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May 16, 2023

Ms. Leah Werner
Remedial Project Manager
United States Environmental Protection Agency
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

**RE: Site Specific Work Plan Addendum No. 1, Revision 0
Former WPSC Green Bay Manufactured Gas Plant Site, Green Bay, Wisconsin
Wisconsin Public Service Corporation
CERCLA Docket No. V-W-06-C-847, CERCLIS ID – WIN000509948, BRRTS # - 02 05
000254**

Dear Ms. Werner:

Please find enclosed the Site Specific Work Plan Addendum 1 – Revision 0 for the upland at Wisconsin Public Service Corporation's (WPSC) Former Green Bay Manufactured Gas Plant (MGP) Site. Based on a review of site data collected to date, the ongoing Early Removal Action in the North Parking Lot, and a preliminary redevelopment plan for residential use, supplemental remedial investigation activities are proposed to address remaining data gaps for the site and close out the remedial investigation phase of work.

Soil boring and monitoring well installation is proposed to be completed during the summer 2023 following USEPA-approval of this work plan. Subslab/soil gas sampling is proposed to begin in August 2023 pending completion of the Early Removal Action in the North Parking Lot. Results of the investigation will be incorporated into a Remedial Investigation Report, which will be submitted by the end of 2023.

If you have any questions, please don't hesitate to contact me at 414-221-2577 or via email at Glenn.Luke@wecenergygroup.com.

Sincerely,

Glenn Luke
Principal Engineer - Environmental
WEC Business Services – Environmental Dept.

Enclosures: Site Specific Work Plan Addendum No. 1, Revision 0

For distribution to: Ms. Sarah Krueger, WDNR (via email)
Ms. Adrienne Korpela, Jacobs (via email)
Ms. Staci Goetz, Ramboll (via email)
Mr. Glenn Luke, WPSC (via email)

MEMO

To: Glenn Luke – WEC Energy Group
From: Abby Small and Staci Goetz – Ramboll
cc: Frank Dombrowski - WEC Energy Group
Re: Site Specific Work Plan Addendum No. 1, Revision 0
 Green Bay Former Manufactured Gas Plant, Green Bay, Wisconsin
 Wisconsin Public Service Corporation

BACKGROUND AND OBJECTIVE

Ramboll has prepared this Site Specific Work Plan, Addendum 1 (SSWP Addendum) on behalf of Wisconsin Public Service Corporation (WPSC) for a portion of the upland operable unit (OU1) of the Green Bay Former Manufactured Gas Plant (MGP) (Figure 1). This investigation is to augment information collected under the USEPA-approved Site-Specific Work Plan (SSWP) Revision 2 (NRT, 2015a and NRT, 2015b) and the USEPA-approved VI Technical Memorandum Revision 1 (NRT, 2016b) to support delineation of the nature and extent of MGP impacts at the Site.

The former WPSC Green Bay MGP (Site) is one of six former MGP sites addressed through the Administrative Order on Consent (AOC) and Statement of Work (SOW), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Docket No. V-W-06-C-847, dated May 5, 2006. The Site is currently enrolled in the United States Environmental Protection Agency (USEPA) Superfund Alternative Approach (SAA) program. Under the AOC/SOW, a generic approach to addressing the six sites is to be developed (the Multi-Site approach), describing the procedures and tasks to be followed to complete the Remedial Investigation/Feasibility Study (RI/FS) at the former Green Bay MGP facility, which, in turn, may be modified to account for site-specific differences that may exist at a particular location.

To facilitate project progress, the site has been divided into a sediment operable unit (OU) and an upland OU. The upland OU (OU1) extends from the top slope of the East River riverbank, landward and includes soil, groundwater, and potential vapor. The sediment OU (OU2) extends from the top slope of the East River riverbank, riverward and includes channel sediments, underlying clay, and surface water. The upland OU1 consists of three parcels, the largest of which is owned by WPSC. The former MGP structures were primarily located on the southern part of this parcel (Figure 2). In relation to the upland OU1, the WPSC General Office and Annex Buildings are located northwest, the KI Convention center is located southwest, the Associated Bank Office Building is located south and parking areas owned by Harbinger Development LLC and Associated Bank National Association adjoin the Site to the south and east, respectively (Figure 3). For the purposes of this document, "Site" refers to areas where contamination related to the former MGP has been discovered through investigation activities completed to-date and nearby areas necessary for implementation of the response

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action inclusive of both the upland OU1 and the sediment OU2. For the purposes of this work plan, the upland OU1 has been further subdivided into two areas as follows:

- “North Parking Lot” refers to the portion of the Site located north of Utility Street/Utility Court. This portion of the site is bounded by the WPSC Annex Building to the west, Utility Court/Utility Street to the south, and the Fox River and East River to the north and east. The North Parking Lot is currently undergoing an Early Removal Action (ERA) as described below.
- “South Parking Lot” refers to the portion of the Site south of Utility Street/Utility Court inclusive of the roadways. The South Parking lot consists of two parcels and the adjacent roadways. The largest parcel is owned by WPSC and used for parking while the smaller parcel is owned by Harbinger Corporation and is used as parking for the Associated Bank Office Building to the south This portion of the Site is bounded by North Jefferson Street to the west, Utility Court/Utility Street to the north, North Madison Street to the East and Elm Street to the south. The former MGP structures were primarily located in this area (Figure 3).

The USEPA-approved SSWP Revision 2 was implemented in October 2015 and February 2016 to characterize the extent of MGP impacts in the subsurface soil and groundwater; and, evaluate vapor intrusion pathways. Supplemental vapor intrusion and indoor air sampling were implemented between August and December 2016 in accordance with the USEPA-approved VI Technical Memorandum Revision 1. An RI data summary package was submitted to USEPA for discussion on February 10, 2017 (NRT, 2017). An Upland Remedial Investigation Data Summary Report (Ramboll, 2020b) was submitted to USEPA in September 2020. USEPA provided comments on December 7, 2020.

In September 2022, an Early Removal Action Work Plan (Ramboll, 2022) was submitted to USEPA to address soil impacts in the North Parking Lot in preparation for potential redevelopment for residential use to expedite the RI/FS process. The ERA construction consists of removal and off-site disposal of soil identified as principal threat waste, removal and off-site disposal of the top four feet of surface soil in the main parking lot, and removal and off-site disposal of the top two feet of surface soil in the Riverwalk area. All areas will be backfilled and clean soil will be imported to address the direct contact pathway. Work began November 2022 and is ongoing with an anticipated completion date of July 2023.

Based on a review of site data collected to date, the ongoing ERA in the North Parking Lot, and a preliminary redevelopment plan for residential use, supplemental RI activities are proposed to address remaining data gaps for the site and close out the RI phase of work. Remaining data gaps are further described below and include:

- Uncertainty regarding remaining residential vapor intrusion (VI) risk in the Annex Building following the ERA in the North Parking Lot.
- Uncertainty regarding principal threat waste potentially remaining in place in the South Parking Lot.

CURRENT DATA GAPS

VI Risk in the Annex Building following ERA

When the SSWP Revision 2 and the VI Technical Memorandum were prepared in 2015 and 2016, the Annex Building (located to the west of the North Parking Lot, Figure 2) was used as commercial office space by WPSC. The potential VI risk was evaluated using the Multi-Site VI Decision Matrix (NRT, 2016a), approved by the USEPA on February 10, 2016. In accordance with the Multi-Site VI Decision Matrix, soil borings and soil vapor probes SG-401 and SG-402 were installed east of the Annex Building (Figure 4). Oil-wetted/oil-

coated material and detected concentrations of constituents of potential concern (COPCs) were identified in soil borings and the industrial screening level (SL) for benzene was exceeded at SG-401. In 2015 and 2016, it was also identified that the southern portion of the building was in contact with groundwater and/or the capillary fringe and groundwater samples collected at the time from neighboring monitoring wells were below SLs but were present in detectable concentrations; therefore, sampling of indoor air and other lines of evidence were pursued. The northern portion of the building is not underlain by basement and is not in contact with groundwater or the capillary fringe. Based on the analytical results and building observations, a combination of indoor air, sub-slab, and soil gas sampling was performed to complete evaluation of the VI pathway at the Annex Building.

Nested sub-slab and soil gas probes (SS413/SG413D and SS414/SG414D, Figure 4) were completed within the Annex building in August of 2016. Coincident samples of indoor air, ambient air, sub-slab, and soil gas were collected from the Annex building in August and December of 2016 to evaluate the VI pathway. Soil gas and indoor air sample results from the North Parking Lot are presented on Table 1 and Table 2 and Figure 4. In 2016, prior to the ERA, naphthalene was identified above the Residential SLs at soil gas/subslab locations SG413/SG413D and SS414/SG414D during the December sampling event and at SS413D during the August sampling event (Table 1). In the southern portion of the building, naphthalene was detected above the residential SL at indoor air location (IA1) in August of 2016 (Table 2). Note that the purpose of indoor air sampling was to compare air quality to site use at the time (industrial), therefore the target reporting limit for multiple compounds including benzene, and naphthalene were higher than the residential SLs (Table 2).

Since the VI sampling was conducted in 2016, site conditions have changed including:

- The ERA was conducted removing principal threat waste to the east of the Annex Building as well as soil in the vicinity of SG401 and SG402.
- The building has been vacated and a potential residential redevelopment opportunity has been identified.

Given the changed conditions, the VI risk associated with residential site use following the ERA is unknown. Further sampling is proposed to address this data gap.

Additional Delineation in the South Parking Lot

In addition to the 2023 ERA, soil remediation was undertaken in 2003 with the objective of removing significant soil impacts and source areas. The selected remedy was source area excavation with medium temperature thermal desorption. Details of the remedial work were summarized in Section 4 of the Completion Report (NRT, 2014).

Excavation and decommissioning of former MGP structures and piping removed approximately 30,075 tons of soil and debris from four areas (Figure 3) that included the following:

- Area 1 (South Parking Lot) - included the 300,000 ft³ gas holder near Elm Street
- Area 2 (South Parking Lot) - included the former tar well, oil tanks, purifiers, and small gas holders
- Area 3 (North Parking Lot) – included the suspected discharge area of the former concrete channel to the river
- Area 4 (North Parking Lot) – included an area along the East River bank near well MW-410 (elevated cyanide)

In addition, former MGP and sewer piping was also excavated and disposed as shown on Figure 3.

Excavation limits were determined by visual inspection because this was a source area removal effort. The main purpose for excavation was to remove former MGP structures (pipes, channels, tar well, etc.) considered to be sources of the tar impacted material. The extent of the excavation areas is shown on Figure 3. Figures 5a through 5c show the South Parking Lot and remediated areas in cross-section view. Areas 3 and 4 in the North Parking Lot were re-excavated as part of the 2023 ERA and are not further described below. A summary of the South Parking Lot 2003 remedial excavation (Area 1, Area 2, and the former piping) is provided below.

Table A. Excavation Volumes and Disposal Summary

Site Area/Feature	Depth Excavated ft. bgs (approx.)	Tons Excavated	Backfill Material	Final Disposal
Area 1	6-8	3,484	Imported Sand; Treated Soil	Excess soil thermally treated and debris disposed at Hickory Meadows
Area 2 & Tar Well	Tar Well: 16-22, Other: 8-14	14,461	Treated Soil	

Area 1

Excavation depths ranged from 6 to 8 feet bgs around the former 300,000 ft³ gas holder near Elm Street and approximately 3,484 tons of MGP impacted soil was excavated from Area 1 (Figure 3) and thermally treated. Approximately 90 to 95 percent of the concrete base of the gas holder was removed. Due to existing utilities and structures, a small portion of the base was left in place but other MGP conveyance piping, sewers, and impacted soil were excavated.

Area 2

The former tar well and subsurface foundations/structures of oil tanks, purifiers, small gas holders, and additional MGP conveyance piping and sewers were excavated from Area 2 (Figure 3). The former 50-foot diameter tar well extended approximately 16 - 20 feet bgs and was filled with tar-impacted soil and debris. An additional gas holder (possibly the remains of a 15,000 ft³ gas holder) filled with similar material was also encountered. These structures, the material within them, and adjacent soils were excavated and thermally treated or transported for landfill disposal. Former MGP piping or structures and areas of impacted soils were excavated south of the tar well. More than 14,460 tons of MGP impacted soil was excavated from Area 2 and thermally treated. Excavation depths ranged from 16 - 22 feet bgs within the tar well, 10 - 12 feet bgs in the 15,000 ft³ gas holder area, and 8 - 14 feet bgs in surrounding areas.

Former Piping

Former MGP piping, abandoned gas lines, and sewer piping were excavated to depths of 5 to 10 feet bgs. Many former MGP conveyance pipes and sewers were excavated according to plan but others were excavated as encountered during excavation (Figure 3). All MGP related piping, sewers, and structures were excavated as part of the remediation effort as discussed in the Completion Report (NRT, 2014). Where inaccessible or at excavation extents, pipes were abandoned in place and filled with concrete grout to prevent preferential migration of groundwater. Tar-impacted conveyance piping, sewers, and structures were removed and segregated for disposal at an off-site landfill while the surrounding soils were thermally treated.

Excavations did not proceed laterally or vertically to remove tar or tar staining that observed in clay fractures or silt seams as agreed upon with Wisconsin Department of Natural Resources (WDNR) in the 2003 Remedial Action Work Plan (NRT, 2003). The USEPA noted in the May 29, 2020 comments on the Pre-Design Investigation Work Plan – Revision 0 (Ramboll, 2020a), that:

The extent of subsurface NAPL in the area of the former MGP structures south of the Utility Court are not known. Based on a review of Table 12 from the 2003 Remedial Action Documentation Report, the side wall and bottom samples from the four excavation areas still have exceedances of screening levels. For example, Sample EW 2-4 (7 ft) has detections of benzene at 8,900 ppb, benzo(a)pyrene at 11,000 ppb, and naphthalene at 95,000 ppb all of which are above screening levels. Additionally, the statement on page 15 of the 2020 PDI WP that excavations did not proceed laterally or vertically to remove tar that occurred in clay fractures or "silt seams", indicates there may be NAPL that extends laterally from the excavation areas in silt seams. The extent of NAPL does not appear to be defined.

This work plan aims to address the aforementioned comment and define the horizontal and vertical limits of potential principal threat waste beyond the previous removal areas.

Additionally, following the 2003 excavation, three monitoring wells (MW-401AR, MW-402R, and MW-403R, Figure 6) were re-installed within the backfilled areas with screens that partially span the remedial excavation backfill and partially span the clay unit. Existing monitoring wells MW-405A and MW-404 are also sampled on a semi-annual basis to monitor groundwater in the South Parking Lot (Figure 6) and are screened across the fill and clay. Figure 5a through Figure 5c depict the remedial excavation, lithology and monitoring wells in the South Parking Lot in cross-section view. Since the 2003 remedial action, dense non-aqueous phase liquid (DNAPL) has been periodically detected in wells MW-401AR and MW-405A. Groundwater concentrations in the cross-unit screened wells MW-402R, MW-403R, and MW-404 have shown ongoing benzene and naphthalene groundwater concentrations exceeding Risk Assessment Framework SLs (Table 3). It is unknown whether the source of the contaminant mass contributing to groundwater impacts and the ongoing DNAPL in wells is predominantly related to principal threat waste in clay fractures below the remedial excavation backfill or principal threat waste outside the excavation areas that has re-affected the backfill. This work plan aims to better define the source of the ongoing groundwater impacts in the South Parking Lot.

Based on these identified data gaps, the primary objectives of this SSWP are to:

- Determine vapor intrusion risk within Annex Building under residential future use conditions following completion of the ERA in the North Parking Lot.
- Delineate the extent of remaining principal threat waste in the South Parking Lot including:
 - Determine the horizontal and vertical limits of principal threat waste beyond the previous removal areas, including in Elm Street and Madison Street.
 - Determine if principal threat waste remains within Excavation Area 1 and 2 or if principal threat waste has re-affected the backfill placed during the 2003 remedial action.
 - Better define the source of the ongoing groundwater impacts in the South Parking Lot. Determine if the contaminant mass contributing to groundwater impacts is predominantly related to principal threat waste in clay fractures or remaining principal threat waste in the fill unit.

PROPOSED SUPPLEMENTAL SAMPLING ACTIVITIES

Based on the discussion above, additional investigation will be performed to understand VI risk to residential receptors in the Annex Building following completion of the ERA and to complete delineation of the nature and extent of principal threat waste in the South Parking Lot. The supplemental RI activities described below will be performed in accordance with the site-specific information included in the SSWP Revision 2 and the Multi-Site Field Sampling Plan (FSP) – Revision 4 (IBS, 2008), except where noted.

Soil Vapor Sampling

Sampling will be conducted in accordance with the guidelines presented in the SSWP Revision 2, Multi-Site SOP SAS-11-06 (Rev 1), and the 2016 VI Technical Memorandum Revision 1. Note that the Annex Building heating, ventilation and air conditioning, (HVAC) was supplied by the neighboring Division Office Building which has been demolished. Therefore, the Annex Building does not have an active HVAC system and the building has been vacant without ventilation. Indoor air sampling in the southern portion of the building where shallow groundwater contacts/is near the basement foundation is not proposed because the current conditions are not representative of functional building conditions. Subslab and soil gas sampling will be conducted under existing conditions without operational HVAC. Because there is no operational HVAC, a single round of soil vapor sampling is proposed. If needed, additional sampling could be conducted in the future with an operational HVAC system based on final building redevelopment plans.

The existing nested sub-slab sampling ports and soil gas probes SS-413/SG-413 and SS-414/SG-414 located in the northern portion of the Annex Building will be evaluated for reuse and re-sampled if the ports pass the chemical leak test described in SOP SAS-11-06 (Rev 1). Sampling will be in accordance with the SSWP Revision 2, the Multi-Site FSP Sub-Slab Sample Port Installation, Sampling and Abandonment SOP SAS-11-01 (Rev 1) and Soil Vapor Probe Installation and Soil Gas Sampling SOP SAS-11-06 (Rev 1). Prior to sample collection, the ports will undergo chemical (helium) leak testing and mechanical leak testing as described in SOP SAS-1106 (Rev 1). A pre-cleaned, evacuated 1-liter (Summa) canister with a laboratory calibrated flow controller will be used to collect the samples. Subslab and soil gas samples will be submitted to a Wisconsin certified laboratory (Pace Analytical of Mount Juliet, Tennessee, EurofinsTest America, South Burlington Vermont or STAT Analysis Corporation of Chicago, IL) for analysis of:

- BTEX, naphthalene, and 1,2,4-trimethylbenzene via USEPA Method TO-15.
- Carbon dioxide, oxygen and methane via ASTM Method 1946 or USEPA Method 3C.

A sampling and analysis plan summary is presented in Table 4. Data will undergo data validation by a third-party data validator.

Quality control (QC) samples will be collected as required by Multi-Site FSP SOP SAS-04-03. Samples will be labeled and packaged in accordance with Multi-Site FSP SOP SAS-03-01 and shipped using chain-of-custody procedures described in Multi-Site FSP SOP SAS-03-02.

Soil Boring and Sampling

This section describes the means and methods proposed to delineate the extent of remaining principal threat waste in the South Parking Lot.

For the purposes of this investigation, a definition of principal threat waste consistent with the definition used in the North Parking Lot Early Removal Action Work Plan (Ramboll, 2022) will be utilized and will be defined as soil that meets one or more of the following metrics:

- Non-aqueous phase liquid (NAPL) identified as separated liquid.
- Oil-coated or oil-wetted soil.
- Highly adsorbed phase concentrations of constituents of concern (COCs) exceeding a lifetime incremental cancer risk (CR) of 10^{-3} or a hazard index (HI) of 10 under applicable, residential land use assumptions.

Soil Boring Locations

Soil borings will be installed at the 19 soil boring locations shown on Figure 6. Seven boring locations are located within the 2003 excavation area to vertically delineate the potential presence of principal threat waste in clay fractures and determine if present, whether the principal threat waste has re-affected the backfill placed during the 2003 remedial action. Twelve boring locations are located exterior to the previous excavation area to laterally delineate the horizontal limits of principal threat waste beyond the previous removal areas. Soil boring locations were also limited by the presence of utilities throughout the parking lot and streets and shown on Figure 6.

Soil borings will be advanced using a direct-push method. Unless otherwise noted, sampling will be continuous, to define the presence/absence and vertical extent of affected soil at each boring location and extend a minimum of 5-ft into the confining clay layer. For the purpose of guiding investigation fieldwork, the vertical and horizontal extent of principal threat waste will be considered delineated if:

- no oil-coated or oil-wetted observations are present for two consecutive sample intervals (e.g., 4-feet); and
- for the evaluation of risk criteria, a Residential CR is less than 10^{-3} and Residential HI is less than 10 within one sample interval.

All borings advanced as part of the investigation will be continuously logged, following Multi-Site standard SOP SAS-05-02, the presence of fill material, moisture content, photoionization detector readings, the nature of each geologic unit encountered, and visual and olfactory observations indicating the presence of NAPL (e.g., oil-coated, or oil-wetted). Soil boring locations will be recorded per Multi-Site SOP SAS-03-03, and will be abandoned following the methods described in Multi-Site SOP SAS-05-05. Field equipment will be calibrated prior to use, as required by Multi-Site SOP SAS-02-01 from the Multi-Site FSP.

Subsurface soil samples will be collected from all delineation borings as follows:

- For borings that show no visual, olfactory, or PID indication of impacts, one sample will be collected in the upper four feet to characterize direct contact risks, one sample will be collected within the 2-foot interval above the clay confining layer, and one sample will be collected from the 2-foot interval within the clay confining layer immediately below the fill unit.
- For borings that indicate the presence of contamination (through visual, olfactory, or PID indication), a sample of impacted material will be collected. A second sample will also be collected below the interval(s) of potential MGP impacts, to document vertical extent. Soils will be collected in both fill and clay units as encountered. A third sample will be collected from the upper four feet to characterize direct contact risks.

All soil samples will be submitted to a Wisconsin certified laboratory (Pace Analytical of Green Bay, Wisconsin or EurofinsTest America, Chicago, IL) for COPCs identified in the SSWP Revision 2 including:

- Petroleum volatile organic compounds (PVOCs) via USEPA Method 8260 (Benzene, Ethylbenzene, Toluene, Total Xylenes, 1,2,4-Trimethylbenzene)

- Polycyclic aromatic hydrocarbons (PAHs) via USEPA Method 8270 (1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Pyrene)
- Total Metals via USEPA Method 6020A (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver) and total Mercury via USEPA Method 7471.
- Total cyanide via USEPA Method 9012B

A sampling and analysis plan summary is presented in Table 4. Data will undergo data validation by a third-party data validator.

Quality control (QC) samples will be collected as required by Multi-Site FSP SOP SAS-04-03. Samples will be labeled and packaged in accordance with Multi-Site FSP SOP SAS-03-01 and shipped using chain-of-custody procedures described in Multi-Site FSP SOP SAS-03-02. Equipment will be decontaminated after use in accordance with Multi-Site FSP SOP SAS-04-04.

Well Installation and Groundwater Sampling

Well installation

Following soil boring installation, five pairs of monitoring wells will be installed as shown on Figure 6. At each well pair, one well will be fully screened within the clay unit just below the fill and one well will be fully screened within the fill unit. Groundwater samples will be collected from both wells to determine if the contaminant mass contributing to groundwater impacts observed to date in the cross-screened wells is predominantly related to principal threat waste in clay fractures or remaining principal threat waste in the fill unit. Two well pairs will be located to the south and west of the previous remedial area, two well pairs will be located within the previous remedial area, and one well pair will be located adjacent to the former piping removal area.

Wells will be constructed according to Multi-Site SOP SAS-05-03, and thread joints will be tightened per manufacturer requirements. A 2-inch inner diameter poly vinyl chloride well with a 0.01-inch factory slotted screen will be installed, and the annular space around the wells will be backfilled with filter pack, bentonite seal, and finished with a steel flush mount cover. The overall depth of the well and the corresponding length of well screen will be determined in the field by the Ramboll field personnel, based on subsurface information collected during soil boring advancement. The following guidelines will be considered when selecting screen placement and length:

- A minimum 3-foot annular seal is preferred; however, a shorter seal length is acceptable if dictated by field conditions.
- Monitoring well screens will be 5 feet in length.
- In each well pair, the bottom of the shallow effective screen interval (i.e., lowermost sand pack) shall be placed at the fill-clay interface. In each well pair, the top of the deep effective screen (i.e., uppermost sand pack) shall be placed approximately 1 foot below the fill-clay interface.

Well Development

Following installation, wells will be developed in accordance with Multi-Site SOP SAS-05-04. Wells will be developed using an electric submersible pump for surging and pumping. Field parameters—specific

conductance, pH, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity—will be measured during development. Wells will be considered developed when field parameters meet the stabilization criteria detailed in Multi-Site SOP SAS-05-04.

Groundwater Sampling

Each well will be sampled for groundwater COPCs, using low-flow sample techniques, in accordance with Multi-Site SOP SAS-08-02. Groundwater sampling will be conducted within two months following well installation. Field parameters—specific conductance, pH, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity—will be measured using a flow-through cell. Samples will be submitted to Pace of Green Bay, Wisconsin for groundwater COPCs identified in the SSWP Revision 2 including:

- PVOCs including BTEX, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene via USEPA Method 8260
- PAHs via USEPA Method 8270 (1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Pyrene)
- Total Metals via USEPA Method 6020A (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver) and total mercury via USEPA Method 7471.
- Nitrate and Nitrite via USEPA method 353.2
- Sulfate via USEPA Method 300

A sampling and analysis plan summary is presented in Table 4. Data will undergo data validation by a third-party data validator.

If the schedule allows, sampling of the newly installed wells will be conducted at the same time as semi-annual sampling of existing wells.

Quality control (QC) samples will be collected as required by Multi-Site FSP SOP SAS-04-03. Samples will be labeled and packaged in accordance with Multi-Site FSP SOP SAS-03-01 and shipped using chain-of-custody procedures described in Multi-Site FSP SOP SAS-03-02. Equipment will be decontaminated after use in accordance with Multi-Site FSP SOP SAS-04-04.

The need for additional sampling at these wells will be evaluated once the results of the initial round of sampling have been received. A recommendation for either abandonment or incorporation into the long-term monitoring network will be provided in the Remedial Investigation Report.

Schedule and Reporting

Soil boring and monitoring well installation is proposed to be completed during the summer 2023 following USEPA-approval of this work plan. Subslab/soil gas sampling is proposed to begin in August 2023 pending completion of the ERA in the North Parking Lot. Results of the investigation will be incorporated into a Remedial Investigation Report, which will be submitted by the end of 2023.

References

Integrus Business Support, 2008. Multi-Site Field Sampling Plan, Revision 4, Remedial Investigation/Feasibility Study, Former Manufactured Gas Plant Sites, CERCLA V-W-06-C-847. September.

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NRT, 2016a, Vapor Intrusion Investigation Decision Matrix. January 15.

NRT, 2016b, Technical Memorandum No. 1 – Rev1, Supplemental RI Activities – VI Evaluation, Green Bay Former MGP, Green Bay, Wisconsin. July 15.

Ramboll, 2020a. Pre-Design Investigation Work Plan, Former green Bay Manufactured Gas Plant. March 16.

Ramboll, 2020b. Upland Remedial Investigation Data Summary Report, Former Green Bay Manufactured Gas Plant Site Operable Unit 1. September 18.

Ramboll, 2022. Early Removal Action Work Plan, Former Green Bay Manufactured Gas Plant, Revision 2. September 26.

Attachments

Figure 1 – Site Location Map

Figure 2 – Site Layout Map

Figure 3 – Soil Remediation Excavation Areas

Figure 4 – North Parking Lot Future Residential Use Vapor Intrusion Evaluation

Figure 5a – Geologic Cross Section D-D'

Figure 5b – Geologic Cross Sections E-E' and F-F'

Figure 5c – Geologic Cross Section G-G' and H-H'

Figure 6 – Proposed Soil Borings and Monitoring Wells

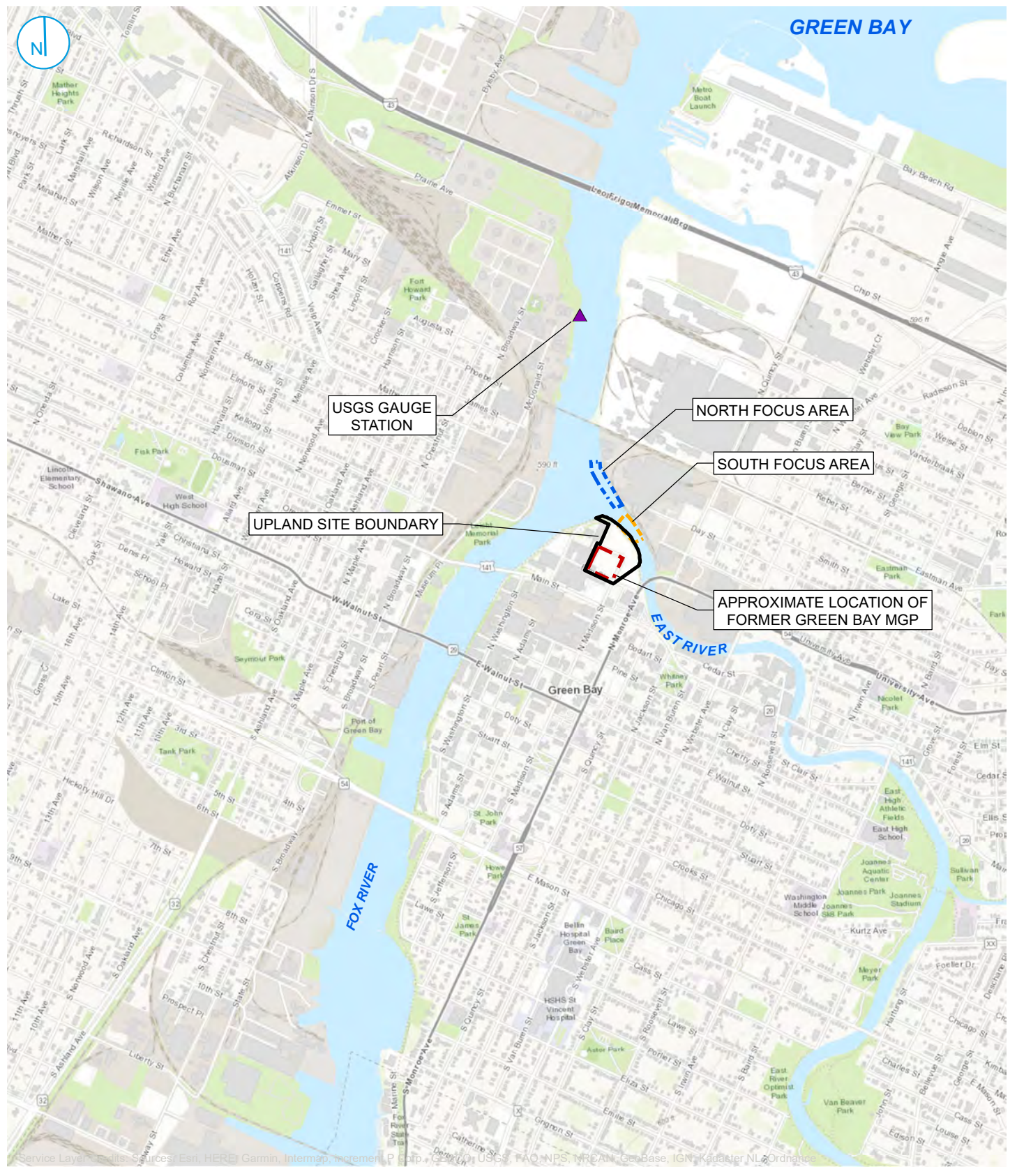
Table 1 – Soil Gas Analytical Results Compared to Residential and Industrial SLs - North Parking Lot

Table 2 – Indoor Air and Ambient Analytical Results Compared to Residential and Industrial SLs - Annex Building

Table 3 – 2018-2022 Groundwater Analytical Results Compared to the Groundwater SL, the PAL, and Tap Water Criteria

Table 4 – Sampling and Analysis Plan

FIGURES



SITE LOCATION MAP

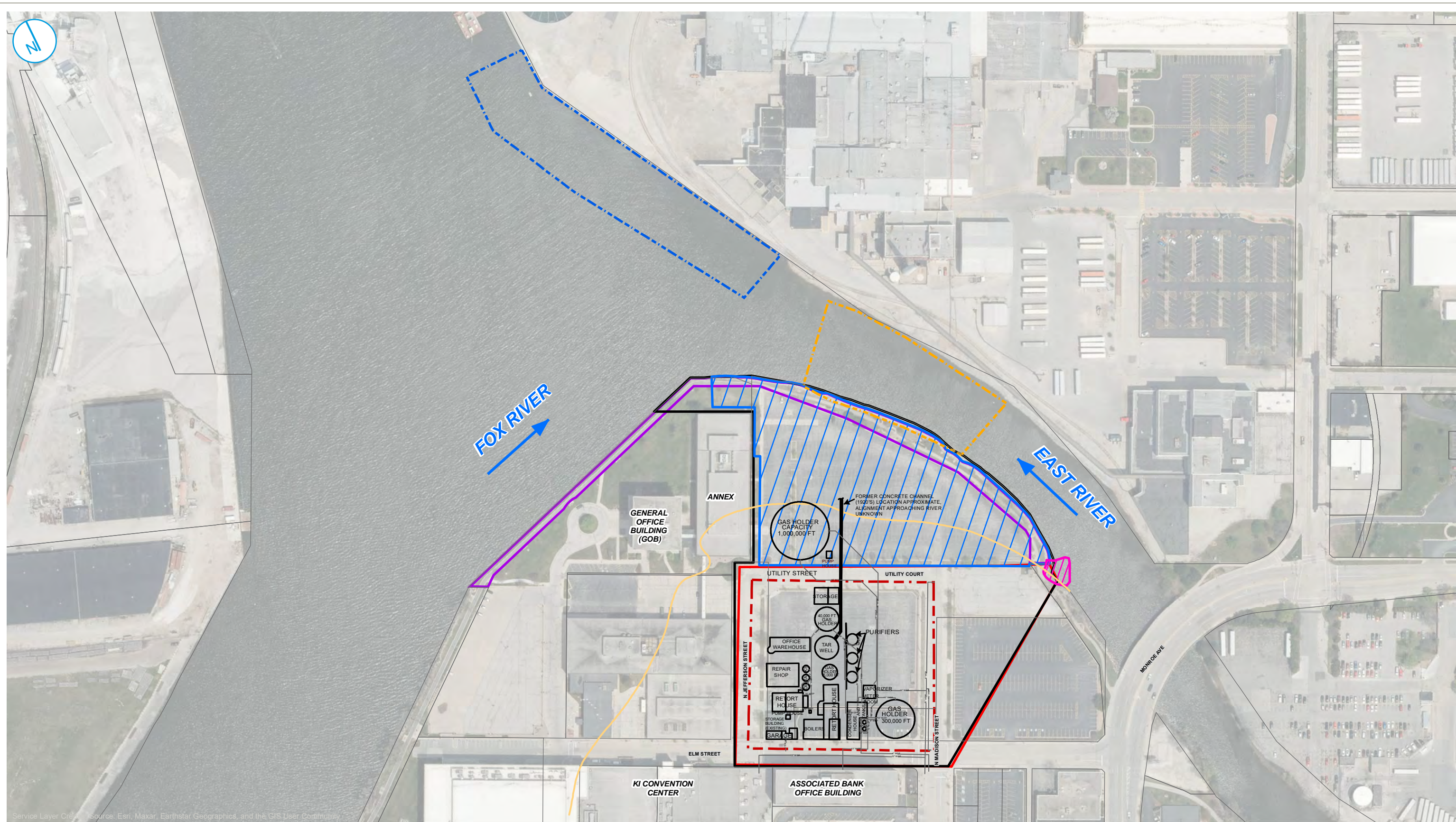
FIGURE 1

Map Scale: 1:124,000;
Map Center: 88°0'52"W 44°31'3"N

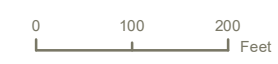
SITE SPECIFIC WORK PLAN ADDENDUM NO.1
FORMER GREEN BAY MANUFACTURED GAS PLANT
WISCONSIN PUBLIC SERVICE CORPORATION
CITY OF GREEN BAY, WISCONSIN

RAMBOLL US CORPORATION
A RAMBOLL COMPANY





- BUILDING FOOTPRINT
- APPROXIMATE SHORELINE (1835)
- ← RIVER FLOW DIRECTION
- PARCEL BOUNDARY
- ▨ EARLY REMOVAL ACTION OU2 EXTENTS
- ▭ UPLAND SITE BOUNDARY (OU1)
- ▭ SOUTH PARKING LOT
- ▭ RIVERWALK EASEMENT AREA
- ▭ NORTH PARKING LOT - EARLY REMOVAL ACTION OU1 ONGOING 2023
- ▭ FORMER MGP SITE
- ▭ NORTH FOCUS AREA (OU2)- EARLY REMOVAL ACTION COMPLETED 2019
- ▭ SOUTH FOCUS AREA (OU2) - EARLY REMOVAL ACTION COMPLETED 2018



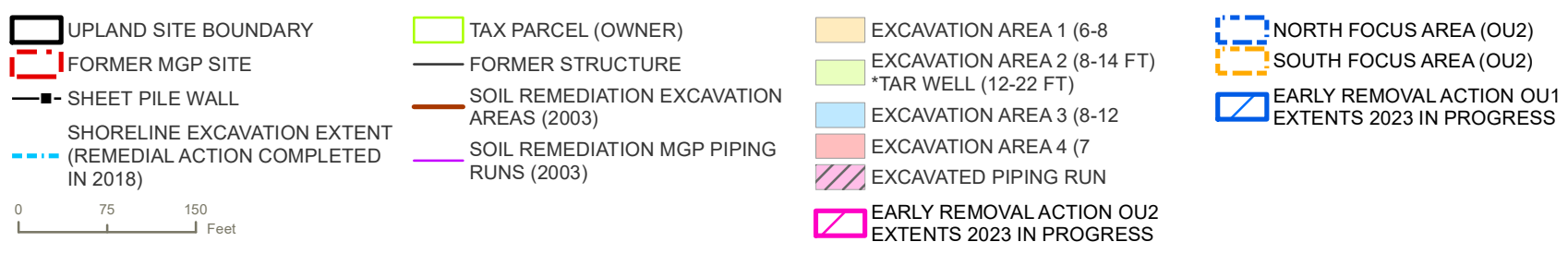
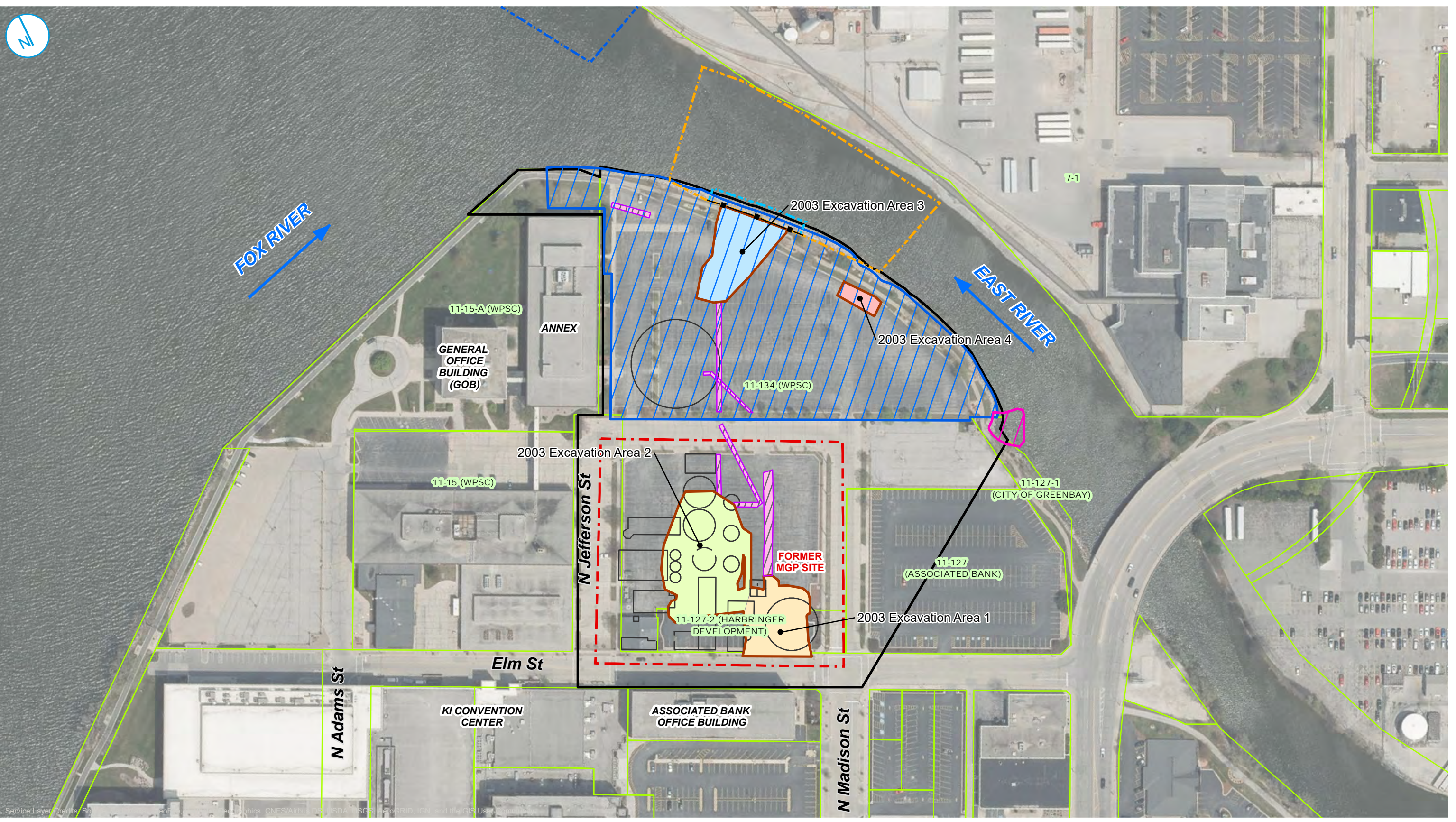
SITE LAYOUT

FIGURE 2

SITE SPECIFIC WORK PLAN ADDENDUM NO. 1
FORMER GREEN BAY MANUFACTURED GAS PLANT
 WISCONSIN PUBLIC SERVICE CORPORATION
 GREEN BAY, WISCONSIN

RAMBOLL US CORPORATION
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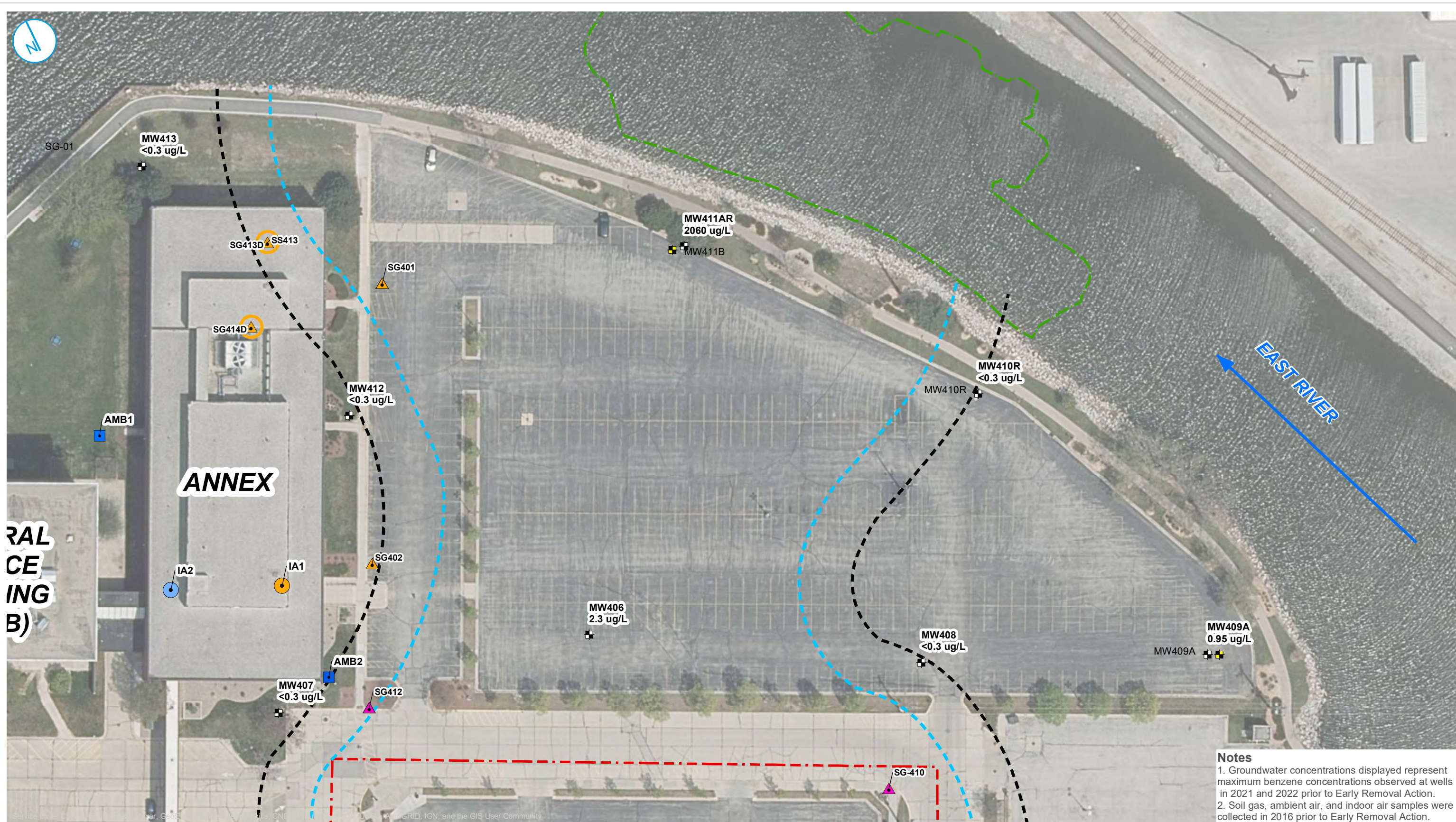




SOIL REMEDIATION EXCAVATION AREAS

SITE SPECIFIC WORK PLAN ADDENDUM NO. 1
FORMER GREEN BAY MANUFACTURED GAS PLANT
 WISCONSIN PUBLIC SERVICE CORPORATION
 GREEN BAY, WISCONSIN

FIGURE 3



Notes
 1. Groundwater concentrations displayed represent maximum benzene concentrations observed at wells in 2021 and 2022 prior to Early Removal Action.
 2. Soil gas, ambient air, and indoor air samples were collected in 2016 prior to Early Removal Action.

- FORMER MGP SITE
- SOUTH FOCUS AREA (REMEDIAL ACTION COMPLETED IN 2018)
- INDOOR AIR SAMPLE EXCEEDED RESIDENTIAL SL
- INDOOR AIR SAMPLE - NO DETECTED RESIDENTIAL SL EXCEEDANCES, MDL EXCEEDS SL
- AMBIENT AIR SAMPLE - NO DETECTED RESIDENTIAL SL EXCEEDANCES, MDL EXCEEDED SL
- ⊕ MONITORING WELL AND BENZENE CONCENTRATION (ug/L)
- ⊕ PIEZOMETER
- ▲ SOIL GAS EXCEEDED RESIDENTIAL SL
- ▲ NO SAMPLE COLLECTED DUE TO WATER IN LINES (SAMPLE DEPTH SHOWN)
- BENZENE ISOCONCENTRATION 1.6 ug/L: RESIDENTIAL GROUNDWATER TO VAPOR SL (RAF ADDENDUM REV 5, 2016)
- 35 FOOT BUFFER
- PROPOSED SUBSLAB/SOIL GAS SAMPLING LOCATION

NORTH PARKING LOT FUTURE RESIDENTIAL USE VAPOR INTRUSION PATHWAY EVALUATION

**SITE SPECIFIC WORK PLAN ADDENDUM NO. 1
 FORMER GREEN BAY MANUFACTURED GAS PLANT
 WISCONSIN PUBLIC SERVICE CORPORATION
 GREEN BAY, WISCONSIN**

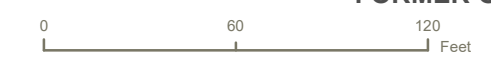
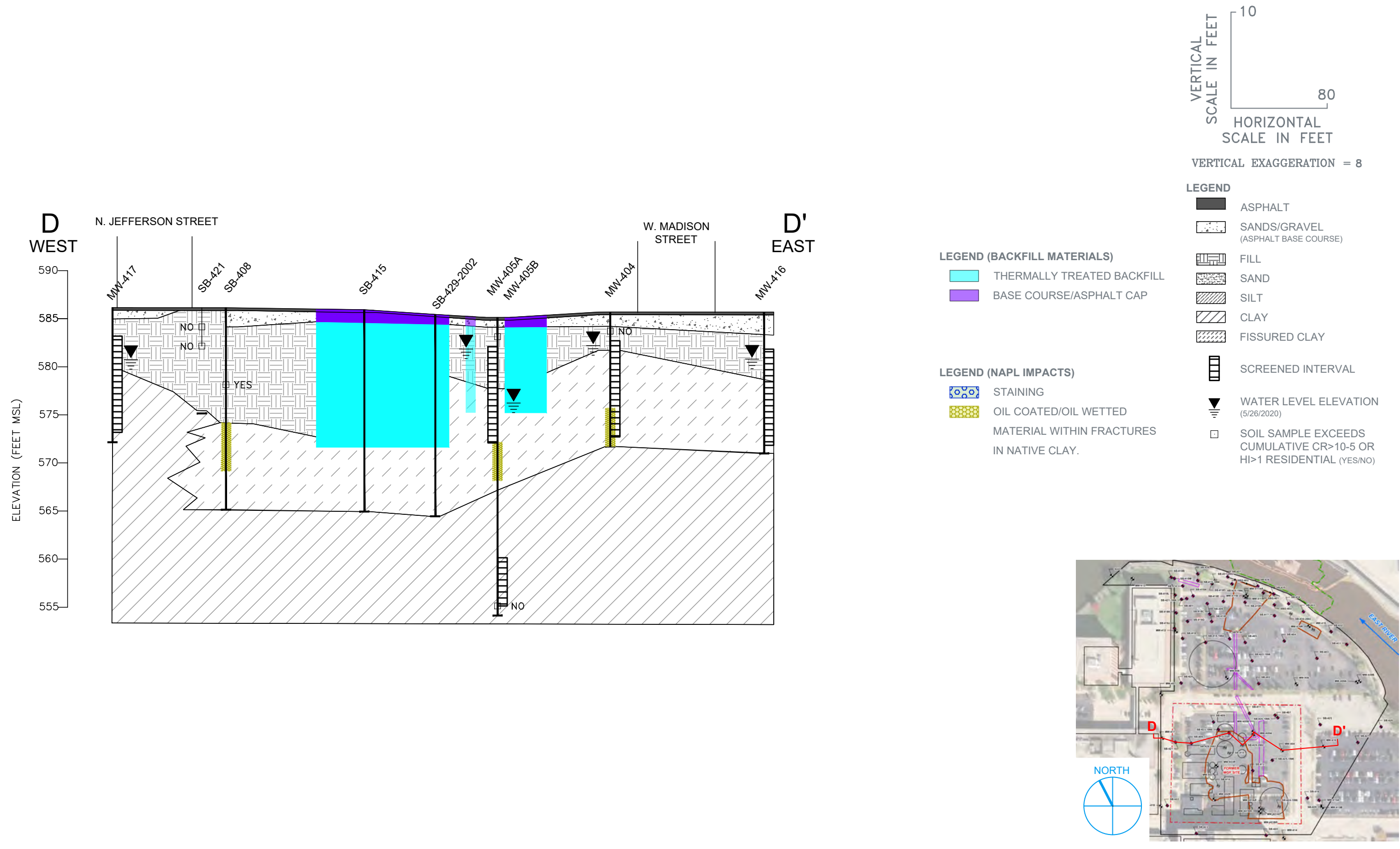


FIGURE 4

RAMBOLL US CORPORATION
 A RAMBOLL COMPANY





NOTES

- CROSS SECTION REPRESENTS A GENERALIZED INTERPRETATION OF SUBSURFACE CONDITIONS. STRATUM LINES ARE BASED ON INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACUTAL SUBSURFACE CONDITIONS. FOR DETAILED DESCRIPTION OF INDIVIDUAL BORINGS, REFER TO SOIL BORING LOGS.
- FORMER STURCTURES SHOWN WHERE BASE WAS FIELD CONFIRMED BY INVESTIGATION.

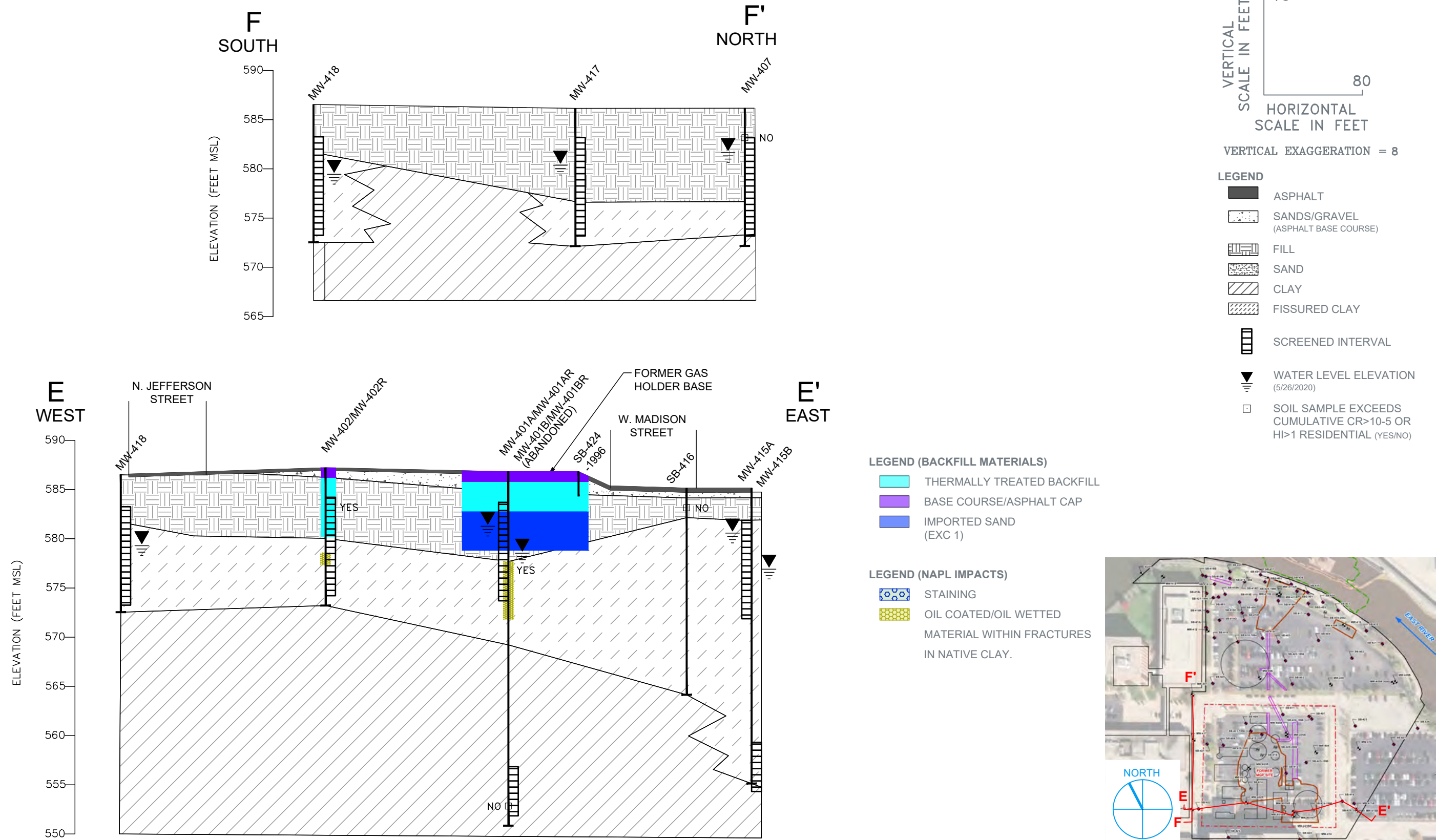
GEOLOGIC CROSS SECTIONS D-D'

SITE SPECIFIC WORK PLAN ADDENDUM NO. 1
FORMER GREEN BAY MANUFACTURED GAS PLANT SITE
 WISCONSIN PUBLIC SERVICE CORPORATION
 GREEN BAY, WISCONSIN

FIGURE 5A

RAMBOLL US CORPORATION
 A RAMBOLL COMPANY





NOTES

- CROSS SECTION REPRESENTS A GENERALIZED INTERPRETATION OF SUBSURFACE CONDITIONS. STRATUM LINES ARE BASED ON INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACUTAL SUBSURFACE CONDITIONS. FOR DETAILED DESCRIPTION OF INDIVIDUAL BORINGS, REFER TO SOIL BORING LOGS.
- FORMER STURCTURES SHOWN WHERE BASE WAS FIELD CONFIRMED BY INVESTIGATION.

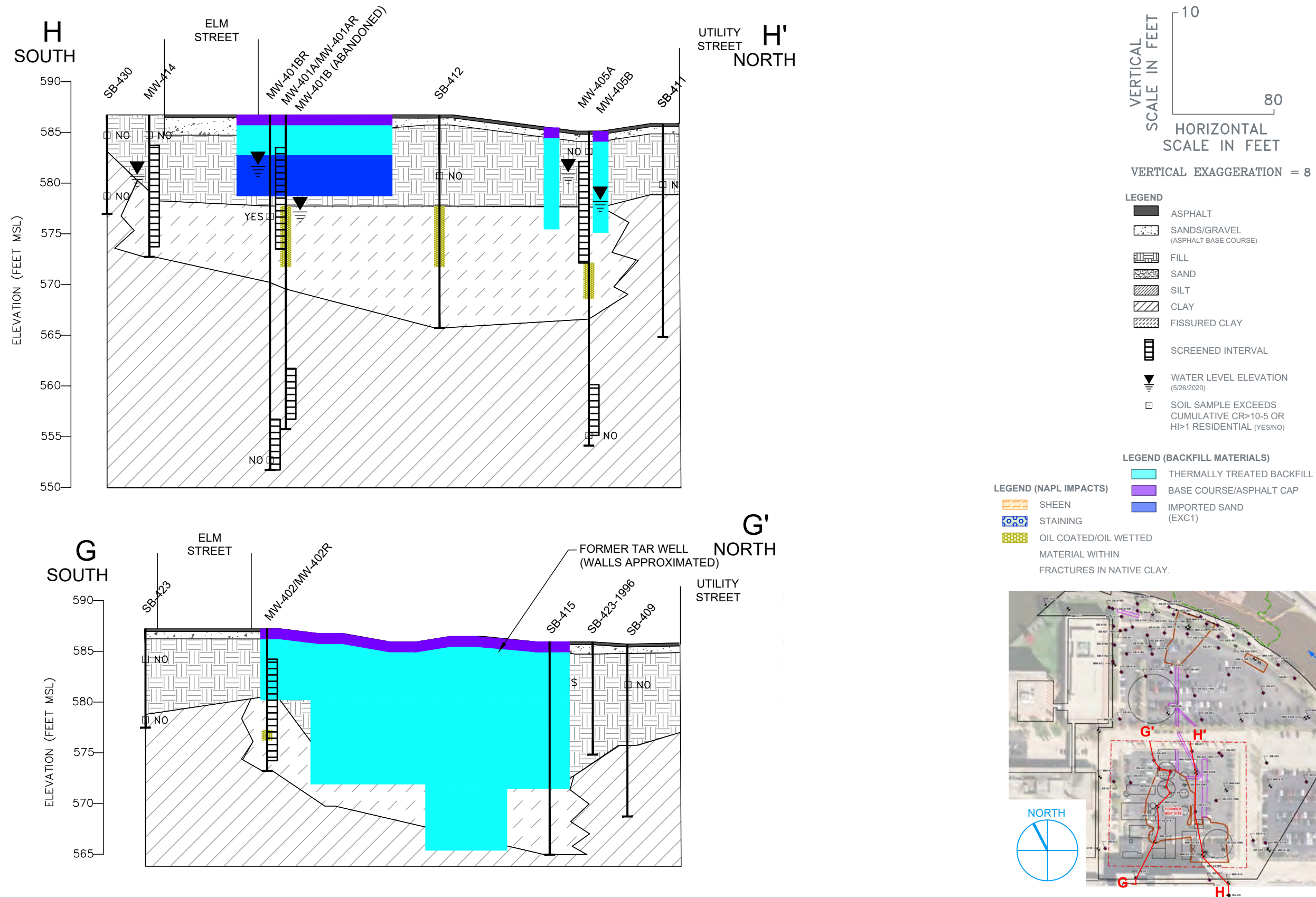
GEOLOGIC CROSS SECTIONS E-E' AND F-F'

**SITE SPECIFIC WORK PLAN ADDENDUM NO. 1
FORMER GREEN BAY MANUFACTURED GAS PLANT SITE
WISCONSIN PUBLIC SERVICE CORPORATION
GREEN BAY, WISCONSIN**

FIGURE 5B

RAMBOLL US CORPORATION
A RAMBOLL COMPANY





NOTES

- CROSS SECTION REPRESENTS A GENERALIZED INTERPRETATION OF SUBSURFACE CONDITIONS. STRATUM LINES ARE BASED ON INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACUTAL SUBSURFACE CONDITIONS. FOR DETAILED DESCRIPTION OF INDIVIDUAL BORINGS, REFER TO SOIL BORING LOGS.
- FORMER STURCTURES SHOWN WHERE BASE WAS FIELD CONFIRMED BY INVESTIGATION.

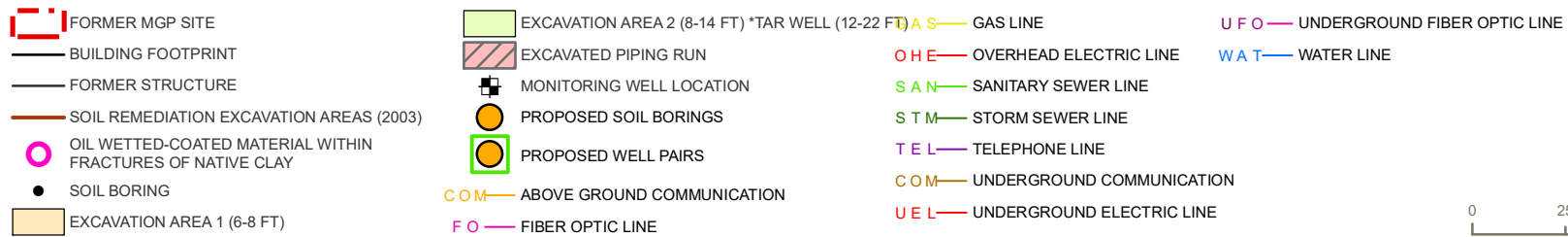
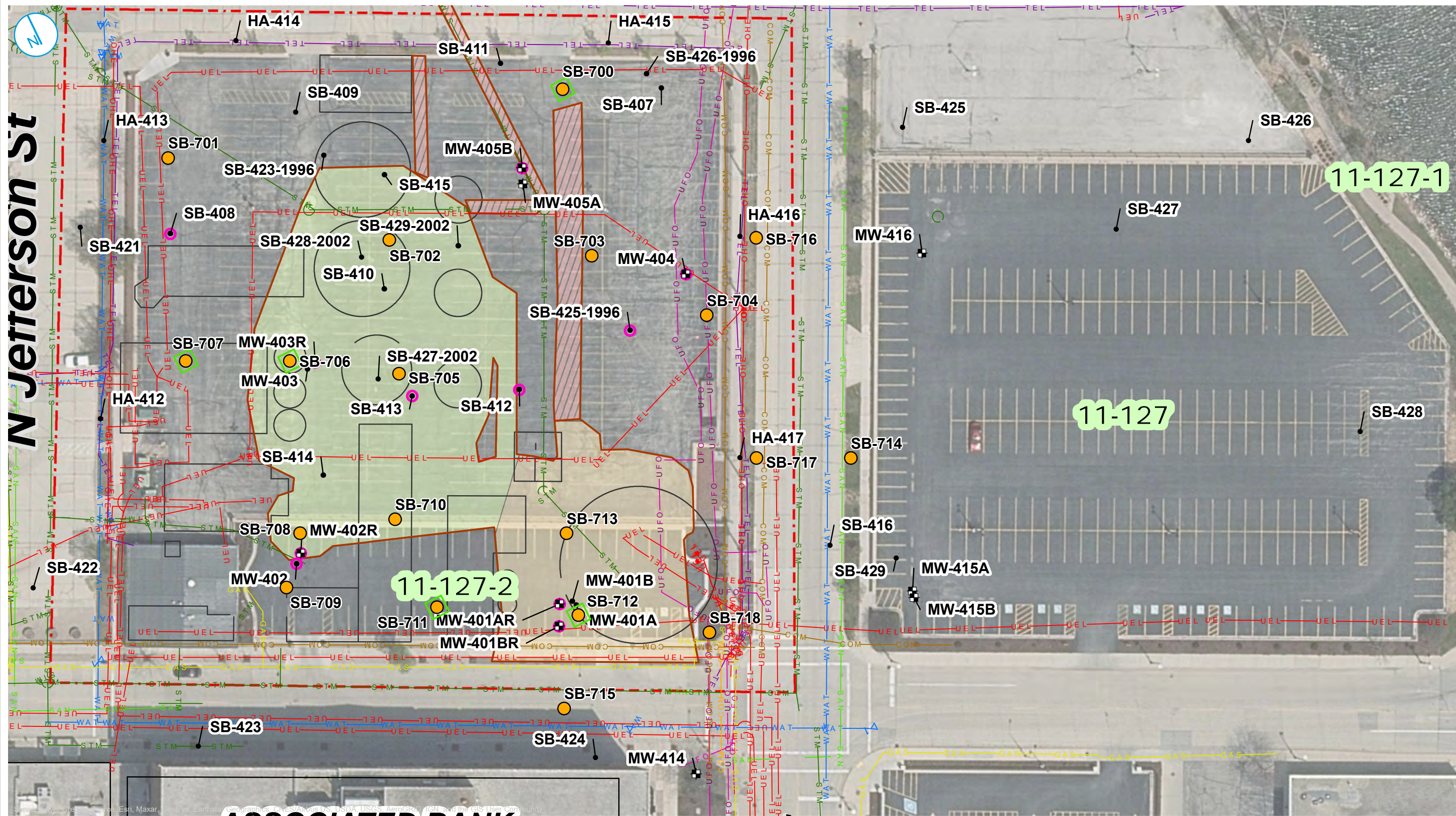
GEOLOGIC CROSS SECTIONS G-G' AND H-H'

SITE SPECIFIC WORK PLAN ADDENDUM NO. 1
FORMER GREEN BAY MANUFACTURED GAS PLANT SITE
 WISCONSIN PUBLIC SERVICE CORPORATION
 GREEN BAY, WISCONSIN

FIGURE 5C

RAMBOLL US CORPORATION
 A RAMBOLL COMPANY





PROPOSED SOIL BORINGS AND MONITORING WELLS

UPLAND REMEDIAL INVESTIGATION DATA SUMMARY
 REPORT FORMER GREEN BAY MANUFACTURED GAS PLANT
 WISCONSIN PUBLIC SERVICE CORPORATION
 GREEN BAY, WISCONSIN



FIGURE 6

TABLES

Table 1. Soil Gas Analytical Results Compared to Residential and Industrial SLs - North Parking Lot

Site-Specific Work Plan Addendum 1
 Wisconsin Public Service Corporation
 Former MGP Site - Green Bay
 700 N. Adams Street, Green Bay, WI 54307
 BRRTS# 02-05-000254 | USEPA# WIN000509948

9-digit Code	Sample Location	Sample Depth	Sample Date	VOC	VOC	VOC	VOC	VOC	VOC	Inorganic	Inorganic	Organic	
				1,2,4-Trimethylbenzene	Benzene	Ethylbenzene	Naphthalene	Toluene	Xylenes, Total	Carbon Dioxide	Oxygen	Methane	
				µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mol percent	mol percent	mol percent	
Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Soil Gas Industrial SL:				8,760	52	164	12	730,000	14,600	NS	NS	NS	
Soil Gas Residential SL:				2,090	12	37	2.8	174,000	3,480	NS	NS	NS	
020416009/020416010 (N)	SG401	4 - 4.5	02/04/2016	2.8	930	8.9	0.84	130	42	12.1	3.51 J	4.27	
080516007/080516008 (N)	SG401	4 - 4.5	08/05/2016	46	12,000	410	13	440	820	28.7	2.61 J	23.4	
020316008	SG402	3.5 - 4	02/03/2016	1.9	1.4	7.0	0.58	170	41	1.50	14.4	0.10 U	
080516006	SG402	3.5 - 4	08/05/2016	12	7.9	14	11	29	25	8.37	5.74	0.0900 U	
080616018	SS413	SubSlab	08/06/2016	7.4	1.100 U	2.1	1.8	11	11	0.09	14.4	0.0800 U	
120416004	SS413	SubSlab	12/04/2016	12	1.7 J	8.1	6.6	27	30	0.11	17.2	0.10 U	
080616019	SG413D	3.5 - 4	08/06/2016	7.6	1.100 U	1.9	7.7	6.1	10	6.53	8.99	0.0900 U	
120416005/120416006 (N)	SG413D	3.5 - 4	12/04/2016	20	7.2 J	15 J	5.0	190 J	73	4.19	13.6	0.10 U	
080616020	SS414	SubSlab	08/06/2016	4.5	1.200 U	1.60 U	1.7	3.5	5.3	4.67	9.98	0.27	
120416007	SS414	SubSlab	12/04/2016	6.8	1.200 U	2.2	8.4	7.1	9.2	2.28	15.7	0.25	
080616021	SG414D	3.5 - 4	08/06/2016	2.8	1.100 U	1.50 U	1.3	1.4	4.50 U	5.39	10.0	0.0900 U	
120416008	SG414D	3.5 - 4	12/04/2016	7.0	1.200 U	5.6	3.3	31	26	3.60	14.2	0.10 U	

[O:MGP 8/12/20, C:SGW 8/13/20, C:YMC 8/13/20, U: AAS 5/8/23]

Notes:

Analyte concentration exceeds the standard for:

BOLD	Soil Gas Industrial SL
<u>Underline</u>	Soil Gas Residential SL
Pink Highlighting	result exceeds one or more screening criteria
Yellow Highlighting	analyte exceedance in statistics for one or more samples

Lab comments and definitions can be found in associated laboratory and validation reports.

Screening Levels:

Screening Levels used on this table were presented in the Multi-Site Risk Assessment Framework (RAF) Addendum Revision 6, issued in August 2017. Since that time, 12 revisions of the RSLs have been published by EPA through May 2023. As a result of these 12 revisions, there were no updates to the RSLs necessary for the MGP-related constituents evaluated in this table.

(N) = Normalized sample locations created from combining parent and field duplicate samples following EPA protocol

µg/m³ = micrograms per cubic meter

BRRTS = Bureau for Remediation and Redevelopment Tracking System

J = Estimated Concentration

MGP = Manufactured Gas Plant

NS = No Screening Level

RI = remedial investigation

SL = Screening Level

U = Concentration was not detected above the reported limit

USEPA = United States Environmental Protection Agency

VOC = Volatile Organic Compound

Table 2. Indoor Air and Ambient Analytical Results Compared to Residential and Industrial SLs - Annex Building

Site-Specific Work Plan Addendum 1
 Wisconsin Public Service Corporation
 Former MGP Site - Green Bay
 700 N. Adams Street, Green Bay, WI 54307
 BRRTS# 02-05-000254 | USEPA# WIN000509948

9-digit Code	Sample Location	Sample Date	VOC		VOC		VOC		VOC		VOC		Inorganic		Inorganic		Organic			
			1,2,4-Trimethylbenzene	Benzene	Ethylbenzene	Naphthalene	Toluene	Xylenes, Total	Carbon Dioxide	Oxygen	Methane									
Reporting Units:			µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mol percent	mol percent	mol percent								
			Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag				
Industrial Indoor Air SL:			263		1.6		4.9		0.36		21,900		438		NS		NS			
Residential Indoor Air SL:			<u>63</u>		<u>0.36</u>		<u>1.1</u>		<u>0.083</u>		<u>5,210</u>		<u>104</u>		<u>NS</u>		<u>NS</u>			
080616011	AMB1	08/06/2016	1.90	U	1.30	U	1.70	U	0.51	U	1.50	U	5.10	U	0.0800	U	15.4	U	0.1000	U
092216001	AMB1	09/22/2016	1.30	U	0.810	U	1.100	U	0.33	U	1.9	U	3.30	U	0.08	U	17.7	U	0.10	U
120416001	AMB2	12/04/2016	1.20	U	0.760	U	1.00	U	0.31	U	0.89	U	3.10	U	0.08	U	17.9	U	0.10	U
080616013	IA1	08/06/2016	1.90	U	1.200	U	1.70	U	0.50	U	1.7	U	5.00	U	0.0800	U	15.5	U	0.1000	U
092216003/092216004 (N)	IA1	09/22/2016	1.30	U	0.860	U	1.100	U	0.35		1.9	U	3.40	U	0.08	U	17.7	U	0.10	U
120416003	IA1	12/04/2016	1.20	U	0.780	U	1.100	U	0.32	U	0.92	U	3.20	U	0.08	U	18.0	U	0.10	U
080616014	IA2	08/06/2016	1.80	U	1.200	U	1.60	U	0.47	U	1.7	U	4.70	U	0.0700	U	15.1	U	0.0900	U
092216002	IA2	09/22/2016	1.20	U	0.790	U	1.100	U	0.32	U	1.8	U	3.20	U	0.08	U	17.6	U	0.10	U
120416002	IA2	12/04/2016	1.30	U	0.84	U	1.100	U	0.35	U	1.5	U	3.40	U	0.08	U	18.3	U	0.10	U

[O:MGP 8/12/20, C:SGW 8/13/20, QA:YMD 8/13/2020, U: AAS 05/8/2023]

Notes:
 Analyte concentration exceeds the standard for:

BOLD	Industrial Indoor Air SL
<u>Underline</u>	Residential Indoor Air SL
Pink Highlighting	result exceeds one or more screening criteria
Yellow Highlighting	analyte exceedance in statistics for one or more samples

Lab comments and definitions can be found in associated laboratory and validation reports.

(N) = Normalized sample locations created from combining parent and field duplicate samples following EPA protocol
 µg/m³ = micrograms per cubic meter
 BRRTS = Bureau for Remediation and Redevelopment Tracking System
 J = Estimated Concentration
 MGP = Manufactured Gas Plant
 NS = No Screening Level
 RI = remedial investigation
 SL = Screening Level
 U = Concentration was not detected above the reported limit
 USEPA = United States Environmental Protection Agency
 VOC = Volatile Organic Compound

Screening Levels:

Screening Levels used on this table were presented in the Multi-Site Risk Assessment Framework (RAF) Addendum Revision 6, issued in August 2017. Since that time, 12 revisions of the RSLs have been published by EPA through May 2023. As a result of these 12 revisions, there were no updates to the RSLs necessary for the MGP-related constituents evaluated in this table.

Table 3. 2018-2022 Groundwater Analytical Results Compared to the Groundwater SL, the PAL, and Tap Water Criteria

Site-Specific Work Plan Addendum 1
Wisconsin Public Service Corporation
Green Bay Former Manufactured Gas Plant Site
700 N Adams St, Green Bay, Wisconsin
BRR#: 02-05-000254 USEPA#: WIN000509948

Table with 28 columns: 9-digit Code, Sample Location, Sample Date, 10 VOCs, 18 PAHs, and 6 Metals. Includes reporting units and groundwater quality criteria (WI Groundwater SL, PAL, Tap Water RSL) for each parameter. Data rows show concentrations and units for various monitoring wells (MW-410R, MW-411AR, MW-411B, MW-412) from 2018 to 2022.



Table 3. 2018-2022 Groundwater Analytical Results Compared to the Groundwater SL, the PAL, and Tap Water Criteria

Site-Specific Work Plan Addendum 1
 Wisconsin Public Service Corporation
 Green Bay Former Manufactured Gas Plant Site
 700 N Adams St, Green Bay, Wisconsin
 BRRTS#: 02-05-000254 USEPA#: WIN000509948

9-digit Code	Sample Location	Sample Date	PVOC	PVOC	PVOC	PVOC	PVOC	PVOC	PVOC	PVOC	PVOC	PAH	PAH	PAH	PAH	PAH	PAH	PAH	PAH	PAH	PAH	PAH	PAH	PAH	PAH	PAH	PAH	Metal	Metal	Metal	Metal	Metal	Metal			
			1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Trimethylbenzenes, Total	Benzene	Ethylbenzene	Toluene	Xylene, o	Xylenes, m + p	Xylenes, Total	1-Methylnaphthalene	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Aluminum, Total	Antimony, Total	Arsenic, Dissolved	Arsenic, Total	Barium, Dissolved	Barium, Total	
Reporting Units:			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			
WI Groundwater SL:			NS	NS	480	5	700	800	NS	NS	2,000	NS	NS	NS	NS	3,000	NS	0.2	0.2	NS	NS	0.2	NS	400	400	NS	100	3,000	250	200	6	10	10	2,000	2,000	
WI Groundwater PAL:			NS	NS	96	0.5	140	160	NS	NS	400	NS	NS	NS	NS	600	NS	0.02	0.02	NS	NS	0.02	NS	80	80	NS	10	NS	50	40	1.2	1	1	400	400	
Tap Water RSL:			56	60	NS	0.46	1.5	1,100	190	190	190	1.1	36	530	530	1,800	0.03	0.025	0.25	120	2.5	25	0.025	800	290	0.25	0.12	1,800	120	20,000	7.8	0.052	0.052	3,800	3,800	
052918001	MW-418	05/29/2018	0.50 U	0.50 U	1.00 U	0.50 U	0.50 U	0.50 U	1.0 U	1.5 U	0.0058 U	0.0048 U	0.0060 U	0.0049 U	0.010 U	0.0074 U	0.010 U	0.0056 U	0.0066 U	0.0074 U	0.013 U	0.0098 U	0.010 U	0.0078 U	0.017 U	0.018 U	0.014 U	0.0075 U	--	--	0.56 U	--	223	--		
110518001	MW-418	11/05/2018	0.84 U	0.87 U	1.71 U	0.25 U	0.22 U	0.17 U	0.26 U	0.47 U	1.5 U	0.0061 U	0.0051 U	0.0063 U	0.0051 U	0.011 U	0.0078 U	0.011 U	0.0059 U	0.0070 U	0.0078 U	0.013 U	0.010 U	0.011 U	0.0082 U	0.018 U	0.019 U	0.014 U	0.0079 U	--	--	2.6 J	--	283	--	
052819001	MW-418	05/28/2019	0.84 U	0.87 U	1.71 U	0.25 U	0.22 U	0.17 U	0.26 U	0.47 U	1.5 U	0.0077 J	0.0095 J	0.0067 U	0.0055 U	0.012 U	0.038 J	0.012 U	0.015 J	0.0096 J	0.014 J	0.017 J	0.011 U	0.026 J	0.0089 U	0.020 U	0.020 U	0.026 J	0.027 J	--	--	0.44 J	--	227	--	
110419001	MW-418	11/04/2019	0.84 U	0.87 U	1.71 U	0.25 U	0.22 U	0.17 U	0.26 U	0.47 U	1.5 U	0.0089 J	0.013 J	0.0061 J	0.0046 U	0.0096 U	0.025 J	0.038 J	0.045	0.039	0.066	0.0092 U	0.097	0.0073 U	0.034 J	0.017 U	0.045 J	0.11	--	--	0.76 J	--	270	--		
052620001	MW-418	05/26/2020	0.84 U	0.87 U	1.71 U	0.25 U	0.32 U	0.27 U	0.26 U	0.47 U	1.5 U	0.0060 J	0.0085 J	0.0059 U	0.0048 U	0.010 U	0.0073 U	0.010 U	0.0059 J	0.0066 U	0.0073 U	0.013 U	0.0097 U	0.012 J	0.0077 U	0.017 U	0.023 J	0.013 U	0.010 J	--	--	1.2 J	--	142	--	
110220001	MW-418	11/02/2020	0.84 U	0.87 U	1.71 U	0.25 U	0.32 U	0.27 U	0.26 U	0.47 U	1.5 U	0.0061 U	0.0051 U	0.0063 U	0.0051 U	0.011 U	0.0078 U	0.011 U	0.0059 U	0.0070 U	0.0078 U	0.013 U	0.010 U	0.011 U	0.0082 U	0.018 U	0.019 U	0.014 U	0.0079 U	--	--	1.2 J	--	177	--	
052421001	MW-418	05/24/2021	0.45 U	0.36 U	0.81 U	0.30 U	0.33 U	0.29 U	0.35 U	0.70 U	1.0 U	0.032	0.043	0.0060 U	0.0052 J	0.010 U	0.0074 U	0.010 U	0.0056 U	0.0066 U	0.0074 U	0.013 U	0.0098 U	0.010 U	0.0078 U	0.017 U	0.18	0.020 J	0.0081 J	--	--	--	1.1 J	--	307	--
110121001	MW-418	11/01/2021	0.45 U	0.36 U	0.81 U	0.30 U	0.33 U	0.29 U	0.35 U	0.70 U	1.0 U	0.028 J	0.032 J	0.013 U	0.012 U	0.017 U	0.013 U	0.018 U	0.018 U	0.022 U	0.021 U	0.025 U	0.017 U	0.024 U	0.022 U	0.014 U	0.042 J	0.024 U	0.021 U	--	--	0.56 U	--	291	--	
050922001	MW-418	05/09/2022	0.45 U	0.36 U	0.81 U	0.30 U	0.33 U	0.29 U	0.35 U	0.70 U	1.0 U	0.017 U	0.013 U	0.014 U	0.012 U	0.018 U	0.013 U	0.019 U	0.019 U	0.023 U	0.022 U	0.026 U	0.017 U	0.025 U	0.023 U	0.015 U	0.019 U	0.025 U	0.022 U	--	--	--	0.56 J	--	142	--
110722001	MW-418	11/07/2022	0.45 U	0.36 U	0.81 U	0.30 U	0.33 U	0.29 U	0.35 U	0.70 U	1.0 U	0.019 U	0.014 U	0.015 U	0.013 U	0.019 U	0.014 U	0.013 U	0.0095 U	0.024 U	0.023 U	0.013 U	0.019 U	0.027 U	0.025 U	0.016 U	0.021 U	0.027 U	0.024 U	--	--	--	0.56 U	--	215	--

Table 3. 2018-2022 Groundwater Analytical Results Cc

Site-Specific Work Plan Addendum 1
 Wisconsin Public Service Corporation
 Green Bay Former Manufactured Gas Plant Site
 700 N Adams St, Green Bay, Wisconsin
 BRRTS#: 02-05-000254 USEPA#: WIN000509948

9-digit Code	Sample Location	Sample Date	Metal																							Inorganic			Organic		Field							
			Cadmium, Dissolved	Cadmium, Total	Chromium, Dissolved	Chromium, Total	Copper, Total	Iron, Dissolved	Iron, Total	Lead, Dissolved	Lead, Total	Manganese, Dissolved	Manganese, Total	Mercury, Dissolved	Mercury, Total	Nickel, Total	Selenium, Dissolved	Selenium, Total	Silver, Dissolved	Silver, Total	Vanadium, Total	Zinc, Total	Chloride, Total	Nitrogen, NO ₂ + NO ₃ , Total	Sulfate, Total	Methane	Dissolved oxygen	Groundwater, depth to	Oxidation Reduction Potential	pH, Field	Specific Conductance, Field	Temperature, Water	Turbidity, Quantitative					
Reporting Units:			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	feet	millivolts	s.u.	µS/cm	Deg C	NTUs						
WI Groundwater SL:			5	5	100	100	1,300	NS	NS	15	15	300	300	2	2	100	50	50	50	50	30	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS						
WI Groundwater PAL:			0.5	0.5	10	10	130	150	150	1.5	1.5	60	60	0.2	0.2	20	10	10	10	10	6	2,500	125,000	2,000	125,000	NS	NS	NS	NS	NS	NS	NS						
Tap Water RSL:			1.8	1.8	22,000	22,000	800	14,000	14,000	15	15	430	430	5.7	5.7	390	100	100	94	94	86	6,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS						

Table 3. 2018-2022 Groundwater Analytical Results Cc

Site-Specific Work Plan Addendum 1
Wisconsin Public Service Corporation
Green Bay Former Manufactured Gas Plant Site
700 N Adams St, Green Bay, Wisconsin
BRRS#: 02-05-000254 USEPA#: WIN000509948

Table with columns for Metal, Inorganic, Organic, Field, and Reporting Units. Rows include 9-digit Code, Sample Location, Sample Date, and various chemical parameters like Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Silver, Vanadium, Zinc, Chloride, Nitrogen, Sulfate, Methane, Dissolved oxygen, Groundwater depth, Oxidation Reduction Potential, pH, Specific Conductance, Temperature, and Turbidity.



Table 3. 2018-2022 Groundwater Analytical Results Cc

Site-Specific Work Plan Addendum 1
 Wisconsin Public Service Corporation
 Green Bay Former Manufactured Gas Plant Site
 700 N Adams St, Green Bay, Wisconsin
 BRRTS#: 02-05-000254 USEPA#: WIN000509948

9-digit Code	Sample Location	Sample Date	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Inorganic	Inorganic	Inorganic	Organic	Field	Field	Field	Field	Field	Field	Field	
			Cadmium, Dissolved	Cadmium, Total	Chromium, Dissolved	Chromium, Total	Copper, Total	Iron, Dissolved	Iron, Total	Lead, Dissolved	Lead, Total	Manganese, Dissolved	Manganese, Total	Mercury, Dissolved	Mercury, Total	Nickel, Total	Selenium, Dissolved	Selenium, Total	Silver, Dissolved	Silver, Total	Vanadium, Total	Zinc, Total	Chloride, Total	Nitrogen, NO2 + NO3, Total	Sulfate, Total	Methane	Dissolved oxygen	Groundwater, depth to	Oxidation Reduction Potential	pH, Field	Specific Conductance, Field	Temperature, Water	Turbidity, Quantitative
Reporting Units:			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	feet	millivolts	s.u.	µS/cm	Deg C	NTUs		
WI Groundwater SL:			5	5	100	100	1,300	NS	NS	15	15	300	300	2	2	100	50	50	50	50	30	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
WI Groundwater PAL:			0.5	0.5	10	10	130	150	150	1.5	1.5	60	60	0.2	0.2	20	10	10	10	10	6	2,500	125,000	2,000	125,000	NS	NS	NS	NS	NS	NS		
Tap Water RSL:			1.8	1.8	22,000	22,000	800	14,000	14,000	15	15	430	430	5.7	5.7	390	100	100	94	94	86	6,000	NS	NS	NS	NS	NS	NS	NS	NS	NS		
052918001	MW-418	05/29/2018	0.16 U	--	2.0 U	--	--	221 U	--	0.39 U	--	23.6	--	0.13 U	--	--	12.5	--	0.20 U	--	--	--	--	6,500	69,000	--	4.21	5.82	214.1	6.80	3,477	16.34	5.27
110518001	MW-418	11/05/2018	2.2 J	--	5.1 U	--	--	553 U	--	2.3 J	--	365	--	0.084 U	--	--	5.8	--	0.93 J	--	--	--	--	3,400	84,800	--	0.46	6.11	227.0	6.88	3,189.6	15.57	4.34
052819001	MW-418	05/28/2019	0.15 U	--	1.0 U	--	--	111 U	--	0.24 U	--	185	--	0.084 U	--	--	10.7	--	0.10 U	--	--	--	--	5,600	86,800	--	0.24	5.13	248.3	6.75	5,596	12.70	5.28
110419001	MW-418	11/04/2019	0.30 U	--	2.0 U	--	--	116 U	--	0.47 U	--	165	--	0.084 U	--	--	5.4	--	0.25 U	--	--	--	--	3,800	65,500	--	0.25	5.81	178.6	6.76	6,288.6	16.33	0.00
052620001	MW-418	05/26/2020	0.83 J	--	2.0 U	--	--	116 U	--	1.0 J	--	128	--	0.084 U	--	--	3.0	--	0.42 J	--	--	--	--	2,000	50,400	0.66 U	0.56	5.36	228.6	7.18	6,146.5	35.63	1.62
110220001	MW-418	11/02/2020	0.58 J	--	2.0 U	--	--	116 U	--	0.57 J	--	294	--	0.066 U	--	--	3.3	--	0.25 U	--	--	--	--	1,700	59,300	14.6	0.16	5.79	-102.3	6.83	5,512.1	16.45	0.00
052421001	MW-418	05/24/2021	--	0.55 J	--	2.0 U	--	--	116 U	--	0.72 J	--	389	--	0.066 U	--	--	5.1	--	0.25 U	--	--	--	2,700	70,500	30.0	6.81	6.14	200.2	6.76	4,956.7	16.23	0.00
110121001	MW-418	11/01/2021	0.30 U	--	2.0 U	--	--	116 U	--	0.47 U	--	779	--	0.066 U	--	--	2.6	--	0.25 U	--	--	--	--	1,400	81,800	1.3 J	0.32	6.33	57.9	6.81	5,407.7	16.00	0.00
050922001	MW-418	05/09/2022	--	0.15 U	--	1.0 U	--	--	58.0 U	--	0.24 U	--	99.1	--	0.066 U	--	--	15.3	--	0.13 U	--	--	--	7,900	59,400	1.5 J	0.00	7.30	168.5	7.18	2,776.5	14.94	5.24
110722001	MW-418	11/07/2022	--	0.45 J	--	2.0 U	--	--	116 U	--	0.60 J	--	145	--	0.066 U	--	--	10.3	--	0.25 U	--	--	--	11,300	153,000	0.77 J	7.23	4.05	227.3	6.91	2,981.7	13.96	0.00

Table 3. 2018-2022 Groundwater Analytical Results Compared to the Groundwater SL, the PAL, and Tap Water Criteria

Site-Specific Work Plan Addendum 1
 Wisconsin Public Service Corporation
 Green Bay Former Manufactured Gas Plant Site
 700 N Adams St, Green Bay, Wisconsin
 BRRTS#: 02-05-000254 USEPA#: WIN000509948

Bold	exceeds the WI Groundwater SL
<u>Underline</u>	attains or exceeds the WI Groundwater PAL
<i>Italic</i>	exceeds the Tap Water RSL
Pink Highlighting	Groundwater SL exceedance; results only exceeding the PAL and/or Tap Water criteria are not highlighted.
Yellow Highlighting	analyte concentration exceedance in one or more samples

Screening Levels:
 Screening Levels used on this table were presented in the Multi-Site Risk Assessment Framework (RAF) Addendum Revision 6, issued in August 2017. Since that time, nine revisions of the RSLs have been published by EPA through May 2022. The RSLs necessary for the MGP-related constituents evaluated in this table are up to date with the most recent revision.
 PAL and ES from WI Administrative Code NR 140 groundwater quality standard revised effective January 2020.

Results & Flags:
 -- = Analysis not performed
 J = Estimated Concentration
 NA = Not Applicable
 U = Concentration was not detected above the reported limit

Acronyms:
 (N) = Normalized sample locations created from combining parent and field duplicate samples following EPA protocol
 µg/L = micrograms per liter
 BRRTS = Bureau for Remediation and Redevelopment Tracking System
 EPA = Environmental Protection Agency
 MCL = Maximum Contaminant Level
 MGP = Manufactured Gas Plant
 NO2 + NO3 = nitrite plus nitrate
 NS = No Screening Level/No Standard
 PAH = Polycyclic Aromatic Hydrocarbon
 PAL = Preventive Action Limit
 PVOC = Petroleum Volatile Organic Compound
 RSL = Regional Screening Level
 SL = Screening Level
 USEPA = United States Environmental Protection Agency
 WI = Wisconsin

Superscripts:
 1. Total Trimethylbenzenes were calculated by Ramboll as follows:
 a. Where no detections were observed, the sum of the reporting limits is presented.
 b. Where detections were observed, only the detected results were added together for the total summation.
 c. Analytes used for the calculation are 1,2,4-Trimethylbenzene and 1,3,5-Trimethylbenzene.

Lab comments, additional data qualifiers and definitions can be found in associated laboratory reports.

Table 4. Sampling and Analysis Plan

Site-Specific Work Plan Addendum 1
 Wisconsin Public Service Corporation
 Former MGP Site - Green Bay
 700 N. Adams Street, Green Bay, WI 54307
 BRRTS# 02-05-000254 | USEPA# WIN000509948

Sample Type	Proposed Number of Samples	Parameter	Method	Field Duplicates ¹ (1 extra volume)	MS/MSD ² (2 extra volumes)	Equipment Blanks	Trip Blanks	Container Type	Minimum Volume	Preservation (Cool All Samples to 4° ± 2°C Unless 'None' Indicated)	Holding Time from Sample Date
Soil Gas	4	BTEX and 1,2,4-trimethylbenzene	TO-15	1 per 20	--	Equipment blanks will be collected at a frequency of 1 per soil sampling day with non-dedicated sampling equipment.	--	Summa	1 L	--	30 days
	4	Oxygen, carbon dioxide, and methane	ASTM D1946 or EPA3C	1 per 20	--		--				
Soil	57	PVOCs ³	8260	1 per 20	1 per 20		VOC trip blanks will accompany each cooler containing VOC samples.	Glass Vial	2 oz.	NaSO4 and MeOH	48 hours to freeze 14 days to analyze
		PAHs ⁴	8270E	1 per 20	1 per 20		--	Glass	4 oz.	--	14 days to extract 40 days to analyze
		Total Metals ⁵	6020B/7471	1 per 20	1 per 20		--	Plastic	5 oz.	--	14 days/6 months
		Total Cyanide	9012	1 per 20	1 per 20		--	Glass	4 oz.	--	14 days
Groundwater	10	PVOCs ³	8260	1 per 20	1 per 20		VOC trip blanks will accompany each cooler containing VOC samples.	Glass Vial	3-40 mL	HCl to pH<2, Zero Headspace	14 days
		PAHs ⁴	8270E	1 per 20	1 per 20		--	Amber Glass	1 L	--	7 days to extract 40 days to analyze
		Total Metals ⁵	6020B/7471	1 per 20	1 per 20		--	Plastic	250 mL	HNO3 to pH<2	6 months
		Sulfate	300	1 per 20	1 per 20		--	Plastic	250 mL	--	28 days
		Nitrogen (Nitrite + Nitrate)	353.2	1 per 20	1 per 20	--	Plastic	250 mL	H2SO4	28 days	

Notes:

- Field duplicates will be collected at a frequency of 1 per 20 or fewer samples.
 - Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples will be collected at a frequency of 1 per group of 20 or fewer samples. Additional volume will be determined by laboratory requirements.
 - Petroleum volatile organic compounds (PVOCs) include benzene, ethylbenzene, toluene, total xylenes, and 1,2,4-trimethylbenzene
 - Polycyclic aromatic hydrocarbon (PAHs) include 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Pyrene
 - Total metals include arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver
- BRRTS - Bureau for Remediation and Redevelopment Tracking System
 BTEX - benzene, toluene, ethylbenzene and xylenes
 L - liter
 mL - milliliter
 MGP - manufactured gas plant
 -- - not applicable
 oz. - ounce
 PAH - polycyclic aromatic hydrocarbon
 PVOC - petroleum volatile organic compound
 TPAH - total polycyclic aromatic hydrocarbons
 USEPA - United States Environmental Protection Agency