REMEDIAL INVESTIGATION WORK PLAN

CHG&E Kingston Gasworks Site #C356017

Kingston - Ulster County, New York

Prepared for

Central Hudson Gas & Electric Corporation
Poughkeepsie, New York

Prepared by

TRC
Windsor, Connecticut

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TRC Project No. 171506

July 2010

"I certify that this 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)".

Douglas A. Martin, LEP, CHMM
Senior Environmental Scientist

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1.0 INTRODUCTION

TRC Environmental Corporation (TRC), under contract to Central Hudson Gas & Electric Company (CHG&E), has been retained to complete characterization of the nature and extent of environmental impacts associated with the CHG&E Kingston Gasworks, located at the foot of North Street in the City of Kingston, New York (the Site). The Site location is depicted on Figure 1.

The Site formerly operated as a manufactured gas plant (MGP) from the 1890's to 1958. Since 1926, the Site has been owned by CHG&E. On September 25, 2008, CHG&E and the New York State Department of Environmental Conservation (NYSDEC) executed a Brownfield Cleanup Agreement (BCA) to provide a framework for conducting environmental investigation and remediation activities at the Site. Future environmental investigation and remediation activities will be conducted in accordance with the provisions of the BCA (NYSDEC, 2008).

This document constitutes the Work Plan (WP) for conducting a Remedial Investigation (RI) at the Former Kingston Manufactured Gas Plant Site.

1.1 Objective

This WP describes investigation procedures and methodologies that will be used to obtain data and information in support of the eventual full characterization of the environmental conditions at the Site and to ensure the reliable collection and handling of environmental samples and analytical data. This plan has been prepared as required under the executed BCA, and in accordance with the NYSDEC Division of Environmental Remediation Draft *DER-10 Technical Guidance for Site Investigation and Remediation* (November 2009).

TRC personnel and their subcontractors are required to become familiar with and follow the provisions of this plan. Copies of this WP will be provided to on-site personnel as well as appropriate subcontractor personnel for orientation to expected levels of project Quality Assurance/Quality Control (QA/QC) activities.

1.2 Project Organization

1.2.1 Project Review and Oversight

This project will be largely performed by TRC personnel under contract to CHG&E, with subcontractor support provided as needed. Project review will be conducted by Mr. Wayne Mancroni and Mr. Adam Etringer, and ultimately by the NYSDEC. The names and addresses of select individuals from CHG&E, TRC, and the NYSDEC involved in project review and oversight appear below:

CHG&E	**TRC**	**NYSDEC**
Wayne Mancroni Senior Environmental Research & Technical Specialist 284 South Avenue Poughkeepsie, NY 12601 (845) 486-5534	Douglas Martin Senior Project Manager 21 Griffin Road North Windsor, CT 06095 (860) 298-6219	Jamie Verrigni Project Manager Division of Environmental Remediation 625 Broadway, 11th Floor Albany, NY 12233-7014
Adam Etringer MGP Project Manager 284 South Avenue Poughkeepsie, NY 12601 (845) 486-5641	Richard Gille Task Manager 21 Griffin Road North Windsor, CT 06095 (860) 298-6219	

1.2.2 Project Staff Responsibilities

TRC will conduct and oversee the field investigation activities at the Site. The main point-of-contact between CHG&E and TRC will be TRC's Project Manager, Mr. Douglas Martin. Mr. Martin will have technical review responsibilities for the project as well. Field investigations and operations will be overseen by Mr. Richard Gille, in coordination with CHG&E and TRC's Project Manager.

1.3 Site Health and Safety

A Site-specific Health and Safety Plan (HASP) has been prepared in accordance with the applicable OSHA standards and the USEPA Office of Emergency and Remedial Response Standard Operating and Safety Guides (Publication 9285.1-03, June 1992) and has been provided under a separate cover.

2.0 SITE INFORMATION

2.1 Site Description

The Site is located near East Strand Street in the City of Kingston, Ulster County, New York. The Site is bounded to the north by a large metal scrap yard (B. Millens Sons, Inc.), to the east by an access road and boat launch off of East Strand Street, to the south by the Rondout Creek, and to the west by a vacant lot which formerly operated as a fuel oil tank farm. A site location map is provided as Figure 1.

The Site is approximately 1.7 acres in size and is surrounded by a chain-link fence. Currently, CHG&E operates a natural gas regulator station at the Site. In addition, CHG&E also uses the Site for equipment storage. Features at the Site include above and below grade gas transmission/distribution lines in the northeast corner, a building on the east side of the Site (former governor house), a building on the west side of the site (a portion of the former compressor room), as well as remnant foundations and footings from former site structures. Most of the ground surface at the Site is covered by former foundations and/or gravel. An aging and deteriorating wooden bulkhead lies at the southern perimeter of the Site, along Rondout Creek (NYSDEC, 2008b).

Topography across the Site is relatively flat and generally slopes toward the south-southeast, toward Rondout Creek at an average gradient of approximately 2 percent. The elevation of the Site is approximately 9-12 feet (ft.) above mean sea level (msl) (NYSDEC, 2008b).

2.1.1 Geology

According to the Surficial Geologic Map of New York, Lower Hudson Sheet (Cadwell, 1988), the Site is underlain by recent deposits of oxidized, non-calcareous, fine sand to gravel, that in larger valleys may be overlain by silt.

Fifty three soil borings have been advanced across the Site and adjacent areas during previous environmental investigations. In their 2002 report, Blasland, Bouck & Lee, Inc. (BBL) noted that soils encountered from the ground surface to 10 ft. bgs. consisted of silty, unsorted sands containing little to some gravel mixed with fill consisting of coal, cinders, concrete, timbers, wood and brick fragments. Beneath this fill layer, native soils encountered reportedly consisted of 3 to 14 feet of silty unsorted sands containing little to some gravel. The unsorted sands, sometimes containing 0.5 to 1 inch layers of silty clay approximately 1-foot apart, were underlain by a fine-sandy/clayey silt unit containing trace amounts of organic material. The top of the silt unit was observed at depths ranging from approximately 6 to 15 ft. bgs. The silt unit, typically mixed with medium to fine sands, extended to at least 44 ft. bgs. along the southern portion of the Site, along Rondout Creek. Saturated conditions were reportedly present beneath the Site at depths ranging from approximately 1.5 to 6.0 ft. bgs.

According to the Geologic Map of New York, Lower Hudson Sheet (Fisher, Isachsen, and Rickard, 1970), bedrock underlying the Site consists of greywacke shale of the Austin Glen Formation which is also present along both sides of the Hudson River from Kingston to Poughkeepsie. Although boring depths typically extended to approximately 50 ft. bgs., BBL reportedly did not encounter bedrock in any of the borings advanced during their investigations of the Site.

2.1.2 Hydrogeology

Adjacent to the Site, Rondout Creek is designated as a Class C Water. Class C waters are designated by the State of New York as water that shall be suitable for fish propagation and survival as well as primary and secondary contact recreation, although other factors may limit the use for these purposes. Approximately 0.5 mile east of the Site, Rondout Creek joins the Hudson River. At the point of confluence, the Hudson River is designated as Class A waters. Class A waters shall be suitable for fish propagation and survival. Class A waters may also be used as a water supply source for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing (NYCRR Parts 701 and 858).

Previous ground water monitoring by BBL in January 2002 indicates shallow ground water elevations ranging from approximately 4 to 8 ft. above msl. Ground water flow is reported to be in a southerly direction, toward Rondout Creek. The results of ground water monitoring by BBL also indicate that ground water beneath the Site is tidally influenced. A relatively moderate slope toward Rondout Creek was observed during high tide, with ground water elevation gradients of 0.023 foot per foot (ft/ft) (between wells MW-2 and MW-1) along the western portion of the Site, 0.005 ft/ft (between wells MW-6 and MW-3) along the central portion of the Site, and 0.005 ft/ft (between wells MW-5 and MW-4) along the eastern portion of the Site. A slightly steeper ground water slope was observed during low-tide conditions, with ground water elevation gradients of 0.03 ft/ft (between wells MW-2 and MW-1) along the western portion of the Site, 0.018 ft/ft (between wells

MW-6 and MW-3) along the central portion of the Site, and 0.015 ft/ft (between wells MW-5 and MW-4) along the eastern portion of the Site.

2.2 Site History

Prior to development and operation as a manufactured gas plant (MGP), the Site was occupied by W.J. Turk Co. Lumberyard (Sanborn, 1899). Although the 1899 Sanborn Map depicts the Site developed with the lumberyard mentioned above, a 1986 Phase I Investigation report by EA Science and Technology indicates that in 1892, the Site was owned and operated by the Rondout & Kingston Gas and Lighting Company which produced coal gas and water gas using the A. Harris process. In the same year, the Rondout & Kingston Gas and Light Company consolidated with the Kingston Electric Company. In 1902, the Site was bought by Kingston Gas and Electric Company (EA, 1986). Full-time gas production operations reportedly continued from 1902 until 1925 when coal gas manufacturing operations ceased and the plant was operated during periods of peak demand only.

In 1926, the Kingston Gas & Electric Company merged with the Ulster Light and Power Company, United Hudson Electric Corporation, and the Upper Hudson Electric & Railroad Company to form Central Hudson Gas & Electric Corporation. In 1927, old processing equipment was retired and new equipment was installed at the Kingston MGP for carbureted water gas manufacturing. The new equipment reportedly increased the plant's overall manufacturing capacity and by the end of year, the Kingston MGP began supplying gas to the Saugerties Gas & Light Company, in the neighboring town of Saugerties, New York (EA, 1986). By the end of the 1920's, the Kingston MGP is reported to have produced an average of 62 million standard cubic feet (MM scf/year) of coal gas, and 53 MM scf/year of water gas. Also in that decade, the plant is reported to have generated an average of 3,000 tons of coke and 16,000 gallons of tar (EA, 1986).

By 1930, the Poughkeepsie North Water Street MGP provided manufactured gas to the Kingston area, and the Kingston MGP produced gas on a standby basis until the plant was retired in 1958. Most of the MGP structures were demolished by 1974, although several building foundations and piping are reportedly still present in the subsurface (BBL, 2002).

2.2.1 Previous Environmental Investigation

According to the Citizen Participation Plan (CPP) for the Kingston Gas Works Site (NYSDEC, 2008b), nine environmental investigations have been conducted at the Site. A summary of these investigations is provided below. Additionally, information obtained from previous environmental reports is incorporated into various sections of this work plan. Previous investigation sample locations including test pits, soil borings, ground water monitoring wells, and sediment sample locations are depicted on Figure 2.

1986 Phase I Investigation, EA Science and Technology

In 1986, EA conducted a Phase I Investigation at the Site. The investigation consisted of a review of available historical records, a compilation of available Site information, calculation of a preliminary Hazard Ranking System (HRS) score, site reconnaissance, and soil vapor survey.

During their site reconnaissance on August 1, 1986, EA noted no obvious visible evidence of the presence of coal gas manufacturing wastes or hazardous chemical compounds. Measurements of total organic vapors made during the site reconnaissance using a photoionization detector (PID) reportedly did not detect the presence of vapors in the breathing zone. On November 17 and 18, 1986, EA performed a soil vapor survey of the Site, involving the collection and analysis of 31 soil vapor samples collected from separate locations in a 50-foot grid pattern across the Site. Soil vapor samples were collected from depths of 2 to 2.5 feet below ground surface (ft. bgs.) and were analyzed on-site using a gas chromatograph. Results of the 1986 Soil Vapor Survey indicate benzene was detected in seven of the 31 soil vapor samples, at concentrations of 0.1 parts per million (ppm) to 22 ppm. Toluene was detected in two of the 31 soil vapor samples, at concentrations of 2 ppm in both samples. The highest concentrations of benzene and toluene were reportedly detected in the vicinity of the former gas holders and former tar wells. Based on the detections of benzene and toluene, EA concluded that there was a reasonable likelihood that coal tar and/or coal tar impacted soil was present beneath the Site.

Based on the completion of their investigation, EA concluded that there was insufficient data available to prepare a final HRS score. In order to prepare a final HRS score for the Site, EA recommended the completion of a Phase II Investigation involving the installation of ground water monitoring wells, advancement of soil borings, and the collection and analysis of ground water, surface water, soil and sediment samples.

2002 Data Report, Kingston Site, Blasland, Bouck & Lee, Inc.

In 2002, BBL summarized all previous environmental investigation work completed at the former Kingston Gasworks to that point. Information summarized in this report included investigations completed by BBL from June 25, 2001 to March 28, 2002 and a summary of remedial activities conducted at the Site from 2003 to 2004 (Appendix H of the same report).

During their investigations on the Site, BBL advanced 53 soil borings across the Site, as depicted in Figure 2. Non-aqueous phase liquids (NAPL) were identified in soils in the form of oil and tars. NAPL and impacted soils were reportedly observed in the fill and sand units above the silt unit. BBL noted the presence of oil within the saturated, unsorted sands of all borings except KSB-7, KSB-23, KSB-27, KSB-30, KSB-39, KSB-41, KSB-42, KSB-43, KSB-44, KSB-45, KSB-46, KSB-47, KSB-50, KSB-51, KSB-52 and KSB-53. Additionally, tars were reportedly observed in soil boring locations KSB-5, KSB-11, KSB-18, KSB-26 and KSB-32. NAPL was generally not observed in the silt unit, except at KSB-8, KSB-15, KSB-17, KSB-19 and KSB-34.

Over the course of their Site investigations, BBL collected 60 soil samples from 53 boring and 9 test pit locations, including the collection of 18 impacted samples, 17 vertical delineation samples, and 25 horizontal delineation samples. The 60 soil samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs). In addition, a sample from the oxide tank/box area was analyzed for total cyanide by EPA Method 9012.

The soil analytical results were screened against the proposed NYSDEC cleanup levels set forth in the Technical and Administrative Guidance Memorandum 95-4046, (TAGM 4046) (NYSDEC, 1994). The screening results are summarized as follows:

- Individual BTEX concentrations and total BTEX concentrations detected above TAGM screening levels were primarily associated with oil and tar impacted soils at KSB-5, KSB-13, KSB-17, KSB-18, KSB-21, KSB-24, KSB-25, KSB-26, KSB-35, KSB-37, KSB-38, and KSB-40 except for samples KSB-7 and KSB-51, which were located along the eastern edge of the site.

- Individual non-carcinogenic PAH concentrations and total PAH concentrations detected above TAGM screening levels were primarily associated with tar impacted soils (versus oil-related impacts) at KSB-5, KSB-6, KSB-17, KSB-18, and TP-1 with the exception of two oil impacted borings KSB-38 and KSB-40.
- Where carcinogenic PAHs (CPAHs) were detected, the concentrations detected were above TAGM screening levels due to TAGM levels below the analytical detection limits.
- Total CPAH concentrations detected above TAGM levels were primarily associated with tar and oil impacted soils at KSB-12, KSB-14, KSB-17, KSB-18, KSB-25, KSB-38, and TP-1 except for the samples from KSB-1, KSB-3, KSB-33, KSB-34, KSB-46, and KSB-48.

On September 25, 2001, BBL collected ground water samples from five of the six wells (MW-1 through MW-5) installed on the Site, to evaluate ground water quality (refer to Figure 2 for monitoring well locations). In their report, BBL notes that monitoring well MW-6 was not sampled, but no explanation is given as to why. Ground water samples were submitted for laboratory analysis of VOCs and SVOCs. During sampling visible indications of NAPL were noted in four of the five monitoring wells sampled.

Groundwater analytical results from BBL's September 2001 sampling event were compared to NYSDEC water quality standards and guidance values set forth in the Division of Water Technical and Operational Guidance Series 1.1.1, typically referred to as the TOGS criteria (NYSDEC, 1998). Xylenes, ethylbenzene, and naphthalene were detected above the NYSDEC TOGS criteria at each of the five wells, while benzene was detected above TOGS criteria at wells MW-1 through MW-4 and toluene was only detected above TOGS criteria at MW-2. Other PAHs detected above TOGS criteria include acenaphthene at MW-1, MW-3, and MW-4 and phenanthrene at MW-4. All the phenolic compounds detected at MW-2 were at concentrations above TOGS criteria.

During their investigations of the Site, BBL also collected a total of 37 sediment samples from an area of Rondout Creek located adjacent to the Site, as shown in Figure 2. Sediment samples were obtained from 35 boring locations, and included the collection of 25 shallow sediment samples (between 0-1 foot), 10 vertical delineation samples (below observations of impacts), and 2 additional sediment samples to evaluate PAH concentration gradients. Shallow sediment samples were obtained at sediment borings KSD-1 through KSD-26 (except at location KSD-10, where the sample could not be recovered). Vertical delineation samples were obtained at KSD-27 through KSD-36. The 37 sediment samples were analyzed for VOCs and SVOCs.

BBL's sediment sampling activities within Rondout Creek identified the presence of NAPL in sediment sample locations KSD-4, KSD-7, KSD-8, KSD-15, KSD-16, KSD-19, KSD-20, KSD-27, KSD-28, KSD-29, KSD-30, KSD-31, KSD-32, KSD-33, KSD-34, and KSD-36. According to the report, NAPL was generally observed from 0 to 2 feet below the top of sediment, but was also observed at greater depths (between 2 to 18 feet below sediment surface) where sediment borings extended deeper.

Though BBL reportedly analyzed the sediment samples for VOCs by EPA Method 8260 and SVOCs by EPA Method 8270, the report only discusses BTEX (benzene, toluene, ethylbenzene, and xylenes) and PAH (polynuclear aromatic hydrocarbons) results. The highest concentrations of BTEX and PAH compounds were detected in those sediment samples where NAPL was observed. In the samples where NAPL was observed, total BTEX concentrations ranged from 286 ppm in sample KSD-4 (0-6 inches) to below the laboratory detection limits in several sediment samples. In the samples where NAPL was observed, total PAH concentrations ranged from 25,730 ppm in sample KSD-4 (0-6 inches) to below the laboratory detection limits in several sediment samples.

<u>2007 Supplemental Site Investigation Report, Fuss & O'Neill</u>

In 2007, Fuss & O'Neill (F&O) conducted a Supplemental Site Investigation (SI) at the Site. The purpose of the SI was to address data gaps in the existing Site characterization and evaluate potential remedial strategies.

As part of their investigation, F&O oversaw the advancement of fourteen soil borings across the Site. Ten of the borings (KSB-55 through KSB-64) were advanced to further delineate MGP impacts at the Site. The report notes that KSB-54 was not completed due to subsurface obstructions. The remaining four borings (KSB-3R, KSB-6R, KSB-14R, and KSB-17R) were advanced adjacent to previous soil boring locations for the purposes of verifying the soil conditions reported by BBL (refer to Figure 2). Soil samples collected from the 14 soil borings were submitted for laboratory analysis of BTEX and PAHs. F&O compared soil sample analytical results to the TAGM 4046 (NYSDEC, 1994). The primary findings reported by F&O are as follows:

- BTEX compounds exceeding TAGM levels were detected in samples from borings KSB-3R, KSB-61, KSB-62 and KSB-64.
- PAH compounds exceeding TAGM levels were detected in borings KSB-17R, KSB-57, KSB-59 and KSB-61 through KSB-64.
- Total carcinogenic PAH concentrations exceeding TAGM levels were detected in samples from borings KSB-3R, KSB-6R, KSB-14R, KSB-55, KSB-59 and KSB-61 through KSB-63.

Three one-inch diameter monitoring wells were installed by F&O and a round of ground water samples were collected from the six existing BBL monitoring wells installed and the three new wells. Ground water monitoring wells installed as part of the 2007 SI are depicted on Figure 2. Ground water samples were analyzed for Target Compound List (TCL) VOCs, and TCL SVOCs. Ground water sample analytical results were compared to the water quality standards presented in TOGS 1.1.1 (NYSDEC, 1998), and are summarized as follows:

- Concentrations of BTEX compounds were detected at concentrations above TOGS ground water criteria in all nine wells.
- Several PAHs (acenaphthene, benzo(a)anthracene, chrysene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene) were detected in Site ground water at concentrations above TOGS criteria.
- Concentrations of cis-1,2-dichloroethene and trichloroethene were detected in well MW-5 only, at concentrations above TOGS ground water criteria. These compounds were not detected in the other wells.

F&O also collected seven sediment samples (KSD-9R, KSD-15R, KSD-23R, KSD-31, KSD-32, KSD-37 and KSD-39) from Rondout Creek to further assess the off-site migration of contaminants and to provide information for a qualitative risk assessment (refer to Figure 2). The report indicates that all sediment samples were collected from 0-1 feet below the sediment surface and analyzed for BTEX and TCL SVOCs. BTEX compounds were detected in one sediment sample (KSD-32) only. One or more PAH compounds were detected in all of the F&O sediment samples, at concentrations consistent with those detected previously by BBL.

F&O concluded that there were substantial areas of tar impacts that would require mitigation in three primary areas of the Site; the northwestern portion of the Site near the former tar well area; the central portion of the Site; and a small area on the eastern portion of the Site adjacent to the former Meter Room. These areas were delineated based on the observed presence of NAPL and concentrations of BTEX and PAH compounds above TAGM 4046 criteria. The presence of chlorinated VOCs in monitoring well MW-5 was attributed to the adjacent scrap yard to the north. F&O concluded that the presence of BTEX and PAH compounds in ground water samples collected from monitoring wells located both on the interior potions of the Site as well as along the east, west and south property boundaries was indicative of the off-site migration of contaminants with ground water.

3.0 INVESTIGATIVE AND FIELD ACTIVITIES

3.1 Work Plan Objectives

The work to be performed during the RI is designed to obtain data sufficient to delineate the nature and extent of contamination both on-site and off-site. It should be noted that all proposed test pits, soil borings, monitoring wells, soil samples, ground water samples, sediment probe locations, sediment core samples, background sediment samples, and deep sediment borings are subject to adjustment in location, depth and laboratory analyses based on field observations, access considerations, field screening and other Site conditions encountered during investigation activities. Proposed changes to the work plan will be discussed with, and approved by, CHG&E and the NYSDEC prior to implementation.

3.2 Land-Based Investigation

The planned land-based field program consists of mobilization, exploratory test pit excavation, soil borings, soil sampling, monitoring well installation and development, ground water sampling and a site survey.

3.2.1 Site Mark-Out

Prior to the start of intrusive investigation activities, area utilities will be located through notification to Dig Safely New York, and through consultation with representatives of CHG&E. TRC will direct the selected drilling subcontractor, Lyon Drilling, to contact Dig Safely New York. Following initial site mobilization, the TRC Field Manager will accompany available mark-out representatives during their mark-out activities and make detailed notes relative to potential and actual presence of subsurface utilities. All proposed sample locations will be reviewed with the CHG&E Project Manager and representatives of the NYSDEC before initiation of sampling. The TRC Field Manager will maintain an annotated field map depicting the results of the line clearance. If necessary, hand digging will be performed prior to drilling when intrusive investigation activities are within 3 feet of CHG&E infrastructure.

3.2.2 Site Preparation

Prior to the start of intrusive field investigation activities, a temporary decontamination pad will be constructed within the fenced portion of the Site, as shown on Figure 3. The decontamination pad will consist of a waterproof tarp laid over the ground surface and constructed with a wooden containment berm around each of its four sides. A sump will be constructed at one end of the pad to allow decontamination fluids to drain to a low point in the tarp where it can then be pumped to 55-gallon drums and labeled for off-site disposal.

3.2.3 Test Pits

A total of six exploratory test pits (TP-100 through TP-105) will be excavated at select locations to evaluate shallow subsurface conditions on-site. Planned test pit locations are shown on Figure 4. Five of the planned test pits (TP-101 through TP-105) are located along the southern side of the Site, between an existing chain link fence and the bulkhead. In order to complete the test pits as planned, TRC proposes to access the test pit locations via the double gate located in along the southwest end of the fence. If necessary, TRC will temporarily dismantle the chain link fence as needed to provide access to test pit locations. In those instances, the chain link fence will be temporarily repaired at the end of each work day to provide continued site security. The chain link fencing will then be permanently repaired at the completion of all land-based investigation activities along this portion of the Site.

Excavation of test pits will be accomplished using a backhoe with an approximate reach of 12 to 15 feet. During test pitting, excavated material will be segregated and temporarily stockpiled on polyethylene sheeting adjacent to the excavation. When excavation of the test pit is complete, the material will be returned to the excavation and compacted with the bucket of the backhoe. If NAPL is present in the excavated materials, the material will immediately be transferred to a separate roll-off container (to be supplied by CHG&E) for off-site disposal, and the excavation will be backfilled with clean fill provided by a local source. Completed test pit locations will be marked with stakes, and their coordinates recorded with a Global Positioning System (GPS) prior to the final Site survey.

The observed subsurface conditions will be documented by TRC in a field notebook and test pit log for each test pit. Additionally, photographs of each test pit will be taken to further document subsurface conditions.

Ambient air monitoring will be performed at the work zone with a portable PID and MiniRAM (or equivalent instrument) dust monitor, with particular attention to fugitive dusts and nuisance odors. Odor mitigation (e.g., limited exposure, plastic sheeting, or spray-applied odor suppressant) and dust suppression will be instituted, as necessary. The TRC Field Manager will conduct periodic air monitoring with the PID and dust monitor in the active work zone, as well as maintain awareness of nuisance odor levels and visible dust. In addition, periodic measurements will be made downwind of the work zone. Air monitoring measurements will be documented. If PID readings exceed pre-set limits (as specified in the site-specific HASP), the excavation will either be ceased or appropriate control measures instituted. Other necessary health and safety precautions (i.e., PPE, procedures, decontamination) will be instituted as prescribed in the HASP.

Heavy equipment (i.e. the backhoe bucket) that comes into contact with NAPL (if encountered) will be decontaminated with a steam cleaner over the decontamination pad described in Section 3.2.2. If necessary, equipment will be decontaminated in between test pit locations. Fluids generated as a result of decontamination procedures will be transferred to containers supplied by CHG&E, labeled, and staged on-site.

3.2.4 Soil Borings

The soil boring program consists of thirteen soil borings, KSB-100 through KSB-112, as indicated on Figure 4. The target depth of all thirteen borings is 50 feet, although a confining layer may be encountered at a shallower depth based on available Site information. Due to the need to obtain geotechnical data along the southern portion of the Site (between the bulkhead and the fence line), hollow-stem auger (HSA) drilling methods with continuous two-inch diameter split-spoon sampling will be employed to advance soil borings KSB-100 through KSB-103. In order to avoid temporary dismantling of the chain link fence along the southern portion of the Site, soil borings KSB-100 through KSB-103 may be advanced within the confines of the fence.

TRC's drilling subcontractor utilizes a truck-mounted HSA with direct-push capability; as a result, all other soil borings (KSB-104 through KSB-112 will be advanced using a combination of HSA and/or direct push drilling techniques.

The physical characteristics, including grain size, color, relative moisture content, etc., of each soil sample will be logged in a field notebook. General observations that will also be described include the presence of staining, odors, fill material and wastes, as applicable. The contents of each sampler will also be screened with a PID. The instrument readings will be recorded in the field notebook, along with sample depth, lithology and other observations.

Soil cuttings that are observed to be impacted (odors, elevated PID readings, visual stains and/or sheens) will be containerized in drums or other waste containers to be provided by CHG&E. Soil cuttings that are not observed to be impacted will be returned to the borehole annulus upon completion of the boring. Completed bore-holes will be grouted to the ground surface with cement-bentonite grout.

All non-disposable drilling equipment (e.g., auger flytes, rods, split-spoons) will be decontaminated between uses. Split-spoons will be decontaminated in the work zone using standard methods; other drilling equipment will be decontaminated in the temporary decontamination pad with a steam-cleaner, as necessary. All decontamination wastewater will be containerized and stored in a vessel(s) provided by CHG&E pending characterization and disposal by CHG&E.

3.2.5 Soil Sampling

The soil sampling equipment to be used during the RI is dependent upon the drilling techniques employed as described previously in Section 3.2.4. Direct-push soil samples (using GeoProbe® technology or equivalent) will be collected using a Macro Core (MC) sampler. The MC samplers are of open-tube design and measure approximately 2- inch diameter by 48-inch long. The samplers are fitted with a removable cutting shoe and dedicated, clear acetate liner. Subsurface samples can be collected over 4-foot intervals. If probe hole “cave-in” is significant at the lower depths, it may be necessary to use the closed-piston assembly that fits into the MC cutting shoe or to switch to the Large Bore (LB) drive-point sampler. Subsurface conditions will dictate the sampler selection. Soil samples collected using hollow stem auger drilling methods will utilize a 2-inch diameter by 24-inch long stainless steel split spoon sampler. In either case, the equipment used for collecting the samples will be decontaminated prior to use and between locations to minimize the potential for cross-contamination.

In addition to field screening using visual, olfactory and PID methods, selected soil samples will be collected for laboratory analysis. One soil sample will be collected from each boring for laboratory analysis for the full list of constituents included on Table 375-6.8(b) of 6NYCRR Part 375, included at the end of this work plan as Appendix A. Soil samples will be collected from depth intervals that exhibit the greatest degree on impacts, including observable NAPL, staining, odors, and/or the highest field screening results. Appropriate QA/QC sampling and analysis (duplicates, blanks, MS/MSDs) will be conducted in accordance with Section 4.4 of this work plan. Soil samples will be collected, documented, and managed in accordance with the standard procedures described in Section 4.0 of this work plan. The samples will be submitted to Accutest Laboratories of New England (an ELAP-certified laboratory), located in Marlborough, Massachusetts, for chemical analysis. Laboratory analysis will be performed in accordance with New York State ASP Category B, and the data will be validated by TRC.

All subsurface soil samples with the exception of those collected for VOC analysis will be placed into dedicated stainless steel bowls for homogenizing. From the bowls, the soils will be placed directly in to the appropriate laboratory containers. Sample material slated for VOC analysis will be placed immediately into sample containers, directly from the sampling device. A summary of the proposed soil sample analyses is presented in Table 1.

3.2.6 Ground Water Monitoring Well Installation

As shown on Figure 4, six new ground water monitoring wells will be installed as part of the RI. The new monitoring wells will be installed to the following specifications:

- Six-inch diameter borehole (minimum) to depth of 15 ft. bgs.;
- Two-inch inside diameter schedule 40 PVC riser and screen (0.020-inch slot);
- Wells screens will be 10 ft. in length;
- Threaded joints only on PVC pipe (no glued joints);
- Clean silica (quartz) sand backfill to two feet above the screened interval;
- Two-foot thick bentonite seal (minimum) above the sand pack;
- Concrete surface seal;
- Casing sealant and drilling fluids mixed only with potable water; and
- Locking well cap.

Monitoring wells MW-7 through MW-10 will be completed at the ground surface using curb boxes constructed flush with grade. Monitoring wells MW-6, MW-11 and MW-12 will be completed with stick-up, locking well protectors. Where appropriate, wells will be installed adjacent to the corresponding soil boring to avoid construction issues. Well riser lengths will be field-determined to accommodate either a flush-mounted or stick-up protective casing. The driller and TRC personnel will maintain accurate written logs of the well construction details.

3.2.7 Monitoring Well Repair

Monitoring well MW-2 will be repaired by removing the damaged portion of the well riser and replacing it with a new one-inch diameter section of riser and a locking well protector cemented in place. If repair of MW-2 is not possible, the existing MW-2 will be decommissioned by grouting in-place. Decommissioning of MW-2 will be done in accordance with the procedures specified in the provided document: "*Groundwater Monitoring Well Decommissioning Procedures,*" dated June 2009, NYSDEC, Division of Environmental Remediation. The well will be replaced with a new two-inch diameter monitoring well. The new MW-2 will be installed using the same drilling techniques and construction as those specified in Section 3.2.6.

3.2.8 Monitoring Well Development

Well development will be conducted in all of the newly-installed wells a minimum of one day following well installation, to allow the grout to cure. TRC will utilize standard pump and surge methods to develop each well, and remove fine-grained materials from the sand pack and surrounding formation. Wells will be developed until the observed discharge water achieves visual clarity. All wastewater that is generated will be containerized in vessels supplied by CHG&E for on-site storage prior to characterization and off-site disposal by CHG&E.

Once completed, the wells will be developed using a surge block and pump. Fine-grained material around the well screen will be drawn into the well and removed by agitating the well water with a surge block and simultaneously pumping water from the well using a centrifugal suction pump at a low discharge rate. A centrifugal pump outfitted with ASTM drinking water grade polyethylene tubing will be used for removing the water from the well. The polyethylene tubing will be replaced between each well.

3.2.9 Ground Water Sampling

A period of at least two weeks will elapse between well development and ground water sampling for any of the monitoring wells installed during the RI. Prior to the initiation of sampling activities, the water level in each monitoring well will be measured to the nearest 0.01 foot with an electronic water level meter and recorded in a field notebook. The water level indicator will be decontaminated with deionized water prior to each use unless visual observations (e.g., oil, odors) indicate additional decontamination is necessary.

Two rounds of ground water samples will be collected from the existing and newly installed ground water monitoring wells using low-flow purging and sampling techniques. Sampling of all wells will be completed using a peristaltic pump outfitted with dedicated virgin silicon pump head tubing and Tygon or polyethylene tubing to minimize the potential for cross-contamination. A multi-parameter monitoring device (such as the YSI 6820) attached to a flow-through cell will be used to monitor field parameters, including pH, temperature, specific conductance, dissolved oxygen, turbidity, and oxidation/reduction conditions in accordance with low-flow purging and sampling procedures. Once the parameters have stabilized to within the prescribed tolerances on three successive readings recorded at three to five-minute intervals, samples will be collected directly into the appropriate laboratory-supplied containers.

Ground water samples will be submitted for laboratory analysis of VOCs (EPA Method 8260), SVOCs (EPA Method 8270) and total and amenable Cyanide (EPA Method 9012). Appropriate QA/QC sampling and analysis (duplicates, blanks, MS/MSDs) will be conducted in accordance with Section 4.3 of this work plan. Ground water samples will be collected, documented, and managed in accordance with the standard procedures described in Section 4.0 of this work plan. The samples will be submitted to Accutest Laboratories of New England (Accutest) for chemical analysis. Laboratory analysis will be performed in accordance with New York State ASP Category B, and will subsequently be validated by TRC. A summary of the planned ground water sample analyses is presented in Table 2.

3.2.10 Site Survey

Following completion of the land-based portion of the RI, survey of all of the new sample locations will be conducted by TRC's selected subcontractor, Thew Associates, of Canton, New York. The survey will be referenced to the North American Datum of 1983 (NAD83) and projected on the New York State Plane Coordinate System (East Zone), and vertically to the North American Vertical Datum of 1988 (NAVD88). Survey information will be integrated into the existing Site survey plan. Elevations of the ground water monitoring wells will include the top of casing and the top of PVC for each, to the nearest 0.01 foot.

3.3 Creek-Based Investigation

The planned creek-based field program consists of mobilization, a sediment probing program, shallow sediment core sampling, completion of a hydrodynamic analysis of Rondout Creek, collection of background sediment samples, and the advancement of deep sediment borings.

3.3.1 Stilling Well Installation/Tidal Monitoring

Prior to the beginning of creek-based investigative work, TRC will install a stilling well along the bulkhead to aid in the collection of tidal elevation data for Rondout Creek. The stilling well will be constructed of an appropriately sized length of 2-inch diameter, schedule 40 PVC well screen and an appropriate length of riser; the actual length of the screen and riser will be determined in the field. Once installed, the top of the stilling well will be surveyed along with the other site features as described in Section 3.2.10.

A pressure transducer (e.g. LevelTROLL® 700 or similar device) will be installed inside of the stilling well to monitor water depths in Rondout Creek during the creek-based investigation. The pressure transducer will be configured as follows:

- The transducer will log data using a Linear Average logging method;
- Measurements will be taken every second for six minutes (360 measurements) and averaged; and
- The averaged measurements will then be logged every 15 minutes.

The output type for the readings recorded by the pressure transducer will be set to surface water elevation by inputting the elevation of the stilling well. The transducer will be used to record surface water elevations during the probing phase of the creek-based investigation. The exact location of the stilling well will be determined in the field based on accessibility.

3.3.2 Sediment Probing

The first phase of the creek-based portion of the RI will consist of a sediment probing program. The objectives of the sediment probing program are to:

- Further delineate the areal extent of MGP impacts in shallow sediments within the portion of Rondout Creek adjacent to, and east and west of the Site;
- Determine the top of sediment elevations in the same area;
- Characterize the types of shallow sediments present (e.g. gravel, silt, clay, sand, etc…); and
- Gather bathymetric data for use in the hydrodynamic analysis.

Sediment probing will be completed at up to eight locations along each of 29 transects oriented perpendicular to the shoreline, as shown on Figure 5. Mobilization to each probe location will be accomplished using a 14 –foot long, flat-bottom Jon boat or other suitable vessel. Probing locations will be located using a GPS unit. New York State Plane coordinates (NAD 83 geodetic datum) will be determined for each of probe locations, and will then be loaded onto a GPS unit prior to field mobilization. During the field investigation, the GPS unit will be used to navigate the sampling vessel to each probe location. The vessel will then be secured in place at each probe location using spuds and/or anchors.

Sediment probing will be accomplished using an extendable probe rod, which will be marked off in feet and tenths of feet. During probing, the rod will be lowered into position within the creek. The rod will then be advanced to the top of the sediment and the depth of water will be recorded at that location. The depth of water measured during sediment probing will be compared to the water elevation in Rondout Creek as measured by the stilling well/transducer (as described in Section 3.3.1.). The elevation of the top of sediment will then be determined by subtracting the depth of water from the elevation of the water in Rondout Creek. Once the depth of water is recorded, the probe rod will be advanced to a maximum of approximately 24 inches into the creek sediments. The probe rod will then be retracted and TRC field personnel will then inspect the end of the probe rod and the surrounding water for visible evidence of MGP impacts (e.g. NAPL and/or sheens). All probe locations exhibiting surface sheens upon disturbance of the shallow sediments will be noted in the field notes and on a master sample grid figure.

3.3.3 Sediment Coring

Sediment core samples will be collected from each of the sediment probe locations that exhibited sheens during the probing program. Each core sample location will be pre-located using an anchored float to aid in guiding the sample vessel to the desired location. Final sediment core samples will be collected using a mobile drilling unit placed on a 24-foot pontoon barge. Sediment coring locations will be located using a hand-held GPS in the same manner as the sediment probe locations. Depending upon standing water depth, the barge will be either spudded or anchored into place. An absorbent boom will be installed around the barge to mitigate any potential floating sheens that may be released during coring.

Using a tripod-mounted hammer and cathead, a Macrocore™ sampler will be advanced two-feet into the sediments to collect a sediment core sample for laboratory analysis. Dedicated acetate sampler liners will be used for each sample. In the event of poor sample recovery, alternative sample collection methods (e.g. split spoon) will be implemented. Unused core samples will be consolidated for containerization on-shore, for disposal by CHG&E. The shallow coreholes will be allowed to collapse and will not be backfilled.

Collected samples will be screened with respect to apparent grain-size, visual and olfactory indications of contamination, PID headspace, and the presence/absence of vegetation. All cores collected from probe locations where sheens were observed will be composited into two samples, a 0-12 inch composite and a 12-24 inch composite. Both composite samples will be submitted to Accutest for laboratory analysis as follows:

- VOCs by EPA Method 8260;
- SVOCs by EPA Method 8270;
- Total and amenable Cyanide by EPA Method 9012 (10% of collected samples);
- PCBs by EPA Method 8082 (10% of collected samples); and
- Total Organic Carbon.

A summary of the planned sediment sample identification nomenclature, planned laboratory analyses, and QA/QC sample requirements is presented in Table 3.

3.3.4 Hydrodynamic Analysis

Following completion of the sediment probing adjacent to the Site, five additional areas will be probed following field procedures detailed in Section 3.3.2. Four of the five areas selected for probing as part of the hydrodynamic analysis are shown on Figure 6 (Areas A-D). The exact location of probing areas may be adjusted in the field based on probe detection of significant thickness of surface, fine-grained sediments. It is expected that such areas of likely recent (i.e. the last 50 to 100 years) deposition will all be in relatively shallow water, probably less than about six feet deep and most will be "sheltered," in coves or similar areas off the main flow. Ideally, one of the areas will be adjacent to the site, along the shore across the creek (Area A; Figure 6). Two of the proposed areas would be outside the creek; Areas B and C are likely candidates. Proposed Area D is about 2,000 feet upstream of the Site and the fifth probing area would be located further upstream, the exact location of which will be determined in the field. At each area, hand probing would be used to determine the areal extent and depth of fine-grained sediment coverage using an anticipated 30 to 50 hand probe locations per area.

A "high resolution" sediment core will be collected at each of the five presumed depositional areas using a push core or gravity core apparatus designed and built by Dr. Richard Bopp. This equipment has been used in several previous studies with NYSDEC and USEPA to collect sediment cores for analysis. It is estimated that this probing and coring will require approximately three days of field effort.

The sediment cores, expected to be 40 to 60 centimeters (cm) in length, will be transported by Dr. Bopp to his laboratory at Rensselaer Polytechnic Institute (RPI). The cores will be extruded, sectioned at 2 to 4 cm intervals, and dried. Individual sections will be ground in a mortar and pestle. Dating information will be obtained from radionuclide analysis of the sections (Bopp et al. 2006) on an ORTEC GWL-120 gamma counter. The dried ground sections will be analyzed for metals including copper, zinc, lead, chromium, and tin on a Spectra XEPOS II X ray fluorescence spectrometer as described in Graber, et al. (2010). All analyses described in this section will be carried out in the RPI laboratory and the final report will include a standard data package including QA/QC analyses.

The radionuclide and metals data will be used to trace the upstream and downstream influence of Roundout Creek particles and associated contaminants in the vicinity of the Site. It is anticipated that perhaps copper and tin, present and past components of marine anti-fouling paint, could provide useful tracers derived from boat maintenance along Roundout Creek. Analyses of metals in dated core sections from the Kingston area along the main stem of the Hudson, available from the consultant's archive, will be used to characterize a Hudson River sediment endmember.

3.3.5 Background and Depositional Sediment Sampling

Upon completion of the hydrodynamic analysis described in Section 3.3.4, TRC will conduct a sediment sampling program to collect a total of up to 75 shallow sediment samples. The sediment samples will be collected from 25 sediment core locations where the hydrodynamic analysis suggests sediment deposition is occurring and at 25 background sediment core locations determined to be outside the depositional area of MGP-impacted sediments. Proposed background and depositional sediment sample locations will be submitted to NYSDEC for concurrence prior to sample collection. Selected sample locations will be located using a GPS capable of sub-meter accuracy.

Similar to the procedures described for sediment coring, sediment core samples will be collected using a mobile sampling unit placed on a 24-foot pontoon barge. Depending upon standing water depth, the barge will be either spudded or anchored into place. An absorbent boom will be installed around the barge to mitigate any potential floating sheens that may be released during sediment coring. A tripod-mounted hammer and cathead assembly will be used to advance a Macro-Core™ sampler two-feet into the sediment to collect a core sample for laboratory analysis. Dedicated acetate sampler liners will be used for each sample. Unused core samples will be consolidated for containerization on-shore, for disposal by CHG&E. The shallow coreholes will be allowed to collapse and will not be backfilled.

Collected samples will be screened with respect to apparent grain-size, visual and olfactory indications of contamination, PID headspace, and the presence/absence of vegetation. For the 25 background sediment cores, a single composite sample collected from 0-12 inches below the top of sediment, will be submitted for laboratory analysis. For the sediment cores collected from depositional areas, a composite sample from 0-12 inches will be collected for laboratory analysis and at up to 25 of the core locations, a second composite sample, collected from 12-24 inches will also be submitted for laboratory analysis. All sediment samples collected during the background and depositional sediment sampling will be submitted to Accutest for laboratory analysis as follows:

- VOCs by EPA Method 8260;
- SVOCs by EPA Method 8270;
- Total and amenable Cyanide by EPA Method 9012 (10% of collected samples);
- PCBs by EPA Method 8082 (10% of collected samples); and

- Total Organic Carbon.

A summary of the planned sediment sample identification nomenclature, planned laboratory analyses, and QA/QC sample requirements is presented in Table 4.

3.3.6 Deep Sediment Borings

A total of ten deep sediment borings (KSD-200 through KSD-209) will be advanced to evaluate deeper sediment quality in the portion of Rondout Creek adjacent to the Site. The locations of the planned deep sediment borings are shown on Figure 7. Deep sediment borings will be advanced to a depth of 20 feet below the top of the sediment surface. Sampling will be performed by Lyon Drilling using the same sampling platform planned for the shallower sediment sampling program, i.e., a 24-foot pontoon boat equipped with a tripod, cathead, and 140-pound hammer. Sediment collection will be accomplished using Geoprobe DT-21 Dual-tube sampling system, advanced with a hammer.

At each planned location, an anchored float marker will be dropped into position from the support boat using pre-determined GPS coordinates. The float will be used to guide the sampling vessel into position, where it will be moored using multiple anchors and/or spuds. Once the boat is properly positioned, a floating absorbent boom will be emplaced around the vessel. Once the TRC Field Team Leader establishes and documents depth to the top of sediment, sampling will be initiated. Four-foot long, one-inch diameter samplers fitted with single-use acetate liners will be driven to depth and retrieved. The outer casing will be advanced to prevent collapse of the corehole.

In the event the dual-tube sampling system is not effective, an alternative sampling method may be used. One such alternative is the use of the piston sampler which will be used to advance the sampler to the next target interval, the piston locking pin removed, and the sampler advanced to the next four-foot interval.

Retrieved samples will be capped, marked with depth and orientation (top/bottom), and transferred to shore where TRC field personnel will process the core samples as follows:

- Core samples will be observed, screened with a PID and logged.
- One composite sample from 0-12 inches below the top of sediment will be collected from each deep sediment boring for laboratory analysis.

- A second sediment sample from each of the deep sediment borings will be selected for laboratory analysis. The second sample will be collected from the most impacted zone based on visible and olfactory observations, and PID screening results.
- All of the collected samples will be transferred to appropriate laboratory containers, labeled, and stored in iced coolers pending shipment to Accutest for analysis.

A summary of the planned sediment sample identification nomenclature, planned laboratory analyses, and QA/QC sample requirements is presented in Table 5.

Completed coreholes will be allowed to collapse; no backfilling is planned due to the small diameter of the borings, anticipated depth of standing water, and natural collapse of the coreholes. Before demobilizing from each deep sediment sample location, TRC will confirm the actual location using the GPS and will record the location coordinates.

3.4 Fish and Wildlife Resources Impact Analysis

A Fish and Wildlife Resources Impact Analysis (FWIA) will be conducted for the Site. A site visit by an ecologist will be conducted to identify habitat cover types present at the Site and within one-half mile of the Site. Cover types will be identified based on the NYSDEC Natural Heritage Program habitat descriptions (Ecological Communities of New York State, NYSDEC, 2002). Significant characteristics associated with each cover type will be assessed in the field as will any indications of stress to fish and wildlife resources (e.g., stained soils, leachate, etc.). A report that describes the existing fish and wildlife resources will be prepared that includes site maps (topographic map and cover type map) and a description of habitats and ecological receptors that may use each cover type. Important resources such as wetlands, habitat for endangered/threatened species, aquatic habitats, and significant fish/wildlife habitats will be identified. The overall value of the fish and wildlife habitat and the value to humans will also be described. Contaminant migration pathways that are of concern to ecological resources will be discussed as will contaminants of ecological concern, if present.

A contaminant-specific impact assessment will also be conducted that compares site-specific media concentrations with appropriate toxicity benchmarks. For example, the concentrations of constituents detected in the sediment samples would be compared to applicable criteria (e.g., New York State sediment criteria). If the detected concentrations are less than their respective criteria (or are similar to localized or background conditions), the FWIA would then be complete and no impacts would be anticipated. If criteria (and background levels) are exceeded, then a more detailed toxic effect analysis would need to be conducted (beyond the scope of this proposed study). This additional analysis may include an evaluation of the contaminant characteristics (e.g., persistence) and distribution within the environment, modeling, toxicity testing or biota sampling (e.g., benthic community diversity/density) in order to characterize whether risk to the fish and wildlife resources is minimal or significant.

4.0 SAMPLE HANDLING AND QA/QC PROCEDURES

While general sample collection and monitoring methodologies are presented in Section 3.0, this section describes sample management methodologies and quality assurance/quality control (QA/QC) procedures associated with this and any future sampling efforts.

4.1 Sample Handling and Shipping

Appropriate sample containers will be used so that minimal chemical alteration occurs between the collection of samples in the field and the receipt of samples at the laboratory. Sample containers will be selected to ensure compatibility with the potential contaminants and to minimize breakage during transportation. The sample bottles will be prepared and shipped to the field by TRC's subcontracted analytical laboratory. Sample labels will be filled out at the time of sampling and will be affixed to each container. The information recorded on the label will include:

- Project name/project number/location;
- Sample identifier/number;
- Analysis to be performed;
- Preservatives used, especially any non-standard types, and any other field preparation of the sample;
- Date of collection;
- Number of containers per analyte (i.e., 1 of 2, etc.); and
- Sampler's initials.

After the bottles for a given sampling event have been filled, they will be packed in coolers in such a manner as to protect them from temperature extremes, light, breakage, and water damage. Each glass sample container will be placed in an individual bubble wrap bag before being placed in the cooler. In cases where a single sample consists of multiple bottles (i.e., volatile organic analysis), the bottles will be strapped together, with a bubble cushion between. Field personnel will add bags of ice to the shipping coolers as the samples are collected. When the cooler is filled, additional absorbent, non-combustible packing material (e.g., bubble wrap) will be placed in the cooler so that the contents are secure.

Samples will be picked up from the Site and delivered to the laboratory for analysis as soon as practical after sampling by an Accutest courier. The coolers will be sealed with custody seals prior to shipment to the laboratory. Clear adhesive tape will be placed over the seals to ensure that seals are not accidentally broken during shipment.

4.2 Sample Identification

Each sample collected during the RI will have a unique identifying number. As sample locations and identification numbers have already been designated by CHG&E for the proposed test pits, soil borings and monitoring wells, these IDs will be incorporated into the sample identification numbers as follows:

TP-100 (2.7-3.7)
TP = Test Pit
100 = Test Pit Number
(2.7-3.7) = Sample Collection Depth in Feet and Tenths of Feet

KSB-100 (4-5)
KSB = Kingston Soil Boring
100 = Soil Boring Number
(4.0-5.0) = Sample Collection Depth in Feet and Tenths of Feet

KSD-100 (0.5-1.0)
KSD = Kingston Sediment Sample
100 = Sediment Sample Number
(0.5'-1.0') = Sample Collection Depth Below Sediment Surface in Feet and Tenths of Feet

MW-9 (06-15-10)
MW-9 = Monitoring Well Number (Ground Water Sample)
(06-15-10) = Sample Collection Date

4.3 Chain-of-Custody Records

TRC will maintain a traceable record of sample possession from collection until laboratory analysis. Part of this process involves the completion of a chain-of-custody record for each sample. A chain-of-custody record will accompany the sample from initial sample container selection and preparation commencing at the laboratory, to the field for sample containment, and through its return to the laboratory. If samples are split and sent to different laboratories, a copy of the chain-of-custody record will be sent with each sample.

The "Remarks" column in the chain-of-custody record will be used to record specific considerations associated with sample acquisition, such as sample type, container type, and sample preservation methods. When transferring samples, the individuals relinquishing and assuming sample custody will sign, date, and note the transfer time on the custody form. TRC will retain one copy of the custody form upon relinquishing the samples.

A minimum of two copies of the chain-of-custody record will accompany each sample to the laboratory. The laboratory will maintain one file copy, and the completed original will be returned to the TRC Project Manager. A copy of the completed original will be returned as a part of the final analytical report. This record will be used to document sample custody transfer from the sampler, to another TRC team member, to a shipper, or to the laboratory, and also to verify the date of sample receipt in the laboratory.

Shipments will be picked up by a laboratory representative or will be sent by overnight carrier with appropriate bill of lading documentation. Bills of lading will be retained as part of the permanent program documentation.

4.4 Field Quality Control Samples

Trip blanks, field blanks and duplicate samples will be collected as part of each sampling event, in order to ascertain a measure of quality control during each sampling round. The following sections describe the purpose and usage of each of these types of samples.

4.4.1 Trip Blanks

Trip blanks are defined as samples prepared at the laboratory which originate as analyte-free water which is placed in 40-ml Teflon-lined septum volatile organic vials, preserved with 1:1 hydrochloric acid (HCl) in the laboratory and shipped to the site in the sample cooler with sample containers. These vials are subsequently returned to the laboratory with the aqueous environmental samples for VOCs. Trip blanks are not required to be collected when a non-aqueous medium is being sampled.

One trip blank per day will accompany the aqueous samples to be analyzed for VOCs, and will be stored at the laboratory with the samples. The analyses will evaluate the effect of ambient site conditions and sample shipment on sample integrity, and will evaluate proper sample container preparation and handling techniques. Trip blanks will be listed on the chain-of-custody form.

Analytical holding times for trip blanks to be analyzed for VOCs will be the same as for environmental samples.

4.4.2 Field Blanks

Field blanks will be collected in order to determine the effectiveness of the decontamination of sample collection equipment and the possible effects of ambient field conditions on samples. The field blank will be collected by pouring laboratory-supplied, HPLC-grade, ASTM Type II water for organic analyses over/in the decontaminated sample collection equipment and into the appropriate sample containers. One field blank will be collected as part of each sampling event. Field blanks will be analyzed for the same analytical parameters as the sample matrix.

Field blanks will be preserved, listed on chain-of-custody forms, and stored and shipped according to the procedures discussed previously. Field blanks will be collected at the beginning of the day's sampling events or after a field decontamination event and will accompany the samples collected that day.

4.4.3 Field Duplicates

Duplicate samples are two separate samples taken from the same source. Field duplicates will be collected at a frequency of 5 percent (i.e., 1 in 20) per sample matrix. The procedure for collecting duplicate samples will consist of alternating the collection of the sample between the sample collection bottle and the duplicate collection bottle. Duplicate samples will be assigned different sample numbers unknown to the laboratory responsible for the sample analysis.

4.5 Sampling Equipment Decontamination Procedures

Sampling equipment which may be used to obtain samples for laboratory analysis during environmental investigations at the site will be decontaminated using the following procedures.

1. Wash and scrub with low phosphate detergent (Alconox) in tap water;
2. Rinse with tap water;
3. Rinse with laboratory-grade methanol;

4. Air dry on clean polyethylene sheeting;
5. Distilled and deionized water rinse;
6. Wrap in aluminum foil, shiny side out for transport (if not being used immediately).

Split-spoon samplers, hand augers and direct-push Macrocore shoes which will contact soil will be decontaminated by soap and water wash (Alconox and tap water) and tap water rinse between uses. If standard decontamination procedures are insufficient to remove contaminants from larger sampling equipment (e.g. Macrocore, split spoon), steam cleaning will also be employed. Decontamination of peripheral equipment shall be conducted as described below.

Well Evacuation and Development Equipment - Tubing will be dedicated to individual wells (i.e., tubing will not be reused). Bailers, if necessary to evacuate wells, will be dedicated to individual wells.

Drilling Equipment and Other Large Equipment - Exploration equipment which comes into contact with potentially grossly contaminated soil will be steam cleaned before and between boreholes. Drilling equipment including drill rods, bits, augers, dredges and any other large equipment will be subject to this steam cleaning requirement.

During ground water sampling, an attempt will be made to coordinate a sampling sequence hierarchy from less-likely to more-likely contaminated locations to reduce the potential for cross-contamination between locations. Decontamination rinsates will be collected and contained in drums for subsequent determination of proper handling and/or disposal by CHG&E.

5.0 RECORD KEEPING

Record keeping will include the management of on-site monitoring data and sampling documentation within permanent field log books as well as the maintenance of project-related information within project files. Documentation management procedures are described below.

5.1 Field Notebooks

The TRC Project Manager will oversee the maintenance of field notebooks. Field notebooks will be bound books, preferably with consecutively numbered pages. Field notebooks will be maintained by the field investigation team members to provide a daily record of significant events, observations, and measurements during any field investigation activities. Notebook entries will be signed and dated.

Information pertinent to the field investigations and/or sampling will be recorded in the notebooks. Field notebook entries will include the following information (at a minimum):

- Name and affiliation of field contact;
- Name and title of author, date and time of entry, and physical/environmental conditions during field activity;
- Names of field crew;
- Names and titles of any site visitors;
- Type of sampling activity;
- Location of sampling activity;
- Description of sampling point(s);
- Date and time of sample collection;
- Sample media (e.g., soil, sediment, ground water, etc.);
- Sample collection method;
- Number and volume of sample(s) taken;
- Analyses to be performed;
- Sample preservatives;
- Sample identification number(s);
- Field observations;
- Any field measurements made (e.g., pH, temperature, conductivity, water level)

- References for maps and photographs of the sampling site(s).

Original data recorded in the field notebooks will be written with waterproof ink. None of these documents will be destroyed or discarded, even if they are illegible or contain inaccuracies. Photocopies of field book entries will be made and kept in the TRC project file.

If an error is made on an accountable document assigned to an individual, that individual will make corrections by crossing a line through the error and entering the correct information and initialing the cross-out. The erroneous information will not be obliterated. Any subsequent error discovered on an accountable document will be corrected by the person who made the entry, and will be initialed and dated, as appropriate.

5.2 Project File

The TRC Project Manager will serve as file custodian. The project file will contain all incoming materials related to the project, such as sketches, correspondence, authorizations, and logs. These documents will be placed in the project file as soon as possible. If correspondence is needed for reference by project personnel, a copy will be made rather than manipulating the original. Examples of the types of records that will be maintained in the project file are:

- Field documents;
- Correspondence;
- Photographs;
- Laboratory data;
- Reports; and
- Subcontract agreements.

6.0 ANALYTICAL METHODS

6.1 Laboratory Methods

Site samples will be analyzed according to USEPA-approved methods by an ELAP/NELAP certified laboratory. The USEPA analytical methods presented in Test Methods for Solid Waste, Physical/Chemical Methods (SW-846, Final Update III, November 2000) will be adhered to by the laboratory performing the analyses. Accutest Laboratories of New England (Accutest) of Marlborough, Massachusetts has been selected as the environmental laboratory for this project. All laboratory analytical results will be reported in accordance with NYSDEC ASP B protocols.

Specific laboratory QA/QC procedures will include the adherence to the NYSDEC ASP B protocols. The use of calibration check samples, spiked samples, laboratory control samples and matrix spikes/matrix spike duplicates provide a means for evaluating the quality of the analytical methods within the applicable guidelines. Other laboratory-specific QC considerations include the type of reagents used, the cleaning of laboratory glassware and compliance with standard laboratory practices. Laboratory control charts provide graphical comparisons of analytical results with the average or expected variability of small groups of data, which may be due to random (indeterminate) or assignable (determinate) causes. The control chart signals the need to investigate data variability, and to find the determinate cause and its correction.

6.2 Field Calibration Procedures

Calibration of field instruments will be performed at approved intervals as specified by the equipment manufacturer (or more frequently as conditions dictate). At a minimum, field instruments will be calibrated by TRC field personnel at the beginning and end of each day. Calibrations may also be performed at the start and completion of each test run; however, such calibrations will be re-initiated as a result of delay due to meals, work shift change, or instrument damage. Calibration standards used as reference standards will be traceable to the National Bureau of Standards (NBS), when possible. Calibration procedures for field instruments will be as specified by the instrument manufacturer. Documentation of instrument calibration will be maintained in the field log book and/or specific instrument calibration log book. Equipment will be checked and calibrated in-house prior to field mobilization. If found to be malfunctioning, the equipment will be returned to the manufacturer for repair and/or recalibration.

6.3 Data Validation and Reporting

Each analytical data package will be evaluated for completeness by TRC according to NYSDEC ASP Category B requirements. Sample integrity and holding times will be evaluated, and QC summary reports (for blanks, tunes, calibrations, surrogate recoveries, spike recoveries, replicates, laboratory controls, etc.) will be reviewed. Raw analytical data will be reviewed if summary reports indicate a problem. Review criteria will generally be those presented in U.S.EPA Region 2 Data Validation Guidelines; however, specific laboratory-defined control limits may also be used as review criteria. All QC problems, data deficiencies, and analytical protocol deviations will be noted and discussed in the DUSR. Data qualifiers added during the validation process will be those presented in U.S. EPA Region 2 Data Validation Guidelines.

Upon completion of the review and qualification of the data set, a Data Usability Summary Report (DUSR) will be prepared in accordance with NYSDEC and EPA guidance. The DUSR will describe the validation process, summarize the results of the validation, and highlight specific issues relating to reliability and/or limitations of the data package. The DUSR will be submitted to CHG&E as an appendix to the RI report.

6.3.1 Data Reporting

The laboratory data packages will include deliverables that conform to NYSDEC's ASP B protocols. At a minimum, the data packages from the analytical laboratory will include the following:

- An Index of Samples (a presentation of the field identification numbers and associated laboratory identification numbers, sample matrix and dates of sample collection and receipt by the laboratory);
- Methodologies;
- Subcontracting information (as necessary – if the prime laboratory subcontracted analyses to another laboratory);
- A laboratory narrative (used to describe non-conformances);

- Results (including sample identification numbers, preparation and analysis dates, analytical results and reporting limits); and
- QC results.

Once the data have been received by TRC, a review of the narrative will be conducted to identify what, if any, factors may affect the data usability. If any such factors are identified, the Project Manager will discuss corrective actions with the laboratory personnel. In addition, the Project Manager or his/her designee will conduct a review of all data received by the laboratory in electronic deliverable formats to provide additional QA/QC measures.

7.0 REPORT

Following completion of the RI, a draft report will be prepared and submitted to CHG&E for review. The RI report will be prepared in accordance with NYSDEC DER-10. The RI report will summarize previous investigations of the Site and incorporate existing data into the findings of the RI for a comprehensive overview of Site conditions. The RI report will include all figures, tables and data identifying where releases to the environment may have occurred and the extent of contamination. TRC will address any comments received from CHG&E and will issue a final report for submittal to the NYSDEC.

8.0 SCHEDULE

A tentative schedule for the completion of the RI, including a brief description of the tasks involved, is presented in Table 6.

9.0 REFERENCES

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6 NYCRR Part 701, 1993. Classifications – Surface Waters and Ground Waters

6 NYCRR Part 858, 1995. Classes and Water Quality Standards for the Lower Hudson River Drainage Basin

TABLES

TABLE 1
PLANNED SOIL BORING SAMPLES AND ANALYSES
Remedial Investigation
CHGE Kingston Gasworks, Site #C356017
East Strand Street
Kingston, NY

Proposed Soil Boring ID	**Boring Depth (ft.)**	**Proposed Laboratory Analyses**
		NYSDEC 6NYCRR Part 375 Table 375-6.8(b) Constituents
KSB-100	0-50	1
KSB-101	0-50	1
KSB-102	0-50	1
KSB-103	0-50	1
KSB-104	0-50	1
KSB-105	0-50	1
KSB-106	0-50	1
KSB-107	0-50	1
KSB-108	0-50	1
KSB-109	0-50	1
KSB-110	0-50	1
KSB-111	0-50	1
KSB-112	0-50	1
MS[1]		1
MSD[1]		1
Duplicate[1]		1
EB[2]		1
FB[2]		1

Notes:

1) Matrix Spike/Matrix Spike Duplicate (MS/MSD) and Duplicate frequency will be 1 in 20; exact ID will be determined in the field.

2) Equipment Blank (EB) and Field Blank (FB) IDs will be determined in the field and will incorporate the date of sample collection (e.g. EB070510).

TABLE 2
PLANNED GROUND WATER SAMPLING AND ANALYSES
Remedial Investigation
CHGE Kingston Gasworks, Site #C356017
East Strand Street
Kingston, New York

Well ID	**Proposed Laboratory Analyses**			
	VOCs by EPA Method 8260	**SVOCs by EPA Method 8270**	**Total Cyanide**	**Amenable Cyanide**
MW-1	2	2	2	2
MW-2	2	2	2	2
MW-3	2	2	2	2
MW-4	2	2	2	2
MW-5	2	2	2	2
MW-6	2	2	2	2
MW-7	2	2	2	2
MW-8	2	2	2	2
MW-9	2	2	2	2
MW-10	2	2	2	2
MW-11	2	2	2	2
MW-12	2	2	2	2
MS[1]	2	2	2	2
MSD[1]	2	2	2	2
Duplicate[1]	2	2	2	2
EB[2]	2	2	2	2
TB[2]	2	2	2	2
FB[2]	2	2	2	2

Notes:
1) Matrix Spike/Matrix Spike Duplicate (MS/MSD) and Duplicate frequency will be 1 in 20; exact ID will be determined in the field.

2) Equipment Blank (EB), Trip Blank (TB) and Field Blank (FB) IDs will be determined in the field and will incorporate the date of sample collection (e.g. EB070510).

3) Two round of ground water samples will be collected during the RI.

TABLE 3
PLANNED SEDIMENT CORE SAMPLING AND ANALYSES
Remedial Investigation
CHGE Kingston Gasworks, Site #C356017
East Strand Street
Kingston, NY

Proposed Sediment Sample ID	**Boring Depth (ft. below top of sediment)**	**Proposed Laboratory Analyses**				
		VOCs by EPA Method 8260	SVOCs by EPA Method 8270	Total & Amenable Cyanide by EPA Method 9012	PCBs by EPA Method 8082[3]	Total Organic Carbon[3]
KSD-100 through KSD-149	0-2	100	100	100	10	10
MS[1]		5	5	5	1	1
MSD[1]		5	5	5	1	1
Duplicate[1]		5	5	5	1	1
EB[2]		1	1	1	1	1
FB[2]		1	1	1	1	1

Notes:

1) Matrix Spike/Matrix Spike Duplicate (MS/MSD) and Duplicate frequency will be 1 in 20; exact ID will be determined in the field.

2) Equipment Blank (EB) and Field Blank (FB) IDs will be determined in the field and will incorporate the date of sample collection (e.g. EB070510).

3) 10% of the sediment samples will be analyzed for PCBs, and Total and Amenable Cyanide.

4) Actual sample ID's may change based on the number of samples collected.

TABLE 4
PROPOSED BACKGROUND AND DEPOSITIONAL SEDIMENT SAMPLING AND ANALYSES
Remedial Investigation
CHGE Kingston Gasworks, Site #C356017
East Strand Street
Kingston, NY

Proposed Sediment Sample ID	**Boring Depth (ft. below top of sediment)**	**Proposed Laboratory Analyses**				
		VOCs by EPA Method 8260	SVOCs by EPA Method 8270	Total & Amenable Cyanide by EPA Method 9012	PCBs by EPA Method 8082[3]	Total Organic Carbon[3]
KSD-150 through KSD-199	0-2	75	75	75	8	8
MS[1]		4	4	4	1	1
MSD[1]		4	4	4	1	1
Duplicate[1]		4	4	4	1	1
EB[2]		1	1	1	1	1
FB[2]		1	1	1	1	1

Notes:

1) Matrix Spike/Matrix Spike Duplicate (MS/MSD) and Duplicate frequency will be 1 in 20; exact ID will be determined in the field.

2) Equipment Blank (EB) and Field Blank (FB) IDs will be determined in the field and will incorporate the date of sample collection (e.g. EB070510).

3) 10% of the sediment samples will be analyzed for PCBs, and Total and Amenable Cyanide.

4) Actual sample ID's may change based on the number of samples collected.

TABLE 5
PLANNED DEEP SEDIMENT BORING SAMPLES AND ANALYSES
Remedial Investigation
CHGE Kingston Gasworks, Site #C356017
East Strand Street
Kingston, NY

Proposed Sediment Sample ID	**Boring Depth (ft. below top of sediment)**	**Proposed Laboratory Analyses**				
		VOCs by EPA Method 8260	SVOCs by EPA Method 8270	Total & Amenable Cyanide by EPA Method 9012	PCBs by EPA Method 8082[3]	Total Organic Carbon[3]
KSD-200 through KSD-209	0-20	20	20	20	2	2
MS[1]		2	2	2	2	2
MSD[1]		2	2	2	2	2
Duplicate[1]		2	2	2	2	2
EB[2]		1	1	1	1	1
FB[2]		1	1	1	1	1

Notes:

1) Matrix Spike/Matrix Spike Duplicate (MS/MSD) and Duplicate frequency will be 1 in 20; exact ID will be determined in the field.

2) Equipment Blank (EB) and Field Blank (FB) IDs will be determined in the field and will incorporate the date of sample collection (e.g. EB070510).

3) 10% of the sediment samples will be analyzed for PCBs, and Total and Amenable Cyanide.

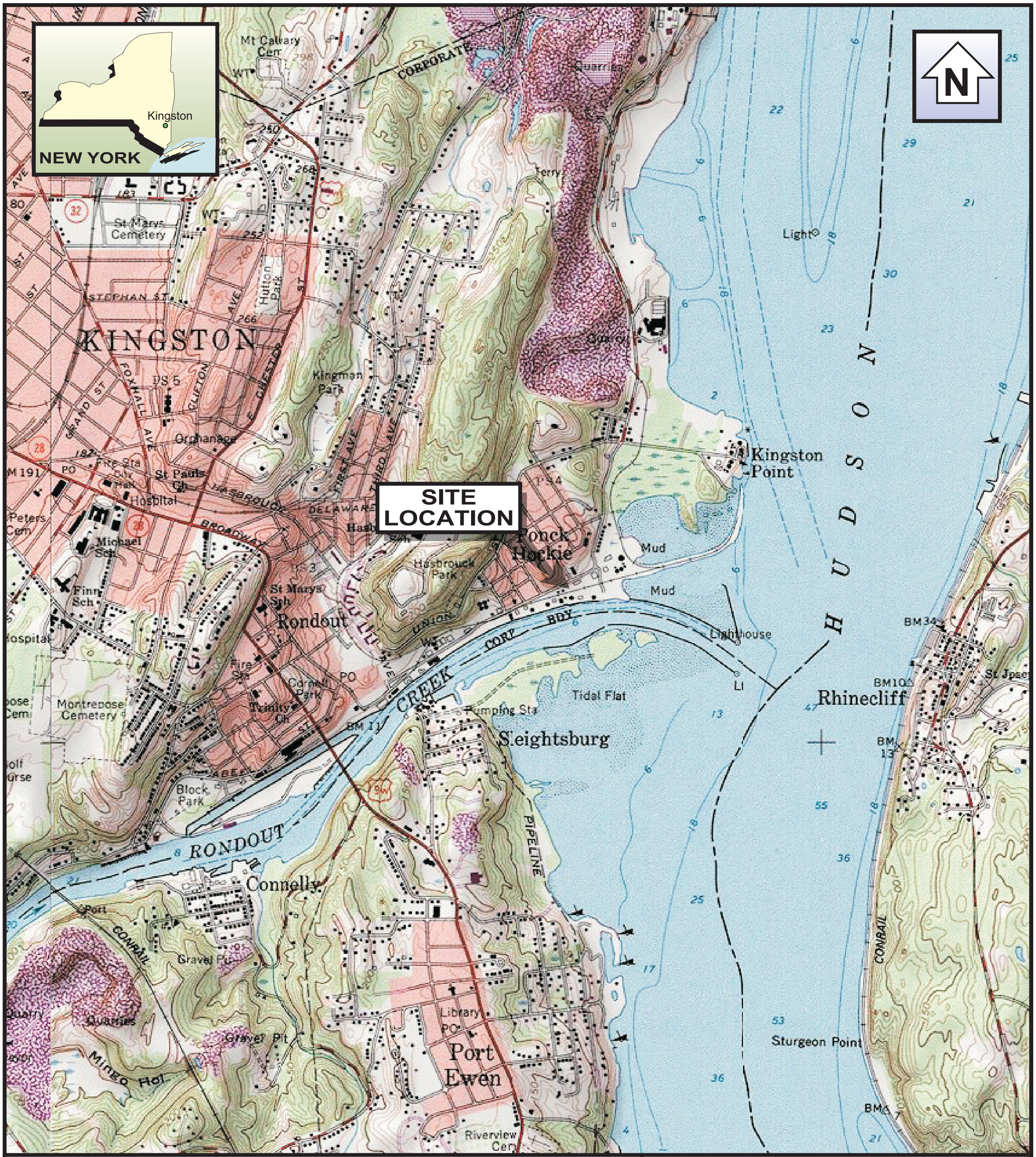
4) Actual sample ID's may change based on the number of samples collected.

TABLE 6 – PROJECT SCHEDULE AND SEQUENCING
Remedial Investigation
CHGE Kingston Gasworks, Site #C356017
East Strand Street
Kingston, NY

TASK	DURATION	DATES	LOGISTICS/ISSUES
1 PRE-INVESTIGATION WORK 1A Written Health and Safety Plan 1B Written Work Plan	**4 weeks**	**02/22/10 to 07/09/10**	• The Work Plan (WP) and HASP will be completed and submitted to the NYSDEC and the designated repository for public comment (The Kingston Library) concurrently.
2 LAND-BASED INVESTIGATION 2A Test Pit Program 2B Soil Boring Program 2C Monitoring Well Installation Program 2D First Round Ground Water Sampling 2D Second Round Ground Water Sampling	**5 weeks** 3 days 13 days 3-4 days 2 days 2 days	**07/19/10 to 12/08/10** 07/19/10 to 07/21/10 07/22/10 to 08/09/10 08/10/10 to 08/13/10 09/07/10 to 09/08/10 12/07/10 to 12/08/10	• Schedule assumes the 30-day public comment requirement for the RI Work Plan has been met. • Test pits, soil borings and ground water monitoring wells will be completed concurrently. • Schedule assumes all necessary access agreements have been obtained. • Allow at least 1 week for wells to stabilize before sampling. • Allow 3 weeks from the completion of investigation to receive all lab data. • Roll-offs for contaminated soil will need to be on-site prior to the start of the test pit program.
3 CREEK-BASED INVESTIGATION 3A Sediment Probing Program 3D Sediment Coring Program 3B Hydrodynamic Analysis 3C Background Sediment Sampling 3E Deep Sediment Borings 3F Fish and Wildlife Impact Analysis	**~4 months** 1 week 2 weeks 11 weeks 1 week 1 week 3 weeks	**07/12/10 to 12/17/10** 08/16/10 to 08/20/10 08/23/10 to 09/03/10 08/16/10 to 10/29/10 11/01/10 to 11/05/10 11/08/10 to 11/12/10 11/29/10 to 12/17/10	• Possible mooring locations for vessels to be used not confirmed. • Some phases of the hydrodynamic analysis will occur concurrently with sediment probing. • Field observations for the FWIA will be done prior to the receipt of data. • Allow 3 weeks from the completion of investigation to receive all lab data. • Allow 4 weeks from the completion of the hydrodynamic analysis to begin background sediment sampling (NYSDEC review).
4 RI REPORT 4A Complete RI Report	**6 weeks** 6 weeks	**12/17/10 to 01/28/11** 12/17/10 to 01/28/11	• A draft RI report will be prepared in approximately 6 weeks. The time does not include CHG&E, NYSDEC, or NYSDOH comments and/or revisions.

Note: All dates provided are estimates and may change based on the availability of the chosen sub-contractors, access restrictions (including areas within Rondout Creek), or other factors outside the control of TRC.

FIGURES



0 2000

SCALE FEET

0 1

SCALE MILE

1:24000

BASE CREATED WITH TOPO™ © 1996 WILDFLOWERS PRODUCTIONS,
www.topo.com 7.5' USGS TOPOGRAPHIC MAPS

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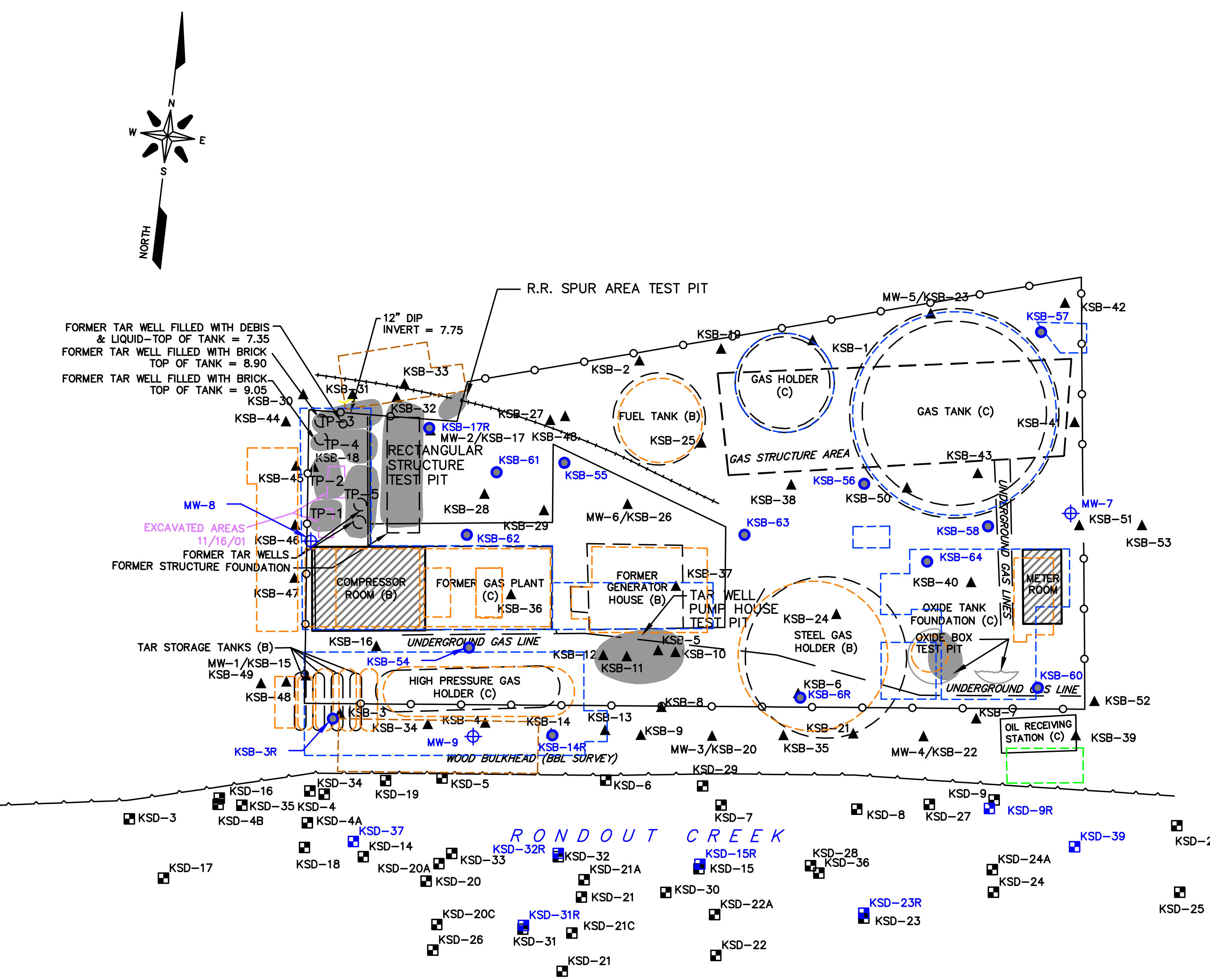
CENTRAL HUDSON GAS & ELECTRIC CORP.
KINGSTON, NEW YORK

FIGURE 1
SITE LOCATION MAP

Date: 03/10	**Project No.** 171506.1000.001A

NOTES:

1. THE LOCATION OF BORINGS, MONITORING WELLS AND SITE DETAILS TAKEN FROM AN ACTUAL SURVEY PREPARED BY JAMES A. BARTLES, LS 49640 ON OR BEFORE OCTOBER 9, 2001.
2. ALL ELEVATIONS BASED ON APPROXIMATE USGS DATUM.
3. BULKHEAD AND RONDOUT CREEK SAMPLING POINTS TAKEN FROM A SURVEY PREPARED BY BLASLAND, BOUCK & LEE ON OR BEFORE SEPTEMBER 21, 2001.
4. BUILDINGS AND/OR STRUCTURES MARKED WITH (B) INDICATE ITEMS TAKEN FROM "FIGURE 2" PROVIDED BY CH ENERGY GROUP. ITEMS MARKED WITH (C) TAKEN FROM MAP ENTITLED KINGSTON HOLDER STATION PROVIDED BY CH ENERGY GROUP.
5. THE LOCATION OF ADDITIONAL BORING LOCATIONS, WELL #6 AND BURIED TANK AND GAS LINELOCATIONS, PROVIDED BY MORRIS ASSOCIATES, 367 VIOLET AVENUE, POUGHKEEPSIE, NEW YORK 12601, AS SHOWN ON "BORING LOCATION SURVEY", FILE 201185.00, DATED 10/29/01, LAST UPDATED 2/25/02.
6. LOCATIONS OF FORMER TAR WELLS IN TP-5 AREA AND FORMER STRUCTURE FOUNDATION ARE APPROXIMATE.
7. BORING LOCATIONS KSB-50 THROUGH KSB-53 BASED ON FIELD MEASUREMENT TIES AND ARE APPROXIMATE.
8. 2007 FUSS & O'NEILL SAMPLE LOCATIONS BASED ON MAP TITLED "SUPPLEMENTAL INVESTIGATION SAMPLE LOCATIONS, FIGURE 2", TAKEN FROM SUPPLEMENTAL SITE INVESTIGATION REPORT, FORMER KINGSTON MANUFACTURED GAS PLANT, APRIL 2007.



KSD-1

KSD-2

KSD-11

KSD-12

KSD-13

LEGEND:

- 2007 F&O MONITORING WELL
- 2007 F&O SOIL BORING
- 2007 F&O SEDIMENT SAMPLE
- MONITORING WELL/SOIL BORING
- SEDIMENT SAMPLE
- TEST PIT LOCATION
- 1889 HISTORIC FEATURE
- 1920 HISTORIC FEATURE
- 1950 HISTORIC FEATURE
- 1974 HISTORIC FEATURE
- FENCE LINE

SOURCE:
FIGURE TITLED "FIGURE 1, CENTRAL HUDSON GAS AND ELECTRIC CORP., FORMER KINGSTON MGP SITE, KINGSTON, NEW YORK, REMEDIAL INVESTIGATION, PROPOSED BORING LOCATION MAP", SCALE: 1"=60', BY ARCADIS.

0 60' 120'
GRAPHIC SCALE

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CHG&E KINGSTON GAS WORKS SITE
REMEDIAL INVESTIGATION WORK PLAN

FIGURE 2
HISTORIC SAMPLE LOCATIONS

Date: 04/12/10 | Project No. 171506-100000-00001B

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FORMER KINGSTON MANUFACTURED GAS PLANT SITE
REMEDIAL INVESTIGATION WORK PLAN

FIGURE 3
PLANNED SITE LAYOUT

Date: 04/12/10 | Project No. 171506-100000-00001B

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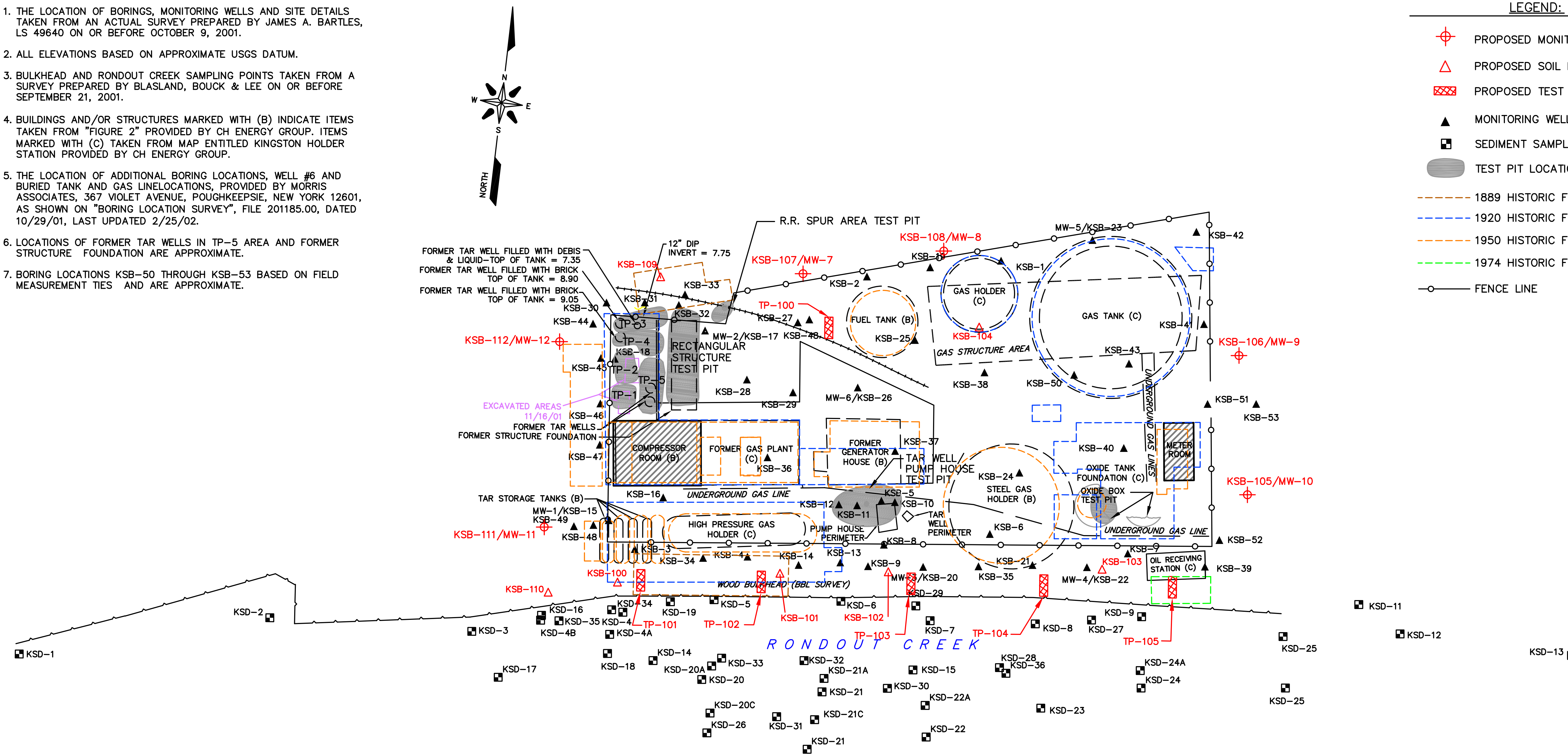
NOTES:

1. THE LOCATION OF BORINGS, MONITORING WELLS AND SITE DETAILS TAKEN FROM AN ACTUAL SURVEY PREPARED BY JAMES A. BARTLES, LS 49640 ON OR BEFORE OCTOBER 9, 2001.
2. ALL ELEVATIONS BASED ON APPROXIMATE USGS DATUM.
3. BULKHEAD AND RONDOUT CREEK SAMPLING POINTS TAKEN FROM A SURVEY PREPARED BY BLASLAND, BOUCK & LEE ON OR BEFORE SEPTEMBER 21, 2001.
4. BUILDINGS AND/OR STRUCTURES MARKED WITH (B) INDICATE ITEMS TAKEN FROM "FIGURE 2" PROVIDED BY CH ENERGY GROUP. ITEMS MARKED WITH (C) TAKEN FROM MAP ENTITLED KINGSTON HOLDER STATION PROVIDED BY CH ENERGY GROUP.
5. THE LOCATION OF ADDITIONAL BORING LOCATIONS, WELL #6 AND BURIED TANK AND GAS LINELOCATIONS, PROVIDED BY MORRIS ASSOCIATES, 367 VIOLET AVENUE, POUGHKEEPSIE, NEW YORK 12601, AS SHOWN ON "BORING LOCATION SURVEY", FILE 201185.00, DATED 10/29/01, LAST UPDATED 2/25/02.
6. LOCATIONS OF FORMER TAR WELLS IN TP-5 AREA AND FORMER STRUCTURE FOUNDATION ARE APPROXIMATE.
7. BORING LOCATIONS KSB-50 THROUGH KSB-53 BASED ON FIELD MEASUREMENT TIES AND ARE APPROXIMATE.



LEGEND:

- PROPOSED MONITORING WELL LOCATION
- PROPOSED SOIL BORING LOCATION
- PROPOSED TEST PIT LOCATION
- MONITORING WELL/SOIL BORING
- SEDIMENT SAMPLE
- TEST PIT LOCATION
- 1889 HISTORIC FEATURE
- 1920 HISTORIC FEATURE
- 1950 HISTORIC FEATURE
- 1974 HISTORIC FEATURE
- FENCE LINE

SOURCE:
FIGURE TITLED "FIGURE 1, CENTRAL HUDSON GAS AND ELECTRIC CORP., FORMER KINGSTON MGP SITE, KINGSTON, NEW YORK, REMEDIAL INVESTIGATION, PROPOSED BORING LOCATION MAP", SCALE: 1"=60', BY ARCADIS.

0 60' 120'
GRAPHIC SCALE

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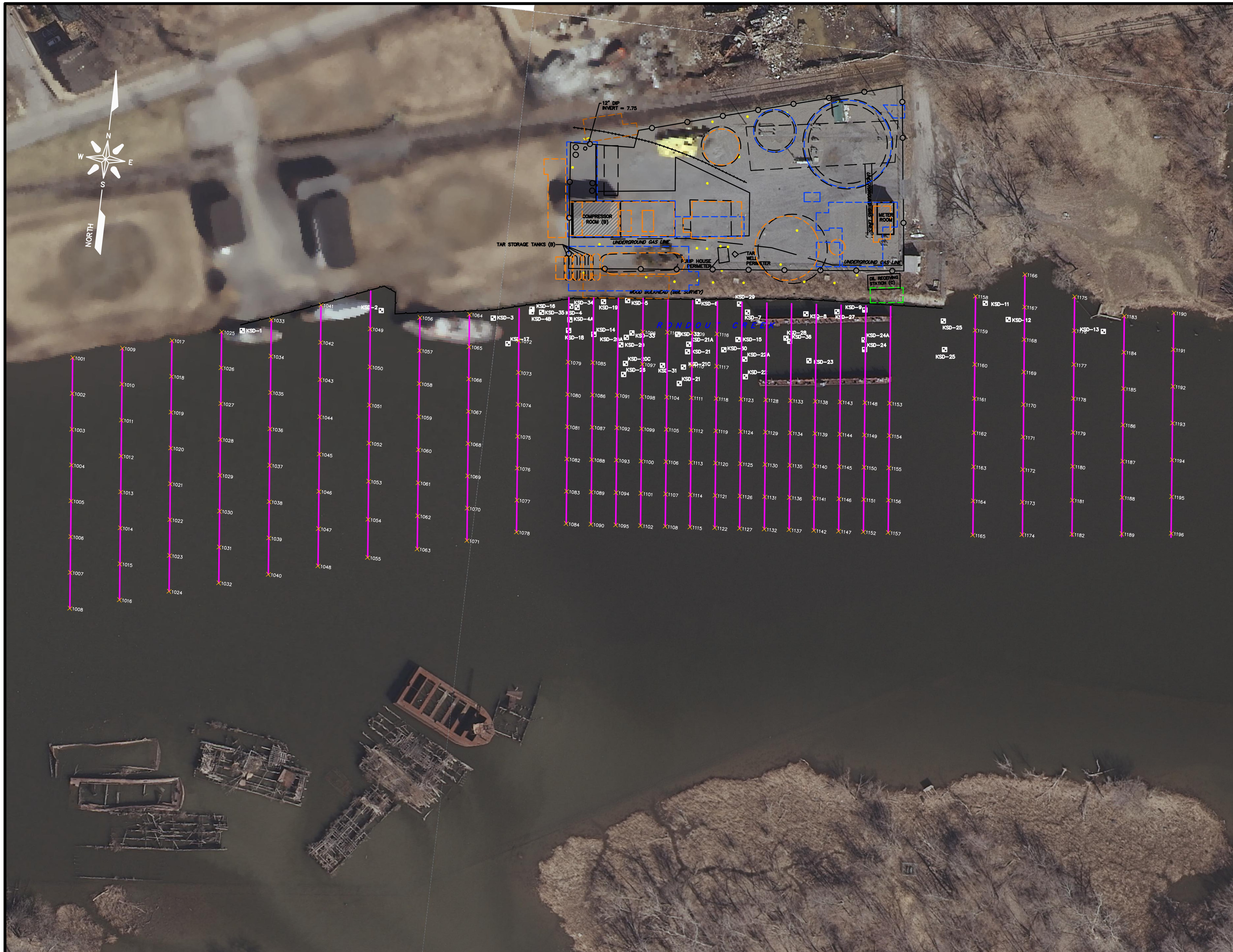
CHG&E KINGSTON GAS WORKS SITE
REMEDIAL INVESTIGATION WORK PLAN

FIGURE 4
PLANNED TEST PIT, SOIL BORING AND MONITORING WELL LOCATIONS

Date: 04/12/10	Project No. 171506-100000-00001B



LEGEND:

SEDIMENT SAMPLE

1889 HISTORIC FEATURE

1920 HISTORIC FEATURE

1950 HISTORIC FEATURE

1974 HISTORIC FEATURE

FENCE LINE

NOTES:

1. ALL ELEVATIONS BASED ON APPROXIMATE USGS DATUM.
2. BULKHEAD AND RONDOUT CREEK SAMPLING POINTS TAKEN FROM A SURVEY PREPARED BY BLASLAND, BOUCK & LEE ON OR BEFORE SEPTEMBER 21, 2001.

SOURCE:

FIGURE TITLED "FIGURE 1, CENTRAL HUDSON GAS AND ELECTRIC CORPORATION, POUGHKEEPSIE, NEW YORK, KINGSTON SITE, RONDUIT CREEK SEDIMENT INVESTIGATION LOCATIONS", SCALE: 1"=100', BY ARCADIS.

0 100' 200'

GRAPHIC SCALE

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FIGURE 5
PLANNED SEDIMENT PROBING LOCATIONS

Date: 05/27/10 | Project No. 171506-100000-00001B

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REMEDIAL INVESTIGATION WORK PLAN

FIGURE 6
PLANNED PROBING AREAS FOR THE HYDRODYNAMIC ANALYSIS

Date: 04/12/10 | **Project No. 171506-100000-00001B**

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LEGEND:

- SEDIMENT SAMPLE
- KSD200 PLANNED DEEP SEDIMENT BORING LOCATION
- 1889 HISTORIC FEATURE
- 1920 HISTORIC FEATURE
- 1950 HISTORIC FEATURE
- 1974 HISTORIC FEATURE
- FENCE LINE

NOTES:

1. ALL ELEVATIONS BASED ON APPROXIMATE USGS DATUM.
2. BULKHEAD AND RONDOUT CREEK SAMPLING POINTS TAKEN FROM A SURVEY PREPARED BY BLASLAND, BOUCK & LEE ON OR BEFORE SEPTEMBER 21, 2001.

SOURCE:

FIGURE TITLED "FIGURE 1, CENTRAL HUDSON GAS AND ELECTRIC CORPORATION, POUGHKEEPSIE, NEW YORK, KINGSTON SITE, RONDUIT CREEK SEDIMENT INVESTIGATION LOCATIONS", SCALE: 1"=100', BY ARCADIS.

0 60' 120'

GRAPHIC SCALE

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REMEDIAL INVESTIGATION WORK PLAN

FIGURE 7

PLANNED DEEP SEDIMENT BORING LOCATIONS

Date: 04/12/10 | Project No. 171506-100000-00001B

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APPENDIX A

6 NYCRR TABLE 375-6.8(b)

(b) Restricted use soil cleanup objectives.

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Metals							
Arsenic	7440-38-2	16[f]	16[f]	16[f]	16[f]	13[f]	16[f]
Barium	7440-39-3	350[f]	400	400	10,000 [d]	433	820
Beryllium	7440-41-7	14	72	590	2,700	10	47
Cadmium	7440-43-9	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent [h]	18540-29-9	22	110	400	800	1[e]	19
Chromium, trivalent [h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50-8	270	270	270	10,000 [d]	50	1,720
Total Cyanide [h]		27	27	27	10,000 [d]	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63[f]	450
Manganese	7439-96-5	2,000[f]	2,000[f]	10,000 [d]	10,000 [d]	1600[f]	2,000[f]
Total Mercury		0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	7440-02-0	140	310	310	10,000 [d]	30	130
Selenium	7782-49-2	36	180	1,500	6,800	3.9[f]	4[f]
Silver	7440-22-4	36	180	1,500	6,800	2	8.3
Zinc	7440-66-6	2200	10,000 [d]	10,000 [d]	10,000 [d]	109[f]	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	93-72-1	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e]	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e]	136
4,4'- DDD	72-54-8	2.6	13	92	180	0.0033 [e]	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04[g]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47	1.3	2.9

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
delta-BHC	319-86-8	100[a]	100[a]	500[b]	1,000[c]	0.04[g]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000[c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan II	33213-65-9	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	1031-07-8	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2
Semivolatiles							
Acenaphthene	83-32-9	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	208-96-8	100[a]	100[a]	500[b]	1,000[c]	NS	107
Anthracene	120-12-7	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	56-55-3	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	50-32-8	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1[f]	3.9	56	110	NS	1[f]
Dibenz(a,h)anthracene	53-70-3	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	206-44-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	86-73-7	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd)pyrene	193-39-5	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	91-20-3	100[a]	100[a]	500[b]	1,000[c]	NS	12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
o-Cresol	95-48-7	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	106-44-5	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	85-01-8	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	108-95-2	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	129-00-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Volatiles							
1,1,1-Trichloroethane	71-55-6	100[a]	100[a]	500[b]	1,000[c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33
1,2-Dichlorobenzene	95-50-1	100[a]	100[a]	500[b]	1,000[c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02[f]
cis-1,2-Dichloroethene	156-59-2	59	100[a]	500[b]	1,000[c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	100[a]	500[b]	1,000[c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1[e]	0.1[e]
Acetone	67-64-1	100[a]	100[b]	500[b]	1,000[c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100[a]	100[a]	500[b]	1,000[c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100[a]	100[a]	500[b]	1,000[c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100[a]	100[a]	500[b]	1,000[c]	100[a]	0.12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Methyl tert-butyl ether	1634-04-4	62	100[a]	500[b]	1,000[c]	NS	0.93
Methylene chloride	75-09-2	51	100[a]	500[b]	1,000[c]	12	0.05
n-Propylbenzene	103-65-1	100[a]	100[a]	500[b]	1,000[c]	NS	3.9
sec-Butylbenzene	135-98-8	100[a]	100[a]	500[b]	1,000[c]	NS	11
tert-Butylbenzene	98-06-6	100[a]	100[a]	500[b]	1,000[c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100[a]	100[a]	500[b]	1,000[c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5- Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20-7	100[a]	100[a]	500[b]	1,000[c]	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm).
NS=Not specified. See Technical Support Document (TSD).

Footnotes

[a] The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

[b] The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

[c] The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

[d] The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

[e] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

[f] For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

[g] This SCO is derived from data on mixed isomers of BHC.

[h] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

[i] This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.

[j] This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See TSD Table 5.6-1.