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Remedial Action Work Plan

Ogdensburg (King Street) Non-Owned Former MGP Site
St. Lawrence County
Ogdensburg, New York

Site # V00479-6

July 2010

ARCADIS

Certification

I, Terry W. Young, P.E., certify that I am currently a NYS registered professional engineer and that this Remedial Action Work Plan was prepared in accordance with all applicable statues and regulations and in substantial conformance with DER Technical Guidance for Site Investigation and Remediation (DER-10).

Terry W. Young, P.E.
NYS PE License No. 074847

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St. Lawrence County
Ogdensburg, New York

Site # V00479-6

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National Grid

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1. Introduction

1.1 General

This Remedial Action Work Plan (RAWP) presents the proposed remedial action approach for the National Grid Ogdensburg non-owned former manufactured gas plant (MGP) site (the site) located in Ogdensburg, New York. A site location map is presented as Figure 1. A site map which shows the layout of current and historical features at the site is presented on Figure 2. This RAWP has been prepared by ARCADIS of New York, Inc. in accordance with the requirements of a multi-site Voluntary Consent Order (VCO Index No. D0-0001-0011) between the New York State Department of Environmental Conservation (NYSDEC) and Niagara Mohawk (acquired by and now referred to as National Grid) dated January 25, 2002.

The proposed remedial action approach has been developed based on the results of previous site investigations, the current and anticipated future use(s) of the site, and communications with the NYSDEC and the New York State Department of Health (NYSDOH). The proposed remedial action approach includes:

- Completion of a pre-design investigation (PDI).

- Removal and offsite disposal of surface and subsurface soil, as well as MGP-related structures and piping, from areas where the soil contains visible tar or non-aqueous phase liquid (NAPL) and/or total polynuclear aromatic hydrocarbons (PAHs) greater than 500 mg/kg or cyanide greater than the appropriate soil cleanup objective (SCO) specified in 6NYCRR Subpart 375-6. Soils exhibiting odors, staining, or sheens will not be considered for removal as visual NAPL, but will be removed if they are MGP-related and exceed the 500 mg/kg total PAH criterion (NYSDEC's March 17, 2010 letter to National Grid).

- Placement of a soil cover consisting of a minimum of 24 inches of clean soil underlain by a visual indicator (e.g., orange plastic snow fence or geotextile fabric) to demarcate the cover soil from the subsurface soil. Clean soil is defined as soil that meets the Division of Environmental Remediation's criteria for backfill or that is equivalent in composition to local background soils.

- Enhanced natural attenuation of dissolved MGP constituents in offsite groundwater immediately to the north of the site, by blending amendments/nutrients into the backfill to be placed in select soil removal areas

and/or introducing the nutrients/amendments through application well(s) to stimulate indigenous bacteria to degrade dissolved MGP constituents. This is similar to the approach being implemented at other former MGP sites, including the one in Fort Plain, NY (NYSDEC's March 2008 Record of Decision).

- Implementation of a groundwater monitoring program, including passive NAPL removal (if necessary).
- Imposition of an institutional control to restrict land and groundwater use on site.
- Development of a site management plan to address the necessary institutional and engineering controls (e.g., management of the soil cover and monitoring of groundwater).

1.2 Work Plan Organization

This RAWP is organized into the following sections:

Section	Purpose
Section 1 – Introduction	Describes the purpose, scope, and organization of this RAWP, and presents the remedial action objectives.
Section 2 – Background Information	Presents a description of the site and a discussion of historical MGP site operations, current and anticipated site usage, site topography and drainage, site geology/hydrogeology, and previous investigations.
Section 3 – Pre-Remediation Activities	Describes the activities to be completed prior to implementation of the proposed remedial action activities.
Section 4 – Remedial Action	Describes the proposed remedial action activities to be conducted.
Section 5 – Post-Remedial Action	Summarizes the proposed post remedial action activities.

Section	Purpose
Section 6 – Schedule	Presents anticipated milestone dates associated with implementing this RAWP.
Section 7 – References	Provides a list of references used to prepare this work plan.

This RAWP is supported by the remedial design documents listed below that will be prepared following completion of the public review/comment period and NYSDEC approval of the proposed remedial approach for the site.

- Technical Plans and Specifications: A set of drawings (plans) graphically presenting the components of the remedial approach, and a set of technical specifications detailing the conditions under which the remedial work is to be conducted, the materials to be incorporated into the work, and the standards for acceptance of the work. These plans and specifications will also support the remedial contractor procurement process and will be prepared, signed, and sealed by an ARCADIS professional engineer licensed to practice engineering in New York State.

- Health and Safety Plan (HASP): The HASP will contain procedures to be followed during the remedial action activities to protect the health and safety of field personnel, and will include a Community Air Monitoring Plan (CAMP).

- Citizen Participation Plan (CPP): The CPP will describe public participation activities that will be conducted in connection with the remedial action. Prior to implementing the remedial action activities, a project-specific public fact sheet will be prepared and distributed.

- Storm Water Pollution Prevention Plan (SWPPP): A SWPPP may be necessary depending on the extent of the remedial activities. A SWPPP is required for activities that disturb one or more acres of land. As such, if the disturbed area meets this requirement, the SWPPP will be prepared in substantive compliance with Phase II of the NYSDEC State Pollutant Discharge Elimination System (SPDES), General Permit for Stormwater Discharges Associated with Construction Activity. The SWPPP will describe the approach to address the storm water runoff

control systems to be implemented in association with the remedial action activities.

- Site Management Plan (SMP): Using NYSDEC's March 2010 SMP template for remedial projects, a site-specific SMP will be developed to establish guidelines and describe protocols to address the necessary institutional and engineering controls (e.g., management of the soil cover and monitoring of groundwater). This plan will also, for example, describe the requirements for managing soils that may be excavated during future development or ground intrusive activities at the site by the current and/or future property owners. The SMP will be submitted draft with the aforementioned remedial design documents and finalized after completion of the remedial construction activities.

1.3 Remedial Action Objectives

Remedial Action Objectives (RAOs) have been developed for MGP-impacted site media based on the results of previous site investigations and in consideration of current/future site uses and potential exposure pathways. The previous investigations are discussed in Section 2.7 of this RAWP. The primary goal of the remedial activities is to mitigate potential risks to public health and the environment based on the contemplated use (current zoning) of the site and surrounding area. The following media-specific RAOs have been developed for this site from the Division of Environmental Remediation's Generic RAOs for soil and groundwater.

Environmental Media	Constituents of Concern	Media-Specific Remedial Action Objectives
Soil	• BTEX • PAHs • Cyanide • NAPL	1. Prevent or minimize to the extent practicable ingestion/direct contact with MGP-impacted soil exceeding standards, criteria, and guidance. 2. Prevent or minimize to the extent practicable inhalation of or exposure from the volatilized compounds volatilizing from MGP-impacted soil. 3. Prevent or minimize to the extent practicable migration of MGP impacts that would result in increased groundwater impacts or potential surface water impacts.

Environmental Media	Constituents of Concern	Media-Specific Remedial Action Objectives
Groundwater	• BTEX • PAHs • Cyanide • NAPL	1. Prevent or minimize to the extent practicable ingestion of groundwater with concentrations of MGP constituents of concern (COCs) exceeding NYS Groundwater Quality Standards. 2. Prevent or minimize to the extent practicable contact with, or inhalation of volatiles, from MGP-impacted groundwater. 3. Prevent or minimize to the extent practicable discharge of impacts to surface water. 4. Minimize future impacts to groundwater and reduce concentrations of COCs in groundwater to the extent practicable.
NAPL	• DNAPL	1. Recover NAPL to the extent practical.

2. Background Information

2.1 General

A summary of relevant site background information as it pertains to the development of this RAWP is presented below. Additional details are presented in the NYSDEC-approved *Remedial Investigation Report* (RI Report) prepared by ARCADIS (September 2009).

2.2 Site Description

The site is located at 10 King Street, Ogdensburg, St. Lawrence County, New York on approximately ¾ acres of land (Figure 1). The site property is currently owned by St. Lawrence Gas Company of Massena, NY. As shown on Figure 2, the site elevation ranges from approximately 264 feet to 260 feet above mean sea level (AMSL), with the ground surface generally sloping downward to the north and west. The site consists of a grassy, vacant, fenced lot with residential properties bordering the site to the east and southeast. National Grid owns a vacant lot east of the site on 207/209 Lake St. A narrow strip of heavily vegetated wetland borders the site to the west and a steep vacant grassy slope is located south of the site. Residential properties are located further to the west and south. King Street is present north of the site, and runs generally southwest/northeast. Across King Street to the north, is an industrial/commercial property owned by the City of Ogdensburg. The City leases this property to St. Lawrence Foods Corporation (a.k.a., Ahava Foods, Primo Foods, or the Cheese Factory). Some of the buildings on this property appear abandoned or are partially demolished. Lake Street is located beyond the residential properties that border the east/northeastern side of the site. Rensselaer Avenue is present south of the site, between the steep grassy slope and residential properties. Canal Street (a.k.a., Lincoln Avenue) is located west of the site, between the narrow wetland and residential properties.

2.3 Historical MGP Operations

The former MGP operated from 1854 until at least 1930 using the coal carbonization process (Radian Corporation, 1985). The key features associated with the former MGP site through time include:

- A gas house (from c. 1874 through at least 1925) and retorts, purifiers, and condensers.

- Gas holders at two locations north/northwest of the gas house (from c. 1865 to at least 1925).

- An electric light plant located south of the gas house (from c. 1892 to at least 1898).

- A circular tar well (near northeast corner of site from c. 1904 to at least 1918) and a rectangular tar well (immediately northeast of gas house from c. 1925 until sometime before 1949).

- A regulator, governor house, coke room, and coal shed.

MGP features from the 1909 and 1925 Sanborn maps are shown on Figure 2. By 1949, the MGP features were not shown on the historical maps, with the exception of the governor house. Other historical features at the site or vicinity included the following:

- A quarry, which was present at the site from about 1850 to after 1865.

- A power canal, mill pond/basin, and tail races north, northeast, and east of the site prior to 1884 until sometime after 1962.

- A railroad track, which ran generally northwest/ southeast immediately west of the site from prior to 1865 until sometime after 1962.

- Propane gas storage tanks, which were present at the site from prior to 1945 until sometime prior to 1997.

2.4 Current Site Usage and Zoning

As indicated above, the site is located on a portion of the property currently owned by St. Lawrence Gas Company of Massena, NY. The property is currently unoccupied and contains a chain-link fence along the property boundary. The entire site consists of grass and vegetated areas. The site and the surrounding area (block) are zoned by the City of Ogdensburg as mixed residential/business.

2.5 Surface Topography and Drainage

The site elevation ranges from approximately 264 feet to 260 feet above mean sea level, with the ground surface generally sloping downward to the north and west. The majority of the site is grass/vegetation covered.

There is no localized groundwater usage in the immediate area of the site; all businesses and residences near the site are supplied by city water. The city receives potable water from the St. Lawrence River, which is located approximately 1,000 feet north of the site. The Oswegatchie River is located approximately 400 feet east of the site and joins the St. Lawrence River approximately 1,000 feet north of the site.

2.6 Geological/Hydrologic Setting

Hydrostratigraphic Units

Investigations have identified two hydrostratigraphic units in the area. These units include:

- ***Fill*** – The fill unit comprises the uppermost hydrostratigraphic unit. This unit consists of re-worked alluvial deposits (sands, gravels, silts) and anthropogenic materials (e.g., slag, coal, wood, metal, piping, ash, concrete, brick and foundations from former MGP structures). The top of this unit is bounded by the water table which lies approximately 3 to 8 feet below grade, depending on location. The thickness of the fill on the site is generally 3 to 9 feet, but thickens to about 10 feet north of the site. This unit does not exist where the water table lies below the top of the Ogdensburg Dolostone. The hydraulic conductivity of the unit was found to range from 0.78 to 41.9 feet/day, with a geometric mean of 3.28 feet/day.

- ***Ogdensburg Dolostone*** – The Ogdensburg Dolostone is the lowest hydrostratigraphic unit encountered during the RI. This unit is fully saturated in most of the investigation area. The exception is in areas where its surface is encountered only a few feet below grade or rises relative to the water table. Given its low primary porosity, groundwater flow in the unit occurs primarily through a network of intersecting horizontal bedding plane fractures and vertical fractures (i.e., joints). Given the increased frequency of horizontal bedding plane fractures relative to joints, groundwater flow is preferentially through the bedding plane fractures. Field tests

provided hydraulic conductivity values for this unit that range from $3.18x10^{-4}$ to 93 feet/day, with a geometric mean of 0.36 feet/day.

Groundwater Flow

The St. Lawrence River is a major regional groundwater discharge location for northern New York. Given the site's proximity to the river, groundwater on and near the site in either hydrostratigraphic unit will eventually flow to the river. In the Ogdensburg Dolostone, the routes of flow can be considerably more tortuous, depending on the degree of fracturing and fracture characteristics. The following conclusions regarding groundwater flow were presented in the RI Report:

- Groundwater in the fill is interpreted to move predominantly horizontally toward the north and discharge to the St. Lawrence and/or Oswegatchie Rivers.

- Strong upward gradients observed between the shallow bedrock and fill indicates that groundwater in the shallow bedrock discharges upward through vertical joint fractures and into the fill before discharging to either river. Downward gradients observed in a few localized areas suggest that a fraction of groundwater in the fill unit also moves downward into the shallow bedrock.

- Because the spacing of horizontal bedding plane fractures is greater than the spacing of joints, groundwater movement in the Ogdensburg Dolostone is predominantly horizontal in the direction of the St. Lawrence River.

- The ability of groundwater to move vertically within the Ogdensburg Dolostone is impeded by the lack of abundant vertical jointing in the unit and the presence of flat lying, unfractured beds of more competent rock and thin shale beds. This is demonstrated by the much higher hydraulic head in the deeper portion of the Ogdensburg as compared to the shallower regions of this unit.

2.7 Summary of Investigation Data and interim Remedial Measures

The site has been the subject of two investigations, starting in 2003 with the Site Characterization and culminating with the Remedial Investigation. During the investigations 22 monitoring wells were installed, 41 soil borings were drilled, seven test pits were excavated, three soil vapor investigations were conducted, and more than 200 samples of environmental media were analyzed. Additionally, interim remedial measures were conducted at the site in 2007 and 2009. This section presents

a brief summary of the results of the previous investigations and discusses the remedial measures that have been conducted at the site. The previous investigations and remedial measures include:

- Initial Site Characterization Investigation conducted by Blasland, Bouck and Lee, Inc. (BBL) in 2003 and 2004.
- Remedial Investigation (RI) conducted by ARCADIS between 2003 and 2009.
- Surface cover installation IRM conducted by ARCADIS in 2007.
- Sewer lateral investigation and IRM conducted by ARCADIS in 2009.

Analytical results for subsurface soil and groundwater that were analyzed in connection with the above-listed investigation activities are summarized on Figures 3 and 4. A summary of the characterization/analytical results and interim remedial measures conducted is provided below.

- **NAPL.** The locations where NAPL has been observed in soil and bedrock samples collected on and off-site are shown on Figure 5. At locations where NAPL-containing soil is observed at and near the site, the NAPL typically occurs below the water table, indicating that the NAPL is predominantly DNAPL. The majority of the DNAPL was observed beneath, within, and near several on-site MGP-related structures including a sewer lateral that extends from the site along the western fence-line. Observed DNAPL thickness ranged from a few inches to several feet. DNAPL has been observed in trace quantities on fracture surfaces the upper approximately 15 feet of bedrock at on-site and off-site well locations. As with NAPL observed in overburden, the NAPL observed in bedrock on-site seems to correspond to the location of the tar wells and holders. DNAPL appears to have migrated a short distance off-site in the north, northwest, and west directions in the bedrock. DNAPL was observed to accumulate in one monitoring well (MW-8R) during the RI. DNAPL was first observed in MW-8R on November 20, 2008 at a thickness of 0.60 feet, approximately two years after the well was installed. The DNAPL was observed to be highly viscous.

- **Soil COCs include BTEX, PAHs, and cyanide**. The distribution of soils exceeding SCOs is shown on Figure 3. Of the 61 collected subsurface soil samples, 8 exceeded SCOs for BTEX compound(s) and 45 samples exceeded for PAHs. All of the samples that exceeded SCOs for BTEX compound(s) also

exceeded SCOs for PAH compound(s). Twenty-two of the 45 samples exceeding SCOs are located off-site. The highest concentrations of BTEX and PAHs were detected in on-site soil samples that contain NAPL found near the bedrock surface and below the water table. The region of subsurface soil containing concentrations of BTEX and/or PAHs in excess of the SCOs is larger than the region containing NAPL. The primary reason for this relates to the heterogeneous nature of the fill material and the locations of potential NAPL sources/transport mechanisms for NAPL. Additionally, offsite soil sampling locations (B-9 and B-11, see Figure 3) exhibited PAH concentrations in excess of the SCOs and were determined to indicative of historic fill, as noted in a February 9, 2010 e-mail from NYSDEC. Finally, thirteen of 51 subsurface samples exceeded the SCO for total cyanide; six of the 13 samples were collected in off-site areas to the east of the site. Free cyanide analysis of 17 subsurface soil samples suggests that the majority of total cyanide detected in the subsurface soil samples is in a complexed form and not biologically available to humans.

- **Groundwater COCs include BTEX, PAHs, and cyanide.** These compounds are the COCs for groundwater because they were detected above the Class GA Standards or Guidance Values. The approximate extent of groundwater exceeding Standards or Guidance Values is shown on Figure 4. The distribution of COCs in overburden and bedrock groundwater appears to be directly related to the presence of NAPL. The COC plume in overburden appears to be constrained primarily to the site property and short distance to the east, north, and west of the site. Bedrock groundwater appears to be unaffected to the south of the site (MW-4R). The shallow bedrock groundwater contains dissolved-phase COCs at levels above Standards or Guidance Values while deep on-site bedrock (below 40 feet bgs) appears not to be affected by the MGP. Off-site shallow bedrock appears to contain dissolved-phase COCs a short-distance (less than 100 feet) east and west of the site and appears to extend a greater distance (at least 200 feet) north of the site. Production wells in the St. Lawrence Foods facility appear unaffected by the MGP.

- **Soil Vapor:** Soil vapor investigations were conducted in 2006, 2007, and 2008 and indicated the presence of several VOCs in soil vapor and indoor air samples at low concentrations; however, the VOCs appeared not to be related to the MGP. The NYSDOH and NYSDEC concluded that no further soil vapor investigations are warranted at the site at this time.

- **Surface Cover Installation IRM.** In January 2007 National Grid purchased the property located at 207/209 Lake Street. The property is located adjacent to the former MGP site which is located to the west. The property contained a vacant four family residential structure with a floor space of approximately 4,500 square feet occupying two floors (gross floor area). The building was wood-sided with a metal/asphalt shingle roof and a stone/ masonry foundation and concrete basement floor slab. A two-level wooden porch was located on the back of the building and a single level wooden porch/enclosed entrance was located in the front of the building. National Grid contracted with Op-Tech Environmental Services, Inc (Op-Tech) to complete a demolition of the building in November 2007. Additionally, National Grid conducted a NYSDEC-approved IRM consisting of installing a focused surface cover in an area of the property (207/209 Lake Street). The focused surface cover IRM was conducted in conjunction with the demolition of the house located on the property by Op-Tech. The purpose of this IRM was to mitigate potential exposure to potential MGP-related materials observed at the ground surface in an area of the property. The IRM surface cover consisted of two layers of nonwoven geotextile fabric (Geotex 801) over the IRM surface cover limits followed by placement of approximately six inches of select fill material on top of the fabric. The select fill material extended beyond the limits of the fabric by approximately three feet on the north and east sides.

- **Sewer IRM.** In March 2009 National Grid completed investigations of a portion of the City of Ogdensburg's (City's) combined sewer system located downstream from the site. The investigations were prompted by the findings of the utility evaluation conducted during the Phase III RI in October 2008. The Phase III RI work identified coal tar in a lateral pipe that extended from the western portion of the site, along the fence line, to one of the manholes in King Street. An evaluation of the sewer confirmed the presence of two 8-inch diameter laterals that extend from the site and terminate in two manholes in King Street. Neither of these laterals was observed to have any additional tie-ins. The configuration of the combined sewer system downstream of the site was confirmed to be consistent with mapping previously provided by the City of Ogdensburg. No visual MGP-related impacts were observed in the material within the manholes located

downstream from the site. Based on the findings of the Phase II RI work and the subsequent sewer investigation, National Grid conducted a NYSDEC-approved IRM to isolate the two existing lateral pipes (extending from the site) from the existing sewer system located to the north of the site. The pipe plugging work was performed by Op-Tech and ARCADIS in March and April 2009. The plugging consisted of installing a mechanical plug and non-shrink grout at the downstream ends of each of the lateral pipes.

3. Pre-Remediation Activities

3.1 General

Prior to the initiation of remedial activities, a number of pre-remediation activities will be completed. These activities are discussed in this section and will include, but are not limited to a Pre-Design Investigation, Contractor procurement, Contractor submittals, Contractor mobilization, and site preparation. This section identifies various activities and procedures that are general in nature, but are to be implemented by National Grid, ARCADIS, National Grid's onsite representative, and/or the National Grid-selected remedial Contractor. Unless otherwise specified in the remedial design documents to be prepared by ARCADIS on behalf of National Grid, the remedial Contractor will be responsible for determining the means and methods to implement the Contractor-specific pre-remediation activities; however, the Contractor's approach (as detailed in a technical submittal(s) to be prepared by the Contractor prior to performing the actual activity) will be subject to review by National Grid, ARCADIS, and the NYSDEC/NYSDOH.

During construction, National Grid's onsite representative will be responsible for observing and documenting that the remedial activities are conducted in general accordance with the RAWP (including the pre-remediation activities discussed in this section and the remediation activities discussed in Section 4).

3.2 Pre-Design Investigation

The objective of the PDI is to further investigate the following:

- Visible tar or NAPL and/or total PAHs greater than 500 mg/kg in the area immediately north of the site

- Cyanide in the area of soil borings B-8 (surface cover IRM area), B-11, B-31, and MW-12R, and in groundwater at monitoring wells MW-9 and MW-11.

The general area and locations of the PDI are depicted on Figure 5. Additionally, soil samples may be collected during the PDI for geotechnical analysis to support the remedial design. The PDI will be conducted following completion of the public review/comment period and NYSDEC approval of this RAWP. The actual start date will be coordinated with the NYSDEC and will be dependent on receipt of necessary approvals/agreements required for the field work.

Area Immediately North of the Site

This PDI area is located immediately north of the site as shown on Figure 5, and a summary of existing information for this area is as follows:

- There are a number of utilities in this area (see Figure 1), including:
  - Below grade combined sewer which is sanitary in the area of the Site and begins to convey storm water on the St. Lawrence Foods Property;
  - Below grade gas;
  - Below grade water; and
  - Overhead electric near the northern site boundary.

- No NAPL was observed in the overburden and total PAH concentrations in soil were all less than 500 mg/kg in the line of 12 borings/monitoring wells located approximately 50 feet north of the site.

- No visual MGP-related impacts were observed in the material within the sewer manholes located downstream of the site, including the two manholes (MH-1 and MH-2) located closest to the site and within the area of the sewer IRM shown on Figure 5.

- At the northern site boundary, NAPL was observed at some locations, as highlighted on Figure 5; however, the NAPL thickness/extent observed was limited (e.g., typically at or near top of bedrock) and generally characterized as viscous and sticky.

There are, however, no investigation locations between the line of 12 borings and the northern site boundary, thus providing the basis for the PDI in this area to further investigate the potential presence of NAPL and/or total PAHs immediately north of the site and potentially under King Street.

To facilitate further investigation of NAPL and/or total PAHs in the area immediately north of the site, the PDI will include verification of existing utilities including utility mark out, and additional research and coordination/planning with the City of Ogdensburg. In addition, verified utilities will be managed and protected during the extent of the PDI. Upon utility verification, test pits are anticipated to be excavated within the fence line along/near the northern site boundary to evaluate the potential presence of NAPL north of areas where NAPL was observed onsite during the RI. Since NAPL has been observed primarily on the bedrock surface during the RI, test pits will be excavated to bedrock. Additional test pits will be excavated and/or soil borings will be installed on

the north side of the fence (and potentially within the limits of King Street) if NAPL is observed in the initial test pits excavated on the site. The purpose of the additional test pits and/or soil borings is to further evaluate whether NAPL is present north of the site, and potentially beneath King Street. The decision to use test pits or soil borings in this area will be determined based on health and safety considerations, including the presence of multiple utilities.

If visibly NAPL impacted soils appear to extend under King Street discussions with National Grid and NYSDEC personnel will dictate if investigations under King Street are viable and necessary. Specific locations and installation methods of test pits and/or soil borings along the northern site boundary/King Street will be determined in the field, however it is anticipated that an auger-equipped drill rig will be used to install borings.

During installation of the test pits and soil borings, soil characteristics and conditions encountered will be documented in the field book. In addition, soil samples will be collected, visually described, screened with a photoionization detector (PID) for the presence and relative concentration of volatile compounds, and sent for laboratory analysis as necessary. Analytical samples collected will be analyzed for PAHs. The number of soil samples submitted for laboratory analysis will be dictated by the PDI and remedial objectives previously identified, and field conditions encountered. For example, soil samples with visible tar or NAPL would not be submitted for laboratory analysis, but samples with sheens would be analyzed for PAHs (at a minimum).

Areas Surrounding Sample Locations B-8, B-11, B-31, and MW-12R

Based on presence of total cyanide concentrations above the existing NYSDEC SCO of 27 mg/kg, additional soil borings will be installed in the areas surrounding B-8 (the area of the Surface Cover IRM), B-11, B-31, and MW-12R to further define the absence/presence of apparent purifier waste pockets (cyanide-impacted soil). During soil boring installation, soil characteristics and conditions encountered will be documented in the field book. In addition, soil samples will be collected and visually described. Specific locations of soil borings will be determined in the field in conjunction with the NYSDEC.

The objective of this PDI effort is to delineate soils containing cyanide above the current SCO, to the extent possible. Although the sampling approach will be discussed and agreed upon with the NYSDEC, National Grid expects the sampling program will be telescopic in nature. Borings will initially be installed radially from each location, at a

distance of approximately 5 to 10 feet. Sampling may begin with resampling of the existing location and then proceed a specified distance (to be determined in the field based on field conditions) away from existing sample locations (e.g., 5 feet from the original location). If purifier waste is observed (typically blue staining and/or strong "burnt" odor) within any initial boring(s), then additional boring(s) will be installed outward from the initial boring(s). Boring installation and sample collection will continue in a radial fashion until purifier waste (if any) is not observed, as agreed to by the NYSDEC. One sample will be collected from the outermost borings where purifier waste is not observed. These samples will also be visually characterized, collected and submitted to the laboratory but will be held pending the results of the samples collected from the closest inward boring. All collected samples will be submitted for laboratory analysis for total and free cyanide. Existing sample locations and results will be used to aid in the delineation of cyanide in the impacted areas.

Additional Cyanide Locations to Sample

To further evaluate the presence of cyanide, a groundwater sample will be collected from monitoring wells MW-9 and MW-11 to confirm the presence and level of total cyanide detected in these wells during the RI. As shown on Figure 4, these monitoring wells are the only offsite locations where groundwater samples contained cyanide at concentrations which exceeded the NYS Glass GA Groundwater Standard of 200 ppb and MW-11 was only sampled once for cyanide. In addition to the cyanide analysis, the groundwater sample from MW-9 will also be analyzed for PAHs and BTEX. Consistent with the sampling method utilized during the RI activities, these wells will be sampled using low-flow sampling techniques.

Field Methods and Quality Assurance

To provide consistency with previous site investigations, field procedures, analytical methods, sample-handling procedures, and laboratory protocols used during the PDI will be conducted in accordance with the NYSDEC-approved *Generic Site Characterization/IRM Work Plan for Site Investigations at Non-Owned Former MGP Sites* and supporting appendices (Field Sampling Plan [FSP] and Quality Assurance Project Plan [QAPP] dated November 2002. The soil and groundwater samples (including quality assurance/quality control [QA/QC] samples) will be packaged, handled, and shipped in general accordance with QA/QC protocols and the soil and groundwater sampling protocols presented in the FSP and QAPP.

All soil samples will be submitted for laboratory analysis using USEPA SW-846 Methods as referenced in the most recent edition of the NYSDEC Analytical Services Protocol (ASP), with Category B analytical laboratory reports. Free cyanide analysis will be performed using SW-846 Test Method 9016 Free Cyanide in Water, Soils and Solid Wastes by Microdiffusion June 2010 Revision 0. Test Method 9016 has been recently approved by USEPA and the current availability of laboratories performing this method is limited. Additionally, it is expected to take time (potentially beyond the schedule for the PDI) for laboratories to become approved in New York State through the Environmental Laboratory Approval Program **(**ELAP**)** to perform Test Method 9016, as currently no laboratories are approved for this method. The preference will be to utilize an ELAP-approved laboratory to provide free cyanide analysis using Test Method 9016. The laboratory(ies) to be used for the PDI activities will be selected in parallel with the PDI activities and in conjunction with the NYSDEC.

Data Usability Summary Reports (DUSRs) of the laboratory data packages will be prepared. Results of the PDI, along with conclusions/recommendations regarding the remedial action, will be submitted to NYSDEC approximately 10 weeks after completing the PDI field activities (see Section 6).

3.3 Contractor Procurement

Following NYSDEC approval of this RAWP and completion of PDI activities, contractor bidding documents will be prepared and distributed (after approval by NYSDEC) to a number of qualified contractors to solicit bids for the performance of the remedial activities. A pre-bid meeting and site visit will be conducted with all prospective contractors, National Grid, the property owner (if available), ARCADIS (the Engineer), and the NYSDEC. The purpose of the pre-bid meeting and site visit will be for prospective contractors to examine existing site conditions and thoroughly acquaint themselves with the work required and potential challenges associated with performing the work. During the pre-bid meeting and site visit, prospective contractors will have the opportunity to verify existing site conditions to facilitate the preparation of their proposal and work schedule.

3.4 Contractor Submittals

Following award of the project, the Contractor will be required to prepare pre-mobilization submittals for review by National Grid and ARCADIS. Once approved, the Contractor submittals will be forwarded to the NYSDEC for review. 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 are not necessarily be limited to:

- A Construction Operations Plan for remedial activities that addresses, at a minimum, procedures for the following: decontamination; materials handling and staging; erosion and sedimentation control; dust, vapor, and odor emissions control; soils dewatering (if necessary); and the handling, transportation, and offsite disposal/treatment of wastes in accordance with the applicable rules and regulations. The Construction Operations Plan will include a Noise Monitoring Plan; a Community Air Monitoring Plan (CAMP), based on the New York State Department of Health's (NYSDOH's) *Generic Community Air Monitoring Plan* (refer to NYSDEC's Final (May 2010) DER-10); and an Odor Control Plan. These plans will identify the monitoring methods and corrective measures to be taken during implementation of the remedial efforts and address, at a minimum, intrusive activities and activities associated with managing/handling of stockpiled soils and storage of contaminated groundwater. General procedures are discussed within the description of remedial activities presented in Section 4 of this document.

- A Waste Management Plan that presents handling and disposition requirements for waste materials generated during the remedial activities.

- A Contingency Plan (see Section 3.5).

- A site-specific HASP for use by the Contractor's onsite personnel. The health and welfare of the Contractor's staff will be the direct responsibility of the Contractor. The Contractor shall take all necessary precautions for the health and safety of all onsite Contractor employees, in compliance with all applicable provisions of federal, state, and local health/safety laws. The Contractor will assume sole responsibility for the accuracy and content of its HASP. The HASP will include an emission control plan that will present a detailed description of the air/odor emission controls to be implemented at the site for each phase of the remedial action, and a CAMP.

- Shop drawings and other plans for the remedial action, as required.

3.5 Contingency Plan

The Contractor will prepare a Contingency Plan describing the provisions required for responding to site-related emergencies that could occur during remedy

implementation. The Contractor-prepared Contingency Plan will, at a minimum, include the following components:

- A Spill Response Plan for addressing spills that may occur as a result of the Contractor's activities or the remedial construction activities. The Spill Response Plan will describe the methods, means, and facilities required to prevent soil, water, structure, equipment, and material impacts caused by spills; provide information regarding spill containment and cleanup; and provide information related to decontamination measures.

- Procedures and routes for emergency vehicular access/egress.

- Procedures for evacuation of personnel from the site.

- List of contactor personnel with phone numbers that, at a minimum, includes the NYSDEC Spill Response Hotline (1.800.457.7362); fire officials; ambulance service; local, county, and state police; local hospitals; and a spill response team. Procedures for notifying each party will also be included.

- Routes to local hospitals, including written directions and a map that depicts the location of the site relative to the hospital(s). The Contingency Plan shall also include protocols/procedures for notifying appropriate hospital personnel of the nature and extent of possible chemical exposure.

In addition, the Contractor will be responsible for implementing non-spill response, non-emergency removal-related contingency measures.

3.6 Site Mobilization/Preparation

Following preparation of the above-referenced submittals, National Grid, National Grid's onsite representative, and/or the selected Contractor will perform the site mobilization/preparation activities and related functions described herein and as specified in the technical plans and specifications.

3.6.1 Site Review

Prior to or as part of site mobilization, the following items, at a minimum, will be completed:

- Applicable permits, regulatory approvals, or notifications will be obtained either by National Grid or the Contractor (as applicable). The permits, approvals, or notifications will be in place prior to initiation of remedial work at the site.

- Necessary access agreements/approvals will be secured by National Grid.

- Existing site conditions will be verified to develop an understanding of the conditions that may be encountered during implementation of the remedial activities. This will include, but is not limited to, identifying the location of, and staking out, all aboveground and active underground utilities, equipment, and structures in and adjacent to the construction area.

- Survey control and limits of work will be established.

- Appropriate utility-locating agencies will be contacted (e.g., Dig Safe New York) prior to the start of intrusive activities. Certain utilities are located close to the construction areas and will require demarcation and implementation of precautionary measures or temporary relocation to safeguard the utilities during intrusive activities. Utilities will be appropriately identified, relocated, protected, and/or abandoned, as required and appropriate to facilitate the remedial activities.

3.6.2 Site Mobilization

Following establishment of the limits of work, the following items, at a minimum, will be completed:

- Mobilize manpower, equipment, and supplies to the site, as necessary, to implement the RAWP. Equipment mobilized to the site will be subjected to a visual review by National Grid's onsite representative.

- Provide appropriate storage areas and trailers for the site, as required, to sustain the field offices, equipment, storage, and operations for the duration of the project.

- Establish potable water supply and portable sanitary services for use by all onsite personnel engaged in the remedial activities.

- Mobilize air monitoring equipment and emission/odor control supplies to the site, as required prior to intrusive activities, to mitigate potential offsite impacts.

- Install appropriate fencing and other site controls (with appropriate warning signs) to limit unauthorized access or unknowing access to those areas associated with the remedial activities, and to provide for safe work conditions.

- Install temporary erosion and sedimentation controls in accordance with the approved remedial design (Final RAWP) and SWPPP (if applicable) to temporarily control or divert surface water flow and mitigate the potential for erosion and migration of MGP-related constituents/materials.

- Construct equipment and material decontamination area(s). As part of the site preparation activities, the Contractor will construct a decontamination area for trucks, equipment, and personnel that come in contact with impacted materials during remedial activities. Upon completion of the remedial activities, the decontamination area will be removed and disposed/treated offsite in accordance with the Waste Management Plan.

- Establish/construct the work areas and staging areas necessary for the remedial activities. The minimum requirements of the temporary soil staging areas will be identified in the remedial design. To facilitate storage of waste materials, temporary staging areas will be constructed at one or more locations onsite, as necessary. The temporary staging areas will be constructed to contain surface water runoff. Upon completion of the remedial activities, the temporary staging area(s) will be removed and transported for offsite disposal or treatment in accordance with the Waste Management Plan.

- Provide temporary storage of water and waste materials removed/generated during implementation of the remedial activities. Upon completion of the remedial activities, the water will be transported for offsite disposal or treatment in accordance with the Waste Management Plan.

- Implement site controls and safety functions as follows:

    - A sign-in/sign-out sheet will be maintained by the Contractor and/or National Grid's onsite representative at the site for the duration of the remedial activities.

    - Implementation of safe work practices will also provide for additional onsite security during remedial activities. Safe work practices that will contribute to overall site safety include the following:

- Installing and maintaining temporary construction barriers (i.e., fencing, warning tape) around all open excavations and stockpile areas.

- Parking heavy equipment within designated areas and removing keys each day following completion of work activities.

- Maintaining an organized work area, including proper storage of all tools, materials, and equipment.

- Decommission bedrock monitoring wells MW-2R, MW-5R, MW-6R, and MW-7R prior to initiation of soil removal activities. These wells will be decommissioned because they extend into bedrock and are located within the extent of the soil removal area which will be completed down to bedrock. Existing overburden wells located within the soil removal area will be decommissioned/removed during the remedial (excavation) activities. The wells will be decommissioned in general conformance with ASTM International (ASTM) Method D5299 (ASTM, 2005) and in accordance with the NYSDEC document titled Groundwater Monitoring Well Decommissioning Policy (NYSDEC, 2009). All existing well construction materials (i.e., casing, grout, and sand pack) will be removed by overdrilling each bedrock well. The removed materials will be disposed offsite in accordance with the Waste Management Plan. Following removal of the well construction materials, the bedrock portion of the borehole will be tremie grouted with a cement/grout mixture.

4. Remedial Action

4.1 General

This section presents a discussion of the remedial action (RA) activities to be implemented following the completion of the pre-remediation activities discussed in Section 3 of this RAWP.

4.2 Soil and MGP-Related Structures Removal and Offsite Disposal

The removal efforts includes a majority of the site, an isolated offsite area adjacent to the northwest portion of the site, the IRM Surface Cover Area, and potentially other areas to be identified during the forthcoming PDI. This will effectively address surface and subsurface soil, as well as MGP-related structures and piping, from areas where the soil contains visible tar or NAPL and/or total PAHs greater than 500 mg/kg or cyanide greater than the appropriate SCO. Anticipated removal and PDI areas are identified on Figure 5. Not included in the removal or PDI areas are two offsite sampling locations (B-9 and B-16) where PAHs were detected at concentrations greater than 500 mg/kg (Figure 3), because these locations/PAH concentrations were determined to be indicative of historic fill (February 9, 2010 email from NYSDEC).

The estimated volume of soil associated with the currently identified removal areas shown on Figure 5 is approximately 11,000 cubic yards.

Soil removal will extend down to bedrock (approximately 3 to 9 feet below grade), and will include removal of MGP-related structures and piping. The actual extent of MGP-related structure and piping removal will be determined during removal activities in conjunction with the NYSDEC. In the event that structures/piping cannot practicably be fully removed, then they will be cut/left in place, drained of NAPL, and filled with grout, as necessary.

Excavated materials will be disposed off offsite, in accordance with applicable rules and regulations, or they may be reused as backfill if they meet the criteria outlined below.

4.2.1 Soil Excavation, Reuse, and Waste Characterization

Excavation to the anticipated excavation depths will require sloping/benching and/or excavation support measures to prevent unstable excavation sidewall conditions in

certain areas. Additional measures may be required to provide for the stability of foundations/utilities during excavation and backfilling activities. If visibly NAPL/MGP-impacted soils extend beyond the proposed extent of excavation, additional soil removal or other appropriate measures may be implemented based on discussions with National Grid and NYSDEC personnel. Because the limits of the excavation currently extend to (or beyond) the site boundaries, expansion of the excavation area will require coordination with, and agreement from, the property owner(s).

Because the water table is encountered 3 to 8 feet below grade, and excavations extend to bedrock, management of saturated soils/water would be required. Actual details for water management will be determined during the remedial design, but would likely include provisions for temporary storage of water in tanks, with possible onsite treatment and discharge to the local publicly owned treatment works (POTW) or offsite treatment/disposal.

Excavated soil may only be reused as backfill on-site below the top 2-feet of the surface if:

- PAHs are less than 500 mg/kg.
- Concentrations are below applicable SCOs for cyanide.
- Tar, NAPL or other MGP-impacts (e.g., purifier wastes) are not observed.

Soils exhibiting odors, staining or sheens will not be considered for removal as visual NAPL, but will be removed if they exceed the 500 mg/kg PAH criterion. Materials not suitable for reuse will be handled and treated/disposed offsite, in accordance with applicable rules and regulations, the Waste Management Plan and as indicated below.

The excavated materials will be moved from the work area to a lined staging area as detailed in the Waste Management Plan. To the extent practical and necessary to facilitate offsite treatment/disposal, materials may be segregated for separate handling and offsite treatment/disposal.

Prior to offsite treatment/disposal, waste characterization samples will be collected (if necessary) and submitted for laboratory analyses required by the receiving facility, including (but not necessarily limited to) Toxicity Characteristic Leaching Procedure (TCLP) volatile organic compounds (VOCs), TCLP semi-volatile organic compounds (SVOCs), TCLP inorganic constituents, ignitability, corrosivity, and reactivity.

Excavation activities may result in the generation of odors, volatile organic vapors, and/or airborne particulates in the work areas. To minimize generation and potential migration of odors, volatile organic vapors, and airborne particulates, appropriate odor/vapor/particulate suppression and control measures will be implemented during the soil excavation activities (e.g., using vapor suppressants and applying water).

4.2.2 Backfill and the Addition of Amendments

Following removal of the impacted soil, the open excavation will be backfilled with a suitable material which consists of reused soil meeting the above-established criteria and imported fill material to achieve final grade. Amendments and nutrients will be blended with backfill material to be placed in select soil removal areas and/or introduced after completion of the remedial construction activities through application well(s). The purpose of the addition of amendments/nutrients will be to stimulate indigenous bacteria to degrade dissolved MGP constituents offsite to the north (e.g., MW-9, see Figure 4). The details for the amendments will be determined during the remedial design and will be based, in part, on the results of the PDI investigation activities to be conducted in the area north of the site.

As part of the remedial design, a suitable soil material similar to existing site soils will be specified (e.g., soil type and gradation). A soil cover consisting of at least two feet of clean imported backfill, to prevent exposure to contaminated soils, will be installed across excavated areas and will be underlain by a demarcation layer to denote the subsurface backfill that will require institutional controls. The top 6 inches of soil cover will consist of: crushed stone or similar clean material, soil of sufficient quality to support vegetation, or a paving system or concrete at least 6 inches thick. The details of the cover system, analytical and field testing requirements for backfill material, as well as material specifications for the demarcation layer, will be developed and included in the remedial design. Clean soil is defined as soil that meets the Division of Environmental Remediation's criteria for backfill or that is equivalent in composition to local background soils.

Additional restoration details are described in Section 4.7.

4.3 Groundwater Monitoring and Passive NAPL Recovery Well Installation

Groundwater monitoring, NAPL recovery wells, and potentially wells for introducing amendments/nutrients into the groundwater north of the site will be installed following completion of soil removal activities. The number, locations, and construction details

for these wells will be established during the remedial design/remedial action process, including determinations based on the presence of NAPL observed on the bedrock surface exposed during soil excavation. Installation of potential DNAPL recovery wells will consider depths where DNAPL was encountered and the location of observed impacts.

Following installation of the wells, periodic monitoring of the wells will be conducted to evaluate the enhanced natural attenuation of dissolved MGP constituents in groundwater and the presence/absence of DNAPL, and also to recover accumulated DNAPL (if any), to the extent practicable. Based on the viscosity and anticipated limited accumulation rates, DNAPL recovery will be performed from the recovery wells using passive removal methods (e.g., manual recovery, periodic pumping, etc.). Specific details regarding the periodic monitoring/recovery activities will be presented in the remedial design. A detailed log of each well installed will be prepared and included in the Final Engineering Report discussed in Section 5.2 of this RAWP.

4.4 Noise, Dust, and Vapor Emissions, and Odor Control

As identified in Section 3.4 (Contractor Submittals), the Contractor shall prepare a Construction Operations Plan that will include a Noise Monitoring Plan; a CAMP, based on the NYSDOH's *Generic Community Air Monitoring Plan* (refer to NYSDEC's Final (May 2010) DER-10); and an Odor Control Plan. These plans will identify the monitoring methods and corrective measures to be taken during implementation of the remedial efforts and will address, at a minimum, intrusive activities and activities associated with managing/handling of stockpiled soils and storage of contaminated groundwater. These procedures are generally discussed in this subsection.

Appropriate measures will be taken during implementation of the remedial activities to keep noise levels (produced by construction equipment) to safe and tolerable limits, as set forth by the Occupational Safety and Health Administration (OSHA), the United States Environmental Protection Agency (USEPA), and any applicable New York State or local code ordinances. All construction equipment posing a potential noise nuisance will be outfitted by the Contractor with noise-muffling devices. As noted above, the methods to address potential noise during remedial activities will be identified by the Contractor in a Noise Monitoring Plan, which will be included in the Construction Operations Plan.

To minimize generation and potential migration of odors, vapor emissions, and/or airborne particulates, appropriate odor/vapor/particulate suppression and control

measures will be implemented during the soil excavation activities (e.g., using vapor suppressants, applying water, etc.). The Contractor will be required to submit in the Construction Operations Plan the methods to address potential emissions during the excavation efforts as the site-specific CAMP and Odor Control Plan. During intrusive remedial activities and material handling activities, real-time air monitoring activities will be implemented at the site for volatile organic compounds (VOCs) and particulate matter less than 10 microns in diameter (PM10). The real-time air monitoring activities will be implemented in accordance with requirements set forth in the (NYSDOH's *Generic Community Air Monitoring Plan*, the site-specific HASP, and the site-specific CAMP. Monitoring will be performed continuously during intrusive remedial activities and material handling activities at locations upwind and downwind along the work area with instrumentation that is equipped with electronic data-logging capabilities.

4.5 Equipment Decontamination

All non-disposable equipment used during implementation of the remedial construction activities will be decontaminated before being removed from the site. Equipment that contracts MGP-impacted material will be decontaminated in the designated onsite area. All material used in equipment washing including, but not limited to, detergent solution, rinsate, rinse water, towels, disposable equipment, and polyethylene sheeting, will be collected and managed as described in the Waste Management Plan.

4.6 Waste Handling, Treatment, and Disposal

Soil, water, tar/NAPL, debris, and miscellaneous wastes generated during the remedial activities will be containerized, handled, and transported for off-site treatment and/or disposal in accordance with the technical specifications, the Waste Management Plan, and all applicable federal, state, and local regulations.

4.7 Site Restoration/Demobilization

At the conclusion of remedial construction activities, the work area will be restored as provided for in the technical plans and specifications (to be provided at a later date). Site restoration activities will generally include the following:

- Restoring all surface features disturbed, damaged, or destroyed during implementation of the remedial activities to their pre-construction condition

- Installation of post-remediation monitoring/NAPL recovery wells in accordance with *Generic Site Characterization/IRM Work Plan for Site Investigations at Non-Owned Former MGP Sites*, dated November 2002. Installation locations will be determined based, in part, on the observations of the bedrock surface exposed during soil excavation

Site demobilization activities will generally include the following activities:

- Dismantling the work area(s), staging area(s), and equipment and material decontamination area(s)

- Cleaning/decontaminating equipment and construction-related materials prior to removal from the site

- Removing from the site all materials, equipment, and support structures

4.8 Survey

A post-remediation site survey will be completed by a New York State licensed surveyor to document the remedial construction work completed as part of the remedial activities. In addition, the location, ground elevation, and top-of-casing elevation for each recovery well installed as part of the remedial activities will be surveyed. This information will be presented in the Final Engineering Report to be prepared upon completion of the remedial activities (see Section 5.2).

5. Post-Remedial Action

5.1 General

This section presents a discussion of post-remedial action activities to be implemented following the remedial activities described in Section 4 of this RAWP.

5.2 Preparing a Final Engineering Report

Upon completion of the remedial activities, a Final Engineering Report will be prepared by ARCADIS for submittal to the NYSDEC. In general, the Final Engineering Report will present the following information:

- Description of the remedial activities, including variations (if any) from the NYSDEC-approved Final RAWP.
- Record construction plans detailing the remedial activities.
- A Certification Statement signed by a Profession Engineer licensed in New York State which certifies that the remedial activities were performed in accordance with the NYSDEC-approved Final RAWP and subsequent modifications (if any).
- Information and documentation regarding the final disposition of materials disposed/treated offsite during implementation of the remedial activities.
- Documentation that the Deed Restriction identified in Section 5.3 is in effect.

5.3 Establishing Institutional Controls

As identified in Section 1.2, a Site Management Plan will be developed to manage the site after the remedial actions have been completed. Additionally, institutional controls in the form of a site Deed Restriction will be developed that will limit the use and development of the site, restrict the use of groundwater, and inform future property owners of the residual soil and groundwater impacts at the site. The Deed Restriction will also reference the Site Management Plan. Groundwater use restrictions implemented for the site will prohibit future groundwater as a source of drinking water or industrial supply without the necessary water quality treatment as determined by the NYSDOH.

Institutional controls are anticipated to be established by the property owner and documentation that the Deed Restriction is in effect are anticipated to be included in the Final Engineering Report documenting the remedial activities.

5.4 Monitoring of Post-Remedial Action Conditions

Groundwater quality at the site is expected to improve as a result of the remedial action activities described above. As such, overburden and bedrock groundwater monitoring, and passive NAPL removal (if necessary), will be conducted to evaluate the concentrations of COCs in groundwater and confirm that groundwater quality is improving and/or does not represent a significant threat to human health or the environment based on the contemplated use of the site. The groundwater samples will be submitted to certified analytical laboratory for analyses for BTEX, PAHs, and cyanide. Quality Assurance/Quality Control (QA/QC) samples (including trip blank, field duplicate, matrix spike, and matrix spike duplicate samples) will be collected and submitted for laboratory analyses for each annual sampling event. The groundwater monitoring results will be summarized in a groundwater monitoring report that will be submitted to the NYSDEC.

In addition, periodic monitoring of the soil cover will be conducted to verify that site conditions have not changed and that the soil cover is intact to control exposure to the subsurface soils. Details of the periodic monitoring and potential methods for soil cover maintenance will be outlined in the SMP.

5.5 Periodic Certification

Periodic certification of institutional and engineering controls will be prepared and submitted by a professional engineer or such other expert acceptable to the NYSDEC, until the property owner is notified by the NYSDEC in writing that this certification is no longer needed. This submittal will:

- Contain certification that the institutional and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with the NYSDEC-approved modifications;

- Allow the NYSDEC access to the site; and

- State that nothing has occurred that would impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with the SMP unless otherwise approved by the NYSDEC.

- Schedule

This section presents the anticipated milestone dates associated with implementation of this RAWP for the Ogdensburg (King Street) non-owned former MGP site. Anticipated schedule milestone dates include:

Project Milestone	Anticipated Date
Distribute Draft Decision Document	August 2010
Public Meeting	August 2010
Close of 30-day Public Comment Period	30 days after distribution of the Draft Decision Document
Initiate Pre-Design Investigation	September/October 2010 (approximately 2 to 3 weeks after close of public comment period)
Submit Pre-Design Report	November/December 2010 (approximately 10 weeks after initiating pre-design investigation)
Submit Draft Technical Plans/Specifications, HASP, CPP, SWPPP, and SMP to NYSDEC	90 days after NYSDEC's approval of the Pre-Design Report

6. References

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NYSDEC. 2006. 6 NYCRR Subpart 375-6, Remedial Program Soil Cleanup Objectives. December 14, 2006.

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Sanborn fire insurance maps, 1884, 1892, 1898, 1904, 1909, 1918, 1925, 1949, and 1962.

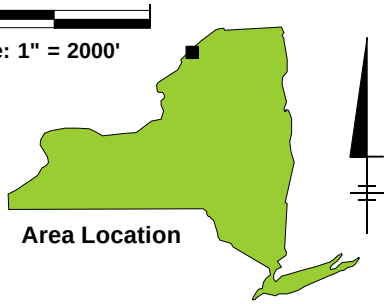
ARCADIS

Figures

REFERENCE: Base Map USGS 7.5 Min. Quad., Ogdensburg East, New York, 1963.

2000' 0 2000'

Approximate Scale: 1" = 2000'



NATIONAL GRID
OGDENSBURG (KING STREET) NON-OWNED FORMER MGP SITE
OGDENSBURG, NEW YORK

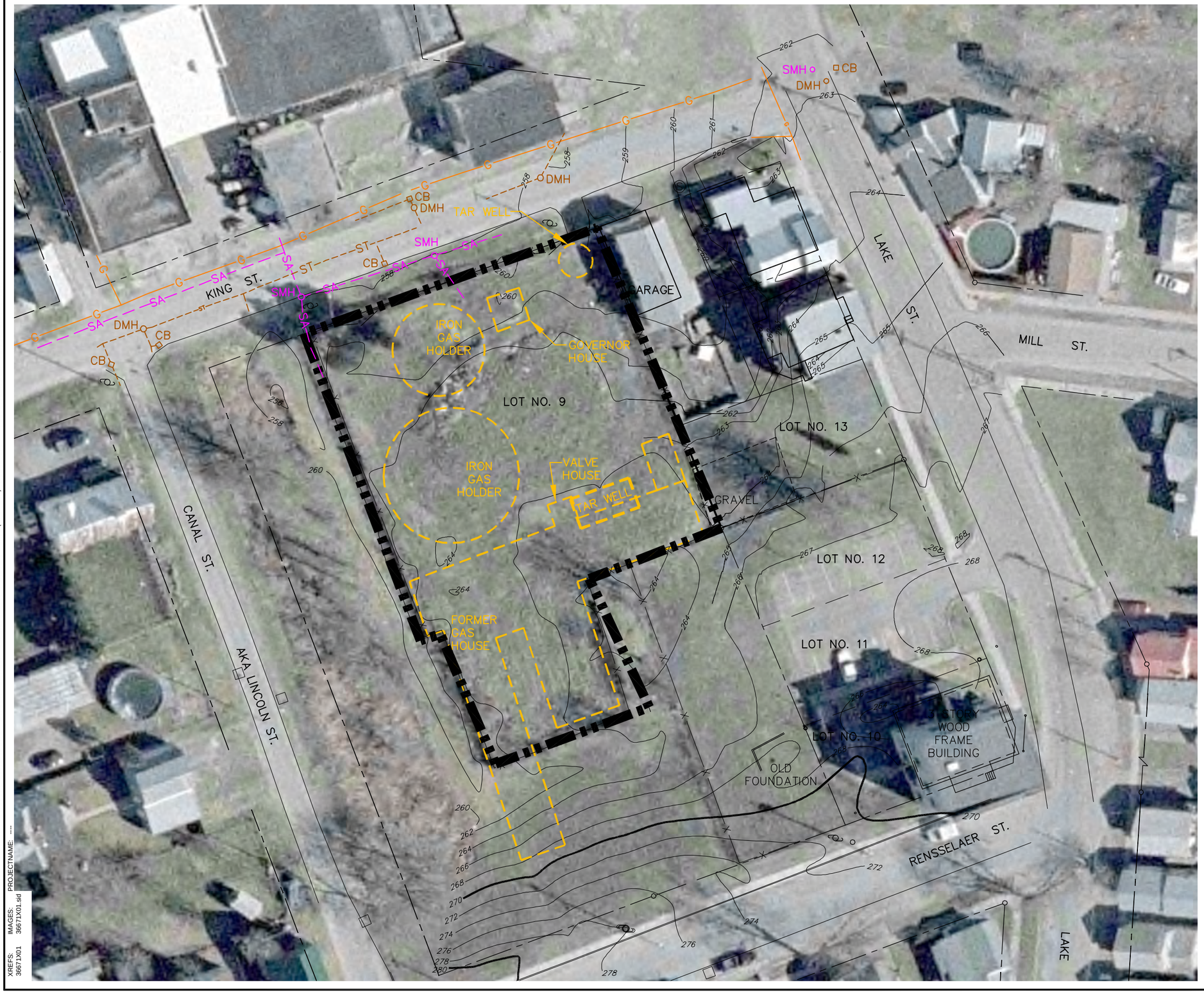
REMEDIAL ACTION WORK PLAN

SITE LOCATION MAP

ARCADIS

FIGURE
1

05/06/2010 SYRACUSE, NY-ENV/CAD-DJHOWES, LJPOSENAUER
B0036671/0001/00018/CDR/36671N01.CDR



LEGEND:

- TAR WELL — FEATURES FROM 1909 AND SEPTEMBER 1925 SANBORN MAPS
- APPROXIMATE SITE BOUNDARY
- APPROXIMATE ROAD RIGHT-OF WAY
- CHAINLINK FENCE
- G — GAS LINE
- ST — STORM LINE
- SA — SANITARY LINE
- CB — STORM LINE CATCH BASIN
- DMH — STORM LINE MANHOLE
- SMH — SANITARY LINE MANHOLE
- UTILITY POLE
- 258 — TOPOGRAPHIC CONTOUR (2 FT. CONTOUR INTERVAL)

NOTES:

1. BASE MAP FROM SURVEY BY WCT SURVEYORS, P.C., ON 11/21/2003, 12/22/2003 AND 4/7/2004. ELEVATIONS ARE BASED ON THE NAVD 88 DATUM. BASE MAP UPDATED BY C.T. MALE SURVEYORS ON SEPTEMBER 7, 2006.
2. HISTORICAL FEATURE LOCATIONS AND SCALE ARE APPROXIMATE.

0 50' 100'

GRAPHIC SCALE

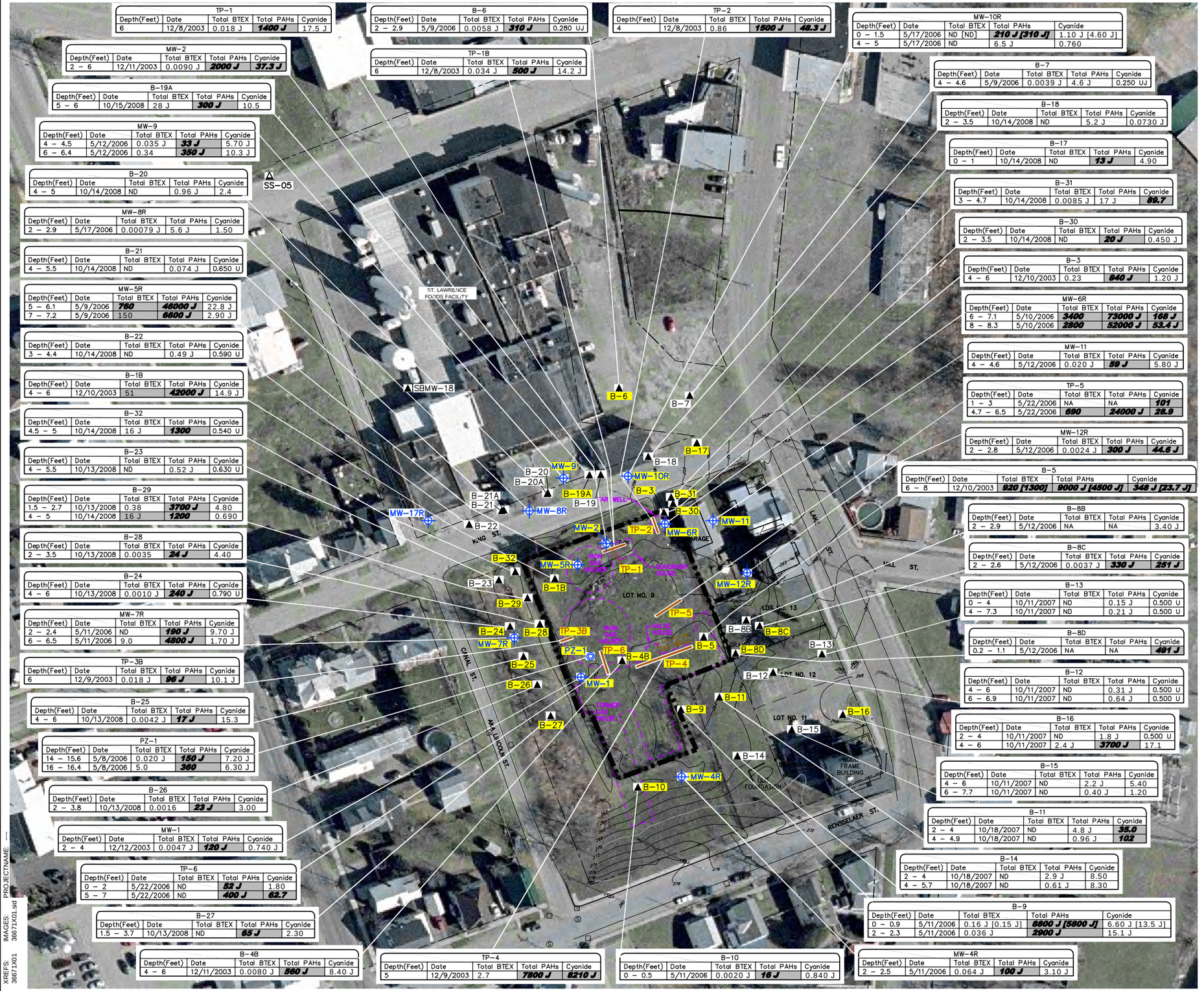
NATIONAL GRID
OGDENSBURG (KING STREET) NON-OWNED FORMER MGP SITE
OGDENSBURG, NEW YORK
REMEDIAL ACTION WORK PLAN

SITE MAP

ARCADIS

FIGURE 2

CITY: SYRACUSE, NY DIV/GROUP: 141/ENVCAD DB: R.ALLEN LD:(Opt) PIC:(Opt) PM: S.POWLIN TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIB\03667\100\00018\DWG\RAWP\36671B02.DWG LAYOUT: 2SAVED: 5/10/2010 11:25 AM ACADVER: 17.0S (LMS TECH) PAGESETUP: ---PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 5/10/2010 11:25 AM BY: POSENAUER, LISA
XREFS: 36671X01 IMAGES: 36671X01.sid PROJECTNAME: ----



TP-1

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
6	12/8/2003	0.018 J	***1400 J***	17.5 J

MW-2

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 6	12/11/2003	0.0090 J	***2000 J***	***37.3 J***

B-19A

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
5 – 6	10/15/2008	28 J	***300 J***	10.5

MW-9

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 4.5	5/12/2006	0.035 J	***33 J***	5.70 J
6 – 6.4	5/12/2006	0.34	***350 J***	10.3 J

B-20

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 5	10/14/2008	ND	0.96 J	2.4

MW-8R

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 2.9	5/17/2006	0.00079 J	5.6 J	1.50

B-21

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 5.5	10/14/2008	ND	0.074 J	0.650 U

MW-5R

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
5 – 6.1	5/9/2006	***760***	***46000 J***	22.8 J
7 – 7.2	5/9/2006	150	***6800 J***	2.90 J

B-22

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
3 – 4.4	10/14/2008	ND	0.49 J	0.590 U

B-1B

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 6	12/10/2003	51	***42000 J***	14.9 J

B-32

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4.5 – 5	10/14/2008	16 J	***1300***	0.540 U

B-23

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 5.5	10/13/2008	ND	0.52 J	0.630 U

B-29

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
1.5 – 2.7	10/13/2008	0.38	***3700 J***	4.80
4 – 5	10/14/2008	16 J	***1200***	0.690

B-28

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 3.5	10/13/2008	0.0035	***24 J***	4.40

B-24

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 6	10/13/2008	0.0010 J	***240 J***	0.790 U

MW-7R

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 2.4	5/11/2006	ND	***190 J***	9.70 J
6 – 6.5	5/11/2006	9.0	***4800 J***	1.70 J

TP-3B

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
6	12/9/2003	0.018 J	***96 J***	10.1 J

B-25

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 6	10/13/2008	0.0042 J	***17 J***	15.3

PZ-1

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
14 – 15.6	5/8/2006	0.020 J	***150 J***	7.20 J
16 – 16.4	5/8/2006	5.0	***360***	6.30 J

B-26

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 3.8	10/13/2008	0.0016	***23 J***	3.00

MW-1

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 4	12/12/2003	0.0047 J	***120 J***	0.740 J

TP-6

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
0 – 2	5/22/2006	ND	***52 J***	1.80
5 – 7	5/22/2006	ND	***400 J***	***62.7***

B-27

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
1.5 – 3.7	10/13/2008	ND	***65 J***	2.30

B-4B

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 6	12/11/2003	0.0080 J	***560 J***	8.40 J

B-6

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 2.9	5/9/2006	0.0058 J	***310 J***	0.280 UJ

TP-1B

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
6	12/8/2003	0.034 J	***500 J***	14.2 J

TP-2

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4	12/8/2003	0.86	***1800 J***	***48.3 J***

TP-4

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
5	12/9/2003	2.7	***7500 J***	***8210 J***

B-10

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
0 – 0.5	5/11/2006	0.0020 J	***16 J***	0.840 J

MW-10R

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
0 – 1.5	5/17/2006	ND [ND]	***210 J [310 J]***	1.10 J [4.60 J]
4 – 5	5/17/2006	ND	6.5 J	0.760

B-7

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 4.6	5/9/2006	0.0039 J	4.6 J	0.250 UJ

B-18

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 3.5	10/14/2008	ND	5.2 J	0.0730 J

B-17

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
0 – 1	10/14/2008	ND	***13 J***	4.90

B-31

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
3 – 4.7	10/14/2008	0.0085 J	17 J	***89.7***

B-30

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 3.5	10/14/2008	ND	***20 J***	0.450 J

B-3

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 6	12/10/2003	0.23	***840 J***	1.20 J

MW-6R

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
6 – 7.1	5/10/2006	***3400***	***73000 J***	***168 J***
8 – 8.3	5/10/2006	***2800***	***52000 J***	***53.4 J***

MW-11

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 4.6	5/12/2006	0.020 J	***89 J***	5.80 J

TP-5

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
1 – 3	5/22/2006	NA	NA	***101***
4.7 – 6.5	5/22/2006	***690***	***24000 J***	***28.9***

MW-12R

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 2.8	5/12/2006	0.0024 J	***300 J***	***44.6 J***

B-5

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
6 – 8	12/10/2003	***920 [1300]***	***9000 J [4500 J]***	***348 J [23.7 J]***

B-8B

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 2.9	5/12/2006	NA	NA	3.40 J

B-8C

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 2.6	5/12/2006	0.0037 J	***330 J***	***251 J***

B-13

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
0 – 4	10/11/2007	ND	0.15 J	0.500 U
4 – 7.3	10/11/2007	ND	0.21 J	0.500 U

B-8D

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
0.2 – 1.1	5/12/2006	NA	NA	***491 J***

B-12

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 6	10/11/2007	ND	0.31 J	0.500 U
6 – 6.9	10/11/2007	ND	0.64 J	0.500 U

B-16

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 4	10/11/2007	ND	1.8 J	0.500 U
4 – 6	10/11/2007	2.4 J	***3700 J***	17.1

B-15

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 6	10/11/2007	ND	2.2 J	5.40
6 – 7.7	10/11/2007	ND	0.40 J	1.20

B-11

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 4	10/18/2007	ND	4.8 J	***35.0***
4 – 4.9	10/18/2007	ND	0.96 J	***102***

B-14

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 4	10/18/2007	ND	2.9 J	8.50
4 – 5.7	10/18/2007	ND	0.61 J	8.30

B-9

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
0 – 0.9	5/11/2006	0.16 J [0.15 J]	***6800 J [5800 J]***	6.60 J [13.5 J]
2 – 2.3	5/11/2006	0.036 J	***2900 J***	15.1 J

MW-4R

Depth(Feet)	Date	Total BTEX	Total PAHs	Cyanide
2 – 2.5	5/11/2006	0.064 J	***100 J***	3.10 J

LEGEND:

- MW-10 — MONITORING WELL
- TP-1 — TEST PIT
- B-1 — SOIL BORING
- TAR WELL — FEATURE FROM 1909 SANBORN MAP
- TAR WELL — FEATURE FROM SEPTEMBER 1925 SANBORN MAP
- APPROXIMATE SITE BOUNDARY
- APPROXIMATE ROAD RIGHT-OF WAY
- CHAINLINK FENCE
- 258 — TOPOGRAPHIC CONTOUR (2 FT. CONTOUR INTERVAL)
- J — APPROXIMATE VALUE
- U — ANALYTE WAS NOT DETECTED AT ASSOCIATED DETECTION LIMITS
- ND — NOT DETECTED
- NA — NOT ANALYZED
- SCO — SOIL CLEANUP OBJECTIVES
- ONE OR MORE CONSTITUENTS AT THIS LOCATION EXCEED ONE OR MORE APPLICABLE CRITERIA

NOTES:

1. FIGURE OBTAINED FROM NYSDEC APPROVED REMEDIAL INVESTIGATION REPORT (ARCADIS 2009).
2. BASE MAP FROM SURVEY BY WCT SURVEYORS, P.C., ON 11/21/2003, 12/22/2003 AND 4/7/2004. ELEVATIONS ARE BASED ON THE NAVD 88 DATUM. BASE MAP UPDATED BY C.T. MALE SURVEYORS ON SEPTEMBER 7, 2006.
3. HISTORICAL FEATURE LOCATIONS AND SCALE ARE APPROXIMATE.
4. SAMPLE RESULTS REPORTED IN MG/KG. DUPLICATE RESULTS PRESENTED IN BRACKETS.
5. BOLDED VALUES WERE DETECTED.
6. SHADING INDICATES THAT ONE OR MORE COMPOUNDS WERE DETECTED AT A CONCENTRATION ABOVE THE NYSDEC RESTRICTED USE RESIDENTIAL SCO.
7. ITALICS INDICATES THAT ONE OR MORE COMPOUNDS WERE DETECTED AT A CONCENTRATION ABOVE THE NYSDEC RESTRICTED USE COMMERCIAL SCO.

0 100' 200'

GRAPHIC SCALE

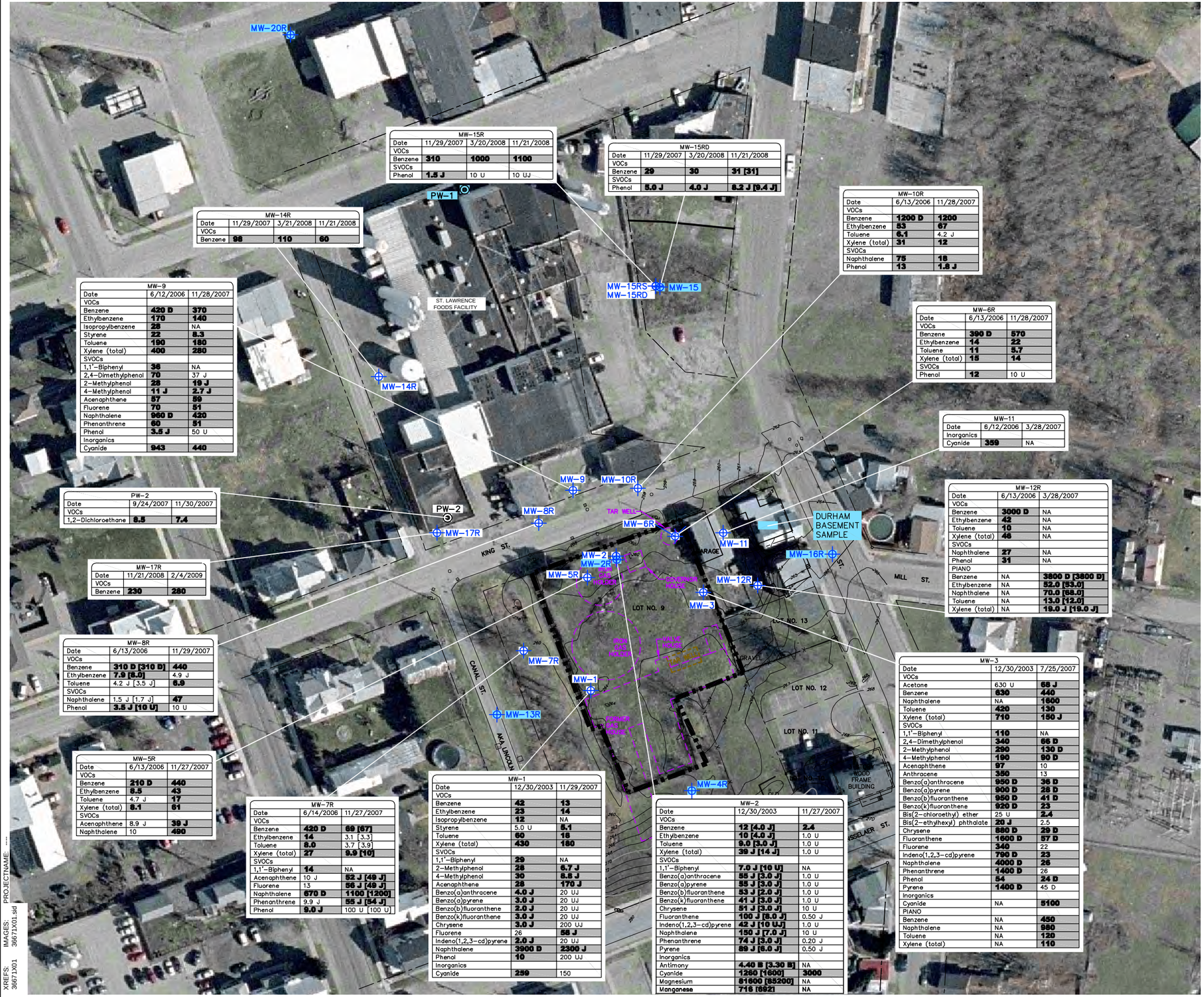
NATIONAL GRID
OGDENSBURG (KING STREET) NON-OWNED FORMER MGP SITE
OGDENSBURG, NEW YORK
REMEDIAL ACTION WORK PLAN

SUBSURFACE SOIL DATA

ARCADIS

FIGURE 3

CITY: SYRACUSE, NY DIV/GROUP: 141/ENVCAD DB: R.ALLEN LD:(Opt) PIC:(Opt) PM: S.POWLIN TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\B003867\10001\0018\DWG\RAWP\36671C01.DWG LAYOUT: 3SAVED: 5/10/2010 11:27 AM ACADVER: 17.0S (LMS TECH) PAGESETUP: ---
XREFS: 36671X01 IMAGES: 36671X01.sid PROJECTNAME: ---
5/10/2010 11:29 AM BY: POSENAUER, USA PLTFULLCTB PLOTTED:



MW-15R			
Date	11/29/2007	3/20/2008	11/21/2008
VOCs			
Benzene	**310**	**1000**	**1100**
SVOCs			
Phenol	**1.5 J**	10 U	10 UJ

MW-15RD			
Date	11/29/2007	3/20/2008	11/21/2008
VOCs			
Benzene	**29**	**30**	**31 [31]**
SVOCs			
Phenol	**5.0 J**	**4.0 J**	**6.2 J [6.4 J]**

MW-14R			
Date	11/29/2007	3/21/2008	11/21/2008
VOCs			
Benzene	**98**	**110**	**60**

MW-10R		
Date	6/13/2006	11/28/2007
VOCs		
Benzene	**1200 D**	**1200**
Ethylbenzene	**53**	**67**
Toluene	**6.1**	4.2 J
Xylene (total)	**31**	**12**
SVOCs		
Naphthalene	**75**	**18**
Phenol	**13**	**1.8 J**

MW-9		
Date	6/12/2006	11/28/2007
VOCs		
Benzene	**420 D**	**370**
Ethylbenzene	**170**	**140**
Isopropylbenzene	**28**	NA
Styrene	**22**	**8.3**
Toluene	**190**	**180**
Xylene (total)	**400**	**280**
SVOCs		
1,1'-Biphenyl	**36**	NA
2,4-Dimethylphenol	**70**	37 J
2-Methylphenol	**28**	**19 J**
4-Methylphenol	**11 J**	**2.7 J**
Acenaphthene	**57**	**59**
Fluorene	**70**	**51**
Naphthalene	**960 D**	**420**
Phenanthrene	**60**	**51**
Phenol	**3.5 J**	50 U
Inorganics		
Cyanide	**943**	**440**

MW-6R		
Date	6/13/2006	11/28/2007
VOCs		
Benzene	**390 D**	**570**
Ethylbenzene	**14**	**22**
Toluene	**11**	**5.7**
Xylene (total)	**15**	**14**
SVOCs		
Phenol	**12**	10 U

MW-11		
Date	6/12/2006	3/28/2007
Inorganics		
Cyanide	**359**	NA

PW-2		
Date	9/24/2007	11/30/2007
VOCs		
1,2-Dichloroethane	**8.5**	**7.4**

MW-12R		
Date	6/13/2006	3/28/2007
VOCs		
Benzene	**3000 D**	NA
Ethylbenzene	**42**	NA
Toluene	**10**	NA
Xylene (total)	**46**	NA
SVOCs		
Naphthalene	**27**	NA
Phenol	**31**	NA
PIANO		
Benzene	NA	**3800 D [3800 D]**
Ethylbenzene	NA	**52.0 [53.0]**
Naphthalene	NA	**70.0 [68.0]**
Toluene	NA	**13.0 [12.0]**
Xylene (total)	NA	**19.0 J [19.0 J]**

MW-17R		
Date	11/21/2008	2/4/2009
VOCs		
Benzene	**230**	**280**

MW-8R		
Date	6/13/2006	11/29/2007
VOCs		
Benzene	**310 D [310 D]**	**440**
Ethylbenzene	**7.9 [8.0]**	4.9 J
Toluene	4.2 J [3.5 J]	**6.9**
SVOCs		
Naphthalene	1.5 J [1.7 J]	**47**
Phenol	**3.5 J [10 U]**	10 U

MW-3		
Date	12/30/2003	7/25/2007
VOCs		
Acetone	630 U	**68 J**
Benzene	**630**	**440**
Naphthalene	NA	**1600**
Toluene	**420**	**130**
Xylene (total)	**710**	**150 J**
SVOCs		
1,1'-Biphenyl	**110**	NA
2,4-Dimethylphenol	**340**	**66 D**
2-Methylphenol	**290**	**130 D**
4-Methylphenol	**190**	**90 D**
Acenaphthene	**97**	10
Anthracene	**350**	13
Benzo(a)anthracene	**950 D**	**36 D**
Benzo(a)pyrene	**900 D**	**28 D**
Benzo(b)fluoranthene	**950 D**	**41 D**
Benzo(k)fluoranthene	**920 D**	**23**
Bis(2-chloroethyl) ether	25 U	**2.4**
Bis(2-ethylhexyl) phthalate	**20 J**	2.5
Chrysene	**880 D**	**29 D**
Fluoranthene	**1600 D**	**57 D**
Fluorene	**340**	22
Indeno(1,2,3-cd)pyrene	**790 D**	**23**
Naphthalene	**4000 D**	**26**
Phenanthrene	**1400 D**	26
Phenol	**54**	**24 D**
Pyrene	**1400 D**	45 D
Inorganics		
Cyanide	NA	**5100**
PIANO		
Benzene	NA	**450**
Naphthalene	NA	**980**
Toluene	NA	**120**
Xylene (total)	NA	**110**

MW-5R		
Date	6/13/2006	11/27/2007
VOCs		
Benzene	**210 D**	**440**
Ethylbenzene	**8.5**	**43**
Toluene	4.7 J	**17**
Xylene (total)	**8.1**	**61**
SVOCs		
Acenaphthene	8.9 J	**39 J**
Naphthalene	10	**490**

MW-7R		
Date	6/14/2006	11/27/2007
VOCs		
Benzene	**420 D**	**69 [67]**
Ethylbenzene	**14**	3.1 [3.3]
Toluene	**8.0**	3.7 [3.9]
Xylene (total)	**27**	**9.9 [10]**
SVOCs		
1,1'-Biphenyl	**14**	NA
Acenaphthene	10 J	**52 J [49 J]**
Fluorene	13	**56 J [49 J]**
Naphthalene	**670 D**	**1100 [1200]**
Phenanthrene	9.9 J	**55 J [54 J]**
Phenol	**9.0 J**	100 U [100 U]

MW-1		
Date	12/30/2003	11/29/2007
VOCs		
Benzene	**42**	**13**
Ethylbenzene	**23**	**14**
Isopropylbenzene	**12**	NA
Styrene	5.0 U	**5.1**
Toluene	**60**	**16**
Xylene (total)	**430**	**180**
SVOCs		
1,1'-Biphenyl	**29**	NA
2-Methylphenol	**28**	**6.7 J**
4-Methylphenol	**30**	**8.5 J**
Acenaphthene	**28**	**170 J**
Benzo(a)anthracene	**4.0 J**	20 UJ
Benzo(a)pyrene	**3.0 J**	20 UJ
Benzo(b)fluoranthene	**2.0 J**	20 UJ
Benzo(k)fluoranthene	**3.0 J**	20 UJ
Chrysene	**3.0 J**	200 UJ
Fluorene	26	**56 J**
Indeno(1,2,3-cd)pyrene	**2.0 J**	20 UJ
Naphthalene	**3900 D**	**2300 J**
Phenol	**10**	200 UJ
Inorganics		
Cyanide	**259**	150

MW-2		
Date	12/30/2003	11/27/2007
VOCs		
Benzene	**12 [4.0 J]**	**2.4**
Ethylbenzene	**10 [4.0 J]**	1.0 U
Toluene	**9.0 [3.0 J]**	1.0 U
Xylene (total)	**39 J [14 J]**	1.0 U
SVOCs		
1,1'-Biphenyl	**7.0 J [10 U]**	NA
Benzo(a)anthracene	**55 J [3.0 J]**	1.0 U
Benzo(a)pyrene	**55 J [3.0 J]**	1.0 U
Benzo(b)fluoranthene	**53 J [2.0 J]**	1.0 U
Benzo(k)fluoranthene	**41 J [3.0 J]**	1.0 U
Chrysene	**51 J [3.0 J]**	10 U
Fluoranthene	**100 J [8.0 J]**	0.50 J
Indeno(1,2,3-cd)pyrene	**42 J [10 UJ]**	1.0 U
Naphthalene	**150 J [7.0 J]**	10 U
Phenanthrene	**74 J [3.0 J]**	0.20 J
Pyrene	**89 J [6.0 J]**	0.50 J
Inorganics		
Antimony	**4.40 B [3.30 B]**	NA
Cyanide	**1260 [1600]**	**3000**
Magnesium	**81600 [85200]**	NA
Manganese	**716 [692]**	NA

LEGEND:

- MW-10 — MONITORING WELL
- PW-1 — APPROXIMATE LOCATION OF PRODUCTION WELL LOCATED INSIDE PRIMO FOOD FACILITY
- TAR WELL — FEATURE FROM 1909 SANBORN MAP
- TAR WELL — FEATURE FROM SEPTEMBER 1925 SANBORN MAP
- APPROXIMATE SITE BOUNDARY
- APPROXIMATE ROAD RIGHT-OF WAY
- CHAINLINK FENCE
- UTILITY POLE
- CATCH BASIN
- MANHOLE
- 258 — TOPOGRAPHIC CONTOUR (2 FT. CONTOUR INTERVAL)
- SAMPLING RESULTS DID NOT EXCEED NEW YORK STATE CLASS GA STANDARDS OR GUIDANCE VALUES

NOTES:

1. FIGURE OBTAINED FROM NYSDEC APPROVED REMEDIAL INVESTIGATION REPORT (ARCADIS 2009).
2. BASE MAP FROM SURVEY BY WCT SURVEYORS, P.C., ON 11/21/2003, 12/22/2003 AND 4/7/2004. ELEVATIONS ARE BASED ON THE NAVD 88 DATUM. BASE MAP UPDATED BY C.T. MALE SURVEYORS ON SEPTEMBER 7, 2006.
3. HISTORICAL FEATURE LOCATIONS AND SCALE ARE APPROXIMATE.
4. BOLDED/SHADED RESULTS EXCEED THE NEW YORK STATE CLASS GA STANDARDS OR GUIDANCE VALUES.
5. RESULTS WITH NO EXCEEDANCES ARE NOTE SHOWN.
6. RESULTS GIVEN IN ug/L.

0 100' 200'

GRAPHIC SCALE

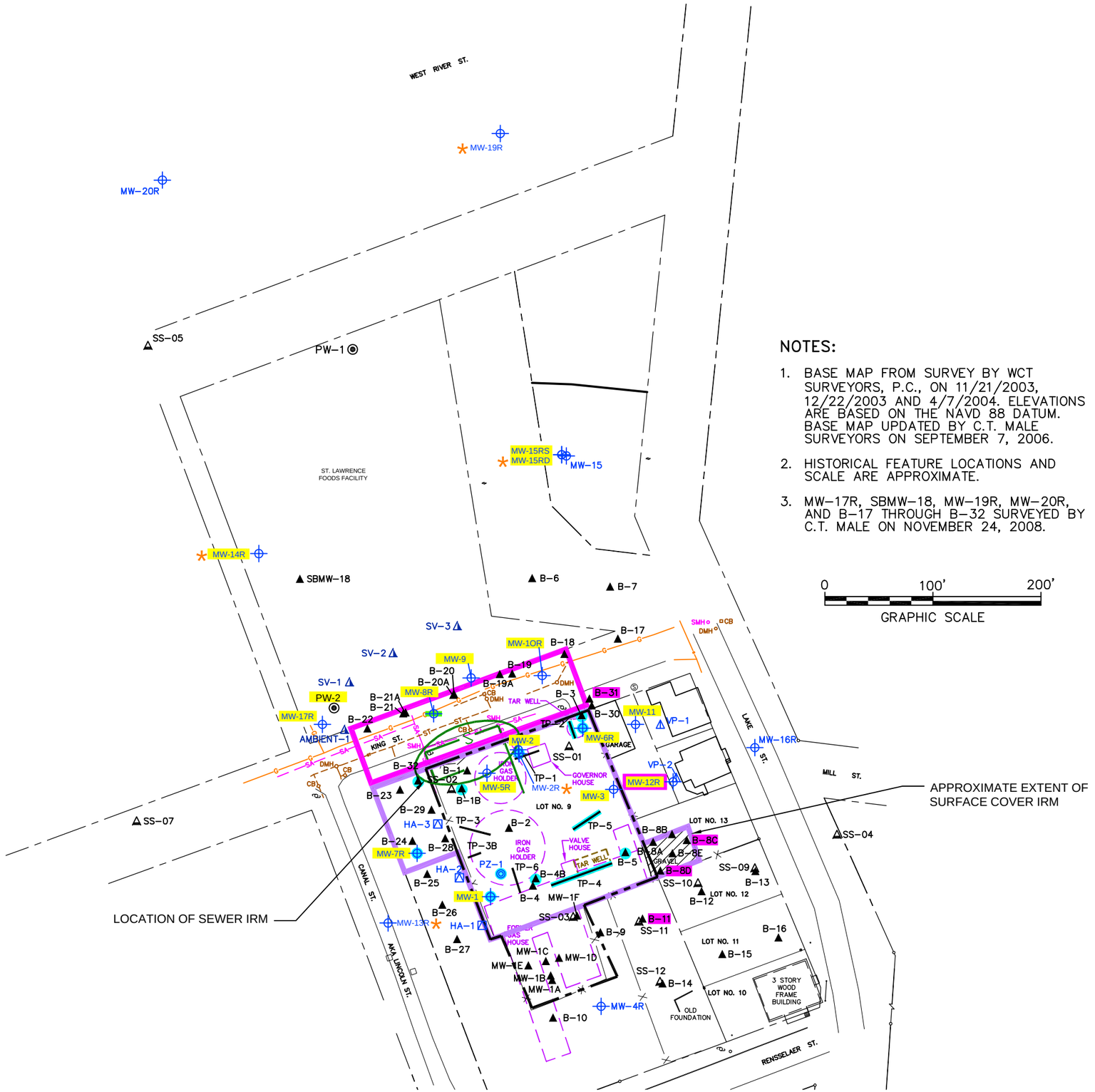
NATIONAL GRID
OGDENSBURG (KING STREET) NON-OWNED FORMER MGP SITE
OGDENSBURG, NEW YORK
REMEDIAL ACTION WORK PLAN

MONITORING WELL GROUNDWATER ANALYTICAL RESULTS

ARCADIS

FIGURE **4**

CITY: SYRACUSE, NY DIV/GROUP: 141/ENVCAD DB: R.ALLEN LD:(Opt) PIC:(Opt) PM: S.POWLIN TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\B003667\100\100018\DWG\RAWP\366710C02.DWG LAYOUT: 4SAVED: 5/10/2010 11:28 AM BY: POSENAUER, LISA
XREFS: 366710X01 IMAGES: 366710X01.sid PROJECTNAME: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 5/10/2010 11:29 AM BY: POSENAUER, LISA
17.0S (LMS TECH) PAGESETUP: ----



NOTES:

1. BASE MAP FROM SURVEY BY WCT SURVEYORS, P.C., ON 11/21/2003, 12/22/2003 AND 4/7/2004. ELEVATIONS ARE BASED ON THE NAVD 88 DATUM. BASE MAP UPDATED BY C.T. MALE SURVEYORS ON SEPTEMBER 7, 2006.
2. HISTORICAL FEATURE LOCATIONS AND SCALE ARE APPROXIMATE.
3. MW-17R, SBMW-18, MW-19R, MW-20R, AND B-17 THROUGH B-32 SURVEYED BY C.T. MALE ON NOVEMBER 24, 2008.

0 100' 200'

GRAPHIC SCALE

LEGEND:

- MW-1O — MONITORING WELL
- VP-1 — SOIL VAPOR SAMPLING POINT
- SV-1 — SOIL VAPOR SAMPLING POINT
- PZ-1 — PIEZOMETER
- HA-1 — HAND-AUGER BORING
- TP-1 — TEST PIT
- B-1 — SOIL BORING
- SS-01 — SURFACE SOIL SAMPLE
- PW-1 — APPROXIMATE LOCATION OF PRODUCTION WELL LOCATED INSIDE ST. LAWRENCE FOODS FACILITY
- TAR WELL — FEATURE FROM 1909 SANBORN MAP
- TAR WELL — FEATURE FROM SEPTEMBER 1925 SANBORN MAP
- APPROXIMATE SITE BOUNDARY
- APPROXIMATE ROAD RIGHT-OF WAY
- CHAINLINK FENCE
- GAS LINE
- STORM LINE
- SANITARY LINE
- STORM LINE CATCH BASIN
- STORM LINE MANHOLE
- SANITARY LINE MANHOLE
- UTILITY POLE
- WELLS CONTAINING CONCENTRATIONS THAT EXCEED NYS CLASS GA GROUNDWATER STANDARDS OR GUIDANCE VALUES DURING DISCRETE SAMPLING
- WELLS CONTAINING CONCENTRATIONS THAT EXCEED NYS CLASS GA GROUNDWATER STANDARDS OR GUIDANCE VALUES DURING PACKER TESTING
- MEASURABLE QUANTITIES OF ACCUMULATED NAPL ENCOUNTERED IN MONITORING WELL
- LOCATIONS OBSERVED WITH NAPL
- AREA PROPOSED TO BE REMOVED AND INSTITUTIONAL CONTROLS PROPOSED TO BE APPLIED TO THIS AREA
- GENERAL AREA AND LOCATIONS SUBJECT TO PRE-DESIGN INVESTIGATION AND POTENTIAL REMEDIAL ACTION AND/OR INSTITUTIONAL CONTROLS
- LOCATION OF IRM SURFACE COVER

NATIONAL GRID
OGDENSBURG (KING STREET) NON-OWNED FORMER MGP SITE
OGDENSBURG, NEW YORK
REMEDIAL ACTION WORK PLAN

PROPOSED REMEDIAL ALTERNATIVE

ARCADIS

FIGURE 5

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB: LJPOSENAUER LD:(Opt) PIC: J.NUSS PM: S.POWLIN TM: S.POWLIN LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIB\00366710001\00019\DWG\36671P01.DWG LAYOUT: SSAVED: 7/29/2010 8:39 AM ACADVER: 17.0S (LMS TECH) PAGESETUP: ---
XREFS: IMAGES: PROJECTNAME: ---
36671X01 PLTFULL.CTB PLOTTED: 7/29/2010 8:40 AM BY: LISTER, PAUL
PLOTSTYLETABLE: ---