nationalgrid

Steven P. Stucker
Lead Engineer
Environmental Department

March 29, 2018

Mr. Matthew King
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation, Remedial Bureau C, Section A
625 Broadway, 11th Floor
Albany, NY 12233-7014

Subject: Work Plan for Supplemental Remedial Investigation Activities
Fulton (Ontario St.) Former MGP Site, Fulton, NY (V00484)

Dear Mr. King:

Please find enclosed the document entitled, "Supplemental Remedial Investigation Work Plan Addendum, Fulton (Ontario St.) Former MGP Site, Fulton, New York" for review by the New York State Department of Environmental Conservation (NYSDEC). This work plan was prepared by Brown and Caldwell Associates on behalf of National Grid.

Following review of the enclosed document, please contact me at (315) 428-5652 to discuss any comments the NYSDEC may have on the work plan and to schedule a site meeting to discuss the Remedial Investigation findings to-date and proposed additional investigation activities.

Sincerely,

FOR:

Steven P. Stucker, C.P.G.
Lead Engineer, Environmental Department

Enclosure

cc: G. Cross – NYSDEC (w/out enclosure)
R. Jones - NYSDOH
J. Giordano - National Grid (w/out enclosure)
J. Marolda - Brown and Caldwell
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Supplemental Remedial Investigation Work Plan Addendum Fulton (Ontario St.) Former MGP Fulton, New York

Prepared for

Niagara Mohawk Power Corporation
d/b/a National Grid, Syracuse,
New York

March 2018

Supplemental Remedial Investigation Work Plan Addendum
Fulton (Ontario St.) Former MGP
Fulton, New York

Prepared for
Niagara Mohawk Power Corporation d/b/a National Grid
300 Erie Boulevard West
Syracuse, New York 13202

March 2018

Project Number: 147351.500.002

I, James L. Marolda, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Remedial Investigation Work Plan 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).

James L. Marolda, C.P.G., P.G.
Principal Geologist/Hydrogeologist

Brown and Caldwell

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Table of Contents

List of Tables

List of Figures

List of Abbreviations

ASP	Analytical Services Protocol
ASTM	American Society for Testing and Materials
BC	Brown and Caldwell Associates
bgs	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, and isomers of Xylene
CAMP	Community Air Monitoring Plan
CLP	Contract Laboratory Program
DER	Division of Environmental Remediation
DOT	Department of Transportation
DPW	Department of Public Works
DUSR	Data Usability Summary Report
EDD	Electronic Data Deliverable
EDR	Environmental Data Resources
ELAP	Environmental Laboratory Approval Program
EM	Electromagnetics
FEMA	Federal Emergency Management Agency
FGLC	Fulton Gas Light Company
FSP	Field Sampling Plan
FWIA	Fish and Wildlife Impact Analysis
FWRIA	Fish and Wildlife Resource Impact Analysis
GC-FID	Gas Chromatograph-Flame Ionization Detector
GPR	Ground-Penetrating Radar
I.D.	Inside Diameter
IDW	Investigation-derived Waste
MGP	Manufactured Gas Plant
NAD	North American Datum
NAPL	Non-Aqueous Phase Liquid
NGVD	National Geodetic Vertical Datum
NYCRR	New York Codes, Rule, and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O.D.	Outside Diameter
PAHs	Polycyclic Aromatic Hydrocarbons
PID	Photoionization Detector
PM	Project Manager
PPE	Personal Protective Equipment
QAPP	Quality Assurance Project Plan
RI	Remedial Investigation

RQD	Rock Quality Designation
SC	Site Characterization
SCOs	Soil Cleanup Objectives
SRI	Supplemental Remedial Investigation
SUNY	State University of New York
SVOCs	Semi Volatile Organic Compounds
TCL	Target Compound List
TOGS	Technical and Operational Guidance Series
USCS	Unified Soil Classification System
USEPA	United Stated Environmental Protection Agency
USGS	United States Geological Survey
VCO	Voluntary Consent Order

Section 1

Introduction

This Remedial Investigation (RI) Work Plan describes the scope of work and procedures that will be used to conduct supplemental RI (SRI) activities at the Fulton (Ontario St.) Former Manufactured Gas Plant (MGP) Site (hereafter referred to as the "Site"). In a letter dated June 30, 2016, which accompanied the deliverable entitled "Data Summary Report, Supplemental Remedial Investigation, Fulton (Ontario St.) Former MGP Site, NYSDEC Site #V00484" (Brown and Caldwell Associates, June 2016) (hereinafter referred to as SRI Data Summary Report), National Grid provided a recommendation to conduct additional RI activities at the Site to further evaluate the nature and extent of MGP-related impacts. On behalf of National Grid, Brown and Caldwell Associates (BC) corresponded with the New York State Department of Conservation (NYSDEC) to inquire about the status of the NYSDEC's review of the above-referenced document in e-mails dated September 28 and October 18, 2017. In February 2018, National Grid was informed by the NYSDEC that a new Project Manager has been assigned to the Site and requested that a site visit be scheduled to discuss the RI findings to-date and the additional investigation activities that National Grid had recommended, as described in the SRI Data Summary Report. Accordingly, this work plan was developed in preparation for the site meeting and serves as an addendum to the "Supplemental RI Work Plan, Fulton (North Ontario St.) Former MGP Site, Fulton, NY" (BC, April 2015).

Investigation activities at the Site are being conducted pursuant to the Voluntary Consent Order (VCO) between NYSDEC and Niagara Mohawk Power Corporation, doing business as National Grid, dated January 25, 2002 (Order Index Number D0 0001 0011). This VCO primarily covers former MGPs that are situated on properties not owned by National Grid, but where National Grid has assumed responsibility for former MGP operations.

The specific objectives of the supplemental RI are to:

1. Further evaluate the extent of NAPL/tar in overburden on the off-site property west of the Site.
2. Further evaluate the extent of NAPL/tar in bedrock.
3. Further evaluate the extent of MGP-related constituents in off-site subsurface soil above applicable Soil Cleanup Objectives (SCOs) as set forth in 6 NYCRR Subpart 375-6.
4. Further evaluate the lateral extent of dissolved-phase, MGP-related constituents in overburden groundwater on south side of the Site and on the off-site property west of the Site.
5. Further evaluate the extent of dissolved-phase, MGP-related constituents in bedrock groundwater.

Section 2.0 provides a summary of the background, geology and history of the Site. Section 3.0 describes the scope of work, including the technical approach and the methods and materials to be used in performing the SRI addendum scope of work. Section 4.0 provides the anticipated schedule for completion of the SRI activities.

Section 2

Background

The Site location and history described below was previously provided in the "Site Characterization/Interim Remedial Measures Work Plan for Site Investigations at the Fulton Non-Owned Former MGP Site" (EECS, January 2004). It is presented again herein with slight modifications. Also provided below is a summary of the investigation findings to-date associated with the Site.

2.1 Site Location and Description

The Site is located at 0 Ontario Street in the City of Fulton, Oswego County, New York. Latitude and longitude coordinates for the property are approximately 43° 19' 41.2" north latitude and 76° 25' 0.8" west longitude. The location of the property is shown on Figure 2-1.

According to the City of Fulton Assessors Office's records, the 0 Ontario Street address is comprised of one parcel owned by Drake Petroleum Company, Inc., successor by merger to Mid-Valley Oil Company, Inc. of North Grosvenordale, Connecticut. The property is identified as Parcel 1-06 on Assessors Office's Map 236.47 and occupies approximately ¾ acre. The 0 Ontario Street property is zoned for commercial use.

The 0 Ontario Street property is abutted to the north by Ontario Street; to the west by Hubbard Street; to the south by another property owned by the Drake Petroleum Company that is currently occupied by a Sunoco service station; and to the east by New York State (NYS) Route 481. The area surrounding the Site is primarily used for industrial and commercial purposes.

The off-site property (currently occupied and owned by Davis-Standard LLC) west of the area of known former MGP operations was formerly owned by the owner of the MGP during the period of MGP operations, but where no MGP operations were known to have taken place. The off-site property is referred to herein as the Parcel C Area.

The topography of much of the Site is generally flat but with a slight decline to the northwest. The ground surface near the western and northern boundaries of the property slopes sharply downward to Hubbard Street and Ontario Street, respectively. The elevation of the property varies from approximately 330 feet, National Geodetic Vertical Datum (NGVD) on the eastern portion of the property to approximately 320 feet NGVD along the western property boundary. On the off-site property, the ground surface is relatively flat, with a variation in elevation from approximately 318 to 321 feet NGVD.

Based on the United States Geological Survey (USGS) 7.5 Minute Series Fulton Quadrangle Topographic Map, the area in the vicinity of the Site is part of the eastern slope of the floodplain for the Oswego River (the on-site area is designated as an Other Area within Zone X [areas determined to be outside the 0.2% annual chance floodplain]; the off-site area is designated as an Other Flood Area within Zone X [areas of 0.2% annual chance flood and areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile], per June 2013 Federal Emergency Management Agency [FEMA] Flood Insurance Rate Map). The Oswego River is located approximately 400 feet west of the Site.

2.2 Site History

The site history presented in this section was collected from several sources including Sanborn® Maps provided by Environmental Data Resources (EDR), the Fulton Historical Society, the Fulton Public Library, "Brown's Directory of American Gas Companies 1887-1907, 1908-1911, and 1917-1918", "Survey of Town Gas and By-Product Production and Locations in the U.S. (1880-1950)" prepared by Radian Corporation in 1985, and the City of Fulton Assessors' Office. Additional resources that were researched included the City Directory and aerial photograph archives maintained by EDR. No information pertaining to the former MGP was discovered during the research of these additional resources.

According to the "Historical and Statistical Gazetteer of New York State", which was published by Heart of the Lakes Publishing in 1980, the Fulton Gas Light Company (FGLC) was organized on June 12, 1858. The first "Brown's Directory of American Gas Companies", which was published in 1887, indicated the FGLC manufactured coal gas. The only schematic of the plant is shown on an 1890 Sanborn® Fire Insurance Map. This Sanborn® Map shows the plant to be located on the northern portion of the current 0 Ontario Street property. However, the plant was identified as being vacant on the 1890 Sanborn® Map indicating that by 1890, the former MGP was no longer in operation. Figure 2-2 shows the structures identified on the 1890 Sanborn® Map transposed onto a current Site map. The FGLC plant appears to only have operated for approximately 30 years. The results of gas chromatograph-flame ionization detector (GC-FID) fingerprint analyses performed on non-aqueous phase liquid (NAPL)-impacted soils collected during previous RI activities indicate it was derived from the coal carbonization processes of gas manufacturing. This is consistent with the types of plant facilities indicated on the 1890 Sanborn® Map

As shown on Figure 2-2, the plant consisted of a main building with a number of attached rooms and a gas holder to the west, which had a diameter of approximately 40 feet. The area surrounding the plant was primarily industrialized. The Hunter Arms Company factory was situated on the southern portion of the 0 Ontario property and the properties located south of the Site. In addition, the eastern portion of the current 0 Ontario Street property and North Second Street overlie what was, during MGP operations, part of the Oswego Canal.

By 1896, the Hunter Arms Company had also occupied the northern portion of the 0 Ontario Street property as shown by the 1896 Sanborn® Map. The gas holder was apparently dismantled prior to this date as the structure was not shown on the 1896 Sanborn® Map. A new building had been built in the same location. In addition, the former MGP building was used for coal storage.

Based on a review of the available Sanborn® Maps, the MGP building was demolished sometime between 1911 and 1924. In addition, the Oswego Canal was filled in during this same time period.

No structures have apparently been built on the Site since the Hunter Arms Company factory was demolished sometime before 1960.

2.3 Summary of Previous Site Investigations

The findings from the Site Characterization (SC) as documented in the "Site Characterization Data Summary Report, Fulton (North Ontario St.) Former MGP" (Brown and Caldwell Associates, August 2005) and subsequent SC and RI activities as documented in and the "Data Summary Report, Supplemental Site Characterization, Fulton (North Ontario St.) Former MGP" (Brown and Caldwell Associates, February 2008), the "Data Summary Report, Remedial Investigation, Fulton (North Ontario St.) Former MGP" (Brown and Caldwell Associates, May 2013) (referred to hereafter as the RI Data Summary Report), and the SRI Data Summary Report are summarized below.

2.3.1 Historical Document Research

Research of the off-site area (Parcel C Area) west of the Site was conducted in an effort to further evaluate a potential subsurface structure as indicated by demolition debris (concrete, brick, etc.) encountered in boring B-106 during the SC and by a review of a historical map (1867 Topographical Atlas of Oswego County, New York) that indicated a circular structure was present in the area of B-106 during the period of MGP operations. This research included obtaining and reviewing available resources such as:

- Maps and Other Cartographic Sources – Sanborn® Fire Insurance maps for areas surrounding the former MGP, historic City plans and atlases, historic survey drawings for the Oswego Canal.
- Aerial photographs.
- Historical topographic maps.

From the available materials reviewed during the research efforts, indications of the above-described potential subsurface structure were not identified on any historical imagery or historic drawings. However, other useful information was obtained during the research, as discussed below.

A segment of the historic Oswego Canal was once located directly adjacent to the eastern side of the on-site property. The canal was subsequently filled and is now buried under the area of existing State Highway NYS-481. Research of the alignment of the historic Oswego Canal in the area of the Site and potential drainage features (e.g., drainage pipes, weirs, ditches, etc.) associated with the canal at or adjacent to the Site was conducted to assess if such features may affect subsurface conditions at the Site. This research included obtaining and reviewing available resources as listed above. The dates which imagery and maps were acquired included the following:

- Sanborn® Fire Insurance Maps: 1890, 1896, 1901, 1906, 1911, 1924, and 1960.
- Aerial Photography: 1955, 1965, 1975, 1978, 1985 and 1994.
- Topographic Maps: 1900 and 1956.

In addition to the imagery and maps obtained during the research efforts, the New York State (NYS) Archives located in Albany was visited to review historic drawings of the City of Fulton and other drawings, including survey maps of the segment of the Oswego Canal that was once located adjacent to the eastern side of the on-site property. The drawings reviewed at the NYS Archives included the following:

- Hutchinson, Holmes. Oswego Canal Survey, Vol. 1, Volney. 1834.
- Scheck, P. Map of the Village of Fulton. 1855.
- Barge Canal Section Maps. Map 5 – Oswego Canal, Volney to Granby; and Map 6 – Oswego Canal, Fulton, Volney, Granby. ca 1896.
- Taylor, B. Maps Plans and Estimates of Enlarged Locks on the Oswego Canal. 1863.
- Bien, J. R. Atlas of the State of New York. 1895.
- Department of Public Works, Division of Canals and Waterways. Maps of Canal Lands Owned by the State of New York ("Blue Line Maps"). Maps 41 through 44 – Town of Volney, City of Fulton. 1930.
- Schillner Maps. Various maps depicting the Oswego Canal in area of site. ca 1896.

The imagery, maps, and drawings compiled during the research efforts are provided on the DVD included in Appendix A of the Data Summary Report. Several of these historic maps/drawings depict a west-east oriented feature (presumably a narrow waterway that intersected the Oswego River) bisecting the off-site property west of the Site. The western end of this feature connected to the eastern shore of the Oswego River. This feature extended approximately 410 feet eastward from the river onto the Site, and turned abruptly south for approximately 80 feet, extending to the position of the former Hunter Arms Co. gun factory building that was once located near the southern portion of the on-site property. Refer to the following drawings contained on the DVD in Appendix A of the SRI Data Summary Report, which depict the feature discussed above:

- Scheck, P. Map of the Village of Fulton. 1855.
- Barge Canal Section Maps. Map 5 – Oswego Canal, Volney to Granby; and Map 6 – Oswego Canal, Fulton, Volney, Granby. ca 1896.
- Schillner Maps. Various maps depicting the Oswego Canal in area of Site. ca 1896.
- 1890 Sanborn® Fire Insurance Map.

The approximate location of this feature is shown on Figure 2-2 and is based on the 1855 map referenced above.

2.3.2 Surface Geophysical Survey

A non-intrusive surface geophysical survey was performed on August 25, 2016 on a portion of the off-site property owned by Davis-Standard. The primary objective of the survey was to identify potential remnants of subsurface structures that may exist in this area based on demolition debris (concrete, brick, etc.) encountered in boring B-106. As discussed above, review of a historical map (1867 Topographical Atlas of Oswego County) indicated a circular structure was present in this area during the period of MGP operations. The surface geophysical survey instruments used included a magnetometer, ground-penetrating radar (GPR) and electromagnetics (EM). Geophysical anomalies identified during the survey (e.g., suspected utilities, metal detector, EM, etc.) were plotted on the Site plan (see Figure 2-2). Naeva Geophysics, Inc. (Naeva) of Congers, New York performed the surface geophysical survey. Anomalies potentially indicating remnants of a subsurface structure were not identified during the survey; however, other linear anomalies interpreted to be suspected utilities and anomalies using a metal detector were identified and were incorporated into the Site plan (see Figure 2-2).

2.3.3 Subsurface Deposits and Stratigraphy

The subsurface materials encountered on the Site generally consist in ascending order of sandstone bedrock, glacial till, and anthropogenic fill (see cross-section A-A' presented as Figure 2-3).

The unconsolidated overburden at the Site generally consists of several feet of fill material overlying glacial till deposits. The fill varies in thickness, but is typically 11 feet thick on-site and approximately 5 feet thick in the off-site area west of the Site (i.e., across Hubbard Street from the parcel that comprises the former MGP). In the area of the former gas holder, the fill extends to a depth of over 20 feet below ground surface (bgs). In general, the fill is composed of various materials including sand, gravel, coal and demolition debris (e.g., brick and concrete). Finer-grained material (silt and clay), where present in the fill, is typically not the predominant component. Soil descriptions indicate the glacial till is composed of poorly sorted sand with varying amounts of silt and gravel, and is moderately dense. The glacial till deposits are, in general, reddish brown in color.

The bedrock beneath the Site can generally be described as a red-brown thin to medium bedded, fine- to medium-grained sandstone, with occasional thin finer-grained layers of shale, mudstone or siltstone, and thin zones of conglomeratic sandstone in which relatively large clasts of mudstone are abundant (e.g., "rip-up clasts" or "clay galls"). This is consistent with regional information, which indicates that the bedrock formation directly underlying the Site is the Queenston Formation. The sediment that now comprises the Queenston Formation was deposited during the Late Ordovician Period (approximately 450 million years ago). Based on available bedrock geologic mapping including the "Geologic Map of New York, Finger Lakes Sheet" (Rickard, L.V. and Fisher, D.V., 1970), the area of the Site is shown to be within the area mapped as the "Undifferentiated Medina Group and Queenston Formation". The Medina Group and the Queenston Formation are commonly mapped together because they are difficult to differentiate without substantial outcrop exposure. In the vicinity of the Site, the Medina Group is represented by the Lower Silurian Grimsby Formation. Both the Grimsby Formation and the Queenston Formation contain red shale, siltstone, and sandstone, and both were deposited in shallow lagoons or bordering tidal flats (Patchen, 1966). Red color of the Queenston and Grimsby sediments are likely the result of exposure to an aerobic environment during and after deposition, which allowed iron within the unit to oxidize. Based on the above, the bedrock underlying the Site could be identified as either the Grimsby Formation or Queenston Formation; however, upon further review of available geologic literature associated these formations, it was determined that the bedrock underlying the Site is that of the Queenston Formation. The following documents were reviewed prior to arriving at this conclusion.

- Patchen, D.G., 1966, Petrology of the Oswego, Queenston, and Grimsby Formations, Oswego County, New York: unpubl. masters thesis, SUNY Binghamton, 191 p.
- Lumsden, D.N. and Pelletier, B.R., 1969, Petrology of the Grimsby Sandstone (Lower Silurian) of Ontario and New York: Journal of Sedimentary Petrology, v. 39, no. 2, p. 521-530.

During the field work completed as part of masters thesis prepared by Douglas G. Patchen at the State University of New York (SUNY) Binghamton, the top of Medina Group: Grimsby Formation, which lies unconformably below the Oneida Conglomerate of the Clinton Group (Rickard, L.V. and Fisher, D.V., 1970), was mapped at a location along the Oswego River south of the Site. This outcrop was examined during the SRI activities and the lithologic contact identified by Patchen was observed at an elevation of approximately 358 feet NGVD. Review of additional literature indicated that the Grimsby Formation in Fulton is relatively thin (7 feet 4 inches) (Lumsden, D.M. and Pelletier, B.R., 1969). Based on the above, it can be inferred that the base of the Grimsby Formation in Fulton would be positioned at approximately 350 feet NGVD in the vicinity of the outcrop. Bedrock surface elevations across the Site range from approximately 309 feet NGVD in the southern portion of the on-site property to a low of 296 feet NGVD on the property immediately north of the Site. Given that outcrop observations and regional mapping indicate that the bedding of the rock units in this area have a generally horizontal to subhorizontal dip, the top of rock surface beneath the Site is at a stratigraphic position approximately 40 feet below the base of the Grimsby Formation.

Moreover, as indicated in the reviewed literature, the Queenston Formation is devoid of fossils in New York State, whereas although the Grimsby Formation is relatively barren of fossils, it does contain Arthrophycus alleghaniensis (worm burrow) throughout the formation (Patchen, 1966). Arthrophycus alleghaniensis was not identified in rock core samples or nearby outcrops, thereby further providing support that the bedrock directly underlying the Site is part of the Queenston Formation.

In summary, based on the review of available geologic literature related to the Grimsby and Queenston Formations, inspection of outcrops located in the vicinity of the Site, and examination of core samples collected during the RI field activities, the sandstones and siltstones encountered beneath the Site during the SRI activities are part of the Queenston Formation.

Based on the relative ease of drilling and observations from split-spoon samples, the upper portion of the bedrock surface is weathered to some degree. Samples of the uppermost part of the sandstone that were recovered in split-spoons were capable of being disaggregated by hand (i.e., friable), thus indicating that the cement matrix (e.g., clays, calcite, silica, etc.), which binds the sand grains together was previously weathered and degraded.

The surface of the top of bedrock underlying the Site is somewhat undulatory. The elevation of the bedrock surface varies from approximately 303 to 298 feet NGVD across the Site.

2.3.4 Underground Utility Evaluation

The City of Fulton's Department of Public Works (DPW) was visited to obtain records for additional information related to subsurface utilities surrounding the Site to support the understanding of subsurface conditions and assess features that may impact groundwater flow. For instance, the operation of the sewer lift station located near the intersection of Hubbard and Ontario Streets has the potential to impact groundwater flow. Additionally, the associated sewers feeding the lift station along these streets also have the potential to impact groundwater flow because the sewer inverts are below the water table in this area. Available drawings depicting the dimensions and configuration of the sewers (storm and sanitary) were reviewed at the DPW. In addition, operational data related to the sewer pump station that is located near the intersection of Hubbard and Ontario Streets was reviewed as well. Copies of the materials reviewed at the DPW are provided in Appendix F of the SRI Data Summary Report.

2.3.5 Hydrogeology

As part of the 2015/2016 SRI activities, groundwater levels were measured on October 19, 2015 and March 14, 2016. On Site, the water table is generally encountered within the till, at approximately 9 to 13 feet bgs. In the areas immediately to the west and north of the Site where the ground surface is at a lower elevation, the water table is encountered at shallower depths (5 to 7 feet bgs). Water table elevation contours for October 19, 2015 (see Figure 2-4) and March 14, 2016 indicate that shallow overburden groundwater at the Site flows generally from southeast to the west and northwest across the Site. Water level data from locations with both shallow and deep overburden wells indicate a downward vertical hydraulic gradient with the exception of the MW-111 well cluster. Based on continuous water level monitoring data and records obtained from the nearby sewer pump station, intermittent fluctuations in groundwater levels at this location could be attributable to the operation of the sewer pump station and the resultant dewatering of the sanitary sewer system proximal to the Site. Distribution of groundwater elevations measured in wells with screened intervals positioned in the deep overburden deposits indicate a similar flow direction to the flow direction observed in the shallow overburden.

Water table elevation contours for previous water level monitoring events (e.g., December 2012 and March 2013)) indicated that the gradient of the water table greatly decreases in the area west of the Site, and water table elevations measured in the shallow overburden wells west of Hubbard Street (i.e., MW-111S and MW-112S) were higher than the elevations measured in the wells positioned on the eastern edge of Hubbard Street (i.e., MW-108 and MW-109S), indicating that locally there is a potential eastward component of flow towards Hubbard Street. In order to further evaluate the groundwater flow conditions in this area, a hydraulic gradient well pair (comprised of wells MW-118 and MW-119) was installed on the off-site property to provide for collecting the necessary water level data. Water elevation data collected on October 19, 2015 and March 14, 2016 indicated that the water table elevation at the eastern well in the well pair, MW-119 was greater than at the western well, MW-118. Also, in contrast to the data collected in December 2012 and March 2013, the water table elevations at MW-108S and MW-109S, located on the east side of Hubbard Street, are greater than at the shallow overburden wells to the west (MW-111S) and northwest (MW-112S), which also supports generally westward directed groundwater flow. Thus, at the time of these October 2015 and March 2016 water level measurements, groundwater in vicinity of this well pair flowed from southeast to west, consistent with the general flow direction across the Site.

Groundwater elevation data collected from the four well locations screened in the bedrock formation underlying the Site indicate that groundwater in the upper bedrock (upper ±20 feet below the top of rock) flows westward towards the off-site property. As described in the section above on "Subsurface Deposits and Stratigraphy", the bedrock formation underlying the vicinity of the Site, the Queenston

Formation, is composed of red-brown thin to medium bedded, fine to medium-grained sandstone, with occasional intervals containing grey and red-brown mudstone clasts (flat pebble conglomerate) throughout. Examination of nearby outcrops, rock cores, along with review of regional mapping, indicate the bedding is oriented with either a nearly horizontal or very shallow dip. Outcrop and core examinations also indicate that apparently open bedding plane parallel fractures do occur, often where there is a contact between variations in lithology within the formation. The bedding plane parallel fractures appear to be the most continuous fractures on an outcrop scale. Based on our understanding of the Queenston Formation, adjacent bedrock strata from regional information, and other sites in the Erie-Ontario Lowlands of New York where groundwater flow in shallow to horizontal dipping sedimentary bedrock units has been examined, as well as on the examination of nearby rock outcrops, on-site rock cores and borehole geophysical logs, it is likely that open, generally continuous bedding plane parallel fractures impart a large degree of influence on lateral groundwater flow in the bedrock at the Site.

During the SRI activities, the upper part of the bedrock, ranging from approximately 1.5 to 18 feet below the top of rock surface, was evaluated at four locations (BRB-1, MW-109R, MW-111R, and MW-117R) using several assessment techniques including rock coring, packer pressure testing and borehole geophysical logging. In addition, during the bedrock drilling processes (i.e., bedrock coring and packer pressure testing), continuous monitoring of water level changes was conducted in nearby, available. bedrock wells using pressure transducers with automatic data loggers (i.e., In-Situ Level TROLLS®); these data supported the assessment of potential interconnectivity of water-bearing fractures in the upper bedrock. Data loggers were installed in the bedrock wells constructed at the beginning of the SRI field work (BRB-1 and MW-117R) to monitor changes in water level during drilling and packer pressure testing of bedrock at subsequent bedrock monitoring well locations (MW-109R and MW-111R). A data logger was also installed in MW-111R during the drilling of MW-109R. During bedrock coring and packer pressure testing performed at MW-111R, increases in water levels were observed in BRB-1 and MW-117R during both processes. Similarly, increases in water levels were also observed in BRB-1, MW-111R and MW-117R during bedrock coring and packer pressure testing performed at MW-109R. This initial evaluation supports the conclusion that the upper bedrock interval evaluated during the SRI contains interconnected water-bearing fractures where lateral groundwater flow likely predominates; the water-bearing fractures encountered during the SRI appear to be part of a water-bearing zone in the shallow bedrock.

The estimated horizontal hydraulic conductivity (K_h) values from slug tests conducted on monitoring wells installed during the SRI activities and previous investigations are summarized as follows:

- **Shallow overburden:** The estimated geometric mean of the horizontal hydraulic conductivity (K_h) of the shallow overburden deposits (upper ±15 feet of overburden deposits), based on slug tests is 5.5×10^{-4} centimeters per second (cm/sec); the estimated values range from 5.3×10^{-3} cm/sec to 1.2×10^{-4} cm/sec.
- **Deep overburden:** The estimated geometric mean K_h of the deep overburden deposits (approximately 15 feet bgs to approximately 28 feet bgs), based on slug tests is 2.3×10^{-3} cm/sec with a range from 8.3 x 10-3 cm/sec, to as low as 2.1 x 10-5 cm/sec.
- **Shallow bedrock:** The estimated geometric mean K_h of the shallow bedrock (upper ±10 to ±20 feet of rock), based on slug tests is 8.0×10^{-3} cm/sec. Estimated K_h values in the shallow bedrock range from 1.6×10^{-2} cm/sec to 3.4×10^{-3} cm/sec.

2.3.6 Visual/Olfactory Indications of Impact

Overburden

Figure 2-5 provides a plan view of locations where visual/olfactory observations indicative of potential impacts including NAPL and indications of potential purifier waste material have been observed in overburden soil through the course of the SC and RI field activities.

In general, the NAPL encountered occurs as a viscous, tacky tar-like material or as a semi-hard material that may have initially been a NAPL (observed at single location [TP-103]). In the subsurface, the viscous NAPL/tar is observed as: partially to fully saturating the soils, as a coating on coarser grained material, or as a seam within the soil matrix. The hard tar occurs as material adhering to a piece of wood in the subsurface. Viscous NAPL/tar was observed within area of the former gas holder at depths ranging from approximately 22 to 27 feet bgs, and outside the area of the former holder at shallower depths (8 feet bgs). In the area of the former gas holder, NAPL was observed on top of the bedrock surface. Most of the NAPL observations exhibited tar-like odors and thus, NAPL at these locations is likely associated with former MGP operations. However, based on observations and odor noted at B-119, B-121, B-123B, MW-111D, and MW-112D, some of the impacts encountered appeared to be petroleum-based and are not likely associated with former MGP operations. Environmental forensic results from samples of NAPL-impacted material collected from on-site location B-117 and off-site location MW-111D during the last phase of RI field work indicate that coal carbonization was likely the process used at the MGP, which did not require petroleum as a feedstock.

NAPL/tar was identified in soil on the off-site area (Parcel C Area) at various depths and at several locations (see Figure 2-5). Typically, the NAPL/tar occurs as a thin seam or blotches of viscous, tacky tar-like material and is encountered immediately above the top of rock surface. These observations were documented at locations B-127, MW-111D, MW-111R, and MW-113D ranging in depth from approximately 19.5 5 to 20.6 feet bgs. However, NAPL has also been observed at shallower depths on the off-site property (at a depth of 10.5 feet bgs in boring B-106 and from approximately nine to 17 feet bgs at B-127). The NAPL encountered at B-127 was described as having an oil-like consistency and heavily coating/saturating the sand and gravel deposits.

NAPL has not been observed in overburden monitoring wells during NAPL gauging events conducted during the RI activities. However, as a screening process to further assess the potential presence of NAPL at the Site, the concentrations of constituents in groundwater were compared to aqueous solubility of those constituents. A concentration that is above one percent of the solubility limit is considered an indicator that the constituent is potentially present in NAPL form in the vicinity of the well. Concentrations of naphthalene in groundwater samples from wells MW-111D (2,000 µg/L during the March 2016 sampling event) and MW-114D (1,200 µg/L during the March 2016 sampling event) were above one percent of the aqueous solubility limit for naphthalene (310 µg/L). NAPL/tar was identified the soil adjacent to the well screen at MW-111D and black discolored soils with a tar-like odor were observed in the soil adjacent to the well screen at MW-114D.

In summary, NAPL/tar was encountered in the overburden material on-site within the area of former MGP operations, primarily in the area of the former gas holder. This NAPL/tar is near the bedrock surface and is generally described as being viscous in nature. NAPL was also identified in the overburden at several locations within the off-site Parcel C Area. The NAPL/tar observed at these locations was described as either being viscous in nature and positioned on top of rock surface or at shallower intervals with the NAPL having an oil-like consistency and heavily coating/saturating the sand and gravel deposits.

Indications of potential purifier waste material (e.g., degraded wood material with burnt/sulfur-like odor) were observed in the interval from approximately 14 to 23 feet bgs at soil boring locations B-117, B-118, and MW-117R, which are in the area of the former gas holder. As described in the discussion of analytical results, analysis of soil samples collected from this interval did not indicate significant concentrations of cyanide, which is sometimes associated with purifier waste.

Bedrock

Figure 2-6 provides a plan view of locations where NAPL/tar was observed in bedrock core samples and/or within bedrock monitoring wells during the supplemental RI field activities.

NAPL/tar was observed in rock core samples at bedrock well locations MW-117R and BRB-1 during the SRI activities. Both of these locations are in the area of the former gas holder. At MW-117R, NAPL/tar was observed discontinuously across the depth interval from 26.8 to 29.2 feet bgs. The NAPL/tar at MW-117R was generally observed as black tacky, viscous NAPL/tar coatings along near horizontal fracture surfaces. At BRB-1, black viscous, tacky NAPL/tar was observed coating a parting surface on a core at a depth of approximately 43.6 feet bgs, which is positioned approximately 17.6 feet below the top of rock at this location.

Observations were also made at MW-109R and MW-111R that were indicative of NAPL in bedrock. For instance, upon removal of geophysical tools from the core hole, blotches of NAPL/tar were sporadically observed on the tools. Similarly, spots of NAPL/tar were observed sporadically on the geophysical tools and partially coating ends of the tools following removal of the tools from the core hole.

Observations of NAPL/tar within bedrock monitoring well MW-117R were documented during NAPL gauging events conducted during the supplemental RI activities. The NAPL/tar was encountered at the base of the well, below the water column, indicating that the NAPL is denser than water and thus is considered to behave as a dense NAPL, or DNAPL. Following identification of NAPL/tar in the well at this location, a periodic NAPL gauging and removal program was initiated in March 2016. To date, more than four gallons of highly viscous NAPL/tar has been removed from MW-117R. NAPL/tar continues to accumulate in the well and removal activities will continue until the rate of recovery decreases such that cessation of removal efforts would be warranted. In addition to the NAPL/tar observed in MW-117R, approximately 0.12 feet of NAPL was measured at the base of the bedrock monitoring well MW-109R during the March 2016 NAPL gauging and groundwater monitoring activities.

In summary, NAPL has been identified in bedrock in three areas:

- In the area of the former gas holder (MW-117R and BRB-1);
- Along the western property boundary beneath Hubbard Street (MW-109R); and
- West of the Site, across Hubbard Street on the Davis-Standard property (MW-111R).

Also, the concentrations of naphthalene in each bedrock well sampled (samples were not collected from MW-117R due to NAPL/tar presence in the well) are above one percent of the aqueous solubility limit, a threshold that is used as an indicator of the potential presence of NAPL to be present in the vicinity of a well.

2.3.7 Surface Soil Analytical Results

0- to 2-inch bgs Interval

For the purposes of evaluating the concentrations and areal distribution of potentially MGP-related constituents in surface soil, surface soil samples from the 0- to 2-inch bgs depth interval were collected from eight locations throughout the Site during RI activities performed in 2012. Surface soil samples from this depth interval were also collected from areas selected to be representative of background conditions (BG-SS-1 through BG-SS-5) and analyzed for comparison to concentrations in on-site surface soils. The sample locations are shown on Figure 2 of the RI Data Summary Report (BC, May 2013). The surface soil samples were analyzed for Target Compound List (TCL) semi-volatile organic compounds (SVOCs) and total cyanide.

As discussed in the cover letter that accompanied the May 2013 RI Data Summary Report, the results of the 0- to 2-inch surface soil evaluation indicated the following:

- There are no impacts from the former MGP operations to the 0- to 2-inch bgs surface soils on the Site; and
- There are no exceedances of applicable SCOs in the 0- to 2-inch bgs surface soils on the Site.

0- to 6-inch bgs Interval

For the purposes of providing data for an ecological assessment (i.e., Steps 1 through 2B of a Fish and Wildlife Resources Impact Analysis [FWRIA]), surface soil samples from the 0- to 6-inch bgs depth interval were collected from eight locations throughout the Site during the 2012 RI activities. Surface soil samples from this depth interval were also collected from potential background areas and analyzed for comparison to concentrations in on-site samples. The 0- to 6-inch surface soil samples were analyzed for TCL SVOCs and total cyanide.

As discussed in the cover letter that accompanied the May 2013 RI Data Summary Report, the results of the 0- to 6-inch surface soil evaluation indicated the following:

- There are no impacts from the former MGP operations to the 0- to 6-inch bgs surface soils on the Site; and
- There are no exceedances of applicable SCOs or USEPA's Ecological Soil Screening Levels for polycyclic aromatic hydrocarbons (PAHs) in the 0- to 6-inch bgs surface soils on the Site.

2.3.8 Subsurface Soil Analytical Results

Throughout the course of the SC and RI field activities to-date, a total of 72 subsurface soil samples from 38 locations were collected and submitted for analysis of benzene, toluene, ethylbenzene and isomers of xylene (BTEX), PAHs, and total cyanide. The subsurface soil data collected throughout the SC and RI activities were compared to the following criteria:

- Subsurface soil cleanup guidance level for total PAHs of 500 mg/kg from Section H from NYSDEC's Draft Soil Cleanup Guidance (November 4, 2009); and
- 6 NYCRR Subpart 375-6 SCOs for commercially or industrially zoned properties (depending on location), Protection of Ecological Resources, and/or Protection of Groundwater.

Total PAH concentrations in the collected subsurface soil samples are above 500 mg/kg at seven locations (see Figure 2-7). These locations generally fall within areas and depth intervals impacted by NAPL/tar. From the seven locations, a total of 12 samples were collected and submitted for laboratory analyses and out of the 12 samples, total PAH concentrations were above 500 mg/kg in eight samples. Total PAH concentrations ranged from a low of 593 in the 19 to 21-foot sample interval from B-127 to a high of 4,895 in the 24 to 26-foot sample interval from B-117.

The distribution of total BTEX, total PAHs and cyanide in subsurface soils is depicted on Figure 2-7. At a location, if a concentration of one or more constituents exceeded any one of the above noted SCOs, it is depicted with a red symbol. Locations where no exceedances were observed are depicted with a green symbol. During the SC and RI activities performed to-date, subsurface soil samples from 15 locations contained concentrations of one or more constituents in the BTEX and/or PAH constituent groups above one or more of the applicable SCOs (see Figure 2-7). The locations with exceedances of the SCOs for PAHs generally fall within areas impacted by NAPL/tar, primarily in and near the area of the former gas holder and on the off-site property west of the on-site parcel. Total Cyanide was not detected at concentrations above applicable SCOs in any of the SC and RI subsurface soil samples collected to-date (see Figure 2-7).

In general, the SCO exceedances for BTEX and PAHs are associated with areas and intervals where NAPL/tar is encountered. The extent of SCO exceedances in the on-site area is adequately defined for the purposes of the RI. However, the extent of SCO exceedances in the off-site area west of the Site requires further delineation.

2.3.9 Groundwater Analytical Results

Two comprehensive rounds of groundwater sampling were conducted during the SRI (October 2015 and March 2016). In accordance with the April 2015 SRI work plan, no groundwater samples were collected from MW-117R during either sampling round and no samples were collected from MW-109R during the March 2016 sampling event because NAPL was detected in these monitoring wells during NAPL gauging performed prior to sampling. The groundwater samples were analyzed for BTEX compounds, PAHs, and total cyanide. Results of the analyses were compared to the 6 NYCRR Part 703 groundwater standards for Class GA water (groundwater) or, where no such standard exists, the corresponding guidance value from Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1; collectively, these are referred to herein as the Class GA criteria.

Overburden Groundwater Quality

Concentrations of BTEX, naphthalene and total cyanide in overburden groundwater for the sampling rounds conducted to date for both the RI and SC activities are posted on Figure 2-8. Concentrations that are above the Class GA criteria are shown in bold type.

The most prevalent constituents detected in overburden groundwater at concentrations above the Class GA criteria were BTEX compounds and naphthalene. These constituents are often associated with MGP-related residuals, but can also be related to non-MGP sources. These constituents are used as indicators for evaluating dissolved-phase impacts in overburden groundwater at the Site. During the sampling rounds completed as part of the SRI activities, one or more constituents in the BTEX constituent group and naphthalene were detected at concentrations above the Class GA criteria in samples collected from MW-103D, MW-110D, MW-111D, MW-113D, and MW-114D. The base of the screens for these wells is positioned immediately above or slightly below the top of bedrock surface. At MW-111D, associated with the naphthalene exceedance were exceedances of lower solubility PAHs, including acenaphthene, fluoranthene, and phenanthrene. Acenaphthene was also reported above the Class GA criteria in samples collected from deep overburden wells MW-113D and MW-114D and in samples collected from MW-111S, which is screened across the water table. Other PAH compounds (i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-c,d)pyrene) were detected above the Class GA criteria in samples collected from MW-102, MW-108, MW-109S, and MW-109D. However, elevated levels of these other PAH compounds, which have very low solubilities, may be related to suspended particulates or turbidity entrained in the sample.

Total Cyanide was not detected above its applicable Class GA criterion at any location.

Concentrations of BTEX compounds, naphthalene, and locally some lower solubility PAHs were measured at concentrations exceeding the Class GA criteria in the deep overburden groundwater at a location within the area of the Site (MW-103D); locations immediately downgradient of the Site (MW-109D and MW-110D); and locations positioned on the downgradient off-site property (MW-111D, MW-113D and MW-114D). In the shallow overburden groundwater, the concentrations of these constituents are generally below the GA criteria, except for MW-111S. The locations where exceedances were observed are within, downgradient and sidegradient of the area of former MGP operations and where NAPL/tar was encountered.

The northern and eastern extents of dissolved-phase BTEX and PAH concentrations in the deep overburden deposits have been adequately characterized for the purposes of the RI; however, the lateral extents of the dissolved-phase MGP-related impacts in this zone in the areas south of MW-103D and on the downgradient off-site property requires further delineation.

Bedrock Groundwater Quality

Concentrations of BTEX, naphthalene and total cyanide in bedrock groundwater for the sampling rounds conducted during the SRI activities are posted on Figure 2-9. Concentrations that are above the Class GA criteria are shown in bold type.

NAPL in the overburden and in bedrock is the source of MGP-related dissolved-phase organic compounds in the bedrock groundwater. As described above, NAPL/tar has been detected in bedrock monitoring wells MW-109R and MW-117R during NAPL gauging performed prior to sampling.

BTEX, naphthalene and acenaphthene were detected within the upper bedrock in each bedrock well sampled during the SRI field work (BRB-1, MW-109R, and MW-111R) at concentrations above the Class GA criteria. At MW-111R, associated with the naphthalene and acenaphthene exceedances were exceedances of other lower solubility PAHs, including fluorene and phenanthrene. Other PAH compounds (i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene and indeno(1,2,3-c,d)pyrene) were detected above the Class GA criteria in samples collected from the bedrock wells. However, elevated levels of these other PAH compounds, which have very low solubilities, may be related to suspended particulates or turbidity entrained in the sample.

Total Cyanide was not detected above its applicable Class GA in samples collected from any of the bedrock monitoring wells sampled during the SRI.

Based on the above, the extent of dissolved-phase MGP-related impacts in the shallow bedrock water-bearing zone requires further delineation.

Section 3

Scope of Work

The proposed SRI activities are described below. Specific methods and procedures associated with these SRI activities will be conducted in accordance with the following plans:

- Generic Field Sampling Plan for Site Investigations at Non-Owned Former MGP Sites, (Foster Wheeler, November 2002) (referred to as "FSP").
- Generic Quality Assurance Project Plan for Site Investigations at Non-Owned Former MGP Sites, (Foster Wheeler, November 2002) (referred to as "QAPP").
- Generic Health & Safety Plan for Site Investigations at Non-Owned Former MGP Sites (Foster Wheeler, November 2002).
- Health and Safety Plan for Remedial Investigation Activities, Fulton (Ontario St.) Former MGP Site (Brown and Caldwell, March 2018) (referred to as "Health and Safety Plan"). This plan was developed consistent with the Generic Health & Safety Plan for Site Investigations at Non-Owned Former MGP Sites (Foster Wheeler, November 2002).
- DER-10/Technical Guidance for Site Investigation and Remediation (NYSDEC, May 2010).

The scope of work for the SRI activities is described in the subsections below.

3.1 Preliminary Activities

3.1.1 Property Access Activities

In 2004, during the SC, the owner of the property that occupies the former MGP Site (Drake Petroleum Company, Inc., successor by merger to Mid-Valley Oil, Inc.) was contacted and an access agreement was established allowing National Grid to conduct investigation activities on the property. Subsequently, in 2007, an access agreement was established with the owner of the property located west of Hubbard Street (David-Standard LLC, formerly Black Clawson Converting Machinery, Inc.) prior to the implementation of supplemental SC activities. Also, an agreement was established in 2016 with the owner of the property located north of the former MGP Site (Universal Properties of New York, LLC) during the SRI field work to provide access to a monitoring well installed on this property (MW-115D). The access agreements previously obtained with each property owner are currently valid; however, these agreements will need to be updated to reflect the activities proposed in this scope of work upon approval of this work plan by NYSDEC.

Prior to initiating proposed SRI field activities, the owners of these properties will be contacted to brief them on the planned activities. These activities will include the advancement of soil and bedrock borings, installation of monitoring wells, and groundwater sampling from monitoring wells.

3.2 Field Activities

3.2.1 Utility Mark Outs and Clearance

Prior to conducting the intrusive activities described below, the planned locations for the soil borings, bedrock boring, and monitoring wells will be marked in the field. Dig Safely New York will be contacted to clear subscribed underground utilities, and the City of Fulton will be contacted to clear utilities that they maintain (e.g., sewer and water).

Some of the proposed drilling and sampling locations may be adjusted to provide for adequate clearance from underground and aboveground utilities. The final locations for the soil borings, bedrock boring and monitoring wells will be determined in the field following the mark-out of underground utilities.

At each drilling location, clearance of subsurface utilities will be confirmed by physical means (e.g., vacuum soil extraction, hand tools, etc.). Physical clearance will be used to remove the soil at each drilling location to a depth of approximately 5 feet bgs.

3.2.2 Soil Borings

Soil borings are proposed at two (2) locations (B-134 and B-135) at the approximate positions shown on Figure 3-1. As mentioned above, the locations of these borings may be modified based on the utility mark-outs and physical clearance activities. The boring locations were selected to contribute to meeting the following objectives: 1) further evaluate the extent of MGP-related constituents in soils above applicable SCOs; and 2) further evaluate the extent of NAPL associated with the off-site area (Parcel C Area) west of the Site. Information from the borings will also be used to improve the understanding of the stratigraphy and hydrogeologic properties of the overburden. Note that the soil boring being conducted to install well MW-121D (see Section 3.2.3) will also be used to achieve the above-noted objectives. A summary of the technical rationale and target depths for the proposed soil borings is presented on Table 3-1.

During the advancement of the proposed soil borings, a Community Air Monitoring Plan (CAMP) will be implemented that meets the requirements of the NYSDOH's Generic CAMP provided in DER-10. The soil borings will be drilled using hollow stem augers and sampled with a two-foot long, two-inch outside diameter (O.D.) split-spoon sampler from ground surface to the top of rock surface. The soil samples will be described in the field to characterize soil type, including grain size, texture, and apparent moisture content. Soil samples will be logged in accordance with a system after Burmister (1959) and classified using the Unified Soil Classification System (USCS) as per the FSP. The samples will also be field screened for indications of MGP-related impacts or other impacts based on appearance, odors or organic vapor concentration measurements using a photoionization detector (PID). Head-space screening will be conducted using the PID by immediately transferring a representative subsample of the soil to a clean glass jar and sealing its lid with aluminum foil or to a sealable polyethylene plastic bag (e.g., Ziploc®). To allow the sample to equilibrate, it will remain sealed for a period of time (approximately 15 minutes) and then the tip of the PID will be inserted through the foil, or though the plastic bag, and the maximum instrument reading will be recorded.

In the event that NAPL is encountered in a boring, and conditions in the boring are such that continued drilling may introduce NAPL into deeper stratigraphic intervals via the borehole (e.g., potentially mobile NAPL perched above a confining layer), measures will be taken to reduce this potential. Advancement of the augers may be suspended and temporary steel casing grouted into the borehole to isolate the NAPL from the borehole before advancing further. Alternatively, the boring will be terminated and consideration given to advancing a boring in an alternate location.

Up to two (2) soil samples will be collected from proposed soil borings (B-134 and B-135) and submitted for analysis of BTEX, PAHs, and total cyanide. The depth interval(s) selected for sampling will be based on visual observations/field screening of the soil samples (biased toward apparent impacts and/or determining the extent of impacts); and/or the results of borings completed during prior investigations (e.g., depth of visual/olfactory impacts or intervals where BTEX and PAHs in soils were above applicable SCOs) in nearby borings. A summary of the planned soil analyses is provided in Table 3-2.

Analysis of soil samples will be conducted by a laboratory certified under the NYSDOH Environmental Laboratory Approval Program (ELAP) to provide Analytical Services Protocol (ASP)/Contract Laboratory Program (CLP) deliverables. The analytical results will be provided to the NYSDEC as an Electronic Data Deliverable (EDD) formatted to the NYSDEC's data submission requirements that are detailed on the NYSDEC's website (http://www.dec.ny.gov/chemical/62440.html). This will include: 1) populating the NYSDEC EDD with the analytical data; 2) validating the EDD using the database software application EQuIS™ from EarthSoft®, Inc.; and 3) submitting the validated EDD to the NYSDEC.

3.2.3 Overburden Monitoring Well Installation

3.2.3.1 Deep Overburden Monitoring Well Installation

Deep overburden monitoring wells are proposed at three locations (MW-120D, MW-121D and MW-122D) at the approximate locations shown on Figure 3-1. The proposed locations were selected to further evaluate groundwater flow direction and the lateral extent of dissolved-phase, MGP-related constituents in deep overburden groundwater. In addition, the soil boring from one of the locations (MW-121D) will be used in conjunction with the soil boring data collected as described in Section 3.2.2 to further evaluate the extent of MGP-related constituents in soils above applicable SCOs and NAPL associated with the off-site area (Parcel C Area) west of the Site. The boring for each monitoring well will also be used to further evaluate the stratigraphic characteristics of the overburden. A summary of the technical rationale and target depths for the proposed monitoring wells is presented on Table 3-1.

The soil borings advanced for the purposes of installing the deep overburden monitoring wells will be drilled using hollow stem augers and sampled with a two-foot long, two-inch O.D. split-spoon sampler from ground surface to top of the bedrock surface (estimated 20 to 26 feet bgs). During advancement of the soil borings for installation of monitoring wells, a CAMP will be implemented as described in Section 3.2.2. The soil samples will be described in the field to characterize soil type, including grain size, texture, and apparent moisture content. Soil samples will be logged in accordance with a system after Burmister (1959) and classified using the USCS as per the FSP. The samples will also be field screened for indications of MGP-related impacts or other impacts based on appearance, odors or organic vapor concentration measurements using a PID. Head-space screening will be conducted as described above in Section 3.2.2.

Consistent with previously installed deep overburden monitoring wells, the screened interval for each well will be positioned immediately above the top of the bedrock surface. Monitoring well installation procedures are provided in the FSP. The wells will be constructed of two-inch diameter, Schedule 40 PVC well casing with 0.020-inch slot PVC screens and an appropriately-sized filter pack. After a minimum period of 12 hours have passed following well installation to allow for the cement/bentonite grout to set, the wells will be developed. Well development will be conducted in accordance with procedures in the FSP.

Approximately one (1) to two (2) soil samples from the soil boring intended for installation of proposed monitoring well MW-121D will be collected and submitted for analysis of BTEX, PAHs, and total cyanide. The depth interval(s) selected for sampling will be based on visual observations/field screening of the soil samples (biased toward apparent impacts and/or determining the extent of impacts); and/or the results of borings completed during prior investigations (e.g., depth of visual/olfactory impacts or intervals where BTEX and PAHs in soils were above applicable SCOs). A summary of the planned soil analyses is provided in Table 3-2.

Analysis of soil samples will be conducted by a laboratory certified under the NYSDOH ELAP to provide ASP/CLP deliverables. As described above in Section 3.2.2, the analytical results will be provided to the NYSDEC as an EDD formatted to the NYSDEC's data submission requirements.

3.2.3.2 Shallow Overburden Monitoring Well Installation

Shallow overburden monitoring wells are proposed at two locations (MW-121S and MW-122S) at the approximate locations shown on Figure 3-1. The proposed locations were selected to further evaluate the lateral extent of dissolved-phase, MGP-related constituents in shallow overburden groundwater on the off-site property west of the Site. The proposed shallow overburden wells will be installed adjacent to the deep overburden wells described above for these locations (MW-121D and MW-122D).

Because these wells will be drilled proximal to and following drilling and well installation of MW-121D and MW-122D, sufficient stratigraphic data will have already been collected and thus, continuous sampling of overburden soils at these locations will not be conducted. However, if there are intervals where sample recovery was low (e.g., less than one foot) during the drilling and sampling of MW-121D and/or MW-122D, these intervals may be re-sampled during the overburden drilling for MW-121S and/or MW-121D.

Consistent with previously installed shallow overburden monitoring wells, the screened interval for each well will be positioned to straddle the water table. It is anticipated that the total depth of the shallow overburden wells will be approximately 15 feet bgs. Monitoring well installation procedures are provided in the FSP. The wells will be constructed of two-inch diameter, Schedule 40 PVC well casing with 0.020-inch slot PVC screens and an appropriately-sized filter pack. After a minimum period of 12 hours have passed following well installation to allow for the cement/bentonite grout to set, the wells will be developed. Well development will be conducted in accordance with procedures in the FSP.

3.2.4 Bedrock Evaluation and Bedrock Monitoring Well Installation

For this phase of RI activities, up to six (6) bedrock monitoring wells (shallow bedrock wells MW-120R through MW-124R, and deeper bedrock well MW-122RD) are proposed at the approximate locations shown on Figure 3-1. The selected locations are intended to: 1) further evaluate the extent of NAPL/tar in bedrock; 2) further evaluate the extent of dissolved-phase, MGP-related constituents in bedrock groundwater; and 3) further evaluate groundwater flow direction in shallow bedrock groundwater. The boring for each monitoring well will also be used to further evaluate the stratigraphic characteristics of the overburden and to evaluate the characteristics of the bedrock. A summary of the technical rationale and target depths for the proposed monitoring wells is presented on Table 3-1.

The procedures for evaluating the bedrock and installing bedrock monitoring wells are described below.

3.2.4.1 Shallow Bedrock Monitoring Wells

Initially, a six-inch diameter pilot borehole will be drilled using 3 ¼-inch inside diameter (I.D.) hollow-stem augers. Continuous sampling of the soil will be conducted using a two-foot long, two-inch O.D. split-spoon sampler from ground surface to refusal on bedrock unless continuous sampling was previously conducted at adjacent location in same well cluster. However, if there are intervals where sample recovery was low (e.g., less than one foot) during the drilling and sampling of nearby drilling locations, these intervals may be re-sampled. If continuous sampling is performed or sampling of certain intervals is completed, the samples will be described in the field to characterize soil type, including grain size, texture, and apparent moisture content. Soil samples will be logged in accordance with a system after Burmister (1959) and classified using the USCS as per the FSP. The samples will also be field screened for indications of MGP-related, or other, impacts based on appearance, odors or organic vapor concentration measurements using a PID as described in section 3.2.2.

An eight-inch diameter borehole will then be drilled through the overburden and approximately one to two feet into competent bedrock using conventional rotary methods. Depending on the subsurface conditions, a temporary well casing may be installed to keep the borehole from collapsing and facilitate drilling.

A four-inch diameter steel casing will then be placed in the borehole, extending from the bottom of the borehole (seated one to two feet into competent bedrock) to the ground surface. The casing will then be grouted in place by filling the annular space between the casing and the borehole, from the bottom of the borehole to a few feet bgs, with a cement/bentonite grout using the tremie method or pressure grouting. The cement/bentonite grout in the annular space will be allowed to set for a minimum period of 12 hours before resuming drilling activities at the borehole location.

Bedrock drilling will resume by means of conventional or wire-line coring techniques using a nominal four-inch O.D. core barrel. Cores will be collected in 5-foot intervals, to a depth of approximately 20 to 30 feet below the top of bedrock surface (approximately 45 to 55 feet bgs); the ultimate depth of the borehole will be determined in the field based on information collected during drilling, in particular the results of the packer pressure testing described below. Core samples will be described in the field to characterize: rock type; bedding thicknesses; texture; fracture type, orientation and spacing; structural features in addition to fractures; and other descriptors used to identify the composition of the bedrock. Rock Quality Designation (RQD) will be measured in accordance with American Society for Testing and Materials (ASTM) Standard D6032-08 and recorded for each five-foot interval as an indicator of bedrock competency. The cores will be field screened for indications of MGP-related impacts, or other impacts, based on appearance, odor and organic vapor concentrations as indicated by a PID. Additionally, drilling return water will be observed and screened with a PID for indications that NAPL or other impacts that may be encountered during the drilling process (e.g., sheens, globules of NAPL, etc.).

Packer pressure testing will be conducted at five-foot intervals following each core run to evaluate changes in hydraulic conductivity versus depth and identify potential water-bearing zones. Packer pressure testing will be conducted in accordance with the procedures specified in the FSP. During packer pressure testing, in the event that the volume of water injected into the tested interval exceeds approximately five gallons over a period of five minutes, the test may be terminated as to limit the volume of water introduced into the formation. Note that packer pressure testing will not be required at location MW-122R because it will be conducted at the adjacent deeper bedrock well location (MW-122RD), as described below in Section 3.2.4.2.

Coring and packer pressure testing will be used to identify the uppermost water-bearing zone in bedrock. Once this zone is identified, coring and packer testing will continue in five-foot intervals to a depth of approximately 5 to10 feet below the identified water-bearing zone in an attempt to evaluate the thickness of the zone, and to identify a relatively lower permeability interval directly below the water-bearing zone.

Following completion of coring and packer testing, borehole geophysical logging will be conducted in the core hole. Specific geophysical parameters that will be recorded during the logging will include natural gamma, fluid temperature, fluid resistivity, spontaneous potential, single point resistance, and caliper. The geophysical data will be used to further evaluate the bedrock conditions and the vertical position of the water-bearing zone. Note that borehole geophysical logging will not be required at location MW-122R because it will be conducted at the adjacent deeper bedrock well location (MW-122RD), as described below in Section 3.2.4.2.

A two-inch diameter screen and riser casing will be installed inside the four-inch steel casing and nominal four-inch borehole. The wells will be constructed of two-inch diameter, Schedule 40 PVC casing with 0.020-inch slot PVC screens with an appropriately-sized filter pack. At well locations where NAPL is encountered, if any, a one to two-foot long sump will be installed below the screen, if appropriate, as described in the FSP. In instances where sumps are installed, the annular space between the sump and formation will be filled with bentonite, cement/bentonite grout, or other suitable, relatively low permeability material. After a minimum period of 12 hours have passed following well installation to allow for the cement/bentonite grout to set, the wells will be developed. Well development will be conducted in accordance with procedures in the FSP.

Up to two (2) soil samples from the soil boring intended for installation of proposed monitoring well MW-124R will be collected, but initially held for lab analysis pending the results of field screening and/or lab analyses of samples from proposed soil boring B-135. Analyses, if conducted, will include analysis of BTEX, PAHs, and total cyanide. The depth interval(s) selected for sampling will be based on visual observations/field screening of the soil samples (biased toward apparent impacts and/or determining the extent of impacts); and/or the results of borings completed during prior investigations (e.g., depth of visual/olfactory impacts or intervals where BTEX and PAHs in soils were above applicable SCOs). A summary of the planned soil analyses is provided in Table 3-2.

Analysis of soil samples will be conducted by a laboratory certified under the NYSDOH ELAP to provide ASP/CLP deliverables. As described above in Section 3.2.2, the analytical results will be provided to the NYSDEC as an EDD formatted to the NYSDEC's data submission requirements.

3.2.4.2 Deeper Bedrock Assessment

RI activities thus far have evaluated the upper bedrock (upper ±20 feet below the top of rock), wherein a fracture-controlled shallow bedrock water-bearing zone has been identified and both DNAPL and dissolved-phase MGP-related impacts have been encountered. To support the delineation of the nature and extent of MGP impacts, bedrock evaluation and well installation activities will be conducted in the deeper bedrock intervals below the shallow bedrock water-bearing zone at location MW-122RD (see Figure 3-1) to:

- Evaluate the hydrogeologic characteristics in the bedrock below the shallow bedrock water-bearing zone identified in previous investigation activities;
- Identify if there are distinct water-bearing zones in the deeper bedrock interval; and
- Support the assessment of the vertical extent of MGP-related impacts in bedrock.

This location was selected for the initial assessment of conditions in deeper bedrock because it is considered to be in an area with a lower likelihood to encounter DNAPL in bedrock than locations closer to the Site, thus reducing the potential for cross-contamination of impacts from shallower to deeper zones during drilling activities as the hydrogeologic characteristics of this interval are assessed. Also, it is positioned at a location downgradient of identified MGP-related impacts. Efforts will be made to determine whether or not a water-bearing zone exists in bedrock at deeper intervals than previously investigated (i.e., below ±20 feet below the top of bedrock), and if identified, evaluate groundwater quality conditions within this potential deeper water-bearing zone.

Prior to commencement of drilling activities, pressure transducers equipped with automatic data loggers (e.g., In-Situ Level TROLLS®) will be installed in existing shallow bedrock well MW-111R and proposed shallow bedrock wells MW-121R and MW-124R. Continuous monitoring of water levels will be conducted during coring and packer pressure testing to monitor changes in water level at these locations during drilling of bedrock at MW-122RD. The automatic data loggers will be set to record water levels from the pressure transducers every minute for the duration of drilling activities.

Initially, a six-inch diameter pilot borehole will be drilled using 3 ¼-inch inside diameter (I.D.) hollow-stem augers. Continuous sampling of the soil at MW-122RD will be conducted using a two-foot long, two-inch O.D. split-spoon sampler from ground surface to refusal on bedrock. The samples will be characterized and field screened for indications of potential impacts as described in section 3.2.2.

A 12-inch diameter borehole will then be drilled through the overburden and approximately one to two feet into competent bedrock using conventional rotary methods. Depending on the subsurface conditions, a temporary well casing may be installed to keep the borehole from collapsing and facilitate drilling.

An eight-inch diameter steel casing will then be placed in the borehole, extending from the bottom of the borehole (seated one to two feet into competent bedrock) to the ground surface. The casing will then be grouted in place by filling the annular space between the casing and the borehole, from the bottom of the borehole to a few feet below ground surface, with a cement/bentonite grout by means of the tremie method or pressure grouting. The cement/bentonite grout in the annular space will be allowed to set for a minimum period of 12 hours before resuming drilling activities at the borehole location. Use of an eight-inch diameter casing will allow for installation of an intermediate four-inch diameter casing to isolate the water-bearing zone in the shallow bedrock to reduce the potential for introducing impacts from one interval to another through the drilling process.

Bedrock drilling will resume by means of conventional or wire-line coring techniques using a nominal four-inch O.D. core barrel. Cores will be collected in 5-foot intervals, to a depth of approximately 20 to 30 feet below the top of bedrock surface (approximately 45 to 55 feet bgs). Core samples will be characterized and field screened for indications of potential impact as described above for the shallow bedrock wells.

If NAPL is encountered during the bedrock drilling process, then information will be assessed to develop a plan to reduce the potential for introducing NAPL to deeper intervals during the drilling process. Advancement of the boring may be terminated at the depth of the NAPL and consideration will be given to setting a well with a screen positioned adjacent to the NAPL interval. Also, if appropriate based on field conditions, the positioning of an intermediate casing (i.e., 4-inch diameter casing described below) may be used to isolate the encountered NAPL from the borehole before the borehole is advanced deeper. Depending on the findings in the field and available data, an alternate well location may also be considered.

Packer pressure testing will be conducted at five-foot intervals following each core run to evaluate changes in hydraulic conductivity versus depth and identify potential water-bearing zones. Packer pressure testing will be conducted in accordance with the procedures specified in the FSP. During packer pressure testing, in the event that the volume of water injected into the tested interval exceeds approximately five gallons over a period of five minutes, the test may be terminated as to limit the volume of water introduced into the formation.

Coring and packer pressure testing will be used to identify the uppermost water-bearing zone in bedrock. Once this zone is identified, coring and packer testing will continue in five-foot intervals to a depth of approximately 10 feet below the identified water-bearing zone in an attempt to evaluate the thickness of the zone, and to identify a relatively lower permeability interval directly below the water-bearing zone.

Following completion of coring and packer testing, borehole geophysical logging will be conducted in the core hole. Specific geophysical parameters that will be recorded during the logging will include natural gamma, fluid temperature, fluid resistivity, spontaneous potential, single point resistance, and caliper. The geophysical data will be used to further evaluate the bedrock conditions and the vertical position of the water-bearing zone.

Next, an eight-inch diameter borehole will be advanced to a depth approximately a foot or more below the depth of the base of the shallow bedrock water-bearing zone, which will be established during the drilling of the upper bedrock interval discussed above. An intermediate four-inch diameter steel casing will then be placed in the borehole, extending from the bottom of the borehole to the ground surface. The casing will then be grouted in place by filling the annular space between the casing and the borehole, from the bottom of the borehole to a few feet below ground surface, with a cement/bentonite grout by means of the tremie method or pressure grouting. The cement/bentonite grout in the annular space will be allowed to set for a minimum period of 12 hours before resuming drilling activities at the borehole location.

Bedrock drilling will resume by means of conventional or wire-line coring techniques using a nominal four-inch O.D. core barrel. Cores will be collected in 5-foot intervals. Core samples will be characterized and field screened for indications of potential impact as described above for the shallow bedrock wells. Packer pressure testing will be conducted at five-foot intervals following each core run as described above.

Coring and packer testing will continue until the first deeper potential water-bearing zone is identified, or until the target depth for the proposed location (see Table 3-1) is reached. The target depth is set at a depth equivalent to approximately 75 feet below the top of bedrock (approximately 96 feet bgs). If a potential water-bearing zone is identified, then additional coring and packer pressure testing will be conducted in an attempt to identify a less permeable interval below the water-bearing zone. Once the drilling activities are completed, geophysical logging will be conducted in the borehole, as described above.

If a potential water-bearing zone is identified, then a monitoring well will be installed with a screen interval intersecting this zone. If no potential water-bearing zone is identified, then the packer pressure test data, geophysical logs and cores will be reviewed for any minor or subtle indications of possible flow into the borehole, and consideration will be given to installing a monitoring well with a screen adjacent to an interval with such minor or subtle indications. Well construction and development activities will be conducted as described above for the shallow bedrock monitoring wells.

Following the completion of the drilling and well installation activities proposed for the MW-122RD location, a shallow bedrock monitoring well (MW-122R) will be drilled and installed at a nearby offset location from MW-122RD. Because this well will be drilled proximal to MW-122RD, sufficient stratigraphic data will have already been collected and thus, continuous sampling of overburden soils at this location will not be conducted. However, if there are intervals where sample recovery was low (e.g., less than one foot) during the drilling and sampling of MW-122RD, these intervals may be re-sampled during the overburden drilling for MW-122R. Cores will be collected in 5-foot intervals during the drilling process, but packer pressure testing and borehole geophysical logging will not be completed at this location. Drilling methods, core sample characterization, well construction, and well development activities will be conducted as described above for the shallow bedrock monitoring wells.

3.2.5 Slug Tests

In-situ hydraulic conductivity tests (i.e., slug tests) will be performed on each monitoring well installed pursuant to this work plan to evaluate the horizontal hydraulic conductivity of the adjacent formation. Rising and/or falling head slug tests will be conducted in accordance with the procedures described in the FSP and the data generated will be input into AQTESOLV® software for hydraulic conductivity calculations using analytical solutions appropriate for the hydrogeologic conditions.

3.2.6 Groundwater Monitoring and NAPL Gauging

Two (2) rounds of groundwater sampling will be conducted as part of this phase of RI field activities. For each round, groundwater samples will be collected from the monitoring wells proposed herein and the existing monitoring wells and piezometers. The first round of groundwater sampling will be initiated after at least one week has passed since completion of well development and after water levels in the wells have stabilized. The second round will be conducted approximately three months (one quarter) after the first round, preferably in a time period where the groundwater elevation conditions differ seasonally from the first round. For example, if the first round is conducted during a period when the water table is relatively high, then it is preferable to schedule the second round for a period when the water table is relatively low.

Prior to groundwater sampling, depth to water measurements and NAPL gauging will be conducted on each well planned for sampling and all on-site and off-site wells. In the event that NAPL is detected in a monitoring well, a groundwater sample will not be collected from that well. Groundwater samples will be collected according to the USEPA low flow sampling protocol and in accordance with procedures outlined in the FSP.

The groundwater samples will be submitted for analysis of BTEX, PAHs, and total cyanide. The groundwater samples will also be analyzed in the field for pH, specific conductivity, temperature, turbidity, and dissolved oxygen.

Analysis of groundwater samples will be conducted by a laboratory certified under NYSDOH ELAP to provide ASP/CLP deliverables. As described in Section 3.2.2, the analytical results will be provided to the NYSDEC as an EDD formatted to the NYSDEC's data submission requirements.

3.2.7 Survey

Each of the borings and monitoring well locations completed as part of the SRI activities will be surveyed. The survey will include location coordinates, ground surface elevation, and in the case of the wells, top of casing elevation data. Coordinates will be referenced to the State Plane coordinate system for New York using the North American Datum of 1983 (NAD 1983) in units of feet. Elevations will be referenced to the National Geodetic Vertical Datum (NGVD) of 1929 in units of feet. The survey will be performed by a New York licensed surveyor.

3.2.8 Investigation-Derived Waste

Investigation-derived waste (IDW) generated during the SRI activities will include soil and rock cuttings, drilling water, development water, equipment decontamination water, purge water, disposable sampling equipment, and personal protective equipment (PPE). The waste will be containerized in DOT-approved, 55-gallon drums, which will be labeled to identify their contents. The appropriate treatment/disposal will be arranged based on the characterization of the waste streams. Treatment/disposal of the IDW will be managed by a licensed, permitted transportation and disposal contractor on National Grid's approved vendor list.

3.3 Data Evaluation and Reporting

Laboratory results for the soil and groundwater samples will be forwarded to a qualified data validator for preparation of a Data Usability Summary Report (DUSR). The DUSR will present a summary of data usability, including a discussion of qualified and rejected data and provide recommendations for resampling/reanalysis, as applicable.

An addendum to the SRI Data Summary Report will be provided to the NYSDEC. The addendum will include the following:

- Soil boring logs and well construction diagrams;
- Data generated during the field investigation in EQuIS™ compatible format;
- DUSR and tabular and graphic summaries of the analytical results;
- Updated site plan depicting SRI sampling locations and previous investigation locations;
- Figures presenting the continuous monitoring data;
- Maps of groundwater elevations and interpreted flow directions;

- Hydrogeologic cross-sections depicting subsurface conditions; and
- Other information pertinent to the SRI activities

Accompanying the addendum will be conclusions related to the objectives of this phase of RI field work, and an assessment of whether or not the data collected to-date are sufficient to meet the RI objectives for the Site. Also included will be either a recommendation that a RI Report be prepared (if the data collected to-date are sufficient), or recommendations for addressing additional data needs to complete the RI, including human and ecological exposure assessments.

In the event that preparation of a RI Report is recommended and the NYSDEC concurs with this recommendation, a RI Report will be prepared to address the following:

- The identity and characteristics of the source(s) of MGP-related impacts;
- The amount, concentration, phase, location, environmental fate and transport, and other significant characteristics of any MGP-related constituents present;
- Hydrogeologic characteristics, including grain size, hydraulic conductivity of saturated formations monitored, depth to saturated zone, nature of bedrock, hydraulic gradients, proximity to potential groundwater discharge areas (e.g., surface water, floodplains, or wetlands, etc.);
- Assessment of routes of exposure and potential human receptors via a qualitative human health exposure assessment in accordance with Section 3.1(C)17 and Appendix 3B of the May 2010 DER-10 Technical Guidance for Site Investigation and Remediation; and
- A determination as to whether or not a Fish and Wildlife Resource Impact Analysis (FWRIA) are required based on Appendix 3C of the May 2010 DER 10 Technical Guidance for Site Investigation and Remediation and, if so required, Steps 1 through 2b of the FWRIA will be conducted and documented in the RI Report in accordance with the following DEC guidance documents: 1) Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA); October 1, 1994 (Steps 1 through 2b); and 2) DER 10 Technical Guidance for Site Investigation and Remediation, May 2010.

The RI Report will include the following:

- Pertinent information obtained throughout the implementation of this work plan and previous investigations;
- Descriptions of the work completed under this work plan and previous investigations and the results of that completed work;
- Deviations from this work plan and previous investigations that result from unexpected conditions encountered during the investigation;
- Summary of the overall nature and extent of contamination referencing any exceedances of applicable State standards, criteria, and guidance;
- Summary of any ecological assessments conducted;
- Summary tables of analytical data collected;
- Soil boring logs and well construction diagrams, which will include well development data and field instrument (e.g., PID) readings;
- Groundwater elevation contour maps with flow directions specified;
- Hydrogeologic cross-sections of the Site;
- Figure depicting the elevation contours of the top of bedrock surface;
- Figures illustrating the distribution of constituent concentrations in soils and groundwater, including sample depths;
- The results and summary of the qualitative human health exposure assessment and FWRIA Steps 1 through 2b.

- Conclusions which summarize the areas of concern, identify any potentially completed exposure pathways, and recommendations for any future work (e.g., none, additional investigation, or an evaluation of remedial alternatives).

Section 4

Schedule

Following NYSDEC/NYSDOH review and approval of the proposed locations and SRI Work Plan addendum, efforts to update the existing property access agreements will commence. Field activities will be initiated approximately two weeks following execution of the property access agreement(s) and notification of the property owners of the planned SRI activities.

It is anticipated that approximately two months will be required to conduct the field activities described in this work plan through completion of: soil borings; bedrock evaluation; monitoring well installations; well development; slug testing; and the first round of groundwater sampling. As noted in Section 3.2.6, the second round of groundwater sampling will be conducted approximately three months following the first round, preferably in an interval of hydrologic conditions that differs seasonally from the first round. Within approximately six to eight weeks of completion of the second round of groundwater sampling, the laboratory analyses and the DUSR are expected to be complete.

The addendum to the SRI Data Summary Report will be submitted approximately two months after the DUSR for the groundwater samples for the second sampling round is received from the data validator. If following the NYSDEC's review of the Data Summary Report (see Section 3.3), it is determined that the RI is complete, then National Grid will develop a schedule for preparing and submitting a RI Report will and propose this schedule to NYSDEC.

Section 5

References

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Tables

TABLE 3-1
RATIONALE FOR SUPPLEMENTAL REMEDIAL INVESTIGATION LOCATIONS
FULTON (ONTARIO ST.) FORMER MGP SITE
FULTON, NEW YORK

Location ID	Objective(s)	Target Depth(1)
SOIL BORINGS		
B-134	1) Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs; and 2) Further evaluate the extent of NAPL/tar in overburden soils on the off-site property west of the Site.	Advance to top of bedrock surface (estimated 20 feet bgs).
B-135	1) Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs; and 2) Further evaluate the extent of NAPL/tar in overburden soils on the off-site property west of the Site.	Advance to top of bedrock surface (estimated 20 feet bgs).
OVERBURDEN MONITORING WELLS AND SOIL BORINGS		
MW-120D	Further evaluate groundwater flow direction and the lateral extent of dissolved-phase, MGP-related constituents in deep overburden groundwater on the south side of the Site.	*Soil Boring* - advance to top of bedrock surface (estimated 26 feet bgs). *Well* - position base of well screen immediately above top of bedrock surface.
MW-121S	Further evaluate the lateral extent of dissolved-phase, MGP-related constituents in shallow overburden groundwater of on the off-site property west of the Site.	*Soil Boring* - 15 feet bgs. *Well* - straddle water table with screen.
MW-121D	1) Further evaluate groundwater flow direction and the lateral extent of dissolved-phase, MGP-related constituents in deep overburden groundwater; 2) Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs; and 3) Further evaluate the extent of NAPL/tar in overburden soils on the off-site property west of the Site.	*Soil Boring* - advance to top of bedrock surface (estimated 20 feet bgs). *Well* - position base of well screen immediately above top of bedrock surface.
MW-122S	Further evaluate the lateral extent of dissolved-phase, MGP-related constituents in shallow overburden groundwater of on the off-site property west of the Site..	*Soil Boring* - 15 feet bgs. *Well* - straddle water table with screen.
MW-122D	Further evaluate groundwater flow direction and the lateral extent of dissolved-phase, MGP-related constituents in deep overburden groundwater.	*Soil Boring* - advance to top of bedrock surface (estimated 21 feet bgs). *Well* - position base of well screen immediately above top of bedrock surface.
BEDROCK EVALUATION/BEDROCK MONITORING WELL LOCATIONS		
MW-120R	1) Further evaluate extent of NAPL within bedrock; 2) Further evaluate the lateral extent of dissolved-phase, MGP-related constituents in shallow bedrock groundwater; and 3) Further evaluate groundwater flow direction in shallow bedrock groundwater.	Pending findings from coring, packer pressure tests and geophysical logging, complete a well with screen that straddles shallowest encountered water-bearing zone in bedrock. Total depth of borehole is anticipated to be approximately 30 feet below the top of bedrock surface (estimated 56 feet bgs).
MW-121R	1) Further evaluate the extent of NAPL/tar in overburden soils and bedrock on the off-site property west of the Site; 2) Further evaluate the lateral extent of dissolved-phase, MGP-related constituents in shallow bedrock groundwater; and 3) Further evaluate groundwater flow direction in shallow bedrock groundwater.	Pending findings from coring, packer pressure tests and geophysical logging, complete a well with screen that straddles shallowest encountered water-bearing zone in bedrock. Total depth of borehole is anticipated to be approximately 30 feet below the top of bedrock surface (estimated 50 feet bgs).

TABLE 3-1
RATIONALE FOR SUPPLEMENTAL REMEDIAL INVESTIGATION LOCATIONS
FULTON (ONTARIO ST.) FORMER MGP SITE
FULTON, NEW YORK

Location ID	Objective(s)	Target Depth(1)
MW-122R	1) Further evaluate extent of NAPL/tar within bedrock; 2) Further evaluate the lateral extent of dissolved-phase, MGP-related constituents in shallow bedrock groundwater; and 3) Further evaluate groundwater flow direction in shallow bedrock groundwater.	Pending findings from coring, packer pressure tests and geophysical logging, complete a well with screen that straddles shallowest encountered water-bearing zone in bedrock. Total depth of borehole is anticipated to be approximately 30 feet below the top of bedrock surface (estimated 51 feet bgs).
MW-122RD	1) Evaluate the hydrogeologic characteristics in the bedrock below the shallow bedrock water-bearing zone identified in previous investigation activities; 2) Identify if there are distinct water-bearing zones in the deeper bedrock interval; and 3) Support the assessment of the vertical extent of MGP-related impacts in bedrock.	If a potential water-bearing zone is identified below the shallow bedrock water-bearing zone, then a monitoring well will be installed with a screen interval intersecting this zone. If no potential water-bearing zone is identified, then the packer pressure test data, geophysical logs and cores will be reviewed for any minor or subtle indications of possible flow into the borehole, and consideration will be given to installing a monitoring well with a screen adjacent to an interval with such minor or subtle indications. Total depth of borehole is anticipated to be approximately 75 feet below the top of bedrock surface (estimated 96 feet bgs).
MW-123R	1) Further evaluate extent of NAPL/tar within bedrock; 2) Further evaluate the lateral extent of dissolved-phase, MGP-related constituents in shallow bedrock groundwater; and 3) Further evaluate groundwater flow direction in shallow bedrock groundwater.	Pending findings from coring, packer pressure tests and geophysical logging, complete a well with screen that straddles shallowest encountered water-bearing zone in bedrock. Total depth of borehole is anticipated to be approximately 30 feet below the top of bedrock surface (estimated 55 feet bgs).
MW-124R	1) Further evaluate extent of NAPL/tar within bedrock; 2) Further evaluate the lateral extent of dissolved-phase, MGP-related constituents in shallow bedrock groundwater; 3) Further evaluate groundwater flow direction in shallow bedrock groundwater; and 4) Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs (if required, pending results of field screening and/or lab analyses of samples from soil boring B-135).	Pending findings from coring, packer pressure tests and geophysical logging, complete a well with screen that straddles shallowest encountered water-bearing zone in bedrock. Total depth of borehole is anticipated to be approximately 30 feet below the top of bedrock surface (estimated 48 feet bgs).

Notes:
(1) - Target depths are estimated based on data from surrounding borings. Adjustments may be required based on field observations.
(2) - Soil Cleanup Objectives (SCOs) as set forth in 6 NYCRR Subpart 375-6.
MGP - Manufactured Gas Plant
NAPL - non-aqueous phase liquid
bgs - below ground surface

TABLE 3-2
SUMMARY OF LABORATORY ANALYSES
FULTON (ONTARIO ST.) FORMER MGP SITE
FULTON, NEW YORK

Media and Sample Type	BTEX Method 8260	PAHs Method 8270	Total Cyanide Method 9012
Soil Boring Samples (2 borings, 2 Soil samples each)	4	4	4
Duplicate(1)	1	1	1
MS/MSD(1)	1	1	1
Trip Blank(2)	--	--	--
Equipment Blank(1)	1	1	1
Monitoring Well Soil Boring Samples (2 Borings, 2 Soil samples each)	4	4	4
Duplicate(1)	1	1	1
MS/MSD(1)	1	1	1
Trip Blank(2)	--	--	--
Equipment Blank(1)	1	1	1
Groundwater (33 wells, 2 events)(3)	66	66	66
Duplicate(1)	4	4	4
MS/MSD(1)	4	4	4
Trip Blank(2)	±10	--	--
Equipment Blank(1)	4	4	4

Notes:
(1) - Per the QAPP, one duplicate sample, one MS/MSD pair, and one equipment blank will be submitted and analyzed for every Sample Deliver y Group (SDG). Maximum of 20 samples per SDG.
(2) - Per the QAPP, one trip blank will be included in every shipment of water samples to be analyzed for volatile organic compounds.
(3) - If NAPL is identified in a well, groundwater samples from that well will not be collected and subsequently analyzed.

Figures

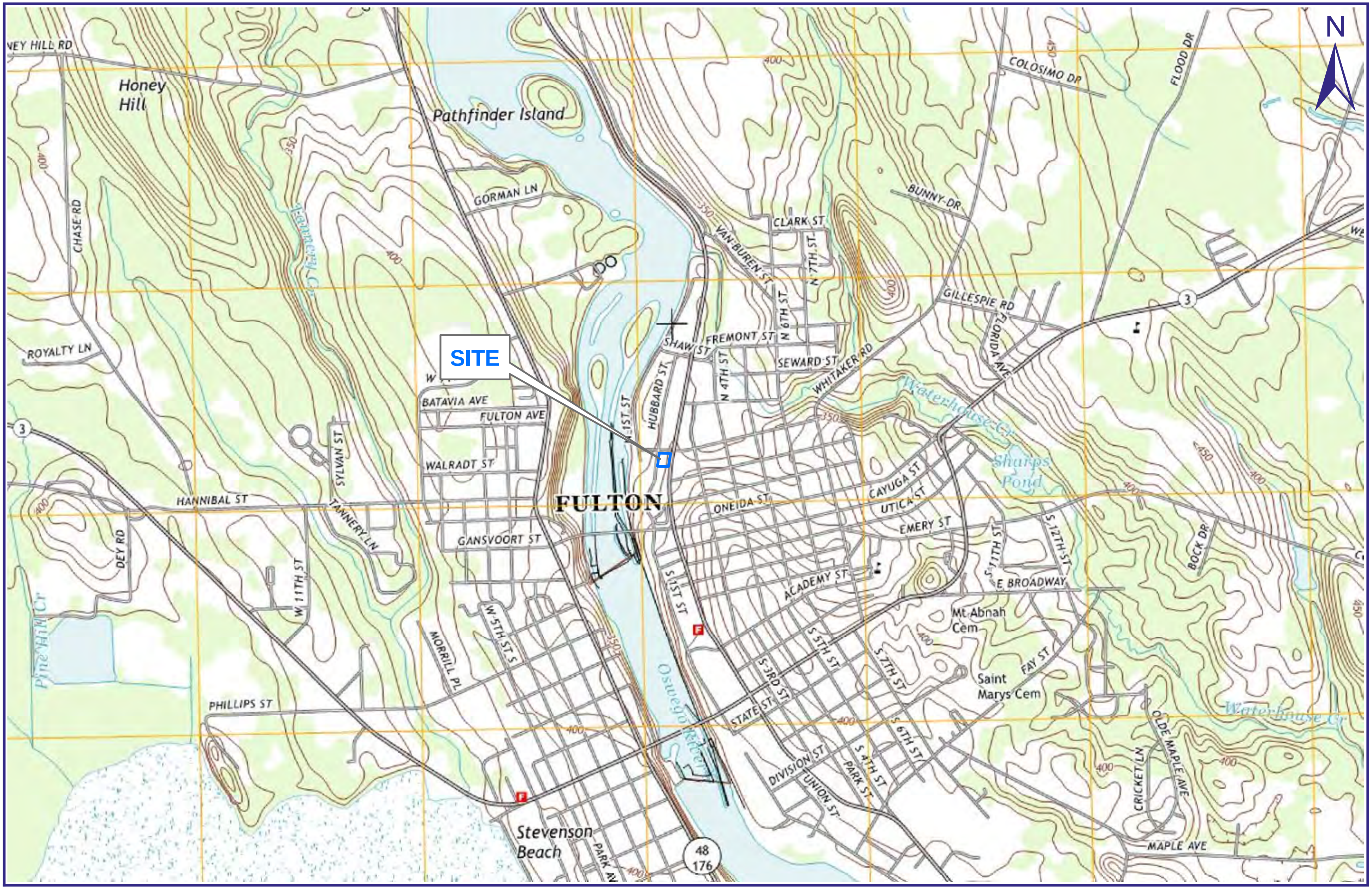
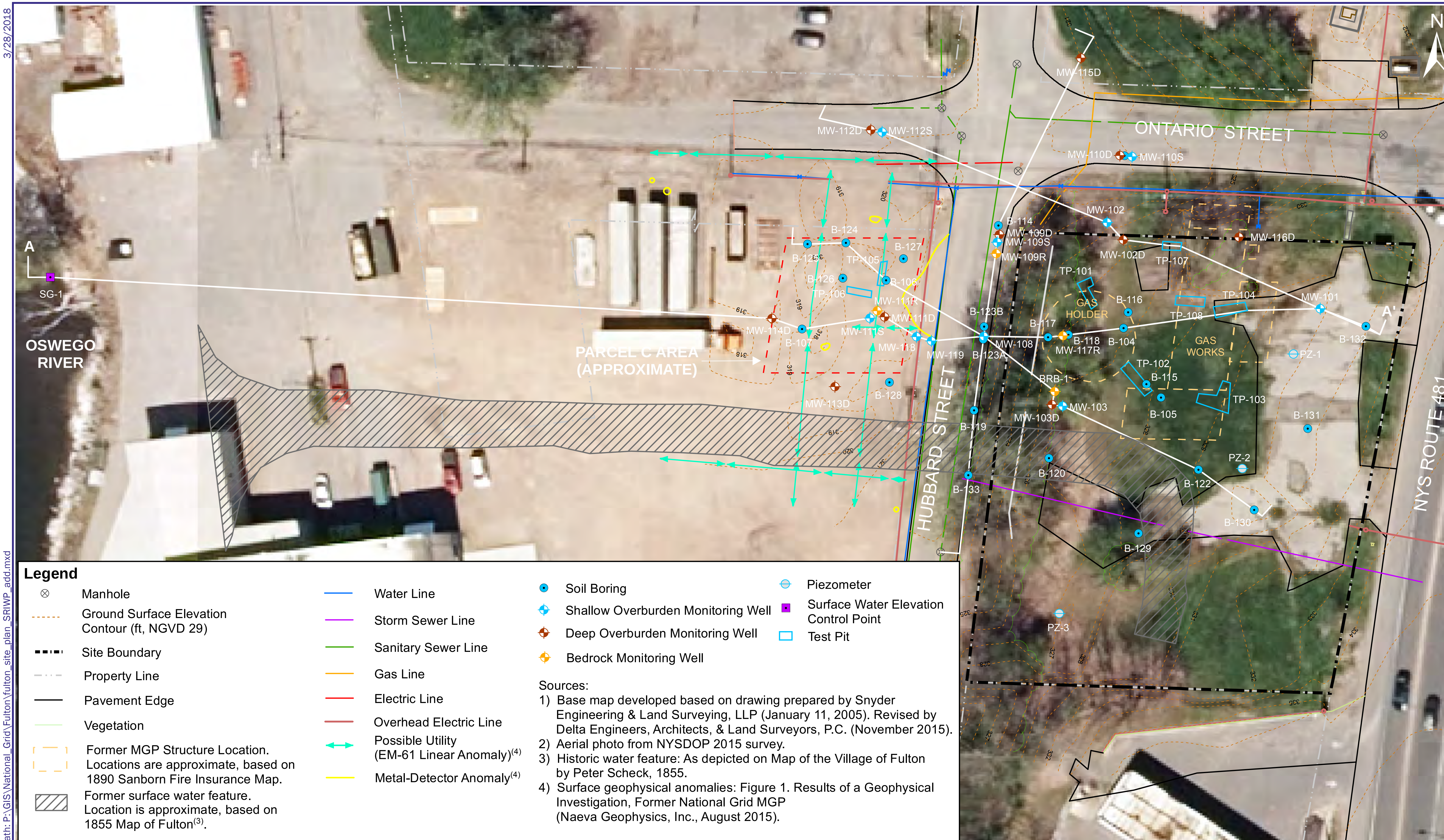


FIGURE 2-1
SITE LOCATION
NATIONAL GRID
FULTON (ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

Source: USGS 7.5 Minute Topographic Map
Fulton Quadrangle (2013)

0 1,000 2,000
Feet

3/28/2018

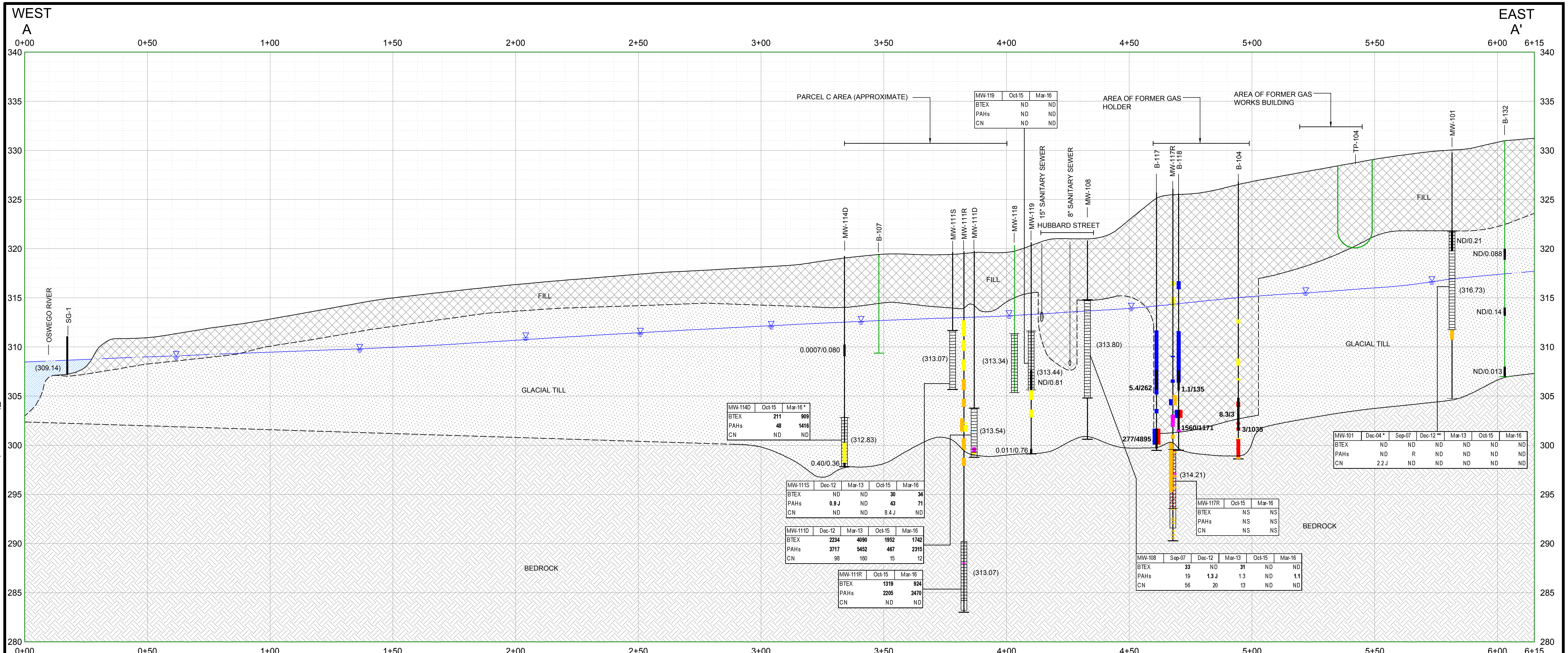


Author: rhojnacki Path: P:\GIS\National_Grid\Fulton\fulton_site_plan_SRIWP_add.mxd

Brown AND Caldwell

FIGURE 2-2
SITE PLAN
NATIONAL GRID
FULTON (ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

0 20 40
Feet



MW-119	Oct-15	Mar-16
BTEX	ND	ND
PAHs	ND	ND
CN	ND	ND

MW-114D	Oct-15	Mar-16 *
BTEX	211	909
PAHs	48	1416
CN	ND	ND

MW-111S	Dec-12	Mar-13	Oct-15	Mar-16
BTEX	ND	ND	30	34
PAHs	0.9 J	ND	43	71
CN	ND	ND	8.4 J	ND

MW-111D	Dec-12	Mar-13	Oct-15	Mar-16
BTEX	2234	4090	1952	1742
PAHs	3717	5452	467	2315
CN	98	160	15	12

MW-111R	Oct-15	Mar-16
BTEX	1319	924
PAHs	2205	2470
CN	ND	ND

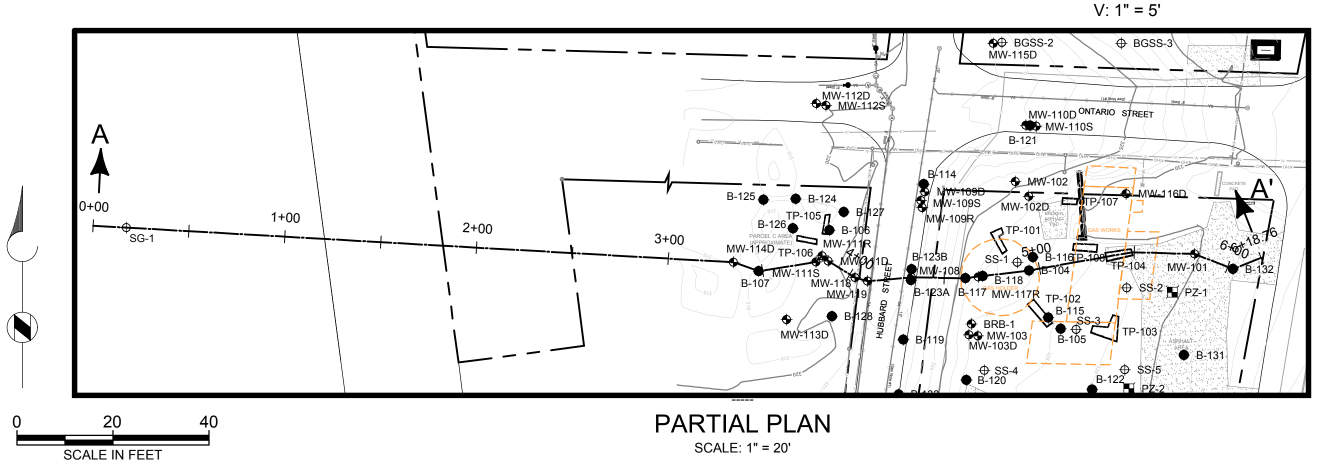
MW-117R	Oct-15	Mar-16
BTEX	NS	NS
PAHs	NS	NS
CN	NS	NS

MW-108	Sep-07	Dec-12	Mar-13	Oct-15	Mar-16
BTEX	**33**	ND	**31**	ND	ND
PAHs	19	**1.3 J**	1.3	ND	**1.1**
CN	56	20	13	ND	ND

MW-101	Dec-04 *	Sep-07	Dec-12 **	Mar-13	Oct-15	Mar-16
BTEX	ND	ND	ND	ND	ND	ND
PAHs	ND	R	ND	ND	ND	ND
CN	2.2 J	ND	ND	ND	ND	ND

PROFILE

SCALE H: 1" = 20'
V: 1" = 5'



0 20 40
SCALE IN FEET

PARTIAL PLAN

SCALE: 1" = 20'

LEGEND:

- TP-104 — MONITORING WELL/SOIL BORING TEST PIT IDENTIFICATION AND APPROXIMATE LOCATION
- GENERALIZED GROUND SURFACE
- 277/4895 — TOTAL BTEX/TOTAL PAH(mg/kg) CONCENTRATION WITHIN SAMPLE INTERVAL. BOLD VALUE INDICATES ONE OR MORE CONSTITUENT CONCENTRATIONS ABOVE NYS PART 375 SOIL CLEANUP OBJECTIVES (PROTECTION OF PUBLIC HEALTH-COMMERCIAL OR INDUSTRIAL ZONING [DEPENDING ON LOCATION] PROTECTION OF ECOLOGICAL RESOURCES, AND/OR PROTECTION OF GROUNDWATER)
- WELL SCREEN INTERVAL
- PVC SUMP
- TOTAL DEPTH OF BOREHOLE
- NON-AQUEOUS PHASE LIQUID (NAPL) OBSERVED WITHIN WELL DURING GAUGING EVENTS
- WATER TABLE, OCTOBER 19, 2015
- (313.07) — GROUNDWATER ELEVATION, OCTOBER 19, 2015

- FILL
- GLACIAL TILL
- BEDROCK

VISUAL/OLFACTORY INDICATIONS OF IMPACTS (SEE NOTE 1):

- TAR SATURATED
- COATED MATERIAL, LENSES
- BLEBS, GLOBS, SHEEN
- STAINING, ODOR
- PETROLEUM IMPACTS STAINING & ODORS
- PURIFIER WASTE AND ODOR
- NO OBSERVED IMPACTS

ABBREVIATIONS:

BTEX	BENZENE, TOLUENE, ETHYLBENZENE AND XYLENE ISOMERS
PAHS	TOTAL POLYCYCLIC AROMATIC HYDROCARBONS
CN	TOTAL CYANIDE
ND	NOT DETECTED
J	ESTIMATED CONCENTRATION
R	RESULT REJECTED AS DETERMINED BY DATA VALIDATOR
NS	NOT SAMPLED. NAPL IN WELL

MW-111S	Dec-12	Mar-13
BTEX	ND	ND
PAHs	0.9 J	ND
CN	ND	ND

GROUNDWATER QUALITY DATA. VALUES REPORTED IN MICROGRAMS PER LITER (µg/L) BOLD VALUE INDICATES ONE OR MORE CONSTITUENTS ARE ABOVE CLASS GA CRITERIA

* HIGHEST CONCENTRATION FROM ORIGINAL GROUNDWATER AND DUPLICATE GROUNDWATER SAMPLE IS POSTED.

** DUPLICATE SAMPLE COLLECTED

NOTE:
1. NYSDEC'S STANDARD COLORS AND ASSOCIATED DESCRIPTORS FOR REPORTING MGP IMPACTS WERE USED TO DEPICT INTERVALS WHERE IMPACTS WERE OBSERVED IN SOIL SAMPLES, BEDROCK CORE SAMPLES, OR DURING DRILLING PROCESSES INCLUDING PACKER PRESSURE TESTING AND BOREHOLE GEOPHYSICS.

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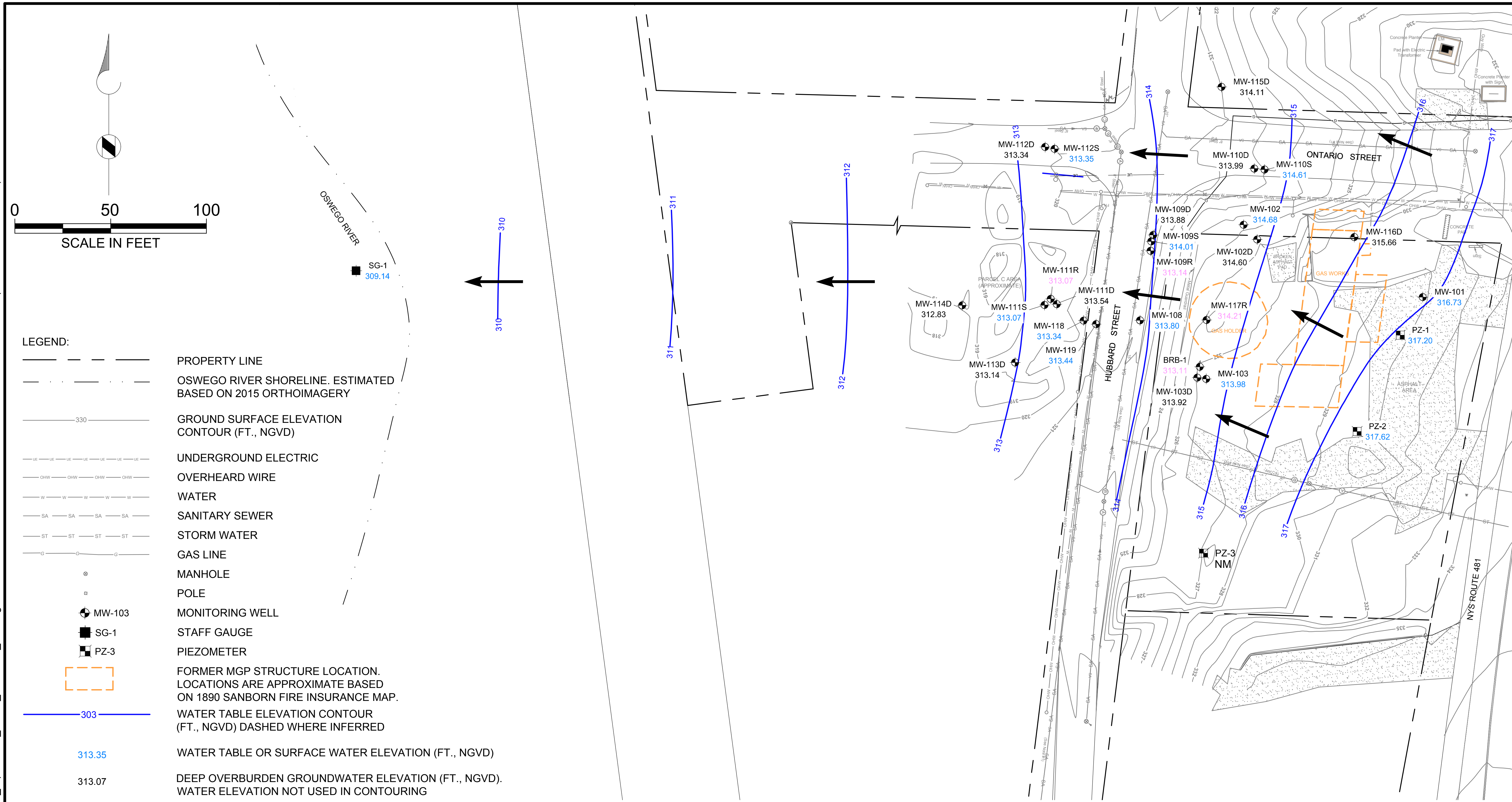
Brown AND Caldwell

DATE: March 16, 2018

NATIONAL GRID
FULTON (ONTARIO ST.) FORMER MGP SITE
FULTON, NEW YORK

GEOLOGICAL CROSS SECTION A-A'

FIGURE
2-3



LEGEND:

Symbol	Description
(dashed line)	PROPERTY LINE
(dash-dot line)	OSWEGO RIVER SHORELINE. ESTIMATED BASED ON 2015 ORTHOIMAGERY
—330—	GROUND SURFACE ELEVATION CONTOUR (FT., NGVD)
—UE—	UNDERGROUND ELECTRIC
—OHW—	OVERHEARD WIRE
—W—	WATER
—SA—	SANITARY SEWER
—ST—	STORM WATER
—G—	GAS LINE
(symbol)	MANHOLE
(symbol)	POLE
MW-103	MONITORING WELL
SG-1	STAFF GAUGE
PZ-3	PIEZOMETER
(orange dashed box)	FORMER MGP STRUCTURE LOCATION. LOCATIONS ARE APPROXIMATE BASED ON 1890 SANBORN FIRE INSURANCE MAP.
—303—	WATER TABLE ELEVATION CONTOUR (FT., NGVD) DASHED WHERE INFERRED
313.35	WATER TABLE OR SURFACE WATER ELEVATION (FT., NGVD)
313.07	DEEP OVERBURDEN GROUNDWATER ELEVATION (FT., NGVD). WATER ELEVATION NOT USED IN CONTOURING
313.35	BEDROCK GROUNDWATER ELEVATION (FT., NGVD). WATER ELEVATION NOT USED IN CONTOURING
(arrow)	GENERALIZED DIRECTION OF GROUNDWATER FLOW
NM	NOT MEASURED

SOURCE:
BASEMAP DEVELOPED BASED ON DRAWING PREPARED BY SNYDER ENGINEERING AND LAND SURVEYING, LLP (JANUARY 11, 2005), REVISED BY DELTA ENGINEERS, ARCHITECTS, AND LAND SURVEYORS, P.C. (NOVEMBER 2015).

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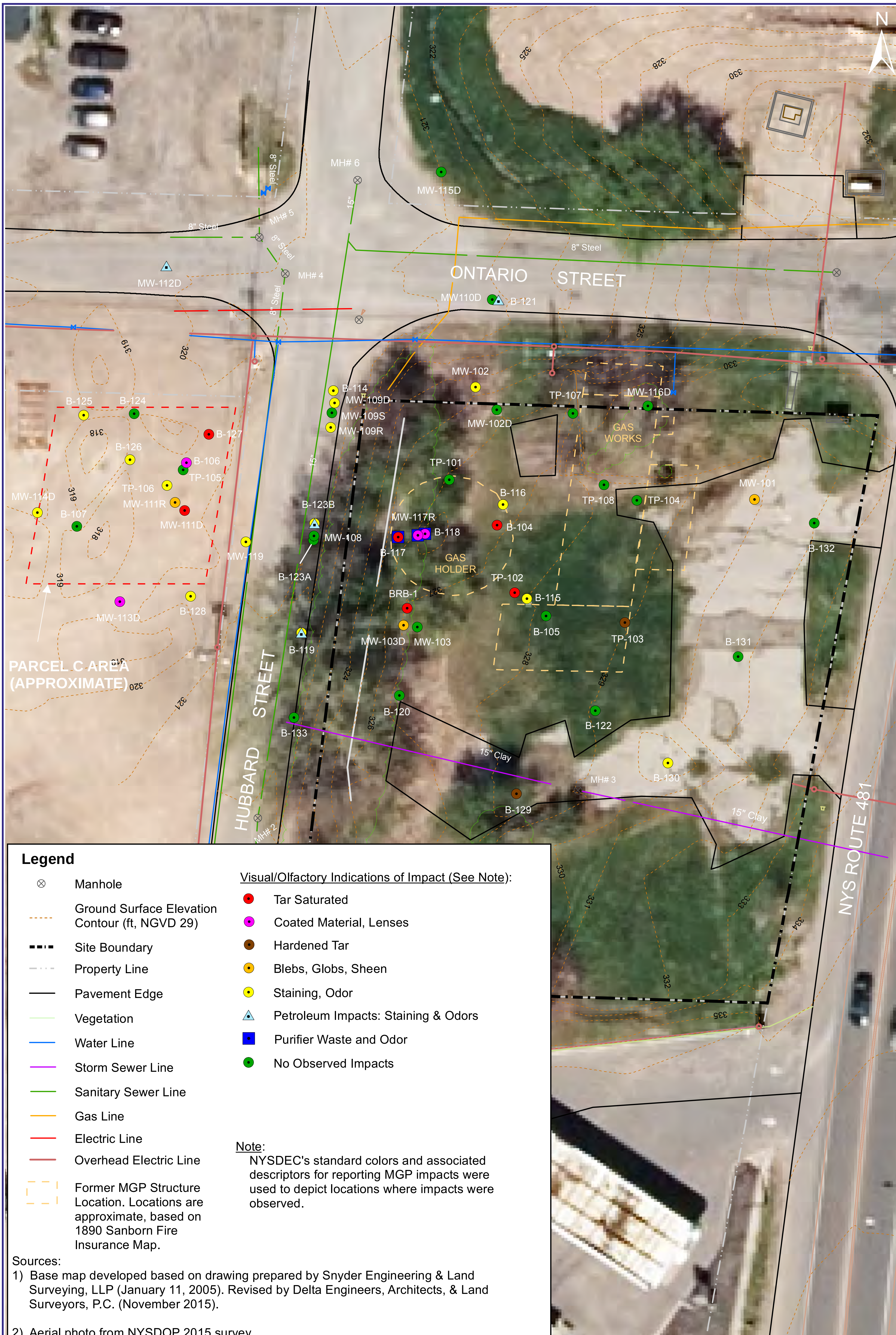
SCALE: 1" = 50'

DATE: March 16, 2018

NATIONAL GRID
FULTON (ONTARIO ST.)
FORMER MGP SITE
FULTON, NEW YORK

WATER TABLE CONTOUR MAP
OCTOBER 19, 2015

FIGURE
2-4



3/27/2018

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FIGURE 2-5
VISUAL/OLFACTORY OBSERVATIONS: OVERBURDEN
NATIONAL GRID
FULTON (ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

3/27/2018

Legend

- Manhole
- Ground Surface Elevation Contour (ft, NGVD 29)
- Site Boundary
- Property Line
- Pavement Edge
- Vegetation
- Water Line
- Storm Sewer Line
- Sanitary Sewer Line
- Gas Line
- Electric Line
- Overhead Electric Line
- Former MGP Structure Location. Locations are approximate, based on 1890 Sanborn Fire Insurance Map.

Visual/Olfactory Indications of Impact (See Note):

- NAPL/Tar observed in bedrock monitoring well during gauging events
- Tar Saturated
- Coated Material, Lenses
- Blebs, Globs, Sheen

Note:
NYSDEC's standard colors and associated descriptors for reporting MGP impacts were used to depict locations where impacts were observed.

Sources:
1) Base map developed based on drawing prepared by Snyder Engineering & Land Surveying, LLP (January 11, 2005). Revised by Delta Engineers, Architects, & Land Surveyors, P.C. (November 2015).

2) Aerial photo from NYSDOP 2015 survey.

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FIGURE 2-6
VISUAL/OLFACTORY OBSERVATIONS: BEDROCK
NATIONAL GRID
FULTON (ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

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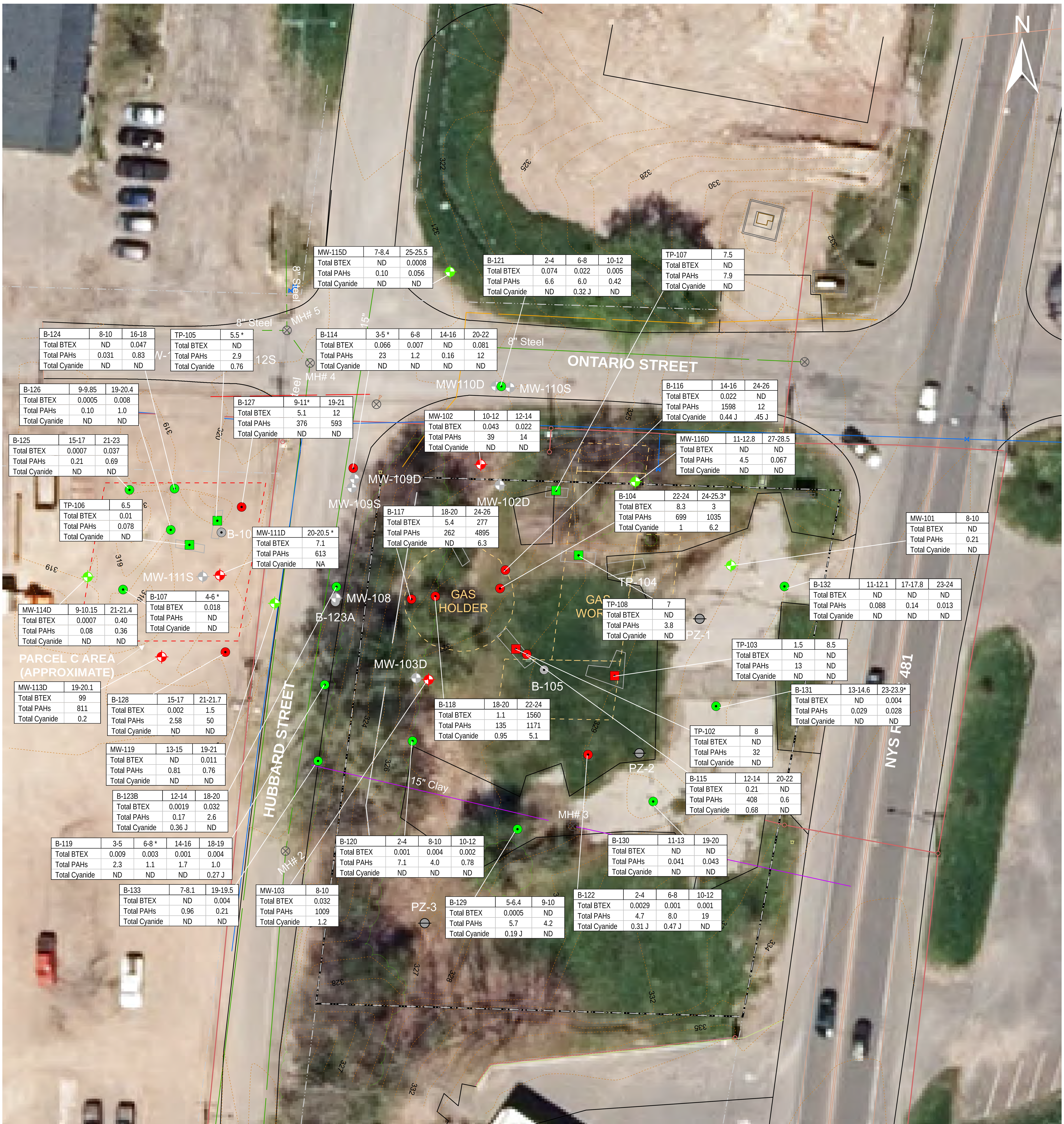
3/27/2018



Legend

Monitoring Well: green symbol indicates no exccedance of New York State Part 375 Soil Cleanup Objectives (SCOs); red symbol indicates one or more constituents exceed SCO(s)

Soil Boring: green symbol indicates no exccedance of SCOs; red symbol indicates one or more constituents exceed SCO(s)

Test Pit Sample: green symbol indicates no exccedance of SCOs; red symbol indicates one or more constituents exceed SCO(s)

Soil Boring

Monitoring Well

Test Pit

Ground Surface Elevation Contour (ft, NGVD 29)

Site Boundary

Pavement Edge

Vegetation

Storm Sewer Line

Electric Line

Former MGP Structure Location. Locations are approximate, based on 1890 Sanborn Fire Insurance Map.

Piezometer

Manhole

Property Line

Water Line

Sanitary Sewer Line

Overhead Electric Line

Gas Line

Explanation of terms and abbreviations:
BTEX - Benzene, Toluene, Ethylbenzene, Xylenes
PAHs - Polycyclic Aromatic Hydrocarbons
J - Estimated Concentration
ND - Not Detected
NA - Not Analyzed

Bold Value - Indicates conentration of one or more constituents in a constituent group are above NYS Part 375 SCOs (Protection of Public Health for Commercially or Industrially Zoned Properties [depending on sample location]; Protection of Ecological Resources; and/or Protection of Groundwater)

Results reported in milligrams per kilogram (mg/kg)

* - Table lists the highest concentration from original and duplicate sample

Sources:
1) Base map developed based on drawing prepared by Snyder Engineering & Land Surveying, LLP (January 11, 2005); Revised by Deltal Engineers, Architects, & Land Surveyors, P.C.(January 2013).

2) Aerial photo from NYSDOP 2015 survey

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FIGURE 2-7
BTEX, PAHS AND CYANIDE IN SUBSURFACE SOIL
NATIONAL GRID
FULTON (ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

0 20 40
Feet

Legend

- Shallow Overburden Monitoring Well
- Deep Overburden Monitoring Well
- Piezometer
- Manhole
- Ground Surface Elevation Contour (ft, NGVD 29)
- Site Boundary
- Property Line
- Pavement Edge
- Vegetation
- Water Line
- Storm Sewer Line
- Sanitary Sewer Line
- Gas Line
- Electric Line
- Overhead Electric Line
- Former MGP Structure Location. Locations are approximate, based on 1890 Sanborn Fire Insurance Map.

Explanation of terms and abbreviations:
ND - Not detected
NA - Not analyzed
J - Estimated concentration
D - Reported result is representative of a diluted sample analysis.

Bold Value - Indicates constituent concentration above Class GA Criterion.

Results reported in micrograms per liter (µg/L)

* - Table lists the highest concentration from original and duplicate sample
** - Duplicate sample collected

Sources:
1) Base map developed based on drawing prepared by Snyder Engineering & Land Surveying, LLP (January 11, 2005); Revised by Deltal Engineers, Architects, & Land Surveyors, P.C.(November 2015).

2) Aerial photo from NYSDOP 2015 survey

MW-112S	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND
Naphthalene	ND	ND	2	ND
Cyanide, total	ND	ND	ND	ND

MW-112D	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND
Naphthalene	ND	ND	2	ND
Cyanide, total	ND	ND	ND	ND

MW-115D	Oct-15	Mar-16
Benzene	ND	ND
Toluene	ND	ND
Ethylbenzene	ND	ND
Xylenes, total	ND	ND
Naphthalene	ND	ND
Cyanide, total	ND	ND

MW-110S	Sep-07	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND
Cyanide, total	ND	ND	ND	ND	ND

MW-110D	Sep-07	Dec-12	Mar-13 *	Oct-15	Mar-16
Benzene	ND	ND	ND	ND	ND
Toluene	ND	1 J	1 J	ND	1
Ethylbenzene	ND	4 J	4 J	ND	5
Xylenes, total	ND	15	13	0.7 J	16
Naphthalene	3.1	75	75	9	76
Cyanide, total	ND	ND	ND	ND	ND

MW-109S	Sep-07	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND
Cyanide, total	ND	ND	ND	ND	ND

MW-109D	Sep-07	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	6.6	2 J	9	ND	ND
Toluene	ND	ND	2 J	ND	ND
Ethylbenzene	18	6	29	ND	ND
Xylenes, total	34	6	33	ND	ND
Naphthalene	150 JD	28	150	5	3
Cyanide, total	ND	ND	ND	ND	7.1 J

MW-116D	Oct-15	Mar-16
Benzene	ND	ND
Toluene	ND	ND
Ethylbenzene	ND	ND
Xylenes, total	ND	ND
Naphthalene	2	ND
Cyanide, total	ND	ND

MW-114D	Oct-15	Mar-16 *
Benzene	13	30
Toluene	27	59
Ethylbenzene	51	280
Xylenes, total	120	540
Naphthalene	7	1200
Cyanide, total	ND	ND

MW-101	Dec-04 *	Sep-07	Dec-12 **	Mar-13	Oct-15	Mar-16
Benzene	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND
Cyanide, total	2.2 J	ND	ND	ND	ND	ND

MW-102	Dec-04	Sep-07	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	2.2 J	ND	ND	ND	ND	ND
Toluene	1.3 J	ND	ND	ND	ND	ND
Ethylbenzene	2.6 J	ND	ND	ND	ND	ND
Xylenes, total	5.1 J	ND	ND	ND	ND	ND
Naphthalene	ND	ND	0.8	0.2 J	ND	0.4 J
Cyanide, total	13.7	23	54	22	15	ND

PZ-1	Dec-04	Sep-07	Dec-12	Mar-13
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND
Naphthalene	ND	ND	12	ND
Cyanide, total	ND	ND	ND	ND

MW-102D	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	0.6 J	0.5 J	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND
Naphthalene	5	5	0.1 J	2
Cyanide, total	8.2 J	5.2 J	ND	ND

MW-111S	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	ND	ND	25	15
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	4	14
Xylenes, total	ND	ND	0.5 J	5
Naphthalene	ND	ND	0.6	8
Cyanide, total	ND	ND	8.4 J	ND

MW-103	Dec-04	Sep-07 *	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	0.2 J	ND	ND	ND
Cyanide, total	11	16	14	15	19	26

MW-111D	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	44	110	72	42
Toluene	320	780	220	200
Ethylbenzene	470	600	360	300
Xylenes, total	1400	2600	1300	1200
Naphthalene	2800	4300	7	2000
Cyanide, total	98	160	15	12

MW-108	Sep-07	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	26	ND	31	ND	ND
Toluene	ND	ND	ND	ND	ND
Ethylbenzene	7.3	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND	ND
Naphthalene	4.1 J	ND	0.2 J	ND	ND
Cyanide, total	56	20	13	ND	ND

MW-103D	Dec-12	Mar-13	Oct-15	Mar-16
Benzene	ND	ND	8	9
Toluene	ND	ND	2	ND
Ethylbenzene	3 J	ND	3	2
Xylenes, total	8	ND	7	3
Naphthalene	70 J	6	25	2
Cyanide, total	15	17	20	23

MW-119	Oct-15	Mar-16
Benzene	ND	ND
Toluene	ND	ND
Ethylbenzene	ND	ND
Xylenes, total	ND	ND
Naphthalene	ND	ND
Cyanide, total	ND	ND

PZ-2	Dec-04	Sep-07	Dec-12	Mar-13
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND
Naphthalene	ND	ND	ND	0.2 J
Cyanide, total	ND	ND	ND	ND

MW-113D	Oct-15	Mar16 *
Benzene	44	23
Toluene	3	2
Ethylbenzene	64	60
Xylenes, total	24	15
Naphthalene	42	10
Cyanide, total	ND	7.7 J

PZ-3	Dec-04	Nov-06 *	Dec-12
Benzene	ND	ND	ND
Toluene	8.8 J	4.2 J	2 J
Ethylbenzene	ND	ND	ND
Xylenes, total	ND	ND	ND
Naphthalene	NA	NA	0.1 J
Cyanide, total	NA	NA	ND

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FIGURE 2-8
BTEX, NAPHTHALENE AND CYANIDE IN OVERBURDEN GROUNDWATER
NATIONAL GRID
FULTON (ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

0 20 40
Feet

MW-111R	Oct-15	Mar-16
Benzene	29	14
Toluene	180	110
Ethylbenzene	250	170
Xylenes, total	860	630
Naphthalene	1900	1800
Cyanide, total	ND	ND

MW-109R	Oct-15	Mar-16
Benzene	7	NS
Toluene	100 J	NS
Ethylbenzene	39	NS
Xylenes, total	320	NS
Naphthalene	760	NS
Cyanide, total	ND	NS

MW-117R	Oct-15	Mar-16
Benzene	NS	NS
Toluene	NS	NS
Ethylbenzene	NS	NS
Xylenes, total	NS	NS
Naphthalene	NS	NS
Cyanide, total	NS	NS

BRB-1	Oct-15	Mar-16
Benzene	13	3
Toluene	77	19
Ethylbenzene	120	36
Xylenes, total	410	140
Naphthalene	1400	710
Cyanide, total	ND	ND

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FIGURE 2-9
BTEX, NAPHTHALENE AND CYANIDE IN BEDROCK GROUNDWATER
NATIONAL GRID
FULTON (ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

3/27/2018

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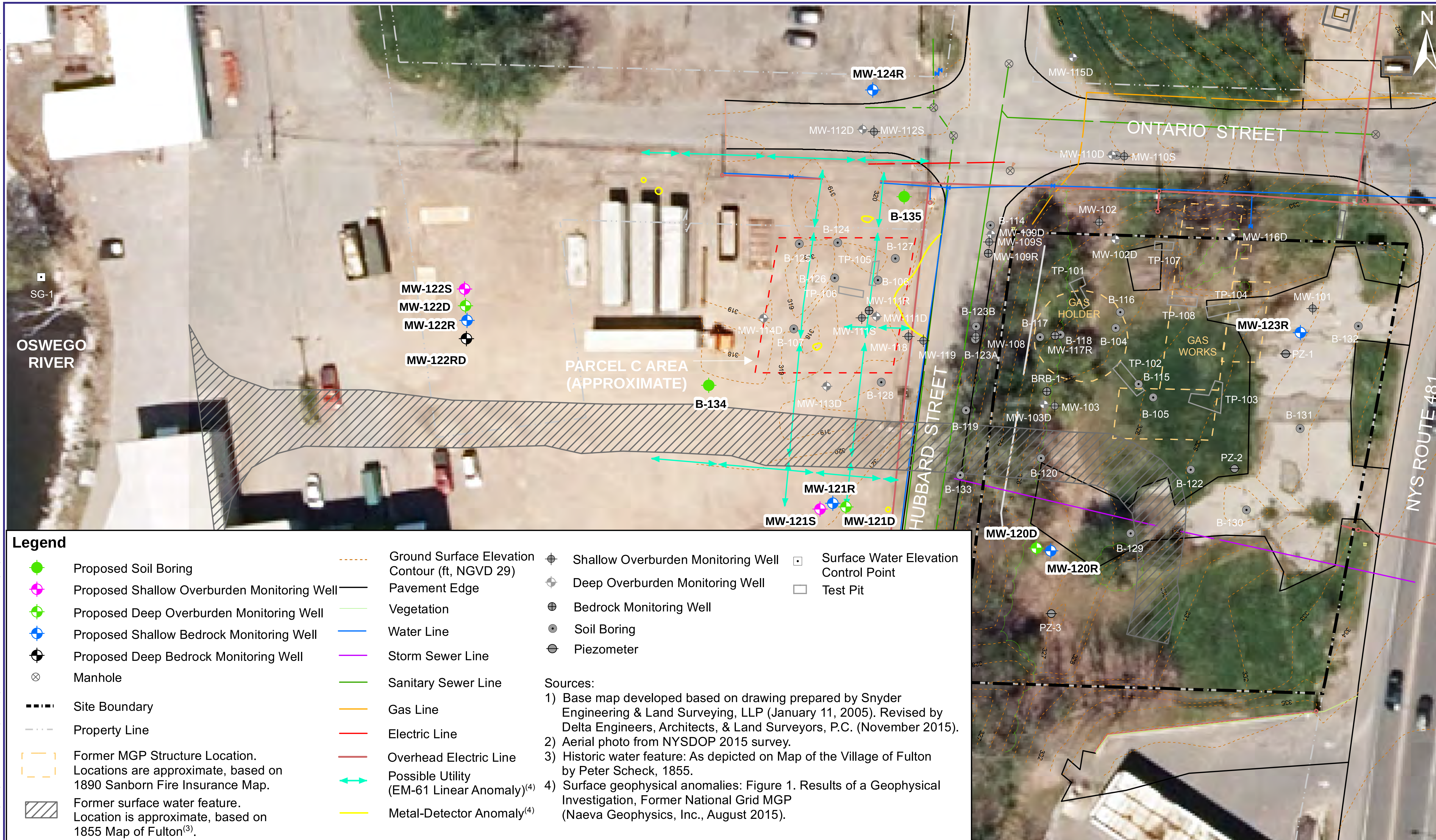

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FIGURE 3-1
PROPOSED SUPPLEMENTAL REMEDIAL INVESTIGATION LOCATIONS
NATIONAL GRID
FULTON (ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK