PROPOSED REMEDIAL ACTION PLAN

NM - Ilion MGP Site
Ilion, Herkimer County
Site No. 622019
February 2011

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that will be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repositories identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repositories:

Ilion Free Public Library
78 West Street
Ilion, NY 13357
Phone: (315)-894-5028

NYSDEC Albany Office
Attn: Mr. Bernard Franklin
625 Broadway
Albany, NY 12233-7014
Phone: (866) 520-2334
bcfrankl@gw.dec.state.ny.us

A public comment period has been set from:

2/15/2011 to 3/17/2011

A public meeting is scheduled for the following date:

2/17/2011 at 7:00 PM

Public meeting location:

The Village of Ilion Municipal Building
49 Morgan ST.
Ilion, NY 13357

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question- and answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through 3/12/2011 to:

Bernard Franklin
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
bcfrankl@gw.dec.state.ny.us

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP, based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environment Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program or Resource Conservation and Recovery Act Program We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html.

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The Ilion Former Manufacture Gas Plant (MGP) Site is a 1.3-acre L-shaped parcel located at 1 East Street in a mixed commercial/residential part of the Village of Ilion, Herkimer County, New York. The site is bounded by East Clark Street and residential properties to the north, East Street to the east, State Street (formerly Canal Street) to the south, and a commercial property and several residences to the west. State Street overlies the location of the former Erie Canal. An automobile dealer, auto service garage and a gasoline station are located to the south and southwest of the site.

Site Features: The site is currently owned by National Grid and contains a gas regulator station recently taken out of service. No other structures exist on-site. The site has a gentle slope from south to north.

Current Zoning/Use(s): The site is currently zoned for commercial uses.

Site Geology and Hydrogeology: Site geology consists of four unconsolidated units. These are, from top to bottom: fill (3 feet to approximately 13 feet thick); silts, fine sands and clays (0 to 15 feet thick); peat (0 to 2 feet thick); and a sand and gravel unit (starting at 13 to 20 feet below grade and extending at least 60 feet). Within the study area, groundwater is encountered at depths of approximately 5 to 15 feet within fill or the silt/sand/clay unit. Groundwater in the unconsolidated deposits flows towards the Mohawk River to the north.

Historical Use(s): The Ilion site was the location of a former gas manufacturing plant from the 1870s through 1912. Subsequently, the site was used for various utility operations (including gas storage and distribution), electrical substation applications, and as a service center.

The Ilion site consists of two parcels with the second parcel added to accommodate increased manufacturing capacity. The first parcel (1.0 acre) was purchased in 1874 by the Ilion Mohawk Gas Light Company at the corner of East Street and the north towpath for the Erie Canal. By 1881, the site contained an octagonal gas holder at the corner of East and East State Streets and a gashouse with a coal shed to the west of the gas holder. The second parcel, approximately 0.31 acre in size was purchased in 1890 to allow for further expansion of the MGP. An electric light station was added to the north side of the gas works building around 1891. By 1897, an 80,000 cubic-foot gas holder was constructed north of the gas plant, adjacent to East Street, and the octagonal gas holder located in the first parcel was taken out of service. The gas plant ceased operation in 1912. In 1917, a 200,000 cubic-foot gas holder was constructed above ground, adjacent to the former gas plant, to store manufactured gas from the Harbor Point MGP in Utica, New York.

The Erie Canal was filled in 1921, and East Canal Street (now State Street) was realigned to the south. In 1940, an outdoor substation was constructed at the corner of East and East State Streets, covering the foundation of the former octagonal gas holder. By 1940, the 80,000 cubic foot gas holder had been removed. In the early 1950s, an auto repair shop, gasoline station, auto dealers, and a junkyard were located south and west of the site, and natural gas replaced manufactured gas in Ilion. In 1956, the 200,000 cubic foot gas holder and most of the remaining

gas equipment were removed from the site. The substation was decommissioned and removed in 1997. The last of the buildings associated with former gas manufacturing operations were demolished in September 2000.
Between 1995 and 1997, Niagara Mohawk (National Grid Co.) conducted a Preliminary Site Assessment (PSA), which involved test trenching; monitoring well installation; and groundwater and soil sampling.

In 1995, National Grid submitted an oil spill report to the Department due to the presence of visibly stained soil underneath and adjacent to electrical equipment at the on-site substation. The top 6-inches of soil below the substation were removed and properly disposed to remediate the reported spill.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use as described in Part 375-1.8(g) is/are being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

National Grid

The Department and Niagara Mohawk Power Corporation (now the National Grid Company) entered into multi-site Consent Orders D0-0001-9210 and A4-0473-0000 on December 12, 1992 and November 11, 2003. The Orders obligate the responsible party to implement a full remedial program for 33 former MGP sites across the State, including the Ilion MGP.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field

activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Information

The analytical data collected on this site includes data for:

- air
- groundwater
- soil
- sediment
- soil vapor

The data has identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site are:

coal tar	naphthalene
benzo(a)pyrene	phenanthrene
acenaphthene	pyrene
anthracene	acenapthylene
benzo(b)fluoranthene	benzo(ghi)perylene
benz(a)anthracene	benzo[k]fluoranthene
dibenz[a,h]anthracene	benzene
chrysene	ethylbenzene
fluoranthene	toluene
fluorene	xylene (mixed)
indeno(1,2,3-cd)pyrene	cyanides(soluble cyanide salts)

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable standards, criteria and guidance for:

- groundwater
- soil
- soil vapor

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

There were no IRMs performed at this site during the RI.

6.3: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

People are not drinking the contaminated groundwater because the area is served by a public water supply that obtains its water from a different source. Also, they are not coming into contact with the groundwater unless they dig below the ground surface. The site is completely fenced, which restricts public access; however, persons who enter the site may come into contact with contaminants in the soil by walking on the dirt, digging on or below the ground surface, and otherwise disturbing the soil. Contact with contaminated soil found in the off-site drainage swale area could occur, however this area is not easily accessible due to heavy vegetation.

Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Currently there are no occupied buildings on the site. In addition, sampling indicates soil vapor intrusion is not a concern for off-site buildings.

6.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The Fish and Wildlife Resources Impact Analysis (FWRIA), which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

The primary contaminants of concern at the site include benzene, toluene, ethylbenzene and xylenes (collectively referred to as BTEX), polycyclic aromatic hydrocarbons (PAH) and cyanide. Subsurface soil and groundwater have been impacted by these contaminants, in some cases exceeding Department standards and guidance values. The principal waste product produced at the former MGP site was coal tar, which is an oily, dark colored liquid. Coal tar is referred to as a dense non-aqueous phase liquid or DNAPL since it is slightly heavier than water and will not readily dissolve in water.

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The following environmental exposure pathways and ecological impacts have been identified: Soils in the off-site drainage swale, which leads to the Mohawk River, contain levels of PAHs above guidance values.

The FWRIA did not identify any current or potential impacts to ecological resources.

No current or potential site-related surface water impacts have been identified.

Groundwater resources at the site include overburden groundwater typically 5-7 feet below grade and are flowing in a northern direction towards the Mohawk River. Site related contamination is impacting groundwater. The groundwater is not used as a source of potable water.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Exhibit B. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit C. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that will be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation,

maintenance, or monitoring will cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit D.

7.1: Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-

effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

7.2: Elements of the Proposed Remedy

The basis for the Department's proposed remedy is set forth at Exhibit E.
The estimated present worth cost to implement the remedy is $5,300,000. The cost to construct the remedy is estimated to be $4,960,000 and the estimated average annual cost is $11,500.

The elements of the proposed remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.

2. Excavation and off-site disposal of surface and subsurface soil, structures and piping from the site and off-site areas where the soil contains visible tar or non-aqueous phase liquids (NAPL), total MGP-related PAHs greater than 500 ppm or cyanide concentrations greater than 40 ppm. Excavation will include near-site soils adjacent to the site where surface soil samples exceed background levels of PAHs and MGP- related contaminated soils located in the off-site drainage swale.

3. A site cover will be required to allow for commercial use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d). Based on the RI, the newly installed cover system would be limited to the

eastern portion of the site. The need to extend the cover system on a portion(s) of the western parcel will be addressed by pre-design sampling and an assessment of findings relative to commercial use SCOs and background values.

4. Excavated materials that are below the remediation criteria may be stockpiled and evaluated for reuse as backfill. The on-site excavation will be backfilled with stockpiled soils and/or imported soil that meets the 6NYCRR 375-6.7(d) criteria for backfill. The off-site excavations will be backfilled with soil meeting the residential SCOs.

5. Natural attenuation of the contamination identified in groundwater.

6. Green remediation and sustainability efforts will be considered in the design and implementation of the remedy to the extent practicable, including;

- using renewable energy sources
- reducing green house gas emissions
- encouraging low carbon technologies
- foster green and healthy communities
- conserve natural resources
- increase recycling and reuse of clean materials
- preserve open space and working landscapes
- design cover systems to be usable for habitat or recreation
- design storm water management systems to recharge aquifers

7. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

(a) requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).
(b) allows the use and development of the controlled property for commercial and industrial use, provided however that the actual use is subject to local zoning.
(c) restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH,
(d) prohibits agriculture or vegetable gardens on the controlled property,
(e) requires compliance with the Department approved Site Management Plan.

8. A Site Management Plan is required, which includes the following:

(a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The environmental easement discussed in Paragraph 7 above.

Engineering Controls: The site cover discussed in Paragraph 3 above.

This plan includes, but may not be limited to:

(i) an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination,
(ii) descriptions of the provisions of the environmental easement including any land use, or groundwater use restrictions,
(iii) provisions for the management and inspection of the identified engineering controls,
(iv) maintaining site access controls and Department notification, and
(v) the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls;

(b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but is not limited to:

(i) monitoring of soil cover and groundwater to assess the performance and effectiveness of the remedy,
(ii) a schedule of monitoring and frequency of submittals to the Department,
(iii) provision to evaluate the potential for vapor intrusion for any buildings developed on the site, including provision to take actions recommended to address exposures related to soil vapor intrusion..

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation (RI). As described in the RI report, waste/ source materials were identified at the site and are impacting groundwater, soil, soil in off-site swale, and soil vapor.

This section describes the findings for all environmental media that were evaluated. As described in Section 6.1.2, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into three categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 6.1.1 are also presented.

Waste/Source Areas

Wastes are defined in 6 NYCRR Part 375-1.2 (aw) and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375 (au). Source areas are areas of concern at a site where substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium.

Manufactured gas was cooled and purified prior to distribution. Two principal waste materials including coal tar and purifier waste were produced in this process. Coal tar is a reddish brown oily liquid by-product which formed as a condensate as the gas cooled. Purifier waste is a mixture of iron filings and wood chips which was used to remove cyanide and sulfur gases from the gas prior to distribution.

Coal tar does not readily dissolve in water. Materials such as this are commonly referred to as non-aqueous phase liquids, or NAPLs. The terms NAPL and coal tar are used interchangeably in this document. Although most coal tars are slightly denser than water, the difference in density is slight. Consequently, they can either float or sink when in contact with water.

Unlike NAPL, purifier waste is a solid waste of oatmeal consistency. Purifier waste has the potential to leach cyanide and create acidic conditions in nearby surface water and/or groundwater. It contains high concentrations of sulfur and cyanide and has a characteristic blue color from complexed ferrocyanides.

Specific volatile organic compounds (VOCs) of concern are benzene, toluene, ethylbenzene and xylenes. These are referred to collectively as BTEX in this document. Specific semivolatile organic compounds of concern are the polycyclic aromatic hydrocarbons (PAHs):

acenaphthene	anthracene
acenaphthylene	*benzo(a)anthracene*

benzo(a)pyrene
benzo(b)fluoranthene
benzo(g,h,i)perylene
benzo(k)fluoranthene
pyrene
chrysene
fluoranthene
fluorene
indeno(1,2,3-cd)pyrene
2-methylnaphthalene
naphthalene
phenanthrene
dibenzo(a,h)anthracene

Total PAH concentrations as referred to in this plan are the sum of the individual PAHs listed above. The italicized PAHs are probable human carcinogens.

The extent of coal tar that was found both on and off the site is shown in Figure 2. On-site, the tar is present in two limited areas of the former MGP, in the vicinity of two of the former gas holders. Off-site, tar appears to have been discharged or migrated to a portion of the off-site study area outlined on Figure 1. A lens of tar and tar-stained soil is present between approximately six and nine feet below ground surface in an area measuring 30 by 110 feet.

The waste/source areas and MGP related structures and piping identified will be addressed in the remedy selection process.

Groundwater

Groundwater samples were collected from overburden monitoring wells to assess groundwater conditions both on and off the site. The results indicate that contamination in shallow groundwater at the site exceeds the SCGs for BTEX, PAHs and cyanide. Figure 3 shows the extent of groundwater that exceeds the SCGs for cyanide.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Benzene	ND - 43	1	3/17
Ethyl benzene	ND - 15	5	1/17
Toluene	ND – 2.7	5	0/17
Xylenes	ND - 17	5	1/17
SVOCs			
Acenapthene	ND - 6	20	0/17
Flourene	ND - 13	50	0/17
Naphthalene	ND - 100	10	2/17
Inorganics			
Cyanide	ND - 3600	200	3/17

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Based on the findings of the RI, the disposal of hazardous waste has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are BTEX, PAHs and cyanide.

Soil

Surface and subsurface soil samples were collected at the site during the RI. A total of 32 surface soil samples were collected from a depth of 0-2 inches to assess direct human exposure. Fourteen surface soil samples were collected from the site, and 18 were collected from off-site areas near the site. Surface soil samples were also collected from 14 locations that are unaffected by the site to evaluate the degree of contamination attributable to background conditions. Surface soil samples were analyzed for volatile and semi-volatile compounds.

Surface soil across the eastern portion of the site exceeds the SCOs for both unrestricted and commercial use. This is consistent with the use of this portion of the site for gas production activities. Surface soil contaminant concentrations across the western portion of the site are consistent with those measured in background samples. This portion of the site was not used for gas production activities.

Surface soil in two off-site areas adjacent to the site contained MGP-related PAHs above background levels. One is a small area on a parcel immediately to the west of the site (sample SS-16 on Figure 4), and one is the strip of land along the eastern boundary of the site between the fence line and East Street (samples SS-10, SS-11, SS-12, SS-13 and SS-22 on Figure 4). Together, these account for the 5 sample locations where background levels of PAHs were persistently and significantly exceeded. The remaining exceedances of individual and total PAHs were slight exceedances that did not follow a pattern.

Table 2 - On-site Surface Soils

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCO[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial Use SCO[c] (ppm)	Frequency Exceeding Restricted SCG
SVOCs					
Benzo(a)anthracene	0.63-17	1	12/14	5.6	3/14
Benzo(a)pyrene	0.66-17	1	12/14	1	12/14
Benzo(b)fluoranthene	0.46-14	1	12/14	5.6	4/14
Benzo(k)fluoranthene	0.6-14	0.8	13/14	56	0/14
Chrysene	0.77-17	1	12/14	56	0/14
Dibenz(a,h)anthracene	0.07-6.5	0.33	6/14	0.56	4/14

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCO[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial Use SCO[c] (ppm)	Frequency Exceeding Restricted SCG
Indeno(1,2,3-cd)pyrene	0.39-16	0.5	12/14	5.6	3/14

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Commercial Soil Cleanup Objectives.

Table 3 – Near-Site Surface Soils

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCO[b] (ppm)	Frequency Exceeding Unrestricted SCG
SVOCs			
Benzo(a)anthracene	0.31-17	1	14/18
Benzo(a)pyrene	0.36-18	1	15/18
Benzo(b)fluoranthene	0.5-20	1	16/18
Benzo(k)fluoranthene	0.2-7.7	0.8	14/18
Chrysene	0.42-15	1	15/18
Dibenz(a,h)anthracene	0.07-2	0.33	8/18
Indeno(1,2,3-cd)pyrene	0.28-9.6	0.5	16/18
Total PAHs	4.2 - 183	N/A	N/A

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

Subsurface soil samples were collected from a depth of 2 - 20 feet to assess soil contamination impacts to groundwater. The results indicate that soils at the site exceed the unrestricted SCO for BTEX, PAHs and cyanide.

Table 4 – On-Site Subsurface Soils

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCO[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCO[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCO[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCO[c] (ppm)	Frequency Exceeding Restricted SCG
Benzene	ND-210	0.06	5/74	0.06	5/74
Ethyl benzene	ND-38	1	3/74	1	3/74
Toluene	ND-310	0.7	3/74	0.7	3/74
Xylenes	ND-570	0.26	7/74	0.26	7/74
SVOCs					
Acenapthene	ND-310	20	3/76	500	0/76
Acenaphthylene	ND-780	100	2/76	500	2/76
Anthracene	ND-1200	100	2/76	500	2/76
Benzo(a)anthracene	ND-980	1	27/76	5.6	18/76
Benzo(a)pyrene	ND-680	1	28/76	1	28/76
Benzo(b)fluoranthene	ND-440	1	24/76	5.6	15/76
Benzo(g,h,i)perylene	ND-400	100	2/76	500	0/76
Benzo(k)fluoranthene	ND-670	0.8	27/76	56	2/76
Chrysene	ND-780	1	27/76	56	3/76
Dibenz(a,h)anthracene	ND-150	0.33	16/76	0.56	15/76
Fluoranthene	ND-1600	100	5/76	500	2/76
Fluorene	ND-1100	30	5/76	500	2/76
Indeno(1,2,3-cd)pyrene	ND-460	0.5	28/76	5.6	14/76
Naphthalene	ND-2800	12	10/76	500	3/76
Phenanthrene	ND-2600	100	5/76	500	2/76
Pyrene	ND-1600	100	3/76	500	2/76
Inorganics					
Cyanide	ND-266	27	4/72	27	4/72

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Commercial Soil Cleanup Objectives.

The primary soil contaminants are BTEX, PAHs and cyanide associated with residues from the operation of the former MGP. Soil contamination is prevalent in the areas near the former MGP structures, including the gas holders.

Soils in the off-site area also exceeded the SCOs for unrestricted use. Chemical fingerprinting analysis of these soils revealed that some of this contamination is related to the former MGP, but other samples have a fuel oil fingerprint, which is not related to the former MGP. Other potential sources of contamination in this area include the Ilion DPW garages, the DPW debris disposal area, the former Ilion Landfill and illegal dumping.

Based on the findings of the Remedial Investigation, the disposal of MGP related hazardous waste has resulted in the contamination of soil on and off the site. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, BTEX, PAHs and cyanide.

Surface Water

No site-related surface water contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for surface water.

Swale Soil

Soil samples were collected during the RI from the off-site drainage swale leading to the Mohawk River. The samples were collected to assess the potential for MGP-related impacts from the site. The results indicate that soil in the off-site drainage swale exceed the background for soil PAHs. Figure 5 shows the extent of MGP-related contamination in the off-site drainage swale.

The site contaminants identified in swale soils which are considered to be the primary contaminants of concern to be addressed by the remedy selection process are total PAHs.

Table 5 – Swale Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)	Frequency Exceeding SCG
VOCs			
Benzene	ND-2.2	0.28	3/51
Ethyl benzene	ND-0.42	0.24	2/51
Toluene	ND-0.74	0.4	1/51
Xylenes	ND-3.1	0.92	2/51
SVOCs	N/A	N/A	N/A
Total cPAHs	ND-9390	43	8/55

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG[b] (ppm) = Site surface soil background for total cPAH

Soil Vapor Intrusion

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of soil vapor. At this site no buildings were present in impacted areas, so only soil vapor was evaluated. There is currently no established technical guidance (SCGs) for soil vapor.

Table 6 – Soil Vapor

Detected Constituents	Concentration Range Detected (ug/m3)[a]
1,1,1-Trichloroethane	ND – 8.7
1,2,4-Trimethylbenzene	ND – 18
1,2-Dimethylbenzene	ND – 13
1,3,5-Trimethylbenzene	ND – 35
1,2-Butadiene	ND – 5.8
1,4-Dichlorobenzene	ND – 5.8
2,2,4-Trimethylpentane	ND – 15
2-Butanone	ND – 3.8
Acetone	ND – 40
Benzene	ND – 22
Carbon disulfide	ND – 9
Chloroform	ND – 2.8
Chloromethane	ND – 2.9
Cyclohexane	ND – 22
Dichlorodifluoromethane	ND – 4.1
Ethylbenzene	ND – 11
Styrene	ND – 3
Tetrachloroethene (PCE)	ND – 18.4
Toluene	4.9-94
Trichlorofluoromethane	ND – 3.5
Vinyl chloride	ND – 1

Detected Constituents	Concentration Range Detected (ug/m3)[a]
N-Heptane	ND – 78
N-Hexane	ND – 120
P-Ethyltoluene	ND – 13

a – ug/m3: micrograms per cubic meter
b – SCGs are not available for soil vapor

Soil vapor samples were collected from the perimeter of the site to assess the potential for soil vapor intrusion to off-site buildings. Outdoor air samples were also collected for comparison. Elevated soil vapor levels were found in the southern corner of the site, in the immediate vicinity of the former octagonal gas holder during the initial soil vapor sampling event. Chemicals detected included both MGP related and non-MGP related contaminants. A second phase of soil vapor sampling was then conducted to further determine the potential for soil vapor to be migrating toward off- site properties. Based on the soil vapor sampling results (see Table 6), the groundwater and soil sampling results (Tables 2, 3 and 4), and our experience at other MGP sites in New York State, the agencies determined that no further investigation of soil vapor or soil vapor intrusion beyond the site boundary was necessary.

However, due to the presence of MGP source areas beneath the site, there is potential for on-site soil vapor contamination. There is also a potential for people to come into contact with this contamination due to soil vapor intrusion if new buildings are constructed on-site. Therefore, the potential for on-site soil vapor intrusion will be addressed by the remedy selection process.

Exhibit B

SUMMARY OF THE REMEDIATION OBJECTIVES

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial objectives for this site are:

Public Health Protection

Groundwater

- Prevent people from drinking groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles from contaminated groundwater.

Soil

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil

Soil Vapor

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the site.

Environmental Protection

Groundwater

- Restore the groundwater aquifer to meet ambient groundwater quality criteria, to the extent feasible.

Soil

- Prevent migration of contaminants that will result in groundwater contamination.

Exhibit C

Description of Remedial Alternatives

The following alternatives were considered to address the contaminated media identified at the site as described in Section 5:

SOIL REMEDIATION ALTERNATIVES

Alternative S1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative S2: Institutional Controls

This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment from any contamination identified at the site. The environmental easement will restrict the use of the site commercial use, require compliance with the site management plan, and require National Grid to periodically certify that the institutional controls are still effective. The site management plan will identify requirements for intrusive activities in the project area, handling and disposal of potentially contaminated materials that may be encountered during subsurface activities, notifications and reporting. The plan will also require an evaluation and mitigation of the potential for vapor intrusion for any buildings that may be developed on the site.

This alternative will require approximately 2 months to design and 2 months to implement.

Present Worth:	$125,000
Capital Cost:	$65,000
Annual Costs:	$2,000

Alternative S3: Removal and Off-site Disposal of MGP Source Material, Soil Cover and Institutional Controls for Commercial Site Use

This alternative will include the excavation of MGP source material, both on and off the site, defined by soil containing visible tar, greater than 500 ppm total MGP-related PAHs, or cyanide concentrations greater than 40 ppm. The volume of this excavation is currently estimated to be 5,460 cubic yards, both on and off the site. This also includes the two areas adjacent to the site where surface soil samples exceed background levels for individual PAH contaminants. A one-foot soil cover will be placed over backfilled excavations and over on-site soils with contaminant concentrations that exceed the SCOs for commercial use. Based on the RI, the newly installed cover system would be limited to the eastern portion of the site. The need to extend the cover system on a portion(s) of the western parcel will be addressed by pre-design sampling and an assessment of findings relative to commercial use SCOs and background values. Off-site excavations will be backfilled and covered with at least two feet of soil meeting the residential SCOs. Based on current data, an estimated 1,000 cubic yards of soil containing MGP-related contaminants will be removed from the upper four feet of the off-site drainage swale. The site management plan

and environmental easement specified in Alternative 2 will also be implemented. The on-site and off-site components of this alternative are shown in Figures 6 and 7, respectively.

This alternative will require approximately 6 months to design and 6 months to implement.

Present Worth: $5,050,000
Capital Cost: $4,890,000
Annual Costs: $3,500

Alternative S4: Removal and Off-site Disposal of MGP Source Material, Soil Cover and Institutional Controls for Restricted Residential Site Use

This alternative was developed to evaluate the feasibility of achieving a restricted residential cleanup of the site based on the presence of residential properties near the site on East Street and East Clark Street. This alternative would include the excavation of MGP source material, both on and off the site, defined by soil containing visible tar, greater than 500 ppm total MGP-related PAHs, or cyanide concentrations greater than 40 ppm. In addition, the on-site source area excavations will be expanded to include soils that exceed the restricted-residential SCOs. The volume of this excavation is currently estimated to be 5,860 cubic yards, both on and off the site. This also includes the two areas adjacent to the site where surface soil samples exceed background levels for individual PAH contaminants. A two-foot soil cover will be placed over backfilled excavations and over on-site soils with contaminant concentrations that exceed the restricted residential use SCOs. Based on current data, an estimated 1,000 cubic yards of soils containing MGP-related contaminants will be removed from the upper four feet of the off-site drainage swale. The site management plan and environmental easement specified in Alternative 2 will also be implemented, except that the environmental easement will specify a restricted residential use of the site. The off-site components are the same as those in Alternative S3.

This alternative will require approximately 6 months to design and 6 months to implement.

Present Worth: $5,800,000
Capital Cost: $5,600,000
Annual Costs: $6,700

Alternative S5: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and soil meets the unrestricted soil cleanup objectives listed in Part 375-6.8 (a). This alternative will include: excavation and off-site disposal of all waste and soil contamination above the unrestricted soil cleanup objectives on the site and specific off-site locations. The volume of this excavation is currently estimated to be 71,600 cubic yards, both on and off the site. An estimated 250 cubic yards of near-site surface soils that exceed unrestricted SCOs will also be removed. Based on current data, an estimated 8,000 cubic yards of soils in the drainage swale that exceed unrestricted SCOs will also be removed to a depth of approximately 12 feet.

This alternative will require approximately 9 months to design and 12 months to implement.

Capital Cost: $37,000,000

GROUNDWATER REMEDIATION ALTERNATIVES

Alternative GW1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative GW2: Institutional Controls

This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment from any contamination identified at the site. The environmental easement will restrict the use of groundwater and require compliance with the site management plan. The site management plan will identify requirements for groundwater monitoring and reporting that will assess changes in the risk to human health and the environment.

This alternative will require approximately 2 months to design and 2 months to implement.

Present Worth:	$86,000
Capital Cost:	$26,000
Annual Costs:	$2,000

Alternative GW3: Natural Attenuation and Institutional Controls

This alternative, in addition to the institutional controls in Alternative GW2, will involve monitoring the natural attenuation processes, such as dilution and biodegradation that have limited the current extent of groundwater contamination to the immediate vicinity of the site and will be more effective with the removal to the source areas soil. A network of groundwater monitoring wells will be monitored, and contaminant levels will be tracked over time and compared to levels prior to source removal actions, if any.

This alternative will require approximately 2 months to design and 2 months to implement.

Present Worth:	$248,000
Capital Cost:	$68,000
Annual Costs:	$6,000

Exhibit D

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Soil Alternatives			
Alternative S1: No Action	0	0	0
Alternative S2: Site Management	$65,000	$2,000	$125,000
Alternative S3: Removal and Off-Site Disposal of MGP Source Material, Soil Cover and Institutional Controls for Commercial Use	$4,890,000	$5,500	$5,050,000
Alternative S4: Removal and Off-Site Disposal of MGP Source Material, Soil Cover and Institutional Controls for Restricted Residential Use	$5,600,000	$6,700	$5,800,000
Alternative S5: Restoration to Pre-Disposal or Unrestricted Conditions	$37,000,000	0	$37,000,000
Groundwater Alternatives			
Alternative GW1: No Action	0	0	0
Alternative GW2: Site Management	$26,000	$2,000	$86,000
Alternative GW3: Natural Attenuation and Institutional Controls	$68,000	$6,000	$248,000
Proposed Remedy: Alternatives S3 and GW3	$4,960,000	$11,500	$5,300,000

Exhibit E

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternatives S3 and GW3, as the remedy for this site. The elements of this remedy are described in Exhibit C. The proposed remedy is depicted in Figures 6 and 7.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives.

Alternatives S3 and GW3 are being proposed because, as described below, they satisfy the threshold criteria and provide the best balance of the balancing criteria described in Section 7.2. They will achieve the remediation goals for the site by providing permanence in the remedy and by reducing the toxicity, mobility of contaminated soil by removal and off-site disposal. The proposed remedy will greatly reduce the source of contamination to groundwater which will allow natural attenuation to restore groundwater quality to the extent feasible based upon DER's experience at other sites, including MGPs. The proposed remedy, including the one-foot soil cover over areas that exceed the SCOs for commercial use, will protect public health.

Alternatives S1 and GW1 do not provide any protection to public health and the environment and will not be evaluated further.

Alternative S3 meets the threshold criteria by removing all source material that may contaminate other media, particularly groundwater and by providing a soil cover and institutional controls to prevent public exposure. Alternative S2 will rely on institutional controls to protect public health by limiting access to the site, but will not provide any environmental protection. Alternative S4 will also comply with these criteria to a slightly greater degree by removing a greater amount of soil, and will protect public health for a higher level of use. Alternative S5 will protect public health and the environment to a greater degree by removing all contamination from the site. Because Alternatives S3, S4 and S5 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site. Both GW2 and GW3 will satisfy the threshold criteria when included with source material removal component of S3, S4 or S5.

Short-term impacts will be the least with S2 because no soil removal will take place. S3 will have the next lowest level of short term impacts. The short-term impacts of Alternatives S3 and S4 will both be significantly less than Alternative S5 due to the smaller volume of contaminated soil removed and transported from the site. Alternatives S3 and S4 will be implemented in approximately the same period of time, though Alternative S4 will take slightly longer to implement due to the additional soil removal and soil cover thickness. Alternative S5 will have the highest short-term impact, since extensive excavation will disturb the soil and more excavated material will need to be transported through residential areas for off-site disposal. Neither GW2 nor GW3 involve any short term impacts.

Long-term effectiveness is best achieved by Alternative S5, since all contamination will be removed from the site and off-site areas to achieve the unrestricted use SCOs. Alternatives S3 and S4 will effectively protect public health and the environment through the removal of source areas and soil with MGP-related contamination from the site and the off-site areas, and by applying a soil cover over remaining on-site contamination. The site management and institutional control provisions of Alternatives S3 and S4 will reliably prevent potential exposures. Alternative S2

will provide the least effective environmental protection since all existing contamination, including source areas, will remain. GW2 does not add any long term effectiveness. GW3 adds some additional assurance that groundwater protection has been achieved.

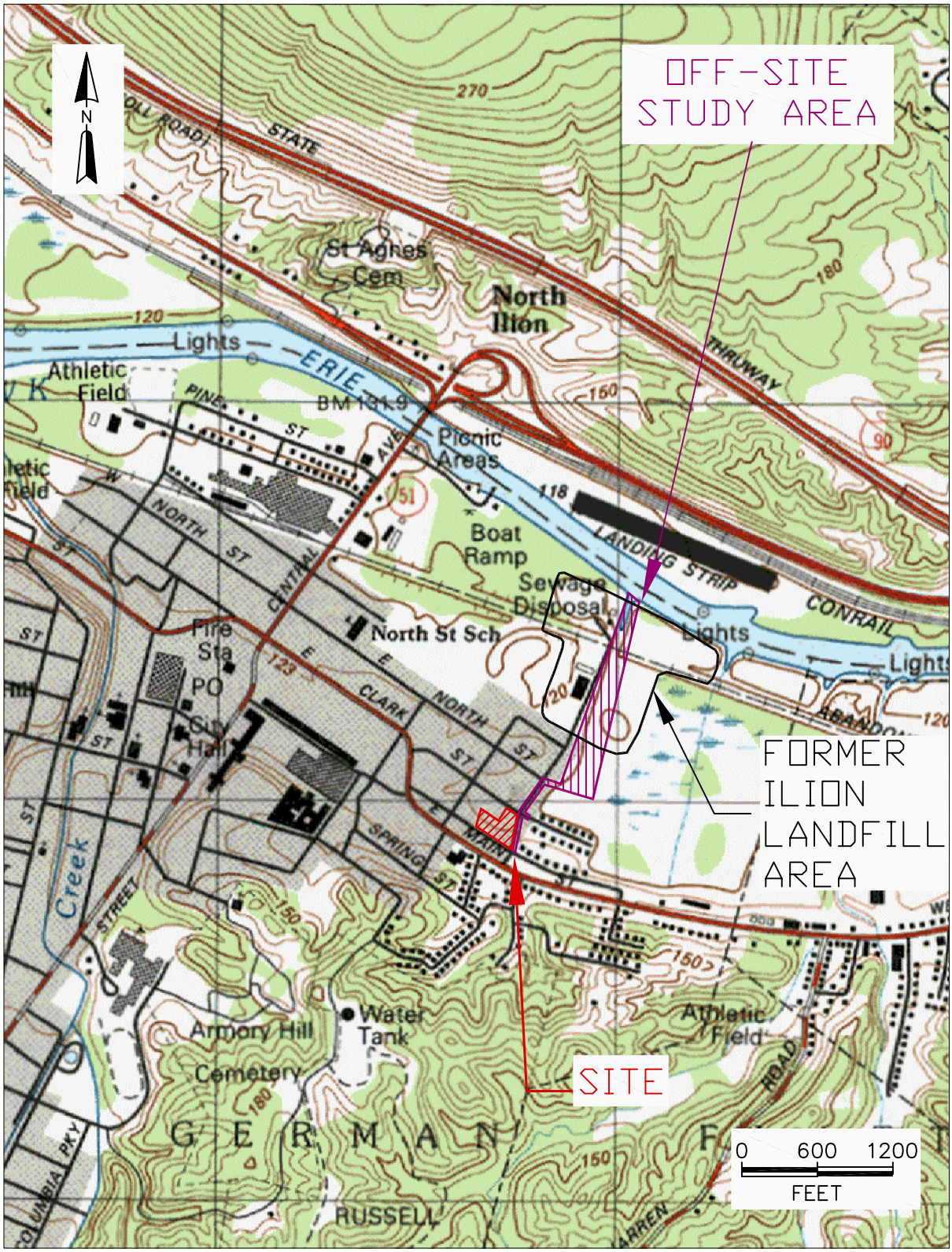
Alternative S2 not reduce the toxicity, mobility or volume of contamination because potential exposures will be addressed with institutional controls. Alternative S3 will reduce the toxicity, mobility and volume of on-site source material by transferring the material to an approved off-site facility for disposal or thermal treatment. Alternative S4 will also permanently reduce the toxicity, mobility and volume of source material and a small amount of additional contaminated soil. Alternative S5 will permanently reduce the toxicity, mobility and volume of all contamination at the site.

Neither GW2 nor GW3 further reduce the toxicity, mobility and volume of contamination in groundwater. GW2 will identify requirements for groundwater monitoring and reporting that will assess changes in the risk to human health and the environment and GW3 will, in addition to monitoring requirement for GW2, monitor groundwater quality to show that contamination reduction as a result of any source removal remedy is effective.

Alternatives S2, S3 and S4 are readily implementable. Alternative S5 is also implementable, but the volume of soil excavated under this alternative is more than 12 times that of Alternatives S3 and S4, and making this alternative significantly more difficult and complex to perform. Alternatives GW2 and GW3 are readily implementable, although Alternative GW3 will require some additional sampling to document the degree of contaminant attenuation.

The costs of the alternatives vary significantly, as presented in Exhibit D. Alternative S2 has a low cost, but the contaminated soil will not be addressed other than by institutional controls. Alternatives S3 and S4 both have moderate and similar costs. With its large volume of soil to be handled, Alternative S5, restoration to unrestricted use will have the highest present worth cost with a low increase in the overall protectiveness of the remedy. GW2 has a low cost and relies only on institutional controls. GW3 has a moderately higher cost but adequately monitors the effectiveness of the remedy.

Since the anticipated use of the site is commercial, Alternatives S3 and GW3 will be the most desirable because they remove contaminated soils necessary to achieve commercial SCOs and should achieve groundwater standards in a reasonable time. Also, the remaining contamination associated with Alternative S3 will be controllable with implementation of institutional controls and a site management plan.

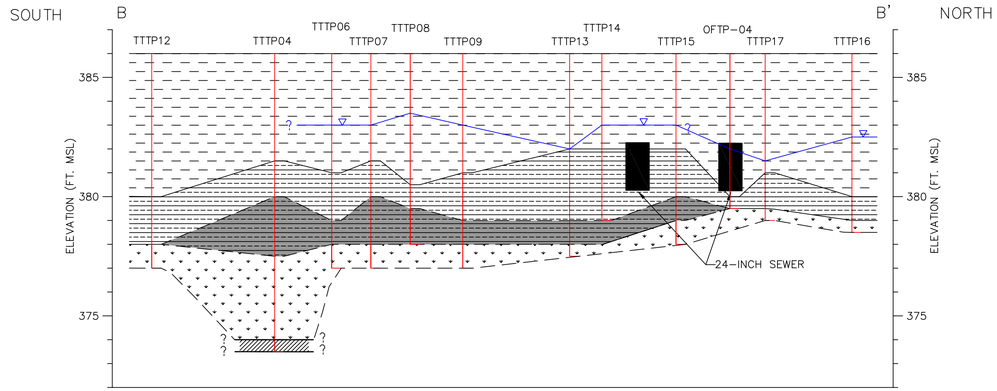


Source: Ilion, N.Y. USGS Topographic Quadrangle, 7.5-minute series, dated 1982.

nationalgrid TETRA TECH EC, INC.	TITLE: SITE LOCATION MAP Remedial Investigation Report Ilion (East Street) Site	DWN: LEA CHKD: PC DATE: 10/12/04	DES.: LEA APPD: RC REV.: 01	PROJECT NO.: 2907.0003.0003 FIGURE NO.: 1

N:\GIS\GISKEY\GISPROJ31\ILION EAST STREET\RI RE-REISSUE FIGURES\RI FIGURE 1-1 SITE LOCATION.DWG

CROSS SECTION B-B'

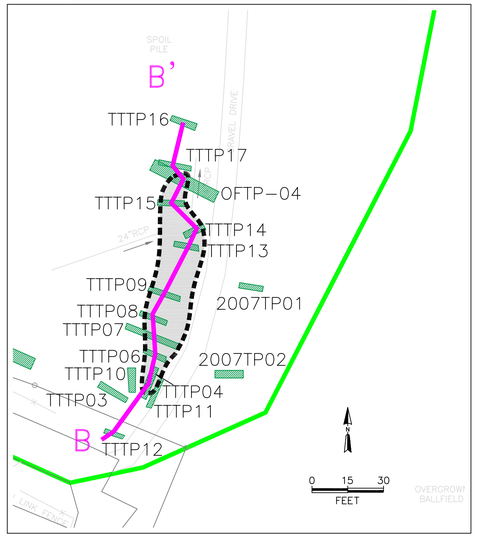


0 7.5 15
FEET
VERTICAL SCALE: 5X

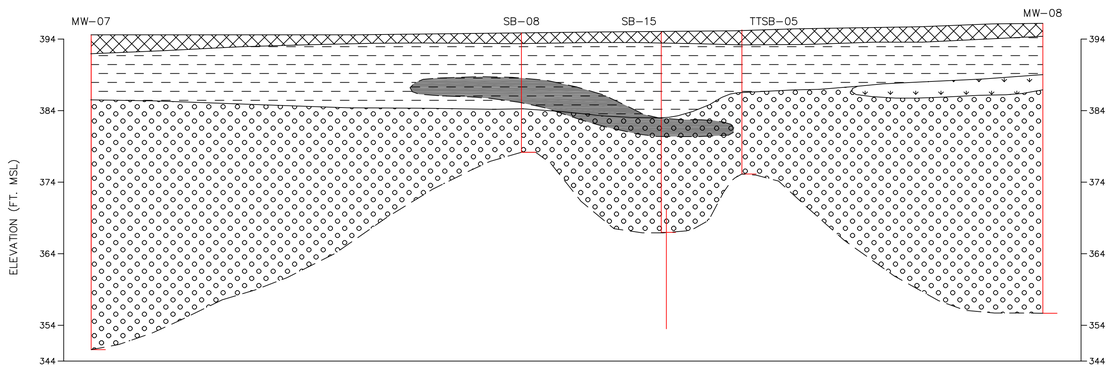
LEGEND

- TEST PIT
- SOIL BORING
- TEST PIT
- BOUNDARY OF SITE PROPERTY
- APPROXIMATE BOUNDARY OF OFF-SITE STUDY AREA
- CROSS SECTION TRANSECT
- ESTIMATED HORIZONTAL EXTENT OF NAPL

PLAN VIEW - CROSS SECTION B-B'

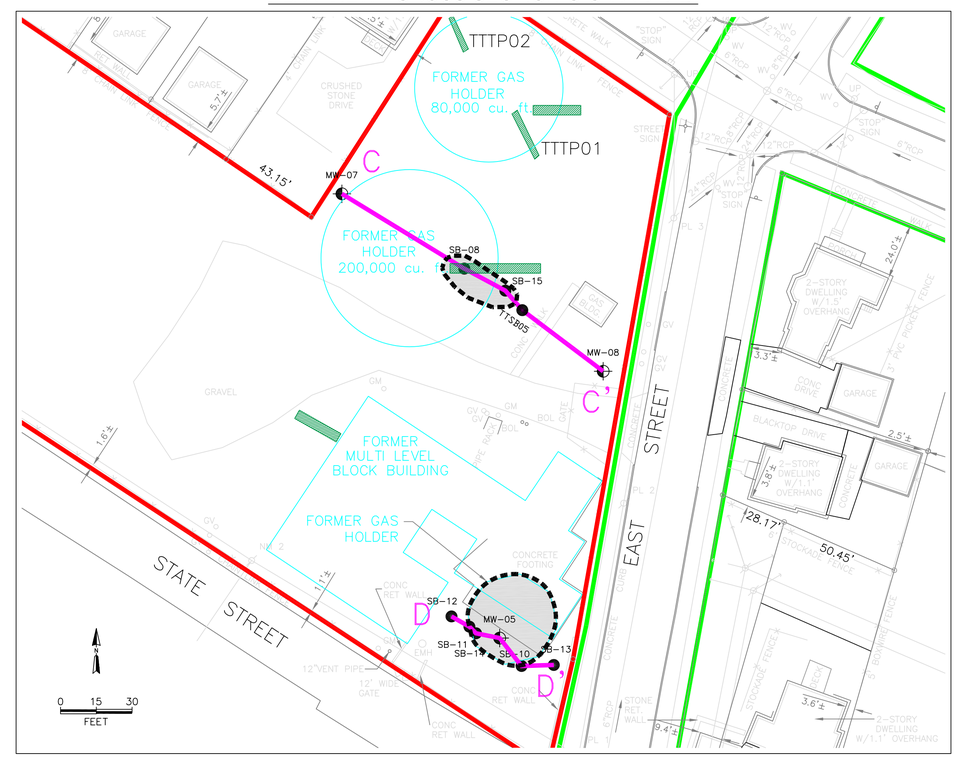


CROSS SECTION C-C'

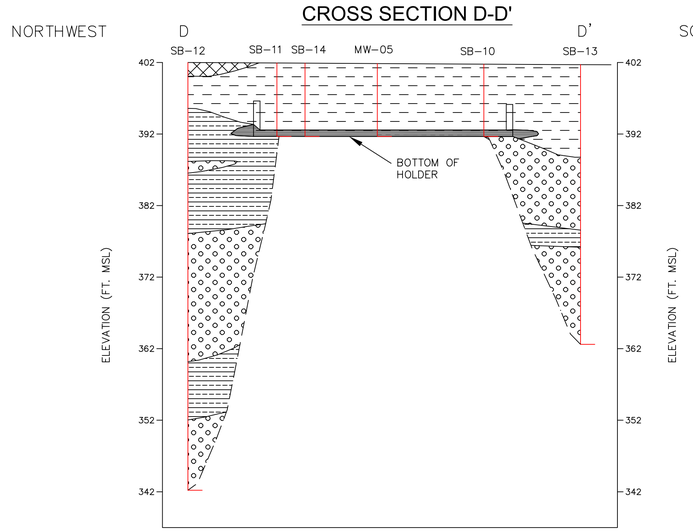


0 5 10
FEET
VERTICAL SCALE: 1X

PLAN VIEW - CROSS SECTION C-C' AND D-D'



CROSS SECTION D-D'



0 5 10
FEET
VERTICAL SCALE: 1X

LEGEND

- TOPSOIL
- FILL
- SILTY, GRAVELLY SAND
- CLAYEY SILT
- PEAT
- CLAY
- STAINING, RESIDUAL TAR AND NAPL
- BORING/TEST PIT
- GROUNDWATER ELEVATION (BASED ON TEST PIT OBSERVATIONS)

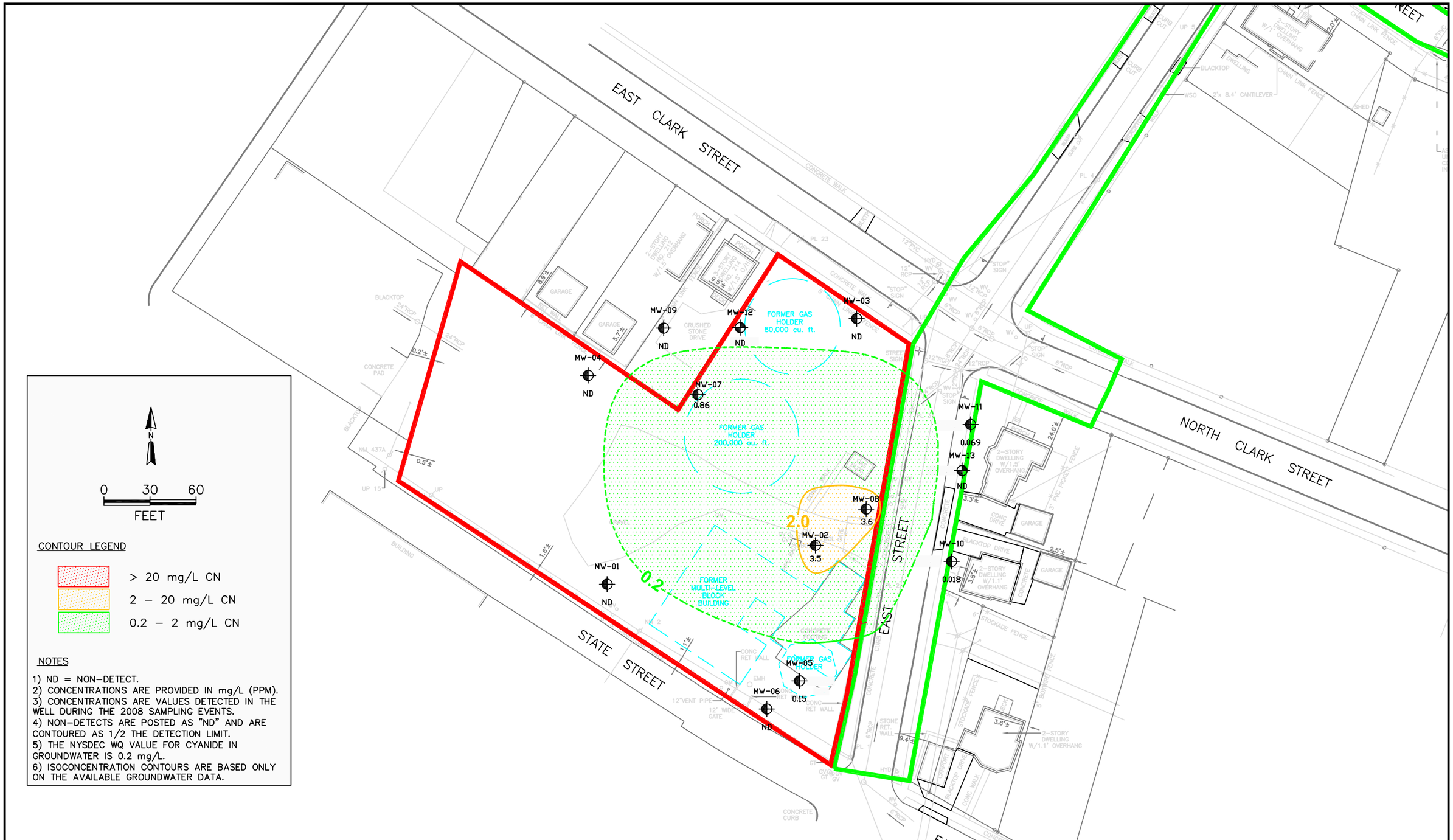
TETRA TECH EC, INC.

TITLE:
ESTIMATED HORIZONTAL AND VERTICAL EXTENT OF NAPL IN SUBSURFACE SOIL MATRIX
Remedial Investigation Report – Ilion (East Street) Site

nationalgrid

DWN: CTS	DES.: CTS	PROJECT NO.: 2907.0003.0006
CHKD: DPC	APPD: RC	FIGURE NO.: 2
DATE: 06/04/08	REV.: 1	

N:\GIS\GISKEY\GISPROJ31\ILION EAST STREET\RI RE-REISSUE FIGURES\RI FIGURE 4-9 NAPL EXTENT 060408.DWG



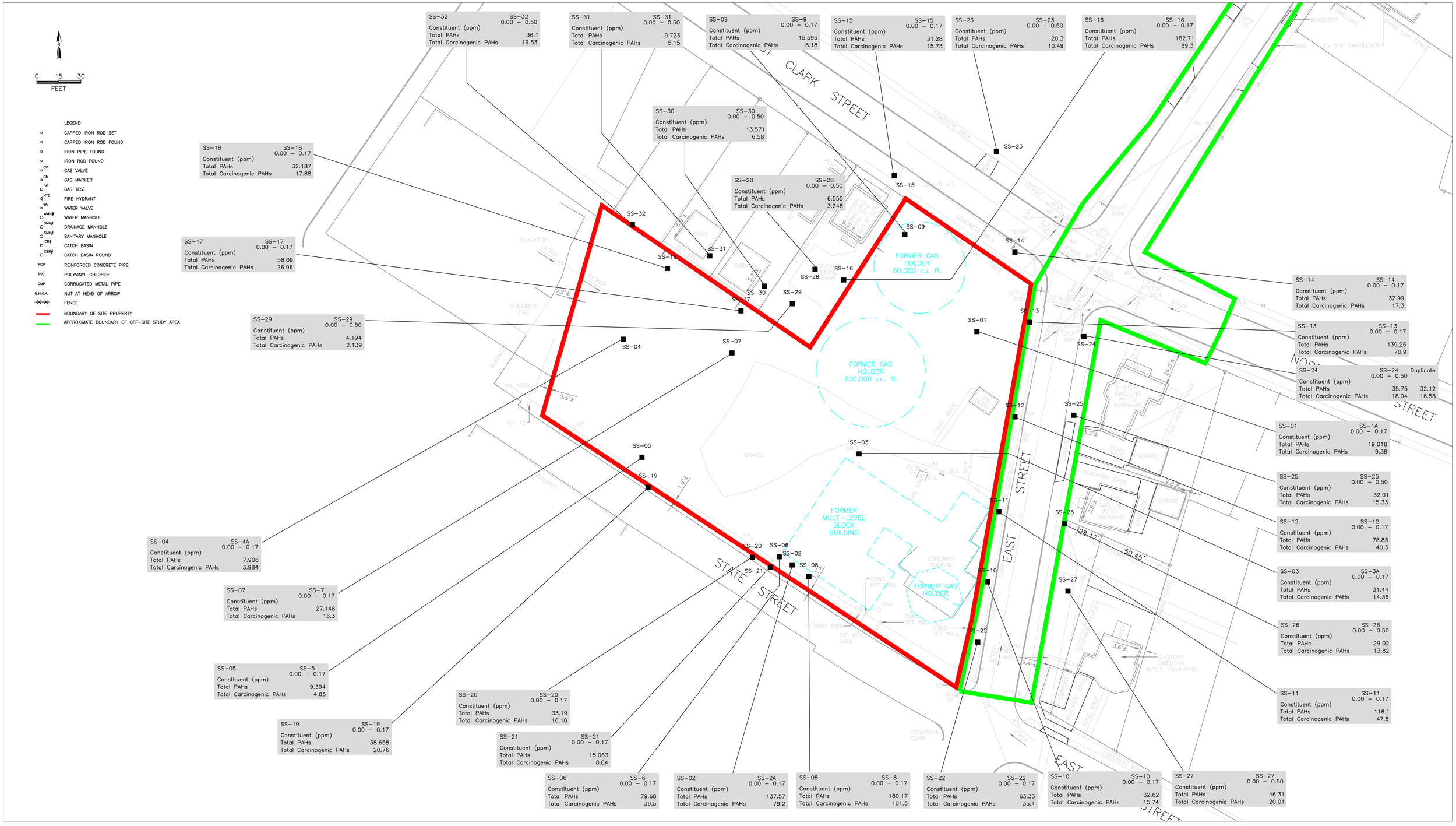
TETRA TECH EC, INC.

TITLE:
ISOCONCENTRATION CONTOUR FOR CYANIDE IN SITE GROUNDWATER – 2008 RESULTS
Remedial Investigation Report Addendum
Ilion (East Street) Site

nationalgrid

DWN.: EAG	DATE: 05/09/08	PROJECT NO.: 2907.0003.0005
CHKD:	REV.: 0	FIGURE NO.: 3
DES.: LEA	APPD:	

N:\GIS\GISKEY\GISPROJ31\ILION EAST STREET\RI RE-REISSUE FIGURES\RI FIGURE 4-5C CN IN GW 050908.DWG



TETRA TECH EC, INC.

TITLE:

TOTAL PAHs AND TOTAL cPAHs IN SITE AND NEAR SITE AREA SURFACE SOIL LOCATIONS

Remedial Investigation Report

Ilion (East Street) Site

nationalgrid

DWN: LEA	DES.: LEA	PROJECT NO.: 2907.0003.0003
CHKD: JG	APPD: RC	FIGURE NO.: 4
DATE: 02/11/05	REV.: 1	

N:\GIS\GISKEY\GISPROJ31\ILION EAST STREET\RI RE-REISSUE FIGURES\RI FIGURE 4-1 SITE SURFACE SOIL BLOCKS.DWG

LEGEND

- APPROXIMATE SOIL SAMPLE LOCATION WITHIN/ADJACENT TO OPEN SWALE AREA
- APPROXIMATE BOUNDARY OF OFF-SITE STUDY AREA
- OUTLINE OF OPEN SWALE
- WMH WATER MANHOLE
- CMP CORRUGATED METAL PIPE

0 40 80
FEET

NOTES:
1. PAH – POLYCYCLIC AROMATIC HYDROCARBON.
2. ft bgs – FEET BELOW GROUND SURFACE.
3. TOTAL PAH CONCENTRATIONS SHOWN IN RED EXCEED THE CORRESPONDING BACKGROUND VALUE OF 43 PPM. FINGERPRINTING RESULTS INDICATE THAT THE OBSERVED PAHs ARE LIKELY MGP-RELATED.
4. TOTAL PAH CONCENTRATIONS SHOWN IN GREEN EXCEED THE CORRESPONDING BACKGROUND VALUE OF 43 PPM. FINGERPRINTING RESULTS INDICATE THAT THE OBSERVED PAHs ARE NOT MGP-RELATED.
5. TOTAL PAH CONCENTRATIONS SHOWN IN BLUE EXCEED THE CORRESPONDING BACKGROUND VALUE OF 43 PPM. FINGERPRINTING WAS NOT PERFORMED.
6. TOTAL PAH CONCENTRATIONS SHOWN IN BLACK ARE BELOW THE CORRESPONDING BACKGROUND VALUE OF 43 PPM.
7. ND – NOT DETECTED.

TTSED05 (2006) Constituent	Depth of Sample 0.0 – 2.0 ft bgs	Depth of Sample 2.0 – 4.0 ft bgs
Total PAHs (ppm)	115.4	57.1

SED-07 (2001) Constituent	Depth of Sample 4.0 ft bgs	Depth of Sample 12.0 ft bgs
Total PAHs (ppm)	0.138	0.182

SED-05 (2001) Constituent	Depth of Sample 4.0 ft bgs	Depth of Sample 12.0 ft bgs
Total PAHs (ppm)	761	ND

SED-01A (2001) Constituent	Depth of Sample 12.0 ft bgs	Depth of Sample 20.0 ft bgs
Total PAHs (ppm)	0.029	0.55

SED-05A (2001) Constituent	Depth of Sample 6.0 ft bgs	Depth of Sample 20.0 ft bgs
Total PAHs (ppm)	ND	ND

SED-01 (2001) Constituent	Depth of Sample 4.0 ft bgs	Depth of Sample 10.0 ft bgs
Total PAHs (ppm)	211.8	42.8

TTSED06 (2006) Constituent	Depth of Sample 0.0 – 2.0 ft bgs
Total PAHs (ppm)	73.6

TTSED08 (2006) Constituent (ppm)	Depth of Sample 8.0 ft bgs
Total PAHs	0.76

SED-06 (2001) Constituent	Depth of Sample 4.0 ft bgs	Depth of Sample 12.0 ft bgs
Total PAHs (ppm)	2.4	ND

TTSED01 (2004) Constituent	Depth of Sample 1.5 – 2.0 ft bgs
Total PAHs (ppm)	8.6

TTSED02 (2004) Constituent	Depth of Sample 1.5 – 2.0 ft bgs
Total PAHs (ppm)	208

SED-02 (2001) Constituent	Depth of Sample 4.0 ft bgs	Depth of Sample 8.0 – 12.0 ft bgs
Total PAHs (ppm)	819.5	22.8

SED-02A (2001) Constituent	Depth of Sample 12.0 ft bgs	Depth of Sample 20.0 ft bgs
Total PAHs (ppm)	ND	ND

TTSED10 (2006) Constituent	Depth of Sample 0.0 – 2.0 ft bgs
Total PAHs (ppm)	49.3

SED-03A (2001) Constituent	Depth of Sample 16.0 ft bgs	Depth of Sample 20.0 ft bgs
Total PAHs (ppm)	0.4	0.3

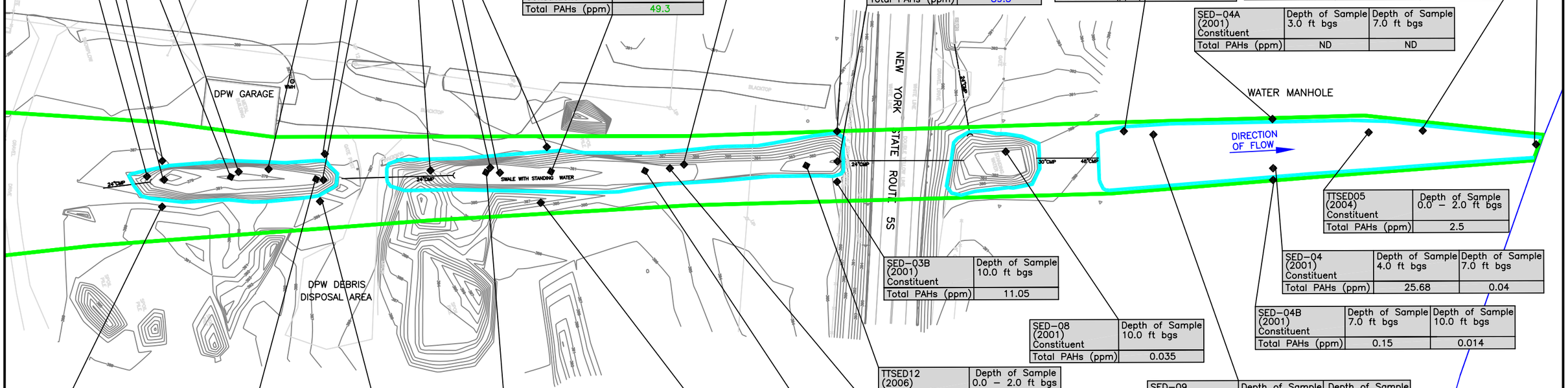
SED-11 (2001) Constituent	Depth of Sample 3.0 ft bgs	Depth of Sample 8.0 ft bgs
Total PAHs (ppm)	44.6	11.7

SED-03 (2001) Constituent	Depth of Sample 4.0 ft bgs
Total PAHs (ppm)	89.3

TTSED04 (2004) Constituent	Depth of Sample 1.5 – 2.0 ft bgs
Total PAHs (ppm)	ND

SED-10 (2001) Constituent	Depth of Sample 4.0 ft bgs	Depth of Sample 10.0 ft bgs
Total PAHs (ppm)	4.7	0.07

SED-04A (2001) Constituent	Depth of Sample 3.0 ft bgs	Depth of Sample 7.0 ft bgs
Total PAHs (ppm)	ND	ND



TTSED05 (2004) Constituent	Depth of Sample 0.0 – 2.0 ft bgs
Total PAHs (ppm)	2.5

SED-03B (2001) Constituent	Depth of Sample 10.0 ft bgs
Total PAHs (ppm)	11.05

SED-04 (2001) Constituent	Depth of Sample 4.0 ft bgs	Depth of Sample 7.0 ft bgs
Total PAHs (ppm)	25.68	0.04

SED-08 (2001) Constituent	Depth of Sample 10.0 ft bgs
Total PAHs (ppm)	0.035

SED-04B (2001) Constituent	Depth of Sample 7.0 ft bgs	Depth of Sample 10.0 ft bgs
Total PAHs (ppm)	0.15	0.014

TTSED12 (2006) Constituent	Depth of Sample 0.0 – 2.0 ft bgs
Total PAHs (ppm)	61.0

SED-09 (2001) Constituent	Depth of Sample 3.0 ft bgs	Depth of Sample 10.0 ft bgs
Total PAHs (ppm)	11.1	ND

TTSED07 (2006) Constituent	Depth of Sample 0.0 – 2.0 ft bgs	Depth of Sample 2.0 – 4.0 ft bgs
Total PAHs (ppm)	62.9	124.7

TTSED09 (2006) Constituent	Depth of Sample 0.0 – 2.0 ft bgs	Depth of Sample 2.0 – 4.0 ft bgs
Total PAHs (ppm)	49.3	9390

TTSED03 (2004) Constituent	Depth of Sample 1.5 – 2.0 ft bgs
Total PAHs (ppm)	131.6

SED-05B (2001) Constituent	Depth of Sample 8.0 ft bgs	Depth of Sample 20.0 ft bgs
Total PAHs (ppm)	123.2	2.5

SED-01B (2001) Constituent	Depth of Sample 8.0 ft bgs	Depth of Sample 16.0 ft bgs
Total PAHs (ppm)	0.047	ND

SED-02B (2001) Constituent	Depth of Sample 8.0 ft bgs	Depth of Sample 20.0 ft bgs
Total PAHs (ppm)	0.059	ND

TTSED11 (2006) Constituent	Depth of Sample 0.0 – 2.0 ft bgs
Total PAHs (ppm)	45.8

NYS Barge Canal/Mohawk River (approximate – not surveyed)

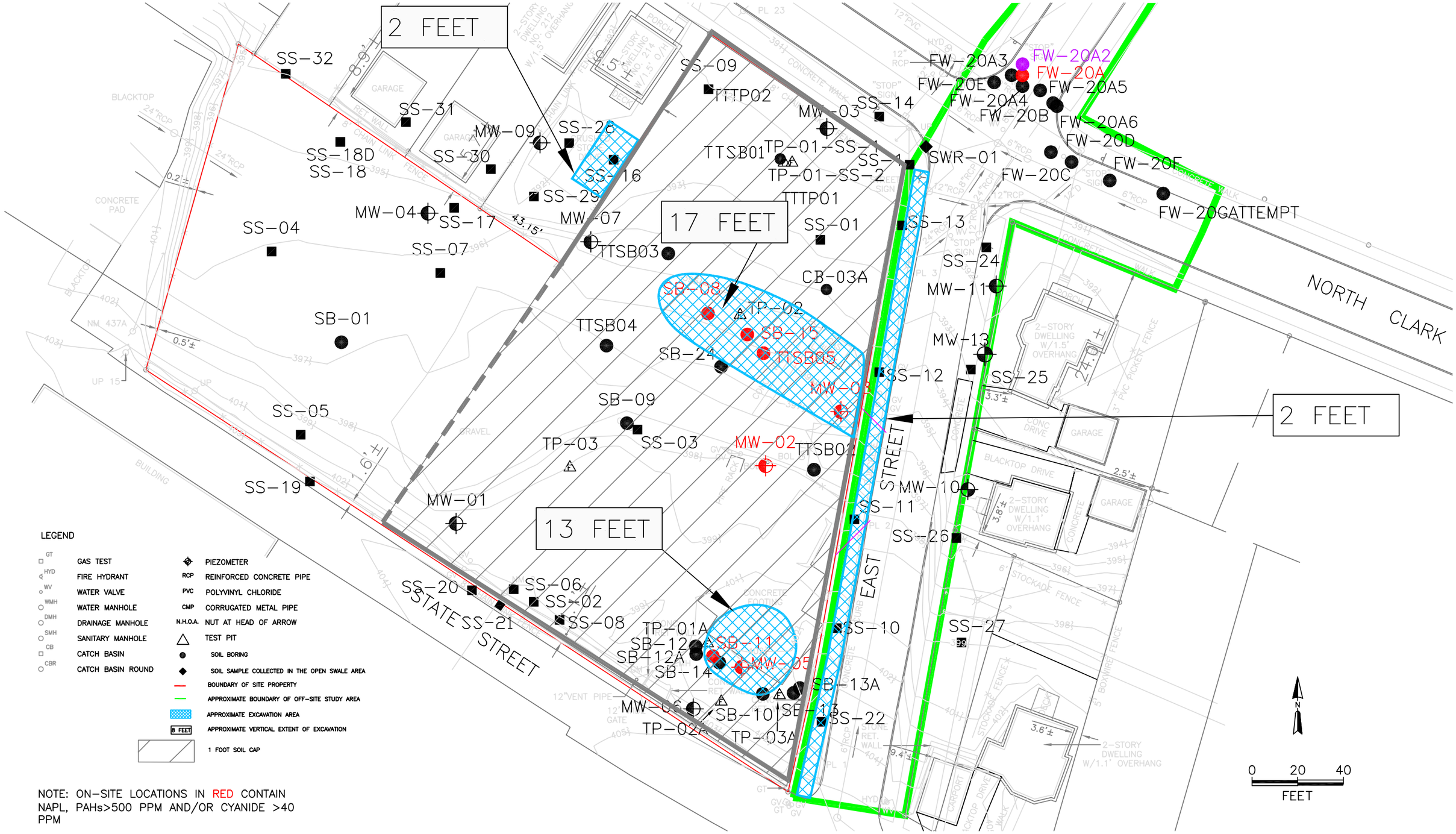
TETRA TECH EC, INC.

TITLE:
TOTAL PAHs IN SOIL WITHIN/ADJACENT TO THE OPEN SWALE AREA
Proposed Remedial Action Plan
Ilion (East Street) Site

nationalgrid

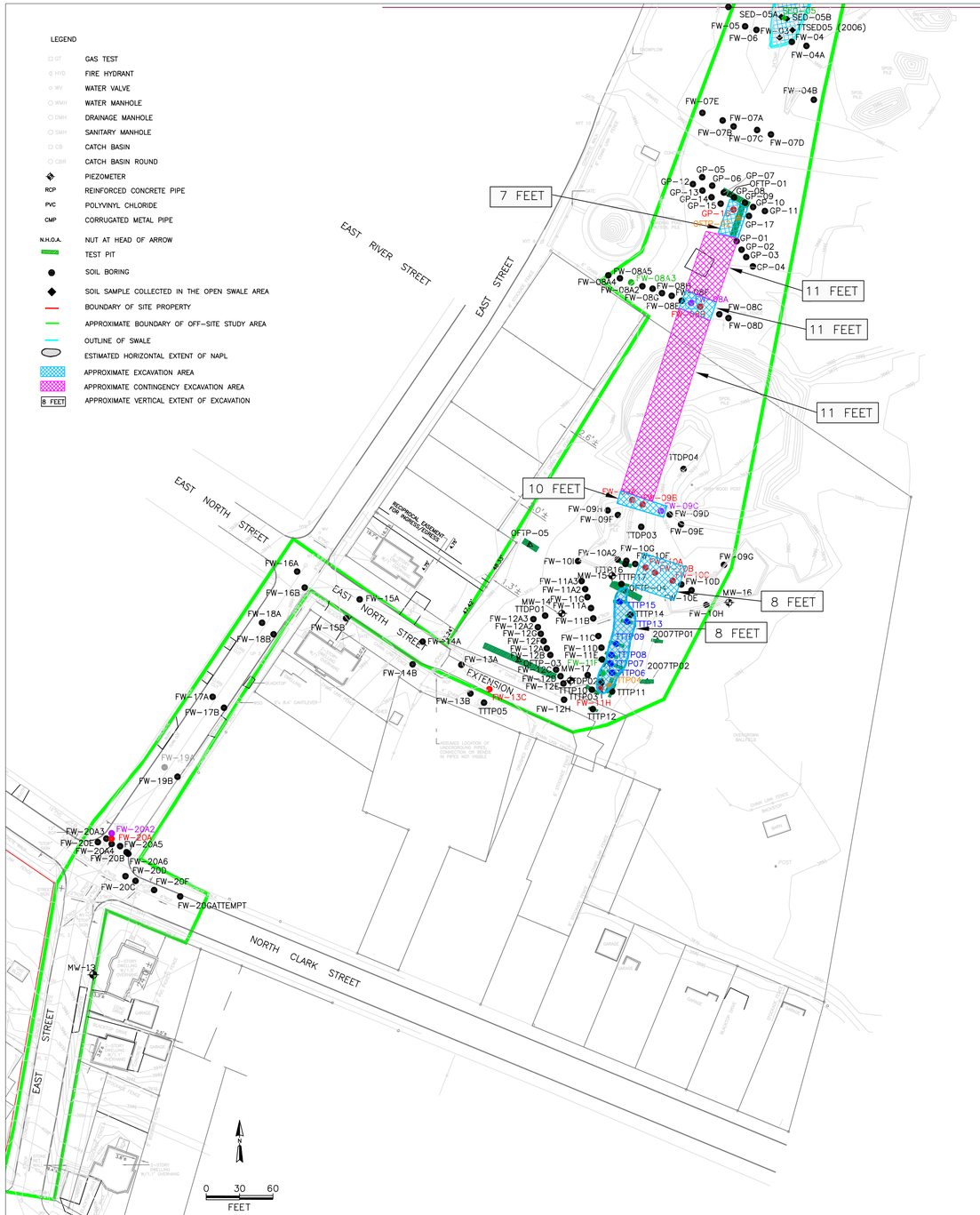
DWN.: LMC / LEA	DATE: 02/10/11	PROJECT NO.: 106-2907.0003
CHKD:	REV.: 1	FIGURE NO.: 5
DES.:	APPD:	

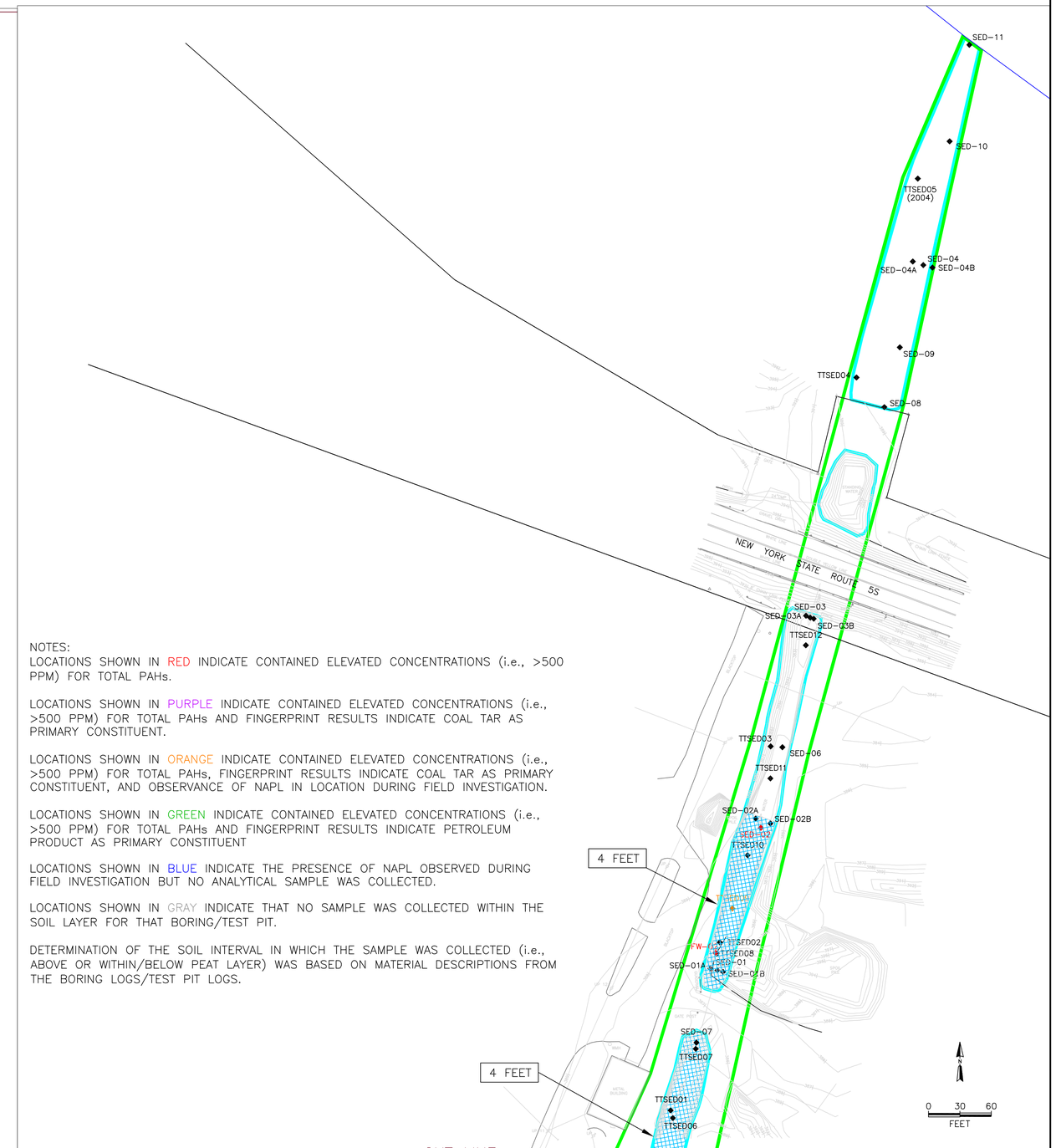
N:\GIS\GISKEY\GISPROJ31\ILION EAST STREET\2011 RAP FIGURES\FIGURE 5 SOIL SWALE BLOCKS 021011.DWG



NOTE: ON-SITE LOCATIONS IN RED CONTAIN NAPL, PAHs>500 PPM AND/OR CYANIDE >40 PPM

TETRA TECH EC, INC.	TITLE: Alternative S-3: Excavation of MGP-Related Impacts, Soil Capping, Off-Site Disposal and Institutional Controls (On and Near-Site Areas) Feasibility Study – Ilion (East Street) Site	DWN: LMC	DES.: CTS	PROJECT NO.: 2907.0003
		CHKD: RC	APPD:	FIGURE NO.: 6
		DATE: 08/27/10	REV.: 0	





NOTES:

LOCATIONS SHOWN IN RED INDICATE CONTAINED ELEVATED CONCENTRATIONS (i.e., >500 PPM) FOR TOTAL PAHs.

LOCATIONS SHOWN IN PURPLE INDICATE CONTAINED ELEVATED CONCENTRATIONS (i.e., >500 PPM) FOR TOTAL PAHs AND FINGERPRINT RESULTS INDICATE COAL TAR AS PRIMARY CONSTITUENT.

LOCATIONS SHOWN IN ORANGE INDICATE CONTAINED ELEVATED CONCENTRATIONS (i.e., >500 PPM) FOR TOTAL PAHs, FINGERPRINT RESULTS INDICATE COAL TAR AS PRIMARY CONSTITUENT, AND OBSERVANCE OF NAPL IN LOCATION DURING FIELD INVESTIGATION.

LOCATIONS SHOWN IN GREEN INDICATE CONTAINED ELEVATED CONCENTRATIONS (i.e., >500 PPM) FOR TOTAL PAHs AND FINGERPRINT RESULTS INDICATE PETROLEUM PRODUCT AS PRIMARY CONSTITUENT

LOCATIONS SHOWN IN BLUE INDICATE THE PRESENCE OF NAPL OBSERVED DURING FIELD INVESTIGATION BUT NO ANALYTICAL SAMPLE WAS COLLECTED.

LOCATIONS SHOWN IN GRAY INDICATE THAT NO SAMPLE WAS COLLECTED WITHIN THE SOIL LAYER FOR THAT BORING/TEST PIT.

DETERMINATION OF THE SOIL INTERVAL IN WHICH THE SAMPLE WAS COLLECTED (i.e., ABOVE OR WITHIN/BELOW PEAT LAYER) WAS BASED ON MATERIAL DESCRIPTIONS FROM THE BORING LOGS/TEST PIT LOGS.

TETRA TECH EC, INC.

TITLE:
Alternative S-3 Excavation of MGP Related Impacts, Soil Capping, Off-Site Disposal and Institutional Controls (Off-Site Area)
Feasibility Study – Ilion (East Street) Site

nationalgrid

DWN: LMC	DES.: EAG	PROJECT NO.: 2907.0003
CHKD: RC	APPD:	FIGURE NO.: 7
DATE: 06/23/10	REV.: 0	

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