 to 15 feet below grade. The sand and gravel varies from 3 feet thick in the western portion of the site to 40 feet thick in the central portion of the site (the vicinity of the former distribution holder). Cobbles and boulders (greater than 6 inches in dimension) have historically been encountered throughout the sand and gravel.

- Remnants of a lacustrine silt and clay likely deposited in a glacial melt-water lake. The lacustrine silt and clay is encountered in the central portion of the site (in the vicinity of the former distribution holder) and east of East Fifth Street. In the central portion of the site, the lacustrine silt and clay is located at depths ranging from 25 to 45 feet below grade and at thicknesses up to 15 feet.

- Dense glacial sandy/silty basal till. The till is encountered at depths ranging from 15 feet below grade (in the western portion of the site) up to 60 feet below grade in the central portion of the site. The silt and clay unit transitions into the basal till unit (i.e., the interface between the units is not well defined). This unit is the deepest unit investigated beneath the site and is approximately 30 to 40 feet thick. The surface of this unit is irregular. The unit is typically very dense and consists of sand and silt with varying amounts of gravel and clay.

Geologic cross section locations are shown on Figure 1 and geologic cross sections are provided on Figure 2. Subsurface logs for borings and monitoring wells completed

during the previous investigations are included with the *Supplemental Information Package*.

Table 2 presents representative blow count ranges per 6 inches (near remediation areas requiring excavation) that were collected during the site investigation. In general, blow counts in the geologic units above the till unit ranged from 3 to 40 and blow counts per 6 inches; blow counts within the till generally ranged from 40 to 50 per 6 inches (however; included counts as high as 50 per 0.1 feet). Blow counts are included on the soil boring logs included in the *Supplemental Information Package.*

1.2.2 Hydrogeology

Four hydrostratigraphic units have been identified beneath the site, consisting of:

- *Alluvial Silt-and-Clay Unit* – This unit is the uppermost hydrostratigraphic unit at the site, and is comprised of recent alluvial silt and clay deposits with occasional peat horizons and fine sand stringers. This unit is thickest (greater than 4 to 8 feet) near and south of the MGP operations area and essentially absent in the eastern portion of the site. The hydraulic conductivity of this unit is low (approximately 1.2 feet per day). The low-hydraulic conductivity of the unit significantly restricts infiltration of precipitation to the underlying sand-and-gravel unit. As such, pronounced groundwater mounding has been observed in areas where this unit is present.

- *Sand-and-Gravel Unit* – This unit is comprised of artificial fill and a sand-and-gravel outwash deposit. The composition of this unit is variable and contains intervals of fine sand and silt. The sand-and-gravel unit is the thickest unit beneath the site (approximately 5 to 50 feet), and is the most significant unit at the site in terms of groundwater flow and storage/transport of site-related constituents. The hydraulic conductivity of the unit is relatively high – about 70 feet per day (ft/day). The sand- and gravel unit is continuous across the area investigated in and around the site.

- *Lacustrine Silt-and-Clay Unit* – This unit was found primarily in the eastern portion of the site and appears to pinch-out just east of the MGP operations area. Where present, this unit was observed immediately above the till unit (described below) and below the sand-and-gravel unit. This unit is thickest near the area of monitoring wells MW-9S/D and MW-12S/D, and is comprised primarily of silt and clay. Groundwater likely flows around this unit and through the adjacent sand and gravel and till units. A vertical hydraulic conductivity test (based on laboratory

analyses using a flexible-tube permeameter) of the unit supports this observation. Testing of an undisturbed (i.e., Shelby tube) sample yielded a vertical hydraulic conductivity estimate of approximately 2 x 10^{-3} ft/day.

- *Till Unit* – The hydraulic conductivity of this unit is low (approximately 7 ft/day) compared to the sand-and-gravel unit.

The groundwater table is approximately 7 to 8 feet below ground surface (bgs), and groundwater generally flows in a south to southeasterly direction.

As part of the PDI, hydraulic conductivity testing (specific-capacity testing) was completed at two nested piezometer locations screened within the till unit to obtain data for the excavation dewatering design. Hydraulic conductivity values for the shallower screened intervals (PZ-0902S and PZ-0909S) ranged between 0.0407 ft/day to 0.155 ft/day; values at the deeper screened intervals (PZ-0902D and PZ-0909D) ranged from 0.049 ft/day to 0.8 ft/day. Prior to conducting the specific-capacity testing, water levels and depths to bottom of the existing on-site wells were gauged. Summaries of the hydraulic conductivity calculation input parameters and results, gauging data, and contour maps for the shallow and deep aquifers are included in the *PDI Summary Report* (ARCADIS, 2010a).

Additional information regarding site geology and hydrogeology (including soil boring logs) are included in the SRI Report (ARCADIS, 2007) and *PDI Summary Report* (ARCADIS, 2010a). These reports are provided in the Supplemental Information Attachment for review by perspective Contractors.

1.3 Nature and Extent of Impacts

The primary MGP-related byproduct responsible for most of the impacts at the site is coal tar, which is a dense nonaqueous phase liquid. Coal tar contains many organic compounds, a number of which have toxic properties and are regulated by the NYSDEC. Chief among these are benzene, toluene, ethylbenzene and xylenes (BTEX); a subset of volatile organic compounds (VOCs); and polycyclic aromatic hydrocarbons (PAHs), a subgroup of semivolatile organic compounds (SVOCs). There is evidence that petroleum hydrocarbons, which are light nonaqueous phase liquids (NAPLs), were also present, primarily in the eastern portion of the site. The NYSDEC has identified VOCs and SVOCs as the constituents of concern (COCs) at the site.

As indicated above, the results of the investigation activities conducted at the site have previously been presented in the documents included in the *Supplemental Information Package*. A brief summary of the nature and extent of site impacts is presented in the following subsections. As presented in the SRI Report (ARCADIS, 2007), no potentially complete exposure pathways are associated with surface soil at the site; therefore, no further discussion of surface soil is presented in this document.

1.3.1 Subsurface Soil

Based on information provided in the *PDI Summary Report* (ARCADIS, 2010), observations of subsurface impacts are shown on Figures 3 and 4 and include the following:

- MGP-impacted soil was observed in two general areas of the site – one in the area of the former MGP structures (gas house, holders, tar storage/handling vessels) and the other to the north and east of the former distribution holder.

- Heavily impacted soil east of the former distribution holder was present from approximately 8 to 14 feet bgs and is located near, and several feet below, the water table. The results of forensic analysis conducted on select soil samples collected during the SRI suggest that the impacts have both a petroleum and coal tar chemical composition.

- MGP-related impacts beneath the area of the former MGP structures appear to have migrated deeper than NAPL observed east of the former Distribution Holder. MGP-related impacts in the area of the former gas holder #2 also appears to have migrated below the top of the till surface at one soil boring location (SB-225). It does not appear that the heavy impacts observed below the top of the till surface are present at recoverable quantities.

- Soil containing MGP-related impacts in both areas is primarily located within the site boundary.

- The majority of heavily impacted soil occurs below the water table (approximately 85 percent by volume).

1.3.2 Groundwater

The extent of groundwater impacts is defined by the following:

- The horizontal extent of the dissolved-phase BTEX and PAHs in site groundwater has been delineated and appears to be limited to within approximately 100 feet of the site boundary to the south.
- The vertical extent of detectable concentrations of dissolved-phase BTEX and PAHs has been delineated and appears to be limited vertically to within approximately 50 feet of the ground surface.
- The extent of dissolved-phase PAHs in groundwater appears much smaller than the extent of dissolved-phase BTEX.
- The deep groundwater zone (i.e., groundwater deeper than approximately 50 feet bgs) does not appear to have been impacted by the former MGP operations.
- Deep monitoring well MW-0801 (screened from 36 to 46 feet bgs to investigate the unconfined aquifer above the till unit and the presence of NAPL beyond the Trayer property) did not indicate the presence of NAPL during the completion of the boring nor was NAPL identified in the well during well gauging activities conducted during the PDI.

1.3.3 Soil Vapor

The SRI Report also concluded that vapor intrusion assessment was not required. However, as presented in the ROD, a process to evaluate the potential for soil vapor intrusion into buildings that may be constructed on the site in the future will be developed and presented in the Site Management Plan (SMP) to be prepared following the completion of the remedial construction activities.

1.3.4 Concrete Pipe

During the SRI, an unreinforced concrete pipe, approximately 18 to 24 inches in diameter located on the eastern portion of the site (near the intersection of Judson and Oak Streets) was investigated. The concrete pipe was encountered approximately 10 feet below grade in a test pit (TP-100). The depth of the concrete pipe varies based on the surface topography (i.e., a potion of the pipe is located beneath a grassed knoll). A

black sludge with a strong coal tar-like odor was observed inside the pipe and subsequently sampled; BTEX and PAHs were detected in a sample of the black sludge. The origin, termination and layout of the entire length of the pipe were not able to be confirmed during the SRI.

1.4 Interim Remedial Measures

Several IRMs have been completed at the site to date including the following:

- *Polychlorinated Biphenyl (PCB) IRM (1996)* – Excavated and disposed of soil containing PCBs at concentrations greater than 10 milligrams per kilogram (mg/kg) in the eastern portion of the site; soil with PCB concentrations between 1 and 10 mg/kg was left in place and covered with clean soil or crushed stone.

- *Former Gas House IRM (2003)* – Demolished and disposed of the former gas house.

- *Former Gas Holders 1 and 2 IRM (2003 and 2004)* – Removed and disposed of the contents and foundations of former gas holders 1 and 2 and associated impacted subsurface materials (excavated to depths of 14 to 16 feet below grade).

- *Purifier Waste Area IRM (2004)* – Excavated and disposed of impacted soil associated with the purifier waste disposal area (excavated to a depth of approximately 3 feet below grade).

While a stand-alone *Remedial Action Monitoring Plan* or *Community and Environmental Response Plan* are not presented herein, the associated requirements for monitoring site conditions to address potential short-term impacts as described by *DER-10: Technical Guidance for Site Investigation and Remediation* (DER-10) (NYSDEC, 2010) are identified and included within this remedial design, as well as with the frequency of monitoring, action levels/triggers and reporting requirements.

2. Basis of Design

As stated in the ROD (NYSDEC, 2008), the selected soil remedy includes a combination of removal and in-situ treatment of soils that are heavily impacted with MGP coal tar. The ROD further states that the actual depth and lateral extent of removal/treatment will be determined after completion of the PDI. This section describes the process and tools that were used to identify soil requiring remediation and presents the rationale for revisions to the NYSDEC-approved remediation areas.

2.1 Remedial Goals

As presented in the ROD (NYSDEC, 2008), the remedial goals for the site are to eliminate or reduce the following, to the extent practicable:

- Potential human exposure to subsurface soil containing COCs.
- Potential human exposure to MGP tar.
- Further off-site migration of MGP tar.
- Future COC impacts to groundwater.
- Potential human exposure to groundwater containing COCs.
- Further off-site migration of groundwater containing COCs.
- Maintaining the existing surface cover materials to provide continued protection against human exposure to soil containing COCs.
- Future exposures resulting from soil vapor intrusion.

Additionally, the remedial goals for the site include attaining, to the extent practicable, NYSDEC ambient groundwater quality standards and guidance values.

2.2 Summary of Remedy

The NYSDEC-selected remedy for the site includes soil removal and/or treatment for Remediation Areas 1 through 12, shown on Figure 3 and consists of the following:

- Excavation and removal of coal tar-impacted soil in Remediation Areas 1, 2 and 6. These activities include the excavation and removal of the contents of an existing concrete oil and tar separator, as well as heavily impacted soil encountered around and below the tar separator, to the extent practicable.

- In-situ treatment of deeper soil above the till unit (encountered at depths ranging from 12 to 28 feet below grade) using in-situ soil stabilization (ISS) technology in Remediation Areas 3 through 5 and 7 through 12.

In addition to the soil removal and ISS activities identified above, the selected remedy includes:

- The removal of the concrete pipe located along the southern property boundary (to the extent practicable, as defined in Section 5.5).

- Passive coal tar recovery using collection wells.

- Introduction of oxygen into the groundwater to enhance natural attenuation of dissolved-phase organic compounds in groundwater.

- Demarcation and placement of a minimum of 1 foot of clean fill materials over excavation and ISS treatment areas.

- Implementation of appropriate environmental easements.

- Development and implementation of an SMP.

The SMP will be prepared at the completion of the field aspects of the remedy installation, and will contain the environmental easements/institutional controls developed for the site.

2.3 Areas of Remediation

Remediation areas are shown on Figures 3 and 4. Coordinates and target elevations for each of the remediation areas are provided in Table 1.

2.3.1 Excavation Areas

Excavation and off-site disposal of soil will be conducted for Remediation Areas 1, 2 and 6. These remediation areas were selected for excavation based on the presence of "heavily impacted" and "some" impacts observed at soil boring, test pit and piezometer locations primarily located above the water table (i.e., shallow soil above the water table is most accessible via excavation). Remediation Area 1 also includes removal of the former oil and tar separator. The lateral extent and depth of these remediation areas presented in this Remedial Action Design is consistent with NYSDEC-approved remediation areas presented in the *PDI Summary Report* (ARCADIS, 2010a).

2.3.2 In-Situ Soil Stabilization Areas

ISS will be conducted for Remediation Areas 3 through 5, and 7 through 12 based on the presence soil containing both "heavy" and "some" impacts that primarily exist below the groundwater table (i.e., areas where excavation is less implementable). As summarized below, several ISS remediation areas have been finalized based on logistical, constructability and design considerations and the presence of utilities. Minor adjustments to the areal extent of the ISS areas presented in the *PDI Summary Report* and *Draft (50%) Remedial Design Report* (ARCADIS, 2010b) were required for the following areas:

- *Remediation Area 3* – A utility pole is located in the southwestern corner of the Area 3. A minimum of 5-feet of clearance must be maintained from the utility pole and 10-feet of clearance from the overhead lines during ISS activities. NYSEG will secure the utility pole during ISS activities.

- *Remediation Area 9* – The northern extent of Remediation Area 9 was moved approximately 13 feet south to maintain a 10-foot clearance from underground electrical transmission lines located immediately south of the NYSEG substation. Based on the results of the PDI and the anticipated extent of NAPL-impacted soil in this area interpreted by the MVS model, the majority of impacted media in this

area meeting the treatment/removal criteria would be addressed by the revised treatment limits.

The figures and tables included in this Remedial Action Design include these constructability-based modifications. The remaining remediation area limits are consistent with NYSDEC-approved proposed remediation areas presented in the *PDI Summary Report* (ARCADIS, 2010a).

2.3.3 Areas Requiring Further Investigation

Based on review of test pit logs from pre-Consent Order investigations, four locations were identified in the *PDI Summary Report* (ARCADIS, 2010a) with soil potentially containing "heavy" impacts:

- TP-20 (4 to 8 feet bgs).
- TP-21 (5 to 7.5 feet bgs).
- TP-108 (7 to 7.1 feet bgs).
- TP-122 (7.5 to 8 feet bgs).

These four test pits were originally identified for remediation in the FS Report based on information collected from pre-Consent Order test pit logs. Based on available information, the locations of these four test pits were identified in the field using survey equipment. Multiple soil borings were installed during the PDI to delineate impacts in these areas; however, at each of the test pit locations, visual evidence of "heavy" impacts was not observed. Note only "trace" impacts (as defined above) were observed in a soil boring completed near test pit TP-108. Based on conversations with the NYSDEC in November 2009 during a project team meeting and as presented in the *PDI Summary Report* (ARCADIS, 2010a), it was agreed that during the excavation portion of the remedial action, shallow (i.e., vadose zone) test pits would be completed in these four areas to further investigate and visually characterize subsurface conditions. Additional information regarding the proposed test pitting activities is presented in Section 5.7 – Remediation Task 7.

2.3.4 NAPL Collection Wells

As indicated in the *PDI Summary Report* (ARCADIS, 2010a) and as presented in Table 2-1, excavation or in-situ treatment of subsurface soil containing "some" visual impacts is not necessarily required as part of the site remediation activities. Additionally, as indicated in the ROD (NYSDEC, 2008), NAPL collection wells are to be installed at locations that contain potentially mobile NAPL. Based on the results of the PDI and on a review of the existing site data, soil boring SB-225 is the only location (with the exception of the 12 remediation areas identified in this Remedial Action Design and the test pits) that contains "heavily impacted" material (i.e., a 0.5 inch layer of NAPL at 42.5 feet bgs). Other soil borings completed in the vicinity of soil boring SB-225 contained "trace" to "some" quantities of impacted material, which are not considered recoverable quantities of NAPL. Therefore, the Remedial Action Design includes installation of three NAPL collection wells in the vicinity of SB-225. Additionally, as requested by NYSDEC, one NAPL collection well will be installed at historical soil boring SB-0816.

2.3.5 Oxygen Application Wells

The ROD (NYSDEC, 2008) specifies enhanced aerobic biodegradation of dissolved-phase COCs through the introduction of oxygen is required along the southwestern portion of the site.

EHC-O™ will be used to enhance the aerobic biodegradation and introduce oxygen through the use of a slow-release oxygen source. EHC-O™ is a proprietary product manufactured by Adventus that is delivered in solid form within a "sock." The sock containing the EHC-O™ product is placed in reusable stainless steel canisters and suspended in the saturated zone via application wells. The EHC-O™ product provides a source of slow-release oxygen, micro-nutrients and pH buffering to promote aerobic bioremediation within the saturated zone.

In general, the EHC-O™ product is composed of the following reagents:

- Calcium Peroxide, CaO_2 (45 to 70 percent).
- Calcium Hydroxide, $Ca(OH)_2$, (10 to 20 percent).
- Sodium, Calcium Aluminosilicate (Hydrated), $Ca_2(NaK_2)Al_9Si_{28}O_{72}$ $24H_2O$ (10 to 45 percent).

Information provided by Adventus indicates that, based on their experience, application wells are typically installed 15 to 20 feet on-center. As a conservative measure, application wells will be installed at approximately 15 feet on-center over the length of proposed treatment area. A total of 19 application wells will be installed. The stainless steel canisters containing the ECH-O™ socks will be placed within the application wells. Details regarding the installation of the applications well are presented in Section 5.11 (Remediation Task 11 – Well Installation). Additional information regarding site monitoring and schedule for changing out the socks will be presented in the SMP (to be provided under separate cover).

2.4 Assumptions

The following assumptions were used to develop the scope of the remedial activities presented in this Remedial Action Design:

- NYSEG will secure access agreements with I.D. Booth and Trayer to facilitate completion of the remedial activities.

- Steel and other miscellaneous materials currently staged by I.D. Booth on the NYSEG property in the vicinity of the former gas house and former coal house will be relocated by others prior to Contractor mobilization.

- The inventory of on-site steel sheet pile (currently staged along the southern portion of the of the NYSEG property) available for use will be proved to the Remediation Contractor (Contractor) by NYSEG. Steel sheet piles that will not be utilized as part of the Madison Avenue remedial construction activities will be relocated to NYSEG's facility located in Dansville, New York by the Contractor prior to mobilization for remedial activities. Additionally, sheet piles owned by NYSEG that are located at other NYSEG facilities may also be available for use at the Madison Avenue site by the Contractor, if needed. If required by NYSEG, the Contractor shall be responsible for transporting sheet piles from these other NYSEG facilities to the Madison Avenue site.

- The catch basin located between Remediation Areas 5 and 6 is not connected to any existing or former stormwater conveyance system. It is assumed that the catch basin serves as a dry well for the distribution of surface water to the subsurface.

- Based on multiple documented conversations with City of Elmira Department of Public works and City of Elmira Water Board (June 23, 2010, June 30, 2010 and

July 1, 2010), sanitary and storm water conveyance pipe lines that may be encountered in Remediation Areas 3 and/or 7 are no longer in service and the Contractor shall abandon the lines in place (as described in Section 5).

- The utility pole located within Remediation Area 3 will be temporarily supported by NYSEG during ISS activities.

- The subsurface gas line located within Remediation Areas 4 and 5 will be relocated by NYSEG prior to Contractor mobilization and is not part of this project. Note that the anticipated approximate location of the new gas line is presented on the project drawings.

- Utility pole guy wires located with Remediation Areas 8 and 12 will be relocated by NYSEG and utility poles near these remediation areas will be temporarily supported by NYSEG during ISS activities.

- Discharge of treated or untreated site related waters (e.g., surface water that enters excavation areas, decontamination waters, groundwater removed excavation areas) to local sewers (i.e., sanitary, storm or combined) is not permitted.

- Confirmation soil sampling will not be completed at the limits of remediation areas.

- Based on correspondence I.D. Booth and Trayer, no known active private utilities exist within the remediation areas.

- The Contractor is not responsible for the installation of application, performance monitoring, or NAPL recovery wells. NYSEG will be responsible for coordinating the installation of the wells.

3. Organizational Structure and Responsibilities

NYSEG, the NYSDEC and NYSDOH will participate jointly in the implementation of the remedial activities described in this Remedial Action Design. NYSEG has the ultimate responsibility for implementing the remedial activities. NYSDEC and NYSDOH personnel are anticipated to be on site periodically to observe work activities. NYSEG will be responsible for all on-site construction operations during the project, except for the operations indicated herein. The construction activities will be observed by NYSEG's Remediation Engineer for general compliance with the Remedial Action Design. Communication with regulatory agencies and with members of the surrounding community will be managed by NYSEG.

Key NYSEG, NYSDEC and NYSDOH personnel are identified below.

Table 3-1 Key Project Personnel

Name/Affiliation	Address	Contact Information
NYSEG		
Mr. Joseph M. Simone, P.E. Manager – Compliance	18 Link Drive P.O. Box 5224 Binghamton, NY 13094	T: 607.762.7498 F: 607.762.8451 jmsimone@nyseg.com
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NYSDEC		
Mr. Richard Dana Project Manager	625 Broadway 11th Floor Albany, NY 12233-7017	T: 518.402.9662 rhdana@gw.dec.state.ny.us
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3.1 Project Responsibilities

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

3.1.1 NYSEG Responsibilities

- Coordinate with the Contractor, Design Engineer and Remediation Engineer (as necessary) to implement the required work activities in conformance with the Remedial Action Design.
- Secure access agreements and coordinating with property owners with respect to the implementation of the remedial activities.
- Prepare and send a Notice and Fact Sheet consistent with NYSDEC Program Policy DER-23, *Citizen Participation Handbook for Remedial Programs* (NYSDEC, 2010) to send to the site contact list before field work begins.
- Contract with the selected Contractor.
- Contract with a firm to serve as the Remediation Engineer.
- Contract with a laboratory for the analysis of soil, water and other waste samples, as appropriate.
- Issue contract addenda (if any) and modifications (if any) based on input from the Remediation Engineer.
- Contract with an engineering firm to document pre- and post-remediation structural conditions of surrounding buildings.
- Act as the “Generator” for material resulting from the remedial activities for off-site treatment and/or disposal of the waste.
- Contract with waste haulers and waste disposal vendors.
- Provide bills of lading/manifests for the off-site shipment of waste materials from the site. These shipping documents may be provided to the Remediation Engineer to sign as Agent for NYSEG, under separate agreement with NYSEG.

- Coordinate with the NYSDEC and NYSDOH regarding environmental-related work activities.

3.1.2 Design Engineer Responsibilities

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

- Conduct pre-remediation in-situ sampling and prepare a *Pre-Remediation In-Situ Sampling and Analysis Report*.
- Decommission monitoring wells and piezometers (as described in Section 4).
- Installing application, performance monitoring, and NAPL recovery wells (as described in Section 5).
- Provide assistance to NYSEG with preparation of waste profiles for off-site treatment/disposal of wastes to be generated as part of the remedial activities.

3.1.3 Contractor Responsibilities

Contractor responsibilities are detailed in the Technical Specifications (Appendix B). Note that the Contractor's responsibilities also include verifying all existing site conditions, including understanding the site data summarized in the *Supplemental Information Package,* thoroughly reviewing the Contract Documents, providing all supervision, labor, equipment and materials necessary to implement the activities described in the Remedial Action Design, reviewing Energy East's Contractor Safety Requirements (last updated June 26, 2008), notifying the Remediation Engineer and NYSEG immediately upon discovery of a conflict between the Contract Documents and actual site conditions, and coordinating with disposal facilities and waste haulers contracted by NYSEG. Additionally, the Contractor shall subcontract with a third party (parties) to complete the baseline noise monitoring program (as described in Section 4), conduct noise monitoring during remedial activities (in accordance with the Noise Monitoring Plan [NMP] provided Appendix G), and conduct vibration monitoring (in accordance with Specification Section – 02205 Excavation Support and Protection).

3.1.4 Remediation Engineer Responsibilities

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

- Review Contractor submittals and provide comments, if any, to the Contractor and NYSEG.
- Provide project management/oversight to observe and monitor implementation of the remedial activities.
- Maintain records of the work efforts associated with implementation of the remedial activities, including daily field reports and digital photographs of the work in progress and to document observations, problems and deficiencies.
- Maintain records of labor, materials and equipment utilized for the remedial activities and any unusual circumstances, if any are encountered.
- Document that the remedial activities are conducted in general conformance with the Remedial Action Design and notifying NYSEG of any deviations.
- Provide a sampling technician to conduct community air monitoring in accordance with the site-specific Community Air Monitoring Plan (CAMP) (Appendix F).
- Monitor the Contractor's survey control for evaluating payment quantities, as applicable.
- Review and sign (as an authorized agent for NYSEG) waste manifests/bills of lading for shipments of waste materials generated by the remedial activities.
- Maintain an on-site project log containing waste manifests/bills of lading for wastes generated by the remedial activities.
- Assist NYSEG in the review of Contractor invoices/requests for payment.
- Coordinate pre-construction project meeting, project construction/coordination meetings (as required), and a project close-out meeting for the remedial activities.
- Prepare a *Construction Completion Report* to document completion of the remedial activities (as discussed in Section 6.1).

Provide NYSEG with support to resolve any problems that may arise when the Remedial Action Design is implemented.

4. Pre-Remediation Activities

The following activities will be completed prior to the initiation of remedial activities prior to Contractor mobilization:

- Preparation of Contractor pre-mobilization submittals.
- Obtain regulatory permits, access agreements and other approvals.
- Conduct pre-remediation sampling and reporting.
- Decommission select monitoring wells.
- Conduct baseline noise monitoring.
- Conduct pre-remediation action structural surveys.

In addition, NYSEG gas line personnel will re-route the existing underground gas line that exists in front (i.e., to the west) of the former transformer repair building (currently used by I.D. Booth as a storage garage). The gas line will be re-routed to a location behind (i.e., east of) the former transformer repair building. Gas line relocation will be completed by NYSEG personnel and a remediation contractor prior to, and independent from, the site remediation activities.

NYSEG's selected Contractor will also be responsible for preparation and submittal of the pre-mobilization submittals presented in the Technical Specifications and discussed below.

4.1 Contractor Pre-Mobilization Submittals

Following contract award, the selected Contractor will be required to prepare pre-mobilization submittals for review by NYSEG and the Design Engineer and/or Remediation Engineer. The Contractor will not be allowed to mobilize to the site prior to review and approval of all required pre-mobilization submittals. These submittals will include, but not necessarily be limited to, the following:

- *Health and Safety Plan (HASP)* – The Contractor will be required to prepare and submit a site-specific HASP (for use by the Contractor's on-site personnel during the remedial activities) to provide a mechanism for establishing safe working

conditions at the site. 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 shall be prepared by a certified by a Certified Industrial Hygienist. The Contractor is required to take all necessary precautions for the health and safety of all on-site Contractor employees in compliance with all applicable provisions of federal, state and local health/safety laws and the provisions associated with the HASP. The Contractor will assume sole responsibility for the accuracy and content of its HASP.

- Contractor's schedule and detailed sequencing plan.

Additional requirements regarding the content of these Contractor pre-mobilization submittals and the overall submittal process are presented in the Specification Section 01010 – Summary of Work and Section 01300 – Submittals (Appendix B).

4.2 Regulatory Permits, Access Agreements, and Other Approvals

Based on the remedial activities to be conducted at the site and information currently available, the following permit(s), authorization(s) and/or notification(s) have been identified (in addition to the Rights-of-Entry to the I.D. Booth and Trayer properties for remedial activities that NYSEG will obtain), at a minimum, as potentially applicable with respect to approval of remedial activities:

- *Fire Hydrant Usage Permit* – A permit from the Elmira Water Board will be required for the use of water from a fire hydrant located proximate to the site. The Contractor will be required to obtain and maintain this permit, including fees and deposit.

In addition to the above, the Contractor shall be responsible for obtaining any other pertinent and applicable local, state or federal permits associated with the implementation of the remedial activities outlined in the Remedial Action Design. However, pursuant to 6 NYCRR Part 375-1.12 (Permits), the NYSDEC may exempt a remedial party from the requirement to obtain any NYSDEC-issued permits for which the substantive requirements are met. Prior to implementing the remedial activities, NYSEG will satisfy notification requirements and obtain applicable review required by the NYSDEC.

4.3 Pre-Remediation Waste Characterization Sampling

Prior to the remedial construction activities, the Design Engineer (ARCADIS) will conduct pre-remediation sampling to characterize soil to be excavated and groundwater to be managed during the remedial construction activities. Sampling will be conducted in accordance with the analytical and sampling frequency requirements provided by anticipated waste disposal/treatment facilities. A detailed description of the sampling protocol, waste characterization, air quality monitoring and analytical requirements is presented in the *Pre-Remediation In-Situ Sampling and Analysis Work Plan* (Appendix D).

The results of the pre-remediation sampling and laboratory analyses will be used to evaluate the potential reuse and disposal/treatment options for materials generated during the remedial construction activities. Following the receipt of analytical data, ARCADIS will prepare a *Pre-Remediation In-Situ Sampling and Analysis Report*. The report will include a brief description of work performed, tabulated summaries of sample analytical results, a plan view of sample locations, and cross sections of the excavation areas so that the information can be used by the waste disposal facilities to approve and accept the material for disposal.

In general, soil/fill impacted with visible NAPL and/or containing total PAHs at concentrations greater than or equal to 1,000 mg/kg, or is characteristically hazardous for benzene shall be treated by low-temperature thermal desorption. As discussed in Section 5, soil that contains total BTEX, PAHs and PCBs at concentrations less than 10, 500 and 25 mg/kg (respectively) can potentially be reused as subsurface fill.

4.4 Well Decommissioning

Although considered part of the remedial design, the Contractor is not responsible for decommissioning the existing piezometers at the site. Well decommissioning activities will be completed by the Design Engineer prior to remedial construction.

The two existing nested piezometers located within and in proximity to proposed Remediation Area 1 (PZ-0909 I/D and PZ-0902 I/D) will be abandoned prior to the implementation of the NYSDEC-selected site remedy. Piezometers PZ-0909I/D and PZ-0902I/D (see Design Drawing 4, Appendix A) will be abandoned in support of the proposed excavation of Remediation Area 1. Decommissioning activities will be completed in accordance with the NYSDEC's guidance *CP-43 Groundwater Monitoring Well Decommissioning Policy* (NYSDEC, 2009). The piezometers are approximately

50 feet deep and extend approximately 35 feet into the confining till unit. Consistent with the NYSDEC policy, the piezometers will be decommissioned by over drilling the wells with a hollow-stem auger fitted with a pilot bit and the remaining voids will be tremie-grouted with a non-shrink grout. NYSDEC Well Decommissioning Records will be completed for the piezometers and submitted to NYSDEC as part of the *Construction Completion Report*.

Although NAPL monitoring well NMW-0401S is located within Remediation Area 1, the well was installed to the top of till at a depth of approximately 15.5 feet below grade, with a 2-foot sump installed into the till unit (from approximately 15.5 to 17.5 feet below grade). Remediation Area 1 will be excavated to the top of the till unit. NAPL monitoring well NMW-0401S does not extend a significant depth into the till unit (i.e., only two feet) and the sump for the well is grouted in-place. Therefore, the Contractor shall remove well construction materials during the Remediation Area 2 excavation activities. NAPL Monitoring well NMW-0401S will not require over-drilling or abandonment in accordance with *CP-43 Groundwater Monitoring Well Decommissioning Policy* (NYSDEC, 2009).

Additionally, monitoring well MW-10S and NAPL monitoring well NMW-0403S are located within Remediation Area 8 and were installed to depths of 24 and 22 feet below grade, respectively. The proposed ISS activities for Remediation Area 8 will be conducted to a depth of 26 feet below grade. Therefore, monitoring well MW-10S and NAPL monitoring well NMW-0403S will not be decommissioned prior to the remedial construction activities. The Contractor shall attempt to pull the well casings prior to conducting the ISS activities. If the well casings cannot be pulled or if the well casings break while being pulled, the remaining well construction materials can be mixed with native material and ISS grout, and solidified in place. If the Contractor elects to mix remaining well construction materials, any equipment damage, scheduling delays, or other complications to ISS activities will be completed at the cost of the Contractor.

4.5 Baseline Noise Monitoring

The Contractor's third party engineering firm will conduct noise monitoring at the site prior to contractor mobilization to serve as a baseline during the remedial construction activities. Baseline noise monitoring will be completed at the property boundaries consistent with the noise monitoring procedures described in the NMP (Appendix G). Noise monitoring results will be submitted to NYSDEC and NYSDOH for review prior to contractor mobilization to the site.

4.6 Pre-Remediation Action Structural Surveys

Prior to the Contractor's mobilization to the site, NYSEG will contract with a third-party engineering firm to conduct a pre-remedial action structural survey of the nearby buildings to establish and document visual conditions of the structures prior to initiating remedial activities, and to identify potentially distressed (static/cosmetic) areas of the structures.

The pre-remedial action structural survey will serve as the baseline for the post-remedial action structural survey and shall include, but not be limited to, visual inspection and documentation of existing conditions of building foundations, basement interior walls (if present), doors and windows (jams, casing and glass), and other signs of potential distress of structures in proximity to the remediation areas. Structural survey activities shall be conducted for the following structures:

- I.D. Booth building located north of Remediation Area 1.
- I.D. Booth building located west of Remediation Area 1(easternmost building only).
- NYSEG building located east of Remediation Areas 4 and 5.
- I.D. Booth loading ramp located northwest of Remediation Area 6.
- NYSEG gas regulator shed located south of Remediation Area 1.
- Trayer building located south of Remediation Area 3.
- Trayer building located southeast of Remediation Area 10.

A representative of NYSEG and/or the Remediation Engineer will be present during the inspections. Potential areas of distress that are identified will be documented in accordance with Specification Section 02205 – Excavation Support and Protection and presented to the owner of the facility. Access to these structures will be arranged by NYSEG. The pre-remedial action structural survey will be completed and submitted to NYSEG and the Remediation Engineer prior to mobilizing equipment to the site.

5. Remedial Action Design

This section presents a task-by-task summary of the remedial activities to be completed as part of this project.

A site-specific *Construction Quality Assurance Plan* (CQAP) that describes the materials, procedures, and testing related to construction, evaluation, and documentation during the implementation of the remedial activities is included as Appendix E. A *Contingency Plan* is included as Appendix I. The Contractor shall complete each remediation task in accordance with the Contractor's HASP. The Contractor shall be responsible for conducting worker health and safety and work space monitoring. The Remediation Engineer will conduct community air monitoring for the duration of the project.

A description of each remediation task, including references to supporting information presented elsewhere in the Contract Documents, is presented in the following subsections. The Contractor shall conduct remediation activities following the general sequence described below.

- Mobilization and site preparation.
- Install sheet pile at Remediation Areas 1 and 2.
- Excavate Remediation Areas 1, 2 and 6.
- Conduct pre-ISS excavation activities and backfill Remediation Areas 1, 2 and 6 with material suitable for reuse.
- Remove sheet piles from Remediation Areas 1 and 2.
- Conduct ISS treatment at Remediation Areas 3 through 5 and 7 through 12.
- Conduct concrete pipe investigation/removal activities.
- Backfill ISS treatment areas.
- Conduct test pitting activities.
- Conduct final site restoration, survey and demobilization activities.

The Contractor may propose an alternative remediation sequence. Alternate construction sequences shall be approved by NYSEG and the Design Engineer prior to implementation.

5.1 Remediation Task 1 – Mobilization

Site mobilization will be initiated by the 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 Contractor include, but are not limited to, the following task:

- Mobilizing necessary labor, equipment, materials, tools and supervision to commence work on the project.

- Coordinating with Dig Safely New York prior to construction activities to mark all on-site underground utilities.

- Installing temporary site security fencing and gates and project/warning signs. Requirements for the project sign are presented in Specification Section 01902 – Project Sign (Appendix B). Locations of temporary fencing are shown on Design Drawing 4 (Appendix A). Temporary fencing shall be 6-foot high chain link fence equipped with “No Trespassing” signs.

- Mobilizing and establishing two field office trailers to be utilized by the Contractor, the Remediation Engineer and the NYSDEC during implementation of the remedial activities. The trailer (and supporting telephone and internet services) shall conform to the requirements presented in Specification Section 01901 – Field Office Trailer and Other Support (Appendix B).

- Coordinating with NYSEG to obtain access to electrical service, as necessary. In the event that on-site electrical service is not available or accessible, the Contractor shall be responsible for providing electrical service, as necessary, for use during the remedial activities.

- Providing and maintaining portable sanitary services for use by on-site personnel engaged in the remedial activities. Portable sanitary services shall be installed at the location shown on Design Drawing 4 (Appendix A) and shall conform to the

requirements presented in Specification 01901 – Field Office Trailer and Other Support (Appendix B).

5.2 Remediation Task 2 – Site Preparation

In general, the Contractor will conduct the following site preparation activities:

- Verify existing site conditions and identify, mark and verify the location(s) of all aboveground and underground utilities, equipment and structures, as necessary, to implement the remedial activities. The Contractor shall also be responsible for maintaining appropriate clearances from utilities (e.g., active overhead electric lines, underground conduit/piping). If the Contractor damages existing utilities, equipment or structures, the Contractor shall be responsible for notifying the appropriate utility company/municipality and fully repairing all damages at no additional cost to NYSEG. Repairs (if necessary) shall be completed in accordance with all requirements of the utility company/municipality and to the satisfaction of the Remediation Engineer. Note that NYSEG does not have a policy for vibration limits and/or monitoring requirements for working near gas lines. Therefore, the Contractor must: a) verify the location of the relocated gas line (scheduled to be relocated after publishing of this Remedial Action Design and prior to remedial construction), and; b) coordinate with NYSEG to obtain acceptable set-backs.

- Establish survey control and work limits. Requirements for establishing survey control are presented in Specification Section 01160 – Survey Control (Appendix B). The Contractor shall survey and mark-out the limits of the excavation areas (including locations of excavation support systems) and ISS treatment areas.

- Install temporary erosion and sediment control measures. Control measures shall be installed in accordance with Design Drawings 4 and 5 (Appendix A) and Specification Section 01110 – Environmental Protection Procedures (Appendix B).

- Deploy work zone air monitoring equipment for worker health and safety monitoring, as required, prior to initiating intrusive activities. Although the Remediation Engineer will be responsible for conducting community air monitoring in accordance with Specification Section 02507 – Odor, Vapor and Dust Control (Appendix B) and the CAMP (Appendix F), the Contractor shall verify daily that community air monitoring is being conducted prior to initiating intrusive site activities.

- Construct material staging and decontamination areas. The Contractor shall construct a material staging area for storage of excavated soils/materials and a decontamination area for trucks, equipment and personnel during implementation of the remedial activities. Anticipated areas to be used by the Contractor are shown on Design Drawing 4 (Appendix A). Section views of the minimum requirements for material staging and decontamination area construction are presented on Design Drawing 11 (Appendix A).

- Remove portions of existing site fencing to facilitate completion of the ISS treatment activities. Existing site fencing to be removed is shown on Design Drawing 4 (Appendix A).

- Clear existing site vegetation and features. Following the installation of erosion and sediment control measures, and before construction activities begin, the Contractor will clear brush/trees and remove portions of the existing chain-link fencing near the remediation areas to provide access to the work areas and facilitate the remedial activities. The Contractor shall conduct the clearing activities in accordance with the requirements of Specification Section 02209 – Clearing (Appendix B). Waste materials generated during these activities will be handled/managed in accordance with Specification Section 02415 – Impacted Material Handling and Excavation Procedures (Appendix B).

Refer to Design Drawing 4 (Appendix A) for additional information regarding site preparation activities.

5.3 Remediation Task 3 – Installation of Excavation Support System

The Contractor will be responsible for providing, installing, monitoring and maintaining an excavation support system to facilitate the removal of materials from Remediation Areas 1, 2 and the concrete pipe area. The Contactor shall utilize excavation support systems to facilitate the removal of material from Remediation Areas 1 and 2 and the concrete pipe area. Information regarding the required materials for the excavation support system is presented on Design Drawings 6 and 7A (Appendix A) and in Specification Section 02205 – Excavation Support and Protection (Appendix B).

The excavation support systems for Remediation Areas 1 and 2 and the concrete pipe area will consist of NYSEG-supplied steel sheet piles. The Contractor is responsible for providing the timber lagging to be used at the concrete pipe removal area. NYSEG-owned steel sheet piles currently stored at the site will be available for use, at the

Contractor's discretion. The excavation support for Remediation Areas 1 and 2 shall consist of AZ-48 steel sheet piles installed to elevations of 817 feet above mean sea level (amsl) and a depth of 825 feet amsl (i.e., depths of 35 and 27 feet below grade), respectively, as shown on Design Drawing 7A (Appendix A). Sheet pile shall be installed to an elevation of 828 or 824 feet amsl (depending the results of the investigation activities, as described in Section 5.5) at the concrete pipe removal area, as shown on Design Drawing 7B (Appendix A). Timber lagging shall be installed along the short sides (i.e., 8-foot length) of the concrete pipe removal area as the excavation progresses. The Contractor shall apply a water-tight sealant to sheet pile interlocks as described in Specification Section 02205 – Excavation Support and Protection (Appendix B). The Contractor shall survey the locations of the excavation support systems and install the excavation support systems to the limits shown on the Design Drawing 6. Excavation area coordinates are provided in Table 1. For convenience, a summary of the range of blow counts obtained within/near Remediation Areas 1 and 2 over 5 foot vertical intervals is provided in Table 2; soil boring logs containing blow counts for all available wells are included in the *Supplemental Information Package*. Note the Contractor shall be responsible for reviewing and fully understanding all information (including subsurface conditions [e.g., blow counts]) presented in the *Supplemental Information Package*.

The Contractor shall pre-drill the entire sheet pile alignment at each interlock to pre-condition the soil and till unit prior to sheet pile installation. The Contractor shall assume that all sheet pile will be installed using an ABI Mobilram.

Note that the Contractor shall submit a bid to complete the remedial construction activities as described in this Remedial Action Design. However, the Contractor may propose alternative excavation support systems and excavation support system installation methods as part of an alternate bid.

Contractor's third party engineering firm will perform real-time vibration monitoring during all vibration-inducing activities (including but not limited to sheet pile driving and extraction) to record seismographic readings to monitor ground vibrations throughout the duration of the activity. In accordance with Specification Section 02205 – Excavation Support and Protection (Appendix B), the recordings will be monitored to confirm that ground vibrations are less than 0.8 inches per second (per the United States Department of Transportation guidelines for structures). As stated above, NYSEG does not have a policy for vibration limits and/or monitoring requirements for working near gas lines. Therefore, the Contractor must: a) verify the location of the relocated gas line (scheduled to be relocated after publishing of this Remedial Action

Design and prior to remedial construction), and; b) coordinate with NYSEG to obtain acceptable set-backs. The third party subcontractor shall submit the results of the vibration monitoring to NYSEG at the completion of the remedial action in a Non-Structural Observation Report.

5.4 Remediation Task 4 – Excavation

The Contractor shall conduct excavation activities to remove the selected impacted soil. The horizontal extent of the excavation areas are presented on Design Drawing 6 (Appendix A). The horizontal extent of excavation completed at Remediation Areas 1 and 2 will be limited by the excavation support systems installed at these locations. The Contractor shall survey and mark out the limits Remediation Area 6 prior to conducting the soil removal activities. The Contractor shall complete removal activities to the following depths:

- *Remediation Area 1* – 15 feet below grade, which corresponds to the top of the till unit.
- *Remediation Area 2* – 10 feet below grade, based on the depth of previously observed impacts.
- *Remediation Area 6* – 8 feet below grade, based on the depth of previously observed impacts.

All excavation activities shall be conducted by the Contractor in accordance with following specifications (included in Appendix B):

- Section 02201 – Earthwork.
- Section 02202 – Rock and Debris Removal.
- Section 02415 – Impacted Material Handling and Excavation Procedures.

Based on the results of the PDI soil boring activities that were used to delineate the extent of soil to be removed, confirmation soil samples will not be completed following the conclusion of the soil excavation activities (i.e., confirmation sampling has already been conducted). Excavated material shall be handled/managed as discussed under Remediation Task 8 – Waste Handling/Management.

Based on the horizontal limits of Remediation Area 1, a portion of the concrete slab associated with the former gas house will require removal to facilitate excavation activities. Additionally, asphalt pavement will require removal to facilitate excavation of material from Remediation Areas 2 and 6. The Contractor shall be responsible for saw-cutting the concrete slab and asphalt pavement to create a clean break line. The Contractor shall remove only the portions of the slab and pavement necessary to install the excavation support system and complete the soil excavation activities. The concrete and asphalt will be disposed in accordance with Specification Section 02415 – Impacted Material Handling and Excavation Procedures (Appendix B).

The Contractor shall dewater/stabilize materials prior to excavation and transportation to the off-site treatment/disposal facility selected by NYSEG. For the purpose of developing a bid, the Contractor shall assume that excavation area dewatering shall be conducted via sump installed within the excavation areas as detailed in Specification Section 02415 – Impacted Material Handling and Excavation Procedures (Appendix B). Approximately 66,000 gallons of water are anticipated to be generated during the remedial construction activities. Based on conversations with the Chemung County Sewer District, discharge of treated or untreated water to the local combined sanitary/storm sewer is not permitted. Water removed from the excavation areas shall be stored in three 20,000-gallon frac tanks to be staged at the potential locations shown on Design Drawing 4 (Appendix A). A pre-fabricated spill containment berm shall be installed around the frac tank(s). If remedial construction activities are conducted during winter months, the Contractor shall winterize the frac tanks as necessary to prevent the freezing of liquid within the tanks. The Remediation Engineer shall coordinate with NYSEG-selected waste transportation vendors and disposal facilities to manage and remove the containerized water from the work area. The Contractor will assume that water generated on site will be sent to Clean Harbors for disposal. All waste transportation and disposal activities shall be conducted in accordance with all state and federal requirements, as well as the requirements set forth by the disposal facility.

5.5 Remediation Task 5 – Concrete Pipe Investigation and Removal

As presented in Section 2, the NYSDEC-selected remedy includes removal of the identified portion of the unreinforced, 18- to 24-inch-diameter concrete pipe and its contents. A concrete pipe containing black sludge with a coal-tar like odor exists in the southeastern portion of the site at the location shown on Design Drawing 6 (Appendix A). During concrete pipe investigation activities conducted in 2005, the pipe's origin and termination were not determined. The objective of the concrete pipe removal

activities is to identify the location, contents, and configuration of the concrete pipe to the east toward East Fifth Street.

The Contractor shall pre-excavate a trench to locate the concrete pipe near the Trayer fence line. The test trench will be located approximately 10 feet from the existing fence line and will be oriented in a general north-south direction (i.e., perpendicular to the direction of the pipe). It is anticipated that the trench will intersect the pipe near the corner of the existing fence. Once the initial location of the pipe has been identified, the Contactor shall utilize an excavation support system, as described in Section 5.3, to facilitate the concrete pipe investigation and removal. Based on the actual location of the pipe, the excavation support sheeting will be installed 4 feet off the center line of the pipe on both sides. The excavation support sheeting will be installed to within 4 feet of the Trayer fence, depending on conditions encountered.

Following installation of the preliminary sections of sheet pile, the Contractor shall conduct concrete pipe investigation activities. The initial activities shall include accessing the pipe and using a sewer video inspection camera equipped with a tracking beacon/probe to visually document the condition of the concrete pipe to the east. The Contractor shall trace the pipe to its eastern extent of the pipe to confirm the final limits of pipe removal and determine where the pipe terminates, if possible. Based on the results of the concrete pipe investigation activities, the Contractor shall coordinate with the Remediation Engineer, NYSEG, and NYSDEC to finalize the concrete pipe removal limits.

Regardless of the eastern extent of the pipe, concrete pipe removal activities will not be conducted within the 20-foot wide excavation exclusion zone (i.e., road influence area) or within East Fifth Street. Based on an assumed concrete pipe alignment, concrete pipe removal limits and excavation support details are presented on Design Drawings 6, 7A and 7B (Appendix A) and in Specification Section 02205 – Excavation Support and Protection (Appendix B). If based on the results of the concrete pipe investigation activities, actual removal limits differ from those shown on the Design Drawings, the Contractor shall coordinate with the Remediation Engineer to facilitate concrete pipe removal activities. Any alternate excavation support systems or removal methods shall be approved by the Remediation Engineer and NYSEG prior to implementation.

Soil boring logs containing blow counts for all available wells are included in the *Supplemental Information Package*. Note the Contractor shall be responsible for reviewing and fully understanding all information (including subsurface conditions [e.g., blow counts]) presented in the *Supplemental Information Package*.

The Contractor shall dewater/stabilize materials prior to transportation to the off-site treatment/disposal facility selected by NYSEG. For the purpose of developing a bid, the Contractor shall assume that excavation area dewatering shall be conducted via sump installed within the excavation areas as detailed in Specification Section 02415 – Impacted Material Handling and Excavation Procedures (Appendix B). NAPL and/or free liquids found within the pipe will be collected separately, containerized and disposed of at a NYSEG-approved permitted facility. If it is determined that the concrete pipe continues east beyond the maximum removal limits shown on the Design Drawings and/or terminates beneath East Fifth Street, the Contractor shall attempt to remove as much of the pipe's contents as possible. Based on the contents of the pipe, the Contractor shall suggest potential removal options for the contents (e.g., vacuum truck). Following removal of NAPL and/or free liquids to the extent practicable, a decision will be made by the Remediation Engineer, NYSEG, and the NYSDEC on the final disposition of the pipe.

The Contractor shall dispose of the removed material in accordance with Specification Section 02415 – Impacted Material Handling and Excavation Procedures (Appendix B); and backfill the excavation area with general fill in accordance with Specification Section 02206 – Selected Fill and Specification Section 02201 – Earthwork (Appendix B).

5.6 Remediation Task 6 – In-Situ Solidification/Stabilization

The Contractor shall conduct ISS activities to treat the targeted impacted soil. The lateral extents of the ISS treatment areas are presented on Design Drawing 8 (Appendix A). The Contractor shall complete ISS treatment activities to the depths listed in Table 5-1. Prior to conducting pre-ISS excavation or ISS treatment activities, the Contractor shall survey and mark out the horizontal limits of the ISS remediation areas. Remediation area coordinates are provided in Table 1.

The Contractor shall conduct pre-ISS excavation to verify the absence/presence of subsurface utilities and obstructions, as well as to account for material bulking during ISS treatment. The Contractor shall conduct pre-ISS excavation to approximately 20 percent of the total ISS treatment depth, or to a minimum of 4 feet below grade (whichever is deeper). Note that stabilized material shall not be permitted within 48 inches of the ground surface to protect the stabilized monolith from freeze/thaw cycle. If ISS activities result in material bulking to within 48 inches of the ground surface, the Contractor shall remove, transport off site, and dispose of the bulked material at no additional cost to NYSEG.

As shown on Design Drawing 8 (Appendix A), a former sanitary sewer line is located within Remediation Areas 3 and 7 and a brick and mortar catch basin structure, potentially associated with the former sanitary sewer, is located with Remediation Area 7. For Remediation Areas 3 and 7, the Contractor shall conduct pre-ISS excavation activities to depths necessary to locate and identify subsurface utilities (as appropriate). Based on documented conversations with the City of Elmira Department of Public Works Sewer Department and the City of Elmira Sewer Board, these sanitary sewer lines are abandoned. The Contractor will excavate, cut and remove portions of the sanitary sewer lines located within Remediation Areas 3 and 7. The ends of the remaining sewer lines shall be capped in-place. The Contractor shall abandon the former sewer lines in accordance with Specification Section 02399 – Former Sewer Abandonment.

Based on the horizontal limits of Remediation Area 7, a portion of the concrete slab associated with the former transformer repair building requires removal to facilitate ISS activities. Additionally, asphalt pavement removal is required to facilitate ISS treatment at Remediation Areas 4 and 5. The Contractor shall saw-cut the concrete slab and asphalt pavement in these remediation areas to create a clean break line as previously described under Remediation Task 5. The Contractor shall remove only the portions of the slab and pavement necessary to complete the ISS treatment activities. The concrete and asphalt shall be disposed in accordance with Specification Section 02415 – Impacted Material Handling and Excavation Procedures (Appendix B).

Table 5-1 ISS Treatment Areas

Remediation Area	ISS Treatment Depth (feet below grade)	Location (Property Owner)
Area 3	15	NYSEG
Area 4	16	NYSEG
Area 5	25	NYSEG
Area 7	28	NYSEG/I.D. Booth
Area 8	16	NYSEG
Area 9	19	NYSEG
Area 10	13	Trayer

Remediation Area	ISS Treatment Depth (feet below grade)	Location (Property Owner)
Area 11	16	NYSEG/Trayer
Area 12	12	NYSEG/Trayer

The Contractor shall complete ISS treatment of site soils to the limits shown on Design Drawing 8 (Appendix A). For the purpose of developing a bid, the Contractor shall assume that ISS activities will be completed using the following treatment methods:

- 70 percent (by volume) via small-diameter (e.g., 5-foot-diameter) augers.
- 20 percent (by volume) via bucket mixing with an excavator with a shallow soil mixing tool.
- 10 percent (by volume) via jet grouting.

Based on the target depth of Remediation Area 5 and the proximity to a garage building, ISS treatment in this area shall be conducted using small diameter augers. ISS treatment shall be complete in rows working perpendicular (away) from the garage (not parallel to the garage). As indicated previously, the Contractor shall submit a bid to complete the remedial construction activities as described in this Remedial Action Design. However, the Contractor may propose alternative ISS treatment methods as part of an alternate bid.

Regardless of treatment method, for Remediation Areas 3, 4 and 9 through 12, the Contractor will be required to complete ISS treatment to the respective target depth of the remediation areas regardless of potential obstructions, including cobbles and boulders. For Remediation Areas 5, 7, and 8, the Contractor shall complete ISS treatment methods using the following rationale:

- The perimeter of the ISS remediation areas must be stabilized to the top of the till surface using all means necessary to maintain a continuous perimeter of stabilized soil that could serve as a containment barrier. For the purposes of this Remedial Action Design, the perimeter will be considered stabilized/treated when either two staggered overlapping rows of either ISS augers or jet grout applications are completed to the target depth. If an obstruction is encountered along the perimeter of an ISS remediation area, the Contractor shall remove, drill

through or jet grout around the obstruction to provide a solid, low-permeability exterior boundary.

- The Contractor shall also be responsible for stabilizing the interior of the ISS remediation areas using their selected treatment methods, in recognition of the likely presence of cobbles and boulders. If obstructions are encountered during ISS treatment of the remediation area interior, the Contractor shall attempt to remove the obstructions using conventional excavation equipment. If an obstruction cannot be removed, the Contactor shall complete ISS treatment to the target depth immediately adjacent to obstruction.

Although all soil within the interior of a remediation area potentially may not be treated using this rationale, the untreated soil below potential obstructions would be encapsulated by the surrounding stabilized material, as the Contractor is required to stabilize the perimeter of the remediation areas, regardless of potential obstructions, including cobbles and boulders, and this stabilized perimeter will serve as a containment barrier. Additionally, the Contractor shall provide proposed procedures of verification of treatment depth based on the Contractor's proposed ISS means and methods and as required in the CQAP (Appendix E).

During the PDI, bench-scale ISS treatability study testing was conducted to identify optimal mix designs. The Contractor shall utilize soil mixing (e.g., auger, bucket) and jet grout mix designs detailed in Specifications Section 02420 – In-Situ Stabilization/Solidification and Section 03002 – Jet Grouting (Appendix B). If the Contractor proposes to utilize mix designs other than those provided in the Technical Specifications, the Contactor shall conduct bench-scale treatability study testing to document the proposed mix designs' hydraulic conductivity and unconfined compressive strength using site soil and groundwater. Bench-scale testing for Contractor-proposed mix designs shall be conducted at no additional cost to NYSEG. Additionally, if the Contractor conducts ISS activities using a mix design other than those provided in the Technical Specifications and does not meet the performance criteria provide in the Technical Specifications, the site soils shall be re-stabilized, removed, or otherwise addressed by the Contractor at the Contractor's expense to meet the original mix design criteria.

ISS mix quality assurance/quality control sampling shall be conducted by the Contractor in accordance with Specifications Section 02420 – In-Situ Stabilization/Solidification, Specification Section 03002 – Jet Grouting (Appendix B), and the CQAP (Appendix E).

5.7 Remediation Task 7 – Areas Requiring Further Investigation

The Contractor shall conduct test pitting activities at the surveyed locations of select pre-Consent Order test pits where potentially "heavily impacted" material was encountered (see Design Drawing 6 for test pit locations). Survey coordinates for each test pit location are provided in Table 1. Test pits shall not be larger than 15 feet in any given direction and shall be completed to the depth of impacts previously observed at the test pit locations, as summarized below:

- TP-20 (4 to 8 feet).
- TP-21 (5 to 7.5 feet).
- TP-108 (7.5 to 8 feet).
- TP-122 (7 to 7.1 feet).

Material removed during the testing pitting activities shall be staged adjacent to the test pit on polyethylene sheeting. If visual impacts are not observed during the test pitting activities, the Contractor shall backfill the test pits with the removed material in the reverse order that the material is removed. If visual impacts are noted or the material is otherwise not suitable for use as backfill (as determined by Remediation Engineer), then the removed material will be disposed in accordance with Specification Section 02415 – Impacted Material Handling and Excavation Procedures (Appendix B); and backfill the excavation area with general fill in accordance with Specifications Section 02206 – Selected Fill and Section 02201 – Earthwork (Appendix B).

No additional test pitting activities will be required if "no visual impacts", "little" or "some" visual impacts are observed (as defined in the MOU dated July 7, 2009). If "heavy" impacts are observed during the test pitting activities, additional test pits may be completed and/or additional soil removal areas may be identified. The need for additional activities will be determined following discussion between NYSEG, the Remediation Engineer and the NYSDEC.

5.8 Remediation Task 8 – Waste Handling/Management

As indicated in Section 4, prior to the remedial construction activities, Design Engineer will conduct pre-remediation sampling to characterize soil to be excavated and groundwater to be managed during the remedial construction activities. The results of

the pre-remediation sampling and laboratory analyses will be presented in a *Pre-Remediation In-Situ Sampling and Analysis Report*. The report shall include the material handling, on-site reuse and off-site disposal/treatment requirements for soil, remediation water, NAPL and miscellaneous wastes generated during the remedial activities.

Traffic routes to be utilized by the Contractor and waste transporters (as well as the importation of construction materials) are provided in the *Traffic Control Plan* included as Appendix C.

5.9 Remediation Task 9 – Noise, Dust, Vapor and Odor Suppression/Control

During installation of excavation support, the Contractor shall maintain noise levels produced by construction equipment to safe and tolerable limits, as set forth by Occupational Safety and Health Association, the United States Environmental Protection Agency, and any applicable New York State or local code ordinances. All construction equipment posing a potential noise nuisance shall be equipped with noise-muffling devices by the Contractor. The Contractor's third party firm will conduct noise monitoring activities in accordance with Specification Section 02510 – Noise Monitoring Program and the NMP included as Appendix G.

As required by the NYSDOH's Generic CAMP, real-time airborne particulate monitoring will be conducted continuously during all intrusive and/or potential dust generating activities (e.g., sheet pile installation, excavation, ISS, backfilling, material handling activities) using instrumentation equipped with electronic data-logging capabilities. Additionally, as required by the NYSDOH's Generic CAMP, VOCs will be monitored continuously during all intrusive and/or potential dust-generating activities. Odors associated with MGP-related impacts to soil are anticipated to be generated during intrusive activities. The Remediation Engineer will be responsible for conducting community air monitoring. However, the Contractor shall address dust and vapors in accordance with CAMP (Appendix F) and Specification Section 02507 – Odor, Vapor, and Dust Control (Appendix B), and odors shall be addressed as directed by NYSEG and/or the Remediation Engineer. The following dust, vapor and odor control measures may be used during these activities, depending upon specific circumstances, visual observations and air monitoring results:

- Water/BioSolve® spray.
- Polyethylene sheeting (e.g., for covering excavation faces, material stockpiles).

- Minimizing excavation surface area to be exposed at any given time.

- Vapor suppression foam.

Upon completion of a shift and prior to leaving the site at the end of a day, any open excavations will be backfilled to minimize potential odors, to the extent practical, or covered with polyethylene. During the work day, exposed areas may be tarped, foamed or temporarily covered with appropriate soil, as required, to control odors. An odor agent (e.g., Bio-Solve, Rusmar Foam product) will be used as necessary. Material Safety Data Sheets for odor suppressant products must be maintained on site.

A more detailed description of the air monitoring program, including routine requirements, action levels for increased monitoring, provisions for corrective actions to address air emissions, and/or provisions for remedial action modifications/work stoppage, is provided in the CAMP (Appendix F) and Specification Section 02507 – Odor, Vapor and Dust Control (Appendix B).

5.10 Remediation Task 10 – Backfilling

Following completion of the soil excavation activities, the Contractor shall place geotextile within the bottom of Remediation Areas 2 and 6 to demarcate the extent of the soil removal. Geotextile requirements are presented in Specification Section 02270 – Geotextile Fabric.

The Contractor may potentially use excavated material as subsurface backfill if:

- Soil is free of visual impacts (including obvious staining and sheens), debris/rubble (e.g., wood, concrete, brick) and odors.

- Soil contains total BTEX and PAHs at concentrations less than 10 and 500 parts per million (ppm) (based on the results of the pre-remediation sampling to be conducted by the Design Engineer).

- Soil contains PCBs at a concentration less than 25 ppm (i.e., 6 NYCRR Part 375-6 industrial use soil cleanup objective).

Soil anticipated to be suitable for reuse will be identified in the *Pre-Remediation In-Situ Sampling and Analysis Report*, to be prepared by the Design Engineer. Contractor

shall obtain approval from NYSEG, the Remediation Engineer and the NYSDEC prior to utilizing an excavated material as fill material.

The Contractor shall backfill excavated Remediation Areas (1, 2 and 6) and the remaining voids in ISS Remediation Areas (3 through 5 and 7 through 12) with general fill or suitable excavated material to within 1 foot of the surrounding grade to facilitate final site restoration. As indicated in Section 5.6, stabilized material in ISS remediation areas shall not be permitted within 48 inches of the ground surface. Backfill material requirements are presented in Specification Section 02206 – Selected Fill (Appendix B). Backfill shall be placed and compacted in accordance with Specification Section 02201 – Earthwork (Appendix B). The Contractor shall achieve compaction levels specified regardless of source of backfill material (included excavated soils from the site that meet the chemical and visual standards listed above).

5.11 Remediation Task 11 – Well Installation

Although considered part of the NYSDEC-selected remedy, the Contractor will not be responsible for the installation of the NAPL collection and oxygen application wells, as described under this Remediation Task: NYSEG will install the wells at the conclusion of the remediation construction activities.

A total of 4 NAPL collection wells, 19 oxygen application wells and 6 performance monitoring will be installed by NYSEG. The proposed locations of NAPL collection, oxygen application and performance monitoring wells are shown on Design Drawing 9 (Appendix A). Well construction details are provided on Design Drawing 10 (Appendix A). Wells will be constructed with polyvinyl chloride risers and well screens. All wells will be equipped with a 5-foot sump and completed with flush-mount well covers.

As shown on Design Drawing 9 (Appendix A), three NAPL collection wells will be installed in the vicinity of soil boring SB-225 in an attempt to address “heavily impacted“ material. Additionally, a NAPL collection well will be installed at soil boring SB-0816 to address oil-like material observed during the completion of this historical soil boring. NAPL collection wells in the vicinity of soil boring SB-225 will be installed to an anticipated depth of 55 feet below grade (NAPL was observed at 42.5 feet bgs in soil boring SB-225), to facilitate potential recovery of NAPL from the till unit. The NAPL collection well at soil boring SB-0816 will be installed to an anticipated depth of 30 feet below grade (NAPL was observed at 26 feet bgs at soil boring SB-0816).

With approval from NYSDEC, if “heavily impacted” material is not observed during installation of the soil boring completed to facilitate well installation, a NAPL collection well will not be installed at the given soil boring location; an additional soil boring will not be “added” to replace the deleted well.

Oxygen application wells will be installed at depths from 15 to 25 feet below grade (i.e., to the top of the till) to facilitate amendment of groundwater within silt and clay, and sand and gravel units. Performance monitoring wells will be use to monitor dissolved oxygen concentrations in groundwater upgradient and down gradient of the application wells. Final locations and installation depths for all wells will be determined in the field based on actual conditions encountered.

5.12 Remediation Task 12 – Survey

The Contractor shall retain a New York State licensed surveyor to conduct survey control during completion of the remedial actions, as required by the Contract Documents. The survey information (including final as-built information) will be used to document that the remedial activities have been completed consistent with the project design requirements. The Contractor shall supply the survey information to the Remediation Engineer for inclusion in the CCR to be prepared by the Remediation Engineer upon completion of the remedial activities. Survey work associated with the remedial activities will be performed in accordance with Specifications Section 01160 – Survey Control and Section 01720 – Project Record Documents (Appendix B).

5.13 Remediation Task 13 – Site Restoration

Under this remediation task, the Contractor shall conduct site restoration activities as described below prior to demobilizing equipment, labor and materials from the site. Removed excavation support components shall be decontaminated on site in accordance with Specification Section 02205 – Excavation Support and Protection (Appendix B).

The Contractor shall restore all surfaces disturbed as part of the remedial construction activities. All site restoration activities shall be conducted in accordance with Specifications Section 02203 – Site Grading and Section 02208 – Restoration of Surfaces (Appendix B). Final surfaces shall be restored as indicated on Design Drawing 9 (Appendix A). The top one foot of the remediation areas shall be backfilled with clean fill material obtained from the NYSDEC-approved location. Remediation

areas shall be restored with either a gravel or vegetated surface. Surface restoration details are provided on Design Drawing 11 (Appendix A).

The Contractor shall restore all other surface features disturbed, damaged or destroyed during the remedial activities, including, but not limited to, sidewalks, pavement and curbs, vegetated surfaces and permanent site fencing. Sidewalks, roadways and curbs shall be replaced in kind, and vegetated surfaces shall be installed in accordance with Specification Section 02210 – Topsoil and Seeding (Appendix B). Repairs to sidewalks, pavement and curbs located within local that are damaged by the Contractor during remedial construction shall be approved the City of Elmira Public Works, prior to conducting surface restoration activities. The Contractor shall be responsible for gaining City approval of any repairs to damaged surfaces and meeting all local, state and federal laws. Existing site fencing that was removed during remedial activities shall be replaced in kind. All fence posts shall be installed (at a minimum) to a depth below the frost line and to the satisfaction of the Remediation Engineer.

5.14 Remediation Task 14 – Project Close-Out and Demobilization

This section presents project close-out activities to be completed by the Contractor. Project close-out activities consist of the following:

- Decontamination.
- Post-Remedial Action Structural Survey.
- Demobilization.

Each of these activities is discussed in greater detail in the following subsections.

5.14.1 Decontamination

The Contractor shall decontaminate (as necessary) all personnel and equipment that comes into contact with excavated materials. The Contractor shall conduct decontamination of personnel and equipment within the constructed decontamination area.

At a minimum, the Contractor shall decontaminate the Contractor's project equipment (including, but not limited to, excavation equipment, trucks, pumps and hand tools) that comes in contact with excavated materials prior to demobilizing and prior to handling

clean material. In addition, equipment used to handle excavated material or liquids shall be decontaminated prior to further handling of non-impacted material. The Contractor shall perform decontamination activities until no visible soil, debris or stains are present on the equipment surfaces (to the satisfaction of the Remediation Engineer). Equipment, such as pumps, shall be flushed using clean water and appropriate cleaning agents (as necessary) to the satisfaction of the Remediation Engineer.

Unless otherwise directed by the Remediation Engineer, any equipment to be taken off site by the Contractor shall be cleaned within the constructed decontamination area (if necessary, and at no additional cost to NYSEG) and subject to a final visual review by the Remediation Engineer. Precautions shall 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 extent and method of cleaning shall be at the discretion of the Contractor; however, each piece of equipment shall be inspected by the Remediation Engineer for any visible soils, staining or other debris prior to its demobilization from the site. Any observed soils, staining or other debris shall be promptly removed by the Contractor to the satisfaction of the Remediation Engineer. Water that is generated during decontamination activities will be collected and containerized in appropriate containers for off-site treatment/disposal.

The Contractor shall prepare the solid and liquid waste streams generated by the decontamination activities for off-site disposal. Treatment/disposal of collected wash water, solids and other materials shall be in accordance with Remediation Task 8 – Waste Handling/Management and Specification Section 02415 – Impacted Material Handling and Excavation Procedures.

5.14.2 Post-Remedial Action Structural Survey

Remediation Engineer shall conduct a post-remedial action visual survey and shall photo-document the conditions of building foundations and structures identified in Section 4 following the completion of the remedial activities. The post-remedial action structural survey shall be completed consistent with scope and extent of activities conducted for the pre-remedial action visual survey (see Section 4). Survey activities shall include, but not be limited to, visual inspection and photo-documentation of building foundations, basement interiors walls (if present), doors and windows (jams, casings and glass), and other signs of potential distress of structures. The objective of the post-remedial action survey is to compare pre- and post-remedial action conditions

of building foundations and structures to verify no visual damage due to vibrations from remedial construction activities occurred.

A representative of NYSEG and/or the Remediation Engineer may be present during the post-remedial action inspections. Potential areas of distress that have been identified will be documented and presented to the owner of the facility. Access to these structures will be arranged by NYSEG.

5.14.3 Demobilization

Following completion of all remedial actions, the Contractor shall conduct the following demobilization activities:

- Dismantle the work area(s), staging area(s) and decontamination area.
- Clean/decontaminate equipment and construction-related materials prior to removal from the site.
- Remove from the site, all material equipment and support structures.

6. Post-Remediation Activities

This section presents the remedial activities to be conducted following the completion of remediation activities at the former MGP site.

6.1 Construction Completion Report

Upon completion of the remedial construction activities, a CCR will be prepared by the Remediation Engineer for submittal to the NYSDEC. In general, and in conformance with the intent of Section 5.8(b) of DER-10 (NYSDEC, 2010) the CCR will present, at a minimum, the following information:

- Description of the remediation activities completed in accordance with the approved remedial design, including problems encountered and variations (if any) from the NYSDEC-approved *Final Remedial Action Design.*
- Record drawings, tables and figures detailing the remedial activities completed.
- Certification statement.
- Information and documentation regarding the final quantities and disposition of materials disposed/treated off site during implementation of the remedial activities, including executed manifests and bills of lading.

The CCR will be prepared in a format based on available templates on the NYSDEC website. A professional engineer licensed in New York State will sign and seal the CCR, including the record drawings and certification statement.

6.2 Post-Remedial Action Activities

Following completion of the remedial construction activities and consistent with the requirements of Chapter 6.1 of DER-10 9NYSDEC, 2010), NYSEG will prepare a SMP that will detail the post-remedial action activities to be conducted at the site. As required by the ROD, the SMP will include site management activities identified by the remedies, including the following:

- An Institutional Control/Engineering Control Plan (IC/EC Plan) to establish the controls and procedures necessary to complete the following:

- Managing soil that may be excavated during future site activities, including procedures for soil characterization, handling, health and safety of workers and the surrounding community, disposal/reuse of excavated material.

- Evaluating the potential for vapor intrusion for any future building(s) developed at the site.

- Maintaining site use and groundwater restrictions established by the environmental easement.

- Requirements for the property owner (NYSEG) to provide periodic IC/EC certification.

- A groundwater monitoring plan to monitor the effectiveness of the NYSDEC-selected remedy and the trends of the dissolved-phase COC concentrations.

- An operation and maintenance plan that will provide the details of the oxygen application and NAPL monitoring/recovery activities to be initiated following completion of the remediation construction activities.

6.3 Institutional Controls

As required by the ROD, institutional controls in the form of an environmental easement will be established for the site. NYSEG will establish the environmental easement in support of the following:

- Restricting the use of the site to commercial and industrial use.

- Restricting the use of groundwater at the site.

- Requiring management of the site in accordance with the provisions of the SMP.

- Requiring the property owner (NYSEG) to complete and submit periodic certifications to NYSDEC that the environmental easement is still in place and remains effective.

NYSEG will establish the environmental easement following the completion of the remediation construction activities.

7. Schedule

This section presents the preliminary project schedule for NYSDEC review of the Contract Documents and contractor procurement activities. The selected Contractor will be responsible for development of a remedial construction schedule.

Table 7-1 Preliminary Project Schedule

Schedule Component	Date
Draft Remedial Action Design to NYSDEC	March 31, 2011
NYSEG receives NYSDEC comments on Draft Remedial Design Report	July 1, 2011
Site meeting to discuss NYSDEC comments	August 1, 2011
NYSEG conducts gas pipeline relocation and pre-remediation sampling	August 15 – 26, 2011
Final Remedial Action Design to NYSDEC	September 12, 2011
Remediation Contractor mobilizes to the Site	September 14, 2011

Initiation of remedial construction will be contingent on meeting all the schedule components defined above and receipt of all required permits, access agreements and approvals. Note that the schedule is critical due to select construction activities (e.g., ISS). Contractor-related delays are not acceptable.

8. References

ARCADIS. 2007. *Supplemental Remedial Investigation Report*, Madison Avenue MGP Site, prepared for NYSEG. February 2007.

ARCADIS. 2008a. *Feasibility Study Report*, Madison Avenue Former MGP Site, prepared for NYSEG. January 2008.

ARCADIS. 2008b. *Remedial Design Work Plan*, Madison Avenue Former MGP Site, prepared for NYSEG. August 2008.

ARCADIS. 2010a. *PDI Summary Report*, Madison Avenue Former MGP Site, prepared for NYSEG. February 2010.

ARCADIS. 2010a. *Draft (50%) Remedial Design Report*, Madison Avenue Former MGP Site, prepared for NYSEG. July 2010.

NYSDEC. 2008. *Record of Decision*, Madison Avenue Former Manufactured Gas Plant (MGP) Site, prepared for NYSDEC Division of Environmental Remediation. March 2008.

NYSDEC. 2009. *CP-43 Groundwater Monitoring Well Decommissioning Policy*. November 2009.

NYSDEC. 2010. *DER-10, Technical Guidance for Site Investigation and Remediation*. May 2010.

ARCADIS

Tables

Table 1
Remediation Area Coordinates

Final (100%)Remedial Action Design
NYSEG - Madison Avenue Former MGP Site - Elmira, New York

Remediation Area	Northing	Easting	Target Depth/Elevation
Area 1	764195.4628	761019.8612	15' / 836.7'
	764185.7618	760994.6771	
	764249.3195	761000.1024	
	764238.4630	760971.5713	
Area 2	764213.9598	761139.9842	10' / 842.67'
	764235.6033	761131.8162	
	764213.1301	761069.5831	
	764190.1396	761079.8213	
Area 3	764149.4213	761208.5582	15' / 837.9'
	764175.9024	761196.0321	
	764152.9121	761147.4921	
	764126.0696	761159.1750	
Area 4	764276.3690	761145.7380	16' / 835.4'
	764292.6673	761121.1842	
	764265.3220	761102.7174	
	764249.0454	761127.6851	
Area 5	764306.1561	761165.4186	25' / 826.0'
	764320.0127	761139.6510	
	764292.6673	761121.1842	
	764276.3690	761145.7380	
Area 6	764399.2670	761131.8168	8' / 844.1'
	764389.5366	761105.1546	
	764345.8460	761148.1231	
	764336.1156	761123.1895	
Area 7	764315.2309	761410.6075	28' / 823.92'
	764352.7827	761410.8357	
	764357.8199	761350.6926	
	764315.1166	761348.0580	
Area 8	764339.7442	761551.8815	16' / 836.25'
	764367.8798	761551.7857	
	764367.7047	761479.9479	
	764339.9554	761480.0156	
Area 9	764394.5843	761521.8184	19' / 833.33'
	764404.6042	761580.8370	
	764390.5513	761578.7879	
	764367.9065	761551.7856	
	764367.8126	761524.1983	

Table 1
Remediation Area Coordinates

Final (100%)Remedial Action Design
NYSEG - Madison Avenue Former MGP Site - Elmira, New York

Remediation Area	Northing	Easting	Target Depth/Elevation
Area 10	764319.1229	761756.9967	13' / 836.7'
	764340.7376	761750.1722	
	764322.7151	761705.4534	
	764301.2830	761713.1907	
Area 11	764371.9169	761622.8985	16' / 837.8'
	764350.4064	761687.0283	
	764316.4620	761672.8294	
	764337.9708	761608.4943	
Area 12	764394.0565	761658.8186	12' / 840.57'
	764394.2102	761711.8796	
	764413.4967	761756.6609	
	764413.4206	761776.5800	
	764393.1164	761776.5024	
	764393.0385	761759.4670	
	764377.4203	761751.3406	
	764377.4270	761658.8668	
TP-20	764265.42	761482.14	8' / 842'
TP-21	764257.35	761442.35	8' / 842'
TP-108	764389.81	761617.57	8' / 845'
TP-122	764265.30	761337.53	8' / 843'

Notes:

1. Refer to North America Datum 1983 (NAD83)
2. State Plane = New York Central
3. Vertical Datum NAVD 88

Table 2
Remediation Areas 1 and 2 Blow Count Summary

Final (100%)Remedial Action Design
NYSEG - Madison Avenue Former MGP Site - Elmira, New York

Soil Boring/ Well ID	Blow Count Range per Depth Interval (ft)							
	0 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40
Remediation Area 1								
NMW-0401S	1 to 5	2 to 40	4 to 34	37 to 53	-	-	-	-
PZ-0909	2 to19	1 to 12	2 to 97	11 to 89	11 to 42	11 to 50/0.4	11 to 50/0.3	50/0.3 to 50/0.4
SB-217	1 to 9	2 to 10	3 to 19	15 to 48	-	-	-	-
SB-222	3 to 37	4 to 16	3 to 50/0.2	10 to 35	17 to 22	-	-	-
Remediation Area 2								
PZ-0902	7 to 45	5 to 50/0.1	4 to 22	30 to 50/0.4	26 to 39	22 to 50/0.5	12 to 50/0.5	25 to 50/0.5
MW-0304D	1 to 27	1 to 14	1 to 2	1 to 24	23 to 45	15 to 45	15 to 50/0.4	24 to 50/0.3
SB-214	2 to 23	3 to 19	1 to 6	2 to 38	20 to 28	-	-	-

Notes:

1. - = Boring not completed or blow counts not collected at given depth interval.

ARCADIS

Figures

EAST FIFTH STREET (AKA JUDSON STREET)

EAST CLINTON STREET

MADISON AVENUE

NYSEG SUBSTATION

FORMER TRANSFORMER REPAIR BUILDING (CONCRETE SLAB REMAINING)

SLAB

NYSEG-OWNED FORMER MGP SITE

STORAGE YARD

COAL HOUSE

GAS HOUSE

OIL & TAR SEPARATOR

GAS HOLDER FOUNDATION #1

GAS HOLDER FOUNDATION #2

HYDRANT

DISTRIBUTION HOLDER

CATCH BASIN STRUCTURE

ELECTRIC TOWER

BRUSH

TRAYER PRODUCTS

PARKING

PURIFIER WASTE IRM AREA

APPROXIMATE LOCATION OF FORMER CANAL

A

A'

B

B'

LEGEND:

- PROPERTY LINE
- CHAIN-LINK FENCE
- BRUSH
- FORMER MGP STRUCTURES - REMOVED
- PRE PDI SOIL BORING
- PHASE I SOIL BORINGS
- PHASE II SOIL BORINGS
- MONITORING WELL; SHALLOW (S), DEEP (D), TRAYER WELL (TMW)
- TEST PIT
- SURFACE SOIL SAMPLING LOCATION
- POWER POLE
- UTILITY POLE WITH GUY
- LIGHT POLE
- CATCHBASIN
- MANHOLE
- PIEZOMETERS INSTALLED DURING THE PDI
- A—A' CROSS SECTION LOCATION
- APPROXIMATE MGP IRM REMOVAL AREAS (DEPTHS VARY)

NOTES:

1. BASE MAP SUPPLIED BY NYSEG, LATEST REVISION DATED APRIL 2004, AT A SCALE OF 1" = 60' AND PROPERTY BOUNDARIES AS PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. DATED OCTOBER 2008.

0 40' 80'
GRAPHIC SCALE

NYSEG
MADISON AVENUE FORMER MGP SITE
ELMIRA, NEW YORK
FINAL (100%) REMEDIAL ACTION DESIGN

SITE PLAN

ARCADIS

FIGURE 1

CITY: SYRACUSE, NY GROUP: ENVCAD DB: L. POSENAUER, P. LISTER, R. BASSETT PIC: K. WHITE PM/TM: B. AHRENS TR: J. GOLUBSKI LYR: ON="OFF+*REF*
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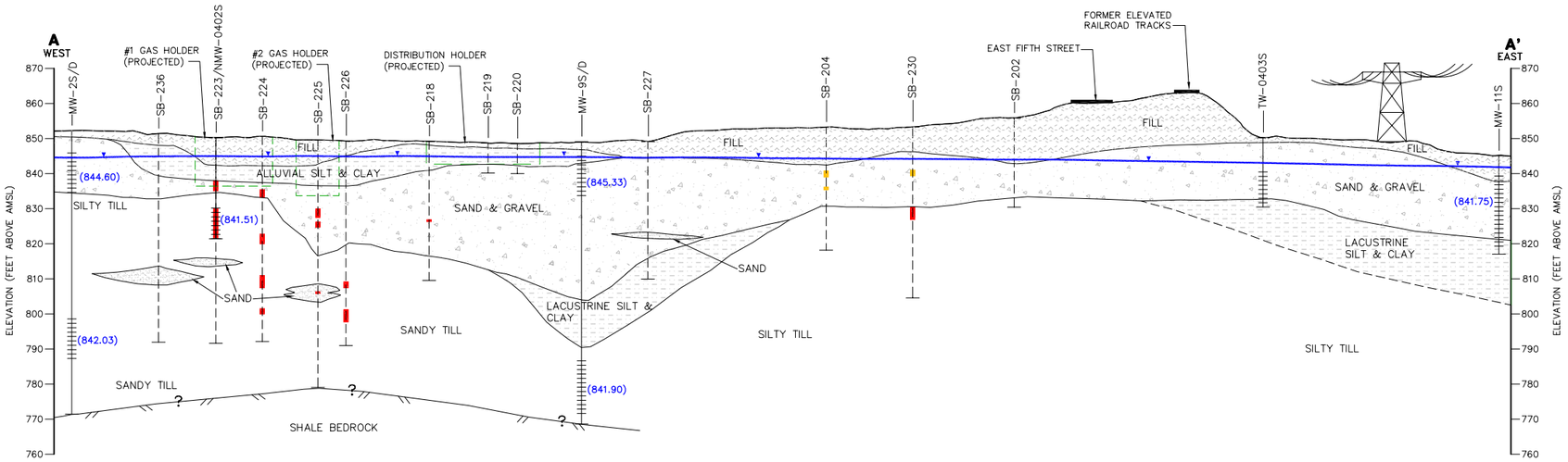
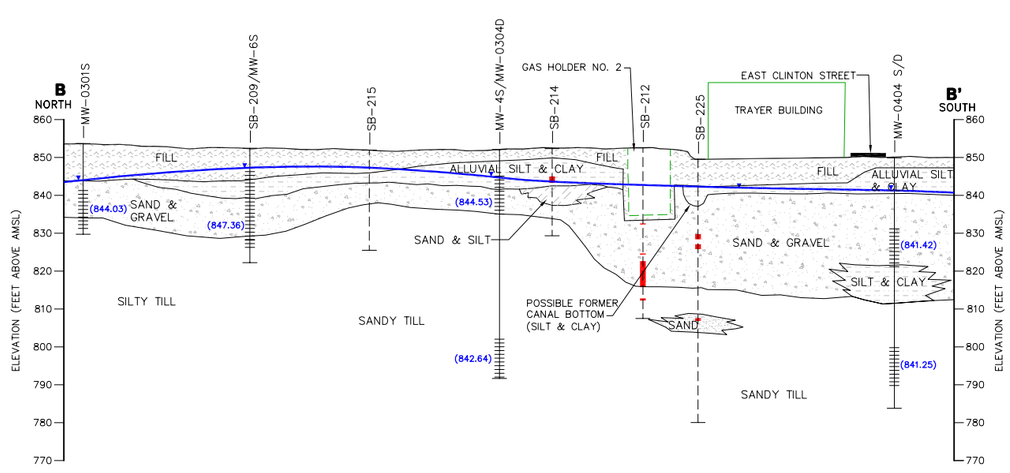
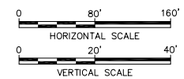
XREFS: IMAGES: PROJECTNAME: --
13087X00
13087X01





LEGEND:

- FILL
- SILT AND CLAY
- SAND AND GRAVEL
- TILL (DENSE UNSORTED SAND AND GRAVEL WITH VARYING AMOUNT OF SAND AND SILT)
- (841.71) GROUNDWATER ELEVATION (4/20/04)



NYSEG
MADISON AVENUE FORMER MGP SITE
ELMIRA, NEW YORK
FINAL (100%) REMEDIAL ACTION DESIGN

GEOLOGIC CROSS SECTIONS

ARCADIS

FIGURE
2

CITY: SYRACUSE, NY GROUP: ENVCAD DB: L. POSENAUER, P. LISTER, R. BASSETT PIC: K. WHITE PM/TM: B. AHRENS TR: J. GOLUBSKI LYR: ON="OFF"REF"
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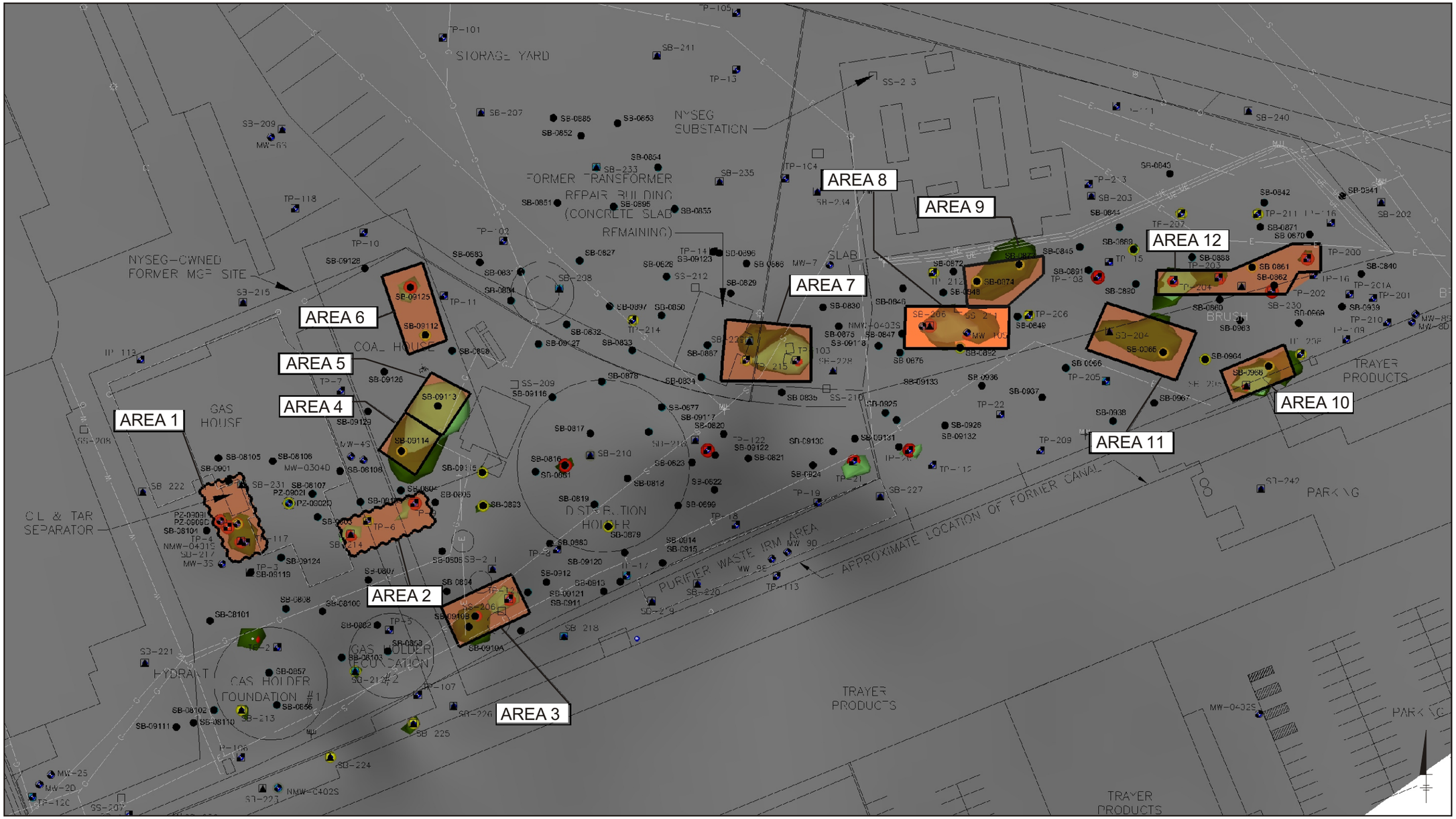
XREFS: IMAGES: PROJECTNAME: ---
13087X00



MODELED DISTRIBUTION OF VISUAL IMPACTS - PLAN VIEW

NOTES:

1. THE LIMITS OF IMPACTS WERE GENERATED USING MINING VISUALIZATION SYSTEM (MVS) SOFTWARE TO CREATE A 3-DIMENSIONAL VISUALIZATION OF THE DISTRIBUTION OF SITE IMPACTS. ADDITIONAL INFORMATION REGARDING THE MODELING TECHNIQUES IS IN THE PDI SUMMARY REPORT (ARCADIS, 2010).
2. MODELED DISTRIBUTION OF VISUAL IMPACTS INCLUDES "SOME" AND "HEAVY" IMPACTS AS DEFINED BY THE MEMORANDUM OF UNDERSTANDING (ARCADIS, 2009) AND THE PDI SUMMARY REPORT (ARCADIS, 2010).

LEGEND:

- IMPACTS ABOVE WATER TABLE
- IMPACTS BELOW WATER TABLE
- TILL SURFACE
- AREA 3 REMEDIATION AREA ID
- REMEDIATION AREA

- BOREHOLE PATH
- NO VISUAL IMPACTS
- TRACE IMPACTS
- SOME IMPACTS
- HEAVILY IMPACTED

60' 0 60'

Approximate Scale: 1 = 60'

Area Location

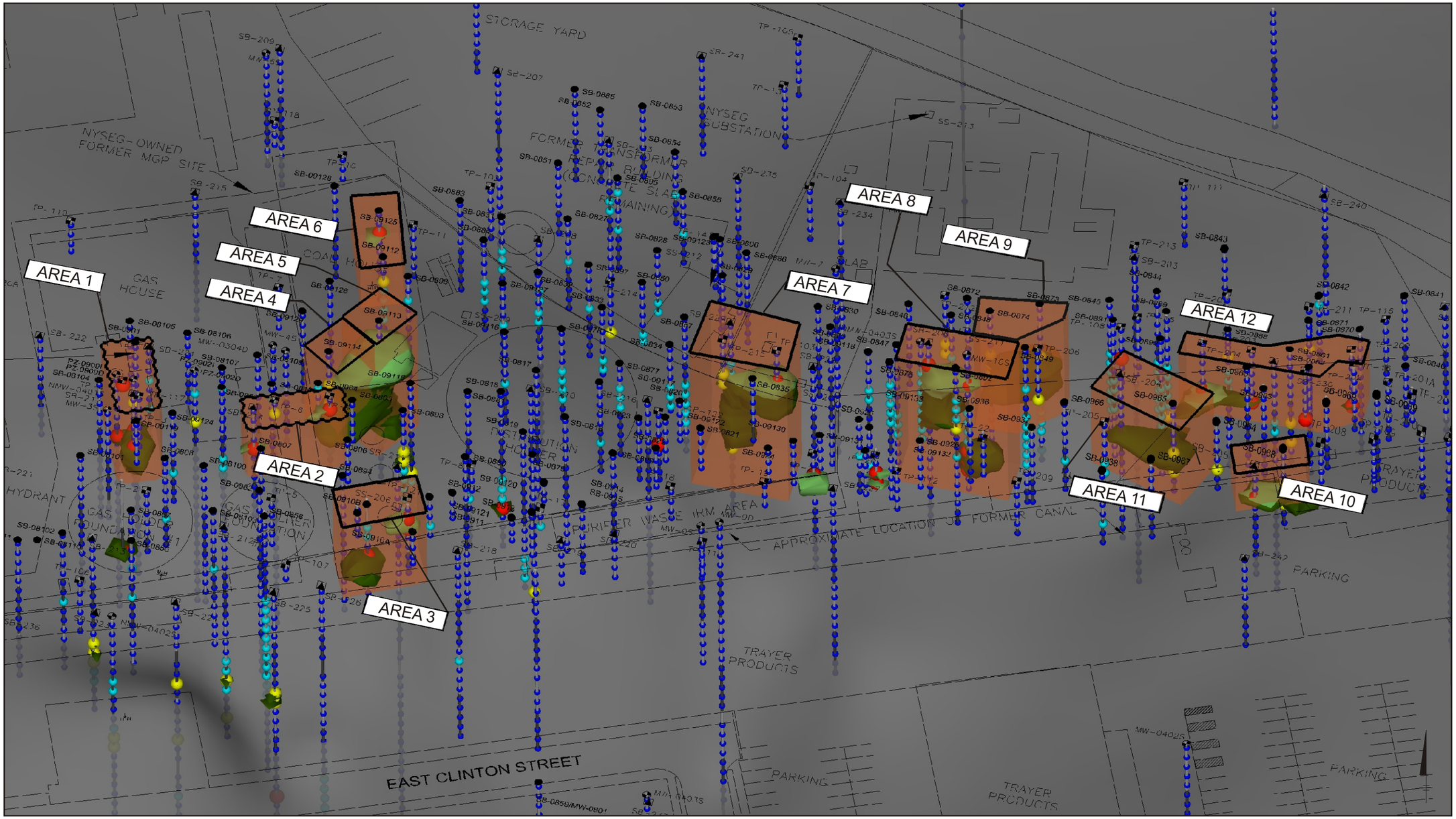
NYSEG
MADISON AVENUE FORMER MGP SITE
ELMIRA, NEW YORK
FINAL (100%) REMEDIAL ACTION DESIGN

REMEDIATION AREAS WITH MODELED IMPACTS - PLAN VIEW

ARCADIS

FIGURE
3

02/28/2010 SYRACUSE, NY-ENV/CAD-DJHOWES
B0013087/0001/00002/CDR/13087G01.CDR



MODELED DISTRIBUTION OF VISUAL IMPACTS - OBLIQUE VIEW (SCALE VARIES)

NOTES:

1. THE LIMITS OF IMPACTS WERE GENERATED USING MINING VISUALIZATION SYSTEM (MVS) SOFTWARE TO CREATE A 3-DIMENSIONAL VISUALIZATION OF THE DISTRIBUTION OF SITE IMPACTS. ADDITIONAL INFORMATION REGARDING THE MODELING TECHNIQUES IS IN THE PDI SUMMARY REPORT (ARCADIS, 2010).
2. MODELED DISTRIBUTION OF VISUAL IMPACTS INCLUDES "SOME" AND "HEAVY" IMPACTS AS DEFINED BY THE MEMORANDUM OF UNDERSTANDING (ARCADIS, 2009) AND THE PDI SUMMARY REPORT (ARCADIS, 2010).

LEGEND:

- IMPACTS ABOVE WATER TABLE
- IMPACTS BELOW WATER TABLE
- TILL SURFACE
- AREA 3 REMEDIATION AREA ID
- REMEDIATION AREA
- BOREHOLE PATH
- NO VISUAL IMPACTS
- TRACE IMPACTS
- SOME IMPACTS
- HEAVILY IMPACTED

Area Location

NYSEG
MADISON AVENUE FORMER MGP SITE
ELMIRA, NEW YORK
FINAL (100%) REMEDIAL ACTION DESIGN

REMEDIATION AREAS WITH MODELED IMPACTS - OBLIQUE VIEW

ARCADIS

FIGURE
4

02/28/2011 SYRACUSE, NY-ENV/CAD-DJHOWES
B0013087/0001/00002/CDR/13087G02.CDR

EAST FIFTH STREET (AKA JUDSON STREET)

EAST CLINTON STREET

MADISON AVENUE

I.D. BOOTH BUILDING

I.D. BOOTH-OWNED STORAGE YARD

NYSEG SUBSTATION

ELECTRIC TOWER

NYSEG-OWNED PROPERTY

TRAYER-OWNED PROPERTY

TRAYER PRODUCTS BUILDING

PARKING

NYSEG-OWNED FORMER MGP SITE

OIL TANK AND CONCRETE DIKE (REMOVED)

FORMER TRANSFORMER REPAIR BUILDING (CONCRETE SLAB REMAINING)

SLAB

OIL TANKS (REMOVED)

COAL HOUSE (REMOVED)

GAS HOUSE (REMOVED)

DISTRIBUTION HOLDER

CATCH BASIN STRUCTURE

OIL & TAR SEPARATOR

GAS REGULATOR SHED

HYDRANT

GAS HOLDER FOUNDATION #1 (REMOVED

GAS HOLDER FOUNDATION #2 (REMOVED)

±22' CLEARANCE

±26' CLEARANCE

±36' CLEARANCE

±16' CLEARANCE

±17' CLEARANCE

±21' CLEARANCE

±20' CLEARANCE

MW-6S
MW-4S
MW-0304D
PZ-0902I
PZ-0902D
PZ-0909I
PZ-0909D
NMW-0401S
MW-3S
MW-2S
MW-2D
NMW-0402S
NMW-0403S
MW-10S
MW-7
MW-9D
MW-9S
MW-6S
MW-8D
TMW-1
MW-0403S

LEGEND

- SEWER LINE
- GAS LINE
- WATER LINE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- PROPERTY LINE
- CHAIN-LINK FENCE
- FORMER MGP STRUCTURES
- PROJECT WORK LIMITS
- UTILITY POLE
- LIGHT POLE
- CATCHBASIN
- MANHOLE
- MONITORING WELL
- PIEZOMETER INSTALLED DURING THE PDI

NYSEG
MADISON AVENUE FORMER MGP SITE
ELMIRA, NEW YORK
FINAL (100%) REMEDIAL ACTION DESIGN

EXISTING UTILITIES PLAN

ARCADIS

FIGURE
5

Appendix A

Design Drawings

DESIGN DRAWINGS

REMEDIAL ACTION DESIGN

MADISON AVENUE
FORMER MANUFACTURED GAS PLANT SITE

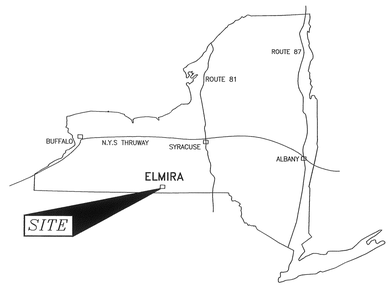
NYSEG
ELMIRA, NEW YORK

DATE ISSUED
SEPTEMBER 2011

REFERENCE: BASE MAP USGS 7.5 MINUTE QUADRANGLE., ELMIRA, N.Y.-PA., 1969.

LOCATION MAP

0 2000' 4000'
GRAPHIC SCALE



THE STATE OF NEW YORK
NOT TO SCALE

ARCADIS

ARCADIS U.S., INC.

INDEX TO DRAWINGS

LEGEND

- 853 — GROUND SURFACE CONTOUR
- S — SEWER LINE (COMBINED SANITARY AND STORM)
- AS — ABANDONED SEWER
- G — GAS LINE
- W — WATER LINE
- E — OVERHEAD ELECTRIC LINE
- UE — UNDERGROUND ELECTRIC LINE
- PROPERTY LINE
- CHAIN–LINK FENCE
- TEMPORARY SITE SECURITY GATE
- FORMER MGP STRUCTURES
- PROJECT WORK LIMITS
- X — TEMPORARY SITE SECURITY FENCING
- EROSION AND SEDIMENT CONTROL
- APPROXIMATE LOCATION OF FORMER CANAL
- SITE FEATURE TO BE REMOVED
- SITE FEATURE TO BE PROTECTED
- EXISTING GRAVEL DRIVEWAY
- VEGETATIVE SURFACE RESTORATION
- GRAVEL SURFACE RESTORATION
- EXCAVATION AREA
- EXCAVATION AREA WITH SHEET PILE SUPPORT
- ISS TREATMENT AREA
- AREA AVAILABLE FOR CONTRACTOR STAGING
- EXCAVATION/ISS TREATMENT DEPTH
- UTILITY POLE
- LIGHT POLE
- GUY WIRE
- CATCHBASIN
- MANHOLE
- MONITORING WELL
- PIEZOMETER INSTALLED DURING THE PDI
- PROPOSED TEST PIT
- PROPOSED APPLICATION WELL
- PROPOSED PERFORMANCE MONITORING WELL
- PROPOSED NAPL COLLECTION WELL
- 2 / 9 — DETAIL # / DRAWING #
- WATER TABLE

GENERAL NOTES:

1. DIFFERENCES IDENTIFIED BY THE REMEDIATION CONTRACTOR BETWEEN THE CONTRACT DOCUMENTS AND ACTUAL SITE CONDITIONS, WHICH MAY AFFECT CONSTRUCTION, SHALL BE SUBMITTED TO THE REMEDIATION AND DESIGN ENGINEERS IN WRITING FOR CLARIFICATION.
2. IT IS THE REMEDIATION CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND OBTAIN FEDERAL, STATE, COUNTY AND/OR VILLAGE SPECIFIC PERMITS REQUIRED TO PERFORM THE WORK.
3. INFORMATION RELATED TO SUBSURFACE CONDITIONS SHOULD BE CONSIDERED AS GENERALLY REPRESENTATIVE AND SHOULD NOT BE RELIED ON AS A COMPLETE DEPICTION OF SITE CONDITIONS. THE REMEDIATION CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, INCLUDING ABOVEGRADE AND SUBSURFACE FEATURES WHETHER OR NOT SHOWN ON DESIGN DRAWINGS OR OTHERWISE DESCRIBED IN THE CONTRACT DOCUMENTS.
4. THE TECHNICAL WORK AND CONTRACTOR REQUIREMENTS ARE DESCRIBED IN SEVERAL COMPONENTS THAT COLLECTIVELY REPRESENT THE CONTRACT DOCUMENTS. THESE COMPONENTS INCLUDE THE REMEDIAL ACTION DESIGN TEXT; DESIGN DRAWINGS; TECHNICAL SPECIFICATIONS; COMMUNITY AIR MONITORING PLAN; CONSTRUCTION QUALITY ASSURANCE PLAN; TRAFFIC PLAN; AND CONTINGENCY PLAN. THESE COMPONENTS SHOULD BE THOROUGHLY REVIEWED BY THE REMEDIATION CONTRACTOR. NOTHING PRESENTED IN ONE OF THE ABOVE DOCUMENTS SHALL RELIEVE THE CONTRACTOR'S OBLIGATIONS TO SATISFY THE COMPONENTS SPECIFIED IN THE OTHER DOCUMENTS. IN ADDITION, IN THE EVENT THAT THERE ARE DISCREPANCIES IN THE INFORMATION CONTAINED IN THE ABOVE–LISTED DOCUMENTS, THE REMEDIATION CONTRACTOR SHALL IDENTIFY SUCH DISCREPANCIES IN WRITING FOR OWNER'S AND REMEDIATION ENGINEER'S REVIEW AND RESOLUTION.

SITE MANAGEMENT/PROJECT PERFORMANCE NOTES:

1. ALL WORK SHALL BE PERFORMED WITHIN THE PROJECT WORK LIMITS, ANY WORK NECESSARY TO BE PERFORMED OUTSIDE THE PROJECT WORK LIMITS, SHALL BE APPROVED BY THE OWNER/REMEDIATION ENGINEER PRIOR TO THE COMMENCEMENT OF SUCH WORK.
2. REMEDIATION CONTRACTOR SHALL PERFORM ALL WORK IN A NEAT AND ORDERLY MANNER IN CONFORMANCE WITH BEST MODERN TRADE PRACTICE BY COMPETENT, EXPERIENCED PERSONNEL. ALL MATERIALS AND INSTALLATION SHALL BE IN ACCORDANCE WITH ALL CODES, REGULATIONS, AND REQUIREMENTS OF ALL APPLICABLE MUNICIPAL, STATE, FEDERAL, AND OTHER PUBLIC OR PRIVATE AUTHORITIES.
3. ALL EQUIPMENT OPERATED WITHIN THE PROJECT WORK LIMITS SHALL BE CLEANED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS PRIOR TO ARRIVAL AT THE SITE AND PRIOR TO TRANSPORT OFF–SITE.
4. PROJECT EQUIPMENT THAT COMES IN CONTACT WITH EXCAVATED MATERIALS MUST BE APPROPRIATELY DECONTAMINATED PRIOR TO HANDLING CLEAN BACKFILL MATERIAL AND PRIOR TO DEMOBILIZING FROM THE SITE.
5. THE REMEDIATION CONTRACTOR SHALL ESTABLISH, MAINTAIN, AND PROTECT THE PROJECT WORK LIMITS INCLUDING SUPPORT ZONES, EXCLUSION ZONES, AND CONTAMINATION REDUCTION ZONES AS DEFINED IN THE CONTRACTOR'S HEALTH AND SAFETY PLAN.
6. THE REMEDIATION CONTRACTOR SHALL COORDINATE ANY NECESSARY TRAFFIC CONTROLS WITHIN THE PROJECT WORK LIMITS AND OBTAIN ANY NECESSARY PERMITS THAT MAY BE REQUIRED IN CONJUNCTION WITH VEHICLE USE ON PUBLIC ROADS.
7. THE REMEDIATION CONTRACTOR SHALL RESTORE ALL AREAS THAT ARE IMPACTED BY THE PROJECT, INCLUDING BUT NOT LIMITED TO, EQUIPMENT AND MATERIAL STORAGE AREAS, MATERIAL LOADING AREAS, PARKING AREAS, AND LOCATION OF SITE TRAILER, EXCEPT WHERE NOTED OTHERWISE IN THE CONTRACT DOCUMENTS.
8. ALL SURFACES DAMAGED AS A RESULT OF WORK PERFORMED SHALL BE RESTORED TO PRE–CONSTRUCTION CONDITIONS AND/OR AS INDICATED ON THE CONTRACT DOCUMENTS IN A TIMELY MANNER AND PRIOR TO REMEDIATION CONTRACTOR DEMOBILIZATION.
9. THE REMEDIATION CONTRACTOR SHALL CONTROL ODORS, DUST, AND VAPORS THAT RESULT FROM THE CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH THE CONTRACTOR'S HEALTH AND SAFETY PLAN, THE CONTRACT DOCUMENTS, AND APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
10. THE REMEDIATION CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL ABOVEGROUND AND BELOW GROUND NON–EARTHEN MATERIALS INCLUDING, BUT NOT LIMITED TO: THE OIL AND TAR SEPARATOR, FORMER BUILDING FOUNDATIONS, DEBRIS, BRUSH, LOGS, TREES, STUMPS, REFUSE, AND RUBBISH FROM WITHIN THE PROJECT WORK LIMITS, AS REQUIRED TO PERFORM THE REMEDIAL ACTIVITIES DESCRIBED HEREIN.
11. THE REMEDIATION CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOADING OF ALL WASTE MATERIALS GENERATED DURING THE PROJECT. THE REMEDIATION ENGINEER SHALL COORDINATE TRANSPORTATION WITH OFF–SITE DISPOSAL FACILITIES.
12. THE REMEDIATION CONTRACTOR SHALL COLLECT, EXTRACT, CONVEY AND CONTAINERIZE ALL WATER GENERATED DURING THE PROJECT. THE REMEDIATION ENGINEER SHALL COORDINATE TRANSPORTATION WITH OFF–SITE DISPOSAL FACILITIES.
13. THE REMEDIATION CONTRACTOR SHALL NOT INITIATE ANY INTRUSIVE ACTIVITIES (I.E., INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES, SHEET PILE INSTALLATION, EXCAVATION, OR MATERIAL HANDLING) WITHOUT FIRST CONFIRMING THAT THE COMMUNITY AIR MONITORING PROGRAM IS IN OPERATION.
14. THE REMEDIATION CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING/PROTECTING ALL EXISTING UNDERGROUND/ABOVEGROUND UTILITY LINES/STRUCTURES, EXCEPT WHERE NOTED OR AS OTHERWISE INDICATED IN THE CONTRACT DOCUMENTS.
15. NYSEG SHALL OBTAIN A THIRD PARTY BUILDING INSPECTOR OR ENGINEERING FIRM FOR THE PERFORMANCE OF A PRE– AND POST–REMEDIAL ACTION STRUCTURAL SURVEY OF THE I.D. BOOTH BUILDINGS LOCATED NORTH AND WEST OF REMEDIATION AREA 1; NYSEG BUILDING LOCATED EAST OF REMEDIATION AREAS 4 AND 5; I.D. BOOTH RAMP LOCATED NORTHWEST OF REMEDIATION AREA 6; NYSEG GAS REGULATOR SHED LOCATED SOUTH OF REMEDIATION AREA 1; AND TRAYER PRODUCTS BUILDINGS LOCATED SOUTH OF REMEDIATION AREAS 3 AND 10 PRIOR TO THE INITIATION OF CONSTRUCTION ACTIVITIES AND A POST–REMEDIAL ACTION STRUCTURAL SURVEY FOLLOWING THE COMPLETION OF BACKFILLING OF EXCAVATION AREAS. THE STRUCTURAL SURVEYS SHALL BE PREPARED AS TWO SEPARATE REPORTS AND AT A MINIMUM SHALL PROVIDE DOCUMENTATION (BOTH IN TEXT DESCRIPTIONS AND PHOTOGRAPHIC DOCUMENTATION) DETAILING THE PRE–REMEDIAL ACTION AND POST–REMEDIAL ACTION STRUCTURAL CONDITION OF THE STRUCTURES. THE PRE–REMEDIAL ACTION STRUCTURAL SURVEY REPORT SHALL BE SUBMITTED TO NYSEG PRIOR TO MOBILIZING EQUIPMENT TO THE SITE AND INCLUDE RECOMMENDATIONS FOR MINIMIZING THE POTENTIAL FOR DAMAGE CAUSED BY THE PROJECT WORK, AS WELL AS THE TYPE, FREQUENCY, LOCATIONS, AND DURATION OF THE MONITORING ACTIVITIES.
16. TEMPORARY SITE SECURITY FENCING SHALL CONSIST OF GALVANIZED CHAIN LINK FENCE WITH A MINIMUM POST–SPACING OF 10' AND MINIMUM HEIGHT OF 6'. THE CONTRACTOR SHALL EQUIP PERIMETER SITE FENCING WITH "NO TRESPASSING" SIGNS.
17. REMEDIATION CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOADING AND OFF–SITE TRANSPORTATION OF STEEL SHEET PILE NOT USED FOR REMEDIAL CONSTRUCTION ACTIVITIES (CURRENTLY PRESENT ON–SITE) TO THE NYSEG FACILITY LOCATED IN DANSVILLE, NEW YORK. REMEDIATION CONTRACTOR SHALL BE RESPONSIBLE FOR TRANSPORTING SHEET PILE FROM OTHER NYSEG FACILITIES TO THE MADISON AVENUE SITE (IF NECESSARY).
18. REMEDIATION CONTRACTOR SHALL BE REQUIRED TO ACHIEVE MINIMUM TIP ELEVATIONS FOR SHEET PILE AS PRESENT IN THE CONTRACT DOCUMENTS.
19. THE REMEDIATION CONTRACTOR SHALL OBTAIN A THIRD PARTY ENGINEERING FIRM TO PERFORM NOISE AND VIBRATION MONITORING.

SAFETY NOTES:

1. THE REMEDIATION CONTRACTOR IS RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY MEASURES AND PROGRAMS IN CONNECTION WITH THE PROJECT. THE REMEDIATION CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF, AND SHALL PROVIDE THE NECESSARY PRECAUTIONS TO PROTECT SITE WORKERS, CONSTRUCTION OVERSIGHT PERSONNEL, AND SITE VISITORS.
2. THE REMEDIATION CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF 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 THE OCCUPATIONAL SAFETY AND HEALTH ACT 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 CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS SET FORTH UNDER 29 CFR 1910 AND 29 CFR 1926. THE REMEDIATION CONTRACTOR SHALL ERECT AND MAINTAIN, AS REQUIRED BY THE CONDITIONS AND THE PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR THE SAFETY AND PROTECTION OF PERSONS AND PROPERTY AND SHALL COMPLY WITH ALL APPLICABLE RECOMMENDATIONS OF THE MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION OF THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.
3. THE REMEDIATION CONTRACTOR SHALL FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, AND PROVIDE ALL EXCAVATION SHORING/BRACING (WITH THE EXCEPTION OF THE NYSEG–SUPPLIED SHEET PILE, IF USED), SCAFFOLDING, SHIELDING, 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 TO SECURE SUCH PROTECTION.
4. 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 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. THE CONTRACTOR'S HEALTH AND SAFETY PLAN SHALL BE DEVELOPED IN ACCORDANCE WITH APPLICABLE OSHA, FEDERAL, STATE, AND LOCAL REGULATIONS.
5. SEVERAL CONTRACTOR ACTIVITIES WILL BE PERFORMED WITHIN, ADJACENT TO, OR IN THE VICINITY OF THE EXCAVATION/BACKFILL AREAS. THE CONTRACTOR'S HEALTH AND SAFETY PLAN 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. OF ADDITIONAL NOTE AND EMPHASIS ARE THOSE ACTIVITIES THAT POTENTIALLY INVOLVE WORK WITHIN THE EXCAVATION AREA ONCE EXCAVATION/BACKFILL ACTIVITIES ARE INITIATED, AND THAT POTENTIALLY REQUIRE WORKER ACCESS INTO THE EXCAVATED AREA. THE REMEDIATION CONTRACTOR SHALL CLEARLY IDENTIFY AND EVALUATE THE SPECIFIC TYPES OF ACTIVITIES THAT COULD INVOLVE WORKER ENTRY INTO THE EXCAVATION AREA, SPECIFIC INGRESS/EGRESS ROUTES AND PROVISIONS, PERSONNEL AND WORK AREA MONITORING, PERSONAL PROTECTION EQUIPMENT, COMMUNICATIONS, ETC. FURTHER, TO THE EXTENT PRACTICABLE (AS DETERMINED BY THE CONTRACTOR), THE REMEDIATION CONTRACTOR IS ENCOURAGED TO MINIMIZE WORKER ENTRY INTO THE EXCAVATED AREA.
6. SEVERAL CONTRACTOR ACTIVITIES WILL BE PERFORMED ADJACENT TO, OR IN THE VICINITY OF UTILITY POLES, OVERHEAD AND UNDERGROUND ELECTRICAL LINES, AND TRANSFORMERS. THE REMEDIATION CONTRACTOR'S HEALTH AND SAFETY PLAN SHALL RECOGNIZE THESE HAZARDS AND INCORPORATE SPECIAL PRECAUTIONS AND CONTROLS SPECIFIC TO WORKING NEAR SUCH HAZARDS.

UTILITY–RELATED NOTES:

1. THE REMEDIATION CONTRACTOR SHALL VERIFY THE PRESENCE AND IDENTIFY THE LOCATION OF ALL ABOVEGROUND AND UNDERGROUND SITE FEATURES POTENTIALLY TO BE ENCOUNTERED DURING PERFORMANCE OF THIS PROJECT. ADDITIONAL SITE FEATURES/UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE DRAWINGS.
2. THE REMEDIATION CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR THE TEMPORARY BRACING, REMOVAL, RELOCATION, AND REPLACEMENT OF ANY OVERHEAD WIRES THAT ARE NEAR OR WITHIN THE PROJECT WORK LIMITS OF CONSTRUCTION, OR THAT MAY INTERFERE WITH THE PROJECT.
3. THE REMEDIATION CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION AND/OR MAINTENANCE OF UNDERGROUND AND OVERHEAD UTILITIES WHICH MAY BE IMPACTED DURING CONSTRUCTION. ALL UTILITIES, UNLESS STATED OTHERWISE, SHALL REMAIN FUNCTIONAL DURING THE PROGRESSION OF THIS PROJECT.
4. THE REMEDIATION CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING/COORDINATING WITH DIG SAFELY NEW YORK. THE DIG SAFELY NEW YORK NUMBER IS 811. THEIR WEBSITE IS WWW.DIGSAFELYNEWYORK.COM.
5. OVERHEAD CLEARANCES SHALL BE VERIFIED BY THE CONTRACTOR.
6. SUBSURFACE GAS LINES ARE SHOWN ON DESIGN DRAWINGS IN AREAS OF ANTICIPATED LOCATION AT TIME OF REMEDIAL CONSTRUCTION.

SURVEY–RELATED NOTES:

1. ACTUAL SITE FEATURES MAY DIFFER FROM THOSE DEPICTED IN THE REMEDIAL DESIGN. THE CONTRACTOR SHALL IDENTIFY DIFFERENCES (IN WRITING) TO SITE FEATURES, RELATIVE TO THOSE INCLUDED IN THIS DESIGN, TO THE EXTENT THAT THEY COULD POTENTIALLY IMPACT IMPLEMENTATION OF THE PROJECT PRIOR TO IMPLEMENTATION OF REMEDIAL ACTIVITIES.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ESTABLISH AND MAINTAIN CONSTRUCTION SURVEY CONTROL AND VERIFY GRADES DURING THE PERFORMANCE OF WORK USING A NEW YORK STATE–LICENSED LAND SURVEYOR.
3. THE CONTRACTOR SHALL PERFORM SURVEY ACTIVITIES IN ACCORDANCE WITH THE REMEDIAL DESIGN (I.E., MATERIALS AND PERFORMANCE – SECTION 01160, TITLED SURVEY CONTROL, AND THE PROJECT CONSTRUCTION QUALITY ASSURANCE PLAN).

REFERENCE DRAWINGS:

1. BASE MAP SUPPLIED BY NYSEG, LATEST REVISION DATED APRIL 2004 AT A SCALE OF 1" = 60' AND PROPERTY BOUNDARIES AS PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. DATED OCTOBER 2008, UPDATED NOVEMBER 2010.
2. MAP ENTITLED "O'BRIEN PLOT, MAP MADE FOR CHEMUNG COUNTY OF LANDS IN THE CITY OF ELMIRA, COUNTY OF CHEMUNG, STATE OF NEW YORK" COMPLETED MAY 3, 1944 AND FILED AS MAP #946.
3. MAP ENTITLED "DIVISION OF LANDS OF NEW YORK STATE ELECTRIC & GAS CORP., CITY OF ELMIRA, CHEMUNG COUNTY, NEW YORK. PREPARED BY WEILER ASSOCIATES, DATED FEBRUARY 12, 1975 AND REVISED JANUARY 25, 1977 AND FILED AS MAP #1872.
4. MAP ENTITLED "ELMIRA–MADISON AVENUE FORMER MGP SITE." PREPARED BY NYSEG ENGINEERING SERVICES, BINGHAMTON, NEW YORK. PROVIDED ON 6/28/2010.
5. ALL LOCATIONS ARE APPROXIMATE.

CITY: SYRACUSE, NY DIV/GROUP: 141/ENV DB: RCA AMS DMW K.SARTORI PM:B.AHRENS LYR:ON=*;OFF=*REF*
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THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARGARET A. CARRILLO-SHERIDAN
Professional Engineer's No.: 082251

State	Date Signed	Project Mgr.
NY	9/16/2011	BWA
Designed by: JRG	Drawn by: SJK	Checked by: BWA

STATE OF NEW YORK — MARGARET A. CARRILLO-SHERIDAN — No. 082251 — LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NYSEG • ELMIRA, NEW YORK
MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN

GENERAL NOTES AND LEGEND

ARCADIS Project No. B0013807.0001.00002
Date SEPTEMBER 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel: 315.446.9120

1

MW-0301S
MW-0401S
EXISTING GATE
I.D. BOOTH BUILDING
I.D. BOOTH-OWNED STORAGE YARD
EAST FIFTH STREET (AKA JUDSON STREET)
NYSEG SUBSTATION
EXISTING GATE
MW-6S
LOADING DOCK
NYSEG-OWNED PROPERTY
ELECTRIC TOWER
OIL TANK AND CONCRETE DIKE (REMOVED)
FORMER TRANSFORMER REPAIR BUILDING (CONCRETE SLAB REMAINING)
CONCRETE PIPE
SLAB
MW-7
EXISTING GATE
COAL HOUSE (REMOVED)
OIL TANKS (REMOVED)
CATCH BASIN STRUCTURE
MW-10S
NMW-0403S
GRAVEL DRIVEWAY
MW-8S
MW-8D
TMW-1
GAS HOUSE (REMOVED)
DISTRIBUTION HOLDER
TRAYER-OWNED PROPERTY
TRAYER PRODUCTS BUILDING
MW-4S
MW-0304D
PZ-0902I
PZ-0902D
NYSEG-OWNED FORMER MGP SITE
PURIFIER BOXES
I.D. BOOTH BUILDING
PZ-0909I
PZ-0909D
OIL & TAR SEPARATOR
NMW-0401S
MW-3S
MW-9D
MW-9S
APPROXIMATE LOCATION OF FORMER CANAL
PARKING
GAS HOLDER FOUNDATION #2 (REMOVED)
TRAYER PRODUCTS BUILDING
HYDRANT
GAS HOLDER FOUNDATION #1 (REMOVED
PARKING
GAS REGULATOR SHED
MADISON AVENUE
MW-2S
MW-2D
NMW-0402S
EAST CLINTON STREET
MW-0403S
PARKING
TRAYER PRODUCTS BUILDING

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

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Professional Engineer's No.: 082251		
State: NY	Date Signed: 9/16/2011	Project Mgr.: BWA
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STATE OF NEW YORK MARGARET A. CARRILLO-SHERIDAN No. 082251 LICENSED PROFESSIONAL ENGINEER

ARCADIS

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NYSEG • ELMIRA, NEW YORK
MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN

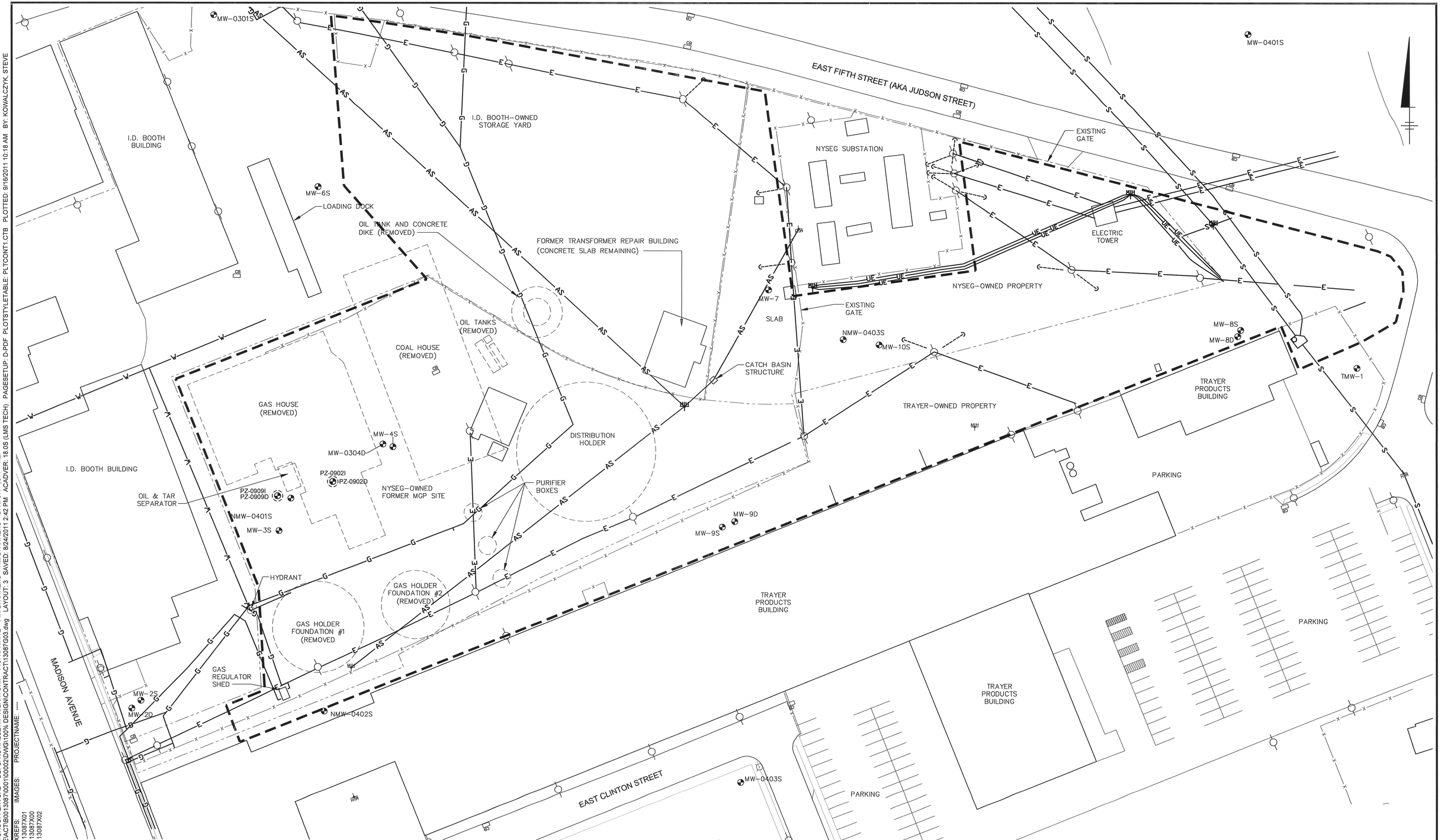
EXISTING SITE PLAN

ARCADIS Project No.
B0013807.0001.00002

Date
SEPTEMBER 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel: 315.446.9120

2



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13087X02

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

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Professional Engineer's Name: MARGARET A. CARRILLO-SHERIDAN		
Professional Engineer's No.: 082251		
State: NY	Date Signed: 9/16/2011	Project Mgr.: BWA
Designed by: JRG	Drawn by: SJK	Checked by: BWA

STATE OF NEW YORK · MARGARET A. CARRILLO-SHERIDAN · No. 082251 · LICENSED PROFESSIONAL ENGINEER

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MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN

EXISTING UTILITIES PLAN

ARCADIS Project No.
B0013807.0001.00002

Date
SEPTEMBER 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel: 315.446.9120

3

MW-0301S
MW-0401S
TRAILER
PORTABLE TOILET
TRAILER
EAST FIFTH STREET (AKA JUDSON STREET)
I.D. BOOTH BUILDING
VEHICLE PARKING
I.D. BOOTH-OWNED STORAGE YARD
EXISTING GATE
NYSEG SUBSTATION
MW-6S
CONTRACTOR EQUIPMENT STAGING AREA
LOADING DOCK
ELECTRIC TOWER
NYSEG-OWNED PROPERTY
FORMER TRANSFORMER REPAIR BUILDING (CONCRETE SLAB REMAINING)
MW-7
SLAB
EXISTING GATE
DECONTAMINATION AREA
PORTABLE TOILET
CATCH BASIN STRUCTURE
NMW-0403S
MW-10S
MW-8S
MW-8D
TRAYER-OWNED PROPERTY
TRAYER PRODUCTS BUILDING
TMW-1
1, 2 / 5 EROSION AND SEDIMENT CONTROL (TYP.)
PERSONNEL DECONTAMINATION AREA
CONTRACTOR STAGING AREA
MW-4S
MW-0304D
PZ-0909I
PZ-0909D
PZ-0902I
PZ-0902D
PARKING
NMW-0401S
MW-3S
MW-9D
MW-9S
I.D. BOOTH BUILDING
HYDRANT
TRAYER PRODUCTS BUILDING
GAS REGULATOR SHED
MADISON AVENUE
MW-2S
MW-2D
NMW-0402S
TRAYER PRODUCTS BUILDING
EAST CLINTON STREET
MW-0403S

NOTES:

1. THE REMEDIATION CONTRACTOR IS NOT RESPONSIBLE FOR THE REMOVAL OF PIEZOMETERS PZ-0909 I/D AND PZ-0902 I/D.
2. ALL SITE FEATURES NOT IDENTIFIED FOR REMOVAL SHALL BE PROTECTED BY THE CONTRACTOR.
3. THE REMEDIATION CONTRACTOR MAY PROPOSE ALTERNATE AREAS FOR OFFICE TRAILERS, VEHICLE PARKING, AND EQUIPMENT AND MATERIAL STAGING. ALTERNATE AREAS SHALL BE APPROVED BY NYSEG AND THE REMEDIATION ENGINEER PRIOR TO USE.
4. THE REMEDIATION CONTRACTOR SHALL INSTALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO DISTURBING EXISTING SITE SOILS AND VEGETATION.
5. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT MIGRATION OF CONSTRUCTION RELATED SOILS, DEBRIS, FUELS, SOLVENTS, LUBRICANTS, CONCRETE, LEACHATE, OR ANY OTHER POLLUTANT BEYOND THE PROJECT WORK LIMITS.
6. ACTUAL LOCATION OF EROSION AND SEDIMENT CONTROL MEASURES MAY VARY BASED ON ACTUAL SITE CONDITIONS ENCOUNTERED AT THE TIME OF CONSTRUCTION.
7. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED AT TIME OF CONSTRUCTION TO CONTROL EROSION AND SEDIMENTATION.

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

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No.	Date	Revisions	By	Ckd

Professional Engineer's Name
MARGARET A. CARRILLO-SHERIDAN
Professional Engineer's No.
082251

State	Date Signed	Project Mgr.
NY	9/16/2011	BWA
Designed by	Drawn by	Checked by
JRG	SJK	BWA

STATE OF NEW YORK · MARGARET A. CARRILLO-SHERIDAN · No. 082251 · LICENSED PROFESSIONAL ENGINEER

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MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN

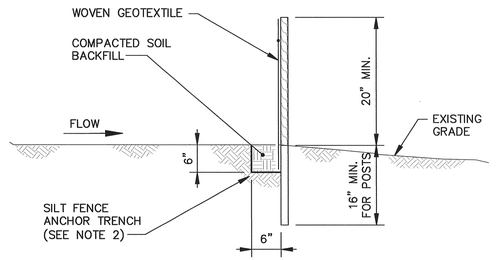
SITE PREPARATION PLAN

ARCADIS Project No.
B0013807.0001.00002

Date
SEPTEMBER 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel: 315.446.9120

4



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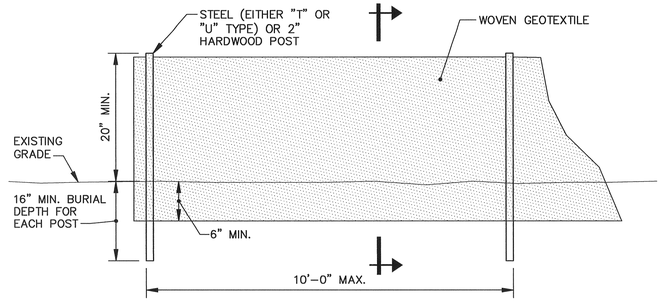


PROFILE

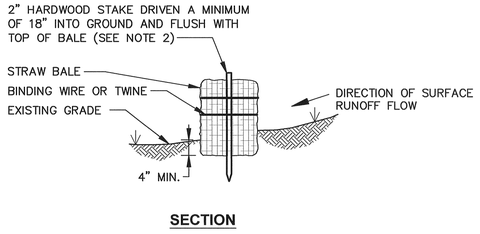
NOTES:

1. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN "BULGES" DEVELOP IN SILT FENCE OR AS DIRECTED BY ENGINEER.
2. THE SILT FENCE SHALL BE FOLDED INTO A TRENCH AND BACKFILLED.
3. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL.

SILT FENCE

NOT TO SCALE

1



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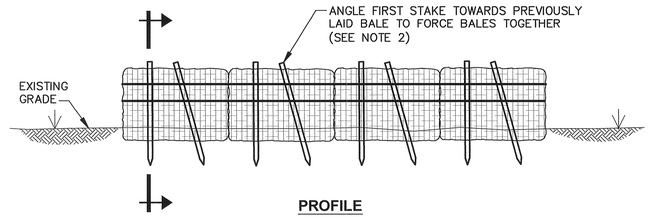

PROFILE

NOTES:

1. BALES SHALL BE BOUND WITH BALE TIES INTACT.
2. WITHIN AREAS WHERE STAKES CANNOT BE EASILY DRIVEN (I.E., PAVEMENT/CONCRETE), THE REMEDIATION CONTRACTOR SHALL PROVIDE AN ALTERNATE MEANS OF ANCHORING STRAW BALES (E.G., SAND BAGS) SUCH THAT EXISTING PAVEMENT/CONCRETE IS NOT DAMAGED.
3. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL.
4. THE REMEDIATION CONTRACTOR MAY USE EITHER, OR A COMBINATION OF, SILT FENCE OR STRAW BALES FOR EROSION CONTROL.

STRAW BALE DIKE

NOT TO SCALE

2

NOT TO SCALE

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Professional Engineer's Name: MARGARET A. CARRILLO-SHERIDAN
Professional Engineer's No.: 082251
State: NY | Date Signed: 9/16/2011 | Project Mgr.: BWA
Designed by: JRG | Drawn by: SJK | Checked by: BWA

STATE OF NEW YORK · MARGARET A. CARRILLO-SHERIDAN · LIC. NO. 082251 · PROFESSIONAL ENGINEER

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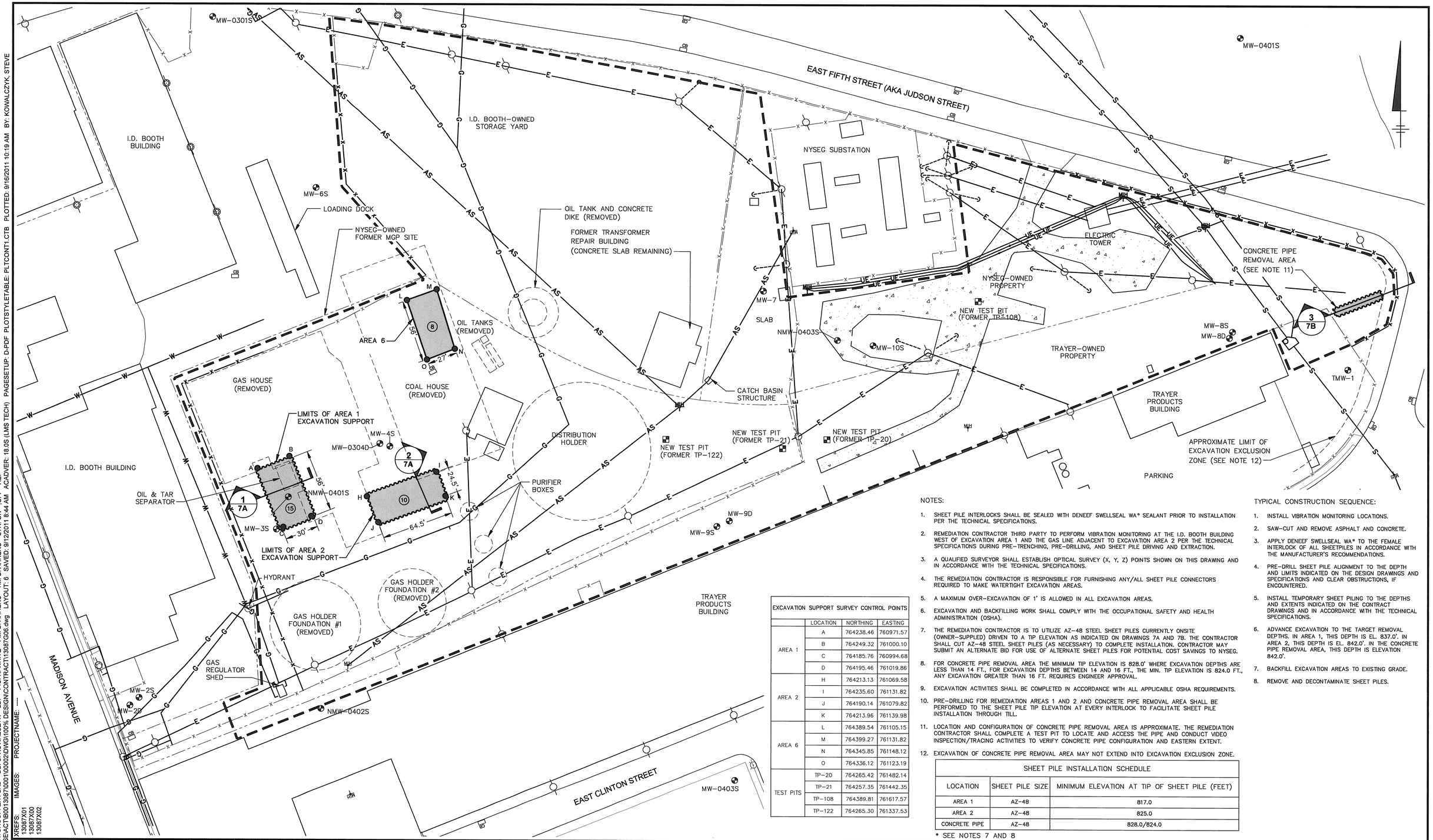
NYSEG • ELMIRA, NEW YORK
MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN

EROSION AND SEDIMENT CONTROL DETAILS

ARCADIS Project No.: B0013807.0001.00002
Date: SEPTEMBER 2011
ARCADIS, 6723 Towpath Road, P.O. Box 66, Syracuse, NY 13214, Tel: 315.446.9120

5



EXCAVATION SUPPORT SURVEY CONTROL POINTS			
	LOCATION	NORTHING	EASTING
AREA 1	A	764238.46	760971.57
	B	764249.32	761000.10
	C	764185.76	760994.68
	D	764195.46	761019.86
AREA 2	H	764213.13	761069.58
	I	764235.60	761131.82
	J	764190.14	761079.82
	K	764213.96	761139.98
AREA 6	L	764389.54	761105.15
	M	764399.27	761131.82
	N	764345.85	761148.12
	O	764336.12	761123.19
TEST PITS	TP-20	764265.42	761482.14
	TP-21	764257.35	761442.35
	TP-108	764389.81	761617.57
	TP-122	764265.30	761337.53

NOTES:

1. SHEET PILE INTERLOCKS SHALL BE SEALED WITH DENEEF SWELLSEAL WA* SEALANT PRIOR TO INSTALLATION PER THE TECHNICAL SPECIFICATIONS.
2. REMEDIATION CONTRACTOR THIRD PARTY TO PERFORM VIBRATION MONITORING AT THE I.D. BOOTH BUILDING WEST OF EXCAVATION AREA 1 AND THE GAS LINE ADJACENT TO EXCAVATION AREA 2 PER THE TECHNICAL SPECIFICATIONS DURING PRE-TRENCHING, PRE-DRILLING, AND SHEET PILE DRIVING AND EXTRACTION.
3. A QUALIFIED SURVEYOR SHALL ESTABLISH OPTICAL SURVEY (X, Y, Z) POINTS SHOWN ON THIS DRAWING AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
4. THE REMEDIATION CONTRACTOR IS RESPONSIBLE FOR FURNISHING ANY/ALL SHEET PILE CONNECTORS REQUIRED TO MAKE WATERTIGHT EXCAVATION AREAS.
5. A MAXIMUM OVER-EXCAVATION OF 1' IS ALLOWED IN ALL EXCAVATION AREAS.
6. EXCAVATION AND BACKFILLING WORK SHALL COMPLY WITH THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
7. THE REMEDIATION CONTRACTOR IS TO UTILIZE AZ-48 STEEL SHEET PILES CURRENTLY ONSITE (OWNER-SUPPLED) DRIVEN TO A TIP ELEVATION AS INDICATED ON DRAWINGS 7A AND 7B. THE CONTRACTOR SHALL CUT AZ-48 STEEL SHEET PILES (AS NECESSARY) TO COMPLETE INSTALLATION. CONTRACTOR MAY SUBMIT AN ALTERNATE BID FOR USE OF ALTERNATE SHEET PILES FOR POTENTIAL COST SAVINGS TO NYSEG.
8. FOR CONCRETE PIPE REMOVAL AREA THE MINIMUM TIP ELEVATION IS 828.0' WHERE EXCAVATION DEPTHS ARE LESS THAN 14 FT., FOR EXCAVATION DEPTHS BETWEEN 14 AND 16 FT., THE MIN. TIP ELEVATION IS 824.0 FT., ANY EXCAVATION GREATER THAN 16 FT. REQUIRES ENGINEER APPROVAL.
9. EXCAVATION ACTIVITIES SHALL BE COMPLETED IN ACCORDANCE WITH ALL APPLICABLE OSHA REQUIREMENTS.
10. PRE-DRILLING FOR REMEDIATION AREAS 1 AND 2 AND CONCRETE PIPE REMOVAL AREA SHALL BE PERFORMED TO THE SHEET PILE TIP ELEVATION AT EVERY INTERLOCK TO FACILITATE SHEET PILE INSTALLATION THROUGH TILL.
11. LOCATION AND CONFIGURATION OF CONCRETE PIPE REMOVAL AREA IS APPROXIMATE. THE REMEDIATION CONTRACTOR SHALL COMPLETE A TEST PIT TO LOCATE AND ACCESS THE PIPE AND CONDUCT VIDEO INSPECTION/TRACING ACTIVITIES TO VERIFY CONCRETE PIPE CONFIGURATION AND EASTERN EXTENT.
12. EXCAVATION OF CONCRETE PIPE REMOVAL AREA MAY NOT EXTEND INTO EXCAVATION EXCLUSION ZONE.

SHEET PILE INSTALLATION SCHEDULE		
LOCATION	SHEET PILE SIZE	MINIMUM ELEVATION AT TIP OF SHEET PILE (FEET)
AREA 1	AZ-48	817.0
AREA 2	AZ-48	825.0
CONCRETE PIPE	AZ-48	828.0/824.0

* SEE NOTES 7 AND 8

TYPICAL CONSTRUCTION SEQUENCE:

1. INSTALL VIBRATION MONITORING LOCATIONS.
2. SAW-CUT AND REMOVE ASPHALT AND CONCRETE.
3. APPLY DENEEF SWELLSEAL WA* TO THE FEMALE INTERLOCK OF ALL SHEETPILES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
4. PRE-DRILL SHEET PILE ALIGNMENT TO THE DEPTH AND LIMITS INDICATED ON THE DESIGN DRAWINGS AND SPECIFICATIONS AND CLEAR OBSTRUCTIONS, IF ENCOUNTERED.
5. INSTALL TEMPORARY SHEET PILING TO THE DEPTHS AND EXTENTS INDICATED ON THE CONTRACT DRAWINGS AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
6. ADVANCE EXCAVATION TO THE TARGET REMOVAL DEPTHS. IN AREA 1, THIS DEPTH IS EL. 837.0'. IN AREA 2, THIS DEPTH IS EL. 842.0'. IN THE CONCRETE PIPE REMOVAL AREA, THIS DEPTH IS ELEVATION 842.0'.
7. BACKFILL EXCAVATION AREAS TO EXISTING GRADE.
8. REMOVE AND DECONTAMINATE SHEET PILES.

CITY: SYRACUSE DIV/GROUP: ENVCAD DB: S. KOWALCZYK LD: PIC: K. WHITE PM: B. AHRENS TM: B. AHRENS LYR: ON=*;OFF=*REF*
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40' 0 40' 80'
1"=40'

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Professional Engineer's No.: 082251

State	Date Signed	Project Mgr.
NY	9/16/2011	BWA
Designed by: APC	Drawn by: SJK	Checked by: BWA

STATE OF NEW YORK · MARGARET A. CARRILLO-SHERIDAN · LICENSED PROFESSIONAL ENGINEER · No. 082251

ARCADIS

ARCADIS OF NEW YORK, INC.

NYSEG • ELMIRA, NEW YORK
MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN

EXCAVATION SUPPORT PLAN

ARCADIS Project No.
B0013807.0001.00002

Date
SEPTEMBER 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel: 315.446.9120

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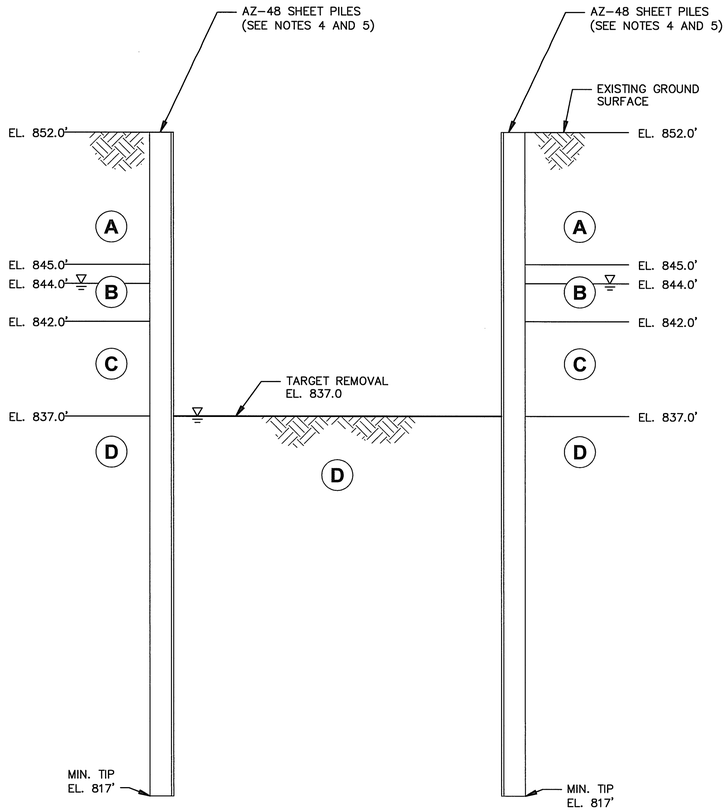
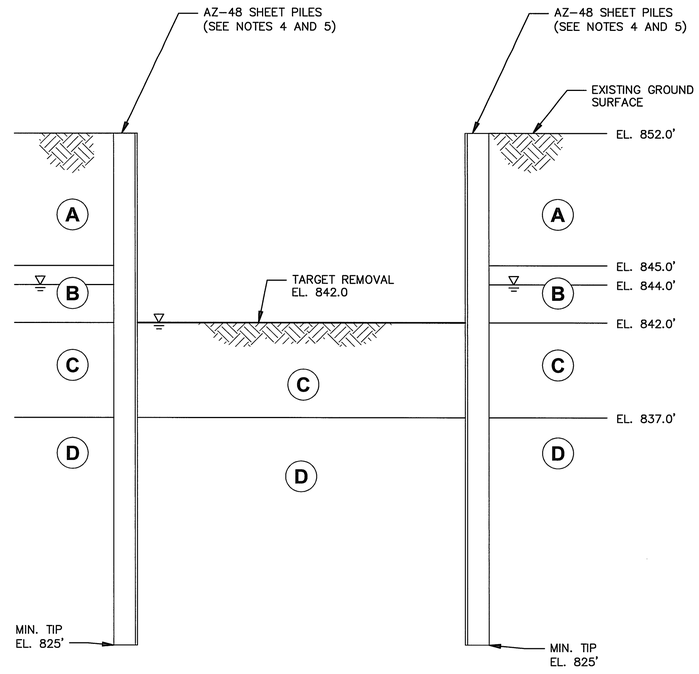


1 REMEDIATION AREA 1 TYPICAL CROSS SECTION

0 4' 8'

SCALE: 1/4"=1'-0"



2 REMEDIATION AREA 2 TYPICAL CROSS SECTION

0 4' 8'

SCALE: 1/4"=1'-0"

SOIL PROPERTIES		
LAYER	SOIL DESIGNATION	DENSITY/CONSISTENCY
A	FILL	LOOSE TO VERY DENSE
B	SILT & CLAY	MEDIUM STIFF TO HARD
C	SAND & FINE GRAVEL.	LOOSE TO DENSE
D	TILL	DENSE TO VERY DENSE

NOTES:

1. GEOTECHNICAL AND WATER TABLE INFORMATION SHOWN IS BASED ON DATA OBTAINED FROM THE SITE; ACTUAL SUBSURFACE CONDITIONS ENCOUNTERED MAY BE DIFFERENT THAN THOSE SHOWN.
2. REFER TO THE SUPPLEMENTAL INFORMATION PACKAGE FOR ADDITIONAL INFORMATION REGARDING SUBSURFACE CONDITIONS AND SUBSURFACE LOGS.
3. GROUNDWATER ELEVATION SHOWN AS MEASURED IN MONITORING WELL MW-3 ON 7/22/2009.
4. 54-FOOT LONG AZ-48 STEEL SHEET PILE SUPPLIED BY NYSEG AND CUT AS NECESSARY BY THE REMEDIATION CONTRACTOR TO FACILITATE INSTALLATION.
5. TOP OF AZ-48 SHEET PILE TO BE, AT A MINIMUM, AT LEAST TO THE EXISTING GROUND SURFACE.

CITY: SYRACUSE DIV/GROUP: ENVCAD DB: S. KOWALCZYK K.SARTORO PIC: K. WHITE PM: B. AHRENS TM: B. AHRENS LYR: ON='OFF='REF'
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Professional Engineer's No.: 082251		
State: NY	Date Signed: 9/16/2011	Project Mgr.: BWA
Designed by: APC	Drawn by: SJK	Checked by: BWA

STATE OF NEW YORK MARGARET CARRILLO SHERIDAN No. 082251 LICENSED PROFESSIONAL ENGINEER

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MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN

EXCAVATION SUPPORT SECTIONS

ARCADIS Project No.
B0013807.0001.00002

Date
SEPTEMBER 2011

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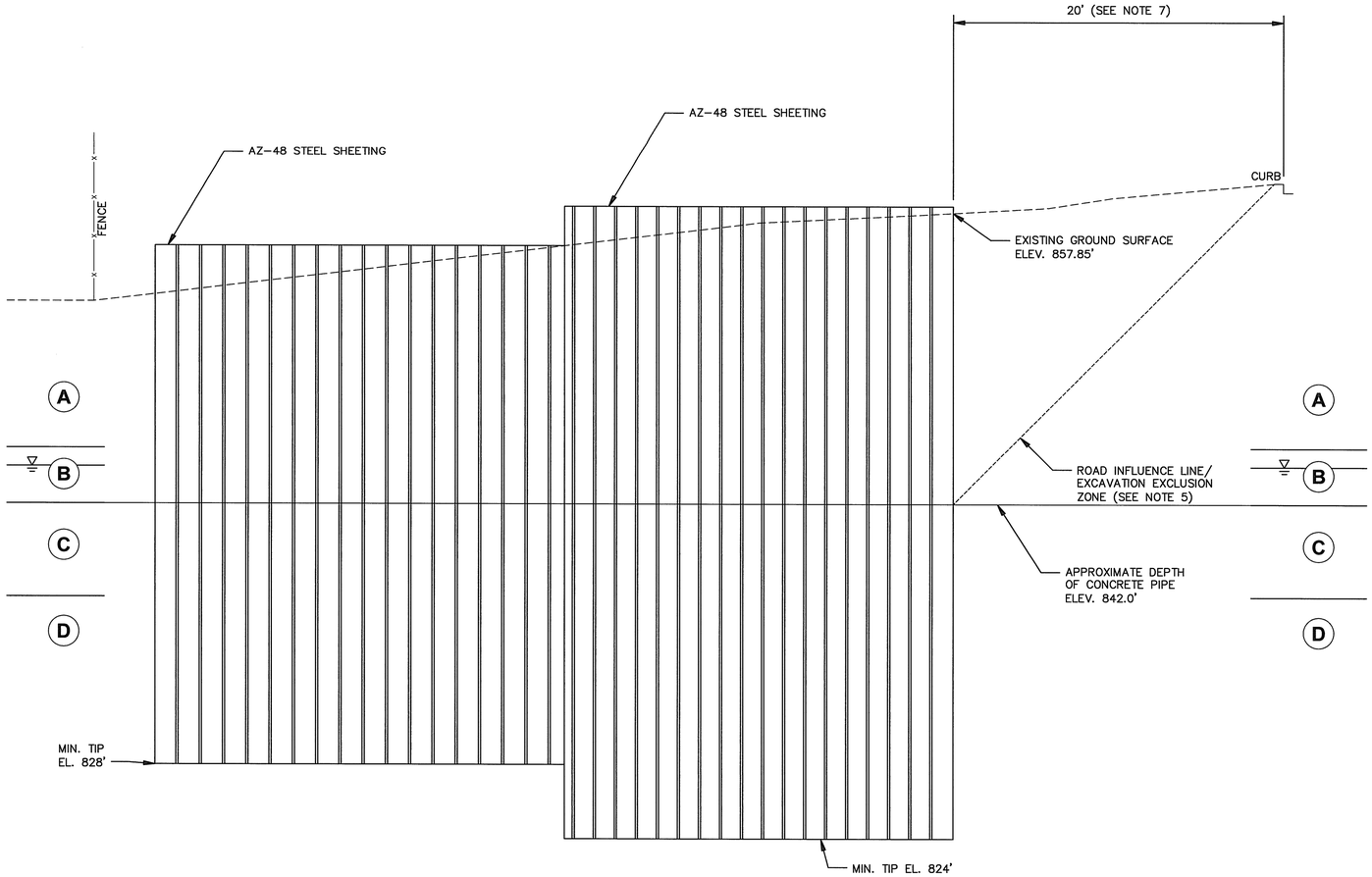

3 CONCRETE PIPE REMOVAL AREA TYPICAL CROSS SECTION

0 4' 8'

SCALE: 1/4"=1'-0"

SOIL PROPERTIES		
LAYER	SOIL DESIGNATION	DENSITY/CONSISTENCY
A	FILL	LOOSE TO VERY DENSE
B	SILT & CLAY	MEDIUM STIFF TO HARD
C	SAND & FINE GRAVEL.	LOOSE TO DENSE
D	TILL	DENSE TO VERY DENSE

NOTES:

1. GEOTECHNICAL AND WATER TABLE INFORMATION SHOWN IS BASED ON DATA OBTAINED FROM THE SITE; ACTUAL SUBSURFACE CONDITIONS ENCOUNTERED MAY BE DIFFERENT THAN THOSE SHOWN.
2. REFER TO THE SUPPLEMENTAL INFORMATION PACKAGE FOR ADDITIONAL INFORMATION REGARDING SUBSURFACE CONDITIONS AND SUBSURFACE LOGS.
3. GROUNDWATER ELEVATION SHOWN AS MEASURED IN MONITORING WELL MW-3 ON 7/22/2009.
4. 54-FOOT LONG AZ-48 STEEL SHEET PILE SUPPLIED BY NYSEG AND CUT AS NECESSARY BY THE REMEDIATION CONTRACTOR TO FACILITATE INSTALLATION.
5. EXCAVATION OF CONCRETE PIPE MAY NOT EXTEND INTO EXCAVATION EXCLUSION ZONE (AS DEPICTED BY 1H:1V LINE ON SECTION).
6. EXCAVATIONS NOT SUPPORTED BY STEEL PILING (I.E.TRENCH WALLS PERPENDICULAR TO CONCRETE PIPE) WILL BE SLOPED/BENCHED/SHORED IN ACCORDANCE WITH OSHA REQUIREMENTS.
7. DISTANCE MAY VARY BASED ON ACTUAL DEPTH OF CONCRETE PIPE.

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Designed by	Drawn by	Checked by
APC	SJK	BWA

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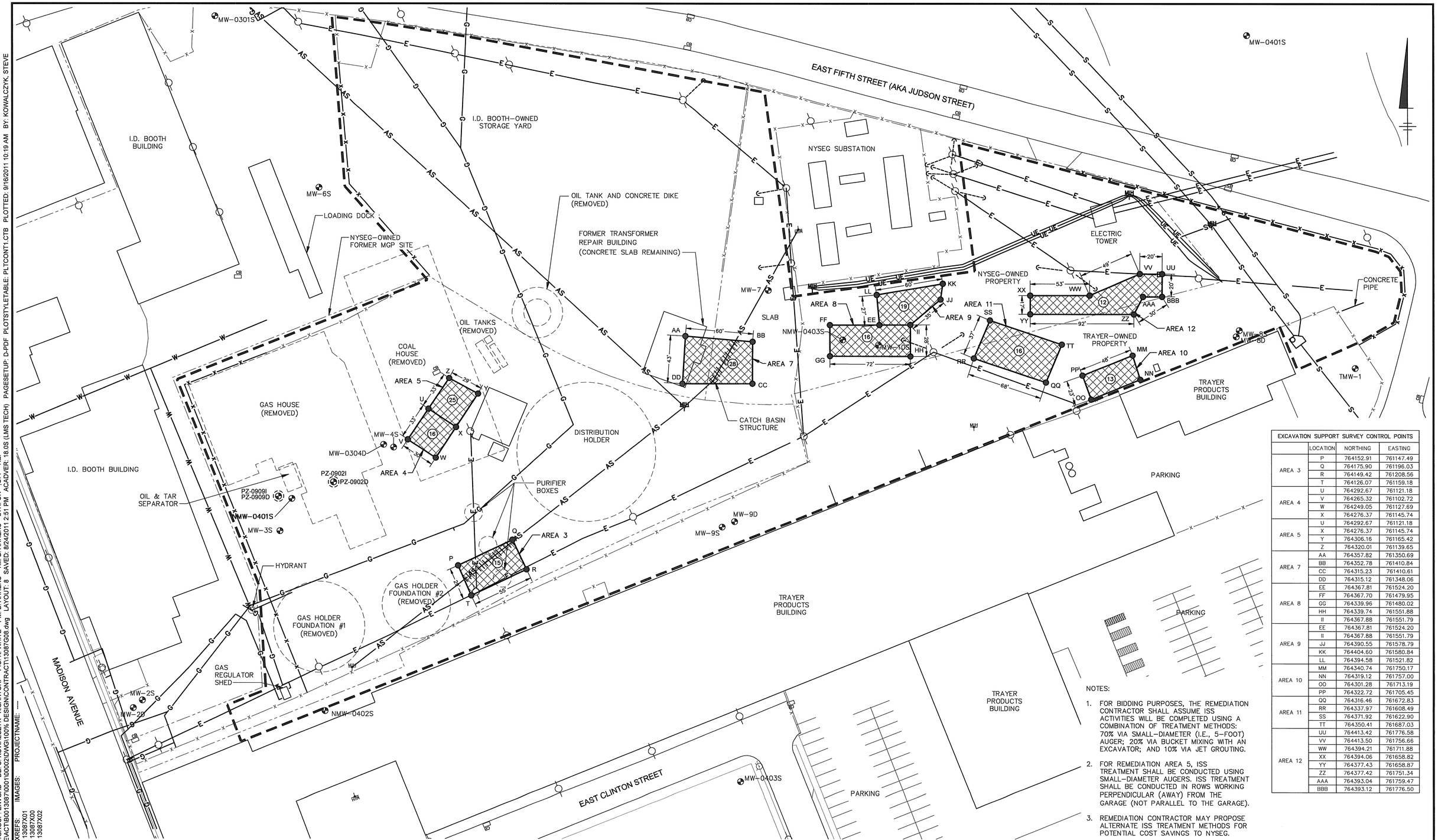

EXCAVATION SUPPORT SURVEY CONTROL POINTS			
	LOCATION	NORTHING	EASTING
AREA 3	P	764152.91	761147.49
	Q	764175.90	761196.03
	R	764149.42	761208.56
	T	764126.07	761159.18
AREA 4	U	764292.67	761121.18
	V	764265.32	761102.72
	W	764249.05	761127.69
	X	764276.37	761145.74
AREA 5	U	764292.67	761121.18
	X	764276.37	761145.74
	Y	764306.16	761165.42
	Z	764320.01	761139.65
AREA 7	AA	764357.82	761350.69
	BB	764352.78	761410.84
	CC	764315.23	761410.61
	DD	764315.12	761348.06
AREA 8	EE	764367.81	761524.20
	FF	764367.70	761479.95
	GG	764339.96	761480.02
	HH	764339.74	761551.88
	II	764367.88	761551.79
AREA 9	EE	764367.81	761524.20
	II	764367.88	761551.79
	JJ	764390.55	761578.79
	KK	764404.60	761580.84
	LL	764394.58	761521.82
AREA 10	MM	764340.74	761750.17
	NN	764319.12	761757.00
	OO	764301.28	761713.19
	PP	764322.72	761705.45
AREA 11	QQ	764316.46	761672.83
	RR	764337.97	761608.49
	SS	764371.92	761622.90
	TT	764350.41	761687.03
AREA 12	UU	764413.42	761776.58
	VV	764413.50	761756.66
	WW	764394.21	761711.88
	XX	764394.06	761658.82
	YY	764377.43	761658.87
	ZZ	764377.42	761751.34
	AAA	764393.04	761759.47
	BBB	764393.12	761776.50

NOTES:

1. FOR BIDDING PURPOSES, THE REMEDIATION CONTRACTOR SHALL ASSUME ISS ACTIVITIES WILL BE COMPLETED USING A COMBINATION OF TREATMENT METHODS: 70% VIA SMALL-DIAMETER (I.E., 5-FOOT) AUGER; 20% VIA BUCKET MIXING WITH AN EXCAVATOR; AND 10% VIA JET GROUTING.
2. FOR REMEDIATION AREA 5, ISS TREATMENT SHALL BE CONDUCTED USING SMALL-DIAMETER AUGERS. ISS TREATMENT SHALL BE CONDUCTED IN ROWS WORKING PERPENDICULAR (AWAY) FROM THE GARAGE (NOT PARALLEL TO THE GARAGE).
3. REMEDIATION CONTRACTOR MAY PROPOSE ALTERNATE ISS TREATMENT METHODS FOR POTENTIAL COST SAVINGS TO NYSEG.

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1"=40' (40' 0 40' 80')

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Designed by: JRG | Drawn by: SJK | Checked by: BWA

STATE OF NEW YORK MARGARET A. CARRILLO-SHERIDAN No. 082251 PROFESSIONAL ENGINEER

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ARCADIS OF NEW YORK, INC.

NYSEG • ELMIRA, NEW YORK
MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN

IN-SITU SOLIDIFICATION/ STABILIZATION PLAN

ARCADIS Project No.
B0013807.0001.00002

Date
SEPTEMBER 2011

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8

MW-0301S
MW-0401S
EAST FIFTH STREET (AKA JUDSON STREET)
I.D. BOOTH BUILDING
I.D. BOOTH-OWNED STORAGE YARD
REMEDIATION CONTRACTOR SHALL REMOVE TEMPORARY SITE SECURITY FENCING FOLLOWING THE COMPLETION OF REMEDIAL ACTIVITIES
MW-6S
LOADING DOCK
REMEDIATION CONTRACTOR SHALL REPLACE EXISTING SITE FENCING IN KIND
NYSEG SUBSTATION
REMEDIATION CONTRACTOR SHALL REMOVE TEMPORARY SITE SECURITY FENCING FOLLOWING THE COMPLETION OF REMEDIAL ACTIVITIES
ELECTRIC TOWER
FORMER TRANSFORMER REPAIR BUILDING (CONCRETE SLAB REMAINING)
SLAB
MW-7
NYSEG-OWNED PROPERTY
CONCRETE PIPE REMOVAL AREA
AREA 6
AREA 9
AREA 12
AREA 8
AREA 7
AREA 11
2/12 VEGETATIVE SURFACE RESTORATION (TYP.)
MW-8S
MW-8D
REMEDIATION CONTRACTOR SHALL REMOVE TEMPORARY SITE SECURITY FENCING FOLLOWING THE COMPLETION OF REMEDIAL ACTIVITIES
AREA 10
TRAYER PRODUCTS BUILDING
TMW-1
NYSEG-OWNED FORMER MGP SITE
AREA 5
AREA 4
TRAYER-OWNED PROPERTY
MW-0304D
MW-4S
NAPL COLLECTION WELL
I.D. BOOTH BUILDING
PARKING
AREA 1
AREA 2
MW-9D
MW-9S
MW-3S
1/12 GRAVEL SURFACE RESTORATION (TYP.)
AREA 3
REMEDIATION CONTRACTOR SHALL REMOVE TEMPORARY SITE SECURITY FENCING FOLLOWING THE COMPLETION OF REMEDIAL ACTIVITIES
HYDRANT
TRAYER PRODUCTS BUILDING
PARKING
GAS REGULATOR SHED
MADISON AVENUE
MW-2S
MW-2D
NMW-0402S
2/10 APPLICATION WELL (TYP.)
1/10 NAPL COLLECTION WELL (TYP.)
3/10 PERFORMANCE MONITORING WELL (TYP.)
TRAYER PRODUCTS BUILDING
EAST CLINTON STREET
MW-0403S
PARKING

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

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JRG	SJK	BWA

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MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN

SITE RESTORATION PLAN

ARCADIS Project No.
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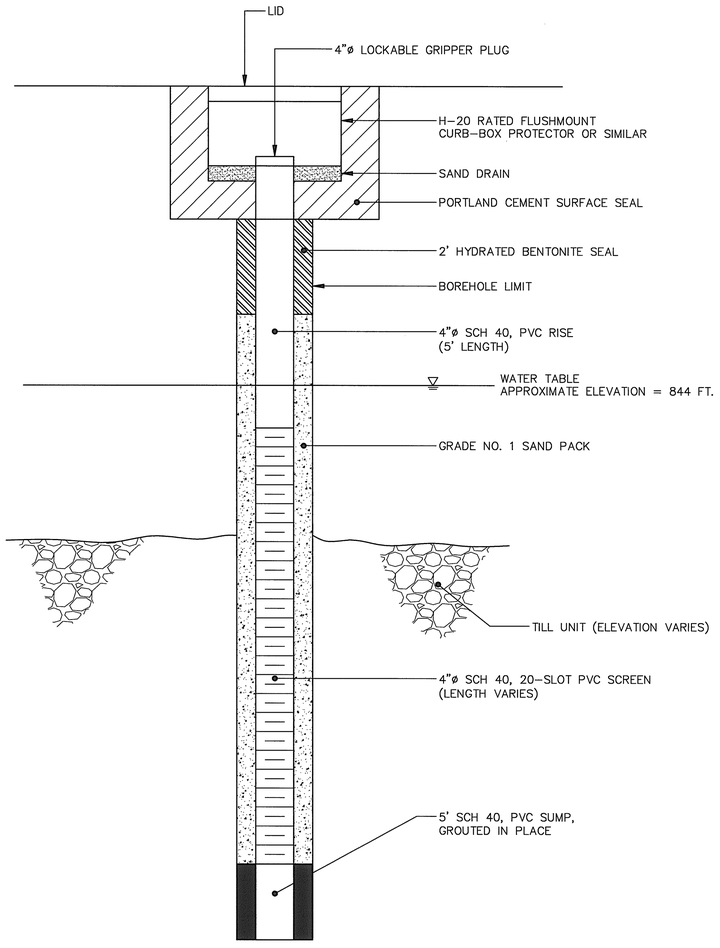

NOTE:

1. NAPL COLLECTION WELL SCREEN LENGTH AND PLACEMENT TO BE DETERMINED IN THE FIELD BASED ON OBSERVED LOCATIONS OF NAPL.

NAPL COLLECTION WELL 1

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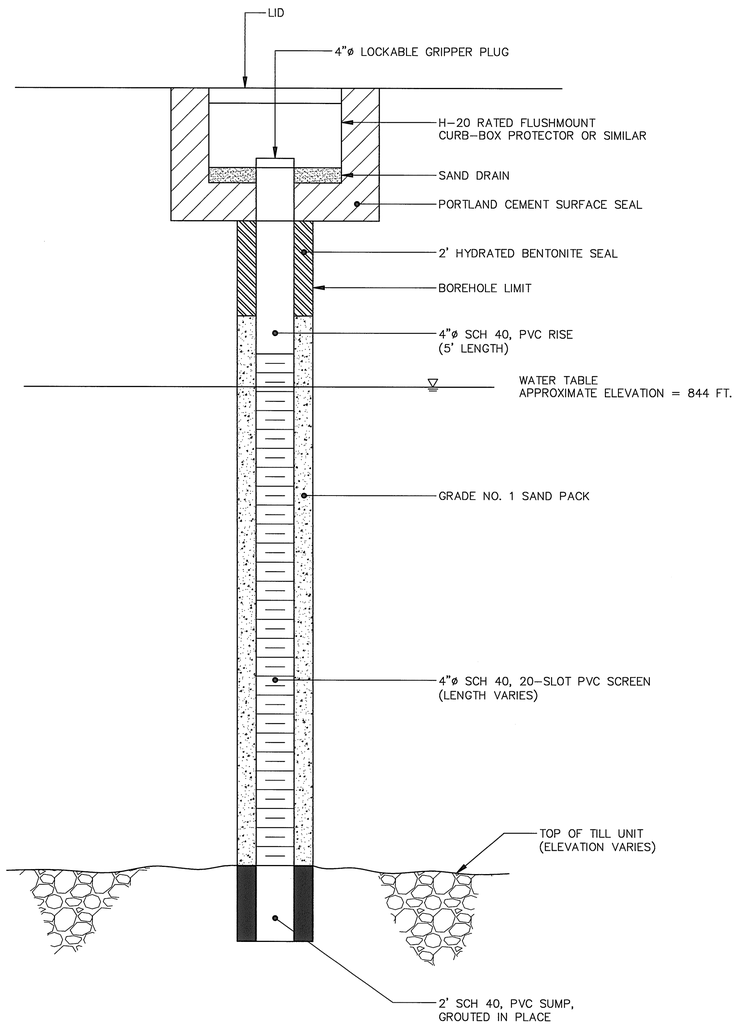

APPLICATION WELL 2

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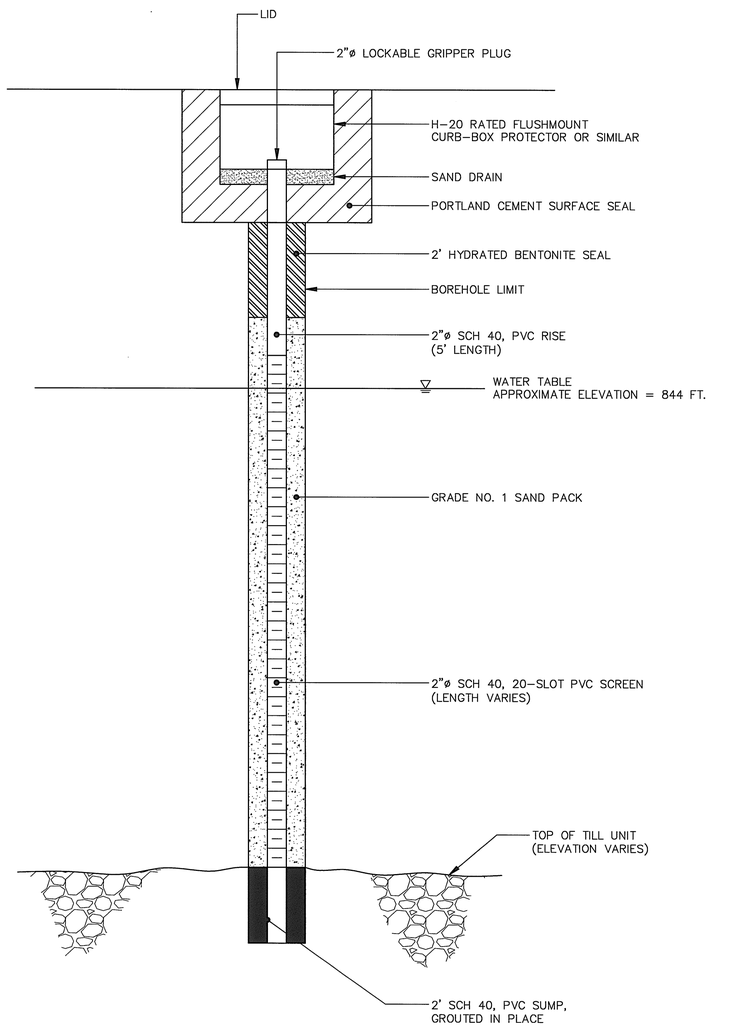

PERFORMANCE MONITORING WELL 3

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MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN

WELL DETAILS

ARCADIS Project No.: B0013807.0001.00002

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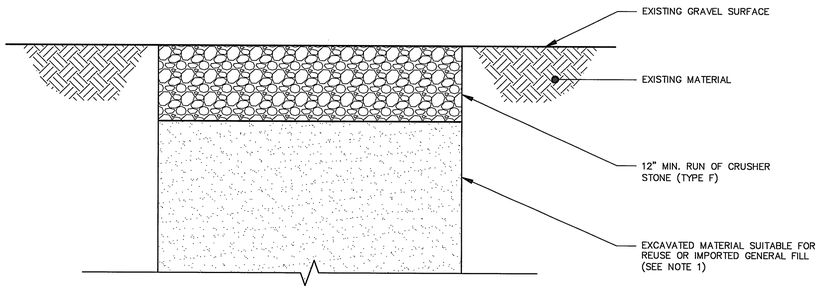

GRAVEL SURFACE RESTORATION 1

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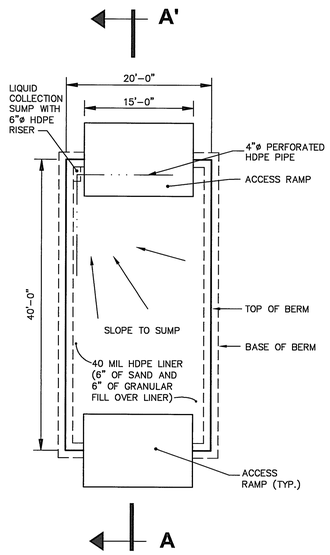

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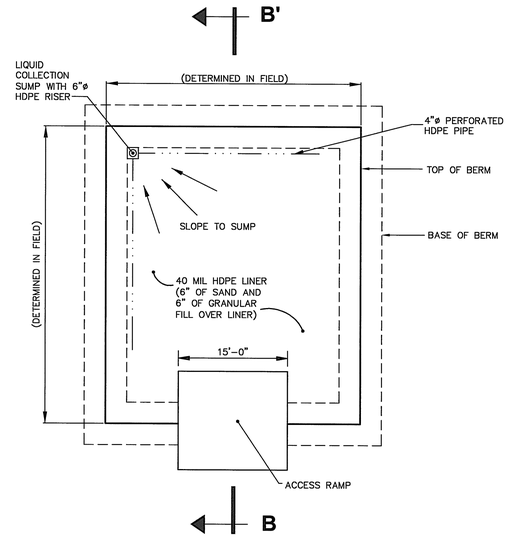

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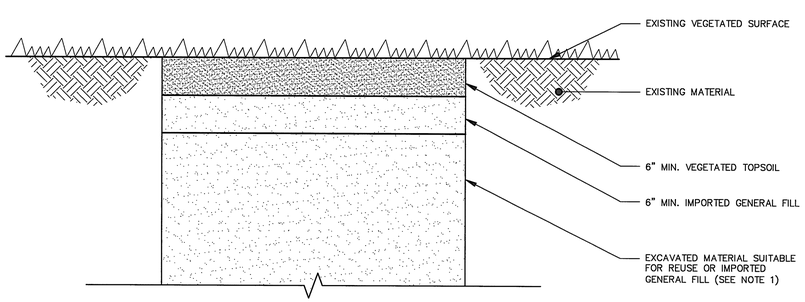
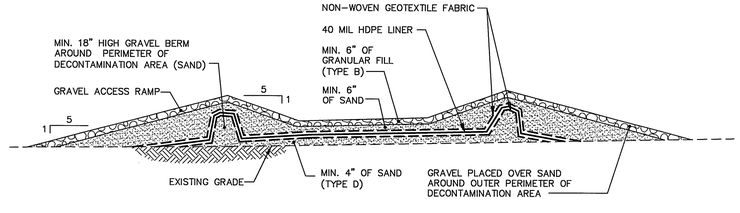


NOTES:

1. STABILIZED SOIL SHALL NOT BE PERMITTED WITHIN 48 INCHES OF THE GROUND SURFACE. IF ISS ACTIVITIES RESULT IN MATERIAL BULKING TO WITHIN 48 INCHES OF THE GROUND SURFACE, THE REMEDIATION CONTRACTOR SHALL REMOVE, TRANSPORT OFF-SITE, AND DISPOSE OF BULKED MATERIAL AT NO ADDITIONAL COST TO NYSEG.

VEGETATIVE SURFACE RESTORATION 2

NOT TO SCALE



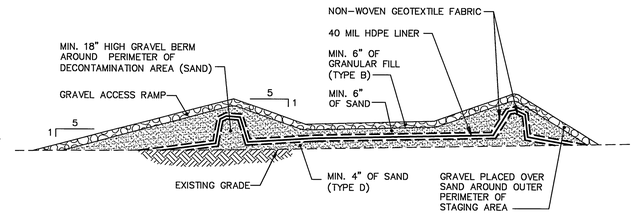
SECTION A-A'

NOTES:

1. DECONTAMINATION AREA SHALL HAVE A GENERAL SLOPE TOWARD A COLLECTION SUMP TO FACILITATE THE COLLECTION OF WASH FLUIDS. FLUIDS SHALL BE PUMPED FROM COLLECTION SUMP INTO 55 GALLON DRUMS OR A TEMPORARY STORAGE TANK (IF NECESSARY).
2. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, THE DECONTAMINATION AREA, INCLUDING HDPE LINER, IS TO BE REMOVED BY THE REMEDIATION CONTRACTOR FOR DISPOSAL.

DECONTAMINATION AREA 3

NOT TO SCALE



SECTION B-B'

NOTES:

1. MATERIAL WITHIN MATERIAL STAGING AREAS SHALL BE COVERED WITH 10 MIL PLASTIC SHEETING AT ALL TIMES EXCEPT WHILE MATERIAL IS BEING ACTIVELY MANAGED.
2. REFER TO PROJECT SPECIFICATIONS FOR MATERIAL REQUIREMENTS.

EXCAVATED MATERIAL STAGING AREA 4

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NYSEG • ELMIRA, NEW YORK
MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN

MISCELLANEOUS DETAILS

ARCADIS Project No.: B0013807.0001.00002
Date: SEPTEMBER 2011
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6723 Towpath Road
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Appendix B

Technical Specifications

List of Technical Specifications
Remedial Action Design

NYSEG – Madison Avenue Former Manufactured Gas Plant Site – Elmira, New York

MATERIALS AND PERFORMANCE – SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 INTRODUCTION

The Madison Avenue Former Manufactured Gas Plant (MGP) Site (the site) is located in the City of Elmira (city), Chemung County, New York. The site occupies most of a city block, bounded by East Clinton Street, Madison Avenue, and East Fifth Street (also known as Judson Street). The site is approximately 1,500 feet west of Newtown Creek; a tributary to the Chemung River located approximately 3,000 feet south of the site. The site is largely flat-lying, with a small topographic rise in the eastern corner, near the intersection of East Fifth and Oak Streets. NYSEG currently owns the former MGP property, with the exception of a storage yard located on the northern portion of the site adjacent to East Fifth Street. NYSEG currently maintains an electrical substation on the property east of the storage yard. Land use in the surrounding area is mixed, with industrial and commercial operations immediately south and west, a public park to the northeast and residential properties within 1,000 feet of the site in all directions. The parcel immediately south of the site is owned by Trayer Products, Inc. (Trayer), a metal-parts manufacturer. The parcel immediately north and west of the site is owned by to I.D. Booth, Inc. (I.D. Booth).

The remedial construction (the Project) will be performed by NYSEG's (the Owner) Remediation Contractor and observed by NYSEG's construction oversight consultant (the Remediation Engineer), and the Remedial Action Design has been prepared by ARCADIS (the Design Engineer). A summary of the Project and the Remediation Contractor's overall responsibilities is provided herein. References to other components of the Remedial Action Design are also provided in this specification along with certain implementation details.

1.02 PROJECT OBJECTIVES

NYSEG entered into an Order on Consent (Order) with the New York State Department of Environmental Conservation (NYSDEC) in March 1994 to investigate and, where necessary, remediate 33 former MGP sites in New York State. The Madison Avenue Former MGP site (Site No. 8-08-018) is included on this list of 33 sites. Section VI of the Order on Consent indicates that NYSEG shall submit a Remedial Action Design to facilitate implementation of the NYSDEC-selected remedial alternative for the site. Several submittals to be prepared by the Remediation Contractor will address the remaining components not otherwise presented in the Remedial Action Design (select Remediation Contractor submittals will be provided to the NYSDEC).

1.03 SCOPE OF WORK

A. The Remediation Contractor shall perform all activities and furnish all labor, materials, equipment, subcontractor services, and incidentals necessary to implement the Project in accordance with the Contract between the Owner and the Remediation Contractor. In general, the Project involves: 1) excavation of approximately 2,000 in-situ cubic yards

MATERIALS AND PERFORMANCE – SECTION 01010

SUMMARY OF WORK

(cy) of MGP-source material from three remediation areas; 2) in-situ treatment of site soil containing MGP-related impacts at depths ranging from 12 to 28 feet below grade in nine remediation areas; 3) off-site treatment/disposal of the excavated materials; 4) off-site treatment/disposal of all water generated during the Project; 5) backfilling the excavation areas; 6) removal of a concrete pipe on the eastern portion of the site ; 7) completing additional test pits to assess the presence/absence of additional MGP-related impacts in site soil; and 8) performance of various restoration activities.

The work shall also include all activities required of the Remediation Contractor to plan, organize, monitor, and coordinate the logical and timely sequence of activities, in accordance with all applicable regulatory requirements. This includes (but is not limited to) activities such as preparation of technical and operational submittals, construction-related permits, attendance at project meetings, incidental expenses, and administrative activities.

B. The Project scope includes, but is not limited to, the following:

1. General/Mobilization

General activities include mobilizing and setting up two field office trailers (one for Remediation Contractor and one for Remediation Engineer and NYSDEC), staff, and construction facilities; mobilizing and demobilizing all equipment, materials, and labor; performing monitoring and protection; implementing health and safety practices; and performing site security during the Project.

In addition, general activities include technical/Project submittals, ancillary support services and activities throughout the performance of site activities, as well as post-construction activities (e.g., as-built survey documentation).

2. Site Preparation

Site preparation generally includes: obtaining all necessary construction-related permits; providing erosion and environmental controls; clearing and grubbing (as necessary); providing traffic controls (as necessary); setting up work zones (including support and decontamination areas); removing existing structures within/adjacent to the remediation areas that are encountered (e.g., former building foundations, fences, and other features as necessary and as indicated in the Remedial Action Design); fence installation/relocation activities; protection/deactivation of active utilities (as necessary); and protecting existing monitoring wells and other site features within the Project Work Limits as indicated in the Remedial Action Design.

MATERIALS AND PERFORMANCE – SECTION 01010

SUMMARY OF WORK

3. Excavation/Material Dewatering

Groundwater and surface water is anticipated to be encountered during the performance of excavation activities. Accordingly, the Contactor shall be responsible for excavation/material dewatering in accordance with Specification Section 02415 – Impacted Material Handling and Excavation Procedures. In addition, all water removed during dewatering activities shall be collected, containerized and transported off site for treatment/disposal in accordance with the above-referenced Section and all applicable regulatory requirements.

4. Earthwork and Material Disposition

Earthwork involves excavation and backfilling to the limits shown on the Design Drawings and off-site treatment/disposal of excavated materials. The Remediation Contractor shall install and maintain the excavation support system as specified Specification Section 02205 – Excavation Support and the Design Drawings included as part of this Remedial Action Design.

5. In-Situ Treatment

In-situ treatment involves treating soil in-place using in-situ soil stabilization technologies including, but not limited to, small-diameter auguring, bucket mixing, and/or jet-grouting. In-situ treatment shall be conducted in accordance with Specification Section 02420 – In-Situ Stabilization/ Solidification and Section 03002 – Jet Grouting.

6. Concrete Pipe Removal

Concrete pipe removal will involve excavating and removing a concrete pipe containing black sludge with a coal-tar like odor that was encountered in the southeastern portion of the site. The Remediation Contractor shall dispose of the removed material in accordance with Specification Section 02415 – Impacted Material Handling and Excavation Procedures.

7. Site Restoration/Demobilization

Site restoration generally includes installing and repairing fences; grading and surface restoration within the excavation area; repairing and replacing any damaged or temporarily relocated site features; restoration of disturbed areas to pre-remediation conditions; planting/revegetation activities; and removing temporary construction facilities and erosion and sediment control measures (e.g., decontamination pads, site trailers, silt fencing, straw bales), in accordance with the Remedial Action Design.

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SUMMARY OF WORK

C. The technical work and Remediation Contractor requirements are described in several components that collectively represent the Remedial Action Design. These components include the following:

1. Remedial Action Design Report text.

2. Design Drawings.

3. Technical Specifications.

4. Traffic Control Plan.

5. Construction Quality Assurance Plan.

6. Community Air Monitoring Plan.

7. Noise Monitoring Plan.

The above components should be thoroughly reviewed by the Remediation Contractor. Nothing presented in one of the above documents should relieve the Remediation Contractor's obligations to satisfy the components specified in the other documents. In addition, in the event that there are discrepancies in the information contained in the above-listed documents, the Remediation Contractor shall identify such discrepancies in writing for the Owner's and Design and Remediation Engineers' review.

As part of the Remediation Contractor selection process, and to provide an opportunity for the Remediation Contractor to familiarize himself with the Project scope, site conditions, physical setting, a mandatory pre-bid meeting and site visit will be conducted. In addition, the Remediation Contractor will be provided with various information related to environmental and geotechnical investigations and investigation results. Such information will be provided as supplemental information to prospective Remediation Contractors during the procurement process and is not part of the Remedial Action Design. This information is available to assist the Remediation Contractor in understanding site conditions and preparing certain of the required technical and operational submittals.

1.04 WORK SEQUENCE/WORK HOURS

A. The Remediation Contractor must prepare and submit a proposed Schedule and Sequencing Plan. Requirements for the Schedule and Sequencing Plan are presented in Section 3 of this Specification.

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B. The Owner anticipates that work activities can be conducted between the hours of 7:00 a.m. and 6:00 p.m. on non-holiday Monday through Friday, except in cases of emergency or unless prior approval has been obtained from the Owner.

C. Project implementation shall be in accordance with the approved construction schedule submitted by the Remediation Contractor.

1.05 REMEDIATION CONTRACTOR'S USE OF PREMISES

A. Remediation Contractor shall limit its activities to the Project Work Limits shown on the Design Drawings. All conflicts over use of the premises shall be resolved without additional cost to the Owner. Costs related to the Remediation Contractor's use of the property (e.g., telephone, electric) shall be borne by the Remediation Contractor.

B. Remediation Contractor shall assume full responsibility for the security of all of its and its subcontractors' materials and equipment stored within the Project Work Limits.

C. At all times, Remediation Contractor shall maintain the Project in a neat, orderly, and safe manner. In addition, safe and clean access shall be available to areas of the Owner's property that are not specifically part of the Project Work Limits.

1.06 CARE AND PROTECTION OF WORK

The Remediation Contractor shall be responsible for the care and protection of materials, supplies, and equipment delivered at the site intended to be used for the Project (whether provided by the Remediation Contractor or the Owner); and all injury or damage to the same from whatever cause, shall be the responsibility of the Remediation Contractor. The Remediation Contractor shall provide suitable means of protection for and shall protect all materials intended to be used. The Remediation Contractor shall take all necessary precautions to prevent injury or damage by flood, fire, freezing, or from other inclemencies of the weather.

1.07 MONITORING OF WORK

A. Remediation Engineer

1. The Remediation Engineer will provide on-site and office-based assistance to the Owner for the duration of the Project. The Remediation Engineer will observe the progress and quality of the Project and determine, in general, if the Project is proceeding in substantial compliance with the Remedial Action Design. The Remediation Engineer may disapprove Project Components as failing to conform to the Remedial Design. Whenever the Remediation Engineer considers such disapproval necessary or advisable for the proper implementation of the intent of

the Remedial Action Design, the Remediation Engineer will bring this to the attention of the Owner.

2. Except where specifically established within the Remedial Action Design, the Remediation or Design Engineer will not have any duty or obligation with reference to and will not be responsible for the Remediation Contractor's construction means, methods, techniques, sequences, or procedures, or for the Remediation Contractor's safety precautions and programs in connection with the Project, and will not be responsible for the Remediation Contractor's failure to carry out the Project in substantial compliance with the Remedial Action Design. The Remediation Engineer's duties, services, and work shall in no way supersede or dilute the Remediation Contractor's obligation to implement the Project.

3. The Remediation Engineer will provide a sampling technician to conduct community air monitoring in accordance with the site-specific Community Air Monitoring Plan (CAMP).

B. Access to Work

1. All parties contracted to do work for the Owner at the site shall, for all purposes that may be required by their contracts, and representatives of State and Federal regulatory agencies shall, for any purpose, have access to the Project and the premises used by the Remediation Contractor, and the Remediation Contractor shall provide safe and proper facilities.

C. Owner

1. The Owner will be on site periodically to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Remedial Action Design. The Owner will not be required to make exhaustive or continuous work area inspections to check the quality or quantity of the Work. The Owner may disapprove Work as failing to conform to the Remedial Action Design. Whenever the Owner considers it necessary or advisable to ensure the proper carrying out of the intent of the Remedial Action Design, the Owner shall have authority to require the Remediation Contractor to make special examination or testing of the work (whether or not fabricated, installed or completed).

2. No matter how extensive or intensive the Owner inspection, the Owner will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and will not be responsible for the Remediation Contractor's failure to carry out

the Work in accordance with the Remedial Action Design. The Owner's duties, services, and work shall in no way supersede or dilute the Remediation Contractor's obligation to perform the Work in conformance with all Project requirements.

3. The Owner is empowered to determine the amount, quality, acceptability and fitness of all parts of the Work, but this authority shall not give rise to any duty or responsibility to the Remediation Contractor, the subcontractor, or any of their agents or employees to do so.

1.08 MATERIALS AND EQUIPMENT

A. Quality and Workmanship

1. All materials furnished or incorporated in the Project shall be of the best quality, and especially adapted for the service required. Whenever the characteristics of any material are not particularly specified, such material shall be utilized as is customary in first class work of a nature for which the material is employed.

2. All materials and workmanship shall be subject to inspection, examination, and tests by the Remediation Engineer and other representatives of the Owner at any and all times during manufacture or construction and at any and all places where such manufacture or construction are carried on.

3. The Remediation Contractor's selection and use of organizations for the inspection and tests of supplies, materials, and equipment shall be subject to the approval of the Owner and Remediation Engineer. Satisfactory documentary evidence that the material has passed the required inspection and tests shall be furnished by the Remediation Contractor prior to the incorporation of the material in the Project.

B. Equivalent Products and Changes to Remedial Action Design

1. The words "similar and equal to," "or equal," "equivalent," and such other words of similar content and meaning (hereinafter, "or equal") shall, for the purposes of this work, be deemed to mean similar and equivalent to one of the named products or Remedial Action Design elements.

2. Whenever any product/design element is specified in the Remedial Action Design by a reference to the name, trade name, make or catalog number of any manufacturer or supplier, the intent shall not be to limit competition, but to establish a standard of quality which the Design Engineer has determined is necessary for the Project. If any product/design element other than that specified

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is proposed for use by the Remediation Contractor, it shall submit to the Remediation Engineer either its certification that the "or equal" strictly conforms to the Remedial Action Design, or a statement specifically identifying all differences between the "or equal" and the Remedial Action Design.

3. Any variation of a proposed "or equal" from the Remedial Action Design which is not specifically noted in the Remediation Contractor's submittal shall be at the sole risk and expense of the Remediation Contractor. In addition, the Remediation Contractor shall provide all the information that the Remediation Engineer requests concerning the product/design element. The proposed product shall not be used until it is accepted by the Remediation Engineer. Any "or equal" product incorporated into the Project without the Remediation Engineer's written acceptance shall be at the Remediation Contractor's sole risk, and the Remediation Engineer may require the removal and replacement of any unaccepted "or equal" product.

4. In all cases, the Remediation Engineer will determine whether a proposed "or equal" is acceptable, and the Remediation Contractor shall have the burden of proving, at its expense, to the satisfaction of the Remediation Engineer that the proposed "or equal" is similar and equal to the named product/design element. In making such determination the Remediation Engineer may establish such criteria as it deems proper for acceptance of the "or equal."

5. Any requested change in the Remedial Action Design not pertaining to an "or equal" must be submitted to the Remediation Engineer in writing and must be stated with sufficient clarity and detail to permit proper consideration by the Remediation Engineer. Unless accepted by the Remediation Engineer after submission as herein provided, any deviation from the Remedial Action Design, or the use of any product/design element which varies from the Remedial Action Design, shall be at the Remediation Contractor's sole risk and expense.

6. The Remediation Contractor's use of "or equal" products or design elements is at his/her own risk. In preparing a cost proposal, the Remediation Contractor may elect to include products/design elements that differ from those included in the Remedial Action Design. Such "or equals" shall be clearly identified in the Remediation Contractor's submittals. In the event that the Remediation Engineer subsequently determines that the "or equal" is not suitable, the Remediation Contractor shall utilize products/design elements established in the Remedial Action Design without any adjustment to the Contract price.

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SUMMARY OF WORK

C. Suppliers

1. All supplies and equipment shall be furnished by manufacturers who shall have at least three years of experience in the design, production, assembly, and field service of equipment of like type, size, and capacity. Where required by the Remediation Engineer, the Remediation Contractor shall supply a list of at least three successful installations.

PART 2 - PROJECT PLANNING

Notwithstanding the required submittals related to several technical aspects of the Project, the Remediation Contractor shall prepare Project-specific documents related to the overall implementation of the Project: Work Schedule and HASP. The information to be addressed in these submittals is provided below. In addition, the technical submittals required as part of the Remedial Action Design are included as an attachment to this Section.

Once approved by the Owner and Remediation Engineer, certain submittals will be provided to the NYSDEC. These submittals are anticipated to include, but not be limited to: Schedule and Sequencing Plan; HASP; proposed backfill source(s); and analytical data associated with the proposed source(s). The specific submittals will be identified based on consultation with the NYSDEC.

2.01 SCHEDULE AND SEQUENCING PLAN

A. The Schedule and Sequencing Plan should include all elements of the Project and be neatly prepared and labeled as a bar graph indicating all anticipated start and completion dates.

B. Submit a horizontal bar chart with separate lines for each section of work.

C. At a minimum, the following major work items should be included, with appropriate subtasks included as necessary:

1. Technical Submittals.

2. Mobilization.

3. Site Preparation.

4. Installation of Excavation Support System.

5. Excavation/Material Dewatering/Disposal.

6. Excavation Backfilling.

MATERIALS AND PERFORMANCE – SECTION 01010

SUMMARY OF WORK

7. In-Situ Soil Stabilization.

8. Concrete Pipe Removal.

9. Test Pitting.

10. Site Restoration.

11. Demobilization/Recordkeeping.

D. Show complete sequence of construction by activity (including work by subcontractors). Indicate the early and late start, early and late finish, float dates, and duration.

2.02 HEALTH AND SAFETY PLAN

The Remediation Contractor will prepare a Project-specific HASP that identifies the health and safety procedures, methods, and requirements to be implemented by the Remediation Contractor during the performance of work activities. The Remediation Contractor's HASP shall be prepared and signed by a Certified Industrial Hygienist (CIH) and cover all personnel who will be employed by the Remediation Contractor to perform the Project, including direct employees as well as subcontractors. If the Remediation Contractor does not include subcontractors under its HASP, then each subcontractor will be responsible for developing, implementing, and submitting to the Remediation Contractor a HASP that meets the requirements outlined herein. The Remediation Contractor will be responsible for ensuring that all of its subcontractors have adequate HASPs prior to on site work by the subcontractor and are adhering to the HASPs during the work activities. If a subcontractor agrees to be included under the Remediation Contractor's HASP, then a statement to this effect shall be submitted by the Remediation Contractor.

Prior to commencement of field activities, the Remediation Contractor must certify (and demonstrate in a submittal to the Owner) that personnel employed at the site who are directly involved with remedial activities, including employees and subcontractors, have completed a 40-hour health and safety training course (and annual refresher training) in accordance with 29 CFR 1910.120 and 29 CFR 1926.65. The Remediation Contractor must also certify that any individuals who later become employed by the Remediation Contractor also receive such training prior to performing work at the site.

The Remediation Contractor must certify that all personnel who will be employed by the Remediation Contractor to perform work at the site, including direct employees as well as subcontractors, have received the initial and annual (if applicable) medical examinations and are enrolled in an ongoing medical surveillance program as required by 29 CFR 1910 and 29 CFR 1926. The Remediation Contractor must also comply with the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of

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1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54).

The Remediation Contractor will be responsible for the safety of its employees, subcontractors, suppliers, and other parties at the site as a result of the Remediation Contractor's direction. Health and safety and work zone air monitoring shall be conducted by on the Remediation Contractor's health and safety subcontractor.

The Remediation Contractor must prepare, submit, and implement a HASP in accordance with 29 CFR 1910.120 and 29 CFR 1926.65. The plan must address, but not be limited to, the following components:

A. Identification of Key Personnel - Identify, by name and by title, the on site and off-site health and safety personnel responsible for the implementation of health and safety procedures. All on-site personnel involved in the measures must have OSHA 40-hour Hazardous Waste Training (29 CFR 1910.120 and 1926.65) and the corresponding 8-hour refresher course update.

B. Training - Describe and provide certification of all supervisory and on-site personnel having received appropriate health and safety training.

C. Medical Surveillance - Certify that all supervisory and on-site personnel have received appropriate medical examinations and are able to conduct the tasks required for this Project.

D. Task-specific Hazard/Risk Analysis - Identify and provide a means of mitigating all foreseeable biological, chemical, and physical hazards associated with the Project including, but not limited to, hazards associated with exposure to constituents of concern, heavy equipment operation, site conditions, weather, material handling, work around excavation areas, and work near water.

E. Work Zones - Provide a site plan that depicts the designation of zones, including: Exclusion Zone(s), Decontamination Zone(s), and Support Zone(s). The level of personal protection required for each zone must be included.

F. Personal Safety Equipment and Protective Clothing - Identify personal safety equipment and protective clothing to be available at the site and used by Project personnel. This shall include identifying expected levels of protection (EPA Protection Levels A, B, C, and D) for each task and the action levels for personal protective equipment (PPE) upgrades. A respiratory protection program that meets the requirements of 29 CFR 1910.134 and establishes specific requirements for respirator use shall be included.

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G. Work Zone Air Monitoring - Identify protocols and criteria associated with work zone air monitoring.

H. Personnel Decontamination - Describe methods and procedures to be used for personnel decontamination.

I. Confined Space Entry - Describe procedures for confined space entry in accordance with OSHA's Confined Space Standard.

J. Material Safety Data Sheets - Provide Material Safety Data Sheets for all materials to be brought on site, as well as constituents which are expected to be encountered during the course of the Project.

K. Construction Safety Procedures (OSHA 1926.1 - 1926.652, Subparts A-P) to address excavation shoring and trenching safety, as well as a daily site safety inspection checklist to evaluate these items.

L. Standard Operating Procedures and Safety Programs as required by applicable sections of 29 CFR 1910 and 1926.

– END OF SECTION –

MATERIALS AND PERFORMANCE – SECTION 01046

CONTROL OF WORK

PART 1 - GENERAL

1.01 LAND AVAILABLE TO REMEDIATION CONTRACTOR

A. Owner will arrange for/coordinate access to the Project Work Limits.

B. The Remediation Contractor shall confine its operations to the Project Work Limits as shown on the Design Drawings.

C. All work shall be conducted in such manner as will cause the minimum inconvenience and disturbance to the site. No excavated materials or supplies of any kind shall be stored on properties not owned by the Owner or public premises without prior approval from the Owner/Remediation Engineer.

D. The Remediation Contractor shall erect new and/or maintain existing fences along the roadways and grounds occupied by the Remediation Contractor within the Project Work Limits.

1.02 PROTECTION OF EXISTING STRUCTURES

A. The Remediation Contractor shall erect and maintain fencing or other provisions around the Project Work Limits in such a way as to deter unwanted/unknowing access to the Project Work Limits.

B. Unless otherwise directed, the Remediation Contractor shall protect from damage any and all pipelines, monitoring wells, pavements, sidewalks, curbs, buildings, trees, poles, drainage features, utilities, and other property in the vicinity of the Project Work Limits.

C. The Remediation Contractor shall be responsible for damage sustained by any structure due to project activities, including settlement of excavation and in-situ solidification/ stabilization areas or to settlement or lateral movement of the sides of such areas, whether such movement occurs during or after excavation or backfilling of such excavations.

D. The Remediation Contractor shall have available on-site equipment and suitable and sufficient material for sustaining and supporting any and all such structures that are uncovered, undermined, weakened, endangered, threatened, or otherwise materially affected.

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CONTROL OF WORK

E. In case damage occurs to any portion of a pipeline or structure, or to the material surrounding or supporting the same, the Remediation Contractor shall immediately notify the Owner and Remediation Engineer and proceed with appropriate and safe response actions, such as: remove such damage; collect, containerize, characterize, appropriately dispose of materials released from pipeline or structure; provide provisions for alternate service (e.g., bypass pumping); and furnish such material and perform such work of repairs or replacements. In the case of utilities, the Remediation Contractor shall immediately notify the utility company and provide assistance to the utility company during repairs unless authorized to undertake such repairs directly by the utility company. Any damage shall be promptly, completely, and satisfactorily repaired by the Remediation Contractor to the satisfaction of Owner and/or the utility company at no additional cost to the Owner.

1.03 EXISTING SUBSURFACE STRUCTURES

A. General

1. Certain existing subsurface structures, which may be encountered during the performance of the Project or located in close proximity to the Project Work Limits will require special precautions and methods for their protection. Items such as sewer lines, drain lines, water mains, gas lines and conduits that are known to the Owner and Design Engineer, together with appurtenances, are shown on the Design Drawings. The sizes, locations, alignment, and depths shown are approximate and require verification by the Remediation Contractor.

2. Certain subsurface structures (e.g., pipe lines, gas holders, gas holder foundations, building foundations) related to former (historic) operations may also be encountered during the performance of the Project. Where encountered, the Remediation Contractor shall consult with the Owner and the Remediation Engineer regarding the need for and scope of activities necessary to remove, protect, or otherwise address such structures to accommodate the Remedial Action Design. In the event that free liquids are encountered within such structures, the Remediation Contractor shall collect and containerize of such materials. The Remediation Engineer will collect characterization samples and coordinate transportation and disposal of the materials.

MATERIALS AND PERFORMANCE – SECTION 01046

CONTROL OF WORK

3. Remediation Contractor shall recognize that subsurface structures and facilities may be located with the Project Work Limits that are either not identified or not accurately shown on the Design Drawings. It is the obligation of the Remediation Contractor to verify the accuracy and completeness of the information shown on the Design Drawings, as necessary to support the Project, and the Remediation Contractor agrees that it shall neither have nor assert against the Owner or the Design Engineer any claim for damages by reason of the inaccuracy, inadequacy, incompleteness, or other deficiency of the information given or the failure to furnish additional or further information in the possession of Owner or Design Engineer.

4. Where any existing subsurface structure such as a sewer line, drain line, gas line, water line, conduit, or other structure is found that is not anticipated or that is found to be materially different in size, location, or depth from that anticipated by the Remedial Action Design, the Remediation Contractor shall immediately notify the Remediation Engineer and Owner.

5. Remediation Contractor shall use due care to avoid damage to subsurface facilities identified, not identified, or inaccurately depicted on the Design Drawings.

6. Where the size, location, or depth of the existing subsurface structure has been anticipated and the Remedial Action Design specifies removal, realignment, or change, all work shall be completed by the Remediation Contractor in mutual cooperation with the utility or other parties concerned.

7. Where the presence of the subsurface structure or its size, location, or depth is not anticipated by the Remedial Action Design, any work by the Remediation Contractor required to remove, realign, or change the structure shall be approved by the Remediation Contractor, Remediation Engineer, Owner, and utility or other parties concerned.

B. Utilities

1. Certain existing subsurface utilities (e.g., natural gas lines, sanitary/storm sewers, water mains, etc.), which may be encountered during the work or are located in close proximity to the Project Work Limits, will require special precautions and methods for their protection. Subsurface utilities that are known to the Owner/Design Engineer, together with appurtenances, are shown on the Design Drawings. The sizes, locations, alignments, and depths shown (if any) are approximate.

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CONTROL OF WORK

2. All utilities whose facilities may be affected by the work shall be notified by the Remediation Contractor at least 72 hours in advance of the start of any operations that might affect such facilities.

3. The removal, replacement, support, or other handling of private and public utilities within the Project Work Limits shall be performed by the Remediation Contractor in accordance with arrangements satisfactory to Owner or operator of the utility involved. The Remediation Contractor shall remove, replace, or support all utilities as required.

4. Where it is necessary (as agreed to by the Owner, Remediation Engineer, and NYSDEC) to interrupt natural gas, sewer, water, or other utility service to remove, realign, or change a subsurface structure, the work shall: 1) be coordinated with the Owner, Remediation Engineer, and appropriate utility company in a timely as not delay remedial construction activities; 2) proceed with expedience; and 3) be continuous after interruption of service until completion of the removal, realignment, or change and return of the utility service to its normal state.

5. The Remediation Contractor shall not permit nor cause any hindrance to or interference with any individual, municipal department, public service corporation, or other company in protecting its poles, posts, or other structures, nor in shifting, removing, or replacing the same. The Remediation Contractor shall allow said individual, department, corporation, or company to take all such measures as they may deem prudent to protect their structures.

C. Existing Subsurface Structures that Require Changes in the Project

1. The Owner and Remediation Engineer will determine whether changes should be made to the Remedial Action Design to avoid a subsurface structure, whether the Project can proceed without changes to the Remedial Action Design, or whether the structure should be removed, realigned, or changed.

2. Any increase or decrease in cost of the Project resulting from any changes in the Remedial Action Design necessitated by the unanticipated presence or difference in size, location, or depth of the subsurface structure will be prepared by the Remediation Contractor for review by the Owner.

MATERIALS AND PERFORMANCE – SECTION 01046

CONTROL OF WORK

C. Interruption of Service

1. Where it is necessary to interrupt water, gas, sewer, or other utility service to remove, realign, or change a subsurface structure, the work shall be coordinated with the Owner, Remediation Engineer, and appropriate utility, and shall proceed with expedience and shall be continuous after interruption of service until completion of the removal, realignment, or change and return of the utility service to its normal state.

1.04 PROTECTION OF UTILITIES

A. All utilities whose facilities may be affected by the Project shall be notified at least 72 hours in advance of the start of any operations that might affect such facilities.

B. The removal, replacement, support, protection, or other handling of private and public utilities within the Project Work Limits shall be accomplished by the Remediation Contractor in accordance with arrangements satisfactory to Owner or operator of the utility involved. The Remediation Contractor shall remove, replace, or support all utilities as required.

C. The Remediation Contractor shall not permit nor cause any hindrance to or interference with any individual, municipal department, public service corporation, or other company or companies in protecting its or their mains, pipes, poles, posts, or other structures, nor in shifting, removing, or replacing the same. The Remediation Contractor shall allow said individual, department, company, or companies to take all such measures as they may deem prudent to protect their structures.

1.05 OPEN EXCAVATIONS

A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights, and other means to prevent unwanted/unknowing access, accidents to persons, and damage to property. Such measures shall be implemented pursuant to the applicable regulations. The length or size of excavation will be controlled by the particular surrounding conditions.

1.06 REPLACEMENT OF PROPERTY

A. The Remediation Contractor shall replace all pavement, driveways, fences, shrubs, lawns, trees, and any other public or private property damaged as a result of the Project. In all cases said replacement shall be new and to the satisfaction of the property owner.

MATERIALS AND PERFORMANCE – SECTION 01046

CONTROL OF WORK

1.07 HOUSEKEEPING

A. As the Project progresses, the Remediation Contractor shall remove all unused materials, tools, equipment and machinery, waste materials, rubbish, refuse, and other debris from the site in a timely manner and ensure that the site is at all times maintained in a neat and orderly condition.

B. At the completion of the Project, the Remediation Contractor shall promptly remove all construction tools, equipment and machinery, surplus materials, waste materials, rubbish, refuse, and other debris from the site and leave the site in a neat and orderly condition.

C. If it is observed that the Remediation Contractor neglects his responsibilities as set forth above, or neglects the repairing of streets, roadways, passageways or areas, or the repairing of fences or damages, the Owner or Remediation Engineer will give notice to that effect to the Remediation Contractor. If the Remediation Contractor does not take reasonable steps upon receipt of such notice to correct the neglected situation, the Owner may do so, and the expense thereby incurred shall be deducted from any monies due or that may become due to the Remediation Contractor.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 01110

ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Management of potential environmental impacts in conformance with applicable laws and regulations, during and as the result of this Project. For the purpose of this Section, environmental impacts are defined as the presence of chemical, physical, or biological elements or agents that adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and/or recreational purposes.

B. The control of environmental pollution requires consideration of air, water, and land, and involves management of noise and solid waste, as well as other pollutants.

C. Schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Provide erosion and sediment control measures as required to prevent silting and muddying of existing and new drainage systems, streams, rivers, impoundments.

D. Mitigate potential disturbance to the existing ecological balance between a water resource and its surroundings.

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American Association of State Highway and Transportation Officials (AASHTO). The following AASHTO specification is referenced in this section and is to be considered part of this section:

M 288 Standard Specification for Geotextile Specification for Highway Applications

B. ASTM International (ASTM). The following ASTM specifications are referenced in this section and are to be considered part of this section:

D3786 Standard Test Method for Bursting Strength of Textile Fabrics (Diaphragm Bursting Strength Tester Method)

D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus

D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity

D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles

D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

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ENVIRONMENTAL PROTECTION PROCEDURES

D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile

D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles

C. Applicable federal, state, and local laws and regulations concerning environmental pollution control and abatement.

D. New York State Standards and Specifications for Erosion and Sediment Control.

1.03 NOTIFICATIONS

A. The Owner and/or Remediation and Design Engineer will notify the Remediation Contractor of any detected non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements may also provide notification of any non-compliance with State or local requirements. After receipt of such notice, the Remediation Contractor shall immediately take corrective action. If the Remediation Contractor fails or refuses to comply promptly, the Owner may direct the Remediation Contractor to stop all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Remediation Contractor unless it is later determined that the Remediation Contractor was in compliance.

PART 2 - PRODUCTS

2.01 EROSION AND SEDIMENT CONTROLS

A. Temporary Silt Fence

1. Silt fence fabric shall be a woven geotextile meeting the geotextile survivability requirements of AASHTO M 288-96 Class 1 or Class 2 with the following minimum average roll values (MARVs):

Property	ASTM Test Method	Units	MARV
Mass per Unit Area	D5261	oz/yd^2	3.2
Grab Tensile Strength	D4632	lb	124
Grab Tensile Elongation	D4632	%	15
Trapezoidal Tear Strength	D4533	lb	45
Mullen Burst Strength	D3786	psi	300
Puncture Strength	D4833	lb	60
Permittivity	D4491	sec^{-1}	0.1

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ENVIRONMENTAL PROTECTION PROCEDURES

Property	ASTM Test Method	Units	MARV
Flow Rate	D4491	gal/min/ft^2	10
Apparent Opening Size	D4751	U.S. Sieve	30
UV Resistance (at 500 hours)	D4355	% strength retained	70

2. Either wood, metal, or synthetic posts may be used. Softwood posts shall be 1½ x 3½ inches, hardwood posts shall be at least 1¼ x 1¼ inches, steel posts shall be "T" or "L" shaped in cross section, with a minimum weight of 1.3 lb/ft.

3. Posts shall be of sufficient strength to resist damage during installation and to support applied loads due to material build up behind the silt fence.

4. Post spacing shall not exceed 8 feet (center to center).

5. Fasteners shall be heavy duty staples, hog rings, tie wires, or any other fastener compatible with the post material.

6. Silt fence fabric shall be fastened to each post in no less than four locations with approved fasteners.

B. Straw Bale Dike

1. Straw bales shall be sound with bale ties intact.

2. Straw bales shall be anchored in place with two re-bars, steel pickets, or 2" x 2" wooden stakes driven 18 inches (minimum) into the ground and flush with the top of the bale.

C. Oil Absorbent Boom

1. Oil absorbent booms shall be a minimum of eight inches in diameter.

2. Oil absorbent booms shall be anchored/secured in place and installed such that there are no gaps to allow the potential migration of oils/sheens beyond the boom.

3. The Remediation Contractor shall maintain and replace oil absorbent booms as necessary to prevent the potential migration of oils/sheens beyond the boom.

MATERIALS AND PERFORMANCE – SECTION 01110

ENVIRONMENTAL PROTECTION PROCEDURES

PART 3 - EXECUTION

3.01 EROSION AND SEDIMENT CONTROL

A. The Remediation Contractor is responsible for the installation, inspection, and maintenance of erosion and sediment control measures during the work.

B. All temporary erosion and sediment control measures shall be installed and maintained in accordance with the latest edition of the New York State Standards and Specifications for Erosion and Sediment Control.

C. At a minimum, erosion and sediment control measures shall be inspected once every seven calendar days and after storm events by the Remediation Engineer. Inspection results shall be summarized in weekly inspection reports. Weekly inspection reports shall include (at a minimum) the following information:

1. Date and time of inspection.

2. Name and title of person(s) performing inspection.

3. Weather and soil conditions (e.g., dry, wet, saturated, etc.) at the time of the inspection.

4. Condition of the storm water runoff at all points of discharge from the construction site.

5. Identification of any erosion and sediment control measures that require repair or maintenance.

6. Identification of any erosion and sediment control measures that were not installed properly or are not functioning as designed.

7. Description and sketch of areas that are disturbed at the time of the inspection and any areas that have been stabilized (temporary and/or final) since the last inspection.

8. Corrective action(s) to be taken to install, repair, replace, or maintain erosion and sediment control measures.

3.02 PROTECTION OF WATER RESOURCES

A. The Remediation Contractor shall 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, creeks, streams, rivers, impoundments, or other water bodies.

B. All water generated during the project (e.g., from excavation/material dewatering, decontamination of equipment, etc.) shall be handled/managed in accordance with the Pre-Remediation In-Situ Sampling and Analysis Report.

C. The Remediation Contractor shall not discharge water from excavation/material dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water or any sanitary or storm sewer unless authorized by the Owner/Remediation Engineer.

3.03 PROTECTION OF LAND RESOURCES

A. Restore affected land resources within/adjacent to the Project Work Limits to a condition that will appear to be natural and not detract from the appearance of the Project, unless otherwise indicated herein. Confine all activities to areas shown in the Remedial Action Design.

B. All scars made on trees by equipment, construction operations, or by the removal of limbs larger than one inch in diameter shall be coated as soon as possible with an approved tree wound dressing.

C. Remove all evidence of temporary construction facilities such as work areas, structures, stockpiles of excess or waste materials, or any other vestiges of construction as directed by the Remediation Engineer. The disturbed areas shall be restored as shown on the Design Drawings, as described in Specifications Section 02208 – Restoration of Surfaces, Section 02210 – Topsoil and Seeding, or as approved by the Remediation Engineer.

D. All debris and excess material will be disposed of in an environmentally sound manner.

3.04 PROTECTION OF AIR QUALITY

A. Dust Control

1. Maintain all excavations, embankments, stockpiles, waste areas, and all other work areas within or outside the Project Work Limits free from dust that could cause action level exceedances.

2. An approved method of dust control consisting of wetting or other similar methods will be permitted. The use of petroleum products is prohibited.

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ENVIRONMENTAL PROTECTION PROCEDURES

3. Wetting must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Remediation Contractor shall have sufficient competent equipment on the job to accomplish this. Dust control shall be performed as the work proceeds, as determined by the Remediation Engineer.

4. Appropriate dust control measures include the following:

   a. Excavating, loading, handling, and backfilling materials in a manner that minimizes dust generation.

   b. Periodic removal of dirt/debris from active vehicle transportation routes.

   c. Spraying water on surfaces.

   d. Spraying water and/or BioSolve® (or approved equivalent) on excavation faces, material stockpiles, buckets during excavation, and excavated soils and sediments when loading transport vehicles.

   e. Spraying water on stockpiles and on backfill materials that have been placed within the excavated area.

   f. Hauling excavated materials and clean backfill materials in properly tarped vehicles.

   g. Restricting vehicle speeds.

   h. Covering excavations and stockpiles with a layer of polyethylene sheeting (anchored appropriately to resist wind forces) or Rusmar Foam after excavation activities cease for the day.

The Remediation Contractor shall make a source of water (e.g., water tank truck) available at the work site. The Remediation Contractor will be responsible for maintaining, in the immediate vicinity of the work, a supply of water and means of dispersion (e.g., a water tank and sprayer) such that water may be applied for dust control immediately as required. Under no circumstances shall the Remediation Contractor use groundwater for dust suppression activities. If the dust control measures being utilized by the Remediation Contractor do not reduce particulate concentrations to acceptable levels, based on visual observations and/or the results of airborne particulate monitoring, all dust generating activities must be suspended until the Remediation Contractor develops the appropriate corrective measure(s) to remedy the situation.

MATERIALS AND PERFORMANCE – SECTION 01110

ENVIRONMENTAL PROTECTION PROCEDURES

B. Vapor/Odor Control

1. The Remediation Contractor is required to mobilize BioSolve® (or approved equivalent) and vapor-suppressant foam (including application equipment) to the site prior to initiating intrusive activities and maintain an adequate supply of such materials for the duration of intrusive activities.

2. The Remediation Contractor shall adhere to the requirements of the *Community Air Monitoring Plan,* included as an appendix to the Remedial Action Design and recognize that precautions may be required for dust/vapor/odor control. Note the Remediation Engineer will be responsible for conducting community air monitoring.

3.05 NOISE CONTROL

A. Make every effort to minimize noises caused by the construction operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with Federal, State, and local noise ordinance regulations.

3.06 PROHIBITED CONSTRUCTION PROCEDURES

A. Prohibited construction procedures include, but are not limited to, the following:

1. Dumping of spoil material into any drainage way, any surface waters, or at unspecified locations.

2. Pumping of silt-laden water from trenches or other excavations into any drainage way, surface waters, or at unspecified locations.

3. Damaging vegetation beyond the extent necessary for construction.

4. Disposal of trees, brush, and other debris in any stream corridors, any drainage way, or at unspecified locations.

B. In the event that the Remediation Contractor utilizes prohibit construction activities, any subsequent cleanup or repair activities shall be conducted at the Remediation Contractor's expense.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 01160

SURVEY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Establishing and maintaining survey control throughout the remedial construction activities to ensure the proper construction, documentation, and testing of the work.

2. Furnishing all materials, equipment, and labor necessary to support the survey activities required by the Remedial Action Design.

B. Related Work Specified Elsewhere

1. Section 01720 – Project Record Documents

2. Section 02205 – Excavation Support and Protection

1.02 SUBMITTALS

A. The Remediation Contractor shall prepare Survey Control Plan that includes (at a minimum) the following:

1. Identification (name, address, and affiliation) of licensed Professional Land Surveyor and Engineer.

2. A figure depicting the Remediation Contractor's proposed survey control points for each excavation area and a listing of coordinates (northing and easting) for each proposed survey control point.

3. The Remediation Contractor's proposed method of recording survey data within each excavation area.

B. For each excavation area, the Remediation Contractor shall submit the following survey information for each survey control point:

1. The existing elevation (submitted prior to initiating excavation activities).

2. The completed excavation elevation (submitted prior to initiating backfilling activities).

3. The completed soil fill elevation (submitted prior to placing sub-base material).

MATERIALS AND PERFORMANCE – SECTION 01160

SURVEY CONTROL

4. The final (post-construction/restoration) surface elevation (submitted following the completion of restoration activities).

C. For each ISS treatment area, the Remediation Contractor shall submit the following survey information for each survey control point:

1. The existing elevation (submitted prior to initiating ISS activities).

2. The completed bottom ISS elevation.

3. The complete top ISS elevation (as measured following solidification of treated soil).

4. The final (post-construction/restoration) surface elevation (submitted following the completion of restoration activities).

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL REQUIREMENTS

A. All survey activities shall be performed by or under the direct supervision of a Professional Land Surveyor licensed in the State of New York.

B. All survey-related work products (including as-built survey drawings) shall be sealed, stamped, and signed by a Professional Engineer licensed in the State of New York.

C. Vertical survey tolerance to be maintained during construction is 0.10 foot for general site grading and 0.01 foot for structural features (e.g., sheet piling, bracing, etc.) unless otherwise specified in the Remedial Action Work Plan or approved by the Owner/Remediation Engineer.

D. Horizontal datum for survey activities shall be the North American Datum of 1983 (NAD 83); New York State Plane East Coordinate System (in U.S. survey feet). Vertical datum shall be the North American Vertical Datum of 1988 (NAVD 88).

E. The Remediation Contractor shall anticipate and schedule site work to accommodate survey activities and Owner/Remediation Engineer review of survey documentation.

F. The scope of survey activities shall include (at a minimum) the following:

1. Performing a detailed pre-construction survey (prior to initiating any intrusive activities) to document existing site features and delineate work limits in the field.

MATERIALS AND PERFORMANCE – SECTION 01160

SURVEY CONTROL

2. Establishing sheet pile survey control points, marking out sheet pile alignments, and (once installed) surveying sheet pile locations, elevations, and alignments pursuant to Materials and Performance (M&P) – Section 02205.

3. Marking out the limits of excavation, establishing survey control points within each excavation area. At each survey control point, the following elevations shall be recorded:

   a. Existing (pre-construction) elevation.

   b. Final excavation elevation.

   c. Final soil fill elevations (e.g., for soil fill, sub-base, etc.).

   d. Final sub-base elevation.

   e. Post-construction/restoration elevation.

4. Surveying the locations, elevations, and alignments of any subsurface structures/features encountered during the work.

5. Performing a detailed post-construction survey (following the completion of restoration activities) to document final site conditions.

3.02 DOCUMENTATION

A. For each ISS/excavation area, the Remediation Contractor shall prepare a tabulated summary of the survey data recorded at each survey control point/grid node. The summary shall be updated and submitted to the Owner/Remediation Engineer on a regular basis throughout the project and include (at a minimum) the following survey data for each survey control point/grid node:

   1. The existing elevation (submitted prior to initiating excavation activities) to establish pre-construction grade.

   2. The completed ISS/excavation elevation (submitted prior to initiating backfilling activities in excavation areas) to verify (via Remediation Contractor proposed methods) that the ISS/excavation elevation specified on the Design Drawings has been achieved. The Remediation Contractor shall not proceed with backfilling activities until the required survey documentation has been provided to and verified by the Owner/Remediation Engineer.

   3. The completed top of ISS elevation to verify that the required sub-grade elevation has been achieved. The Remediation Contractor shall not proceed with the

placement of final surface material until the required survey documentation has been provided to and verified by the Owner/Remediation Engineer.

4. The final post-construction/restoration surface elevation (submitted following the completion of restoration activities) to verify that the elevation specified on (or required by) the Design Drawings has been achieved.

B. The Remediation Contractor is responsible for documenting the following construction quantities during the project:

1. Excavation volumes (in units of *in-situ* cubic yards) for each ISS/excavation area.

2. Backfill volumes (in units of *in-situ* cubic yards) for each fill material type (e.g., soil fill, sub-base, etc.).

C. Sheet pile and other excavation support survey data shall be tabulated and submitted as specified in M&P – Section 02205.

D. Requirements for as-built survey drawings are provided in M&P – Section 01720.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. A pre-construction meeting, bi-weekly progress and coordination meetings, and other Project meetings will occur throughout progress of the Project. For each meeting, the Owner/Remediation Engineer will:

1. Prepare agendas for meetings.
2. Make physical arrangements for meetings.
3. Preside at meetings.
4. Record the minutes and include significant proceedings and decisions.
5. Reproduce and distribute copies of minutes after each meeting:
   a. To participants in the meeting.
   b. To parties affected by decisions made at the meeting.

B. Representatives of Remediation Contractor, Subcontractors, and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

C. Remediation Contractor attendance at all meetings is mandatory.

1.02 PRE-CONSTRUCTION MEETING

A. The Remediation engineer will schedule a pre-construction meeting after date of Notice to Proceed.

B. Location: A central site, convenient for all parties, designated by the Owner.

C. Attendance:

1. Owner.
2. New York State Department of Environmental Conservation (NYSDEC).
3. Remediation Engineer.
4. Remediation Contractor.

MATERIALS AND PERFORMANCE – SECTION 01200

PROJECT MEETINGS

5. Major Subcontractors.

6. Others, as appropriate.

D. Anticipated Agenda Items:

1. Safety/safe work practices.

2. Distribution and discussion of:

a. List of major subcontractors and suppliers.

b. Construction schedule.

c. Remediation Contractor submittals.

d. Major construction activities.

e. Contact information for project team.

3. Major equipment deliveries and priorities.

4. Project Coordination:

a. Designation of responsible personnel.

b. Handling of public relations.

c. Traffic controls.

5. Procedures and processing of:

a. Field decisions.

b. Proposal requests.

c. Submittals.

d. Change Orders.

e. Applications for payment.

6. Procedures for maintaining Record Documents.

MATERIALS AND PERFORMANCE – SECTION 01200

PROJECT MEETINGS

7. Use of premises:

   a. Office, work, and storage areas.

   b. Owner's requirements.

8. Construction facilities, controls, and construction aids.

9. Temporary utilities.

10. Housekeeping procedures.

11. Other.

1.03 PROGRESS AND COORDINATION MEETINGS

A. The Remediation Engineer will schedule bi-weekly progress and coordination meetings, as necessary and appropriate.

B. Attendance:

1. Owner.

2. NYSDEC.

3. Remediation Engineer.

4. Remediation Contractor/subcontractors.

5. Suppliers.

6. Others, as appropriate.

C. Potential Agenda Items:

1. Safety/safe work practices.

2. Review/approval of prior meeting minutes.

3. Review of work progress since previous meeting.

4. Field observations, problems, conflicts, and resolution.

5. Issues that potentially impede construction schedule.

6. Corrective measures and procedures to address issues.

7. Revisions to construction schedule.

8. Review upcoming construction activities.

9. Review submittal status and schedules.

10. Maintenance of quality standards.

11. Pending changes and substitutions.

12. Other.

D. The Remediation Contractor is required to attend progress and coordination meetings and be prepared to discuss pertinent topics.

1.04 DAILY SITE SAFETY/COORDINATION MEETINGS

A. The Remediation Contractor will hold daily site safety/coordination progress and coordination meetings.

B. Attendance:

1. Remediation Engineer.

2. Remediation Contractor/subcontractors.

3. Others, as appropriate.

C. Potential Agenda Items:

1. Safety/safe work practices.

2. Review of planned construction activities for the day and associated health and safety concerns/measures associated with planned activities.

3. Potential problems/conflicts that may be encountered.

1.05 PROJECT CLOSE-OUT MEETING

A. The Remediation Engineer will schedule the project close-out meeting.

MATERIALS AND PERFORMANCE – SECTION 01200

PROJECT MEETINGS

B. Attendance:

1. Owner.

2. NYSDEC.

3. Remediation Engineer.

C. Potential Agenda Items:

1. Review/approval of prior meeting minutes.

2. Restoration/project close-out activities.

3. Debris disposal.

4. Demobilization.

5. Final site walk with Owner, NYSDEC, the Remediation Engineer, the Remediation Contractor to gain final approval of completion of work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. This Section specifies the general methods and requirements of submissions applicable to Remediation Contractor submittals, including various plans, shop drawings, product data, samples, mock-ups, and construction or submittal schedules. Detailed and specific submittal requirements are specified elsewhere within the Remedial Action Design.

B. All submittals shall be clearly identified by reference to Section Number, Paragraph, Drawing Number, or Detail as applicable. Submittals shall be clear and legible and of sufficient size for presentation of data.

C. Submittals required prior to mobilization shall be provided per the schedule in Section 01010. Each submittal shall be prepared and transmitted to the Remediation Engineer a minimum of two weeks 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/Remediation Engineer will not be liable for any project costs and/or schedule delays resulting from the Remediation Contractor's failure to provide submittals in a timely manner

1.02 SHOP DRAWINGS, PRODUCT DATA, SAMPLES

A. Shop Drawings

1. Shop drawings as specified in individual Sections include work plans, samples, supporting vendor information, calculations, test reports, custom-prepared data such as fabrication and erection/installation (working) drawings, schedules for carrying out the Project, setting diagrams, actual shop work manufacturing instructions, custom templates, coordination drawings, individual system or equipment inspection and test reports including performance curves and certifications, as applicable to the Project.

2. Shop drawings shall not be provided by subcontractors and should only be forwarded to the Remediation Engineer once the Remediation Contractor has verified that they are complete. The Remediation Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.

3. The Remediation Contractor shall be responsible for checking all subcontractor shop drawings regarding measurements, size of members, materials, and details

to make sure that they conform to the intent of the shop drawings and related Sections.

4. All details on shop drawings shall show clearly the relation of the various parts to the main members and lines of the structure and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the shop drawings before being submitted.

5. Any shop drawings submitted via facsimile or that are otherwise illegible will be rejected.

B. Product Data

1. Product data as specified in individual Sections include standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the Project.

C. Samples

1. Samples specified in individual Sections include physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products and units of work to be used by the Remediation Engineer or Owner for independent inspection and testing, as applicable to the work.

1.03 REMEDIATION CONTRACTOR'S RESPONSIBILITIES

A. Review shop drawings, product data, and samples, including those by subcontractors, prior to submission to determine and verify the following:

1. Field measurements.

2. Field construction criteria.

3. Catalog numbers and similar data.

4. Conformance with related Sections.

MATERIALS AND PERFORMANCE – SECTION 01300

SUBMITTALS

B. Make submittals promptly in accordance with approved schedules and in such sequence as to cause no delay in the project.

C. Notify the Remediation Engineer in writing, at the time of submittal, of any deviations in the submittal from the Remedial Action Design.

1.04 SUBMISSION REQUIREMENTS

A. Submittals shall be identified with a 10-character numbering system in the following manner:

1. The first character shall be a D, S, or P, representing shop/working drawing and other product data (D), sample (S), or preliminary submittal (P).

2. The next five digits shall be the applicable section number.

3. The next three digits shall be the numbers 001 to 999 to sequentially number each initial separate item or drawing submitted under each specific section number.

4. The last character shall be a letter, A to Z, indicating the submission, or resubmission of the same item (e.g., A=1st submission, B=2nd submission, C=3rd submission, etc). A typical submittal identification number would be as follows:

D-02270-008-B
D = Shop/working drawing or other product data
02270 = Section for geotextile fabric
008 = The eighth initial submittal under this section
B = The second submission (first resubmission) of that particular item

B. Except where noted or as otherwise indicated in the Remedial Action Design, all submittals shall be provided electronically (in Adobe® PDF or other mutually agreeable format) to the Remediation Engineer. Where hard copies are required, the following shall be provided:

1. Shop Drawings and Product Data – Six copies. Shop drawings and product data sheets 11 by 17 inches and smaller shall be bound together in an orderly fashion.

2. Samples – Number and/or size stated in the respective sections.

MATERIALS AND PERFORMANCE – SECTION 01300

SUBMITTALS

C. Submittals shall include:

1. The date of submission and the dates of any previous submissions.

2. The project title and number.

3. Submittal identification number.

4. Identification of any subcontractors, suppliers, or manufacturers.

5. Identification of the product, with reference to the appropriate section number, page, and paragraph(s).

6. Field dimensions, clearly identified as such.

7. Relation to adjacent or critical features of the work or materials.

8. Applicable standards, such as ASTM International (ASTM) or Federal Standards numbers.

9. Identification of deviations (if any) from the Remedial Action Design.

10. Identification of revisions on resubmittals.

11. A blank space suitably sized for Remediation Contractor and Remediation Engineer stamps.

12. Where calculations are required to be submitted by the Remediation Contractor or subcontractor, the calculations shall have been checked by a qualified individual other than the preparer. The submitted calculations shall clearly show the names of the preparer and of the checker.

D. Each submittal shall be signed by the Remediation Contractor and have affixed to it the following Certification Statement: "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."

E. Submittals shall be accompanied by a cover sheet or letter of transmittal that fully describes the packaged data and includes a listing of all items within the package.

1.05 REVIEW OF SUBMITTALS

A. Submittals will be reviewed by the Remediation Engineer for general conformance with the Remedial Action Design. All risks of error and omission are assumed by the

MATERIALS AND PERFORMANCE – SECTION 01300

SUBMITTALS

Remediation Contractor and the Remediation Engineer will have no responsibility therefore. Remediation Engineer corrections/comments to Remediation Contractor submittals shall not be construed as:

1. Permitting any departure from the Remedial Action Design.

2. Relieving the Remediation Contractor of responsibility for any errors, including details, dimensions, and materials.

3. Approving departure from details furnished by the Remediation Engineer, except as otherwise provided herein.

B. If the Remediation Contractor considers any correction/comment on a shop drawing to constitute a change to the Remedial Action Design, the Remediation Contractor shall give written notice thereof to the Owner/Remediation Engineer at least seven (7) working days prior to release for manufacture.

C. The Remediation Contractor shall remain responsible for details and accuracy, coordinating the work with all other associated work and trades, selecting fabrication processes, techniques of assembly, and performing work in a safe manner.

D. Project work, materials, fabrication, and installation shall conform to the Remedial Action Design unless otherwise approved by the Owner/Remediation Engineer.

E. If the shop drawings, data, or samples as submitted describe variations and show a departure from the Remedial Action Design which the Remediation Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in project cost or schedule, the Remediation Engineer may return the reviewed shop drawings without noting an exception.

F. Following review by the Remediation Engineer, each submittal will be returned to the Remediation Contractor under one of the following codes:

"R" "REVIEWED" is assigned when there are no notations or comments on the submittal. When returned under this code the Remediation Contractor may release the equipment and/or material for manufacture.

"N" "REVIEWED AND NOTED" is assigned when a confirmation of the notations and comments IS NOT required by the Remediation Contractor. The Remediation Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.

"S" "RESUBMIT" is assigned when notations and comments are extensive enough to require a resubmittal of the package. The resubmittal is to address all comments, omissions, and non-conforming items that were noted. The

resubmittal is to be provided to the Remediation Engineer within 15 calendar days of the date of the Remediation Engineer's transmittal requiring the resubmittal.

"J" "REJECTED" is assigned when the submittal does not meet the intent of the Remedial Action Design. The Remediation Contractor must resubmit the entire package revised to bring the submittal into conformance with the Remedial Action Design within 15 calendar days of the date of the Remediation Engineer's transmittal requiring the resubmittal. It may be necessary to resubmit using a different manufacturer/vendor to meet the intent of the Remedial Action Design; however, a change in manufacturer/vendor shall not entitle the Remediation Contractor to a cost increase.

"I" "FOR YOUR INFORMATION" is assigned to acknowledge receipt of a submittal that does not require the Remediation Engineer's review and is being filed for informational purposes only. This code is generally used in acknowledging receipt of field conformance test reports and Health and Safety Plans.

G. Resubmittals shall be handled in the same manner as first submittals. On resubmittals the Remediation Contractor shall identify all revisions made to the submittals, either in writing on the letter of transmittal or on the shop drawings by use of revision triangles or other similar methods. The resubmittal shall clearly respond to each comment made by the Remediation Engineer on the previous submission. Additionally, the Remediation Contractor shall direct specific attention to any revisions made other than the corrections requested by the Remediation Engineer on previous submissions.

H. Partial submittals may not be reviewed by the Remediation Engineer. Incomplete submittals shall be returned to the Remediation Contractor and considered "Rejected" until resubmitted as a complete submittal. The Remediation Engineer may at its option provide a list or mark the submittal directing the Remediation Contractor to the areas that are incomplete.

I. When shop drawings have been completed to the satisfaction of the Remediation Engineer, the Remediation Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instruction from the Remediation Engineer.

J. Work started, or materials fabricated or installed, prior to review of the applicable submittal items by the Remediation Engineer shall be at the sole risk of the Remediation Contractor. Fabrication performed, materials purchased, or on-site construction accomplished that does not conform to the Remedial Action Design shall be corrected at the Remediation Contractor's expense. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity with the Remedial Action Design.

MATERIALS AND PERFORMANCE – SECTION 01300

SUBMITTALS

K. Certain submittals may be subject to review/approval by the New York State Department of Environmental Conservation, City of Elmira, and/or other Agencies or interested parties. Modifications required by Agencies or interested parties shall not entitle the Remediation Contractor to a cost increase or schedule delay.

1.06 DISTRIBUTION

A. Distribute reproductions of reviewed shop drawings and copies of reviewed product data and samples, where required, to the job site file and elsewhere as directed by the Remediation Engineer. Number of copies shall be as directed by the Remediation Engineer but shall not exceed six.

1.07 SCHEDULES

A. Schedules shall be updated as needed (minimum of monthly), and resubmitted to the Owner and the Remediation Engineer.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Remediation Contractor shall maintain at the site (in an organized manner) one record copy of:

1. Remedial Action Design.
    a. Design Drawings
    b. Technical Specifications
    c. Traffic Plan
    d. Community and Environmental Response Plan
    e. Construction Quality Assurance Plan
    f. Contingency Plan
2. Remediation Contractor's Schedule and Sequencing Plan and Health and Safety Plan
3. Addenda.
4. Change Orders and other modifications to the Remedial Action Design.
5. Remediation Engineer's Field Orders or written instructions.
6. Approved shop drawings, working drawings, and samples.
7. Field test records including, but not limited to personal air monitoring data, survey information, waste manifests and bills of lading.
8. Detailed Schedule.
9. Record Drawings (24 by 36 inches).

B. Related Work Specified Elsewhere

1. Section 01160 – Survey Control

MATERIALS AND PERFORMANCE – SECTION 01720

PROJECT RECORD DOCUMENTS

1.02 CHANGES TO REMEDIAL ACTION DESIGN

A. No additions to, deletions from, or alterations in the Remedial Action Design shall be made unless first authorized in writing by the Owner and Remediation Engineer. If the Remedial Action Design bearing the seal of an Engineer or Land Surveyor is altered, the altering Engineer or Land Surveyor shall affix to it his or her seal and the notation "Altered By" followed by his or her signature and the date of such alteration, and a specific description of the alteration.

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Store documents and samples in Remediation Contractor's field office apart from documents used for construction.

B. File documents and samples in accordance with Construction Specifications Institute (CSI) format.

C. Maintain documents in a clean, dry, legible, condition, and in good order. Do not use record documents for construction purposes.

D. Make documents and samples available at all times for inspection by the Remediation Engineer.

E. The Remediation Contractor is to exhibit the currently updated "record documents" for review by the Remediation Engineer and Owner.

1.04 RECORDING

A. Label each document "PROJECT RECORD" in neat large printed letters.

B. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.

C. Legibly mark drawings to record actual construction:

1. Elevations of various structure elements in relation to grade.

2. Horizontal and vertical locations of underground utilities (if encountered) and appurtenances, referenced to permanent surface structures.

3. Field changes of dimension and detail.

4. Changes made by Field Order or by Change Order.

5. Details not in original Remedial Action Design.

MATERIALS AND PERFORMANCE – SECTION 01720

PROJECT RECORD DOCUMENTS

D. Legibly mark specifications and Addenda to record:

1. Manufacturer, trade name, catalog number, and Supplier of each Product and item of equipment actually installed.

2. Changes made by Field Order or by Change Order.

E. Maintain a complete, accurate log of all control and survey work as it progresses.

F. Update Record Documents on a weekly basis to reflect work performed during the previous week.

G. Maintain an accurate record of all changes, revisions, and modifications to the Remedial Action Design (if any).

1.05 SURVEY DRAWINGS

A. Within 21 days following the completion of the project, and prior to final payment, the Remediation Contractor shall provide one complete, accurate, and legible set of as-built survey drawings prepared by a licensed New York State surveyor to the Remediation Engineer depicting and documenting the following:

1. Pre-Construction Survey – Survey the site prior to initiating construction activities (i.e., under pre-construction conditions) at a scale of one inch = 40 feet on reproducible sheet(s) 24 inches by 36 inches and in digital format, indicating paved areas, sidewalks, curbs, and location of all above ground structures and berms, drainage control structures, ditches, utilities, and other important site features.

2. ISS and Excavation Limits – Survey at a scale of one inch = 10 feet on a reproducible sheet 24 inches by 36 inches and in digital format documenting that the target ISS/removal elevation was achieved across the entire remediation area and at each of the treatment/removal elevation tracking locations.

3. Topographic Survey – Provide the results of a topographic survey (on reproducible sheet[s] 24 inches by 36 inches and in digital format) for the constructed areas, including existing (i.e., pre-construction) surface topography and final grades (following surface restoration). Spot elevations shall be identified to show all important topographic features with a minimum one-foot contour at a scale of one inch = 40 feet. In addition to spot elevations, the topographic survey shall include grade changes and other significant topographic features not otherwise depicted.

4. Post-Construction Survey – Survey the site following the completion of all construction/restoration activities (i.e., under post-construction conditions) at a

scale of one inch = 40 feet on reproducible sheet(s) 24 inches by 36 inches and in digital format, indicating paved areas, sidewalks, curbs, and location of all above ground structures and berms, drainage control structures, ditches, utilities, and other important site features.

B. Survey drawings will be reviewed by the Remediation Engineer for accuracy and completeness.

C. Once reviewed and accepted by the Remediation Engineer, the Remediation Contractor shall provide finalized as-built survey drawings stamped and signed by a Professional Engineer or Professional Land Surveyor licensed in the State of New York.

1. Provide six (6) complete sets of finalized, stamped/signed as-built survey drawings on 24- by 36-inch sheets.

2. Provide electronic copies (in Adobe® PDF format) of finalized, stamped/signed as-built survey drawings.

3. Provide AutoCAD files (Release 2000 or newer) of finalized as-built survey drawings.

1.06 SUBMITTALS

A. Six (6) complete sets of finalized, stamped/signed as-built survey drawings on 24- by 36-inch sheets.

B. Electronic copies (in Adobe® PDF format) of finalized, stamped/signed as-built survey drawings.

C. AutoCAD files (Release 2000 or newer) of finalized as-built survey drawings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 01901

FIELD OFFICE TRAILER AND OTHER SUPPORT

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Remediation Contractor shall provide temporary facilities, utilities, and office-related equipment for the Owner/Remediation Engineer and the New York State Department of Environmental Conservation (NYSDEC) for the duration of the project.

B. Offices shall be ready for occupancy within 5 days of mobilization and shall be provided and maintained until final acceptance of the work conducted under this project.

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA). The following ANSI/ISEA specification is referenced in this section and is to be considered part of this section:

Z308.1 American National Standard – Minimum Requirements for Workplace First Aid Kits and Supplies

PART 2 - PRODUCTS

2.01 FIELD OFFICES (TWO TRAILERS)

A. The field office trailers shall consist of Mobile Offices manufactured by ModSpace (or equivalent) and provide a minimum of 400 square feet of floor space and shall each be partitioned to provide three separate office spaces (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 Engineer's Trailer.

B. The Remediation Contractor shall provide and maintain, in accordance with all applicable codes and regulations, the fire protection system (e.g., fire extinguishers, etc.) and electric, heating, and cooling services for the office trailers.

C. The Remediation Contractor, Owner/Remediation Engineer, and NYSDEC shall each be provided separate office space within the office trailers.

D. Remediation Contractor and Owner/Remediation Engineer/NYSDEC office trailer shall have the following items:

1. Flat-top surfaces (measuring entire width of the trailer) or four movable desks (measuring a minimum of 44 inches long by 30 inches) with lockable filing and storage drawers.

MATERIALS AND PERFORMANCE – SECTION 01901

FIELD OFFICE TRAILER AND OTHER SUPPORT

2. Four office chairs.

3. One drafting table (measuring a minimum of 48 inches long by 89 inches wide) with double storage cabinets underneath.

4. Two four-drawer legal size, filing cabinets with locks.

5. Three portable folding tables (measuring 60 inches long by 30 inches wide).

6. 10 folding or stacking chairs.

7. Two 10-pound Class ABC fire extinguishers.

8. Two large waste baskets.

9. One first aid kit meeting the minimum requirements of ANSI/ISEA Z308.1.

10. One refrigerator (minimum 5 cubic-foot capacity).

11. Coffee maker.

12. Two cordless telephones, each equipped with speakerphone function.

13. Two combination printer/scanner/copier/facsimile machines (HP Office Jet 4315 or similar).

E. The Remediation Contractor shall provide and maintain telephone and high-speed wireless internet service for each field office trailer. The Remediation Contractor is responsible for outfitting field offices as necessary for telephone and internet services.

1. Separate telephone lines (each with its own direct-dial telephone number) shall be provided for the Owner/Remediation Engineer, Remediation Contractor personnel, and the NYSDEC (three telephone lines/numbers total). The Remediation Contractor is responsible for local and long distance telephone charges for each telephone line.

2. Telephone service shall include a 24-hour/7-day a work answering service to pick up and direct calls to NYSDEC.

3. High-speed wireless internet service shall be capable of supporting a minimum of 10 users simultaneously.

F. Trailer maintenance shall include adequate heating, cooling, electric, internet, and telephone services, lighting, portable sanitary facilities, snow removal (as required), and janitorial services not less than weekly. All garbage, dust, and miscellaneous material

collected during clean-up of the facilities shall be disposed at an Owner-approved sanitary landfill.

2.02 TEMPORARY SERVICES

A. Temporary Water Service

1. The Remediation Contractor shall provide and maintain suitable bottled drinking water service including one 5-gallon capacity bottled drinking water coolers for each trailer.

2. The Remediation Contractor shall provide temporary water service as deemed necessary for construction purposes.

B. Temporary Sanitary Facilities

1. The Remediation Contractor shall provide and maintain temporary sanitary facilities and enclosures as required by the Occupational Safety and Health Administration (OSHA).

a. The Remediation Contractor shall provide a minimum of two portable sanitary toilets. The Remediation Contractor is responsible for the periodic removal and off-site disposal/treatment of sanitary wastes as required and in accordance with manufacturer's recommendations, applicable laws and regulations.

b. The Remediation Contractor shall provide a minimum of two portable hand wash stations. The Remediation Contractor is responsible for the periodic removal and off-site disposal/treatment of waste water as required and in accordance with manufacturer's recommendations, applicable laws and regulations.

C. Health and Safety Equipment

1. The Remediation Contractor shall provide all equipment and personnel necessary to maintain worker safety and compliance with regulatory requirements and as specified.

2. The Remediation Contractor shall provide a portable eye wash station and other necessary first-aid equipment and supplies.

D. Site Communications

1. The Remediation Contractor shall equip key Contractor personnel with two-way portable radios and necessary charging units. Portable radios shall be furnished,

at a minimum, to the Remediation Contractor's Superintendent, Foreman, and key construction personnel. A minimum of two portable radios and charging units shall be provided to the Remediation Engineer.

PART 3 - EXECUTION

3.01 TEMPORARY FACILITIES

A. Barriers and Enclosures

1. Protection of Workers and the Public

a. Effect and maintain at all times during work activities, barriers and lights necessary for the protection of workers and the public.

b. Provide suitable barricades, lights, and signage at all places where the work causes obstruction to normal traffic or in any way constitutes a hazard to the public, other contractors, the City of Elmira, and/or the Owner and its representative(s).

c. Install, repair, and maintain existing or new fencing, barriers, and gates for the protection of workers and the public.

2. Barricades and Lights

a. Protect all streets, roads, highways, excavations, and other public thoroughfares that are closed to traffic. Use effective barricades that display acceptable warning signs.

b. Install and maintain all barricades, signs, lights, and other protective devices within roadway rights-of-way in strict conformity with applicable statutory requirements by the authority having jurisdiction.

3.02 VEHICLE ACCESS AND PARKING

A. Vehicle Access

1. Routes of ingress and egress are subject to review and approval by the Owner/Remediation Engineer.

2. The Remediation Contractor is responsible for maintaining public roads clear of dirt and debris that result from the work activities and providing means of removing mud from vehicle wheels before entering paved roads.

MATERIALS AND PERFORMANCE – SECTION 01901

FIELD OFFICE TRAILER AND OTHER SUPPORT

3. The Remediation Contractor's means and methods for maintaining paved areas and roadways during construction are subject to review and approval by the Owner/Remediation Engineer.

B. Vehicle Parking

1. Personally-owned vehicles will not be allowed on-site except in designated employee parking areas. As necessary, the Remediation Contractor is responsible for transporting personnel between off-site parking areas and the site.

2. Construction personnel shall park vehicles and construction equipment in areas where they will not impede the public. Vehicle parking shall be in full compliance with all local and state traffic laws.

3. The Remediation Contractor shall maintain designated parking areas clear of dirt and debris resulting from the work.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 01902

PROJECT SIGN

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. The furnishing, installation, and maintenance of one project sign.

2. The project sign shall be constructed per NYSDEC Signs for Remedial Programs Specifications (attached) as specified herein.

3. The project sign shall be posted in a prominent location at the site following the notice to proceed and shall be maintained throughout the course of the Project.

PART 2 - PRODUCTS

2.01 MATERIAL AND EQUIPMENT

A. General

1. All lumber shall be structural quality and exterior grade (pressure treated).

2. All bolts, nuts, and washers shall be plated or galvanized steel.

3. Project signs shall be rectangular in shape with minimum dimensions of 96 inches wide by 48 inches high.

B. Painting

1. Paint shall be weather resistant, suitable for exterior sign applications and compatible with exterior grade plywood or aluminum and primer.

2. The sign face background shall be white.

3. All lettering shall be blue and green in color.

4. The back of the sign and all supports, bracing and trim, shall be painted white.

PART 3 - EXECUTION

3.01 GENERAL

A. The project signs shall read as provided in the attached example.

MATERIALS AND PERFORMANCE – SECTION 01902

PROJECT SIGN

B. The signs shall be adequately supported and braced and properly positioned and aligned.

3.02 MAINTENANCE

A. The Remediation Contractor shall provide any and all patching, painting, lettering, and bracing required to maintain the sign in good condition throughout the course of the Project.

3.03 CLOSURE

A. The signs are to remain on site until Project completion, and notification from the Remediation Engineer. At that time the sign is to be dismantled and shall become the Remediation Contractor's property.

- END OF SECTION -

STATE SUPERFUND PROGRAM

Elmira Madison Avenue Former MGP Site
Site No. 8-08-018
NYSEG

Governor: Andrew M. Cuomo
Commissioner: Joe Martens
Mayor: John S. Tonello

Transform the Past…. Build for the Future

NYSDEC ORDER ON CONSENT N$^{o.}$ D0-0002-9309

Elmira Madison Avenue Former MGP Site
Site N$^{o.}$ 8-08-018
NYSEG

Governor: Andrew M. Cuomo
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Transform the Past…. Build for the Future

MATERIALS AND PERFORMANCE – SECTION 02201

EARTHWORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Excavating, including the loosening and removal of all materials classified as "earth", to the horizontal and vertical limits specified on the Design Drawings or as directed by the Remediation Engineer.

2. Backfilling excavated areas with authorized materials to the lines and grades specified on the Design Drawings.

3. Furnishing all materials, equipment, and labor necessary to complete the earthwork activities required by the Remedial Action Design.

B. Related Work Specified Elsewhere

1. Section 02202 – Rock and Debris Removal

2. Section 02205 – Excavation Support and Protection

3. Section 02206 – Selected Fill

4. Section 02415 – Impacted Material Handling and Excavation Procedures

5. Section 01160 – Survey Control

6. Section 02420 – In-Situ Stabilization/Solidification

7. Section 03002 – Jet Grouting

8. Community Air Monitoring Plan (CAMP)

C. Definitions

1. Earthwork - Earthwork is defined to include, but not be limited to: clearing, topsoil removal, asphalt and concrete pavement removal, gravel removal, roadbase removal, classified and unclassified excavation for structures, handling and disposal of surplus materials, maintenance of excavations, removal of water, sheeting and bracing, backfilling operations, rough grading, embankments and fills, compaction, and protection of existing structures and facilities.

MATERIALS AND PERFORMANCE – SECTION 02201

EARTHWORK

2. Earth - All 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 ledge or bedrock and individual boulders, masonry, or debris larger than ½ cubic yard in volume.

3. Backfill - 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.

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. ASTM International (ASTM). The following ASTM specification is referenced in this section and is to be considered part of this section:

D6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 MAINTENANCE AND PROTECTION OF UTILITIES

A. The Remediation Contractor shall field-verify the presence and location of all overhead/underground site features and utilities (in service and out of service) relevant to and potentially to be encountered during the work.

B. The Remediation Contractor is responsible for contacting/coordinating with Dig Safely New York to locate and identify underground utilities within the Project Work Limits prior to initiating any intrusive activities at the site.

C. Except where noted or as otherwise indicated in the Remedial Action Design, the Remediation Contractor is responsible for the maintenance and protection of all overhead/underground site features and utilities that may be affected by the work. All utilities, unless stated otherwise, shall remain in operation for the duration of the work. Damage to any utilities (or caused as a result of the Remediation Contractor's failure to verify and/or protect utilities) shall be repaired to pre-construction condition and to the satisfaction of the affected party at no additional cost to the Owner.

D. Except where noted or as otherwise indicated in the Remedial Action Design, the Remediation Contractor is responsible for contacting/coordinating with the appropriate

utility companies for the temporary bracing, removal, relocation, and/or replacement of any utilities, utility poles, or guy wires.

3.02 EXCAVATION

A. General

1. Excavation activities shall be performed using suitable excavation equipment (sized appropriately based on site conditions and constraints) and methods determined by the Remediation Contractor.

2. The Remediation Contractor shall furnish and install excavation support where necessary in accordance with the Design Drawings and M&P – Section 02205.

3. The Remediation Contractor is responsible for providing safe and adequate vehicle/equipment access to and egress from the excavations. The Remediation Contractor shall adhere to the access restrictions specified in the Remedial Action Design relating to excavation support structures. The Remediation Contractor shall not drive, load, or store any equipment or materials within such restricted areas.

4. The Remediation Contractor shall excavate soils and debris (e.g., concrete, brick, piping, etc.) to the horizontal and vertical limits specified on the Design Drawings or as directed by the Remediation Engineer.

5. The final horizontal and vertical limits of excavation shall be surveyed and documented in accordance with M&P – Section 01160.

B. Excavation Dewatering

1. The Remediation Contractor shall, at all times, provide and maintain proper and satisfactory means and devices for the removal of all water currently present within and/or entering the excavation areas, and shall remove all such water as it may collect, in such manner as shall not interfere with the prosecution of the work.

2. Water pumped or drained from the excavation or other areas of the site shall be handled/managed in a suitable manner approved by the Remediation Engineer and without injury to adjacent property, the work under construction, or to pavement, roads, drives, and water courses. Water shall be collected, containerized, and transported off site for treatment/disposal. Additional information regarding water handling/management is provided in Specification Section 02415 – Impacted Material Handling and Excavation Procedures.

MATERIALS AND PERFORMANCE – SECTION 02201

EARTHWORK

C. Handling/Management of Excavated Materials

1. Excavated materials shall be handled/managed in accordance with M&P Section 02415.

2. Crushing/downsizing requirements for excavated rock and debris are provided in M&P – Sections 02202 and 02206.

D. Odor, Vapor, and Dust Control

1. Community air monitoring for volatile organic compounds (VOCs) and particulate will be performed by the Remediation Engineer on a continuous basis during the remedial construction activities. The Remediation Contractor shall ensure that community air monitoring is being performed prior to initiating intrusive and/or potential dust-generating activities each day.

2. Real-time work zone air monitoring shall be performed by the Remediation Contractor on a continuous basis during all intrusive and/or potential dust-generating activities.

3. Odors shall be controlled to the satisfaction of the Owner/Remediation Engineer and NYSDEC. Vapors and dust shall be controlled as necessary to meet the 1) community air monitoring action levels set forth in the CAMP and 2) work zone air monitoring action levels set forth in the Remediation Contractor's Health and Safety Plan.

4. Additional requirements for odor, vapor, and dust control are provided in M&P – Section 02507.

3.03 BACKFILLING

A. General

1. All excavation areas shall be backfilled to the original surface of the ground or to such other grades as specified on the Design Drawings or as directed by the Owner/Remediation Engineer.

2. Backfilling shall be done with satisfactory soils or specified materials, as appropriate.

3. The Remediation Contractor shall anticipate and schedule site work to accommodate laboratory/field testing of backfill materials and review of test results.

MATERIALS AND PERFORMANCE – SECTION 02201

EARTHWORK

4. Any settlement occurring in backfilled areas shall be refilled and compacted at the Remediation Contractor's expense.

5. The Remediation Contractor is responsible for any damage or injury done to utilities, structures, any existing or new site features, property, or persons due to improper placement and/or compaction backfill materials. Any such damage shall be repaired and/or replaced by the Remediation Contractor to the satisfaction of the affected party and at no additional cost to the Owner.

B. Equipment

1. Backfilling and compaction equipment shall be sized appropriately based on site conditions and constraints.

2. Compaction of backfill material in confined areas shall be accomplished by means of a drum-type, power-driven, hand-guided vibratory compactor, or by hand-guided vibratory plate tamper. Contractor may propose alternate compaction methods. Alternate compaction methods shall be reviewed and approved by the Owner and/or Remediation Engineer.

3. If the proposed method does not produce the required degree of compaction, an alternate method shall be adopted until the required compaction is achieved.

C. Minimum Compaction Requirements

1. Unless otherwise specified in the Remedial Action Design, the degree of material compaction specified for the items listed in Table 1 below shall be the minimum allowable.

2. Sufficient water shall be added to backfill material during placement and compaction to achieve the minimum compaction requirements specified in Table 1. If, due to rain or other causes, the material becomes too wet and cannot be compacted as specified, the Remediation Contractor shall mechanically adjust (reduce) the moisture content of the material as necessary to achieve the required degree of compaction.

3. The Remediation Engineer shall verify that Remediation Contractor achieves the material compaction requirements listed in Table 1.

MATERIALS AND PERFORMANCE – SECTION 02201

EARTHWORK

Table 1 – Minimum Compaction Requirements

Fill Material	Maximum Uncompacted Lift Thickness (inches)	Minimum Compaction Required (% of Maximum Dry Density)
1. Sub-grade (Existing Soil)	Not Applicable	Proof-Rolling
2. Soil Fill	18	95
3. On-Site Materials Subject to Re-Use	18	95
4. Crushed Stone	Not Applicable	Not Applicable
5. Subbase Course	12	95
6. Controlled Low Strength Material	Not Applicable	Not Applicable

3.04 GRADING

A. Backfill material shall be graded by the Remediation Contractor to meet the lines, grades, and elevations specified on the Contract Drawings, taking into account any subsequent site restoration requirements (e.g. installation of new pavement).

B. The final horizontal and vertical limits of backfill material shall be surveyed and documented in accordance with M&P – Section 01160.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02202

ROCK AND DEBRIS REMOVAL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Rock and debris removal to facilitate excavation to the vertical and horizontal limits shown on the Design Drawings or as directed by the Remediation Engineer.

2. Backfill (with acceptable materials) of areas from which rock and/or debris have been removed.

B. Related Work Specified Elsewhere

1. Section 02201 – Earthwork

2. Section 02205 – Excavation Support and Protection

3. Section 02415 – Impacted Material Handling and Excavation Procedures

C. Definitions

1. Rock - All pieces of ledge or bedrock, boulders, or masonry larger than ½-cubic yard in volume.

2. Debris - Man-placed buried material, including brick, concrete slabs, abutments, foundations, demolition debris, and miscellaneous fill materials.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 REMOVAL

A. General

1. All existing pipes or structures to remain that are exposed during excavation activities shall be adequately protected from damage before proceeding with material removal.

2. The Owner and Remediation Engineer reserve the right to require the Remediation Contractor to alter rock and debris removal techniques and activities, as required.

MATERIALS AND PERFORMANCE – SECTION 02202

ROCK AND DEBRIS REMOVAL

3. The Owner and Remediation Engineer reserve the right to discontinue rock and debris removal techniques and activities at any time.

4. The Remediation Contractor shall account for the presence of rock and debris along sheet pile alignments and within excavation areas.

B. Repair of Damages Due to Removal

1. Any injury or damage to the work or to existing utilities or structures shall be repaired or rebuilt at the Remediation Contractor's expense. If damage occurs to any portion of a utility or structure, or to the material surrounding or supporting the same, the Remediation Contractor shall immediately notify the Owner and Remediation Engineer and proceed with appropriate and safe response actions to (as necessary): 1) collect, containerize, and appropriately dispose of any materials released from the damaged utility or structure; 2) provide provisions for alternate/temporary service; and 3) furnish necessary materials and repair or replace the damaged utility/structure. In the case of utilities, the Remediation Contractor shall immediately notify the appropriate utility company and provide assistance to the utility company during repairs unless authorized by the utility company to undertake such repairs directly. Any damage to existing structures shall be promptly and completely repaired by the Remediation Contractor to the satisfaction of the Owner, utility company, and/or affected party.

C. Explosives

1. At no time shall explosives be used at the site.

3.02 MATERIAL CRUSHING

A. The Remediation Contractor shall provide all equipment necessary to sufficiently crush/downsize excavated rock and debris for either off-site disposal or re-use as on-site backfill. Such equipment shall be mobilized to the site at the beginning of the project (prior to initiating excavation activities) and remain on-site until project completion.

1. Excavated rock and debris subject to off-site disposal shall be crushed/downsized as required by the Owner's waste transportation and disposition vendors.

2. Excavated rock and debris subject to re-use as on-site backfill shall be crushed/downsized to 24 inches (maximum) in any dimension.

B. The Remediation Contractor shall provide sufficient equipment and personnel to control dust during the crushing/downsizing of excavated rock and debris.

MATERIALS AND PERFORMANCE – SECTION 02202

ROCK AND DEBRIS REMOVAL

3.03 BACKFILL

A. Excavated rock and debris shall be replaced with the quantity of acceptable material required for backfilling. Backfill material shall be placed and compacted in accordance with M&P – Section 02201.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02203

SITE GRADING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. The Remediation Contractor shall complete all rough and final grading to the elevations presented on the Design Drawings or as directed by the Remediation Engineer.

2. The Remediation Contractor shall provide survey verification and certification of existing surfaces, all prepared sub-grade elevations and final grade elevations as depicted on the Design Drawings or as directed by the Remediation Engineer, and in accordance with Specification Section 01160 – Survey Control.

3. The Remediation Contractor shall be responsible for all excavation, backfilling, compaction, slope protection, and erosion control required to complete site grading, as specified herein.

B. Related Work Specified Elsewhere

1. Section 01160 – Survey Control

2. Section 01720 – Project Record Documents

3. Section 02201 – Earthwork

4. Section 02208 – Restoration of Surfaces

5. Section 02209 – Clearing

1.02 SUBMITTALS

A. Record Drawings shall be stamped and signed by a New York State-licensed Land Surveyor or Professional Engineer.

PART 2 - PRODUCTS

2.01 DESCRIPTION

A. Rough and final site grading shall be as specified on the Design Drawings or as directed by the Remediation Engineer.

MATERIALS AND PERFORMANCE – SECTION 02203

SITE GRADING

PART 3 - EXECUTION

3.01 PLACEMENT

A. The Remediation Contractor shall maintain survey control. All final surface elevations (following restoration) shall be verified, and a Record Drawing depicting final (as-built) grades shall be produced, stamped by a New York State-licensed Land Surveyor or Professional Engineer, and submitted by the Remediation Contractor to the Remediation Engineer for review.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02205

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Owner will Furnish AZ-48 sheet piles. The Remediation Contractor will install, monitor, and maintain excavation support and protection systems in accordance with this Section and the Design Drawings. Excavation support and protection systems shall be capable of supporting excavation sidewalls, and resisting soil and hydrostatic pressures and superimposed and construction loads.

   a. Install excavation support and protection systems without damaging existing buildings, pavement, embankments, subsurface utilities, and other installed construction adjacent to the excavations.

   b. Prevent surface and groundwater from entering excavations by means of applying a sealant to excavation support and protection system. Surface water or groundwater that enters the excavation will be handled/managed in accordance with the requirements of Specification Section 02415 – Impacted Material Handling and Excavation Procedures.

   c. Minimize groundwater upwelling within excavations by installing steel sheet piling into a subsurface glacial till unit.

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. Prevent water leakage through the sheet pile interlocks.

   d. Removing and decontaminating/cleaning temporary sheet piles.

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 steel sheeting installation, including the level of effort to be put forth by the Remediation Contractor concerning the installation activities.

MATERIALS AND PERFORMANCE – SECTION 02205

EXCAVATION SUPPORT AND PROTECTION

It is the Remediation Contractor's responsibility to thoroughly review the sheet pile wall design configuration and the available information concerning subsurface conditions, including the presence of 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 Remedial Action Design. Excavations will not extend below the limits depicted on the Design Drawings unless the Remediation Engineer (in consultation with the Owner, the Design Engineer, and NYSDEC) determines that such work can be conducted in a safe manner.

B. Related Work Specified Elsewhere

1. Section 01160 – Survey Control

2. Section 01720 – Project Record Documents

3. Section 02201 – Earthwork

4. Section 02415 – Impacted Material Handling and Excavation Procedures

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. Driving and Erecting: Installer shall be regularly engaged in the driving and erection of steel sheet piling.

B. Qualifications of Welders: In accordance with the American Welding Society (AWS), and qualified within the past year.

C. Codes and Standards

1. 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 piling.

MATERIALS AND PERFORMANCE – SECTION 02205

EXCAVATION SUPPORT AND PROTECTION

1.03 SUBMITTALS

A. Certification: Provide documentation of agreement with licensed installer for provisions of quality control service for the sheet pile installation. Provide current welder certifications for personnel to perform welding. Only personnel with current certifications will be permitted to weld materials.

B. 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

C. Vibration monitoring:

1. Before any construction induced vibration operations begin, the Remediation Contractor shall obtain all permits and licenses required. In addition, the Remediation Contractor shall submit to Remediation Engineer all data listed herein. Remediation Contractor must subcontract a third-party vibration monitoring contractor.

2. Pre- and Post-Construction Property Surveys: Reports on adjacent properties shall be completed by third-party firm contracted directly with NYSEG as outlined below in Part 3.02.

3. Vibration Notice: The Remediation Contractor shall give written notice to the Remediation Engineer and Owner of his or her intention to cause vibration at least 5 working days in advance.

4. Records: The Remediation Contractor shall submit a record of each vibration operation (e.g. driving and/or extracting sheet piles) no later than 1 working day after occurrence. The record shall include the following information:

a. Location, duration, number, and depth of intrusion.

b. Weather conditions.

c. Name of the responsible person in charge.

d. Signature and title of person making record entries.

5. Vibration Monitoring Records: The subcontracted vibration monitoring firm shall submit all vibration monitoring records for each occurrence no later than 1 working day after the event to the Remediation Engineer and the Remediation Contractor simultaneously. The records shall include the following:

   a. Strip charts of peak particle velocity and vibration-frequency.

   b. Summary of the maximum peak particle velocity and vibration frequency including the identification of the vibration event.

   c. Signature and title of the person in charge of monitoring.

D. Results of test pit and video inspection/pipe tracing at concrete pipe removal area, indicating elevation and direction of concrete pipe. Remediation Contractor shall also provide the proposed limits of excavation based on test pit results and Remedial Action Design.

1.04 COORDINATION

A. Notify the Remediation Engineer at least 5 days prior to beginning excavation support and protection installation operations at any location. Notification shall not relieve the Remediation Contractor of its responsibilities for performing the work in accordance with the Remedial Action Design. 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 PROJECT CONDITIONS

A. Employ a qualified land surveyor and establish exact elevations and northing and easting coordinates at fixed points (as shown on the Design Drawings) to act as control points. Clearly identify benchmarks and record existing elevations.

   1. During installation and extraction of excavation support and protection systems, regularly resurvey benchmarks, and maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Remediation Engineer if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

   2. Prior to advancing sheet pile in certain areas, the remnants, or intact elements of below ground structures (e.g., the at-grade building foundation) may require demolition and removal in these areas. Following discussions with the Remediation Engineer regarding the presence of such features, the Remediation Contractor shall conduct these activities to facilitate sheet pile installation and achieve the removal limits specified in the Remedial Design.

MATERIALS AND PERFORMANCE – SECTION 02205

EXCAVATION SUPPORT AND PROTECTION

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. All materials shall be new (or in like new condition) and undamaged, unless otherwise directed by the Owner/Remediation Engineer, and shall conform to pertinent AISC, ANSI, ASTM or other industry standards. Unless specified otherwise in other Sections, all materials in fabricated metal items shall conform to the following requirements:

B. Owner supplied AZ-48 steel sheet piling (AZ- sections without discontinuities that may affect ability to drive vertical/plumb and water tightness).

1. The Remediation Contractor is to utilize AZ-48 steel sheet piles (supplied by the Owner), driven to the tip elevations shown on the Design Drawings. The Remediation Contractor shall coordinate directly with the Owner to verify the sheet pile inventory currently present on-site and assess the need for additional sheet pile. Remediation Contractor shall be responsible for the transportation and loading of sheet pile on-site not to be used during remedial construction to other NYSEG facilities and the transportation and loading of sheet pile from other NYSEG facilities to the site (if needed).

2. Interlocking steel sheet piling that meets or exceeds one of the following:

a. ASTM A 328

b. ASTM A 572 - Grade 50 and 55

c. ASTM A 690

3. Splicing of sheet piling is not permitted, unless approved by the Remediation Engineer.

D. Pile driving equipment.

1. Pile driving equipment shall be ABI Mobilram.

E. Polyurethane Waterstop Sealant (Swellseal® WA - de neef®)

1. Gunnable single component hydrophilic mastic.

2. Swells to approximately 200 percent of its original volume when in contact with water and resists hydrostatic pressures of up to 492 feet of water column.

MATERIALS AND PERFORMANCE – SECTION 02205

EXCAVATION SUPPORT AND PROTECTION

F. Lagging

1. Minimum 2 inch by 8 inch hardwood.

2.02 GENERAL REQUIREMENTS

A. General

Except as otherwise specifically noted in the Remedial Design, or specified herein, all materials and work for structural steel and miscellaneous metal work shall be in conformance with applicable provisions of the latest edition of the AISC *Steel Construction Manual.*

B. Shop Fabrication (if Remediation Contractor supplied sheet pile is utilize).

1. Structural steel shall be fabricated in conformance with dimensions, arrangement, sizes, and weights or thicknesses shown or stipulated on the Design Drawings.

2. All members and parts, as delivered and erected, shall be free of winds, warps, local deformations, or unauthorized bends.

C. Field Erection

1. Structural steel and miscellaneous metal shall be stored on blocking so that no metal touches the ground and water cannot collect thereon. The material shall be protected against bending under its own weight or superimposed loads.

2. Before assembly, surfaces to be in contact with each other shall be thoroughly cleaned. All parts shall be assembled accurately as shown on the Design Drawings. Light drifting will be permitted to draw parts together, but drifting to match unfair holes will not be permitted. .

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, dewatering, and other hazards that could develop during excavation support and protection system operations.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

C. Provide adequate clearance of support and protection systems within work areas to allow for proper installation/construction of required site features.

D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or leaks, to ensure that excavation remains stable and free of standing water.

E. Damages to or destabilizing adjacent facilities, structures, pavement and/or earthen slope caused by activities associated with the installation or removal of the excavation support and protection systems shall be promptly repaired or replaced in-kind at the Remediation Contractor's expense.

F. Determine sheet piling layout and grade by survey.

G. Establish necessary lengths as determined on the Design Drawings.

H. Locate and protect all underground utilities, piping, structures.

I. Locate and protect all aboveground utilities, structures.

3.02 PRE-AND POST-REMEDIAL ACTION SURVEY

A. The Owner shall obtain an engineering firm for the performance of a pre- and post-remedial action structural evaluation of the following structures:

1. I.D. Booth building located north of Remediation Area 1.

2. I.D. Booth building located west of Remediation Area 1.

3. I.D. Booth building located east of Remediation Areas 4 and 5.

4. I.D. Booth loading ramp located northwest of Remediation Area 6.

5. NYSEG gas regulator shed located south of Remediation Area 1.

6. Trayer Products building located south of Remediation Area 3.

7. Trayer Products building located southeast of Remediation Area 10.

The pre-remedial action survey shall be conducted prior to the initiation of remedial activities and a post-remedial action structural evaluation shall be conducted following the completion of the remedial activities. The structural evaluations shall be completed in accordance with applicable laws, practices, and regulations. Evaluation documents shall be prepared as two separate reports and at a minimum shall provide documentation

(both in text descriptions and photographic documentation) detailing the pre- and post-remedial action structural conditions of the buildings listed above. The reports (pre- and post-) shall include recommendations for minimizing the potential for damage caused by the Project, as well as the type, frequency, location, an duration of monitoring activities.

B. A copy of each report, when completed, covering each structure inspected, shall be delivered to the Remediation Engineer/Owner (one copy each) within two weeks from completion of each field work event. The pre-remedial action survey report shall be submitted to the Owner and Remediation Engineer prior to Remediation Contractor mobilization to the site.

3.03 INSTALLATION OF STEEL SHEET PILES

A. The Remediation Contractor shall identify the presence of underground utilities or other obstructions. All underground utilities located within the pathway of the proposed steel sheet pile shall be removed, relocated, protected, or abandoned to facilitate installation of the steel sheet pile.

B. The Remediation Contractor shall remove any material that stops driving prior to continuation of driving, or develop an alternative methodology, reviewed by the Remediation Engineer, for completing sheet pile system installation.

C. Pre-Drilling – The Remediation Contractor shall Pre-drill the alignment to the proposed depth of sheet pile at each interlock.

D. Plumb steel sheet piling within four percent of pile length.

E. Sheet piling shall be constructed so as to keep the excavations free from earth or surface water runoff (into the excavation).

F. Sheet piling shall be installed using a template to maintain vertical and horizontal alignment during installation.

G. Sheet piling shall be constructed to meet all safety requirements.

H. All sheets shall interlock and be sealed in areas where groundwater may infiltrate. The Remediation Contractor shall minimize leakage through the sheet pile joints (and other locations as required) by water proofing the interlocks as described below. The Remediation Contractor is responsible for all delays, repairs, or additional work resulting from improper sealing of sheet pile interlocks at no cost to the Owner.

MATERIALS AND PERFORMANCE – SECTION 02205

EXCAVATION SUPPORT AND PROTECTION

I. Apply polyurethane waterstop gunnable sealant (Swellseal® WA - de neef®)[1] according to manufacturer's recommendations and as follows:

1. Must not be applied at ambient temperatures below 40°F.

2. The female interlock must be wire brushed clean and air blown so there is no scale, dust or debris in the annular space of the interlock. Immediately after cleaning by the above procedure and prior to application of the Swellseal® WA.

3. Apply Swellseal® WA into the female section and move the material such that it is has an even thickness within the interlock (by mean of a brush, or similar). The interlock should be coated but not over coated (to prevent the male section from dragging on the Swellseal® WA during installation of the sheeting). Use of an electric caulking gun (Albion or similar) is recommended for consistency and to increase productivity.

4. The 10.5 ounce (oz.) caulk tubes will yield approximately 20 linear feet coverage, and the 20.0 oz. caulk tubes (used with the electric gun) will yield approximately 40 linear feet of coverage using an average annular space interlock joint.

5. Any sealant that has prematurely expanded prior to driving must be removed, the female interlock re-cleaned, and the sealant re-applied.

6. Check the maximum annular space in the interlock area to ensure that enough Swellseal® WA is being applied. Swellseal® WA shall be re-applied if sheet pile is pulled and re-driven.

7. In concrete pipe removal area, where sheeting cannot be installed due to alignment of pipe, hardwood lagging, as indicated in Section 2.01F will be installed between edges of sheeting (over pipe) to retain soil as excavation progresses.

J. Set Up Sheet Piles

1. Drive piles with equipment suitable for the conditions encountered. The method and equipment selected shall deliver the necessary energy to drive the piling to the design depths as shown on the Design Drawings and minimize damage to each end of piling and adjacent interlocks. Suitable procedures must be employed to prevent damage to pile tops and joints.

[1] The Swellseal® WA – de neef® sealant is a hydrophilic, solvent-free material that will expand to approximately 200% of its original cured volume. This sealant can be readily applied with standard caulking guns.

2. Care should be maintained during pile pick-up to prevent damage due to excessive bending or twisting while positioning pile for driving. In the opinion of the Remediation Engineer, twisted or bent 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 piles do not declutch. The integrity of each pile and interlocked joint must be maintained during and after driving.

4. Piles damaged or driven outside the above tolerances shall be replaced. Any sheet pile ruptured in the interlock or otherwise damaged during driving shall be immediately pulled and replaced.

5. The Remediation Contractor shall take necessary precautions to ensure adjacent piles do not penetrate deeper during 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 is not permitted, unless approved by the Remediation Engineer.

3.04 VIBRATION MONITORING

A. The Remediation Contractor shall subcontract an experienced third party firm to perform vibration monitoring on the ID Booth Building located west of Excavation Area 1 and alignment of active NYSEG gas line adjacent to Excavation Area 2 during pile driving and extraction activities. Additionally vibration monitoring shall be conducted at work limits near the concrete pipe removal area while work is being conducted in this area.

B. Vibration levels shall be in accordance with all federal, state and local laws, rules, and regulations.

C. Pile driving shall only be permitted where utilities have been cleared and coordinated with the responsible utility prior to excavation near underground structures or utilities. All utilities identified within proposed excavation support limits shall be hand excavated to expose and confirm. All existing pipes or structures to be exposed during excavation shall be adequately protected from damage before proceeding with the pile driving operation.

D. Continuous monitoring of vibrations produced by the Remediation Contractor's pile driving and extraction operations shall be performed by a third-party subcontractor retained by the Remediation Contractor at their own expense during pile driving activities. Each vibratory event shall be monitored by a three-component seismograph in at least three separate locations. Additional locations shall be monitored, if required.

E. Vibrations at existing structures shall not exceed the allowable values listed below:

1. The peak particle velocity as measured by a three-component seismograph shall not exceed 0.8 inches per second at any adjacent buildings or structures. The peak particle velocity shall not exceed 2 inches per second elsewhere.

F. Any injury or damage to the work or to existing pipes, facilities, or other structures resulting from vibration operations shall be repaired or rebuilt by the Remediation Contractor at the Remediation Contractor's expense. Whenever vibrations may damage adjacent pipes, facilities, or structures, operations shall be discontinued and installed by other methods. No separate payment will be made for this change in methods.

3.05 RECORDS

A. Provide accurate records of each sheet pile installed. Submitted records shall include the following information:

1. Pile identification number, along with location.

2. Date and time of driving.

3. Model of hammer and energy rating.

4. Elevation at top of pile.

5. Length of sheet pile in the ground when driving is complete.

6. Rate of penetration in feet/minute, as well as changes in rate of penetration and depth at which change occurred.

7. Detailed remarks concerning alignment, obstructions.

8. Vibration records associated with each driven pile section.

B. Mark identification number clearly visible on each sheet pile with a waterproof marking device, within two feet of the top, before driving is initiated.

C. 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 shall 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. Remove excavation support and protection systems when approved by the Remediation Engineer and when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities; repair the above items as needed.

B. Once the sheeting is extracted the Swellseal® WA - de neef® sealant can be removed from the female joint by the hand peeling method (or wire brush as needed).

C. All sheeting interlocks must be checked for damage and must be properly cleaned in accordance with the sealant manufacturer's requirements prior to reuse.

D. All NYSEG owned sheeting will be cleaned and stockpiled on site.

3.08 PROVISIONS FOR REUSE OF STEEL SHEET PILING

A. Following extraction, the Remediation Contractor shall clean/decontaminate steel sheet piling and inspect for any damage that may have occurred while driving and/or extracting the piling. Decontamination shall be performed in the decontamination area constructed by the Remediation Contractor.

B. All piling must be approved by the Remediation Engineer for reuse prior to redriving.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02206

SELECTED FILL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Selected fill materials shall be used for backfill as shown on the Design Drawings, as specified herein, or as directed by the Remediation Engineer.

B. Related Work Specified Elsewhere

1. Section 02201 – Earthwork
2. Section 02202 – Rock and Debris Removal
3. Section 02203 – Site Grading
4. Section 02208 – Restoration of Surfaces
5. Section 02415 – Impacted Material Handling and Excavation Procedures

1.02 APPLICABLE CODES, STANDARDS, AND SPECS

A. New York State Department of Transportation (NYSDOT) Standard Specifications.

B. ASTM International (ASTM). The following ASTM specification is referred to in this Section and is to be considered a part of this Section:

D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

C. NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (DER-10).

Appendix 5 – Allowable Constituent Levels for Imported Fill or Soil

D New York State Department of Transportation, Standard Specifications:

Section 204 Controlled Low Strength Material (CLSM)

E. American Concrete Institute (ACI). The following codes, standards and recommendations are intended to specify minimum standards of performance:

ACI 301 Specifications for Structural Concrete for Buildings

MATERIALS AND PERFORMANCE – SECTION 02206

SELECTED FILL

ACI 523.1 Guide for Cast-in-Place Low Density Concrete

ACI 318 Building Code Requirements for Reinforced Concrete

ACI229R Controlled Low-Strength Materials

F. American Society for Testing and Materials (ASTM). The following ASTM specifications are referred to in these specifications (in addition to those ASTM specifications listed in ACI) and are to be considered a part of these specifications:

C31 Standard Method of Making and Curing Concrete Test Specimens in the Field

C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

C150 Standard Specification for Portland Cement

C260 Standard Specification for Air-Entraining Admixtures for Concrete

C494 Standard Specification for Chemical Admixtures for Concrete

C495 Standard Test Method for Compressive Strength of Lightweight Insulating Concrete

C513 Standard Test Method for Obtaining and Testing Specimens of Hardened Lightweight Insulating Concrete for Compressive Strength

C618 Standard Specifications for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete

1.03 SUBMITTALS

A. Identification of proposed off-site fill sources (names, addresses, and any state or local approvals as fill sources). If no prior state or local approval is available for the source, the Remediation Contractor shall provide a brief history of the use of property which is the source of the fill.

B. Laboratory test report for each proposed fill material indicating the grain-size profile (determined by ASTM D422).

MATERIALS AND PERFORMANCE – SECTION 02206

SELECTED FILL

C. For any off-site material proposed for use on site as General Fill, Select Fill, or topsoil, the Remediation Contractor must provide the following information (for each material) at least three weeks prior to bringing such material on site:

1. Certification that the proposed fill material is from a NYSDOT-certified source.

2. Results of analytical testing for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides/herbicides, and inorganics to demonstrate that the proposed fill material meets the Allowable Constituent Levels for Imported Fill or Soil (Commercial/Industrial Use) presented in Appendix 5 of NYSDEC DER-10 – Technical Guidance for Site Investigation and Remediation.

3. Certification that the laboratory used to analyze the proposed fill material is certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) for the parameters being analyzed.

D. For excavated soil proposed for reuse on-site, soil must meet the following conditions, as documented by the Remediation Contractor:

1. Soil that is free of debris/rubble (e.g., wood, concrete, brick).

2. Soil is free of visual impacts (including obvious staining and sheens) and odors.

3. Soil contains total benzene, toluene, ethylbenzene, and xylene, and polycyclic aromatic hydrocarbons at concentrations less than 10 and 500 parts per million (ppm) (based results of analytical testing to be conducted by the Remediation Engineer).

4. Soil contains PCBs at a concentration less than 25 ppm (i.e., 6 NYCRR Part 375-6 industrial use soil cleanup objective).

5. Soil must be suitable for sustaining vegetative growth and free of organic matter (including wood and plant waste), debris, waste, frozen material, and other deleterious materials and debris, lumps and rocks larger than three inches, and free of loam organic matter, very soft clays, swelling clays, and fine uniform sands that may be difficult to compact.

E. Controlled Low-Strength Material (CLSM)

1. Description of Remediation Contractor's proposed CLSM mixture design, including sources and proportions of CLSM ingredients.

MATERIALS AND PERFORMANCE – SECTION 02206

SELECTED FILL

2. CLSM producer's certification that the mixture design will achieve the strength specified in this section.

3. Remediation Contractor's proposed method of placement for CLSM.

4. Bills of lading for the transport and delivery of imported fill materials to the site (documenting that the materials were obtained from NYSDEC-approved sources).

5. Certified batch reports for CLSM delivered to the site (documenting that the CLSM was prepared in accordance with the approved mixture design).

PART 2 - PRODUCTS

2.01 MATERIALS

A. General

1. Satisfactory Fills: Soil Classification Groups GW, GP, GM, SW, SP, and SM (as determined by ASTM D2487), or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen material, organic matter, and other deleterious materials.

2. Unsatisfactory Fills: Soil Classification Groups GC, SC, CL, ML, OL, CD, MH, OM, and PT (as determined by ASTM D2487), or a combination of these groups, unless otherwise required in the Contract Documents. Where soils of these groups are specifically required in the Contract Documents, the soils shall be considered satisfactory only for the specific use for which they are specified. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

3. Excavated soil may be suitable for re-use as subsurface backfill subject to the conditions set forth in the Remedial Action Design.

B. Soil Fill

1. Soil fill shall consist of clean common earth fill, free from excessive moisture, organic material, coatings, sharp angular stones, unsatisfactory soils, and other deleterious materials.

2. Soil fill shall have the following gradation by weight:

Percent Passing	Sieve
100	3 inch
10 to 30	No. 200

MATERIALS AND PERFORMANCE – SECTION 02206

SELECTED FILL

C. Granular Type Fill

1. Type "B" Crushed Stone

Thoroughly washed clean, sound, tough, hard crushed limestone or approved equal free from coatings. Crushed stone shall have the following gradation by weight:

Percent Passing	Sieve
100	1 1/2 inch
0 to 25	3/4 inch
0 to 5	1/2 inch

2. Type "C" #2 Crushed Stone

Thoroughly washed clean, sound, tough, hard crushed limestone or approved equal free from coatings. Crushed stone shall have the following gradation by weight:

Percent Passing	Sieve
100	1 1/2 inch
90 to 100	1 inch
0 to 15	1/2 inch

3. Type "D" Washed Sand

Washed coarse sand having the following gradation by weight:

Percent Passing	Sieve
100	3/8 inch
95 to 100	No. 4
80 to 100	No. 8
50 to 85	No. 16
25 to 60	No. 30
10 to 30	No. 50
2 to 10	No. 100

MATERIALS AND PERFORMANCE – SECTION 02206

SELECTED FILL

4. Type "E" Run-of-Bank Gravel

Run-of-bank gravel or other acceptable granular material, free from organic matter, having the following gradation by weight:

Percent Passing	Sieve
100	1 1/2 inch
30 to 65	1/4 inch
0	to 10 #200 sieve

5. Type "F" Run-of-Crusher Stone

Run-of-crusher hard durable limestone, or approved equal, having the following gradation by weight:

Percent Passing	Sieve
100	1 1/2 inch
95 to 100	1 inch
65 to 85	1/2 inch
40 to 60	1/4 inch
0 to 10	#200 sieve

D. CLSM

1. Type I or II Portland Cement conforming to the chemical and physical requirements of those respective types as specified in AASHTO M 85.

2. Clean (potable) water free from oil, salts, acid, strong alkalis, vegetable matter, and other impurities that would have an adverse effect on the quality of the CLSM.

3. Aggregates shall have the following gradation by weight:

Sieve	Percent Passing
No. 10	100
No. 200	0-20

4. CLSM ingredients shall be mixed to produce a uniform product with a flow of 4 to 8 inches prior to placement (as determined by ASTM D6103) and capable of achieving a 28-day unconfined compressive strength between 50 and 150 psi.

5. CLSM ingredients shall be proportioned by the ready mixed concrete supplier on the basis of field experience and/or laboratory trial mixtures to produce a cohesive and non-segregating mixture meeting the specified properties.

6. In work involving quantities of CLSM less than 2 cubic yards, the Contractor may use a small construction mixer. The mixer shall be capable of mixing the CLSM ingredients to produce a uniform product that has the compressive strength and flow consistency specified in this section.

2.02 LABORATORY TESTING AND QUALITY CONTROL

A. Any off-site materials proposed for use as General Fill, Select Fill, or topsoil must be from a NYSDOT-certified source, and results of analytical testing for VOCs, SVOCs, PCBs, pesticides/herbicides, and inorganics must be presented to demonstrate that the proposed fill materials meet the Allowable Constituent Levels for Imported Fill or Soil (Commercial/Industrial Use) presented in Appendix 5 of NYSDEC DER-10 – Technical Guidance for Site Investigation and Remediation. The laboratory used to analyze the proposed fill materials shall be certified by the NYSDOH ELAP for the parameters being analyzed. The laboratory shall be capable of providing detection limits at or below the commercial soil cleanup objectives outlined DER-10 to allow for comparison of the analytical results to those objectives.

B. The Remediation Contractor shall provide the analytical data to the Remediation Engineer at least three weeks prior to bringing any General Fill, Select Fill, or topsoil material on site. If sample results show that the proposed material does not meet the requirements, the Remediation Contractor must identify a new source for the material and provide the required data report for the new source of material prior to the use of such material on site.

C. Prior to importing fill materials to the site, Remediation Contractor shall submit a laboratory test report for each material type that indicates the grain-size profile of the material as determined by ASTM D422.

PART 3 - EXECUTION

3.01 PLACEMENT

A. In general, fill material shall be placed and compacted in horizontal layers not exceeding those thicknesses specified in M&P – Section 02201. Sub-grade that will receive fill material shall be first approved by the Remediation Engineer. Fill materials shall not be placed in areas that will not support the weight of construction equipment.

B. Each lift of fill material shall be thoroughly tamped or rolled to the required degree of compaction by mechanical tampers or vibrators as specified in M&P – Section 02201. Successive lifts shall not be placed until the lift under construction has been thoroughly compacted.

C. Where required, the Remediation Contractor shall (at its own expense) moisture-condition the fill material to meet the required degree of compaction. If the material is too wet for satisfactory compaction (due to rain or other causes), it shall be allowed to dry or be removed as required before compaction.

D. Any settlements in the finished work shall be restored to design grade by the Remediation Contractor at no additional cost to the Owner.

E. CLSM

1. CLSM shall be batched and delivered in accordance with AASTHO M 157.

2. CLSM may be transported in open haul units provided the material is placed within 30 minutes of the end of mixing. A rotating drum unit capable of 2 to 6 rotations per minute shall be used to transport CLSM that cannot be placed within 30 minutes after the end of mixing.

3. CLSM shall be placed at a uniform rate using methods identified by the Remediation Contractor and approved by the Remediation Engineer.

4. CLSM shall not be placed on frozen ground. The minimum ambient temperature at the time of placement shall be 35°F.

3.02 DOCUMENTATION

A. Bills of Lading

1. The Remediation Contractor shall prepare a bill of lading for each load of imported fill material transported to the site.

2. Bills of lading shall include (at a minimum) the following information:

   a. Source address.
   b. Name of shipping company.
   c. Transporter's name.
   d. Load description (fill material type).
   e. Gross and net weight of load.

3. Bills of lading shall be maintained on-site in the project file and submitted to the Remediation Engineer on a monthly basis.

MATERIALS AND PERFORMANCE – SECTION 02206

SELECTED FILL

B. Batch Reports

1. A batch report shall be prepared and certified by the production facility for each load of CLSM delivered to the site.

2. A batch report shall accompany each load of CLSM to the site and shall be submitted to the Remediation Engineer upon arrival.

3.03 FIELD TESTING AND QUALITY CONTROL

A. In-place density tests shall be performed (in accordance with ASTM D6938) by an independent testing laboratory at the Remediation Contractor's expense and at the frequency specified in M&P – Section 02201.

B. If a defect (e.g., insufficient layer thickness, materials that exceed particle size requirements, etc.) is discovered in a finished fill material layer, the Remediation Engineer will determine the extent and nature of the defect by additional testing, observation, a review of records, or other means the Remediation Engineer deems appropriate. The Remediation Contractor is responsible for correcting all deficiencies to the satisfaction of Owner/Remediation Engineer and at no additional cost to the Owner.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02208

RESTORATION OF SURFACES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. All types of surfaces, sidewalks, curbs, gutters, culverts, and other features disturbed, damaged, or destroyed during the performance of the Project, shall be restored and maintained as specified herein and as shown on the Design Drawings.

2. The quality of materials and the performance of work used in the restoration shall produce a surface or feature equal to or better than the condition of each before the Project began, as reviewed by the Remediation Engineer.

B. Related Work Specified Elsewhere

1. Section 02201 – Earthwork

2. Section 02205 – Excavation Support and Protection

3. Section 02210 – Topsoil and Seeding

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. New York State Department of Transportation (NYSDOT) Standard Specifications.

1.03 SUBMITTALS

A. If surfaces are damaged during the remedial construction activities, the Remediation Contractor shall provide all details (e.g., materials list, shop drawings) for proposed restorations of concrete (i.e., sidewalks) and asphalt pavement (i.e., roadways) prior to restoring surfaces. Concrete and asphalt pavement surface restorations within local and state right-of-ways shall be approved by the City of Elmira Department of Public Works and/or New York Start Department of Transportation, as appropriate, prior to conducting surface restoration activities.

1.04 SCHEDULE OF RESTORATION

A. After an accepted schedule has been agreed upon, the schedule shall be adhered to unless otherwise revised and reviewed by the Remediation Engineer.

MATERIALS AND PERFORMANCE – SECTION 02208

RESTORATION OF SURFACES

B. The replacement of surfaces at any time, as scheduled or as directed, shall not relieve the Remediation Contractor of responsibility to repair damages by settlement or other failures.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 STONE OR GRAVEL PAVEMENT

A. All pavement and other areas surfaced with stone or gravel shall be replaced with material to match the existing surface unless otherwise specified.

1. The depth of the stone or gravel shall be at least equal to the existing.

2. After compaction, the surface shall conform to the slope and grade of the area being replaced.

3.02 LAWNS AND IMPROVED AREAS

A. If topsoil has been removed from the area to be restored, the area shall be graded to a minimum depth of 6 inches below the proposed finish surface prior to placement of 6 inches of new topsoil.

B. If topsoil has not been removed from the area to be restored, the existing topsoil surface shall be loosened to a depth of 2 to 4 inches prior to reseeding.

C. The furnishing and placing of topsoil, seed, and mulch shall be in accordance with Specification Section 02210 – Topsoil and Seeding.

D. When required to obtain germination, the seeded areas shall be watered in such a manner as to prevent washing out of the seed.

E. Any washout or damage which occurs shall be regraded and reseeded until a good sod is established.

F. The Remediation Contractor shall maintain the newly seeded areas, including regrading, reseeding, watering, and mowing, in good condition in accordance with Specification Section 02210 – Topsoil and Seeding.

MATERIALS AND PERFORMANCE – SECTION 02208

RESTORATION OF SURFACES

3.03 OTHER TYPES OF RESTORATION

A. Trees, shrubs, and landscape items damaged or destroyed as a result of the construction operations shall be replaced in like species and based on discussions with the property owner, unless otherwise directed by the Remediation Engineer.

B. Fences destroyed or removed as a result of the construction operations shall be replaced in like size and material and shall be replaced at the original or new location, as shown on the Design Drawings, or as directed by the Remediation Engineer.

C. Other site features removed or damaged as a result of the construction operations (e.g., sidewalks, curbs) shall be restored in-kind to their original location and condition unless otherwise indicated in the Remedial Action Design, or as directed by the Remediation Engineer, the City of Elmira Department of Public Works, or the New York State Department of Transportation.

3.04 MAINTENANCE

A. The finished products of restoration shall be maintained in an acceptable condition for and during a period of one year following the date of substantial completion or other such date as set forth elsewhere in the Remedial Action Design.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02209

CLEARING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Clearing and grubbing outside of the excavation limits and within the Project Work Limits (as needed), or as directed by the Remediation Engineer, of the following:

   a. Topsoil.

   b. Pieces of rock up to ½ cubic yard in volume.

   c. Trees and bushes.

   d. Pavements.

   e. Brush and scrub.

   f. Logs and stumps.

   g. Refuse and rubbish (on top of ground surface).

   h. Decayed and growing organic matter.

   i. Snow and ice.

2. Cleared materials that come in contact with impacted or potentially impacted materials shall be handled in accordance with Specification Section 02415 – Impacted Material Handling and Excavation Procedures.

3. Cleared materials that do not come in contact with impacted or potentially impacted materials shall be stockpiled on site, downsized (as appropriate and as required by the waste transportation and disposition vendors), and transported off site to an appropriate Owner-selected disposal facility in accordance with all applicable rules and regulations (including local flow control regulations).

4. All stockpiled materials shall be removed from the site within 24-hours of placement, unless a longer duration is approved by the Owner.

5. The Remediation Contractor shall remove, replace, support, and protect all utility poles and posts as required.

MATERIALS AND PERFORMANCE – SECTION 02209

CLEARING

B. Related Work Specified Elsewhere

1. Section 01110 – Environmental Protection Procedures
2. Section 02201 – Earthwork
3. Section 02203 – Site Grading
4. Section 02208 – Restoration of Surfaces
5. Section 02210 – Topsoil and Seeding
6. Section 02415 – Impacted Material Handling and Excavation Procedures

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. Tree Protection

1. Any tree that will not, in the opinion of the Remediation Engineer, hinder construction or landscaping shall be protected.

B. Monitoring Well Protection

1. Existing monitoring wells designated on the Design Drawings shall be protected.

C. Debris Removal

1. Refer to Part 1.01A, Items 2 and 3 above.

D. Chain Link Fence

1. Existing chain link fence posts and appurtenances suitable for reuse shall be dismantled and stored for such, as directed by the Remediation Engineer.
2. Existing chain link fence that is damaged shall be disposed of and replaced as directed by the Remediation Engineer, in kind.

MATERIALS AND PERFORMANCE – SECTION 02209

CLEARING

E. Site and Access Clearing

1. Any trees not subject to clearing, but damaged by the Remediation Contractor as part of construction activities and requiring removal, in the opinion of the Remediation Engineer, shall be removed and replaced by the Remediation Contractor at its own expense.

2. To the extent practicable, existing vegetation and topsoil shall be left in place in areas that will not be subject to near-term construction activities.

F. Erosion and Sediment Control

1. Erosion and sediment control procedures, inclusive of mulching, shall be implemented at the site in accordance with the Design Drawings and Specification Section 01110 – Environmental Protection Procedures. Erosion and sediment control shall occur as required prior to initiating clearing activities.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02210

TOPSOIL AND SEEDING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. The furnishing of topsoil, fertilizer, seed, and mulch; the preparation of the sub-grade and the placing of the topsoil, fertilizer, seed, and mulch.

2. The maintenance required until acceptance.

B. Related Work Specified Elsewhere

1. Section 01110 – Environmental Protection Procedures

2. Section 02201 – Earthwork

3. Section 02206 – Selected Fill

4. Section 02208 – Restoration of Surfaces

1.02 APPLICABLE REGULATIONS

A. New York State Standards and Specifications for Sediment and Erosion Control (latest edition).

1.03 SUBMITTALS

A. The Contractor Engineer shall submit the source location and associated data (including pH and organic content) for off-site topsoil.

B. Analytical results for the proposed topsoil material. Refer to Specifications Section 02206 – Selected Fill for laboratory and analytical testing requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Topsoil shall be unfrozen friable clayey loam free from clay lumps, stones, roots, sticks, stumps, brush, and foreign objects. The topsoil shall have a pH ranging between 5.0 and 7.5 and an organic content between 5 and 20 percent, as determined by laboratory testing of representative samples.

MATERIALS AND PERFORMANCE – SECTION 02210

TOPSOIL AND SEEDING

B. Fertilizer shall be a standard-quality, commercial carrier of available plant food elements (a complete, prepared, and packaged material containing a minimum of 5 percent nitrogen, 10 percent phosphoric acid, and 10 percent potash, or as recommended by the seed supplier).

1. Each bag of fertilizer shall bear the manufacturer's guaranteed statement of analysis.

C. Seed mixtures

1. Permanent seed mixture shall consist of the following (or an approved equivalent):

Type	Variety	Application Rate (lbs. per 1,000 sq. ft.)
Birdsfoot trefoil[3]	Empire/Pardee	0.2[4]
OR		
Common white clover[3]	Common	0.2
Tall fescue	KY-31/Rebel	0.45
Redtop	Common	0.05
OR		
Ryegrass (perennial)	Pennfine/Linn	0.10

Notes:
1. lbs. = Pounds.
2. sq. ft. = Square feet.
3. Add inoculants immediately prior to seeding.
4. Mix 0.1lbs. each of Empire and Pardee or 0.1 lbs. of Birdsfoot (of any mixture of Empire and Pardee) and 0.1 lbs. of white clover per 1,000 sq. ft.

D. The Remediation Contractor shall select, supply, and install mulch material in accordance with this Section, the New York State Standards and Specifications for Erosion and Sediment Control, and/or as directed by the Remediation Engineer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The area to receive topsoil shall be graded to a depth of not less than six inches below the proposed finished grades shown on the Design Drawings or as directed by the Remediation Engineer.

1. All debris and inorganic material shall be removed and the surface loosened for a depth of two inches prior to the placing of the topsoil.

MATERIALS AND PERFORMANCE – SECTION 02210

TOPSOIL AND SEEDING

2. The topsoil shall not be placed until the sub-grade is in suitable condition and shall be free of excessive moisture and frost.

B. The fertilizer shall be applied uniformly at the rate of 15 pounds per 1,000 square feet, unless otherwise specified by the seed supplier.

C. After the topsoil surface has been fine graded, the seed mixture shall be uniformly applied upon the prepared surface with a mechanical spreader at a rate of not less than 1 pound per 1,000 square feet.

1. Seeding and mulching shall not be done during windy weather.

2. The seed shall be raked lightly into the surface and rolled with a light lawn roller to incorporate seed into the uppermost ½-inch of soil.

D. The mulch shall be hand or machine spread to form a continuous blanket over the seed bed, approximately two inches uniform thickness at loose measurement. Excessive amounts or bunching of mulch will not be permitted.

1. Mulch shall be anchored by an acceptable method.

2. Unless otherwise specified, mulch shall be left in place and allowed to disintegrate.

3. Any anchorage or mulch that has not disintegrated at time of first mowing shall be removed. Anchors may be removed or driven flush with ground surface.

E. Seeded areas shall be watered as often as required to obtain germination and to obtain and maintain a satisfactory sod growth. Watering shall be in such a manner as to prevent washing out of seed.

F. Hydroseeding may be accepted as an alternative method of applying fertilizer, seed, and mulch. If hydroseeding is the selected method of planting, the following shall also apply:

1. Mulch materials shall be free of weeds and other foreign materials; free of growth or germination inhibiting ingredients; manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material will become uniformly suspended to form a homogeneous slurry; dyed a suitable color to facilitate inspection of the placement of the material; and capable of forming an absorptive mat, which will allow moisture to percolate into the underlying soil.

MATERIALS AND PERFORMANCE – SECTION 02210

TOPSOIL AND SEEDING

2. Seeding and mulching shall be a one-step process in which seed, fertilizer, hydraulic mulch, and mulch adhesive are applied simultaneously in a homogeneous water slurry via hydraulic seeder/mulcher.

3. Hydraulic Seeder/Mulcher: Apply seed, fertilizer, hydraulic mulch, and temporary cover adhesive using an acceptable hydraulic seeder/mulcher. The hydraulic seeder/mulcher shall be equipped with mechanical agitation equipment capable of mixing the materials into a homogeneous water slurry and maintaining the slurry in a homogeneous state until it is applied. The discharge pumps and gun nozzles shall be capable of applying the materials uniformly.

4. Volume Certification: Hydraulic seeding/mulching equipment shall have the tank volume certified by a plate affixed by the manufacturer and confirmed by the Remediation Engineer by means of measurements or tests prior to the commencement of work. This plate shall be affixed in plain view on the hydraulic seeder/mulcher and shall not be removed or altered. The plate shall certify tank volume only, and shall imply equipment conformance to other requirements of this Section.

5. Application of Materials: Measure the quantity of each material to be charged into the hydraulic seeder/mulcher tank either by mass or by a system of mass-calibrated volume measurements acceptable to the Remediation Engineer. Add the materials to the tank while it is being loaded with water. Thoroughly mix the materials into a homogeneous water slurry and distribute uniformly over the designated surface area via the hydraulic seeder/mulcher. Apply seed, fertilizer, and where applicable, hydraulic mulch adhesive within 2 hours of being charged into the hydraulic seeder/mulcher tank. During loading of the hydraulic seeder/mulcher tank, add materials in the following sequence: seed, then fertilizer, then, where applicable, hydraulic mulch, and adhesive.

6. Blend into existing adjacent grass areas to bond new growth to existing adjacent areas or to previous applications to form uniform surfaces.

7. Seed mixture shall be applied in accordance with the manufacturer's written instructions and Part 2.01 of this Section.

3.02 MAINTENANCE

A. All lawn areas shall be mowed by the Remediation Contractor before the new grass reaches a height of approximately four to six inches.

MATERIALS AND PERFORMANCE – SECTION 02210

TOPSOIL AND SEEDING

B. Remediation Contractor shall maintain the newly seeded areas in good condition until seeded areas have established a minimum uniform 80 percent density of perennial vegetation and until acceptance by the Remediation Engineer, including regular mowing to a height of approximately two inches. The Remediation Contractor shall be required to repair any areas of erosion or failed vegetative growth and reseed as necessary until complete coverage and satisfactory sod growth is achieved.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02270

GEOTEXTILE FABRIC

PART 1 - GENERAL

1.01 DESCRIPTION

A. Furnishing and installing geotextiles as specified in this section and in accordance with the manufacturer's recommendations/specifications.

B. Quality assurance (QA)/quality control (QC) testing of geotextiles as specified in this section and in accordance with the manufacturer's recommendations/specifications

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American Association of State Highway and Transportation Officials (AASHTO). The following AASHTO specification is referenced in this section and is to be considered part of this section Remediation Engineer.

M 288 Standard Specification for Geotextile Specification for Highway Applications

B. ASTM International (ASTM). The following ASTM specifications are referenced in this section and are to be considered part of this section:

D3786 Standard Test Method for Bursting Strength of Textile Fabrics (Diaphragm Bursting Strength Tester Method)

D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus

D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity

D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles

D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile

D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles

MATERIALS AND PERFORMANCE – SECTION 02270

GEOTEXTILE FABRIC

C. Geosynthetics Research Institute (GRI). The following GRI test method is referenced in this section and is to be considered part of this section:

GT12 Test Methods and Properties for Non-Woven Geotextiles Used as Protection (or Cushioning) Materials

D. 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. Non-Woven Geotextile

1. Written certification that the minimum average roll values (MARVs) specified in this section are guaranteed by the manufacturer.

2. Manufacturer's standard warranty provided for the non-woven geotextile fabric.

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. Unit weight.

b. Grab tensile strength.

c. Grab tensile elongation.

d. Trapezoidal tear strength.

e. Puncture strength.

f. Ultraviolet (UV) resistance.

4. Remediation Contractor's written certification that the field-delivered material meets the manufacturer's specifications.

B. Remediation Contractor's written certification (provided prior to installation) that the field-delivered geotextiles have not been damaged due to improper transportation, handling, or storage.

MATERIALS AND PERFORMANCE – SECTION 02270

GEOTEXTILE FABRIC

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. SKAPS Industries.

B. TenCate Mirafi.

C. U.S. Fabrics.

D. Approved equal.

2.02 MATERIALS

A. Non-woven geotextile shall be of needle-punched construction and consist of long-chain polymeric fibers or filaments composed of polypropylene. The non-woven geotextile shall be chemically inert to naturally encountered chemicals, acids, and bases and resist biological degradation.

B. Non-woven geotextile shall 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.

C. The non-woven geotextile shall meet GRI GT12 specifications and have the following MARVs:

Property	ASTM Test Method	Units	MARV
Unit Weight	D5261	oz/yd^2	12
Grab Tensile Strength	D4632	lb	300
Grab Tensile Elongation	D4632	%	50
Trapezoidal Tear Strength	D4533	lb	115
Puncture Strength	D4833	lb	140
UV Resistance (at 500 hours)	D4355	% strength retained	70

2.03 DELIVERY, STORAGE, AND HANDLING

A. Geotextiles shall be furnished in a protective wrapping that shall be labeled with the manufacturer's name, product identification, lot number, roll number, and dimensions.

B. Geotextile shall be protected from ultraviolet light, precipitation, mud, soil, excessive dust, puncture, cutting, and/or other damaging conditions prior to and during delivery and on-site storage.

MATERIALS AND PERFORMANCE – SECTION 02270

GEOTEXTILE FABRIC

C. Geotextiles shall be shipped and stored in relatively opaque and watertight wrappings.

D. Geotextiles shall be stored on-site in locations approved by the Owner/Remediation Engineer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Prior to installing the geotextile, placement surfaces shall be leveled and uniformly compacted, as necessary and as required by Materials and Performance (M&P) – Section 02201, to provide a stable interface for the geotextile that is as smooth as possible.

B. The sub-grade shall be cleared of all sharp objects, tree stumps, and large stones.

C. Geotextiles shall be placed (rolled out) in the direction of most frequent vehicular travel.

D. Adjoining edges shall have a 2- to 3-foot overlap and shingled in a manner that prevents material rollup during aggregate placement.

E. Placement of the geotextile shall not be conducted during adverse weather conditions. The geotextile shall be kept dry during storage and up to the time of deployment. During windy conditions, all geotextiles shall be secured with sandbags or an equivalent approved anchoring system. Removal of the sandbags or approved anchoring system shall only occur upon placement of an overlying bedding layer.

F. Proper cutting tools shall be used to cut and size the geotextiles. Care shall be exercised while cutting geotextiles.

G. During the placement of geotextiles, all dirt, dust, sand, and mud shall be kept off to prevent clogging.

H. Geotextiles shall be covered within the time period recommended by the manufacturer, and in no case later than two weeks after its placement.

I. In all cases, seams on slopes shall be parallel to the line of slope. No horizontal seams shall be allowed on slopes.

J. Aggregates shall be placed in a manner which prevents damage to or dislodgement of underlying geosynthetics.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02272

GEOMEMBRANE – HDPE LINER

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. All labor, materials, equipment, and services necessary to furnish and install 40-mil High Density Polyethylene (HDPE) liner systems within the decontamination and other areas as indicated in the Remedial Action Design and to complete the associated quality control/quality assurance (QC/QA) activities.

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:

D792 Standard Test Methods for Density and Specific Gravity (Relative Gravity) of Plastics by Displacement

D1004 Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting

D1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique

D1603 Standard Test Method for Carbon Black Content in Olefin Plastics

D3895 Standard Test Method for Oxidative Induction Time of Polyolefins by Differential Scanning Calorimetry

D4218 Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique

D4437 Standard Practice for Non-destructive Testing (NDT) for Determining the Integrity of Seams Used in Joining Flexible Polymeric Sheet Geomembranes

D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

D5397 Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test

D5596 Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics

MATERIALS AND PERFORMANCE – SECTION 02272

GEOMEMBRANE – HDPE LINER

D5721 Standard Practice for Air-Oven Aging of Polyolefin Geomembranes

D5885 Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry

D5994 Standard Test Method for Measuring Core Thickness of Textured Geomembrane

D6693 Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

D7466 Standard Test Method for Measuring the Asperity Height of Textured Geomembrane

B. Geosynthetics Research Institute (GRI). The following GRI test methods are referenced in this section and are to be considered part of this section:

GM11 Accelerated Weathering of Geomembranes using a Fluorescent UVA-Condensation Exposure Device

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. Written certification that the minimum test values provided in Part 2.02 of this section are guaranteed by the manufacturer.

B. Manufacturer's standard warranty for the geomembrane.

C. 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:

1. Thickness (ASTM D5994).

2. Asperity Height (ASTM D7466).

3. Density (ASTM D1505).

4. Tensile Properties (ASTM D6693).

MATERIALS AND PERFORMANCE – SECTION 02272

GEOMEMBRANE – HDPE LINER

5. Tear Resistance (ASTM D1004).

6. Puncture Resistance (ASTM D4833).

7. Stress Crack Resistance (ASTM D5397).

8. Carbon Black Content (ASTM D1603).

9. Carbon Black Dispersion (ASTM D5596).

10. Oxidative Induction Time (OIT) (ASTM D3895 or D5885).

11. Oven Aging at 85°C (ASTM D5721).

12. Ultraviolet (UV) Resistance (GRI GM11).

D. 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.

E. FML lot and roll number.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Solmax Geosynthetics.

B. GSE Lining Technology, Inc.

C. Poly-Flex, Inc.

D. Approved equal.

MATERIALS AND PERFORMANCE – SECTION 02272

GEOMEMBRANE – HDPE LINER

2.02 MATERIALS

A. HDPE Geomembrane.

1. HDPE geomembrane liner shall meet the following minimum test values:

Property	Test Method	Test Value
Thickness (min. avg.) • Lowest individual for 8 out of 10 values • Lowest individual for any of the 10 values	ASTM D5994	38 mil 36 mil 34 mil
Asperity Height (min. avg.) (See Note 1)	ASTM D7466	10 mil
Density (min. avg.)	ASTM D1505/D792	0.940 g/cm^3
Tensile Properties (min. avg.) (See Note 2) • Yield Strength • Break Strength • Yield Elongation • Break Elongation	ASTM D6693 (Type IV)	 84 lb/in 60 lb/in 12% 100%
Tear Resistance (min. avg.)	ASTM D1004	28 lb
Puncture Resistance (min. avg.)	ASTM D4833	60 lb
Stress Crack Resistance (See Note 3)	ASTM D5397	300 hrs
Carbon Black Content (range)	ASTM D1603 (See Note 4)	2.0 – 3.0%
Carbon Black Dispersion	ASTM D5596	See Note 5
OIT (min. avg.) (See Note 6) • Standard OIT or • High Pressure OIT	 ASTM D3895 ASTM D5885	 100 min. 400 min.
Oven Aging at 85°C (% retained after 90 days) (See Notes 6 and 7) • Standard OIT (min. avg.) or • High Pressure OIT (min. avg.)	ASTM D5721 ASTM D3895 ASTM D5885	 55% 80%
UV Resistance (See Note 8) • Standard OIT (min. avg.) or • High Pressure OIT (min. avg.) – % retained after 1,600 hours (See Note 10)	GRI GM11 ASTM D3895 ASTM D5885	 See Note 9 50%

Notes:

1. Of 10 readings; 8 out of 10 must be ≥ 5 mils (see also Note 6).
2. Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction.
   Yield elongation is calculated using a gage length of 1.3 inches
   Break elongation is calculated using a gage length of 2.0 inches
3. The notched constant tensile load (NCTL) test is not appropriate for testing geomembranes with textured or irregular rough surfaces. Test should be conducted on smooth edges of textured rolls or on smooth sheets made from the same formulation as being used for the textured sheet materials. The yield stress used to calculate the applied load for the NCTL test should be the manufacturer's mean value via manufacturer quality control testing.
4. Other test methods, such as ASTM D4218 or microwave methods, are acceptable if an appropriate correlation to ASTM D1603 can be established.
5. Carbon black dispersion (only near spherical agglomerates) for 10 different views:
   9 in Categories 1 or 2 and 1 in Category 3

6. The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content of the geomembrane.
7. It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.
8. The condition of the test should be 20-hour UV cycle at 75°C followed by 4-hour condensation at 60°C.
9. Not recommended since the high temperature of the Standard OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.
10. UV resistance is based on percent retained value regardless of the original High Pressure OIT value.

2. The geomembrane shall be free of defects, such as holes or blisters, or any contamination by foreign matter.

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 liable 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/Remediation Engineer.

MATERIALS AND PERFORMANCE – SECTION 02272

GEOMEMBRANE – HDPE LINER

PART 3 - EXECUTION

3.01 INSTALLATION

A. General Requirements

1. The liner shall be placed, seamed, and tested in accordance with the manufacturer's recommendations/specifications.

2. The installation of geomembrane liner shall be performed 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. The placement of geomembrane panels shall follow all instructions on the boxes or wrapping containing the material that describe the proper methods of unrolling the panels.

2. Liner deployment shall not be undertaken if weather conditions will preclude material seaming following deployment.

3. During placement, geomembrane shall be visually inspected for uniformity, tears, punctures, blisters, or other damage or imperfections. Any such damage or imperfections shall be immediately repaired and reinspected at the Remediation Contractor's expense.

4. No equipment used shall damage the liner by handling, trafficking, leakage of hydrocarbons, or other means.

5. No personnel working on the liner shall smoke, wear damaging shoes, or engage in other activities that could damage the liner.

6. The prepared surface underlying the liner shall not be allowed to deteriorate after acceptance, and shall remain acceptable up to the time of liner installation and until completion of the project.

7. Adequate temporary loading and/or anchoring (e.g., sand bags), not likely to damage the liner, shall be placed 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. Direct contact with the liner shall be minimized. In high-traffic areas, the liner shall be protected by geotextiles, extra geomembrane, or other suitable materials.

9. The method used to unroll or adjust the panels shall not cause excessive scratches or crimps in the liner and shall not damage the supporting soil or underlying geotextile (where applicable).

10. The method used to place the panels shall minimize the potential for wrinkles (especially differential wrinkles between adjacent panels).

11. Any damage to the geomembrane panels or portions of the panels as a result of placement shall be replaced or repaired 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. Generally, all seams whether field or factory, shall be oriented parallel to the line of slope, not across slope. At liner penetrations and corners, the number of seams shall be minimized.

C. The area of the liner to be seamed shall be cleaned and prepared 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 "fishmouths" resulting from seam orientation.

D. Field seaming is prohibited when either the air or sheet temperature is below 32°F, when the sheet temperature exceeds 122°F, or when the air temperature is above 104°F. At air or sheet temperatures between 32°F and 40°F, seaming shall be conducted directly behind a preheating device. In addition, seaming shall not be conducted when the liner

material is wet from precipitation, dew, fog, etc., or when winds are in excess of 20 miles per hour.

E. Seaming shall not be performed on frozen or excessively wet underlying surfaces.

F. Seams shall have an overlap beyond the weld large enough to perform destructive peel tests, but shall not exceed 5 inches.

G. The Remediation Contractor shall 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 fishmouths occur, the material shall be cut, overlapped, and an overlap weld shall be applied. 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. The Remediation Contractor shall perform non-destructive seam testing on all field seams.

1. Non-destructive seam testing shall be conducted 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:

   a. Apply a soapy water mixture over the seam.

   b. Place vacuum box over soapy seam and form a tight seal.

   c. Create a vacuum by reducing the vacuum box pressure to 5 psi for 10 seconds.

   d. Observe through the vacuum box window any bubbles.

   e. Where bubbles are observed, mark seam for repair.

   f. Move vacuum box further down seam, overlapping tested seam by 3 inches.

   g. 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, used to repair small sections of extruded seams.

MATERIALS AND PERFORMANCE – SECTION 02272

GEOMEMBRANE – HDPE LINER

3. Spot Welding or Seaming, used to repair pinholes or other minor, localized flaws.

4. Capping, used to repair large lengths of failed seams.

5. Topping, used 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 -

MATERIALS AND PERFORMANCE - SECTION 02399

FORMER SEWER ABANDONMENT

PART 1 – GENERAL

1.01 DESCRIPTION

A. This Section specifies the abandonment of former sewer piping where such piping or structures will be removed to facilitate in-situ soil stabilization. Such piping will be cut, capped, and abandoned in place at the limits of the ISS areas.

1.02 Related Work Specified Elsewhere

A. Section 02206 – Selected Fill

PART 2 - PRODUCTS\EXECUTION (NOT USED)

PART 3 – EXECUTION

3.01 SEWER ABANDONMENT

A. The Remediation Contractor shall remove all former sanitary or storm sewer piping within in-situ stabilization areas by saw cutting all former sanitary or storm sewer piping at the limits of the ISS areas. The ends of the abandoned piping shall be filled with flowable fill (low strength concrete) to eliminate the pipe's ability to collect, convey, or store stormwater and/or groundwater. Following placement of flowable fill, the Remediation Contractor shall install a mechanical plumber's plug at the cut end of the piping.

B. Manhole and catch basin structures to be abandoned shall be abandoned such that no part of the abandoned structure remains within 2 feet of finished grade. Use of the construction material manhole (e.g., concrete, brick) material to backfill structures is prohibited. Abandoned structures shall be filled to within 2 feet of grade with flowable fill (low strength concrete) and the remainder of the structure will be filled with compacted Type E run-of-bank gravel to the required grade.

C. All excavated/disturbed earth areas shall be restored as specified in the Contract Documents, or otherwise restored to conditions existing prior to construction.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02415

IMPACTED MATERIAL HANDLING AND EXCAVATION PROCEDURES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. The Remediation Contractor shall furnish all labor, materials, tools, and equipment and perform all operations necessary for the excavation of soil and debris to the limits identified in the Remedial Action Design. Excavation activities will encounter manufactured gas plant- (MGP-) impacted soil and debris containing volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), inorganics, and non-aqueous phase liquid (NAPL). Excavated materials will be transported to an appropriate offsite. The Remediation Engineer shall be responsible for scheduling and coordinating the off-site transportation of all Project-related solid waste for treatment/disposal at an Owner-selected facility.

2. The Remediation Contractor shall furnish all labor, materials, tools, and equipment and perform all operations necessary to collect, extract, convey, and containerize, all water generated during the Project (e.g., groundwater and precipitation that is extracted from and/or accumulated within the excavation area; equipment/personnel decontamination water). Such water is likely to contain suspended and dissolved solids, VOCs, semi-volatile organic compounds (SVOCs), inorganics, and NAPL. The Remediation Engineer shall be responsible for scheduling and coordinating the off-site transportation of all Project-related water for treatment/disposal at an Owner-selected facility.

B. Related Work Specified Elsewhere

1. Section 01010 – Summary of Work
2. Section 02201 – Earthwork
3. Section 02202 – Rock and Debris Removal
4. Section 02203 – Site Grading
5. Section 02206 – Selected Fill
6. Section 02209 – Clearing
7. Section 02272 – Geomembrane – HDPE Liner

MATERIALS AND PERFORMANCE – SECTION 02415

IMPACTED MATERIAL HANDLING AND EXCAVATION PROCEDURES

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. United States Environmental Protection Agency (USEPA), including Title 40, Code of Federal Regulations (CFR).

B. Occupational Safety and Health Administration (OSHA), including Title 29, Code of Federal Regulations, and Parts 1910 and 1926, OSHA, U.S. Department of Labor.

C. State of New York Rules and Regulations, including Title 6 of the Official Compilation of Codes, Rules, and Regulations (6 NYCRR) Parts 360, 364, and 370 regarding treatment/disposal, transportation, and management of hazardous waste.

D. New York State Department of Environmental Conservation (NYSDEC) Technical Administrative Guidance Memorandum (TAGM) 4061 – *Management of Coal Tar Wastes and Coal Tar Contaminated Soil and Sediment from Former Manufactured Gas Plants (MGPs).*

E. Recommendations of the National Institute of Occupational Safety and Health (NIOSH).

F. Applicable guidelines of the New York State Department of Health (NYSDOH).

G. Transportation regulations, including U.S. Department of Transportation (USDOT) regulations, including Title 29 Parts 171 and 172 and New York State Department of Transportation (NYSDOT) rules and regulations.

H. Applicable federal, state, and local government regulations.

I. Whenever there is a conflict or overlap of the above-referenced documents, the most stringent provision shall be applicable.

J. In the event that any requirement of this Section contradicts any such regulatory requirement, the Remediation Contractor shall immediately notify the Owner of such conflict or contradiction.

1.03 SUBMITTALS

A. The Remediation Engineer shall maintain copies of the following items as they relate to the transport and off-site treatment/disposal of waste materials:

1. Uniform Hazardous Waste Manifests or Bills of Lading.

2. Waste Profiles

MATERIALS AND PERFORMANCE – SECTION 02415

IMPACTED MATERIAL HANDLING AND EXCAVATION PROCEDURES

3. Chain of custody records.

4. Trucking logs.

The above materials shall be provided to the Owner in a timely manner following the last shipment of waste materials from the site.

PART 2 - PRODUCTS

2.01 INFLUENT HOLDING TANKS

A. Influent Holding Tanks (or FRAC tanks) shall be constructed of materials compatible with the constituents that may be present in the water generated during the Project and shall provide a common collection point for such water.

B. The Remediation Contractor shall provide three (3) modular water storage weir tanks (Influent Holding Tanks) that can each accommodate a volume of approximately 20,000 gallons. The tanks shall be equipped with valving, piping, as needed to receive extracted groundwater (and other liquids generated during the Project) and to transfer collected water to a tanker truck for transport to an off-site treatment/disposal facility. Influent Holding Tanks shall include internal baffles/wiers to facilitate the accumulation and removal of solids and floatables.

C. The Remediation Contractor shall provide portable, pre-fabricated spill containment berms for the Influent Holding Tanks.

PART 3 - EXECUTION

3.01 EXCAVATION

A. Excavation activities shall be conducted using excavation equipment (e.g., excavator, backhoe) and methods determined by the Remediation Contractor.

B. The Remediation Contractor shall excavate soil and debris (e.g., brick, concrete, abandoned piping, former oil and tar separator, tree stumps/root balls) to the horizontal and vertical limits identified in the Design Drawings or as directed by the Remediation Engineer.

C. The Remediation Contractor is responsible for providing safe and adequate vehicle/equipment access and egress to the excavation area to facilitate the excavation of materials to the horizontal and vertical limits identified in the Design Drawings or as directed by the Remediation Engineer. The Remediation Contractor shall provide appropriately sized vehicles/equipment (taking into account the close proximity of utility poles and overhead electrical lines) to excavate and load waste materials for off site for treatment/disposal.

MATERIALS AND PERFORMANCE – SECTION 02415

IMPACTED MATERIAL HANDLING AND EXCAVATION PROCEDURES

3.02 MAINTENANCE OF UTILITIES

A. The Remediation Contractor shall field-verify the locations of all utilities (in service and out of service), which include, but may not be limited to, the following: water lines, gas lines, storm sewer lines, sanitary sewer lines, overhead and underground electrical lines/equipment /structures. The Remediation Contractor shall be responsible for reviewing the Remedial Action Design and, if necessary, using a locator ser*vice to field-delinea*te the location(s) of each utility. The Remediation Contractor shall coordinate with Dig Safely prior to initiating any intrusive activities at the site. Once the locations of the utilities have been field-delineated, the Remediation Contractor shall expose the utilities, as appropriate (active and inactive), that are, or may potentially be impacted by the ISS/excavation activities and, for those to be retained, install supports and/or bracing in accordance with the Remediation Contractor's submittal as reviewed by the Remediation Engineer, and as necessary to temporarily support these utilities during ISS/excavation and backfilling activities. During the ISS/excavation activities, the Remediation Contractor shall be responsible for maintaining the temporary support system until the excavation and backfilling activities are completed. If utilities are present at locations that will interfere with the implementation of excavation activities, the Remediation Contractor shall remove and/or relocate the utility (unless otherwise specified in the Remedial Action Design) in coordination with the appropriate utility company.

B. The Remediation Contractor shall relocate, remove, abandon, and/or protect existing utilities as indicated in the Remedial Action Design. In the event that free liquids are encountered within such structures, the Contractor shall collect, containerize, and appropriately dispose of such materials. Free liquids will be characterized by the Remediation Engineer.

3.03 TEMPORARY STOCKPILING OF EXCAVATED MATERIALS

A. Only material suitable for reuse shall be staged at the site. All material destined for off-site treatment/disposal shall be direct-loaded.

B. All dewatering, stabilization, mixing, segregation, and/or downsizing of excavated materials shall be conducted within the limits of the material staging area(s). Emission controls shall be employed, as necessary and to the satisfaction of the Owner/Remediation Engineer, during these activities.

C. Excavated debris (e.g., brick, concrete, stone) not suitable for on site reuse or off-site low-temperature thermal desorption (LTTD) treatment/disposal shall be segregated as appropriate from other excavated materials and downsized (as required by the waste transportation and disposition vendors).

D. Excavated materials shall only be stockpiled in locations approved by the Remediation Engineer so as not to endanger the work, and so that easy access may be had at all times to

all parts of the excavation area. Stockpiled materials shall be kept neatly piled and trimmed, so as to cause as little inconvenience as possible to adjoining property owners.

E. Stockpiles shall be covered by the Remediation Contractor inspected daily and any noted deficiencies shall be promptly corrected. Compliance with the NYSDOH Generic Community Air Monitoring Plan and emission controls must be maintained while materials are being stockpiled.

F. Based on site conditions, the Owner may elect to limit the maximum allowable stockpile size. Limitations to stockpile size shall not result in additional expense to the Owner.

G. Special precautions must be taken to permit access at all times to fire hydrants, fire alarm boxes, police and fire department driveways, and other points where access may involve the safety and welfare of the general public.

3.04 DEBRIS PROCESSING/MATERIAL SEGREGATION

A. The potential exists for encountering brick, concrete, abandoned piping, the building foundation, the former oil and tar separator, tree stumps/root balls, and other debris at the site. The Remediation Contractor shall be responsible for segregating debris into that which is suitable for off-site treatment/disposal and that which requires off-site disposal. Debris that is not suitable for off-site treatment due to size (e.g., concrete, cobbles/boulders, and miscellaneous debris) shall be manipulated into a manageable size (cubic foot) to render the materials suitable for offsite disposal (as determined by the offsite disposal facility). All segregation and downsizing activities shall be conducted within the limits of the material staging area(s). Once segregated and downsized, such debris shall be stockpiled onsite for characterization by the Remediation Engineer prior to off-site disposal at an Owner-approved facility. Materials such as tree stumps/root balls shall be subject to appropriate offsite disposal. The Remediation Engineer shall be responsible for characterization of any materials generated during remedial construction (that are not characterized by the Design Engineer prior to remedial construction) for treatment/disposal.

B. The Remediation Contractor shall segregate materials as necessary during excavation activities to allow for material handling (e.g., mixing, stabilizing) as required to render the materials suitable for off-site treatment/disposal. Stock piles shall be covered at all times (i.e., during both work and non-work hours) with a minimum 10 mil thick plastic cover or Rusmar Foam, except when materials are actively being placed or removed. The cover shall be properly anchored to prevent uplift due to wind conditions and shall be maintained for the duration of excavation activities. The Remediation Contractor shall not be permitted to dispose of any debris offsite prior to Remediation Engineer approval.

C. If free phase NAPL is encountered during the excavation activities, the NAPL shall be removed, segregated, and transferred to an appropriate USDOT-approved container(s)

(proposed by the Remediation Contractor and reviewed by the Remediation Engineer) for characterization by the Remediation Engineer to determine offsite treatment/disposal requirements in accordance with applicable regulations. Containers shall be compatible with chemical characteristics of coal tar-based NAPL.

3.05 EXCAVATION AND MATERIAL DEWATERING

The Remediation Contractor shall use appropriate means and methods to dewater/stabilize materials prior to excavation, and once excavated, prior to transportation to the Owner-selected off-site treatment/disposal facility. Such means and methods may include, but are not limited to, the following (or a combination of the following): active dewatering of the excavation area prior to material removal, use of drier materials excavated from above the water table to augment wet materials excavated from below the water table, temporarily stockpiling excavated materials (within the limits of the excavation area) to allow for gravity dewatering, and use of cement kiln dust (CKD) to augment wet excavated materials. The Remediation Contractor shall not use lime-based stabilizing agents (e.g., quick lime, lime kiln dust) that contain greater than 50 percent Ca/MgO as an amendment. However, NYSDEC approval is required if the Remediation Contractor elects to use lime kiln dust containing lower percentages of free oxide. If the Remediation Contractor elects to use CKD, such material may only be mobilized to and stored at the site in one-ton bags (i.e., no on-site stockpiling of bulk shipments of CKD), unless otherwise approved by the Owner/Remediation Engineer. The Remediation Contractor shall submit (in writing) any proposed deviations from the means/methods identified in the Remedial Action Design to the Owner/Remediation Engineer for approval prior to implementation of such activities.

A. Water that accumulates within the excavation area shall be removed. The Remediation Contractor shall take precautions to minimize the solids present in the water extracted from the excavation area, (e.g., constructing a sump and keeping the intake of the pump off the bottom and away from the sidewalls of the area being dewatered). The sump shall consist of one of or a combination of the following methods:

   1. A sump backfilled with washed gravel.

   2. A perforated vessel (i.e., a corrugated metal pipe or drum), wrapped with a non-woven geotextile fabric and/or filled with gravel.

   3. Straw bales/silt fences around the area where surface water/groundwater is being pumped.

B. To assess the performance of the groundwater extraction system, the Remediation Contractor shall conduct initial system start-up activities. These activities are intended to demonstrate and troubleshoot, as necessary, system operations, and to provide planning-level information regarding subsequent operations related to extraction rates/timing and other related operations. Start-up testing shall occur once the sealed sheet pile wall

encompassing the excavation area has been installed. The results of the extraction system start-up activities may provide additional information related to extraction rates and timing.

C. Groundwater extraction shall occur from within the sealed sheet pile wall encompassing the excavation area and at a location(s) that is offset (horizontally and vertically) from the immediate vicinity of active soil disturbance/removal (to reduce the potential for excessive mixing of these materials and groundwater during extraction). The method of extraction shall include one or more extraction wells, caissons, well points, or similar applications that are appropriately sized and positioned within the excavation area. Included at the end of this Section is an example of a suitable extraction point construction.

D. Neither the construction nor operation of the selected extraction method shall extend more than three feet beneath the base of the excavation without prior approval from the Remediation Engineer.

E. All water generated during the Project shall be collected, extracted, and conveyed to the on-site Influent Holding Tanks for storage by the Remediation Contractor.

F. Project-related water shall be transported off site for treatment/disposal at an Owner-selected facility. The Remediation Engineer shall be responsible for scheduling and coordinating the off-site transport of all Project-related water.

G. The Remediation Contractor shall closely coordinate and monitor the system operations with respect to potential impacts and disruptions to the overall implementation of the Project. Under no circumstances shall the Remediation Contractor discharge any Project-related water to any location without the prior consent of the Remediation Engineer.

H. The Remediation Contractor shall continuously monitor the operation of the extraction system and at no time leave the system operating without qualified attending personnel present within the Project Work Limits. During the initial dewatering activities, the Remediation Contractor may elect to operate the extraction system on a continuous basis during non-working hours (depending on the available on-site storage capacity). Such a plan must be formally communicated (in writing) to the Owner and Remediation Engineer for review and approval.

3.06 DUST, VAPOR, AND ODOR CONTROL

A. Dust, vapor, and odor control activities shall be performed within the Project Work Limits in accordance with the *Community Air Monitoring Plan* (included as an appendix to the Remedial Action Design).

B. The Remediation Contractor shall control dust within the Project Work Limits. The need to implement dust controls shall be based on the results of airborne particulate monitoring

and/or visual observations. Dust monitoring activities shall be conducted within the work/breathing zone by the Remediation Contractor and at the site perimeter by the Remediation Engineer in accordance with the Remediation Contractor's Health and Safety Plan (HASP) and the Remedial Action Design, respectively.

C. The Remediation Contractor may also be required to implement vapor suppression activities based on the results of organic vapor monitoring and/or the presence of nuisance odors. Vapor monitoring activities shall be conducted within the work/breathing zone by the Remediation Contractor and at the site perimeter by the Remediation Engineer in accordance with the Remediation Contractor's HASP and the Remedial Action Design, respectively.

3.07 MATERIAL TESTING

A. Soils to be excavated and groundwater to be extracted during remedial construction activities will be sampled and characterized prior to remedial construction activities by the Design Engineer in accordance with the *Pre-Remediation In-Situ Sampling and Analysis Work Plan*. Results of the sampling and material handling procedures will be presented in *Pre-Remediation In-Situ Sampling and Analysis Report* to be prepared by the Design Engineer.

B. Any additional sampling (if required) during remedial construction activities will be conducted by the Remediation Engineer.

3.08 TRANSPORTATION AND OFF-SITE TREATMENT/DISPOSAL

A. The Owner/Remediation Engineer shall be responsible for the transportation of waste material (e.g., soil, water, debris) generated during excavation activities to an appropriate off-site treatment/ disposal facility(ies), as determined based on the matrix of the waste material and the results of characterization sampling.

B. The Remediation Contractor shall load excavated soil/debris into lined dump trucks for transportation to an appropriate off-site facility for treatment/disposal. The loading activities shall be conducted in accordance with the Remedial Action Design. Based on the results of the waste characterization activities to be conducted by the Design Engineer, the excavated soil/debris deemed suitable for offsite LTTD treatment/disposal will be treated/disposed in a manner consistent with NYSDEC TAGM 4061 (*Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants*). The policy outlines criteria wherein materials that have been contaminated with coal tar waste from MGPs exhibiting only the hazardous waste toxicity characteristic for benzene (D018) may be excluded from the requirements of 6 NYCRR Parts 370 - 374 and 376 when they are destined for permanent thermal treatment. Accordingly, the off-site LTTD facility identified by the Owner shall be permitted to accept such waste material. Other materials generated

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IMPACTED MATERIAL HANDLING AND EXCAVATION PROCEDURES

during the remedial activities will be transported offsite for treatment/disposal based on the results of characterization sampling.

C. The Owner/Remediation Engineer shall be responsible for the disposal of soil free of visual impacts containing total BTEX and total PAHs at concentrations greater than or equal to 10 and 500 mg/kg, respectively, and soil not suitable for reuse at an Owner-selected solid waste facility.

D. All water generated during the Project shall be collected, extracted, and conveyed to the onsite Influent Holding Tanks for storage by the Remediation Contractor.

E. The Remediation Contractor shall transfer collected Project-related water from the onsite Influent Holding Tanks to a tanker truck for transport to an Owner-selected off-site treatment/disposal facility. The Remediation Engineer shall be responsible for scheduling and coordinating the off-site transport of all Project-related water.

G. The Remediation Contractor shall be responsible for properly containerizing and preparing waste material for off-site treatment/disposal. Each waste medium (e.g., soil, water, NAPL, waste debris, PPE) shall be properly containerized via temporary tanks, lined and covered roll-off containers, tanker trucks, or lined and covered dump trailers and properly labeled and stored with like materials. The cover for dump trailers/trucks shall consist of a solid tarp that can be secured on all sides below the top of the box.

H. The Remediation Engineer shall coordinate the transportation and offsite treatment/disposal of materials (e.g., soil, water, debris) generated during excavation activities. The Remediation Engineer, at a minimum, shall be responsible for the following:

1. Provision/preparation of a Uniform Hazardous Waste Manifest or Bill of Lading, to be signed by the Owner and the truck driver.

2. Preparation a log for each disposal facility that indicates, at a minimum, the following information regarding each truck load:

    a. Load number (sequential).

    b. Uniform Hazardous Waste Manifest Number or Bill of Lading Number.

    c. Transporters name

    d. Truck ID number (tractor or trailer number).

    e. Estimated tar weight.

MATERIALS AND PERFORMANCE – SECTION 02415

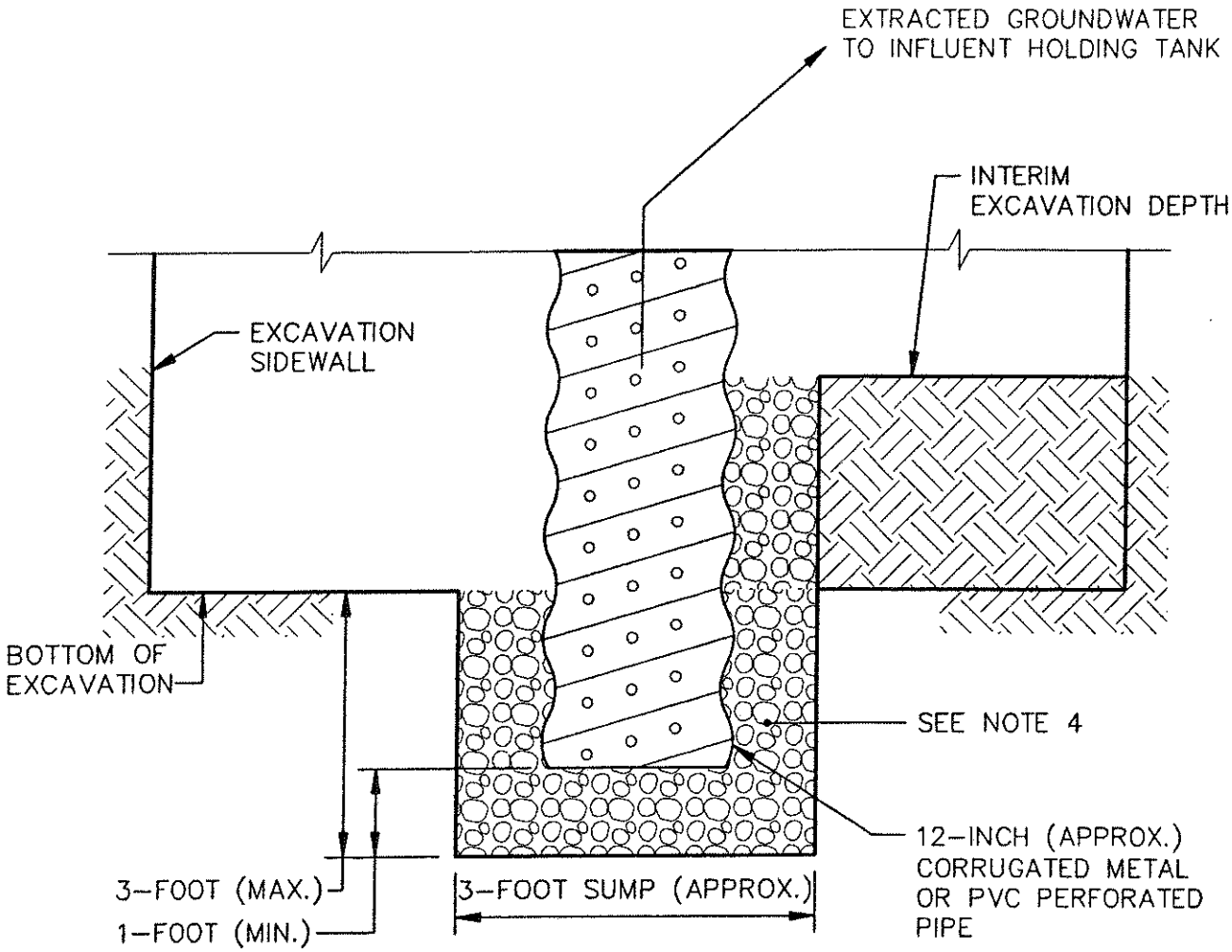
IMPACTED MATERIAL HANDLING AND EXCAVATION PROCEDURES

f. Material type (nonhazardous, hazardous, debris, water).

g. Destination.

- END OF SECTION –

(ATTACHMENT FOLLOWS)



NOTES:

1. THE INFORMATION SHOWN ON THIS FIGURE IS CONCEPTUAL AND PROVIDED FOR INFORMATIONAL PURPOSES.
2. TO THE EXTENT PRACTICABLE, CONTRACTOR SHALL TAKE MEASURES TO MINIMIZE THE PRESENCE OF SOLIDS IN THE EXTRACTED GROUNDWATER.
3. CONTRACTOR SHALL 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 SHALL BE CREATED, THE PIPE INSTALLED, AND WASHED GRAVEL PLACED IN THE REMAINING SUMP AREA. IN THE ABSENCE OF GRAVEL, THE PIPE SHALL BE WRAPPED IN A NON-WOVEN GEOTEXTILE FABRIC.

NYSEG
MADISON AVENUE FORMER MGP SITE
ELMIRA, NEW YORK
FINAL (100%) REMEDIAL ACTION DESIGN

EXAMPLE DEWATERING TECHNIQUE

ARCADIS

FIGURE
1

MATERIALS AND PERFORMANCE - SECTION 02420

IN-SITU STABILIZATION/SOLIDIFICATION

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work Specified

1. The Remediation Contractor shall furnish all labor, materials, tools, and equipment and perform all operations necessary for the in-situ stabilization/solidification (ISS) of soil, as described in this Specification and as shown and described on the Design Drawings.

B. Related Work Specified Elsewhere:

1. Section 02201 – Earthwork
2. Section 02415 – Impacted Material and Soil Excavation Procedures
3. Section 03002 – Jet Grouting

1.02 REFERENCES

A. The most recent version of the following American Society of Testing Materials (ASTM) Standards shall be utilized in concert with this Specification:

D 1633	Standard Test Method for Unconfined Compressive Strength of Molded Soil – Cement Cylinders.
D 5084	Measurement of Hydraulic Conductivity of Saturated Porous Materials using a Flexible Wall Permeameter.
D 4832	Preparations and Testing of Controlled Low Strength Material Test Cylinders.
C 150	Standard Specification for Portland Cement.

1.03 QUALIFICATIONS

A. The ISS Remediation Contractor must be able to demonstrate that they have successfully completed a minimum of three (3) ISS projects of similar scope and size.

B. The ISS Remediation Contractor's Project Manager/Superintendent must demonstrate a minimum of 5 years of relevant experience with ISS work and must have a minimum of 2 years of experience as a Project Manager/ Superintendent.

MATERIALS AND PERFORMANCE - SECTION 02420

IN-SITU STABILIZATION/SOLIDIFICATION

C. The ISS Remediation Contractor's other key personnel must demonstrate a minimum of 2 years of experience with ISS projects of similar scope and size. Other key personnel include technical staff and equipment and mixing plant operators involved with the ISS activities.

1.04 SUBMITTALS

A. The ISS Contractor shall submit the following required information in an In-Situ Stabilization/Solidification Implementation Plan within 15 working days of award of bid:

1. Detailed description of ISS process, equipment, and specifications, including grout mixture installation, to be utilized for ISS operations.

2. Layout drawing depicting the limits of the ISS area, as well as proposed ISS layout/pattern to illustrate continuous ISS consolidation.

3. Procedures for the tracking/labeling of ISS progression, determining/verifying location coordinates and depths including global positioning system (GPS) or physical measurement equipment/methods.

4. Air and noise control procedures including equipment emission control, air quality monitoring and response procedures, and noise monitoring and control procedures. The Contractor shall be required to install appropriate engineering controls such that sound levels as measured at a distance of 100 feet in any direction from the ISS mixing plant or ISS area, are less than 85dB. The Contractor shall be responsible to address identified or reported odor issues and must employ engineering controls to mitigate the presence of perceived odors at the site perimeter.

5. Detailed description of ISS equipment and layout, power requirements, backup equipment, equipment failure replacement/repair procedures and estimated related downtimes.

6. Detailed description and procedures for preparing ISS mixtures and specific application methods to ensure proper in-situ proportions and sequencing.

7. Estimated production rate expressed as volume of ISS per day and estimated schedule for completion of ISS efforts.

8. Procedures for the removal and/or jet grouting of subsurface obstructions (if encountered).

9. Procedures to minimize the surface water flow into the work areas.

MATERIALS AND PERFORMANCE - SECTION 02420

IN-SITU STABILIZATION/SOLIDIFICATION

10. Equipment cleaning/decontamination procedures and waste material handling procedures.

B. Resumes for key project personnel including Project Manager/ Superintendent, engineering and technical staff, and equipment and mixing plant operators.

B. The Remediation Contractor must provide a submittal on a daily basis which includes the following:

1. Grout batch calculations.

2. ISS equipment used.

3. Total volume of ISS completed, volume of ISS completed for the day, and an updated map identifying and depicting completed ISS areas and associated IDs.

4. Documentation of any unforeseen site conditions.

5. Documentation of equipment failures and/or maintenance/repairs.

6. Documentation of modifications or deviations from the approved In-Situ Stabilization/Solidification Implementation Plan, or this Specification.

C. The Remediation Contractor must provide a weekly submittal which contains the following:

1. Total quantity of material stabilized/solidified for the week in terms of total cubic yards of material stabilized/solidified and the number and depth of installed ISS locations.

2. Total quantities of materials (water and reagents) used for the week, and waste quantities (if any).

3. Summary of material deliveries for the week, including backup in the form of bills of lading, weight tickets, flow meter records.

4. ISS progress schedule and percent complete, and modifications to the progress schedule based on ISS production rates.

5. Documentation of material swell, and a description of collection/handling methods and quantities of excess materials.

6. Equipment cleaning methods, and quantities of cleaning fluids/materials generated.

1.05 GROUT MIX DESIGN

A. The Remediation Contractor shall provide grout mix materials (i.e., specified reagents and water) in sufficient quantities to allow for uninterrupted In-Situ Soil Solidification/Stabilization activities and the production rate as determined by the Remediation Contractor.

B. The Remediation Contractor shall calculate and provide in an acceptable format, the following ISS grout mix parameters:

1. The volume of soil being treated in each ISS area, including the volume of treated soil as a result of overlap from adjacent areas.

2. Based on an approximate average density of 125 pounds per cubic foot (pcf), show the calculation that indicates the weight of soil being treated in each ISS area.

3. Show the calculation that indicates the quantity of grout materials required for each ISS area by a percentage of the total weight of treated soil. The following mix design shall be used for ISS installation.

a. The following percentages of stabilization mixture components are relative to the total calculated weight of the soil treated:

1. Portland Cement (PC) @ 0.75 percent.

2. Ground Granular Blast Furnace Slag (BFS) cement @ 5.0 percent.

3. Bentonite Clay @ 0.5 percent.

4. Water @ 14.4 percent.

4. Show calculations of volume expansion of treated soils (swelling) based on amounts of water within grout mixture and estimated groundwater contained within each ISS area. The volume expansion must be kept below 20 percent for ease of management of the site.

5. Final grout mix must have a flowing viscosity less than 10 centipoise and have a density lower than 95 pcf.

6. Based on treatability study analysis, the amount of water to be added to the baseline composite grout mixture is approximately 14.4 percent by net soil weight. In-situ field conditions may warrant a change in grout mix water content. If this is the case, the Remediation Contractor must submit a request to the Design Engineer/Owner for approval to alter the grout mixture water quantities.

1.06 PERFORMANCE CRITERIA

A. The Remediation Contractor is required to ensure the performance of the remediated ISS area meets the requirements set forth in the Design Drawings and Specifications. The Remediation Contractor shall be responsible to meet performance requirements by any means necessary and any replacement or repairs will be incurred at the Remediation Contractor's expense.

B. The Remediation Contractor must verify that the treated soil matrix used in ISS activities meets the performance standards specified, including, but not limited to, the following:

1. Hydraulic conductivity (permeability) of the treated soil matrix must be less than 1×10^{-6} centimeters per second.

2. Unconfined compressive strength (UCS) of the treated soil matrix must be greater than 50 pounds per square inch (psi) after 28 days.

C. The ISS mixing shall cover the entire ISS area and meet all target depths as depicted on the Design Drawings. The Remediation Contractor must provide sufficient overlap between mixed areas such that no soil within the established ISS area limits goes untreated.

D. The Remediation Contractor shall pre-excavate below the existing ground surface in the ISS areas to account for swelling of the stabilized material.

E. ISS areas shall be installed from the top of the pre-excavation as indicated in the Remedial Design.

F. In the event that refusal is encountered prior to achieving the target anticipated depths, the Owner/Remediation Engineer shall be notified immediately. Upon notification, the Owner/Remediation Engineer may request the Remediation Contractor to remove the obstruction. The Remediation Contractor shall have available on-site an excavator capable of reaching a depth of 28 feet in order to remove obstructions encountered during ISS activities.

G. The Remediation Contractor shall evenly distribute the grout throughout the ISS area to result in a homogeneous mixture.

MATERIALS AND PERFORMANCE - SECTION 02420

IN-SITU STABILIZATION/SOLIDIFICATION

H. The Remediation Contractor shall be required to thoroughly mix the ISS area as required to achieve a homogeneous mixture.

I. The Remediation Contractor must collect a set of four 3-inch by 6-inch sample specimens (cylinders) using both homogenized surface soils and including at least one cylinder sampled from the vertical midpoint of each ISS mixed area at a frequency of one set every 500 CY of treated material and test the materials for permeability and compressive strength (ASTM D5084 and D1633, respectively).

J. The Owner/Remediation Engineer will be on-site during all ISS operations to observe and document the overall ISS operation. The Remediation Contractor shall be required to notify the Owner/Remediation Engineer a minimum of 2 weeks prior to the start of ISS activities.

K. ISS activities shall be performed in a manner so as to minimize swell and minimize the quantity of flowable material at ground surface.

PART 2 – PRODUCTS

2.01 ISS EQUIPMENT

A. It is assumed that 70% of the ISS area (by volume) will be performed using 5-foot diameter augers, 20% using excavator bucket (or other shallow method), and 10% using jet grouting (in accordance with Section 03002 – Jet Grouting).

B. For Remediation Area 5, ISS treatment shall be conducted using small diameter (i.e., 5 foot diameter) augers, ISS treatment shall be conducted in rows working perpendicular (away) from the garage (not parallel to the garage).

2.02 GROUT MIXTURE MATERIALS

A. The Remediation Contractor shall provide all required reagent materials in sufficient quantities to complete the ISS activities as specified, without delay.

B. PC shall be Type I/II.

C. BFS cement shall be Grade 120, manufactured by Lafarge Cement (or approved equal).

D. Bentonite Clay shall be Wyo-Ben HydroJel 90 and designated as API 13A, 90 bbl/ton (or approved equal). Bentonite used in preparing the grout shall be pulverized (powder or granular) premium grade sodium cation montmorillonite and must meet the most current API Standard 13A, Section 9, 2004 Edition and shall require a manufacturer's certificate of compliance.

E. The Remediation Contractor must provide a means for accurate measurement and documentation verifying the required grout material quantities are maintained, as specified.

F. The Remediation Contractor is required to have on the site at all times, reagent material capable of maintaining a maximum production rate for a minimum of 3 days. The Remediation Contractor is responsible for the coordination of an appropriate material delivery schedule to accommodate this indicated stock requirement.

2.02 GROUT MIXTURE WATER

A. Grout mixture water must be provided by the Remediation Contractor. The Remediation Contractor is required to supply the water or arrange for and obtain appropriate permits for the use of hydrant water or temporary hook up of water. The Remediation Contractor shall be responsible for all fees associated with water delivery or city water usage. If an off-site source of water is utilized other than city-provided water, the Remediation Contractor must submit documentation of the source of water for Owner/Design Engineer review.

B. The Remediation Contractor must provide a means for accurate measurement and documentation of water quantities utilized for grout batch mixtures. The water measurement devices must be capable of measuring totalized and instantaneous flows. Measuring devices must be calibrated to within +/-2 percent to accurately measure the required quantity of water necessary for each grout batch mixture. The Remediation Contractor is required to provide documentation for equipment calibration and calibration schedule.

C. If water for ISS-related activities is stored on site, the water storage containers/tanks must be clean and free of any waste residuals or debris.

PART 3 – EXECUTION

3.01 GROUT MIXTURE PREPARATION

A. The Remediation Contractor must complete and submit a form calculating the required quantities of water and grout materials for the batch mix design. The following grout mixture information must be documented.

1. Quantity of reagents added.

2. ISS area ID.

3. Identification of ISS overlap and reduction in grout volume due to overlap (where applicable).

B. The Remediation Contractor shall add the calculated quantities of grout mixture ingredients (water and specified reagent quantities) to the mixing plant and thoroughly mix the grout mixture to achieve a homogeneous mixture.

C. The equipment must provide adequate pressure and flow rate and a means of measuring pressure and flow such that grout is delivered at a constant rate throughout the ISS area.

D. Grout mixture must not be allowed to stand for a period of greater than 90 minutes.

E. Processed grout that reaches a temperature of 90°F or greater should be discarded.

F. The Remediation Contractor is required to provide spare parts/pumps/mixing equipment to be available on site during full-scale operations to minimize potential downtime.

3.02 STABILIZATION/SOLIDIFICATION

A. The Remediation Contractor shall mix grout with the soil until a homogeneous mixture of soil and grout is achieved from the top of the ISS area to the target depths.

B. Information relative to each installed ISS area must be documented throughout the ISS efforts. Documentation for each ISS area must, at a minimum, include the following:

1. ISS area ID.

2. ISS area coordinates.

3. Surface elevation at top of ISS.

4. Total installed depth of ISS (elevation).

5. Location/Depth of post-mix representative sample.

6. Start time and finish time.

7. Quantity of grout installed.

8. Soil mixing technique and duration.

9. Diagram of ISS area depicting location and overlap configuration.

MATERIALS AND PERFORMANCE - SECTION 02420

IN-SITU STABILIZATION/SOLIDIFICATION

C. Backfilling/covering of the ISS area will not be permitted for a minimum period of 7 days following the completion of ISS activities and receipt of approved results from field QA/QC testing program indicating ISS has achieved the design strength. The Remediation Contractor shall place a 6-mil plastic liner over the entire ISS area to protect the area from contact with surface water. During the 7-day "cure" period, the ISS area shall be secured by placing orange plastic construction fencing around the entire area. Prior to initiating activities associated with backfill and site restoration, the Remediation Contractor shall test the stability of the area to verify that it has sufficient strength to support the equipment required for backfill and restoration.

3.03 ISS PERFORMANCE MONITORING

A. The Owner/Remediation Engineer must be on site during all ISS operations. The Owner/Remediation Engineer will observe the installation of each ISS area to document the soil mixing process.

B. The Owner/Remediation Engineer will visually inspect each batch of mixed grout prior to its use in an ISS area. The grout batch will be visually observed to verify that the material has been mixed creating a homogeneous grout mixture.

C. Collecting samples, at the specified frequency, from complete ISS areas shall be performed by the Remediation Contractor as directed by the Owner/Remediation Engineer. Samples will be collected from discrete depths within the soil/grout mixture. These materials will be placed into molds and sent out for testing as designated in the CQAP at the Remediation Contractor's expense.

D. Samples from the ISS areas shall be submitted by the Remediation Engineer to a qualified QA/QC laboratory for testing as described below.

Unconfined Compressive Strength (UCS) shall be determined by ASTM D1633. USC tests shall be performed after a 7-day cure time. As determined by the Remediation Engineer, additional samples may be may be tested at a longer cure time (i.e., 28 days) if 7-day samples do not meet the project performance standard of at least 50 psi. Test samples submitted (if any) will be determined by the Remediation Engineer based up on observation of jet grouting performance.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02507

ODOR, VAPOR, AND DUST CONTROL

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work Specified

1. The control and suppression of odors, vapors, and dust generated during remedial construction activities.

2. Furnishing all materials, equipment, and labor necessary to control/suppress odors, vapors, and dust generated during remedial construction activities.

B. Related Work Specified Elsewhere

1. Community Air Monitoring Plan (CAMP)

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. New York State Department of Environmental Conservation (NYSDEC) DER-10 Technical Guidance for Site Investigation and Remediation (DER-10).

Appendix 1A New York State Department of Health (NYSDOH) Generic Community Air Monitoring Program

Appendix 1B Fugitive Dust and Particulate Monitoring

B. Other applicable federal, state, and local air monitoring requirements.

PART 2 – PRODUCTS

2.01 MATERIALS

A. BioSolve® Hydrocarbon Mitigation Agent

B. AC-645 and AC-667SE Vapor-Suppressant Foams, as manufactured by Rusmar, Inc.

C. Approved equals.

2.02 APPLICATION AND ANCILLARY EQUIPMENT

A. Pressure washers (minimum of two) and spray wands operating to the satisfaction to the Owner/Remediation Engineer.

B. Three portable polyethylene water storage tanks, each with a minimum capacity of 150 gallons.

C. Pneumatic Foam Unit 400/25, as manufactured by Rusmar, Inc.

D. Approved equals.

PART 3 – EXECUTION

3.01 GENERAL REQUIREMENTS

A. Community air monitoring for volatile organic compounds (VOCs) and particulate will be performed by the Remediation Engineer on a continuous basis during the remedial construction activities. The Remediation Contractor shall ensure that community air monitoring is being performed prior to initiating intrusive and/or potential dust-generating activities each day.

B. Real-time work zone air monitoring shall be performed by the Remediation Contractor on a continuous basis during all intrusive and/or potential dust-generating activities.

C. Odors shall be controlled to the satisfaction of the Owner/Remediation Engineer and New York State Department of Environmental Conservation (NYSDEC). Vapors and dust shall be controlled as necessary to meet the 1) community air monitoring action levels set forth in the CAMP and 2) work zone air monitoring action levels set forth in the Remediation Contractor's Health and Safety Plan.

D. The Remediation Contractor shall provide and maintain sufficient materials, equipment, and personnel on-site to control odors, vapors, and dust generated during the work. BioSolve®, vapor-suppressant foams (AC-645 and AC-667SE), and appropriate application and storage equipment shall be mobilized to the site prior to initiating any intrusive activities.

E. When not in use, odor, vapor, and dust control measures shall be properly stored at the site in locations approved by the Owner/Remediation Engineer and in accordance with manufacturer's recommendations.

3.02 CONTROL MEASURES

A. BioSolve® shall be combined with clean water to create a 6% solution.

B. The Remediation Contractor is responsible for maintaining, in the immediate vicinity of the work, a supply of clean water and means of storage/dispersion (e.g., portable water tanks, pressure washers, sprayers, etc.) such that water and/or BioSolve® solution may be immediately applied for odor, vapor, and dust control.

MATERIALS AND PERFORMANCE – SECTION 02507

ODOR, VAPOR, AND DUST CONTROL

C. As necessary and as required by the Owner/Remediation Engineer, BioSolve® solution shall be sprayed on excavation faces, stockpiles of excavated materials, buckets during excavation, and excavated soils when loading transport vehicles.

D. Vapor-suppressant foam (AC-645 or AC-667SE, as appropriate) shall be applied to excavation faces and stockpiles of excavated materials prior to extended work breaks (greater than 30 minutes in duration) and at the end of each work day. Foam shall be applied at a uniform rate to completely cover surfaces to a minimum thickness of 3 inches at loose measurement.

1. AC-645 foam is effective for a period of up to 17 hours and is appropriate for daily work breaks and nightly cover (Monday through Thursday).

2. AC-667SE foam is effective for a period of up to 72 hours and is appropriate for weekend cover (applied Friday afternoons/evenings prior to leaving the site for the weekend).

3. Additional applications (of AC-645 or AC-667SE foam) are required for periods greater than 72 hours. The Remediation Contractor shall be prepared to re-apply foam in such instances.

E. The Remediation Contractor shall maintain all excavations, embankments, stockpiles, access roads, and other work areas to minimize airborne releases of dust.

F. Other appropriate methods of controlling odors, vapors, and dust include the following:

1. Excavating, loading, handling, and backfilling materials in a manner that minimizes dust generation.

2. Periodic removal of dirt/debris from access roads and active vehicle transportation routes.

3. Spraying water on access roads and active vehicle transportation routes.

4. Hauling excavated materials and clean backfill materials in properly tarped/covered vehicles.

5. Restricting vehicle speeds on access roads and active vehicle transportation routes.

6. Covering excavations and material stockpiles with 10-mil polyethylene sheeting (anchored appropriately to resist wind forces) prior to extended work breaks and at the end of each work day.

MATERIALS AND PERFORMANCE – SECTION 02507

ODOR, VAPOR, AND DUST CONTROL

G. If the Remediation Contractor's methods of controlling vapors and dust do not reduce airborne concentrations to acceptable levels, based on visual observations, the results of community air monitoring, and/or the results of work zone air monitoring, work activities shall be suspended until the Remediation Contractor implements appropriate corrective measure(s) to remedy the situation.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02510

NOISE MONITORING

PART 1 – GENERAL

1.01 DESCRIPTION

Work Specified

1. The monitoring of noise levels during remedial construction activities.
2. Furnishing all materials, equipment, and labor necessary to reduce noise levels during remedial construction activities.

Related Work Specified Elsewhere

1. Noise Monitoring Plan (NMP)

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. New York State Department of Environmental Conservation (NYSDEC) DER-10 Technical Guidance for Site Investigation and Remediation (DER-10).

B. Zoning Ordnance of the City of Elmira.

PART 2 – PRODUCTS

2.01 MONITORING EQUIPMENT

A. Quest Q-500 dosimeter.

B. Larson Davis 820 Noise Meter.

C. Approved equals.

PART 3 – EXECUTION

3.01 GENERAL REQUIREMENTS

A. The Remediation Contractor shall hire a third party consultant to conduct noise monitoring in accordance with the *Noise Monitoring Plan* included in the Remedial Action Design.

MATERIALS AND PERFORMANCE – SECTION 02510

NOISE MONITORING

B. Pre-mobilization background noise monitoring shall be conducted to establish baseline noise levels at the site. Continuous monitoring will be recorded during the anticipated duration of the construction work day (from approximately 8:00 a.m. to 6:00 p.m.) over a three (3) day period.

C. Noise monitoring shall be conducted during installation of excavation support systems.

3.02 MITIGATION PROCEDURES

A. The Remediation Contractor is required to provide proposed noise mitigation/reduction measures, or combination of measures.

B. Potential mitigation activities that the Remediation Contractor may employ may include:

1. Use of moveable acoustic curtain to shield the equipment.

2. Restricting times that high noise activities can be conducted.

C. The Remediation Contractor shall employ adequate measures, or combination of measures, during implementation of the remedial activities to maintain noise levels produced by construction equipment to safe and tolerable limits. The following action noise threshold values will be used to assess the effectiveness of mitigation activities/techniques:

1. "Temporary Halt" Noise Threshold Value of 80 dBA. If this action level is exceeded over a 1-hour measurement period (i.e., time weighted average [TWA]), work will be temporarily halted, if necessary, while the apparent cause is investigated and corrective actions are taken. If the cause is related to equipment or operational factors, then these would be corrected and work resumed. If this level is exceeded due to site conditions (e.g., obstructions in the ground that cause sheet pile refusal), either mitigation methods will be employed, the obstruction will be removed, or the drive will continue at the next sheet position.

2. "Stop Work" Noise Threshold Value of 85 dBA. If this action level is exceeded over a 1-hour TWA, a review into the cause will immediately be investigated. Work would stop and an evaluation of an appropriate mitigation measure (or effectiveness of an implemented measure) would be reviewed. The Contractor would propose an appropriate (or alternate) noise mitigation measure. If 85 dBA is exceeded due to obstructions in the ground which cause refusal of sheets, either the obstruction will be removed or the sheet pile driving activities will be stopped and the next sheet position will be attempted.

D. All construction equipment and activities that cause exceedances in sound levels at the perimeter of the site shall be halted and the Remediation Contractor and Remediation

MATERIALS AND PERFORMANCE – SECTION 02510

NOISE MONITORING

Engineer shall select and implement noise reduction measures such that work can be conducted at acceptable noise levels. The implementation details, feasibility, and the expected effectiveness of the noise reduction measure will be discussed with the NYSDEC, the owner, and the Remediation Engineer.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 03002

JET GROUTING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Should it be determined during the field implementation of the in-situ stabilization/solidification (ISS) work that Jet Grouting is necessary to seal around large subsurface debris as recommended by the Remediation Engineer, the Remediation Contractor shall furnish all labor, materials, tools, and equipment and perform all operations necessary for the jet grouting of soil, as described in this Specification and as shown and described in the Technical Specifications.

B. Related Work Specified Elsewhere:

1. Section 02201 – Earthwork

2. Section 02415 – Impacted Material and Soil Excavation Procedures

3. Section 02420 – In-situ Stabilization/Solidification

1.02 REFERENCES

A. The most recent version of the following American Society of Testing Materials (ASTM) Standards shall be utilized in concert with this Specification:

1. C 150 - Standard Specification for Portland Cement.

2. D 1633 – Standard Test Method for Unconfined Compressive Strength of Molded Soil – Cement Cylinders.

1.03 QUALIFICATIONS

A. The Jet Grouting Remediation Contractor must be able to demonstrate that they have successfully completed a minimum of 3 projects of similar scope and size.

B. The Jet Grouting Remediation Contractor's Project Manager/Superintendent must demonstrate a minimum of 5 years of relevant experience with Jet Grouting work and must have a minimum of 2 years of experience as a Project Manager/Superintendent.

C. The Jet Grouting Remediation Contractor's other key personnel must demonstrate a minimum of 2 years of experience with ISS projects of similar scope and size. Other key

personnel include technical staff and equipment and mixing plant operators involved with the work activities.

1.04 SUBMITTALS

A. The Jet Grouting Contractor shall submit the following required information in a Jet Grouting Implementation Plan:

1. Detailed description of jet grouting process, equipment and plant layout plan, and specifications, including grout mixture installation, to be utilized for jet grouting operations.

2. Following location of subsurface debris, a layout drawing depicting the limits of the jet grouting area, as well as proposed grouting injection point layout/pattern, sequencing, and grout injection point overlap shall be prepared by the Contractor. Layout provide discussion of how sequencing/treatment.

3. Procedures for the tracking/labeling of injection points, determining/verifying treatment locations/depths.

4. Air and noise control procedures including equipment emission control, air quality monitoring and response procedures, and noise monitoring and control procedures.

5. Detailed description of jet grouting equipment and layout, power requirements, backup equipment, equipment failure replacement/repair procedures and estimated related downtimes.

6. Detailed description and procedures for preparing jet grout mixtures and specific application methods to ensure proper in-situ proportions and sequencing.

7. Provide an estimated production rate.

8. Procedures for containment of the jet grout area and specific sediment, erosion and spill control procedures, as well as minimizing flow at the ground surface.

9. Equipment cleaning/decontamination procedures and waste material handling procedures.

10. Resumes for key project personnel including Project Manager/ Superintendent, engineering and technical staff, and equipment and mixing plant operators.

B. The Remediation Contractor must provide a submittal on a daily basis which includes the following:

1. Grout batch calculations.

2. Jet grout equipment used.

3. Total number of grout injection points completed, number of injection points completed for the day, and an updated map identifying and depicting completed injection points and associated IDs.

4. Documentation of any unforeseen site conditions.

5. Documentation of equipment failures and/or maintenance/repairs.

6. Documentation of modifications or deviations from the approved Jet Grout Implementation Plan, or this Specification.

C. The Remediation Contractor must provide a weekly submittal which contains the following:

1. Total quantity of volume grouted for the week in terms of total cubic yards of material grouted and the number and depth of completed grout injection points.

2. Total quantities of materials (water, Portland cement, bentonite clay) used for the week, and waste quantities (if any).

3. Summary of material deliveries for the week, including backup in the form of bills of lading, weight tickets, flow meter records.

4. Documentation of material swell and spoils generated, and a description of collection/ handling methods and quantities of excess materials.

5. Equipment cleaning methods, and quantities of cleaning fluids/materials generated.

1.05 GROUT MIX DESIGN

A. The Remediation Contractor shall provide grout mix materials (i.e., Portland Cement, Bentonite, water) in sufficient quantities to allow for uninterrupted jet grouting at the production rate as determined by the Remediation Contractor and stated in the approved Jet Grouting Implementation Plan.

B. The Remediation Contractor shall calculate and provide in an acceptable format, the following grout mix jet grout parameters:

1. The volume of soil being treated based on the treatment radius for each injection points and estimated total depth, minus the volume of soil treated as a result of overlap from adjacent areas.

2. Based on an average total unit weight of 125 pounds per cubic foot, show the calculation that indicates the weight of soil being treated for each injection point.

3. Show the calculation that indicates the quantity of grout materials required for each grout injection point based on the required mixture of reagents. The following mix design shall be used throughout jet grouting operations.

   a. The following components are based on the total calculated weight of the soil treated:

      1. Portland Cement (PC) @ 1.6 percent.

      2. Ground Granular Blast Furnace Slag (BFS) cement @ 15.4 percent.

      3. Bentonite Clay @ 1.1 percent.

      4. Water @ 45.1 percent.

4. Final grout mix must have a flowing viscosity less than 10 centipoise and have a density lower than 95 pounds per cubic foot.

5. Based on treatability study analysis, the amount of water to be added to the baseline composite grout mixture is approximately 45.1 percent by net soil weight. In-situ field conditions may warrant a change in grout mix water content. If this is the case, the Remediation Contractor must submit a request to the Design Engineer/Owner for approval to alter the grout mixture water quantities.

1.06 PERFORMANCE CRITERIA

A. The jet grout injections shall treat the area around potential obstructions as indicated in the Remedial Action Design. The Remediation Contractor must provide sufficient overlap between injection points such that no soil within a 5-foot area around the obstruction goes untreated.

B. Grout injection points shall be advanced to the target treatment depth indicated in the Technical Specifications.

C. In the event that refusal is encountered prior to achieving the anticipated depth, the Remediation Engineer's on-site representative shall be notified immediately. Upon notification, the Remediation Engineer may direct the Remediation Contractor to alter the grout layout to accommodate grouting around the new obstruction.

D. The Remediation Contractor shall evenly distribute the grout throughout the treatment depth to result in a homogeneous mixture.

E. The Remediation Contractor shall demonstrate that the injection procedure results in 100% coverage of the jet grout area (i.e., the area extending to the target treatment depth beneath the potential obstruction and within a 5-foot area around the obstruction).

F. An on-site representative of the Remediation Engineer will be onsite during all jet grout operations to observe and document the overall jet grout operation. The Remediation Contractor shall be required to notify the Remediation Engineer's on-site representative a minimum of 48 hours prior to the start of jet grout activities.

G. The Remediation Contractor must verify that the treated soil matrix used in jet grout activities meets the performance standards specified, including, but not limited to, the following:

1. Hydraulic conductivity (permeability) of the treated soil matrix must be less than 1×10^{-6} centimeters per second.

2. Unconfined compressive strength (UCS) of the treated soil matrix must be greater than 50 pounds per square inch (psi).

PART 2 - PRODUCTS

2.01 GROUT MIXTURE MATERIALS

A. The Remediation Contractor shall provide all required Portland cement and bentonite clay materials in sufficient quantities to complete the ISS activities as specified, without delay.

B. Portland cement shall be Type I/II.

C. BFS cement shall be Grade 120, manufactured by Lafarge (or approved equal).

D. Bentonite Clay shall be Wyo-Ben HydroJel 90 and designated as API 13A, 90 bbl/ton (or approved equal). Bentonite used in preparing the grout shall be pulverized (powder or granular) premium grade sodium cation montmorillonite and must meet the most current

API Standard 13A, Section 9, 2004 Edition and shall require a manufacturer's certificate of compliance.

E. The Remediation Contractor must provide a means for accurate measurement and documentation verifying the required grout material quantities are maintained, as specified.

F. The Remediation Contractor is required to have on the site at all times, reagent material capable of maintaining a maximum production rate for a minimum of 3 days. The Remediation Contractor is responsible for the coordination of an appropriate material delivery schedule to accommodate this indicated stock requirement.

2.02 GROUT MIXTURE WATER

A. Grout mixture water must be provided by the Remediation Contractor. The Remediation Contractor is required to arrange for and obtain appropriate permits for the use of hydrant water or other temporary hook up of water. The Remediation Contractor shall be responsible for all fees associated with water delivery or city water usage. If an off-site source of water is utilized other than city-provided water, the Remediation Contractor must submit documentation of the source of water for the Remediation Engineer's review.

B. The Remediation Contractor must provide a means for accurate measurement and documentation of water quantities utilized for grout batch mixtures. The water measurement devices must be capable of measuring totalized and instantaneous flows. Measuring devices must be calibrated to accurately measure the required quantity of water necessary for each grout batch mixture and calibration certificates provided for the Remediation Engineer's review. The Remediation Contractor is required to provide documentation for equipment calibration and calibration schedule.

C. If water for jet grout-related activities is stored onsite, the water storage containers/tanks must be clean and free of any waste residuals or debris.

PART 3 – EXECUTION

3.01 GROUT MIXTURE PREPARATION

A. The Remediation Contractor must complete and submit a form calculating the required quantities of water and grout materials for each jet grout injection point. At a minimum, the following grout mixture information must be documented for each injection point:

1. Quantity of reagents added.

2. Grout injection point ID.

3. Identification of injection point overlap and reduction in grout volume due to overlap.

B. The Remediation Contractor shall add the calculated quantities of grout mixture ingredients (water, PC, BFS, and Bentonite) to the mixing plant and thoroughly mix the grout mixture to achieve a homogeneous mixture.

C. The equipment must provide adequate pressure and flow rate and a means of measuring pressure and flow such that grout is delivered at a constant rate throughout the treatment depth.

D. Grout mixture must not be allowed to stand for a period of greater than 90 minutes prior to usage, or as otherwise identified in the Remediation Contractor's approved Jet Grouting Implementation Plan that identifies a specific stand time based on calculated grout mixtures.

3.02 JET GROUTING

A. The Remediation Contractor shall mix grout with the soil until a homogeneous mixture of soil and grout is achieved from the target treatment depth to the top of the ISS treatment area.

B. Information relative to each installed grout injection point must be documented throughout the jet grout efforts. Documentation for each injection point must, at a minimum, include the following:

1. Injection point ID.

2. Injection point coordinates.

3. Injection point angle.

4. Surface elevation at top of injection point.

5. Total installed depth of injection point.

6. Start time and finish time.

7. Quantity of grout installed.

8. Number of jet grouting passes.

9. Injection rate.

10. Injection pressure.

11. Rotation rate.

12. Diagram of grout injection points depicting location and overlap configuration.

13. Movement of the pipeline recorded prior to, during, and after grout injection.

C. Backfilling/covering of the jet grout area will be required as part of the final soil cap as indicated in the Technical Specifications.

3.03 JET GROUT PERFORMANCE MONITORING

A. The Remediation Engineer must be onsite during all jet grout operations. The Remediation Engineer will observe the installation of each grout injection point to document the treatment process.

B. The Remediation Engineer will visually inspect each batch of mixed grout prior to its use in a grout injection point. .The grout batch will be visually observed to verify that the material has been mixed creating a homogeneous grout mixture.

C. Samples will be collected from completed jet injection points by the Remediation Engineer. These materials will be placed into molds provided by the Remediation Engineer.

D. Samples from the grout injection points shall be submitted by the Remediation Engineer to a qualified QA/QC laboratory for testing as described below.

UCS shall be determined by ASTM D1633. UCS tests shall be performed after a 7-day cure time. As determined by the Remediation Engineer, additional samples may be may be tested at a longer cure time (i.e., 28 days) if 7-day samples do not meet the project performance standard of at least 50 psi. Test samples submitted (if any) will be determined by the Remediation Engineer based up on observation of jet grouting performance.

E. If QA/QC testing results do not meet established project objectives a more exhaustive sampling/testing program will be developed and performed to evaluate jet grout properties.

- END OF SECTION -

Appendix C

Traffic Control Plan

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Traffic Control Plan

Madison Avenue Former Manufactured Gas Plant Site

Elmira, New York

September 2011

Traffic Control Plan

Madison Avenue Former
Manufactured Gas Plant Site

Prepared for:
NYSEG

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Our Ref.:
B0013087.0000

Date:
September 2011

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Figures

1. Introduction

This *Traffic Control Plan* (TCP) has been prepared to support the implementation of remedial activities at the NYSEG Madison Avenue Former Manufactured Gas Plant (MGP) site located in Elmira, New York. This TCP describes the procedures that will be used to maintain highway and pedestrian traffic and minimize impacts to motorists, highway workers, and pedestrians during the performance of remedial activities. This TCP has been prepared in conformance with the *Federal Highway Administration Manual on Uniform Traffic Control Devices* (United States Department of Transportation [USDOT], 2003) and the requirements of *DER-10, Technical Guidance for Site Investigation and Remediation* (New York State Department of Environmental Conservation [NYSDEC], 2010).

1.1 Site Description

The former MGP property is located on Madison Avenue in the City of Elmira, Chemung County, New York. The site occupies most of the city block bounded by East Clinton Street, Madison Avenue, and East Fifth Street (also known as Judson Street). NYSEG currently owns the property that was occupied by the former MGP operations, with the exception of a storage yard located on the northern portion of the site adjacent to East Fifth Street, which is currently owned by I.D. Booth, Inc. (I.D. Booth), an industrial supply wholesaler. I.D. Booth also owns the parcel immediately west of the former MGP site. The parcel immediately south of the site is owned by Trayer Products, Inc. (Trayer), a metal-parts manufacturer.

Land use in the surrounding area is mixed, with industrial and commercial operations immediately south and west, a public park to the northeast, and residential properties within 1,000 feet of the site in all directions. The site is largely flat-lying, with a small topographic rise in the eastern corner, near the intersection of East Fifth and Oak Streets. Multiple utility poles containing overhead transmission and distribution wires exist throughout the entire site.

1.2 Summary of Remedial Activities

In general, the remedial activities to be performed at the site include:

- Excavation of coal tar-impacted soil in three areas of the site and removal of an existing concrete oil and tar separator.

- In-situ treatment of deeper soil above the till unit in nine areas of the site.
- Removal of a concrete pipe located along the southern property boundary (to the extent practicable).
- Passive recovery of non-aqueous phase liquid using collection wells.
- Introduction of oxygen into the groundwater to enhance natural attenuation of dissolved-phase organic compounds.
- Off-site treatment/disposal of the excavated materials.
- Off-site treatment/disposal of water generated during the project.
- Backfilling the excavated areas.
- Demarcation and placement of a minimum of 1 foot of clean fill materials over excavation and in-situ stabilization treatment areas.

A detailed description of the remedial activities to be conducted at the site is presented in the Remedial Action Design, (ARCADIS, 2011).

2. Traffic Control

The remedial activities presented in Section 1.2 will be conducted within NYSEG's former MGP property, or property owned by Trayer and/or I.D. Booth. Because the entire site will be located within a fenced area and will not affect pedestrian traffic, it will not be necessary to close any sidewalks or public streets, or divert pedestrian traffic, to conduct the work.

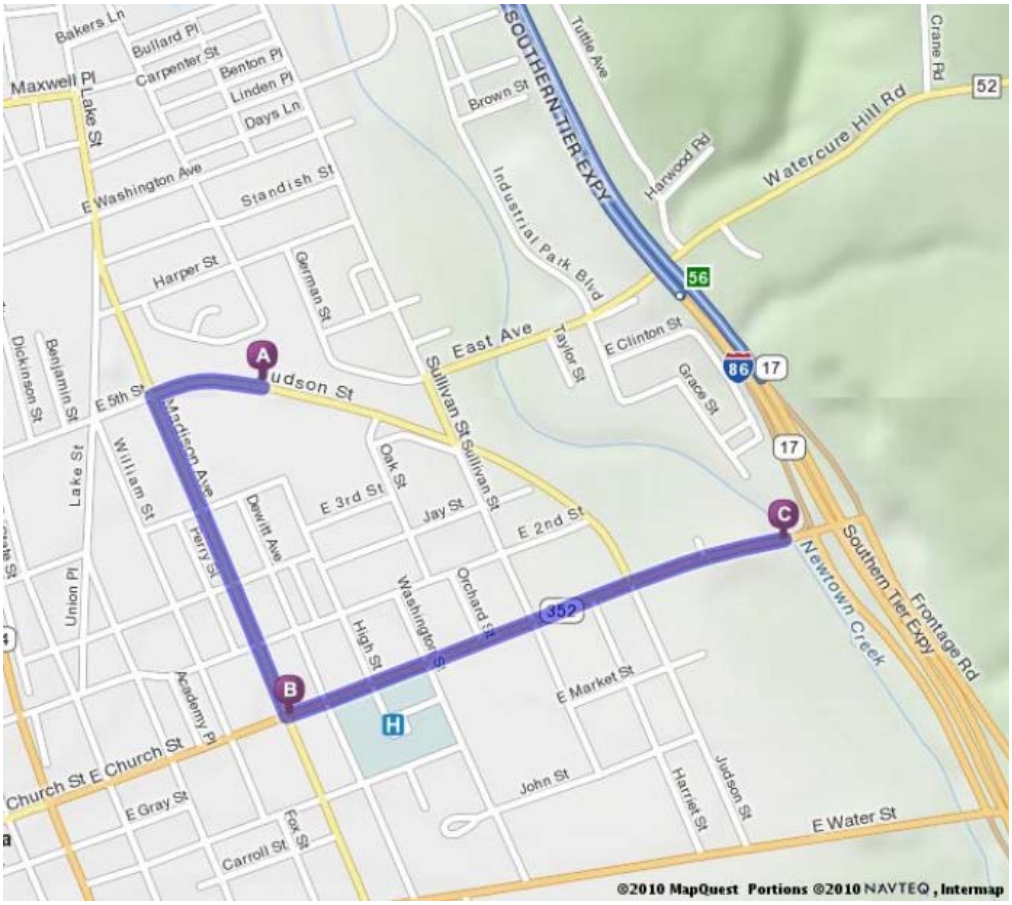
Two-way vehicle traffic on Madison Avenue and East Fifth Street will be maintained for the duration of the remedial activities. Permanent lane closure of public streets will not be permitted during the remedial activities at the site; however, if short-term, temporary lane closure or traffic control measures (e.g., flagmen, cones) are required to facilitate delivery/pickup of equipment and material to the site, the temporary lane closures or traffic diversions will be the responsibility of the Remediation Contractor. The Remediation Contractor will avoid temporary lane closure during peak traffic periods (e.g., morning or afternoon rush hours, lunch time).

The following section presents the preferred truck route to be used for vehicles coming from New York State (NYS) Route 17 (Southern Tier Expressway, I-86) during the completion of remedial activities.

2.1 Truck Route

The preferred truck traffic route for vehicles traveling to and from the site from NYS Route 17 (Southern Tier Expressway, I-86) is illustrated on Figure 1, below.

Figure 1
Truck Traffic Route



From the I-86/NY-17, Church Street exit (exit 56):

- Turn at end of exit ramp to head west on E. Church St.
- Turn right onto Madison Avenue.
- Turn right onto Judson Avenue.
- Enter the site from Judson Avenue.

2.2 Traffic Control Responsibility

This TCP has been prepared to identify minimal traffic control measures and the preferred truck route in support of the Remedial Action Design. The NYSEG's Remediation Contractor will have ultimate responsibility for traffic control at the site; daily site operations will be conducted under the direction the Remediation Contractor's personnel.

3. References

ARCADIS. 2011. *Draft (95%) Remedial Action Design*, Madison Avenue Former MGP Site, prepared for NYSEG, New York. March 2011.

NYSDEC. 2010. *DER-10, Technical Guidance for Site Investigation and Remediation*. May 2010.

USDOT. 2003. *Federal Highway Administration Manual on Uniform Traffic Control Devices,* United States Department of Transportation, Federal Highway Administration (2003 Edition, including November 2004 and December 2007 revisions).

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Appendix D

Pre-Remediation In-Situ Sampling and Analysis Work Plan (not part of Contractor bid package)

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Pre-Remediation In-Situ Sampling and Analysis Work Plan

Madison Avenue Former Manufactured Gas Plant Site

Elmira, New York

September 2011

1. Introduction

NYSEG is preparing to implement a Remedial Action Design involving the in-situ stabilization (ISS), excavation, removal and off-site disposal of tarry waste, fill and soil (collectively referred to herein as "material") at the Madison Avenue Former Manufactured Gas Plant (MGP) site located in Elmira, New York. The site occupies most of the city block bounded by East Clinton Street, Madison Avenue, and East Fifth Street (also known as Judson Street). This *Pre-Remediation In-Situ Sampling and Analysis Work Plan* describes the sampling and analysis protocol that will be utilized to provide waste characterizations data for materials generated during the site remediation and to provide general geologic data.

NYSEG will conduct the sampling of in-place material under a contract separate from the remedial construction activities. NYSEG's Design Engineer will provide conventional hollow-stem auger drilling and/or direct push sampling of the soil to be excavated during the site remediation. All composited samples will be analyzed by a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified analytical laboratory utilizing the methods and procedures specified herein. Analytical results will be used to evaluate the potential for reusing material on site as subsurface fill and, if the material is not suitable for reuse, determine appropriate off-site treatment/disposal requirements. Additionally, the Design Engineer will collect groundwater samples within and near excavation areas to evaluate off-site treatment/disposal requirements of water removed during soil excavation activities.

Prior to conducting the sampling activities, the Design Engineer will coordinate with the appropriate utility-locating agency (e.g., Dig Safely New York). Underground utilities are located adjacent to select remediation areas and will require demarcation to safeguard them during sampling activities.

All sampling and analysis will be performed in accordance with the existing site *Quality Assurance Project Plan* (QAPP). Quality Assurance/Quality Control (QA/QC) requirements and data quality objectives are also specified in the site QAPP. Data will be submitted to the New York State Department of Environmental Conservation (NYSDEC) and the treatment facility for review and approval prior to final disposition of the material.

The Design Engineer will follow the requirements of the existing NYSDEC-approved *Health and Safety Plan* (HASP) during the pre-remediation sampling event. The HASP

provides emergency response procedures and contacts, and appropriate levels of personal protective equipment required for the field activities.

During the pre-remediation sampling activities, the Design Engineer will conduct community air monitoring in accordance with the *Community Air Monitoring Plan* (CAMP) included as Appendix F of the *Remedial Action Design*. Requirements for air monitoring activities are discussed in Section 4 and in greater detail in the CAMP.

2. Sampling Protocol

The areas targeted for remedial excavation includes Remediation Areas 1, 2 and 6. Pre-remediation soil samples will be collected from each of these areas and groundwater samples will be collected from wells within/near these areas. In addition, representative near surface samples will be collected from the nine areas identified for ISS treatment (Remediation Areas 3 through 5 and 7 through 12). ISS treatment requires the removal of the top (approximately) 20 percent of the soil to facilitate ISS activities. Representative soil samples will also be collected from the area identified for concrete pipe removal. Locations of the areas targeted for remedial excavation activities are shown on Figure D-1.

Representative soil samples will be collected and the analytical data used to identify the following soil management categories, which are consistent with the site-specific remediation goals, and as allowed by Division of Environmental Remediation's *DER-10, Technical Guidance for Site Investigation and Remediation* (DER-10) (NYSDEC, 2010) in accordance with Table 5.4(e)4: Reuse of Soil.

- Source Material – material that contains visible tar or oil, exhibits a sheen or odor and contains total benzene, toluene, ethylbenzene and xylenes (BTEX) at concentrations greater than or equal to (≥) 10 milligrams per kilogram (mg/kg), total polycyclic aromatic hydrocarbons (PAHs) at concentrations ≥ 500 mg/kg, or contains purifier waste with reactive cyanide or reactive sulfide at concentrations ≥ 250 mg/kg and 500 mg/kg, respectively.

- Residually Impacted Soil – material that exhibits a sheen or staining, produces an odor, contains total BTEX at concentrations less than (<) 10 mg/kg and PAHs at concentrations < 500 mg/kg PAHs, or contains purifier waste with reactive cyanide and reactive sulfide at concentrations < 250 mg/kg and < 500 mg/kg, respectively.

- General Backfill – material that contains no visible tar or oil in any form, does not exhibit a sheen, does not emit an odor, and does not contain purifier waste.

NOTE: The above definitions were developed for use when describing soil for disposal purposes only; these definitions are not meant to supersede or be confused with the terminology jointly developed by NYSEG and NYSDEC that was used to describe the magnitude of visual impacts in soil and used to determine the extent of material requiring removal/treatment.

Soil classified as Source Material will be thermally treated and/or disposed off site. Residually Impacted soil may remain on site for potential reuse as subsurface backfill (i.e., at depths greater than 1-foot below ground surface [bgs]). A geotextile liner will be placed above the Residually Impacted soil to serve as a visual demarcation barrier to identify the Residually Impacted material. Material classified as General Backfill will also be used on site at depths below 1-foot bgs.

2.1 Pre-Excavation Borings

Soil borings will be advanced and sample collection and analysis will be performed prior to excavation activities to determine the presence and extent of material that can be used on site as fill material, and the presence and extent of material that must be transported for off-site thermal treatment/disposal. Soil borings will be advanced in a systematic pattern within the planned remediation areas. The number and spacing of soil borings within a remediation area was determined based on: a) the number of samples required by the disposal facilities; b) the estimated volume of material requiring excavation/pre-excavation; c) the geometry of the area and; d) the objective of obtaining a representative distribution of soil from within the area. One sample will be sent for laboratory testing from every 3- to 5-foot vertical zone (on average) within the sampling grid for each area. The required number of samples per area is provided in Table D-1, and was determined based on disposal facility requirements from Seneca Meadows Landfill and Environmental Soil Management of New York (ESMI). The assumed soil density is approximately 1.5 tons per cubic-yard (cy).

Physical obstructions such as building foundations, underground utilities, may result in relocation of borings, if encountered. Care will be taken to insure the sampling is representative of the interval being sampled and any relocation remains in close proximity to the original location.

Each boring will be advance using conventional hollow-stem auger drilling and/or direct-push sampling methods; continuous split barrel or Macrocore samples will be collected. Borings at each area will be terminated at the depth identified in Table D-1.

Each split barrel sampler or Macrocore will be opened and visually inspected in the field to identify the presence of tar or oil, purifier waste, sheen or odor. A sample will be collected from each sampling interval. Results will be documented in a field book. A qualified geologist or engineer will supervise sampling activities.

Table D-1 Soil Boring and Sampling Requirements

Remediation Area	Depth of Soil Borings (ft)	Estimated Quantities (cy / tons)[3]	Minimum No. of Required Samples[2]	Proposed No. of Samples	Soil Borings within Area	Vertical Sampling Intervals
Area 1	15	940 / 1,400	4	6	2	0' – 5' 5' – 10' 10' – 15'
Area 2	10	560 / 880	4	4	2	0' – 5' 5' – 10'
Area 3	4	240 / 360[1]	3	4	2	0' – 4'
Area 4	4	140 / 210[1]	2	2	2	0' – 4'
Area 5	5	190 / 280[1]	2	2	2	0' – 5'
Area 6	8	460 / 690	3	4	2	0' – 4' 4' – 8 '
Area 7	6	510 / 760[1]	3	4	2	0' – 3' 3' – 6'
Area 8	4	300 / 450[1]	3	3	3	0' – 4'
Area 9	4	220 / 330[1]	3	3	3	0' – 4'
Area 10	4	220 / 330[1]	2	2	2	0' – 4'
Area 11	4	360 / 550[1]	3	3	3	0' – 4'
Area 12	4	360 / 550[1]	3	3	3	0' – 4'
Concrete Pipe	8	70 / 110	1	2	1	0' – 4' 4' – 8'

Notes:

1. Volume requiring pre-excavation in ISS areas.
2. Based on requirements provided by Seneca Meadows Landfill and ESMI.
3. Volumes based on in-place measurements.

Because the designated boring/sampling locations will undergo remedial excavation, sand and bentonite pellets will be used to seal the bore holes to grade. Excess materials will be containerized. After completion, each boring will be located using a mapping-grade global positioning system, which had an accuracy of +/- 1 meter, or better. All boring locations will be marked in the field using wooden lath and flagging.

The drill rig or direct-push sampling rig, along with any supporting equipment that comes into contact with soil, will be thoroughly decontaminated prior to and at the conclusion of site work.

Investigation-derived waste (IDW) generated during the sampling operation will be containerized and managed in accordance with criteria in Section 2.3 of this document.

Precautions will be taken to prevent the contamination of the surface soil with any subsurface materials. Plastic sheeting will be used to minimize the risk of cross contamination, and subsurface materials will be immediately containerized for laboratory analysis.

Each soil boring will be numbered as directed by NYSEG and the location surveyed for X-Y-Z coordinates using commonly accepted procedures by a New York state-licensed surveyor (Horizontal Datum – NAD 83; Vertical Datum – NAVD 88).

2.2 Borehole Logging

A log of sampling activities will be kept on individual boring log forms or in a field notebook. Recorded information will include location, time on site, personnel, equipment and materials used, samples collected, sample percent recovery, lithology, visual observations of impacts present, photoionization detector (PID) measurements, and any other observations or information that would be necessary to re-construct field conditions at a later date.

Unconsolidated samples for lithologic description will be obtained over a continuous interval. Lithologic descriptions of materials encountered will be descried in accordance with ASTM D-2488 Standard Practice for Description and identification of Soils (Visual-Manual Procedure). Additional information to be recorded will include depth to water table (if encountered), depths of samples collected for laboratory analysis, and other noteworthy observations or conditions, such as locations of geologic boundaries.

2.3 Field Protocols

Recovered samples will be placed in containers specified in the project QAPP. Soil and groundwater samples will be collected as described in the following subsections.

2.3.1 Soil Sample Collection

Each split barrel sampler or Macrocore will be opened and screened for volatile organic vapors (VOCs) with a PPB-Rae, or equivalent. A discrete material sample will be collected for laboratory VOC analysis from the section of the sampling interval with the highest volatile organic vapor concentration, as measured with the PPB-Rae, and/or distinct coal tar odor or discoloration. Samples with visible coal tar will be noted. The material from each interval will be placed in a large stainless steel collection vessel and

thoroughly mixed. A representative sample of the homogeneous material samples will be collected. Excess soils will be containerized for disposal.

Samples will be collected using decontaminated stainless-steel hand tools, such as trowels, scoops and spoons. Organic debris (such as leaves, twigs and bark) along with large pieces of gravel or stone will not be included in the sample. Sampling containers will be filled completely to avoid creating a headspace where volatile compounds may escape. After each sample container is filled, the threads will be wiped clean so that the cap may be threaded on without creating and air gap. Once the soil sample is collected, it will be maintained at 4 degrees Celsius (ºC) until it is delivered to the laboratory for analysis.

Samples will be collected at 3 to 5-foot intervals (Table D-1) from each boring location. Based on the 15-foot excavation depth for Remediation Area 1, soil samples will be collected from three 5-foot intervals. For all other remediation areas, soil samples will be collected from two depth intervals: the borings will be divided into two equal intervals regardless of depth. Additionally, QA/QC samples will be collected as required by the QAPP.

Wastewater generated during pre-remediation activities, such as decontamination fluids, will be containerized in NYSEG-approved containers, and left on site at a location approved by NYSEG. Storage containers will be clearly labeled with pertinent source information/data. IDW characterization samples will be collected as required by NYSEG.

2.3.2 Groundwater Sample Collection

Groundwater samples will be collected from site wells in and near soil removal areas to characterize groundwater that will be removed from the excavations during remedial construction activities. Groundwater samples will be collected using low-flow sampling techniques from monitoring wells NMW-0401S, MW-3S and MW-4S. QA/QC samples will be collected as required by the QAPP.

2.4 Documentation of Site Activities

2.4.1 Logbook

A designated logbook(s) will be used to document daily site activities. The logbook(s) will be kept by the field geologist/field engineer until completion of the project, and will be provided to NYSEG upon request.

2.4.2 Master Sample Log

In addition to documenting daily field activities in the logbook(s), a separate Sample Log will be maintained to record every sample collected. The field geologist/field engineer will log all samples collected and those sent to the contract laboratory for analysis. The Sample Log will include Chain-Of-Custody numbers. Waybill numbers (i.e., shipping information) will also be recorded on the Sample Log at the end of each day. An electronic file of the Sample Log (i.e., Word or Excel file) will be maintained electronically, and provided to NYSEG at the completion of the project.

2.4.3 Air Monitoring Log

Dedicated field logbooks will be maintained on site to document daily calibration of the air monitoring instruments. Sufficient information will also be recorded so that daily conditions may be reconstructed without reliance on the air monitoring system's electronic data and printed reports (e.g., PID measurements recorded on a regular basis in the logbook[s], with the intervals determined based on levels detected).

2.4.4 Waybills

A waybill (i.e., shipping) receipt will be obtained at the time of accepted sample shipment from the courier. The waybill receipts will be recorded on, and maintained with, the Master Sampling Log(s).

2.4.5 Near Miss/Accident Reporting

NYSEG report forms will be used to document any accident or near miss occurring on site during the field activities. The forms will be attached as addendums to the site HASP that will be maintained on site at all times.

3. Waste Characterization

Soil and groundwater samples will be sent for laboratory analysis to assess the potential to reuse materials on-site and evaluate off-site treatment/disposal requirements. Samples that are identified as Source Material (Section 2) will be sent to the laboratory for waste characterization analysis because they will be transported for off-site treatment/disposal.

Laboratory analyses for soil samples required by Seneca Meadows Landfill include:

- TCLP VOCs using USEPA Method 8260.
- TCLP SVOCs using USEPA Method 8270.
- TCLP Metals using USEPA Method 6010B.
- TCLP Mercury using USEPA Method 7471.
- Pesticides/Herbicides using USEPA Method 8081/8151A.
- PCBs (total) using USEPA Method 8082.
- Corrosivity (pH) using USEPA Method 9040C.
- Reactivity (Cyanide) using USEPA Method 9012.
- Reactivity (Sulfide) using USEPA Method 9030A.
- Ignitibility using USEPA Method 9010.
- Paint Filter using USEPA Method 9095.

Laboratory analyses for soil samples required by ESMI Fort Edward include:

- TPH (GRO and DRO) using USEPA Method 8015.
- Total VOCs using USEPA Method 8260B.
- Total SVOCs using USEPA Method 8270C.

- Total PCBs using USEPA Method 8080.
- Total Metals (plus antimony, beryllium, nickel, thallium, vanadium and zinc) using USEPA Method 6010B.
- Total Cyanide using USEPA Method 9010.
- Percent Sulfur using USEPA Method D129-64.
- BTU using ASTM D240-87.

Laboratory analyses for groundwater samples required by Clean Harbors include:

- Total BTEX using USEPA Method 8260.
- Total SVOCs using USEPA Method 8270C.
- Total Metals using USEPA Method 6010A.
- PCBs (total) using USEPA Method 8082.
- Corrosivity (pH) using USEPA Method 9040B.
- Reactivity (Cyanide) using USEPA Method 9012.
- Reactivity (Sulfide) using USEPA Method 9030A.
- Ignitibility using USEPA Method 9010.

Verification from the disposal facilities of the required analyses should be obtained prior to conducting the field sampling.

The laboratory will be certified and maintain certification under the NYSDOH ELAP and NYSDOH ELAP Contract Laboratory Protocol (CLP) for analysis of solid and hazardous waste. Only laboratories that have experience with MGP projects or similar projects, and are included on Iberdrola's/NYSEG's master services laboratory contract, will be used. NYSEG will provide a list of laboratories to be considered.

Analytes, along with their regulatory limits (as applicable) are presented in Tables D-2 through D-4. Based on the laboratory results, the disposition of materials for on site reuse or thermal treatment/disposal will generally be as follows:

- If the analytical results indicate that total PAHs listed in Table D-2 are less than 500 mg/kg and the analytes listed in Tables D-3 and D-4 do not exceed their regulatory limit, PCBs are less than 25 mg/kg and total BTEX is less than 10 mg/kg, then the material will be eligible for onsite reuse.

- If the analytical results indicate that the total PAHs listed in Table D-2 are greater than 500 mg/kg and less than 1,000 mg/kg and the analytes listed in Tables D-3 and D-4 are below their regulatory limits, the material will be sent to Sub-Title D Landfill.

- If the analytical results indicate that total PAHs listed in Table D-2 are greater than 1,000 mg/kg and the analytes listed in Tables D-3 and D-4 are below their regulatory limits, but fail to meet the TCLP limit for benzene (0.5 milligrams per liter [mg/L]), then the soil may be managed as a Resource Conservation and Recovery Act (RCRA) conditionally exempt waste and sent to an off-site thermal desorption facility permitted to accept it.

- If the analytical results indicate that total PAHs listed in Table D-2 are greater than 1,000 mg/kg and any of the analytes listed in Tables D-3 and D-4 exceed their regulatory limit, then the material will be sent to a RCRA permitted facility.

4. Air Quality Monitoring

Real-time air quality monitoring will be conducted in accordance with the CAMP included as Appendix F of the Remedial Action Design, and the Design Engineer's HASP. The air monitoring program will provide a direct measurement of VOCs and particulates that are released during the soil sampling activities. Real time air monitoring will commence at the start of each workday and will continue until daily activities have ceased. The real time data generated will allow an assessment of the impact of the sampling activities on air quality.

During the pre-remediation sampling, monitoring will be conducted at representative locations in the vicinity of the work area for VOCs and particulate matter less than 10 micrometers in diameter (PM_{10}). Meteorological monitoring will not be required during the pre-remediation sampling. Additionally, particulate monitoring will not be performed during precipitation events. Organic vapor and PM_{10} monitoring station locations will be determined daily based on weather conditions (e.g., wind direction). An upwind location for both organic vapors and PM_{10} monitoring will be selected at the start of each workday. Air monitoring locations will be documented in a field logbook. Based on the limited soil disturbance associated with soil boring installation, only one downwind (based on predominant wind direction) location for both organic vapor and PM_{10} monitoring will be required.

A real-time VOC monitor (RAE Systems SentryRAE [or equivalent]), equipped with either a PID, or flame ionization detector, calibrated to 100 parts per million (ppm) Isobutylene will be used to monitor for VOCs. The instrument will be capable of calculating 15 minute running average concentrations. As outlined in the NYSDOH Generic CAMP (GCAMP), if the ambient air concentration for total VOCs exceeds 5 ppm above background (upwind location) for the 15-minute average, work activities will be temporarily halted while monitoring continues. If the total VOC concentration readily decreases (through observation of instantaneous readings) below 5 ppm above background, then work activities can resume with continuous monitoring. Additionally, if odors deriving from the site operations are detected in the nearby community, despite VOCs being below the action level, odor suppression activities will be taken.

As also required by NYSDOH GCAMP, if the average ambient air PM_{10} concentration (calculated for continuous 15-minute increments as specified above) at any one (or more) of the downwind perimeter locations exceeds 100 micrograms per cubic meter ($\mu g/m^3$) above the average background concentration (calculated for continuous 15-minute increments as specified above), or if airborne dust is visually observed leaving

the work area, then dust suppression measures will be implemented, and air monitoring will continue.

Additional information regarding the community air monitoring locations, equipment and action levels is presented in the CAMP.

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Tables Appendix

Table D-2 Sample Analytes for PAHs

(Total PAHs Not to Exceed 500 mg/kg)
Naphthalene
2-Methylnaphthalene
Acenapthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(g,h,I)perylene
Benzo(j)fluoranthene
Chrysene
Dibenzo(a,h)anthracene
Fluoanthene
Fluorene
Indeno(1,2,3-cd)pyrene
Phenanthrene
Pyrene

Table D-3 TCLP Analytes and Limits

TCLP Analyte	Regulatory Limit (mg/L) 6 NYCRR Part 371
Arsenic	5.0
Barium	100.0
Benzene	0.5
Cadmium	1.0
Carbon Tetrachloride	0.5
Chlordane	0.03
Chlorobenzene	100.0
Chloroform	6.0
Chromium	5.0
Cresols (total of o, m, p)	200.0
2,4-D	10.0
1,4-Dichlorobenzene	7.5
1,2-Dichloroethane	0.5
1.1-Dichloroethylene	0.7
2,4-Dinitrotoluene	0.13
Endrin	0.002
Heptachlor Epoxide	0.008
Hexachlorobenzene	0.13
Hexachlorobutadiene	0.5
Hexachloroethane	3.0
Lead	5.0
Lindane	0.4
Mercury	0.2
Methoxychlor	10.0
Methyl ethyl ketone	200.0
Nitrobenzene	2.0
Pentachlorophenol	100.0
Pyridine	5.0
Selenium	1.0
Silver	5.0
Silvex (2, 4, 5 – TP)	1.0
Tetrachloroethylene	0.7
Toxaphene	0.5
Trichloroethylene	0.5
2,4,5-Trichorophenol	400.0
2,4,5-Trichlorophenol	2.0
Vinyl chloride	0.2

Table D-4 Other RCRA Characteristics and Landfill Requirements

Analysis	Limit
Ignitability	Must be >60° C
Corrosivity (pH)	Non-corrosive pH must be >2 and <12.5
Reactive Cyanide	<250 mg/kg
Reactive Sulfide	<500 mg/kg
PCBs (Total)	50 mg/kg
% Solids	Must be >20%

Table D-5 Sample Analytes for Thermal Treatment[1]

Analyte
TPH Diesel Range Organics (8015B)
Total VOCs (8260)
Total SVOCs (8270)
Total Metals (14)[2] (6010B)
Total Cyanide (9010)
Percent Sulfur (ASTM D129-64)
PCBs (total) (8080)
BTU using ASTM D240-87

[1] provided by ESMI

[2] Total Metals: Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium (total), Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc

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Figures

EAST FIFTH STREET (AKA JUDSON STREET)

I.D. BOOTH BUILDING

I.D. BOOTH-OWNED STORAGE YARD

NYSEG SUBSTATION

ELECTRIC TOWER

LOADING DOCK

OIL TANK AND CONCRETE DIKE (REMOVED)

FORMER TRANSFORMER REPAIR BUILDING (CONCRETE SLAB REMAINING)

SLAB

NYSEG-OWNED PROPERTY

NEW TEST PIT (FORMER TP-108)

CONCRETE PIPE REMOVAL AREA

AREA 6

COAL HOUSE (REMOVED)

OIL TANKS (REMOVED)

AREA 5

AREA 4

AREA 8

AREA 7

AREA 12

AREA 11

AREA 10

AREA 9

GAS HOUSE (REMOVED)

DISTRIBUTION HOLDER

NAPL COLLECTION WELL

CATCH BASIN STRUCTURE

NEW TEST PIT (FORMER TP-122)

NEW TEST PIT (FORMER TP-21)

NEW TEST PIT (FORMER TP-20)

TRAYER-OWNED PROPERTY

TRAYER PRODUCTS BUILDING

PARKING

I.D. BOOTH BUILDING

NYSEG-OWNED FORMER MGP SITE

OIL & TAR SEPARATOR

AREA 1

AREA 2

AREA 3

GAS HOLDER FOUNDATION #2 (REMOVED)

GAS HOLDER FOUNDATION #1 (REMOVED

HYDRANT

GAS REGULATOR PIED

MADISON AVENUE

EAST CLINTON STREET

±22' CLEARANCE

±26' CLEARANCE

±36' CLEARANCE

±16' CLEARANCE

±17' CLEARANCE

±21' CLEARANCE

±20' CLEARANCE

LEGEND

- S — SEWER LINE
- G — GAS LINE
- W — WATER LINE
- E — OVERHEAD ELECTRIC LINE
- UE — UNDERGROUND ELECTRIC LINE
- PROPERTY LINE
- x — CHAIN-LINK FENCE
- FORMER MGP STRUCTURES
- PROJECT WORK LIMITS
- EXCAVATION SUPPORT
- (16) TARGET DEPTH FOR EXCAVATION AND/OR PRE-EXCAVATION
- UTILITY POLE
- GUY WIRE
- CATCHBASIN
- MANHOLE
- PROPOSED SOIL BORING

0 40' 80'
GRAPHIC SCALE

NYSEG, ELMIRA, NEW YORK
MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
PRE-REMEDIATION IN-SITU SAMPLING AND ANALYSIS WORK PLAN

SOIL BORING LOCATIONS

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FIGURE
D-1

Appendix E

Construction Quality Assurance Plan

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

NYSEG

Construction Quality Assurance Plan

Madison Avenue Former Manufactured Gas Plant Site

Elmira, New York

September 2011

Construction Quality Assurance Plan

Madison Avenue Former
Manufactured Gas Plant Site

Prepared for:
NYSEG

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Date:
September 2011

Table of Contents

1. Introduction

1.1 Purpose

This *Construction Quality Assurance Plan* (CQAP) has been prepared to support the implementation of remedial activities at the NYSEG Madison Avenue Former Manufactured Gas Plant Site located in Elmira, New York. This CQAP describes the materials; procedures and testing necessary for proper construction, evaluation and documentation during remedial activities. Details related to the remedial activities are presented in the *Remedial Action Design* (ARCADIS, 2011).

1.2 Definitions and Terms

The following terms and abbreviations are used throughout this CQAP. The definition of each term or abbreviation is consistent throughout this CQAP:

- *ASTM* – American Society for Testing and Materials.
- *Remediation Contractor* – The person, persons or firm designated by NYSEG to perform the remedial activities, including the person or persons hired by the Remediation Contractor to install the components of the remedial work and the person or persons designated by the Remediation Contractor to perform work associated with the remedial activities.
- *Remedial Action Design* – The Remedial Action Design collectively includes the *Final (100%) Remedial Action Design* text; Technical Specifications; Design Drawings; CQAP; *Community Air Monitoring Plan* (CAMP); *Traffic Control Plan* (TCP), *Noise Monitoring Plan* (NMP), and *Contingency Plan* (CP).
- *CQA* – Construction quality assurance.
- *CQC* – Construction quality control.
- *Design Engineer* – The Design Engineer (ARCADIS) is responsible for preparing the Remedial Action Design. Duties of the Design Engineer generally include conducting pre-remediation sampling, decommissioning monitoring wells and piezometers prior to remedial construction, and preparing waste profiles for off-site treatment/disposal of wastes to be generated as part of the remedial activities.

- *Remediation Engineer* – For purpose of this CQAP, the Remediation Engineer is the person or persons responsible for verifying that the Remediation Contractor completes the remedial construction activities in accordance with the Remedial Action Design. The Remediation Engineer's duties include reviewing proposed modifications to the Remedial Action Design. In addition, the Engineer will be responsible for the quality assurance/quality control (QA/QC) aspects of the project. Duties will include CQA sampling, testing, determination of work limits and measurement of work for payment and final acceptance.

- *Manufacturer* – The person or persons designated by the Remediation Contractor to provide construction materials.

2. Required Personnel and Qualification

2.1 CQA Management Organization

This section identifies the general CQA roles, qualifications and responsibilities of Remediation Engineer and Remediation Contractor personnel, as well as NYSEG's role in the CQA process. Additional requirements are specified throughout in the Remedial Action Design.

2.2 NYSEG

NYSEG will have the final authority on all aspects of the remedial construction activities. NYSEG is empowered to determine the amount, quality, acceptability and fitness of all parts of the Remedial Action Design.

The NYSEG Project Manager is knowledgeable of the project requirements and objectives and is familiar with the Remedial Action Design. The NYSEG Project Manager will be on-site, as required, during construction activities. The responsibility of the NYSEG Project Manager is to review the quality of construction that meets or exceeds that defined by the Remedial Action Design and identified in this CQAP.

The NYSEG Project Manager will have the following responsibilities in the implementation of the procedures in the CQAP:

- Attend the pre-mobilization site meeting.
- Attend project coordination meetings, as required.
- Evaluate the construction activities and the Remediation Engineer's CQA efforts.
- Contract with a third-party consulting firm to conduct a pre- and post-remedial action structural survey of the nearby buildings in accordance with applicable laws, practices and regulations.

2.3 Remediation Engineer

The Remediation Engineer will provide on-site and office-based assistance to NYSEG throughout duration of remedial activities. The Remediation Engineer will observe construction activities and document that the materials and workmanship delivered by

the Remediation Contractor comply with the requirements of the Remedial Action Design and are of sufficient quality to permit the development of construction completion certifications as may be required by the New York State Department of Environmental Conservation (NYSDEC). The observation, sampling, and/or documentation of construction activities and associated procedures will be performed by a person or persons familiar with construction procedures and materials. In general, observation, sampling, testing and/or documentation of the installation of construction materials and associated procedures will be performed by a person or persons familiar with contemporary construction procedures, materials and the project requirements. The project personnel will be under the direct supervision of a Professional Engineer licensed in the State of New York. The CQA Personnel will be familiar with the use of equipment and methodology needed to sample and test soil, water, and other materials.

The Remediation Engineer will have experience in a position of significant responsibility for construction projects similar in magnitude and complexity to the project being undertaken. The Remediation Engineer must be knowledgeable of the project requirements and objectives and must be familiar with the Remedial Action Design. The Remediation Engineer's on-site personnel must demonstrate knowledge of construction, excavation support and bracing system installation/removal, excavation, in-situ soil stabilization and applicable test methods through a combination of formal education, training and experience.

The Remediation Engineer will have the following responsibilities during the implementation of the procedures in the CQAP:

- Coordinate the pre-construction site meeting.
- Schedule and coordinate CQA inspection activities.
- Coordinate periodic project meetings.
- Attend to routine daily topics related to the overall performance of the construction activities.
- Maintain responsibility for the implementation of the procedures in this CQAP.

- Provide the appropriate technical review (i.e., by qualified representatives of the Remediation Engineer) of the Remedial Action Design, proposed modifications to the Remedial Action Design, and construction summary report.

- Maintain contact with NYSEG, Remediation Contractor and subcontractors regarding conformance with the requirements in this CQAP.

- Provide overall coordination of the remedial activities.

- As an agent for NYSEG prepare transportation manifests for the transportation of non-hazardous waste, hazardous waste and conditionally exempt materials (i.e., soil, water, debris).

- Monitor the delivery of samples to the CQA Laboratory for testing.

- Document that field and laboratory testing is conducted at the frequency established in this CQAP, review field and laboratory QA/QC testing results for conformance with the Remedial Action Design, and provide assistance in the review and interpretation of field and laboratory testing results.

- Provide assistance in the review of shop drawings, product data and other submittals from the Remediation Contractor.

- Review the progress of the remedial activities: prepare Daily Field Construction Reports.

- Review the installed portion of work to permit further construction.

- Identify noted deficiencies during construction activities (based on QC testing results) so corrective actions can be taken.

- Prepare the *Construction Completion Report* following the completion of remedial activities.

The Remediation Engineer's on-site personnel will also have the following responsibilities in the implementation of the procedures in the CQAP:

- Oversee and coordinate the QA/QC sampling and testing.

- Record on-site activities that could result in damage to the site and report these activities to the Remediation Contractor and NYSEG.
- Review shop drawings, product data and other submittals from the Remediation Contractor.
- Identify/determine areas that require rework and/or repair.
- Coordinate activities to establish proper sampling procedures.
- Perform regular site walkthroughs to review progress and QA/QC procedures.
- Perform community air monitoring in accordance with Remedial Action Design.
- Identify areas of non-conformance based upon the results of field and laboratory testing.
- Perform and document field sampling for QA/QC testing.
- Observe construction materials, such as steel, soils, piping and geosynthetics, delivered to the site, to determine general conformance with material specifications.
- Observe and record the procedures used for the following:
    - Pre-construction activities/mobilization.
    - Excavation support/bracing system installation, monitoring and removal.
    - Excavation activities.
    - In-situ stabilization activities.
    - Noise, vapor/odor suppression and dust control.
    - Decontamination of equipment and personnel.
    - Waste handling, treatment and disposal.

- Backfilling/restoration of excavated and disturbed areas.
- Installation of the surface cover materials.
- Site restoration/demobilization.

2.4 Remediation Contractor Qualifications and Responsibilities

The Remediation Contractor will be trained and experienced, and demonstrate that the superintendent, field crew foreman and subcontractors have similar experience in the construction, installation and performance of the various components outlined in the Remedial Action Design, including excavation support and bracing system installation/removal, excavation, in-situ stabilization and water handling/management. The Remediation Contractor will also hire a third party firm to conduct vibration monitoring and noise monitoring throughout the remedial construction activities, as specified in the Remedial Action Design.

The Remediation Contractor will have the following responsibilities for implementing the procedures presented in the CQAP:

- Review and be completely familiar with the Remedial Action Design.
- Maintain lines of communication with NYSEG and the Remediation Engineer to identify and discuss field issues as they arise.
- Coordinate with all equipment suppliers to document compliance with CQAP requirements.
- Provide NYSEG and/or the Remediation Engineer with at least 5 days written notice of any tests or inspections required by the Remedial Action Design; timely notice of all other tests and inspections and an additional 48 hours notice prior to the actual performance of any test or inspection.
- Prepare and submit to the Remediation Engineer all shop drawings and other required submittals specified in the Remedial Action Design.
- Identify any potential design and/or construction issues as early as possible to allow resolution in a manner that will not impact the quality of the construction or the schedule of construction activities.

- Maintain a continuous record of any approved changes or modifications to the Remedial Action Design.

- Contract with surveyor; all surveys necessary for the implementation of the remedial activities and for the collection of as-built information will be carried out by personnel practiced in land survey techniques and under the direction of a New York State-licensed Land Surveyor.

3. Documentation Requirements

3.1 Documentation

The documentation of CQA activities will support a determination of whether construction activities have been carried out in general accordance with the Remedial Action Design. The documentation process includes recognition of construction tasks that will be observed and documented; assignment of responsibilities for the observation, testing and documentation of these tasks; and the completion of the required reports, data sheets, forms and checklists to provide an accurate record of the work performed during the remedial activities.

3.1.1 Daily Field Construction Reports

The Remediation Engineer will complete a Daily Field Construction Report (DFCR) of each day's construction activities. The DFCRs will be submitted at the end of the week in an electronic format to NYSEG's Project Manager. The DFCR report will contain, at a minimum, the following information:

- Date, project name, location and the number of workers on site for the Remediation Contractor.
- Time that work starts and ends, in addition to the time of work stoppages related to inclement weather, or insufficient equipment or personnel or other reasons.
- Data on weather conditions, including temperature, cloud cover and precipitation.
- Remediation Contractor's workforce, equipment and materials delivered to or removed from the job site.
- Chronological description of work in progress, including notices to or requests from the Remediation Contractor and/or installer.
- A description of any health and safety issues.
- Results of testing performed by on site personnel.
- Problem/deficiency identification and documentation describing corrective actions taken for field problems and non-conformance with this CQAP.

- A record of pertinent communications with other on-site parties, outside companies, regulatory agencies or consultants regarding the day's construction activities.

- Erosion and sediment control inspection results, including date and time of inspection, a description of the weather and soil conditions at the time of inspection, a description of the condition of the runoff at all points of discharge from the construction site and identification of all erosion and sediment control measures that need repair or maintenance and/or are not functioning as designed and need corrective action(s).

- Documentation of problems and/or deficiencies noted during construction (e.g., when construction material or activity is observed or tested that does not meet the requirements set forth in the Remedial Action Design), and corrective action employed by the Remediation Contractor to address the problems or deficiencies.

3.1.2 Health and Safety Accident Reports

In the event of any accident occurring on-site during the remedial project, NYSEG's *Public Liability Accident Report,* NYSEG's *Report of Employee Injury,* and/or NYSEG's *Incident Report* will be completed by affected personnel. The Remediation Engineer's Project Manager, CQA Engineer and NYSEG Project Manager will be contacted in the event of an accident. NYSEG's accident report sheets will be attached to the Health and Safety Plan and will be located in the field project trailer.

3.1.3 Transportation Log

The Remediation Engineer will prepare a transportation log to record all loads of solid or liquid waste that are transported off-site. The transportation log will remain in the field office during remedial construction activities.

3.1.4 Photographic Documentation

The Remediation Engineer will document observations, problems, deficiencies and work in progress. Photographs will be in color print format and will be filed in chronological order in a permanent protective file and computer storage system.

The following information will be documented in the daily report or a logbook for each photograph:

- Date and time.
- Location where photograph was taken.
- Description of the subject matter.

3.1.5 Construction Completion Report

A *Construction Completion Report* will be prepared by the Remediation Engineer at the end of construction. The report will meet the requirements of NYSDEC DER-10, and at a minimum, contain the following information:

- Record Drawings showing the installation of each construction material as it relates to the plan views and individual details.
- Correspondence with the NYSDEC and others, as deemed relevant to the remedial activities.
- A summary of field observations and tests performed, laboratory samples collected and test results reported.
- A summary of problems and deficiencies encountered during construction, including recurring problems and/or deficiencies discovered.
- Documentation indicating that acceptance criteria were met, including a comparison of documented procedure data with the Remedial Action Design.
- A summary and documentation of all waste streams generated as part of the project, including final treatment/disposal destination and volume.

3.1.6 Construction Submittals

The Remediation Contractor shall prepare and submit, to the Remediation Engineer, all submittals required in the Remedial Action Design. Information contained in the Remediation Contractor's submittals that is not applicable to the specification furnished

should be clearly lined out or deleted. The Remediation Contractor's submittals must be easily legible, clean, and clearly reproduced.

All required submittals shall be reviewed by the Remediation Engineer for conformance with the requirements presented in the Remedial Action Design. The Remediation Contractor will not be permitted to perform any activity that directly or indirectly involves the item or items covered by a submittal until a "reviewed" or "reviewed and noted" stamp is provided by the Remediation Engineer.

The Remediation Engineer's review shall in no way be construed as permitting departure from the Remedial Action Design, except where the written request by the Remediation Contractor and written acceptance by the Remediation Engineer and NYSEG for such departure is provided. The Remediation Engineer's review does not relieve the Remediation Contractor of any responsibility to comply with applicable laws, rules, regulations or agreements. The Remediation Engineer will mark each submittal with a stamp to indicate the following:

1. "Reviewed" if no objections are observed or comments made.

2. "Reviewed and Noted" if minor objections, comments or additions are made but re-submittal is not necessary.

3. "Resubmit" if the objections, comments or additions are extensive. In this case, the Remediation Contractor shall revise and resubmit the items for review by the Remediation Engineer within 4 days of receiving comments on the original submittal.

4. "Rejected" if the submittal does not comply, even with reasonable revision, with contract conditions. In this case, the Remediation Contractor shall resubmit to the Remediation Engineer within 4 days a new or modified supplemental submittal that meets the scope and intent of the work specified herein.

5. "For Your Information" if a submittal does not require the Remediation Engineer's review and is being filed for informational purposes only (this code is generally used in acknowledging receipt of field conformance test reports and Health and Safety Plans [HASPs]).

3.2 Project Meetings

Daily, weekly and/or monthly project safety inspections and/or progress and coordination meetings will be conducted for the duration of the construction activities. A brief description of the project meetings and inspections/ reviews to be conducted is provided below.

3.2.1 Pre-Construction Meeting

Following award of the contract and prior to Remediation Contractor mobilization, a pre-construction meeting will be held at the site to introduce project team members representing the Remediation Contractor, NYSEG, the Remediation Engineer and the NYSDEC. The meeting will be scheduled by NYSEG shortly after the award of the Contract. The meeting will be conducted to review Contract requirements, establish a detailed schedule of operations and resolve issues (if any) raised by the attending parties.

The Remediation Engineer will prepare a summary of the pre-construction meeting. A copy of this summary will be provided to each of the parties in attendance. Failure by the Remediation Contractor to inform NYSEG, within 7 days of receiving this summary, of any discrepancies or inaccuracies contained therein indicates that the Remediation Contractor concurs with the Remediation Engineer's summary of the meeting.

3.2.2 Daily Site Safety and Coordination Meetings

Daily meetings will be attended by the Remediation Contractor's representative(s), the Remediation Engineer's representative(s), NYSEG (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.

3.2.3 Periodic Progress and Coordination Meetings

Periodic progress and coordination meetings will be held on site bi-weekly or as required weekly for the duration of the project. Participants in these meetings will include on-site representatives of the Remediation Contractor and the Remediation Engineer. NYSEG and the NYSDEC may also attend some or all of the weekly progress and coordination meetings. Progress and coordination meetings will be held to discuss issues, including, but not limited to, project status, schedule, scope of work and overall project implementation.

Site inspections/reviews will be conducted by NYSEG and/or Remediation Engineer as part of the periodic progress and coordination meetings prior to, during and at the completion of the remedial activities. The weekly progress and coordination meetings will be scheduled by the Remediation Engineer.

3.2.4 Project Close-Out 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, NYSEG, the Remediation Engineer and the NYSDEC. The meeting will be scheduled by the Remediation Engineer. As part of the meeting, a final site inspection will be conducted by NYSEG, the Remediation Engineer and NYSDEC.

4. Pre-Construction Activities/Mobilization

This section describes the construction and testing procedures for the activities that will take place prior to the start of the remedial activities.

4.1 Pre-Construction Surveys

An initial site survey will be performed by the Remediation Contractor's surveyor to document existing (pre-construction) site conditions. During these activities, the surveyor will also establish survey control for the proper construction, documentation and testing of subsequent work activities (e.g., sheet pile installation, excavation). The Remediation Engineer will document, through visual observation, that survey activities are performed in accordance with Specification Section 01160 – Survey Control and survey documentation conforms to the requirements of Specification Section 01720 – Project Record Documents. The Remediation Engineer will also obtain photographic documentation of pre-construction conditions prior to the initiation of construction activities.

Prior to initiating any construction activity that could generate vibrations, NYSEG will subcontract with a third party firm to conduct a pre-remedial action structural survey of the nearby buildings to establish and document visual conditions of the structures prior to initiating remedial activities, and to identify potentially distressed (static/cosmetic) areas of the structures. The third party shall be experienced with conducting structural surveys. Survey activities shall be conducted as detailed in Section 4.6 of the Remedial Action Design. Potential areas of distress that are identified will be documented in accordance with Specification Section 02205 – Excavation Support and Protection. The pre-remedial action survey report shall be submitted to NYSEG and Remediation Engineer within two weeks of completion of the survey and prior to Remediation Contractor mobilization to the site.

4.2 Erosion and Sediment Control Measures

Prior to the start of the remedial activities, erosion and sediment control measures will be constructed/installed/placed by the Remediation Contractor in general accordance with the Design Drawings and Specification Section 01110 – Environmental Protection Procedures.

The Remedial Engineer will document, through visual observations, that erosion and sediment control measures are constructed and maintained in accordance with the

Design Drawings and Specification Section 01110 – Environmental Protection Procedures.

4.3 Temporary Site Security Measures

Temporary site features and site security measures (e.g., fencing, signage) will be installed by the Remediation Contractor to. The Remediation Engineer will document, through visual observation, that temporary site security measures are installed, inspected and maintained by the Remediation Contractor in accordance with the Remedial Action Design.

4.4 Remedial Support Areas

Prior to the start of the remedial activities, the Remediation Contractor will construct remedial support areas (e.g., equipment/personnel decontamination area, Remediation Contractor administrative area). The Remediation Contractor will be responsible for submitting to the Remediation Engineer a figure indicating the proposed locations of such areas for approval prior to mobilization if different than indicated in the Remedial Action Design.

The Remedial Engineer will observe that the decontamination area is constructed in accordance with the Remedial Action Design and is sloped and equipped with a sump to collect liquids. The Remedial Engineer will also observe that the remedial support areas are constructed in approved locations within the Project Work Limits.

4.5 Utility Identification

Prior to remedial construction activities, the Remedial Engineer will document, through visual observation, the following:

- Dig Safely New York is contacted by the Remediation Contractor and the utility clearance is completed prior to the initiation of any intrusive activities.

- Utility locations/alignments are marked-out on the ground.

The locations, alignments, and construction of utilities shown on the Design Drawings are approximate and based on information available to NYSEG and the Design Engineer. 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 NYSEG and the Remediation Engineer.

5. Excavation Support

5.1 General

A watertight, sealed, temporary steel sheet piling system will be installed within/adjacent to Remediation Areas 1 and 2, and at the concrete pipe removal area. Additionally, timber lagging will be used at the concrete pipe removal area.

5.2 Sheet Pile Manufacturing and Delivery

This subsection describes the CQA procedures applicable to the steel sheet pile prior to installation. The temporary steel sheet piles (provided by NYSEG) and joint sealant used for support of excavations will conform to the Design Drawings and – Specification Section 02205 – Excavation Support and Protection.

5.3 Handling and Storage of Sheet Piling

Sheet piling to be provided by NYSEG shall be inspected by the Remediation Contractor, cleaned of rust and/or dirt, as necessary, covered and protected from weathering. Sheet pile panels shall be stored to adequately protect them from equipment damage. The Remediation Contractor shall assume that sheet pile installation activities will consist of pre-drilling the entire sheet pile alignment at each interlock to pre-condition site soil prior to sheet pile installation. Sheet pile installation will then be completed using the ABI Mobilram. The Remediation Engineer will maintain a log of the sheet pile used. Note the timber lagging is to be supplied by the Remediation Contractor.

CQA Observations

The Remediation Engineer will observe and document, throughout the pre-installation, installation and post-installation periods, that the Remediation Contractor is providing adequate handling equipment for moving sheet piles and that the equipment and the handling methods used do not pose unnecessary risk of damage.

5.4 Pre-Installation

Prior to installation of sheet piling, the Remediation Engineer will check the following and note observations in the daily construction report:

- Line and grade of sheet pile wall.
- Condition of timber lagging.
- Actual pile lengths.
- Special piles (i.e. corner piles) are labeled as such.
- Pile installation method to be utilized will not damage the sheet pile or any nearby structures.
- The locations of obstructions (or potential obstructions) have been verified by the Remediation Contractor and adequate removal has occurred to facilitate sheet pile installation.
- Vibration monitoring systems have been installed and the systems are operating properly.

5.5 Sheet Pile Wall and Joint Sealant Installation

As indicated above, the sheet piles will be driven using an ABI Mobilram. All sheet piling will be installed vertically to the elevations indicated in the Remedial Action Design. Care should be taken to establish that piles are plumb prior to installation. Leads, templates, or timber bracing shall be used for guiding the piles during driving.

CQA Observations

During installation of sheet piling (and timber lagging), the Remediation Engineer will monitor for irregularities and indications that the pile is out of plumb. Such instances will be reported to the Remediation Contractor. If deficiencies cannot be corrected, the pile will be pulled and a new pile driven. The Remediation Contractor shall provide the Remediation Engineer documentation of the depth to which each sheet pile is driven and that joint sealant has been applied in accordance with the manufacturer's specifications.

A sheet pile driving record will also be maintained by the Remediation Engineer during the installation of the steel sheet piling. Each sheet pile will be numbered and its location recorded. The installation log will include the sheet pile length, method for

installation, approximate penetration rate, condition of joint sealant and final sheet elevation.

Real-time vibration monitoring will be conducted by the Remediation Contractor's third-party subcontractor during all vibration-inducing activities (including but not limited to sheet pile driving, excavation and extraction) to record seismographic readings to monitor ground vibrations throughout the duration of the activity. Vibration monitors shall be equipped with real audio/visual alarms. Any vibration levels that may cause damage to the building or nearby utilities will be immediately (i.e., within 1 hour) reported to the Remediation Engineer. The Remediation Engineer will inform the Remediation Contractor to cease sheet pile installation and engineering controls (e.g. vibration free equipment, additional trenched installation, additional pre-drilling) will be implemented by the Remediation Contractor prior to continuation of sheet pile installation. Vibration monitoring results will be submitted to NYSEG at the completion of the remedial action in a *Non-Structural Observation Report*.

5.5.1 Sealant Application

Prior to installation of the sheet piling, the Remediation Contractor will apply joint sealant to the female interlocks of the sheet piling to minimize the seepage of groundwater through the sheet pile joints and into the excavation areas. The joint sealant will be installed as specified in the Remedial Action Design.

CQA Observations

The Remediation Engineer will document the methods employed by the Remediation Contractor, will inspect the sealant prior to installation, and will notify the Remediation Contractor if the system is not working effectively during excavation and dewatering activities. Any deficiencies in the joint sealant will be repaired by the Remediation Contractor. If sheet piling is pulled and re-driven during installation, the Remediation Contractor shall re-apply joint sealant prior to re-driving.

5.6 Post-Installation

Following sheet pile installation activities, monitoring activities will continue, as described below.

CQA Observations

During excavation and backfilling activities, the Remediation Engineer will inspect the sheet pile alignment and ground surface (up to 40 feet) behind the wall and inside the excavation areas. Observations will be noted on the daily logs and will include at a minimum observations of:

- Movement/cracking/settlement of the ground surface behind the sheet pile wall (including roadways near the concrete pipe removal area).
- Visually observed deflection of the sheet piling.
- Liquefaction of the excavation bottom (sand boils).
- Excessive heaving of the ground surface inside the excavation area and immediately behind the sheet pile wall.

The Remediation Engineer will also monitor the seepage of water through the interlocks (and lagging) during excavation activities. These observations will be documented in the Daily Field Construction Report, and the Remediation Contractor will be notified immediately if excessive leakage is occurring.

5.7 Decontamination of Excavation Support System

Following completion of excavation activities and removal of the excavation support system, the Remediation Contractor will decontaminate the components of the support system. This will be done in accordance with Section 8 of this document and the Remedial Action Design.

CQA Observations

The Remediation Engineer will observe and document decontamination procedures of the excavation equipment and support structures.

6. Excavation

Excavation activities will be performed by the Remediation Contractor in accordance with the Remedial Action Design. All removed soil, non-aqueous phase liquid (NAPL) (if any), debris and water will be handled in accordance with the *Pre-Remediation In-Situ Sampling and Analysis Report* (to be provided by NYSEG prior to remedial construction).

6.1 Soil and Former Structure Removal

Excavation activities will be performed in general accordance with the following Specification Sections:

- Section 01160 – Survey Control.
- Section 02201 – Earthwork.
- Section 02205 – Excavation Support and Protection.
- Section 02415 – Impacted Material Handling and Excavation Procedures.

The excavation area and excavation support system are shown in the Design Drawings.

CQA Observations

The Remediation Engineer will observe excavation activities to: 1) document that they are being performed in accordance with the Remedial Action Design and; 2) report non-conformances to the Remediation Contractor. During excavation activities, the Remediation Engineer will also observe and document the effectiveness of dewatering activities.

Throughout excavation activities, the surveyor (contracted by the Remediation Contractor) will measure the excavation elevations, and the Remediation Engineer will document that the appropriate removal elevation has been achieved.

6.2 Excavation and Material Dewatering

Excavation and material dewatering will be completed in general accordance with the following M&P Sections:

- Section 02201 – Earthwork.
- Section 02415 – Impacted Material Handling and Excavation Procedures.

CQA Observations

The Remediation Engineer will observe and document that the dewatering system is functioning properly and that water generated during construction activities is being handled in accordance with the *Pre-Remediation In-Situ Sampling and Analysis Report* and Specification Section 02415 – Impacted Material Handling and Excavation Procedures.

6.3 Waste Handling, Treatment and Disposal

The Remediation Engineer shall arrange for proper handling, treatment and disposal of waste materials, including, but not limited to, soil, water, NAPL, debris and miscellaneous wastes generated during the remedial activities in accordance with the *Pre-Remediation In-Situ Sampling and Analysis Report*, Specification Section 02415 – Impacted Material Handling and Excavation Procedures, and all applicable federal, state and local regulations. NYSEG will contract directly with waste haulers and treatment/disposal facilities.

CQA Observations

The Remediation Engineer will observe the implementation of the remedial activities at the site to document that waste materials are being handled/managed in accordance with the *Pre-Remediation In-Situ Sampling and Analysis Report*, Specification Section 02415 – Impacted Material Handling and Excavation Procedures, and all applicable federal, state, and local regulations.

The Remediation Engineer will maintain the following documentation for waste handling, treatment and disposal activities:

- Bills of Lading/Hazardous Waste Manifests.

- Chain of Custody records.
- Trucking logs.

6.4 Loading of Materials for Transportation

Materials will be loaded with an excavator into dump trucks for transportation to permitted disposal facilities. To retain any spilled materials, polyethylene sheeting will be placed between dump truck and excavations or stockpiles. Following completion of loading, any spilled material will be added back into the truck or excavation. Vapor suppression will be conducted in accordance with the Remedial Action Design (e.g., Biosolve, poly sheeting, foam)

CQA Observations

The Remediation Engineer will visual inspect the loading area to confirm that impacted material that collects on the polyethylene sheeting is removed from the area.

7. In-Situ Stabilization

In-Situ Soil Stabilization/Solidification (ISS) operations will occur at Remediation Areas 3 through 5 and 7 through 12. Limits of the ISS activities are shown on the Design Drawings. Subsurface impacted soil will be homogenized and stabilized/solidified using stabilizing/solidifying (S/S) agents (i.e., reagents) to fixate/immobilize these materials. Treatment areas of a reagent/soil mixture will be formed from the ground surface to the target elevations as specified in the Remedial Action Design.

The Remediation Engineer will be on site during the S/S reagent application to perform stabilizing reagent QC observation/testing activities including, testing and certification of the cement materials and the wet sample method for the stabilizing reagent.

The Remediation Contractor will provide the Remediation Engineer with final treatment depths; the Remediation Engineer will document the final depth of each treatment area. Upon completion of ISS operations, the Remediation Contractor will develop a final layout plan using this information. Additionally, the final mixing volumes of each column will be documented by the Remediation Contractor and provided to the Remediation Engineer upon completion.

In-situ S/S reagent and soil mixtures (created during the stabilization/solidification application) will be tested using the wet sample method. A sample set of four 3”x 6” molds will be collected a minimum of every 500 cubic-yards of treated ISS soils using homogenized surface materials. Additional sampling may be required at the discretion of the Remediation Engineer based on conditions encountered during construction. Samples will be collected and placed into molds before the S/S reagent/soil mixture begins to cure.

The soil/reagent samples will be collected, handled, packaged and tested as indicated below and in accordance with Specification Sections 02420 – In-Situ Stabilization/ Solidification and 03002 – Jet Grouting:

- Samples will be placed in properly labeled boxes (indicating location, depth, and column of sample origin).
- Samples will be wrapped in clear plastic wrap to prevent moisture loss.
- Samples will be stored in a cool, dry location and allowed to cure and stabilize for shipping to a testing laboratory.

- Samples will not be allowed to freeze.
- Samples will be tested for unconfined compressive strength of cohesive soils ASTM D2166-85 and unconfined compressive strength of cylindrical concrete specimens ASTM D1633-84.
- Samples will be tested for permeability in conformance with ASTM D5084.
- Sample results will be reported the same week the samples are received.

8. Decontamination

The Remediation Contractor will decontaminate (as necessary) all personnel and equipment that has come into contact with excavated materials at the site in accordance with the Remedial Action Design. The Remediation Contractor will conduct decontamination of personnel and equipment within constructed decontamination area(s).

8.1 General Decontamination Activities

As part of everyday activities, the Remediation Contractor will provide a personnel decontamination area (to be specified in the Remediation Contractor's HASP). The personnel decontamination area (within the contamination reduction zone) will include those facilities necessary to decontaminate personnel upon exit of the work area (exclusion zone), in accordance with the Remediation Contractor's HASP, and in accordance with local, state and federal laws and regulations.

The Remediation Contractor will establish procedures for the decontamination of all vehicles and equipment used for construction activities. These procedures will be reviewed by NYSEG and the Remediation Engineer prior to initiation of construction activities. Visual observation of the equipment will be performed by the Remediation Contractor. This observation will occur while the equipment is positioned in the Equipment Decontamination Area. Any visible soils or other debris will be promptly removed and disposed in a manner consistent with materials excavated.

Unless otherwise directed by NYSEG/Remediation Engineer, any equipment to be taken off site will be subject to final visual inspection and decontamination (if necessary) at a designated Equipment Decontamination Area. In general, this area will consist of an impermeable barrier, which shall be sloped to a collection sump. The Equipment Decontamination Area will be constructed in accordance with the Decontamination Area Detail shown on the Design Drawings. Precautions shall be taken to limit contact between the equipment, personnel performing the decontamination activities, and any decontamination liquids that may accumulate in the decontamination area. The Remediation Contractor shall be responsible for constructing and maintaining the decontamination area to accommodate all loads, equipment and migration scenarios. The Remediation Contractor will dismantle and properly dispose of all materials associated with the decontamination area and will restore the area to its original (pre-construction) condition.

The extent and method of decontamination will be at the discretion of the Remediation Contractor; however, equipment and materials will be observed by the Remediation Engineer prior to its departure from the Equipment Decontamination Area. In addition, NYSEG and/or the Remediation Engineer reserves the right to require additional decontamination if deemed necessary.

Wash water, solids and other materials generated during equipment cleaning shall not contact native soils and existing facilities, and shall be collected by the Remediation Contractor and placed into designated containers. Disposal of collected wash water, solids and other materials shall be in accordance with Specification Section 02415 – Impacted Material Handling and Excavation Procedures.

Personnel engaged in vehicle decontamination will use personal protective equipment, including disposable clothing in accordance with the Remediation Contractor's HASP.

Should vehicles be required to transport materials over site roadways or roadways traversed by local traffic, it is imperative that these roads be kept free of any potentially impacted, as well as non-impacted, soils due to Remediation Contractor's operations. All Remediation Contractor vehicles will be carefully loaded to avoid potential contamination of areas beyond the limits of excavation.

CQA Observations

The Remediation Engineer will observe decontamination activities to document that the following activities (at a minimum) are completed in accordance with the Remedial Action Design and Remediation Contractor's HASP:

- Project equipment (including, but not limited to, excavation equipment, soil mixing equipment, steel sheet piling, trucks, pumps, hand tools) that comes in contact with excavated materials is decontaminated prior to demobilization from the site and prior to handling non-impacted material.

- No visible soil, sediment, debris or stains are present on the equipment surfaces (to the satisfaction of the Remediation Engineer).

- Equipment, such as pumps, are flushed using clean water and appropriate cleaning agents, as necessary (to the satisfaction of the Remediation Engineer).

- Solids and other materials generated during equipment decontamination requiring off-site treatment/disposal are collected and placed into appropriate waste containers for characterization (as appropriate) and off-site treatment/disposal in accordance with Specification Section 02415 – Impacted Material Handling and Excavation Procedures.

8.2 Decontamination of Excavation Support Systems

Following completion of excavation activities and removal of the excavation support system, the Remediation Contractor will decontaminate the components of the support system. This Excavation support system decontamination will be completed by the Remediation Contractor in accordance with this CQAP and the Remedial Action Design.

CQA Observations

The Remediation Engineer will observe and document decontamination procedures of the excavation equipment and support structures.

9. Site Restoration/Demobilization

Following completion of excavation and soil mixing activities, the Remediation Contractor shall backfill and restore the excavation and soil mixing areas (and other disturbed areas) and demobilize labor, equipment and materials from the site in accordance with the Remedial Action Design. Site restoration activities shall include surface cover installation, repairing/installing pavement, and completing final grading of disturbed areas. Site restoration and demobilization activities shall be completed and tested as indicated below.

9.1 Backfilling

The excavation and soil mixing areas will be backfilled accordance with the Remedial Action Design. The Remediation Contractor will select an appropriate off-site backfill source and provide the analytical data for that source to the Remediation Engineer at least 3 weeks prior to bringing the selected material on site. If sample results show that the material does not meet the requirements of the Specification Section 02206 – Selected Fill, the Remediation Contractor must identify a new source for the material and provide the required data report for the new source of material prior to the use of such material on site.

Remediation Contractor Submittals

Remediation Contractor submittal requirements for backfilling activities and proposed fill materials are presented in Specification Sections 02201 – Earthwork and 02206 – Selected Fill, respectively. Such submittal requirements include, but are not limited to, the following:

- Name and location of the source of each proposed fill material.
- Laboratory test report for each proposed fill material indicating the grain-size profile (determined by ASTM D422).
- Results of in-place density tests performed on fill materials (determined by ASTM D1556 or ASTM D2922).
- For any off-site material proposed for use on-site as General Fill, Select Fill or topsoil, the Remediation Contractor must provide the following information (for each material) at least 3 weeks prior to bringing such material on-site:

- Certification that the proposed fill material is from a New York State Department of Transportation- (NYSDOT-) certified source.

- Results of analytical testing for volatile organic compounds, semivolatile organic compounds, polychlorinated biphenyls, pesticides/herbicides and inorganics to demonstrate that the proposed fill material meets the commercial soil cleanup objectives outlined in 6NYCRR Part 375 (Environmental Remediation Programs) in accordance with Specification Section 02206 – Selected Fill.

- Certification that the laboratory used to analyze the proposed fill material is certified by the New York State Department of Health Environmental Laboratory Approval Program for the parameters being analyzed.

CQA Observations

The Remediation Engineer will observe backfilling activities to document that the following activities (at a minimum) are completed in accordance with the Remedial Action Design:

- Backfilling is conducted in accordance with Specification Section 02201 – Earthwork.

- Material is placed and compacted in accordance with Specification Section 02201 – Earthwork.

- Compacted surface of material is smooth and free of any loose stones, protrusions and other sharp objects or foreign matter.

- Material placed within the excavation area contains the optimum moisture content.

- Any settlement occurring in the backfilled area is refilled and compacted.

9.2 Surface Restoration

Following backfilling activities, the excavated and disturbed areas will be restored to the final grades and conditions indicated in the Remedial Action Design.

CQA Observations

Prior to the start of construction, the Remediation Engineer will obtain photographic documentation of pre-construction conditions in all areas that will or may be disturbed during remedial activities.

The Remediation Engineer will observe surface restoration activities to document that: 1) restoration is completed in accordance with latest edition of NYSDOT Standard Specifications and/or the NYS Standards and Specifications for Erosion and Sediment Control (NYS E&SC Manual), as applicable, and 2) the following activities (at a minimum) are completed in accordance with the Remedial Action Design:

Gravel Surface Cover:

- The sub-grade is shaped to line and grade and compacted in accordance with the Remedial Action Design.
- All depressions that develop in the sub-grade under rolling are filled with acceptable material and re-rolled.
- Soft areas of the sub-grade are removed and filled with acceptable material and re-rolled.
- Should the sub-grade become rutted or displaced prior to placing geotextile, it is re-worked to bring to line and grade.
- Compaction is conducted throughout the sub-grade, as required by the Remedial Action Design.
- The sub-base material is placed to the minimum required thickness, in accordance with the Remedial Action Design.
- The final surface material is placed to the minimum required thickness, in accordance with the Remedial Action Design.
- The final surface material is shaped to line and grade and lightly compacted in accordance with the Remedial Action Design.

Vegetative Surface Cover:

- The sub-grade is shaped to line and grade and compacted in accordance with the Remedial Action Design.
- All depressions that develop in the sub-grade under rolling are filled with acceptable material and re-rolled.
- Soft areas of the sub-grade are removed and filled with acceptable material and re-rolled.
- Should the sub-grade become rutted or displaced prior to placing geotextile, it is re-worked to bring to line and grade.
- Compaction is conducted throughout the sub-grade, as required by the Remedial Action Design.
- The sub-base material is placed to the minimum required thickness, in accordance with the Remedial Action Design.
- The sub-base is shaped to line and grade and lightly compacted in accordance with the Remedial Action Design.
- All depressions that develop in the sub-base during grading/compacting are filled with acceptable material and re-graded/re-compacted.
- Should the sub-base become rutted or displaced prior to placing surface material, it is re-worked to bring to line and grade.
- A minimum of 1 foot of topsoil is placed to the lines and grades indicated in the Remedial Action Design, and lightly compacted.
- Prior to placement of seed and mulch, the topsoil surface is lightly loosened, roughened or tracked (i.e., in accordance with the tracking procedures outlined in the NYS E&SC Manual).
- Seed and mulch are placed at the minimum required application rates specified in the Remedial Action Design, and uniformly distributed over the entire area to be re-vegetated.

- Following seeding and mulching, the Remediation Contractor continues to maintain the vegetated areas (including reseeding, if necessary) until a minimum 80 percent density of perennial vegetation is established in the vegetative surface cover area.

9.3 Post-Remedial Action Structural Survey

Following the completion of all vibration-causing construction activities, a post-remedial action structural survey shall be completed by a qualified third party consistent with scope and extent of activities conducted for the pre-remedial action survey and in accordance with applicable laws, practices and regulations. Potential areas of distress that are identified will be documented in accordance with Specification Section 02205 – Excavation Support and Protection. The post-remedial action survey report shall be submitted to NYSEG and Remediation Engineer within two weeks of completion of the survey.

9.4 Demobilization

The Remediation Contractor will demobilize from the site following completion of all remedial activities. Demobilization activities will include, at a minimum, the following:

- Cleaning/decontaminating equipment and construction-related materials prior to removal from the site.
- Dismantling the work area(s), equipment/personnel decontamination area(s) and other remedial support areas.
- Disposing of decontamination area construction materials in accordance with Specification Section 02415 – Impacted Material Handling and Excavation Procedures.
- Removing from the site, all materials, equipment and support structures.

<u>CQA Observations</u>

The Remediation Engineer will observe the Remediation Contractor demobilization activities to document that the following activities were completed in accordance with the Remedial Action Design:

- Equipment and construction-related materials have been cleaned/decontaminated prior to demobilization from the site.
- Work area(s), equipment/personnel decontamination area(s) and other remedial support areas have been dismantled.
- All Remediation Contractor materials, equipment and support systems have been removed from the site.

Appendix F

Community Air Monitoring Plan

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

NYSEG

Community Air Monitoring Plan

Madison Avenue Former Manufactured Gas Plant Site

Elmira, New York

September 2011

Community Air Monitoring Plan

Madison Avenue Former
Manufactured Gas Plant Site

Prepared for:
NYSEG

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Date:
September 2011

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1. Introduction

This *Community Air Monitoring Plan* (CAMP) has been prepared to support the implementation of remedial activities at the NYSEG Madison Avenue Former Manufactured Gas Plant (MGP) Site located in Elmira, New York (site). Details related to the remedial activities are presented in the September 2011 *Remedial Action Design* (ARCADIS, 2011).

The purpose of this CAMP is to describe the monitoring activities that will be conducted by the Remediation Engineer to detect potential airborne releases of constituents of concern 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 02507 – Vapor, Odor and Dust Control, the Remediation Engineer is responsible for providing all labor, materials and equipment necessary to implement the community air monitoring program specified herein. Nevertheless, it is ultimately the Remediation Contractor's responsibility to confirm that all corrective measures associated with the community air monitoring program (including the control of dust, vapors and odors) are performed in accordance with this CAMP.

1.1 Site Location and Description

The site is located in the City of Elmira (Elmira), Chemung County, New York. The site occupies most of the city block bounded by East Clinton Street, Madison Avenue and East Fifth Street (also known as Judson Street). The site is approximately 1,500 feet west of Newtown Creek; a tributary to the Chemung River located approximately 3,000 feet south of the site. The site is largely flat-lying, with a small topographic rise in the eastern corner, near the intersection of East Fifth and Oak Streets. NYSEG currently owns the property that was occupied by the former MGP operations, with the exception of a storage yard located on the northern portion of the site adjacent to East Fifth Street, which is currently owned by I.D. Booth, Inc. (I.D. Booth), and industrial supply wholesaler. I.D. Booth also owns the parcel immediately west of the former MGP site. NYSEG also maintains an electrical substation on the property east of I.D. Booth's storage yard. The parcel immediately south of the site is owned by Trayer Products, Inc. (Trayer), a metal-parts manufacturer. A site plan is included as Figure 1. Land use in the surrounding area is mixed, with industrial and commercial operations immediately south and west, a public park to the northeast and residential properties within 1,000 feet of the site in all directions.

1.2 Summary of Remedial Activities

In general, the remedial activities to be performed at the site include:

- Excavation and removal of coal tar-impacted soil in three remediation areas. These activities include the excavation and removal of the contents of an existing concrete oil and tar separator, as well as heavily impacted soil encountered around and below the tar separator, to the extent practicable.

- In-situ treatment of deeper soil above the till unit (encountered at depths ranging from 12 to 28 feet below grade) using in-situ soil stabilization (ISS) technology in nine remediation areas.

- The removal of a portion of a concrete pipe located along the southern property boundary, to the extent practicable.

- Passive coal tar recovery using collection wells.

- Introduction of oxygen into the groundwater to enhance natural attenuation of dissolved-phase organic compounds in groundwater.

- Installation of a demarcation and placement of a minimum of 1 foot of clean fill materials over excavation and ISS treatment areas.

Additional details regarding the remedial activities are provided in the *Remedial Action Design* (ARCADIS, 2011).

1.3 Potential Air Emissions Related to Remedial Activities

As defined in the New York State Department of Health (NYSDOH) Generic 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 steel sheet piling for the excavation support system.

- Excavation to the limits shown in the Remedial Design.

- In-situ soil stabilization/mixing to the limits shown in the Remedial Design.

- Material handling (e.g., separation of large debris from soils, manipulation of excavated materials to render them suitable for off-site treatment/disposal, stockpiling materials, loading materials for transport to the off-site treatment/disposal facility).

- Other ancillary intrusive activities.

1.4 Air/Odor Emissions and Control Measures

Air emissions control and fugitive dust suppression measures will be implemented by the Remediation Contractor concurrently with the activities identified above (as needed) to limit the potential for organic vapor and dust emissions from the site. Air emissions associated with excavation/backfilling, soil mixing, material handling and stockpiling, other intrusive activities, and certain non-intrusive activities, such as mobilization, transportation and restoration activities, will be controlled as described below. The following vapor and dust control measures may be used during these activities, depending upon specific circumstances, visual observations, and air monitoring results:

- Water/BioSolve® spray.

- Polyethylene sheeting (e.g., for covering excavation faces, material stockpiles).

- Minimizing excavation surface area to be exposed at any given time.

- Vapor suppression foam.

The Remediation Contractor is required to mobilize BioSolve® (or approved equivalent) and vapor-suppressant foam (including application equipment) to the site prior to initiating intrusive activities. The Remediation Contractor shall maintain an adequate supply of such materials for the duration of intrusive activities.

2. 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 air monitoring program. 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 exclusion zone (work area) for volatile organic compounds (VOCs) and total suspended particulates (particulates). However, particulate monitoring will not be performed during precipitation events. Additional information regarding the monitoring locations, equipment, and action levels is presented below.

The daily data will be submitted weekly in an electronic format to Justin Deming, NYSDOH at jhd01@health.state.ny.us; Richard Dana, New York State Department of Environmental Conservation (NYSDEC) at rhdana@gw.dec.state.ny.us; Thomas Kump, Chemung County DOH at tkump@co.chemung.ny.us; and Tracy Blazicek , NYSEG at tlblazicek@nyseg.com. A hard copy of the data will be maintained at the Remediation Engineer field office trailer.

2.1 Monitoring Location Selection and Deployment

VOCs and particulate 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 VOCs and particulate monitoring will be selected at the start of each workday. Two downwind (based on predominant wind direction and nearest receptor) locations for both VOCs and particulate monitoring will also be selected. The VOCs and particulate 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° 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.

2.2 Volatile Organic Compounds (VOCs) Monitoring

Real-time monitoring for VOCs will be conducted during remedial activities at the former MGP site. As required by the NYSDOH Generic CAMP, VOCs will be monitored continuously during all intrusive and/or potential dust-generating activities (e.g., installation of erosion and sediment control measures, sheet pile installation,

excavation, backfilling, soil mixing/stabilization, material handling activities) using instrumentation equipped with electronic data-logging capabilities. A real-time VOC monitor (RAE Systems SentryRAE [or equivalent]), equipped with either a photoionization detector, or flame ionization detector, calibrated to 100 parts per million (ppm). Isobutylene, will be used to monitor for VOCs and polycyclic aromatic hydrocarbons. All average 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 by using an electronic data logger and/or in the field logbook.

2.3 Total suspended Particulate (Particulate) Monitoring

Real-time monitoring for particulates will be conducted during remedial activities at the former MGP site. As required by the NYSDOH Generic CAMP, real-time airborne particulate monitoring will be conducted continuously during all intrusive and/or potential dust generating activities (e.g., installation of erosion and sediment control measures, sheet pile installation, excavation, backfilling, soil mixing/stabilization and material handling activities) using instrumentation equipped with electronic data-logging capabilities. A real-time particulate monitor (MIE DataRAM PDR1000 [or equivalent]) will be used for particulate monitoring. All average 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 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 1.5).

2.4 Action Levels

The action levels provided below 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 action levels specified below.

2.4.1 Action Levels for VOCs

As outlined in the NYSDOH Generic CAMP, if the ambient air concentration for total VOCs exceeds 5 ppm above background (i.e., upwind location) for the 15-minute

average, work activities will be temporarily halted while monitoring continues. If the total VOCs concentrations readily decrease (through observation of instantaneous readings) below 5 ppm above background, then work activities can resume with continuous monitoring.

If the ambient air concentrations for total VOCs persist at levels in excess of 5 ppm above background but less than 25 ppm above background, work activities will be halted, the source of the elevated VOCs concentrations identified, corrective actions to reduce or abate the emissions undertaken, and air monitoring will be continued. Once these actions have been implemented, work activities can resume provided the following two conditions are met:

- The 15-minute average VOCs concentrations remain below 5 ppm above background.

- The VOCs level 200 feet downwind of the monitoring location or half the distance to the nearest potential receptor or residential/commercial structure (whichever is less but in no case less than 20 feet) is below 5 ppm over background for the 15-minute average.

If the ambient air concentrations for total VOCs exceed 25 ppm above background, the work activities must cease, and emissions control measures must be implemented.

2.4.2 Action Levels for Particulates

As required by NYSDOH Generic CAMP, if the average ambient air particulate concentration (calculated for continuous 15-minute increments as specified above) at any one (or more) of the downwind perimeter locations exceeds 100 micrograms per cubic meter (µg/m^3) above the average background concentration (calculated for continuous 15-minute increments as specified above), or if airborne dust is visually observed leaving the work area, then dust suppression measures will be implemented, and air monitoring will continue. Work activities may continue following the implementation of dust suppression measures provided that the average ambient air particulate concentration does not exceed 150 µg/m^3 above the average background concentration.

If, after implementation of dust suppression measures, the downwind average ambient air particulate concentration is greater than 150 µg/m^3 above the average background concentration, work activities must be stopped and re-evaluated. Work activities may

resume only if dust suppression measures and other corrective actions are successful in reducing the downwind average ambient air particulate concentration to less than 150 µg/m^3 above the average background concentration and if no visible dust is observed leaving the site. The particulate concentrations will be recorded in accordance with Section 2.3 above.

2.5 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 the NYSDEC for meteorological monitoring systems *(Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV - Meteorological Measurements*, as revised August 1989; and New York State Air Guide-19 – "Oversight of Private Air Monitoring Networks," dated June 1989). Use of these guidelines enables the meteorological monitoring system to provide representative observations of the local meteorological conditions. Security and accessibility to the meteorological monitoring system will also be considered during the selection of the meteorological monitoring system location. 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. A digital meteorological monitoring system (AutoMet or equivalent) will be used to collect the meteorological data.

2.6 Instrument Calibration

Calibration of the VOCs, particulate, and meteorological monitoring instrumentation will be conducted in accordance with each of the equipment manufacturer's calibration and quality assurance requirements. The VOC and particulate monitors will be calibrated daily (at a minimum), and calibrations will be recorded in the field logbook.

3. Vapor Emission Response Plan

The *Vapor Emission Response Plan* (see attachment) will be triggered for contractor worker safety by an exceedance of the 15-minute average VOCs concentration of 1.5 ppm (above background) within the Exclusion Zone. The contractor will initiate engineering controls for employee safety.

If an exceedance of the 15-minute average VOCs concentration of 5.0 ppm (above background) measured at the perimeter of the Exclusion Zone all excavation activities will be stopped and the following action will be taken:

- Continue total VOCs monitoring within the Exclusion Zone and perimeter of the Exclusion Zone. If the total VOCs level drops below 5.0 ppm (above background) then excavation activities can resume with the addition of engineering controls or modifications to the excavation process to minimize VOCs emissions. However if the VOCs level persists above 5.0 ppm, based on continual observance of the total volatile organic analyzer, then the contractor will immediately implement engineering controls such as misting the area with a vapor suppression solution of BioSolve®, covering excavation, backfilling required to reduce emissions and at the same time notify the Remediation Engineer.

- If after the implementation of additional engineering controls the total VOCs levels drop below 5.0 ppm (above background) within the Exclusion Zone and at the perimeter of the Exclusion Zone, then the excavation activity can resume provided process and work activities were adjusted to reduce emission levels

- If the total VOCs levels continue to be greater than 5.0 ppm (above background) at the perimeter of the Exclusion Zone than all site activities must be discontinued. When the work is shut down, downwind air monitoring as directed by Remediation Engineer in consultation with the NYSDEC representative will be implemented to ensure that the emission does not impact the nearest residential of commercial structure at levels exceeding those specified in the Major Vapor Emission response Plan (Section 4.0).

- Primary engineering controls that may be implemented to reduce emission levels include:

- Adding a vapor suppression solution of BioSolve® to impacted media (application in excavated areas will be a light mist as to avoid increasing solubility of wastes leading to increased groundwater contamination).

- Limiting excavation size and the surface area of exposed contaminated soil.

4. Major Vapor Emission Response Plan

If after the cessation of the work activities and implementation of engineering controls, total VOCs levels exceed 5.0 ppm (above background) at the perimeter of the Exclusion Zone, then the following action will be immediately taken:

- Cover the excavation with polyethylene sheeting or clean soil.
- Notify Tracy Blazicek with NYSEG 607.762.8839; Thomas Kump with Chemung County Health Department at 607.737.2019; City of Elmira Police Bureau at 607.737.5811; Amen Omorogbe with the NYSDEC at 518.402.9662 and Justin Deming with the NYSDOH at 1.800.458.1158, Ext 2-7860.
- Continue real-time VOCs monitoring at the upwind, downwind and nearest receptor until VOCs level drop below 2.5 ppm.
- If total VOCs levels persist above the 2.5 ppm (above background), Remediation Engineer and NYSDEC on-site representative will consult with each other and the emergency response agencies to determine the appropriate actions to be implemented. The NYSEG/Remediation Engineer has ultimate authority during major vapor emission emergencies. The NYSDEC must approve any action to continue work following such an event.

Exhibit I

Generic Community Air Monitoring Plan

APPENDIX 1A

New York State Department of Health
Generic Community Air Monitoring Plan

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

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

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

Community Air Monitoring Plan

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

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

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

VOC Monitoring, Response Levels, and Actions

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

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

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

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

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

Particulate Monitoring, Response Levels, and Actions

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (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.

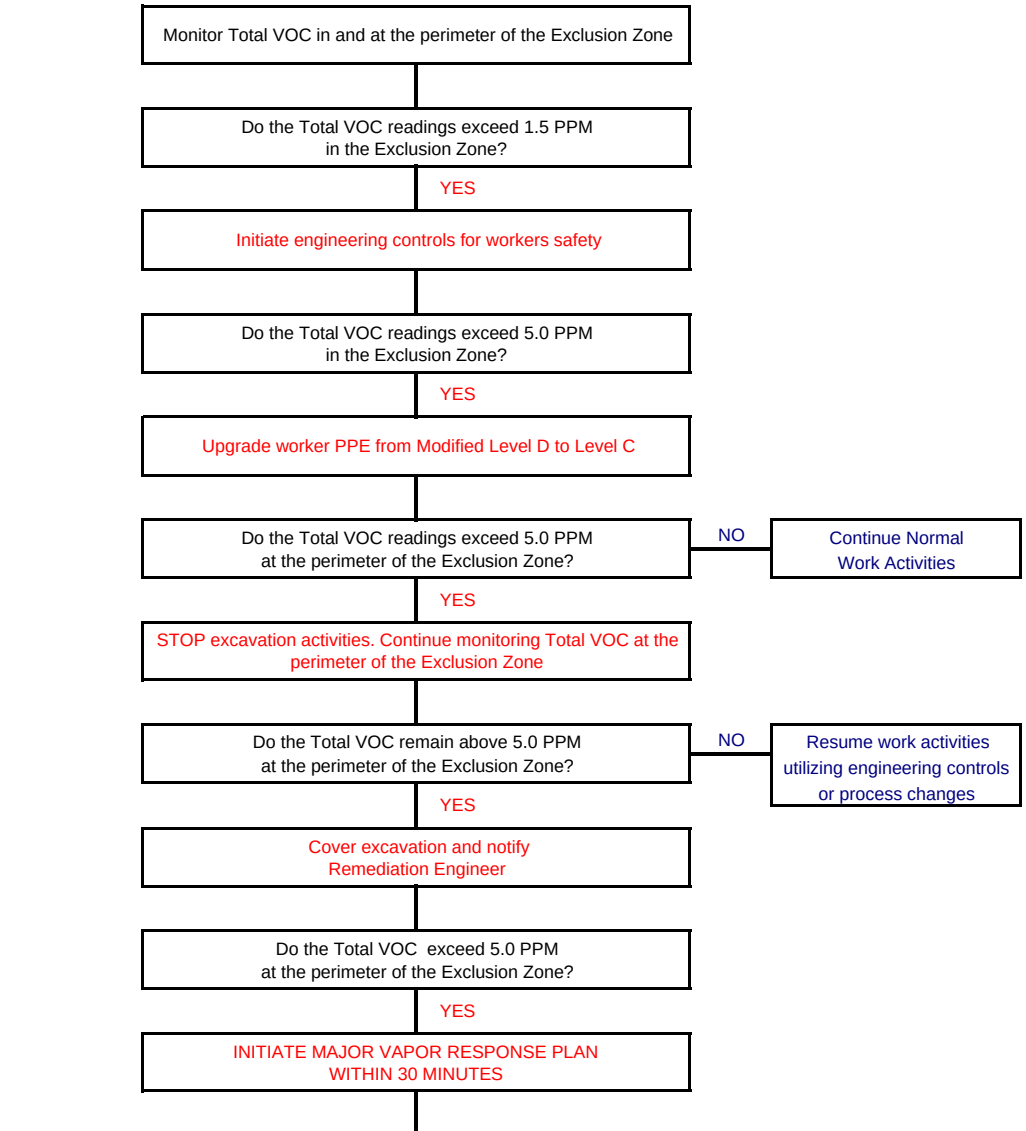
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

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

Exhibit II

Vapor Emission Response Plan
Flowchart

ELMIRA MADISON AVENUE
FORMER MANUFACTURED GAS PLANT SITE
REMEDIAL ACTION DESIGN
VAPOR EMISSION RESPONSE PLAN



1. Notify NYSEG Tracy Blazicek at (607) 762-8839, Chemung County Health, Thomas Kump at (607) 737-2019, City of Elmira Police Bureau at (607) 737-5811, NYSDEC Amen Omorogbe at (518) 402-9662, and NYSDOH Justin Deming at 1-(800) 458-1158 Ext. 2-7860.

2. Total VOC levels will be monitored within 20 feet of the nearest downwind residential or commercial structure. (20-foot zone)

3. 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.

4. If the Total VOC levels persist above 5.0 PPM within the 20-foot zone, the NYSEG/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 G

Noise Monitoring Plan

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

NYSEG

Noise Monitoring Plan

Madison Avenue Former Manufactured Gas Plan Site

Elmira, New York

September 2011

Noise Monitoring Plan

Madison Avenue Former
Manufactured Gas Plant Site

Prepared for:
NYSEG

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Date:
September 2011

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Figures

1. Introduction

1.1 General

This *Noise Monitoring Plan* (NMP) has been prepared to support the implementation of remedial activities at the NYSEG Madison Avenue Former Manufactured Gas Plant (MGP) Site (site) located in Elmira, New York. The New York State Department of Environmental Conservation (NYSDEC), Department of Environmental Remediation (DER) *Technical Guidance for Site Investigation and Remediation* (DER-10) requires that noise monitoring and mitigation be considered as part of the remedial design process, and that noise levels that would trigger alternate construction methods should be included in the remedial design.

In September 2010 the NYSDEC requested that a noise monitoring plan be prepared prior to the start of remedial activities. This site-specific NMP describes the requirements for noise monitoring activities to be conducted during implementation of the remedial activities described in the *Remedial Action Design* (ARCADIS, 2011), and identifies action levels and the general process and responsibilities for noise mitigation, if required.

1.2 Background

The site is located in the City of Elmira (Elmira), Chemung County, New York and occupies most of the city block bounded by East Clinton Street, Madison Avenue and East Fifth Street (also known as Judson Street). The site is largely flat-lying, with a small topographic rise in the eastern corner, near the intersection of East Fifth and Oak Streets. NYSEG currently owns the property that was occupied by the former MGP operations, with the exception of a storage yard located on the northern portion of the site adjacent to East Fifth Street, which is currently owned by I.D. Booth, Inc. (I.D. Booth), an industrial supply wholesaler. I.D. Booth also owns the parcel immediately west of the former MGP site. NYSEG also maintains an electrical substation on the property east of I.D. Booth's storage yard. The parcel immediately south of the site is owned by Trayer Products, Inc. (Trayer), a metal-parts manufacturer.

According to the Zoning Ordnance of the City of Elmira, the site is located within a light industrial zone (IA). Land use in the surrounding area is mixed, with industrial and commercial operations immediately south and west. A public park (Parker Field) exists to the northeast across East Fifth Street (approximately 500 feet from the center of the site). Residential properties exist to the south and south-east of the Trayer

manufacturing facility. The closest residential properties are located within 500 feet to the south/south-east from the site.

The primary components of the NYSDEC-selected site remedy include excavation, in-situ stabilization (ISS), and groundwater treatment. These technologies require the use of noise generating equipment to complete their installation. Drilling and installation of steel sheet piling will be conducted on the western portion of the site, approximately 100 feet north of the Trayer property line, and approximately 75 feet east of the I.D. Booth buildings. Drilling and installation of steel sheet piling will also be conducted on the eastern portion of the site to facilitate the removal of an underground concrete pipe, approximately 250 feet from the closest residential building. In addition, ISS will require either augers and/or soil mixing tools to complete soil treatment. Other construction-related vehicles (e.g., transportation vehicles, front-end loaders) and equipment will be operated on site.

The City of Elmira zoning ordinances do not include maximum noise levels for short-duration environmental construction activities; only maximum allowable noise levels at property lines for noise radiated continuously from a facility (between the hours of 7:00 a.m. and 9:00 p.m.) are provided based on Industrial/Light Industrial property zoning.

This NMP describes the requirements for noise monitoring activities to be conducted during implementation of these remedial activities and identifies the general process and responsibilities for noise mitigation, if it is required.

2. Noise Monitoring and Mitigation

The noise monitoring and mitigation strategy at the site includes the following elements:

- Pre-mobilization background noise monitoring.
- Noise monitoring during remedial activities.
- Noise mitigation procedures.

Each of these elements is presented below.

2.1 Pre-Mobilization Background Noise Monitoring

Monitoring data are needed to assess the baseline noise conditions, noise levels associated with site activities, and the effectiveness of any implemented mitigation measures. Prior to mobilization of remediation equipment, the Remediation Contractor's third party consulting firm (Consultant) will measure background noise along the perimeter of the site. The approximate locations of four (4) continuous noise monitors are shown on Figure 1; actual locations will be selected in the field based on conditions encountered and NYSDEC concurrence. Continuous monitoring will be recorded during the anticipated duration of the construction work day (from approximately 8:00 a.m. to 6:00 p.m.) over a three (3) day period. The noise monitoring data will be summarized by the Remediation Contractor's Consultant (i.e., data tables and plotted graphically) and submitted to NYSEG and the NYSDEC prior to mobilization of remedial equipment. Data will include the "A-weighted" frequency response scale (dBA scale). The dBA scale simulates the response to human ear sound levels and has been given prominence as a means for estimating annoyance and for speech interference caused by noise. The equivalent sound level (Leq) (the A-weighted equivalent continuous sound level) is the values of a steady-state sound that has the same A-weighted sound energy as that contained in the time-varying sound. The Leq is a single sound level value for a desired duration, which includes all of the time-varying sound energy during the measurement period. Noise measurements will be performed using the A-weighting network and the "slow" response of the sound level meter and will be calculated over a 1-hour measurement period. This data will form the baseline for noise monitoring data at the site, and will be representative of ambient (existing) sound levels for the area. Activities that generate background noise (e.g., vehicular traffic, trucks, busses, car horns, loud car stereos, car alarms, brakes

squealing, ambulance/police sirens, off-site construction work, low-flying planes, general city background noise) observed during noise monitoring will be noted in the summary.

The Remediation Contractor's Consultant will use a Quest Q-500 dosimeter or Larson Davis 820 Noise Meter, or similar, capable of measuring from approximately 40 to 140 decibels (dBA), to conduct the noise monitoring. The instrument will be capable of recording instantaneous sound exposure levels and time weighted averages. The measurement microphone will be fitted with a wind screen, and will be located approximately 5 feet above ground surface. Noise monitoring will not be performed during inclement weather (e.g., downpours) or during excessive wind conditions (greater than approximately 15 mile per hour), as sheet pile driving would be suspended during these conditions.

As stated above, the results from the pre-mobilization background noise monitoring will be submitted to NYSEG and NYSEG's Remediation Engineer. The report will provide both the instantaneous sound exposure levels and time weighted averages during the anticipated duration of the construction work day (from approximately 8:00 a.m. to 5:00 p.m.).

2.2 Noise Monitoring During Remedial Activities

This section presents the noise monitoring procedures that the Remediation Contractor's Consultant shall follow during implementation of the remedial activities at the site. The remedial activity that is anticipated to generate the highest noise levels is installation of the excavation support system (i.e., sheet pile). The Remediation Contractor's Consultant will conduct continuous perimeter noise monitoring during installation of the excavation support system; noise monitoring will not be conducted during soil boring/monitoring well installation or ISS activities.

The locations of the perimeter noise monitoring stations will be selected based on:

- The location on the site where the remedial activities are being conducted.
- Approval of the NYSDEC, NYSEG and the Remediation Engineer.

At a minimum, noise monitoring will be conducted at the two closest site boundaries.

The Remediation Contractor will use a Quest Q-500 dosimeter or Larson Davis 820 Noise Meter, or similar, capable of measuring from approximately 40 to 140 dBA, to conduct the noise monitoring. The instrument will be capable of recording instantaneous sound exposure levels and time weighted averages. The measurement microphone will be fitted with a wind screen, and will be located approximately 5 feet above ground surface. Noise monitoring will not be performed during inclement weather (e.g., downpours) and/or when site construction activities are suspended.

The Remediation Contractor will physically monitor the noise measurement results during initial excavation support system installation activities. Noise measurements will be performed using the A-weighting network and the "slow" response of the sound level meter and will be calculated over a 1-hour measurement period. The Remediation Contractor's Consultant will provide a report to NYSEG and the Remediation Engineer at the completion of the construction activities (i.e., tables and plotted graphically). This report will be included as an appendix in the Remediation Engineer's *Construction Completion Report.*

2.3 Noise Mitigation Procedures

The Remediation Contractor will be required to provide noise mitigation/reduction measures, or combination of measures if noise levels are exceeded. Potential mitigation activities that the Remedial Contractor may employ may include:

- Use of moveable acoustic curtain to shield the equipment.
- Restricting times that high noise activities can be conducted.

The Remedial Contractor shall employ adequate measures, or combination of measures, during installation of the excavation support systems to maintain noise levels produced by construction equipment to safe and tolerable limits at the site boundaries. If installation of the excavation support system causes exceedances in sound levels at the perimeter of the site then installation activities shall be halted and the Remedial Contractor and Remedial Engineer shall select and implement noise reduction measures such that work can be conducted at acceptable noise levels. The implementation details, feasibility and the expected effectiveness of the noise reduction measure will be discussed with the NYSDEC, NYSEG and the Remedial Engineer.

The following action noise threshold values will be used to assess the effectiveness of mitigation activities/techniques:

- **"Temporary Halt" Noise Threshold Value of 80 dBA Leq**. If this action level is exceeded over a 1-hour measurement period (i.e., time weighted average [TWA]) work will be temporarily halted, if necessary, while the apparent cause is investigated and corrective actions are taken. If the cause is related to equipment or operational factors, then these would be corrected and work resumed. If this level is exceeded due to site conditions (e.g., obstructions in the ground that cause sheet pile refusal), either mitigation methods will be employed, the obstruction will be removed, or the drive will continue at the next sheet position.

- **"Stop Work" Noise Threshold Value of 85 dBA Leq**. If this action level is exceeded over a 1-hour TWA, a review into the cause will immediately be investigated. Work would stop and an evaluation of an appropriate mitigation measure (or effectiveness of an implemented measure) would be reviewed. The Remedial Contractor and Remedial Engineer would propose an appropriate (or alternate) noise mitigation measure. If 85 dBA is exceeded due to obstructions in the ground which cause refusal of sheets, either the obstruction will be removed or the drive will be stopped and the next sheet position will be attempted.

3. References

Elmira. 2010. City of Elmira, New York Zoning Ordinance. Updated February 2010.

NYSDEC. 2010. *DER-10, Technical Guidance for Site Investigation and Remediation*. May 2010.

ARCADIS

Figures

EAST FIFTH STREET (AKA JUDSON STREET)

MADISON AVENUE

EAST CLINTON STREET

HIGH STREET

I.D. BOOTH BUILDING

I.D. BOOTH-OWNED STORAGE YARD

NYSEG SUBSTATION

NYSEG-OWNED FORMER MGP SITE

OIL TANK AND CONCRETE DIKE (REMOVED)

FORMER TRANSFORMER REPAIR BUILDING (CONCRETE SLAB REMAINING)

NYSEG-OWNED PROPERTY

ELECTRIC TOWER

CONCRETE PIPE REMOVAL AREA (SEE NOTE 8)

CONCRETE PIPE

AREA 8

AREA 7

AREA 9

AREA 11

AREA 12

AREA 10

AREA 5

AREA 4

AREA 3

AREA B (SEE NOTE 8)

COAL HOUSE (REMOVED)

OIL TANKS (REMOVED)

GAS HOUSE (REMOVED)

LIMITS OF AREA 1 EXCAVATION SUPPORT

LIMITS OF AREA 2 EXCAVATION SUPPORT

NEW TEST PIT (FORMER TP-108)

NEW TEST PIT (FORMER TP-122)

NEW TEST PIT (FORMER TP-21)

NEW TEST PIT (FORMER TP-20)

CATCH BASIN STRUCTURE

DISTRIBUTION HOLDER

PURIFIER BOXES

TRAYER-OWNED PROPERTY

TRAYER PRODUCTS BUILDING

PARKING

OIL & TAR SEPARATOR

GAS HOLDER FOUNDATION #1 (REMOVED)

GAS HOLDER FOUNDATION #2 (REMOVED)

GAS REGULATOR SHED

HYDRANT

MW-6S

MW-0301S

MW-0401S

MW-4S

MW-0304D

MW-3S

MW-7

MW-10S

MW-0403S

MW-8S

MW-8D

MW-9S

MW-9D

MW-2S

MW-2D

NMW-0402S

PZ-0902I

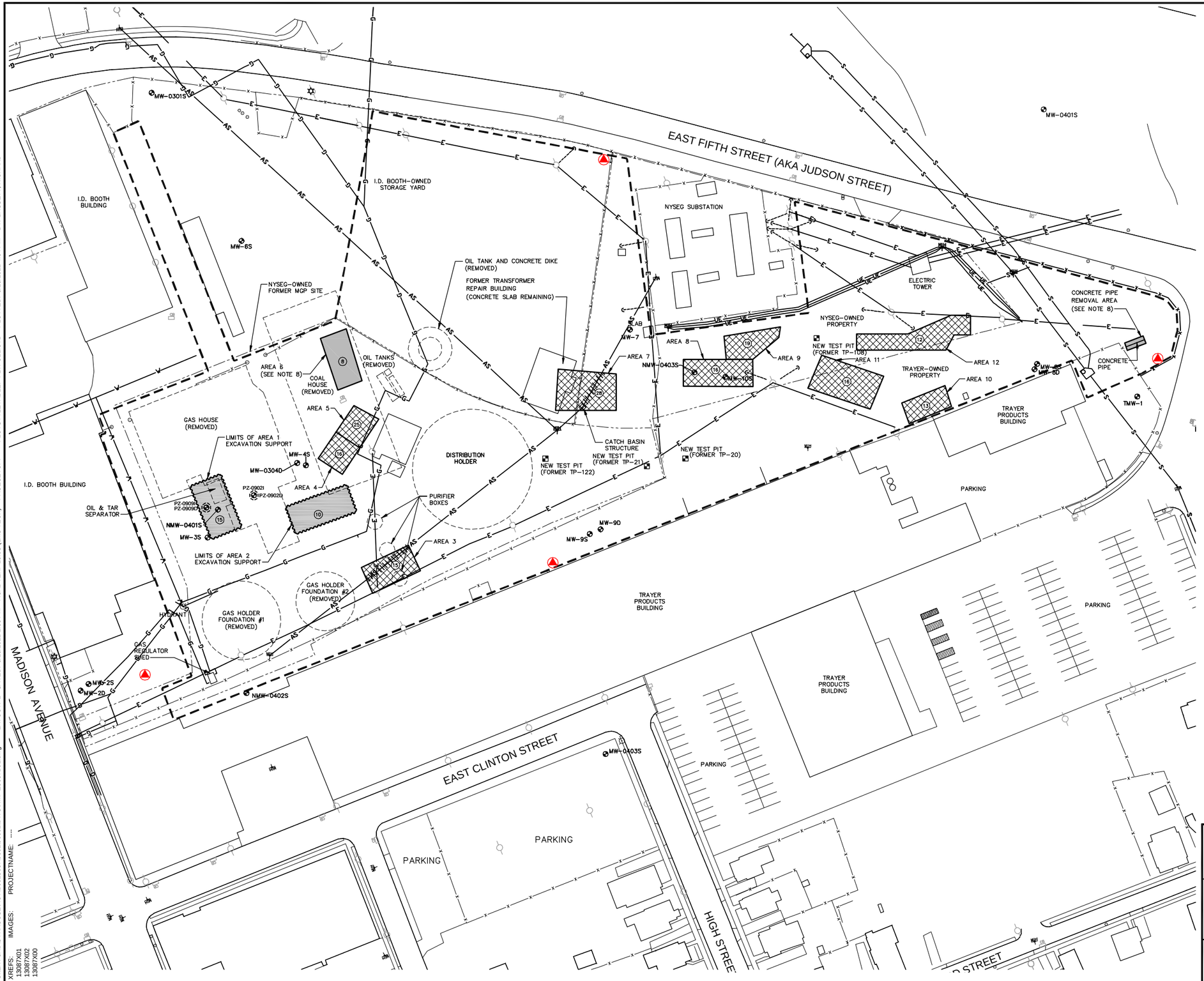
PZ-0902D

PZ-0909I

PZ-0909D

TMW-1

SLAB



LEGEND:

- SEWER LINE (COMBINED SANITARY AND STORM)
- ABANDONED SEWER
- GAS LINE
- WATER LINE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- PROPERTY LINE
- CHAIN-LINK FENCE
- FORMER MGP STRUCTURES
- PROJECT WORK LIMITS
- TEMPORARY SITE SECURITY FENCING
- SITE FEATURE TO BE REMOVED
- EXCAVATION AREA
- EXCAVATION AREA WITH SHEET PILE SUPPORT
- ISS TREATMENT AREA
- EXCAVATION/ISS TREATMENT DEPTH
- UTILITY POLE
- LIGHT POLE
- GUY WIRE
- CATCHBASIN
- MANHOLE
- MONITORING WELL
- PIEZOMETER INSTALLED DURING THE PDI
- PROPOSED TEST PIT
- PROPOSED NOISE MONITORING LOCATION

NOTES:

1. BASE MAP SUPPLIED BY NYSEG, LATEST REVISION DATED APRIL 2004 AT A SCALE OF 1" = 60' AND PROPERTY BOUNDARIES AS PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. DATED OCTOBER 2008, UPDATED NOVEMBER 2010.
2. MAP ENTITLED "O'BRIEN PLOT, MAP MADE FOR CHEMUNG COUNTY OF LANDS IN THE CITY OF ELMIRA, COUNTY OF CHEMUNG, STATE OF NEW YORK" COMPLETED MAY 3, 1944 AND FILED AS MAP #946.
3. MAP ENTITLED "DIVISION OF LANDS OF NEW YORK STATE ELECTRIC & GAS CORP., CITY OF ELMIRA, CHEMUNG COUNTY, NEW YORK. PREPARED BY WEILER ASSOCIATES, DATED FEBRUARY 12, 1975 AND REVISED JANUARY 25, 1977 AND FILED AS MAP #1872.
4. MAP ENTITLED "ELMIRA-MADISON AVENUE FORMER MGP SITE." PREPARED BY NYSEG ENGINEERING SERVICES, BINGHAMTON, NEW YORK. PROVIDED ON 6/28/2010.
5. ALL LOCATIONS ARE APPROXIMATE.

0 50' 100'
GRAPHIC SCALE

NYSEG
MADISON AVENUE FORMER MGP SITE
ELMIRA, NEW YORK
NOISE MONITORING PLAN

BACKGROUND NOISE MONITORING LOCATIONS

ARCADIS

FIGURE
1

CITY:SYRACUSE DIV/GROUP:ENVCAD DB:R. BASSETT LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIB0013087\0001\00002\DWG\NMP13087B01.dwg LAYOUT: 1 SAVED: 3/23/2011 2:53 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/23/2011 4:54 PM BY: BASSETT, RICHARD
XREFS: 13087X01 13087X02 13087X00 IMAGES: PROJECTNAME: ----

Appendix H

Citizens Participation Plan (not part of Contractor bid package)

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

NYSEG

Citizens Participation Plan

Madison Avenue Former Manufactured Gas Plant Site

Elmira, New York

September 2011

Citizens Participation Plan

Madison Avenue Former
Manufactured Gas Plant Site

Prepared for:
NYSEG

Prepared by:
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Our Ref.:
B0013087.0001

Date:
September 2011

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Figures

1. Introduction

Citizen participation is an integral component of remedial programs in New York State. Input from affected or interested individuals and organizations on the remedial program helps ensure outcomes that account for both technical and human concerns for protecting public health and the environment. A project-specific plan is a mechanism to inform and involve community residents, public and private leaders, and other stakeholders. This *Citizen Participation Plan* (CPP) documents the planned project-specific public outreach activities and resources organized for the remedial program associated with the NYSEG Madison Avenue Former Manufactured Gas Plant (MGP) site located in Elmira, New York (site).

The primary purpose of this CPP is to outline the communication methods that, based on applicable New York State law and New York State Department of Environmental Conservation (NYSDEC) regulations and guidance, provide for constructive communication of program activities between the stakeholders and other interested parties. This CPP has been prepared in accordance with the NYSDEC guidance document entitled "DER-23 *Citizen Participation Handbook for Remedial Programs"* (NYSDEC, 2010). This document includes methods intended to inform interested parties of program developments, elicit responses and public involvement and provide a central point of contact for inquiries regarding the remedial program for the Madison Avenue Former MGP Site. This CPP presents the planned communication and outreach activities, describes how interested individuals and groups can participate in the remedial program, and provides a variety of reference materials to facilitate gaining access to project-specific information and management personnel.

Both the NYSDEC and NYSEG are committed to the implementation of this CPP as required by 6 NYCRR Part 375, applicable NYSDEC guidance, and the Administrative Order on Consent (Index No. D0-0002-9309). As required by 6 NYCRR Part 375-1.10, NYSDEC and NYSEG will review and update this CPP to account for significant changes in the Madison Avenue Former MGP Site remedial program.

2. General Site Information

In March 1994, NYSDEC and NYSEG entered into a multi-site Administrative Order of Consent to evaluate the nature and extent of MGP-related constituents at 33 former MGP sites in New York State and, where necessary, remediate the sites for the protection of human health and the environment. The Madison Avenue Former MGP Site (Site No. 8-08-018) is included on the list of 33 sites.

2.1 Site Location

The site is located in the City of Elmira (Elmira), Chemung County, New York. The site occupies most of the city block bounded by East Clinton Street, Madison Avenue and East Fifth Street (also known as Judson Street). The site is largely flat-lying, with a small topographic rise in the eastern corner, near the intersection of East Fifth and Oak Streets. NYSEG currently owns the property that was occupied by the former MGP operations, with the exception of a storage yard located on the northern portion of the site adjacent to East Fifth Street, which is currently owned by I.D. Booth, inc. (I.D. Booth), an industrial supply wholesaler. I.D. Booth also owns the parcel immediately west of the former MGP site. NYSEG maintains an electrical substation on the property east of the I.D. Booth storage yard. The parcel immediately south of the site is owned by Trayer Products, Inc. (Trayer), a metal parts manufacturer. A site plan is included as Figure 1. Land use in the surrounding area is mixed, with industrial and commercial operations immediately south and west, a public park to the northeast and residential properties within 1,000 feet of the site in all directions. According to historical maps, a former canal (Junction Canal) was located along, and parallel to the southern boundary of the site.

2.2 Site History

A chronological history of the former MGP property and surrounding area is presented in Section 1.2.2 of the *Remedial Action Design* (ARCADIS, 2011) and summarized below.

The MGP was built between 1865 and 1869 along the Junction Canal (the canal), a waterway connecting the Chemung and North Branch Canals. The original southern Site boundary was the canal, which was used to transport coal. The canal was backfilled and replaced by a railroad in the late 1800s. The MGP operated for approximately 80 years (circa 1865 to 1947) using coal, oil and water to produce gas. The MGP initially produced coal gas, then water (or blue) gas and finally carbureted

water gas. With plant closure in 1947, most of the aboveground MGP structures were dismantled. The last remaining MGP structure, the former gas house, was demolished by NYSEG during an interim remedial measure completed in 2004.

After 1947, NYSEG used the entire site as a service center for its electric and gas crews. Activities at the site (post 1947) included storage of various utility supplies, such as wire, insulators, line hardware, treated wood poles, cross-arms and oil-filled electrical equipment, and minor equipment maintenance (performed in the Transformer Repair Building).

NYSEG ceased active use of the Site in 1975 when it moved operations to their current service center located in Horseheads, New York. The former Transformer Repair Building continued to be used for storage of various supplies, but was not used for equipment maintenance. The western portion of the Site, including all the remaining buildings, was sold to I.D. Booth in 1977. I.D. Booth uses several of the old buildings as warehouses in support of operations across Madison Avenue to the west. NYSEG retained ownership of the eastern portion of the Site where an electrical substation and a storage yard is maintained. In 2003, NYSEG re-acquired the portion of the property where the primary MGP operations were located from I.D. Booth (western portion) and transferred ownership of the storage yard (to the west of the substation) to I.D. Booth.

3. Remedial Investigation Summary and Program Overview

3.1 Remedial Program Overview

During the remedial investigation phase of the project, the site was the subject of eight environmental investigations and other studies starting in 1986 and culminating in 2009 with the completion of a pre-design investigation (PDI). During these investigations, more than 200 soil borings were drilled, approximately 29 monitoring wells and 25 temporary piezometers/wells were installed, 61 test pits were excavated and hundreds of samples of environmental media were collected and analyzed. Soil borings were completed to a variety of depths required to delineate the horizontal and vertical extent of soil containing visual evidence of heavy impacts within the proposed treatment areas. The comprehensive results of the remedial investigation activities were presented in the *Pre-Design Investigation Report* (PDI Report) (ARCADIS, 2010).

These investigation activities were conducted in accordance with the Order of Consent and NYSDEC-approved work plans.

3.2 Summary of Findings

The remedial investigation focused on assessing the nature and extent of former MGP-related residuals. Based on these investigations, the primary MGP-related impact associated with the site is a dark colored, somewhat viscous, oil-like material, defined as dense nonaqueous phase liquid (DNAPL). DNAPLs are heavier than water, if present in sufficient quantities. The oil-like material itself contains many organic compounds that are regulated by the NYSDEC, including Benzene, Toluene, Ethylbenzene, Xylene (BTEX), and a general class of organic compounds identified as Polycyclic Aromatic Hydrocarbons (PAHs). The remedial investigation results are summarized below:

3.2.1 General Site Geology and Hydrogeology

Investigations have identified five principal geologic units beneath the site, consisting of (in increasing depth):

- Fill and an assortment of man-made structures, originating during the site's industrial history. The fill varies in thickness from approximately 3 feet in the western portion of the site to up to 15 feet in the eastern portion of the site.

- Alluvial sequence of silt and clay with sand stringers and peat. The alluvial silt and clay is only present on the western portion of the site at depths ranging from 3 to 13 feet below grade and at thicknesses of 5 to 10 feet.

- Outwash deposit of sand and gravel with few discontinuous interspersed fine sand, silt and clay lenses deposited by melt water rivers during glacial recession. The sand and gravel is present throughout the site and is generally encountered at depths ranging from 3 to 15 feet below grade. The sand and gravel varies from 3 feet thick in the western portion of the site to 40 feet thick in the central portion of the site (the vicinity of the former distribution holder). Cobbles and boulders have historically been encountered throughout the sand and gravel.

- Remnants of a lacustrine silt and clay likely deposited in a glacial melt water lake. The lacustrine silt and clay is encountered in the central portion of the site (in the vicinity of the former distribution holder) and east of East Fifth Street. The in the central portion of the site, the lacustrine silt and clay is located at depths ranging from 25 to 45 feet below grade and at thicknesses up to 15 feet.

- Dense glacial sandy/silty basal till. The till is encountered at depths ranging from 15 feet below grade (in the western portion of the site) up to 60 feet below grade in the central portion of the site. The silt and clay unit transitions into the basal till unit; i.e., the interface between the units is not well defined.

The groundwater table is approximately seven to eight feet below ground surface (bgs), and groundwater generally flows in a south to southeasterly direction.

3.2.2 Subsurface Soil Impacts and Remedial Actions

As stated in the Record of Decision (NYSDEC, 2008), the selected soil remedy will include a combination of removal and in-situ treatment of contaminated soil that are heavily impacted with MGP coal tar. To assist with determining areas/volumes of soil requiring remediation, the database of visual impacts, along with the surveyed CAD base map, geologic/stratigraphic information, and groundwater gauging data were entered into Mining Visualization System (MVS) software to create a 3-dimensional visualization of the distribution of site impacts.

Proposed areas requiring remediation were based on a detailed evaluation of both the MVS model output figures and the raw data, including the surrounding soil characteristics, the length of the interval exhibiting impacts, the depths that the impact

was noted and level of impact observed in nearby samples. The areas proposed for excavation and/or In-situ stabilization (ISS) are presented on Figure 2. Each of these areas is briefly discussed below.

3.2.2.1 In-Situ Stabilization Areas

ISS is proposed in nine areas of the site (Areas 3 through 5 and Areas 7 through 12). These nine areas primarily exist below the groundwater table. The approximate depths of each of these areas are presented on Figure 2. Approximately 11,500 cubic yards of soil is included within the ISS treatment areas. The actual lateral extent and depth of each area may vary slightly based on site conditions encountered.

3.2.2.2 Excavation/Removal Areas

As also presented on Figure 2, excavation of soil is proposed in three areas of the site (Area 1, Area 2 and Area 6). The rationale/criteria for defining areas requiring excavation/removal was consistent with the method used to identify areas proposed for ISS treatment.

Area 1 includes the location of the former oil and tar separator (to approximately 15 feet bgs). Area 2 and Area 6 includes the removal of soil to depths of 10 and 8 feet bgs, respectively. Excavation support will be used to facilitate soil removal at Areas 1 and 2 due to the depth of impacts within this area. Approximately 2,300 cubic yards of soil is estimated to be excavated and removed for disposal. Excavated soil will be transported off-site for treatment and/or disposal at an appropriate facility/landfill.

3.2.2.3 Areas Requiring Further Investigation

Based on review of logs from historical investigations, four additional locations were identified with soil potentially containing “heavy” impacts. Based on available information, the locations of these four test pits were identified in the field using survey equipment. Multiple soil borings were installed during the PDI to delineate impacts in these areas; however, at each of the test pit locations, visual evidence of “heavy” impacts was not observed. NYSEG has agreed to install test pits to evaluate subsurface conditions in these four locations. The test pit locations are also shown on Figure 2.

3.2.3 Groundwater Impacts and Remedial Actions

The nature and extent of MGP-related impacts to groundwater at the site have been characterized. Impacted groundwater is defined as groundwater containing MGP-related constituents (BTEX and PAHs) above NYSDEC Class GA Standards and Guidance Values (i.e., drinking water standards). This definition is used even though groundwater in the area is not used as a source for drinking water.

The extent of groundwater impacts is defined by the following:

- The horizontal extent of the dissolved-phase BTEX and PAHs in site groundwater has been delineated and appears to be limited to within approximately 100 feet of the site boundary to the south.

- The vertical extent of detectable concentrations of dissolved-phase BTEX and PAHs has been delineated and appears to be limited vertically to within approximately 50 feet of the ground surface.

- The deep groundwater zone (i.e., groundwater deeper than approximately 50 feet bgs) does not appear to have been impacted by the former MGP operations.

The groundwater remedy will consist of a combination of nonaqueous phase liquid (NAPL) recovery and oxygenation of groundwater. The proposed locations of NAPL collection and oxygen application wells, as well as performance monitoring wells, are shown on Figure 2. Wells will be constructed with polyvinyl chloride risers and well screens. All wells will be equipped with a 5-foot sump and completed with flush-mount well covers.

As shown on Figure 2, three NAPL collection wells will be installed in the southwestern portion of the site to address “heavily impacted” material. Additionally, a NAPL collection well will be installed in the area east of the former Distribution Holder to address oil-like material observed during the completion of an historical soil boring. With approval from NYSDEC, if “heavily impacted” material is not observed during installation of the soil boring completed to facilitate well installation, a NAPL collection will not be installed at the given soil boring location.

Nineteen (19) oxygen application wells will be installed to facilitate amendment of groundwater within silt and clay, and sand and gravel units. Four performance

monitoring wells will be use to monitor dissolved oxygen concentrations in groundwater upgradient and downgradient of the application wells.

3.2.4 Concrete Pipe

During the Supplemental Remedial Investigation (SRI), a concrete pipe located on the eastern portion of the site (near the intersection of Judson and Oak Streets) was investigated. The concrete pipe was encountered approximately 10 feet below grade. The depth of the concrete pipe varies based on the surface topography (i.e., a potion of the pipe is located beneath a grassed knoll). A black sludge with a strong coal tar-like odor was observed inside the pipe. BTEX and PAHs were detected in a sample of the black sludge. The origin, termination, and layout of the entire length of the pipe were not able to be confirmed during the SRI. The Remediation Contractor will remove the concrete pipe, to the extent practical, as part of the remedial construction activities.

4. Citizens Participation Activities

This section presents the specific citizen participation and outreach activities planned for implementation during the remedial program and to be implemented in accordance with 6 NYCRR Part 375 and with NYSDEC Program Policy DER-23, *Citizen Participation Handbook for Remedial Programs* (NYSDEC, 2010). Operating under project-specific citizen participation goals, clearly defined objectives will be achieved by implementing a range of communication tools and methods. The planned activities are geared toward making project-specific information (e.g., work plans, technical reports, information sheet summaries) available to the public; facilitating communication among stakeholders including the creation of contact lists; scheduling and conducting public meetings; establishing comment periods; and notifying the public of document availability, public meetings, comment periods and major program milestones.

4.1 Goals and Objectives

The primary goal of this CPP is to achieve effective, open communication among stakeholders and interested parties, NYSEG, the NYSDOH and the NYSDEC. Common goals include:

- Provide a process for the affected/interested public to effectively participate in the decision making process for remedial actions.
- Encourage meaningful public participation that reflects the diversity of interests and perspectives found within a community.
- Solicit public comments at formal milestones, while encouraging public input throughout the site remedial process.
- Encourage communication among the interested parties and regulatory agencies that promotes the exchange of information and strengthens trust among the parties.
- Minimize unnecessary delays caused by uncertainty or lack of publicly available information.

To accomplish these goals, the following specific objectives will be pursued through the implementation of this CPP:

- Communicate goals, accomplishments and status of the project to the contact list (including community leaders, public officials and the wider community, as necessary) through appropriate means at appropriate milestones.

- Establish, maintain, update and utilize the contact lists.

- Educate the community, in lay terms, about the nature and magnitude of potential site risks, including instructions for mitigating risk (if appropriate) and assurances that the environment and worker/public health and safety are protected.

- Provide interested parties the opportunity to review technical reports generated through the remedial program (e.g., document repository as required by 6 NYCRR Part 375).

- Provide a designated project spokesperson as point of contact through which community inquiries regarding the project can be addressed consistently and effectively.

- Periodically review the effectiveness of citizen participation and outreach activities during the remedial action and make adjustments in the CPP's methods and/or activities, if necessary.

The Madison Avenue Former MGP Site project contacts (NYSDEC, NYSDOH and NYSEG representatives) are provided in Section 5.

4.2 Tools and Methods

There are many ways to reach and communicate with the community and other interested parties as this CPP is implemented over the course of the remedial program. A variety of outreach tools and methods will be used to ensure proper communication with the interested parties that include various organizations, public and business leaders and a diverse assemblage of individuals of all ages, education backgrounds and cultures.

Interested parties will be informed and invited to participate in the planned citizen participation activities through appropriate means such as mailings to the contact list, legal notice in newspapers, press releases, information sheets and other documents made available in the document repository.

Specific public participation activities will be implemented as required by 6 NYCRR Part 375 and current NYSDEC guidance as described below.

4.2.1 Document Repository and List of Available Documents

Two document repositories were established early on in publicly accessible locations that have accommodations necessary to house and make project-related documents available for community reference and review. The use of document repositories is intended to maximize public access to site information while minimizing abuse, destruction or theft of project documentation.

The document repositories for the Madison Avenue Former MGP Site are:

Steele Memorial Library
101 East Church Street
Elmira, New York 14901

NYSDEC
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, New York 12233-7014
518.402.9662
Attn: Bernard Franklin

4.2.2 Public Notice

After completion of the Remedial Action Design Construction Completion Report, the report will be included in the project Document Repositories. Before field work begins at the site to implement the remedy, NYSEG will work in cooperation with the NYSDEC Department of Environmental Remediation (DER) to develop a notice that will be sent to all parties on the Site Contact List and to the Document Repository. The notice includes a Fact Sheet that describes the upcoming field work. The Fact Sheet will be sent so that they are received before site activities occur.

In addition, an availability session may be conducted by the NYSDEC prior to the start of remedial actions at the site. An availability session is an informal gathering of the NYSDEC staff, NYSEG representatives and the public. The NYSDEC will distribute public notification at least two weeks prior to the scheduled session. The availability session would be used to describe to the public the upcoming remedial construction

activities. Sessions would provide citizens with the opportunity to interact with project experts one-on-one.

4.3 Roles and Responsibilities

The specific roles and associated responsibilities for implementing this CPP are as follows:

- **NYSDEC Project Manager** – The NYSDEC Project Manager is responsible for enforcement, oversight and management of the overall remedial program. Typical citizen participation-related activities include making presentations at public meetings, reviewing project documents such as notices and Fact Sheets, and providing technical assistance in preparing the responsiveness summary or answering public inquiries.

- **NYSDOH Project Manager** – The NYSDOH Project Manager is responsible for review and comment of technical information generated during the remedial program and protection of public health. Typical citizen participation-related activities include making presentations at public meetings, reviewing project documents such as information sheets and addressing public inquiries.

- **NYSDEC Citizen Participation Specialist** – The Citizen Participation Specialist assists the project managers in implementing the CPP. Typical activities include preparation and/or review of information sheets/notices and the responsiveness summary, assistance with the development of the Site Contact List and coordination of public meetings and availability sessions.

- **NYSEG Project Manger** – The NYSEG Project Manager, in cooperation with the NYSDEC Project Manager, is responsible for implementing the overall remedial program at the site. Typical citizen participation-related activities include management of CPP implementation, presentations at public meetings and technical assistance to the NYSDEC Project Manager and Citizen Participation Specialist.

Current project management staffing is identified in Section 5.

4.4 Schedule for Implementing Elements of the CPP

Implementing elements of this CPP depends upon completion by NYSEG and final NYSDEC-approval of the Remedial Action Design. NYSEG has established Document Repositories (see Section 4.2.1) and has placed completed documents in the repository for public review.

5. Project Contracts and Interested and Affected Parties

The following is a list of project contacts overseeing the Madison Avenue Former MGP Site project. For questions related to any aspect of the former MGP Site, please contact the following staff:

NYSDEC Project Manager (for project-related issues)
Amen Omorogbe, P.E.
NYSDEC
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, New York 12233-7014
Phone: 518.402.9564
Fax: 518.402.9679

NYSDOH Representative (for site-related health concerns)
Justin Deming
NYSDOH, BEEI
547 River Street, Room 300
Troy, New York 12180-2216
Phone: 800-458-1158 ext. 27860

NYSEG Project Manager (NYSEG Representative)
Tracy Blazicek
NYSEG
18 Link Drive
Binghamton, New York 13902-5224
Phone: 607.762.8787

5.1 Residents and/or Nearby Property Owners

At the direction of the NYSDEC, the names and contact information for local residents and/ or property owners have been withheld from this document (for privacy reasons). Please contact the NYSDEC Project Manager (Mr. Bernard Franklin) to: 1) determine if you are on the contact list; or 2) be added to the contact list.

6. References

ARCADIS. 2010. *PDI Summary Report*, Madison Avenue Former MGP Site, prepared for NYSEG. February 2010.

ARCADIS. 2011. *Remedial Action Design*, Madison Avenue Former MGP Site, prepared for NYSEG. September 2011.

NYSDEC. 2010. *DER-23*. *Citizen Participation Handbook for Remedial Programs.* January, 2010.

Exhibit A

Glossary of Terms and Guide to Acronyms

Exhibit A: Glossary of Terms and Guide to Acronyms

Terms

Citizen Participation Plan (CPP) – A document that describes the project-specific citizen participation and outreach activities that will take place along-side the technical components of the remedial program. The CPP also provides project information, citizen participation goals and objectives, and lists of contact persons and document repositories.

Citizen Participation Specialist – A NYSDEC staff member whose duty it is to provide guidance and assistance in carrying out the CPP. The Citizen Participation Specialist is the key contact for public inquiries about the project and the remedial activities.

Contact List – A list developed by NYSEG, the NYSDEC, and CPP containing names and addresses of individuals, groups, organizations, news media and public representatives interested and/or affected by the project. The contact list is used to distribute important information and notices about the project and the remedial program.

Document Repository – Project documents and other information are placed in the document repositories to facilitate convenient public access to these articles. Documents are available for public reference and review at the NYSDEC Central office in Albany, New York and at the Steele Public Library. Refer to Section 4.2.1 of the plan for more information about the document repository locations.

In-Situ Stabilization (ISS) – The ISS process involves mixing a cement material with impacted site soil to reduce the leachability and mobility of MGP-related impacts present in the soil. The resulting mixture is generally a homogeneous mixture that hardens to become a weakly-cemented material. The ISS process would stabilize soil containing MGP-related impacts into a solid mass (micro-encapsulation), as well as soil surrounding impacted soil (macro-encapsulation), thereby preventing migration of impacts and NAPL beyond the stabilized mass.

Polycyclic Aromatic Hydrocarbons (PAHs) – Contaminants typically found at MGP sites and associated with coal tar residues.

Remedial Design (RD) – This report includes a detailed description of the remedial objectives and the means by which each essential element of the selected remedial

alternative will be implemented to achieve those objectives. It incorporates the findings of a feasibility study to provide a remedial design which will be implemented during the performance of the cleanup activities at the site.

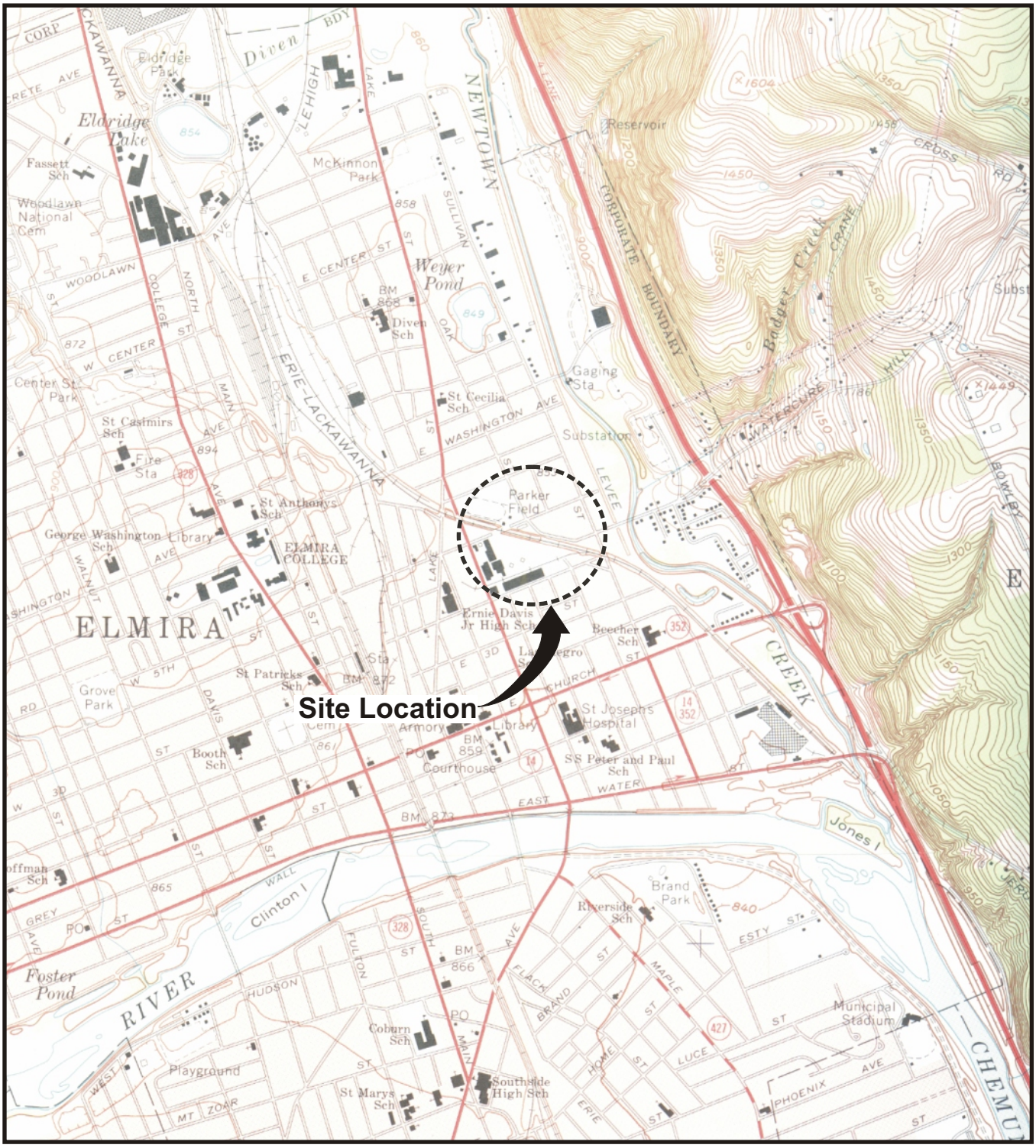
Volatile Organic Compounds (VOCs) – Benzene, Toluene, Ethylbenzene, Xylene (BTEXs) – are typical contaminants found at MGP sites and other sites where coal, oil, refined products and other hydrocarbons were burned or used.

Acronyms

bgs	below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CO	Consent Order/Administrative Order of Consent
CPP	Citizen Participation Plan
DER	Division of Environmental Remediation
DNAPL	Dense Non-Aqueous Phase Liquid
MGP	Manufactured Gas Plant
NAPL	Non-Aqueous Phase Liquid
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
PAHs	Polycyclic Aromatic Hydrocarbons
PSA	Preliminary Site Assessment
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

ARCADIS

Figures



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., ELMIRA, N.Y.-PA., 1969.

2000' 0 2000'

Approximate Scale: 1" = 2000'

NYSEG
MADISON AVENUE FORMER MGP SITE
ELMIRA, NEW YORK
CITIZEN PARTICIPATION PLAN

SITE LOCATION MAP

ARCADIS

FIGURE
1

12/01/2010 SYRACUSE-141ENV-DJHOWES
B0013087/0001/00002/CDR/13087N01.CDR

I.D. BOOTH BUILDING

LOADING DOCK

I.D. BOOTH-OWNED STORAGE YARD

±22' CLEARANCE

±26' CLEARANCE

±36' CLEARANCE

EAST FIFTH STREET (AKA JUDSON STREET)

NYSEG SUBSTATION

ELECTRIC TOWER

OIL TANK AND CONCRETE DIKE (REMOVED)

FORMER TRANSFORMER REPAIR BUILDING (CONCRETE SLAB REMAINING)

SLAB

NYSEG-OWNED PROPERTY

CONCRETE PIPE REMOVAL AREA

AREA 6

OIL TANKS (REMOVED)

COAL HOUSE (REMOVED)

AREA 7

AREA 8

AREA 9

NEW TEST PIT (FORMER TP-108)

AREA 12

AREA 11

AREA 10

±16' CLEARANCE

AREA 5

AREA 4

GAS HOUSE (REMOVED)

DISTRIBUTION HOLDER

NAPL COLLECTION WELL

CATCH BASIN STRUCTURE

TRAYER-OWNED PROPERTY

TRAYER PRODUCTS BUILDING

NEW TEST PIT (FORMER TP-21)

NEW TEST PIT (FORMER TP-20)

NEW TEST PIT (FORMER TP-122)

±16' CLEARANCE

PARKING

I.D. BOOTH BUILDING

NYSEG-OWNED FORMER MGP SITE

±17' CLEARANCE

OIL & TAR SEPARATOR

AREA 1

AREA 2

±26' CLEARANCE

AREA 3

GAS HOLDER FOUNDATION #2 (REMOVED)

±21' CLEARANCE

GAS HOLDER FOUNDATION #1 (REMOVED

HYDRANT

GAS REGULATOR PIED

±20' CLEARANCE

MADISON AVENUE

EAST CLINTON STREET

PARKING

PARKING

TRAYER PRODUCTS BUILDING

TRAYER PRODUCTS BUILDING

LEGEND

S — SEWER LINE	(16) TARGET DEPTH FOR EXCAVATION/ISS
G — GAS LINE	UTILITY POLE
W — WATER LINE	GUY WIRE
E — OVERHEAD ELECTRIC LINE	CATCHBASIN
UE — UNDERGROUND ELECTRIC LINE	MANHOLE
PROPERTY LINE	NEW TEST PIT
CHAIN-LINK FENCE	NAPL COLLECTION WELL
FORMER MGP STRUCTURES	APPLICATION WELL
PROJECT WORK LIMITS	PERFORMANCE MONITORING WELL
EXCAVATION AREA	
EXCAVATION SUPPORT	
ISS AREA	

0 40' 80'
GRAPHIC SCALE

NYSEG, ELMIRA, NEW YORK
MADISON AVENUE FORMER MANUFACTURED GAS PLANT SITE
CITIZEN PARTICIPATION PLAN

SITE REMEDIATION PLAN

ARCADIS

FIGURE
2

Appendix I

Contingency Plan

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

NYSEG

Contingency Plan

Madison Avenue Former Manufactured Gas Plant Site

Elmira, New York

September 2011

Table of Contents

1. Contingency Plan

This Contingency Plan addresses potential emergencies that may arise as a result of operations during the remedial activities that will be completed at the Madison Avenue Former Manufactured Gas Plant (MGP) site, Elmira, New York. This Contingency Plan supplements the Remedial Action Design.

NYSEG's Remediation Contractor will identify a Site Health and Safety Officer (SHSO). The SHSO shall be made aware of any emergencies and coordinate any response activities carried out at the site. The SHSO shall 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, he/she shall specify another senior individual to serve in this capacity. The alternate PEC shall become familiar with contingency plans developed by each Remediation Contractor/subcontractor.

1.1 Identifying the Hazards and Assessing the Risk

The objectives during any emergency shall be to 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 then 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). He/she shall make this assessment by:

- Identifying the materials involved in the incident.
- Consulting the appropriate occupational health guideline or material safety data sheets (MSDS) 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 possible follow-up requirements that may result from implementing those actions (e.g., equipment repair, material disposal, etc.).

If operating personnel cannot control the incident without incurring undue risk, the PEC shall implement the Site Evacuation Procedures (Section 2.1). If off-site neighboring population is at risk the PEC will implement the Off-Site Evacuation Procedures (Section 2.2). The PEC shall notify NYSEG's Project Manager and the appropriate government agencies and departments that a situation resulting in evacuation has occurred. Should emergency assistance in treating injuries or carrying out the evacuation be required, the PEC shall request assistance of the appropriate parties.

1.2 Conditions for Implementing a Contingency Plan

Some of the conditions under which the contingency plan would be implemented are:

- Fire or explosion.
- Occurrence of a spill or material release.
- Severe weather conditions.
- Physical or chemical injury to a worker.

The conditions are discussed below; additional conditions under which the contingency plan would be implemented will be identified by the PEC.

1.2.1 Fire and/or Explosion Conditions

Contingency procedures shall immediately be implemented upon notification that any of the following scenarios involving fire and/or explosion is imminent or has 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 off-site areas.
- A danger exists that an explosion could occur causing a safety or health hazard.
- An explosion has occurred.

1.2.2 Spill or Material Release Conditions

Any of 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 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 off-site soil contamination and/or groundwater or surface water pollution.

The PEC (or Remediation Contractor's emergency coordinator) shall immediately identify the character, source, amount, and extent of any release. Spills or material releases shall be reported immediately to the PEC. Initial identification shall be based on visual analysis of the material and location of the release. If the release material cannot be identified, samples of potentially affected media shall be taken for analysis as directed by NYSEG.

1.2.3 Severe Weather Conditions

The following severe weather conditions, whether imminent or having occurred, may 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).

1.2.4 Physical or Chemical Injury Conditions

The following worker injuries may cause implementation of the Contingency Plan:

- Major physical injuries.
- Chemical injuries.
- Severe symptoms of chemical overexposure.

1.3 Contingency Procedures

If any of the aforementioned conditions for implementing the Contingency Plan are met, the appropriate following contingency procedure(s) shall be performed.

1.3.1 Contingency Procedures for Fire/Explosion

When fire or explosion appear imminent or have occurred, all normal activity in affected areas shall cease. The PEC shall make an assessment of the potential risk and severity of the situation to decide whether the emergency event shall or shall not be readily controllable with existing portable fire extinguishers or site equipment and materials at hand. Fire fighting shall not be done 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 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 fire fighting.

- Determine if smoke and/or fumes from fire are potentially impacting off-site areas.

- If the fire is not impacting off-site areas and is within on-site personnel capabilities, utilize 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 Plan shall be implemented. If the chances of an impending explosion are 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 department. All equipment 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.

1.3.2 Contingency Procedures for Spills or Material Releases

If a hazardous waste spill or material release or process upset resulting in probable vapor release is identified, the PEC shall immediately assess the magnitude and potential seriousness of the spill or release based upon:

- MSDS 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 ensure 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.

1.3.3 Contingency Procedures for Severe Weather

When a tornado is sighted in the area, when a tornado warning has been issued, or when a lightning storm occurs, the information shall be immediately relayed to the PEC. In the case of a tornado sighting, the PEC shall then institute emergency shutdown procedures, 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 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 positive action as identified herein.

When the severe weather has passed, the PEC shall direct the Remediation Contractor(s) to inspect on-site equipment to ensure its readiness for operation prior to restarting operations.

If an inspection indicates a fire, explosion, or release has occurred as the result of a severe weather condition, the procedures for those events shall be followed.

1.3.4 Contingency Procedures for Physical Injury to Workers

Regardless of the nature and degree of the injury, the PEC shall be appraised of all injuries requiring first aid of any kind. A report of the injury or incident shall be completed.

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. Appropriate medical assistance shall be summoned immediately.

Minor injuries sustained by workers shall be treated onsite using materials from the first aid kits. Whenever possible, such treatment shall be administered by trained

personnel in a “clean 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 summon an ambulance and contact the hospital to which the injured worker will be transported. The PEC shall notify 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).

1.3.5 Contingency Procedures for Chemical Injury to Workers

Injuries involving hazardous chemicals or symptoms of severe chemical overexposure shall automatically trigger 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.

Steps shall immediately be taken to remove the victim from the incident site using whatever Personal Protective Equipment and safety equipment is necessary.

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 MSDSs or Occupational Health Guidelines.

2. Emergency Evacuation Procedures

2.1 Site Evacuation Procedures

If an emergency occurs that requires the evacuation of an area to ensure personnel safety, including (but not limited to) fire, explosion, severe weather or hazardous waste/material spills, 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 shall not be necessary.

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.

Remediation Contractor(s) emergency coordinators and/or health and safety officers (as designated) will be responsible for ensuring that emergency response requirements specific to their own operations are carried out. 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 also. The evacuated workers shall assemble at the primary assembly area 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 at the intersection of Judson Street and Madison Avenue. The PEC shall phone for backup assistance.

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 that will 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, as in the event of a fire or explosion, personnel who have been trained in these 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 squads as they arrive to deal with the situation. The PEC shall have the authority to shut down any part or the entire project after an emergency until he deems it safe to continue operations. He shall dictate any changes in project safety practices, which are made necessary by the emergency that has occurred, or are required for preventing further emergencies.

2.2 Off-Site Evacuation Procedures

If the PEC deems that humans outside of the site are at risk, he/she shall notify the appropriate agencies and departments (e.g., NYSEG Project Manager, Elmira Police Department, New York State Department of Environmental Conservation, and Fire Department) of the need, or potential need, to institute off-site 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 materials or materials involved, to the extent this information is known.
- The extent of injuries, if any.
- The possible hazards to human health or environment, and cleanup procedures.

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Supplemental Information Attachment

(on CD – not part of Contract Documents)