Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision
Plattsburgh (Saranac Street)
Operable Unit 1
MGP Site, Plattsburgh,
Clinton County, New York
Site Number 5-10-007

March 2004

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* ERIN M. CROTTY, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Plattsburgh (Saranac Street) MGP Site
Inactive Hazardous Waste Disposal Site
Operable Unit No. 1
Plattsburgh, Clinton County New York
Site No. 5-10-007

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for Operable Unit 1 of} the Plattsburgh (Saranac Street) MGP site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for Operable Unit 1 of the Plattsburgh (Saranac Street) MGP Site inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and/or the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the Plattsburgh (Saranac Street) MGP site and the criteria identified for evaluation of alternatives, the NYSDEC has selected excavation of source material, with stabilization of the perimeter. The components of the remedy are as follows:

1. Excavation of the former MGP tar lagoon and surrounding areas where coal tar has migrated in the subsurface.

2. Off-site treatment and/or disposal of heavily contaminated soils, including any soils which contain visible coal tar.

3. In-situ stabilization of soils surrounding the excavation, using soil augering technology.

4. Excavation and off site treatment/disposal of contaminated sediments in portions of the Saranac River immediately adjacent to the site.

5. Excavation and off site treatment/disposal of subsurface soils from a small area near the Broad Street

Bridge, across the Saranac River from the MGP Site.

6. Accelerated removal of tar from the bedrock via the drilling of at least two additional bedrock tar collection wells.

7. Delineation of the contamination under Saranac and Caroline Streets. As part of the investigation, an evaluation of soil gas will be done.

8. Institutional controls to limit human contact with any remaining contaminated soil and groundwater. Vapor intrusion in proposed site structures must be appropriately evaluated and addressed prior to redevelopment due to the possible presence of volatile organic compounds from remaining contaminated soils.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

MAR 3 1 2004

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

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SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the NYSEG Plattsburgh (Saranac Street) MGP Site, Operable Unit No. 1, Manufactured Gas Plant Site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, operations at the former manufactured gas plant have resulted in the disposal of hazardous wastes, including carburetted water gas tar (coal tar). These wastes contain chemicals including polycyclic aromatic hydrocarbons (PAHs) and benzene, toluene, ethylbenzene, and xylenes (BTEX). These wastes have contaminated the subsurface soils, river sediments, groundwater and surface water at the site, and have resulted in:

- a significant threat to human health associated with exposure to coal tar which seeps from the banks of the Saranac River.

- a significant threat to human health associated with exposure to MGP contaminants in subsurface soils and groundwater.

- a significant environmental threat associated with the impacts of contaminants to river sediments, surface water, groundwater, and subsurface soils.

- a significant threat to biota along the banks of the Saranac River associated with exposure to coal tar which seeps from the banks

To eliminate or mitigate these threats, the NYSDEC has selected the following remedy:

- Excavation of the former MGP tar lagoon and surrounding areas where coal tar has migrated in the subsurface.

- Off-site treatment and/or disposal of heavily contaminated soils, including any soils which contain visible coal tar.

- In-situ stabilization of soils surrounding the excavation, using soil augering technology.

- Excavation and off site treatment/disposal of contaminated sediments in portions of the Saranac River immediately adjacent to the site.

- Excavation and off site treatment/disposal of subsurface soils from a small area near the Broad Street Bridge, across the Saranac River from the MGP Site.

- Accelerated removal of tar from the bedrock via the drilling of at least two additional bedrock tar collection wells.

- Delineation of the contamination under Saranac and Caroline Streets. As part of the investigation, an evaluation of soil gas will be done.

- Institutional controls to limit human contact with any remaining contaminated soil and groundwater. Vapor intrusion in proposed site structures must be appropriately evaluated and addressed prior to redevelopment due to the possible presence of volatile organic compounds from remaining contaminated soils.

The selected remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of this remedy also takes into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

SECTION 2: <u>SITE LOCATION AND DESCRIPTION</u>

The site is located in the City of Plattsburgh, Clinton County. The site, as shown on Figure 1, occupies roughly 11 acres on the inside of a major bend in the Saranac River. The river forms most of the southern, western, and northern site boundary. Along the east side, the site is bounded by Caroline Street and by property owned by the United States Army. The nearest residences are on the east side of Caroline Street, roughly 50 feet from the site boundary.

Operable Unit 1 (OU1), which is the subject of this PRAP, consists of the MGP site including the adjacent former lagoon, and other areas nearby where tar has migrated in the subsurface. Immediately adjacent portions of the Saranac River (as far downstream as the Broad Street Bridge) are also included, as is a small area of soil contamination on the north side of the Saranac River, adjacent to the Broad Street Bridge. An operable unit represents a portion of the site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

The remaining operable unit for this site (Operable Unit 2) will address the coal tar which has been carried away from the site in the Saranac River, and deposited with sediments either in the river or in Lake Champlain. Contamination in these areas is currently being delineated. Any MGP-related contamination left in the river following the remediation of Operable Unit 1 will be included in Operable Unit 2.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

A manufactured gas plant (MGP) was operated on this site by New York State Electric and Gas (NYSEG) and predecessor companies from 1896 to 1960. The layout of the facility during operations is shown on Figure 2. The plant used the Lowe carburetted water gas process to produce gas for lighting, cooking, and heating purposes. The carburetted water gas process involved the passage of steam through hot coal or coke. This formed a gaseous mixture (water gas or blue gas) which was then passed through a super heater. Oil sprayed into the super heater would generate additional gas, enhancing the heat and light capacity of the overall gas mixture.

The gas produced was cooled and purified prior to distribution. Two principal waste materials were produced by the gas manufacturing process. Coal tar was an oily liquid by-product of the gas production which formed as a condensate as the gas cooled. Purifier waste was a mixture of iron filings and wood chips which was used to remove cyanide and sulfur gases from the gas mix prior to distribution. Both wastes have been found in the subsurface at the Saranac Street site .

While the MGP was operating, most of the coal tar generated from gas manufacturing was discharged into a lagoon located between Saranac Street and the Saranac River, across the street from the MGP plant. This lagoon was a large, unlined pond. Tar was discharged to the lagoon as a tar/water emulsion, and this mixture was held in the lagoon to allow the tar to settle to the bottom. The remaining water, often including some tar, was discharged without further treatment to the Saranac River. Following closure of the plant in 1960, the lagoon was filled in; however, the tar-contaminated material in the bottom of the lagoon remained in place.

The Saranac Street site is currently vacant land, bordered by a residential area on the east side and the Saranac River on the remaining sides. NYSEG retains ownership of the former MGP plant site, and operated a service center there until 1982. Ownership of some of the property adjacent to the former lagoon has been transferred to the City of Plattsburgh. The City maintains an electrical substation in this area, and a large city-owned sewer line traverses the area.

3.2: Remedial History

NYSEG conducted several rounds of investigation work at the site during the late 1970s and 1980s. These investigations focused on an ongoing discharge of coal tar into the Saranac River along the northwestern and northern site boundaries. Tar was found to be seeping into the river along the river bank in several places.

In an effort to halt the leakage of tar from the site, NYSEG constructed an underground barrier wall encircling the lagoon in the early 1980s. The area of the lagoon inside this barrier wall is now referred to as the “containment cell.” A second barrier wall was built along the river bank to contain any tar which had already passed by the limits of the lagoon barrier. Both walls were designed to block migration of tar through sand-rich soils which occupied the area between the lagoon and the river. At the time the walls were constructed, it was believed that the deeper soil deposits below the sand were impermeable and would not allow tar to migrate through them.

Tar-contaminated river sediments beyond the barrier wall were removed from the river bottom and replaced with comparable clean material (sand and gravel) from off site sources. Unfortunately, tar migration through the subsurface has continued, and this formerly clean material has become re-contaminated with tar.

SECTION 4: 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. New York State Electric and Gas Corporation (NYSEG) is the only PRP identified for this site.

The NYSDEC and NYSEG entered into a Consent Order on March 30, 1994. The Order obligates NYSEG to investigate and, if necessary, remediate 33 former MGP sites in their service area. The Plattsburgh (Saranac Street) site is one of the sites included in the multi-site order.

SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between October 1997 and December 2000. The field activities and findings of the investigation are described in the RI report.

The following activities were conducted during the RI (some of the total figures include work completed during previous investigations):

- Installation of 99 soil borings and 21 monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions;
- Installation of 13 bedrock monitoring wells for analysis of groundwater as well as physical properties of the bedrock and hydrogeologic conditions;
- Sampling and chemical analysis of groundwater samples from 15 new and existing monitoring wells;
- Excavation of 26 test pits to further describe subsurface soil conditions and the distribution of contamination, and;
- A geophysical survey to determine the orientation of fractures in the bedrock which may be functioning as conduits for migration of tar.

To determine whether the soils, sediments, and groundwater contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on NYSDEC “Ambient Water Quality Standards and Guidance Values” and Part 5 of the New York State Sanitary Code.

- Soil SCGs are based on the NYSDEC “Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels".

- Sediment SCGs are based on the NYSDEC “Technical Guidance for Screening of Contaminated Sediments.” In addition, sediments which contain enough tar contamination to generate a sheen on the water surface are evaluated with respect to New York State Ambient Water Quality Standards.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized below. More complete information can be found in the RI report.

5.1.1: Site Geology and Hydrogeology

The site is underlain by several layers of overburden (unconsolidated soils), which in turn overlie limestone bedrock.

A thin layer of man-placed fill covers the entire site. The depth of this fill layer ranges from a few feet near the southern boundary of the site to 21 feet inside the containment cell. The fill consists of a complex mix of reworked site soils, building demolition debris, and soils brought on site from outside sources.

Below the fill lies a layer of alluvium, which is a generally coarse-grained material deposited by the Saranac River during historic periods of very high flow. The thickness of this unit ranges from less than a foot to roughly 15 feet. In most locations, this material contains a large proportion of sand and consequently transmits liquids such as water or tar quite readily. Most of the migration of site contaminants through the subsurface has taken place in this unit.

Beneath the alluvium lies a layer of glacial till, which is a dense, compacted mix of clay, silt, sand, and boulders which accumulated beneath the glacial ice which once covered the area. This material lacks any obvious internal structure, and its dense, tightly packed texture greatly restricts the ability to pass liquids such as water or tar. However, the till does contain some fine cracks (referred to as joints) which in some places have allowed tar to penetrate into the till.

Below the glacial till lies a gray limestone bedrock unit. The overall texture of the limestone is quite dense, and the rock does not transmit liquids readily. However, small openings in the rock have been found along bedding planes which allow water and tar to pass and accumulate. These bedding planes dip slightly to the northwest.

5.1.2: <u>Nature of Contamination</u>

As described in the RI report, many soil and groundwater samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants which exceed their SCGs are volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs).

Specific volatile organic compounds of concern are benzene, toluene, ethylbenzene and xylenes. These are referred to collectively as BTEX in this document.

The specific semivolatile organic compounds of concern in soil and groundwater are the following polycyclic aromatic hydrocarbons (PAHs):

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

PAH concentrations referred to in this plan are the summation of the individual PAHs listed above (i.e. total PAHs or TPAHs). The italicized PAHs are probable human carcinogens. The summation of the italicized PAHs is referred to in this document as cPAHs.

As reported in Section 4.1.3, a dense oily liquid that does not readily dissolve in water is typically found at MGP sites. Although this liquid is largely derived from the petroleum products used in the water gas process, it is commonly known as "coal tar."

It is important to note that this liquid does not have the sticky, viscous consistency of other materials commonly labeled as "tar." The tar found at this site has the consistency of used motor oil, and is consequently able to move about as a liquid through the subsurface. The tar is slightly more dense than water, and thus tends to sink through the subsurface until it reaches a geologic unit which will not allow it to pass.

Materials such as this are referred to as dense non-aqueous phase liquids (DNAPL). Analysis of the DNAPL at this site reveals that it contains BTEX and PAHs several orders of magnitude greater than the SCGs for these compounds. The DNAPL was found to saturate the unconsolidated deposits in some areas and to exist in scattered, discontinuous globules in other areas. There is extensive evidence that the DNAPL has moved through the subsurface and is still moving slowly in some areas; however, it is often not obvious exactly where the movement is taking place.

5.1.3: <u>Extent of Contamination</u>

This section describes the findings of the investigation for all environmental media that were investigated.

Chemical concentrations are reported in parts per billion (ppb) for water, and parts per million (ppm) for waste and soil. For comparison purposes, where applicable, SCGs are provided for each medium.

Table 1 summarizes the degree of contamination for the contaminants of concern in soil and groundwater and compares the data with the SCGs for the site. Sediment contamination data from the Saranac River is not included; this issue will be addressed in Operable Unit 2. The following are the media which were investigated in Operable Unit 1 and a summary of the findings of the investigation.

Waste Materials

Coal tar was found in the immediate vicinity of many on-site MGP structures, but particularly in the area surrounding the former lagoon. From these source areas, the tar appears to have migrated vertically downward until encountering a less permeable (confining) layer. In most cases, this less permeable layer was the top of the glacial till unit. Once it reached the top of the glacial till unit, the tar migrated laterally along the sloping surface of till toward the Saranac River. The tar reached the banks of the river in several places, and has contaminated river sediments over a large portion of the site's boundary. In other areas, the tar pooled in low spots on the till surface and became temporarily immobilized. Although the former lagoon was surrounded by a containment wall in the early 1980s, tar has continued to move throughout the area. Some of this tar had evidently left the area of the lagoon before the containment wall was built, and some appears to have continued moving from the lagoon by either passing beneath the containment wall or through imperfections in the wall.

Although the glacial till stopped most of the vertical tar migration, it was not totally effective in doing so. Beneath the MGP plant itself, tar penetrated as deep as 19 feet into the till along joints, and appears to have followed these joints all the way down to the river bank. In areas near the former lagoon, it appears that the till unit was very thin or totally absent, allowing tar to penetrate all the way through to the underlying bedrock.

The extent of coal tar contamination in all of these geologic units is presented on Figure 3. It should be noted that not all of the soil shown inside the contaminated area is contaminated. Much of the lateral migration of tar took place at depth in the sandy alluvium, immediately above the upper surface of the glacial till. Consequently, there are large areas of the site north and west of the former lagoon where, for example, 8-10 feet of uncontaminated soil overlie 1-2 feet of tar-saturated soil.

Tar was also found in subsurface soils on the north side of the Saranac River, opposite the MGP site along the eastern edge of the Durkee Street Parking Lot. It appears that this tar was deposited by the river, rather than by migrating through the subsurface. During the period of MGP operations, tar was occasionally discharged directly to the river from the lagoons. Some of this tar was transported downstream and apparently deposited on a sand bar immediately upstream from the west abutment of the Broad Street bridge, where it infiltrated into the soil and rock beneath. The sand bar was subsequently covered with fill and building debris, and now lies 8-10 feet below the ground surface.

No tar has been detected along the eastern site boundary. Tar which moves away from the source areas on the site moves toward the Saranac River and does not pass beneath neighboring residential properties east of the site.

On-site disposal of purifier waste took place in an area north of the original MGP plant, between Caroline Street and Saranac Street. Prior to the operation of the MGP, a small stream channel had occupied this area. The channel was originally about 12 feet deep; however, it was found to have been entirely filled with purifier waste and soil. Cyanide levels in the purifier waste ranged from non-detect to 2 ppm. Unlike the tar contamination, the purifier waste was a solid material which remained where it had been buried.

Most, but not all, of the purifier waste material was removed by an Interim Remedial Measure (IRM) completed by NYSEG in 2002. Further details of this removal are presented in Section 5.2.

Bedrock

Tar contamination has also been found in bedrock on both sides of the Saranac River. Tar spontaneously accumulates in four bedrock monitoring wells, demonstrating that this material continues to be mobile in the subsurface. NYSEG is currently monitoring tar levels in these wells and removing it when sufficient volumes have accumulated. It should be noted that much of the tar contamination in bedrock occurs at substantial depths (over 100 feet) in areas where the surface soils are uncontaminated.

Surface Soil

Surface soils have been impacted by MGP site related contaminants. However, most of these impacts have already been addressed by past remedial activities at the site, notably the IRM conducted in 2002. Further discussion of the IRM can be found in Section 5.2.

Twenty three surface soil samples were collected during the course of the RI. Total PAH concentrations ranged from below detection to 278 ppm. However, the area where the 278 ppm value was detected has since been removed as part of the 2002 IRM. The highest PAH value detected in soils which remain on the site is 90 ppm.

No volatile compounds were detected in any of the surface soil samples.

Cyanide levels in surface soils ranged from non-detect to 35 ppm. Again, the area where the 35 ppm value was detected has since been removed as part of the 2002 IRM. The highest cyanide value detected in soils which remain on the site is 7.5 ppm. This sample lies in an area which will be excavated during the implementation of the remedy.

Subsurface Soil

Subsurface soils at the Saranac Street site have been contaminated by leakage of tar from plant structures and the former lagoon, and by on-site disposal of purifier waste.

Tar has moved through subsurface soils in many areas, contaminating these soils with PAHs and BTEX compounds. In many cases, subsurface soils were found to be saturated or nearly saturated with tar. Chemical analysis of these tar-saturated soils shows high levels of PAH and BTEX contamination, due to the continued presence of the tar. Soils which have been in contact with tar in the past typically retain elevated high levels of PAH and BTEX contamination, even when the liquid tar has been drained away.

PAHs levels in subsurface soils range from non-detect to 9767 ppm. BTEX levels in subsurface soils range from non-detect to 26 ppm. Results from the analysis of subsurface soil samples for PAHs and BTEX are presented on Figure 4.

Most of the movement of tar through subsurface soils took place in sandy soils north and west of the former lagoon. Tar which escaped from the MGP plant itself did not migrate as extensively, due to the much lower permeability of the glacial till soils in that area. However, some tar did move along thin joints in the till to discharge along the river bank at the south end of the site, near the pedestrian foot bridge.

Groundwater

Groundwater which has come in contact with the coal tar or with impacted subsurface soil has become contaminated by PAHs and BTEX compounds. Groundwater which has come into contact with purifier waste has become contaminated with PAH, BTEX, and cyanide. In both cases, the contaminated groundwater moves through the subsurface and eventually discharges to the Saranac River.

PAH levels in groundwater ranged from non-detect to 6945 ppb. BTEX levels in groundwater ranged from non-detect to 10670 ppb. Cyanide levels ranged from non-detect to 624 ppb.

Because groundwater flows from the site source areas toward the Saranac River, contaminated groundwater does not pass beneath neighboring properties.

Sediments

Tar contamination has been observed in scattered areas of river sediments from the MGP site downstream to Lake Champlain, and has also been found in lake sediments as far as 500 feet off shore. This contamination results from the ongoing leakage of tar from the Saranac Street site into the river. MGP tar which reaches the river bank accumulates in small balls or pools (typically a few inches across) in the sediments on the river bottom. The tar balls are then washed downstream during periods of high river flow.

Contaminated sediments containing visible drops or balls of tar produce a sheen on the water surface when the sediments are disturbed. These sediments are typically found in low-flow areas along the river bank. Sediment contamination in the main channel of the Saranac River is not as severe.

Detailed assessment of the impacts of PAH sediment contamination is being performed as part of the OU 2 Remedial Investigation. Identification and selection of remedial actions for OU2 will follow once the RI is approved. It stands to reason that Operable Unit 1 must be completed to a point where the site is no longer discharging tar to the river before remediation of Operable Unit 2 can begin. However, from a logistical standpoint, it is advisable to treat contaminated sediments which are located near the Saranac Street site as part of Operable Unit 1.

Surface Water

Obvious surface water impacts can be observed in the portion of the Saranac River immediately adjacent to the site. Tar-containing sediments and pools of liquid tar are found on the river bottom in several areas along the site perimeter. When these sediments are disturbed, they create a sheen on the water surface, which is a violation of Section 703.2 of the New York State Ambient Water Quality Standards. Smaller amounts of sheen-generating sediments can be observed in sheltered locations farther downstream, and for several hundred feet into Lake Champlain.

Less obvious impacts are also present in surface water. Four individual MGP-related PAH compounds were detected in a river water sample collected as part of the Operable Unit 2 RI, immediately downstream from the site, at levels which exceed NYSDEC Ambient Water Quality Standards. This sample was collected in an area of heavy tar contamination, and it appears that the surface water contamination results from disturbance of tar-containing sediments on the river bottom. In areas where liquid tar is not present in the river bed, no surface water contamination has been detected.

Surface water impacts in the Saranac River will be addressed in greater detail in Operable Unit 2.

5.2: 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 completion of the RI/FS.

NYSEG conducted an IRM at the Saranac Street site in 2002. The IRM consisted of excavating the former plant site and an area of purifier waste disposal where contamination had not spread far from its original source, as shown on Figure 3.

Soils were excavated to a depth of four feet over the entire area which the MGP plant originally occupied. The purpose of this work was to locate and remove underground tanks, pipes, and other structures associated with the MGP, and to remove any contaminated soils surrounding these structures. Soils were stockpiled and analyzed. Soils found to be uncontaminated were returned to the excavation, regraded, and seeded to control erosion.

The plant site excavation was successful in removing tar-contaminated structures and the surrounding contaminated soils from the former plant site. However, some tar was found to have migrated downward along thin joints in the underlying glacial till. Tar migration along these joints may have been an important factor in transporting tar to the Saranac River in the past. However, the actual volume of tar contained in the joints in this area is believed to be quite small, with the band of tar contamination around each joint typically less than half an inch wide.

Excavation of the deep joints was deemed impractical, so an alternative approach was taken during the IRM. Following completion of the excavation, a solid phase oxidant was spread along the joints which were found to contain tar. This material dissolves slowly over a period of several months, releasing oxygen into the groundwater. Over time, this oxidant will be transported along the joints, where chemical reaction with the tar will destroy or immobilize the tar. With removal of the tar source areas in the MGP plant site and immobilization or destruction of the tar contained in the joints, further transport of tar to the Saranac River in this area is expected to cease.

The purifier waste area located north of the former MGP was also excavated, but to a greater depth than the main MGP plant area. Prior to construction of the MGP, a stream channel roughly 12 feet deep had occupied this area. During the RI, the channel was found to have been filled with a mixture of purifier waste and other fill materials. The IRM excavation removed this material to its maximum depth. However, along the northern and eastern edges of the excavation, some of the waste appeared to extend beneath Caroline Street and Saranac Street at depths of 8-12 feet. Excavation of this material was not attempted during the IRM because to do so would have jeopardized the integrity of these two streets. Further investigation work will be required to delineate the extent of remaining waste materials.

With the exception of the purifier waste left beneath Saranac and Caroline streets, NYSDEC believes the IRM has successfully addressed MGP contamination in these two areas. The remaining contamination related to the former lagoon to the west and north of Saranac Street is the subject of this PRAP.

5.3: <u>Summary of Human Exposure Pathways</u>:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 6 of the RI report.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

There are both completed and potential exposure pathways at the site. A completed exposure pathway is:

- dermal contact with contaminated surface soil, surface water, sediments and coal tar

Those who use the Saranac River in the area of the site can be exposed to contaminants, including DNAPLs, that seep from the site into the Saranac River. Currently there are warning signs that may discourage the use of the immediate area for swimming or wading, but there are no mechanisms in place to prevent people from using the area.

Potential exposure pathways are:

- dermal contact with contaminated subsurface soil;

- ingestion of contaminated groundwater, and;

- inhalation of vapors from contaminated soil gas.

Dermal contact with contaminated subsurface soil is possible since site access is not controlled and there are no mechanisms in place to prevent future development that could bring contaminants to the surface. Site groundwater is not currently used for drinking, but groundwater could be used in the future since there are no restrictions in place to prevent its use. Although the ingestion of contaminated groundwater is a potential exposure pathway, the ingestion of contaminated groundwater is not expected because the surrounding area is serviced by municipal water. Soil vapor intrusion could be a concern if buildings are erected on site in the future.

5.4: <u>Summary of Environmental Impacts</u>

This section summarizes the existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

- Saranac River sediments along the site boundary contain liquid coal tar. During periods of low water levels in the river, tar seepage from the subsurface into the river bed is frequently observed. During these periods, there is a potential for direct contact by fauna and flora with DNAPL.

- Dead and /or obviously impacted crayfish and juvenile fish have been observed occasionally in the areas of heaviest tar discharge along the river bank at the northern edge of the site.

- Tar is transported downstream by river currents and deposited in Lake Champlain, resulting in an exposure pathway for bottom-dwelling organisms in the Lake. Contamination of the lake sediments and Saranac River sediments downstream of the Broad Street bridge will be addressed in Operable Unit 2.

- Site contamination has impacted the groundwater resource in the overburden and bedrock.

SECTION 6: <u>SUMMARY OF THE REMEDIATION GOALS</u>

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- the migration of MGP tar through subsurface soils into the Saranac River;

- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards;

- the ingestion of groundwater with contaminant levels exceeding drinking water standards;
- the ingestion/direct contact with contaminated soil, contaminated sediment, and MGP tar, and;
- impacts to biota from ingestion/direct contact with DNAPL or contaminated soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

Further, the remediation goals for the site include attaining to the extent practicable:

- Recommended soil cleanup objectives in TAGM 4046;
- Sediment screening guidelines contained in "Technical Guidance for Screening of Contaminated Sediments", and;
- Ambient Groundwater Standards.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected 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. Potential remedial alternatives for the NYSEG Plattsburgh (Saranac Street) MGP Site were identified, screened and evaluated in the FS report which is available at the document repositories identified in Section 1.

A summary of the remedial alternatives that were considered for this site are discussed below. The present worth represents the amount of money invested in the current year that would 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 would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated soils, sediments, and groundwater at the site.

With the exception of Alternative 1, which calls for no further action at the site, all of the alternatives include the following common elements:

1) Excavation and off-site disposal of the contaminated sediments along the river bank and adjacent portions of the river bed, from the site downstream as far as the Broad Street Bridge. The river bank area presents the greatest risk of human and ecological exposure, and no viable alternatives to excavation have been identified. The excavated material will be replaced with similar material (coarse gravel, cobbles, and sand) from uncontaminated off site sources. All work related to excavation of river

sediments and restoration of the stream bed and banks must meet the substantive technical requirements of 6 NYCRR Part 608 Use and Protection of Waters

2) Excavation and off site disposal of the small volume of contaminated soil located north of the Saranac River, near the Broad Street Bridge. This material will be sent off site for proper treatment and/ or disposal, and will be replaced with uncontaminated soil from off site sources.

3) Recovery of tar from the bedrock aquifer will continue for as long as the bedrock wells continue to produce tar. At least two additional wells will be installed to increase the rate of tar recovery.

4) Delineation of the contaminated area north of Saranac Street and east of Caroline Street. Contaminated soils beneath these two streets were left behind during the 2002 IRM. This area will be investigated further, including an evaluation of soil gas contamination. Appropriate action will be taken if necessary.

5) Institutional controls to limit human contact with any remaining contaminated soil and groundwater. Vapor intrusion in proposed site structures must be appropriately evaluated and addressed prior to redevelopment due to the possible presence of volatile organic compounds from remaining contaminated soils.

Beyond the five common elements described above, the remedial alternatives differ primarily in the degree to which they attempt to remove, contain, or treat the MGP tars which were deposited in the former lagoon and which have migrated away from the lagoon in the subsurface.

Alternative 1: No Further Action

Present Worth: *$140,000*
Capital Cost: *$0*
Annual OM&M:
Years 1-30: *$3,700*

The No Further Action alternative recognizes the partial remediation of the site conducted under a previously completed IRM. Groundwater contamination at the site would continue to be monitored, and the bedrock well tar removal program would continue in its current form.

This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Excavation to TAGM 4046 Levels for Individual MGP Contaminants, With Off Site Treatment and Disposal

Present Worth: *$71,648,000*
Capital Cost: *$57,318,275*
Annual OM&M:
Years 1-30: *$5,400*

Alternative 2 is designed as a maximal site-wide remedy to restore the site soils to pre-release conditions. All soils containing site contaminants at levels higher than specified in NYSDEC TAGM 4046 (for individual PAH compounds) would be excavated using conventional excavating equipment and taken off site in dump trucks for treatment and/or disposal. The resulting hole in the ground would be backfilled with uncontaminated soils from off site sources. The physical extent of this alternative is shown on Figure 5.

Because much of the most heavily contaminated soil is found at depths of 10-15 feet below ground surface, the volume of soil to be excavated would be extraordinarily large. An estimated 225,000 cubic yards of soil would need to be excavated. Approximately 85,000 cubic yards of uncontaminated soil would be reused as backfill. The remaining 140,000 cubic yards would be trucked off site for thermal treatment and/or landfilling, depending on the level of contamination contained.

Haul trucks transporting any hazardous wastes will be required to have a polyethylene-lined box and a water-tight tarp cover. All waste transport trucks would have water-tight tailgates with a gasket between the box and tailgate.

On-site disposal of a portion of the excavated soil was evaluated. However, it was determined that the site is not large enough to construct an on-site landfill in compliance with NYSDEC regulations.

Because the excavation would proceed beneath the water table, groundwater will be encountered and extensive dewatering efforts may be required. Steel sheeting would be used to limit the amount of water entering the excavation, but substantial volumes of water would still need to be pumped to maintain safe working conditions. This water would be treated to remove DNAPL and other site related contaminants prior to being discharged to the Saranac River.

After removal of the subsurface soils, end-point soil samples would be collected to confirm that all soils above TAGM levels have been removed. The excavation would then be backfilled with general fill that meets TAGM 4046 criteria. The site would then be graded and seeded.

Institutional controls in the form of an environmental easement that would restrict future use of groundwater from the bedrock aquifer would be required, because the bedrock aquifer is known to be contaminated with tar and other site related contaminants. Tar recovery efforts in the bedrock would continue for as long as tar continues to move into the recovery wells. No restrictions on the use or excavation of site soils would be required, however.

Following remediation, all remaining soils at the site would meet TAGM levels. Consequently, no ongoing monitoring program would be required for groundwater in the overburden.

Alternative 3A: Excavation of Source Material

Present Worth: *$23,186,000*
Capital Cost: *$18,549,000*
Annual OM&M:
Years 1-30: *$20,000*

This alternative would also include large-scale excavation of contaminated soils. However, instead of excavating and removing all soils which exceed NYSDEC TAGM levels, only soils determined to be heavily contaminated "source material" would be removed, as shown on Figure 6. The primary objective would be to eliminate the source of the ongoing tar discharge to the Saranac River by removing soils with mobile tar or very high levels of site contaminants. Consequently, application of the Department's soil TAGM level (500 ppm for semi-volatile compounds such as PAHs) would be replaced with an evaluation of whether the soils should be considered as "source material."

"Source material" for this alternative consists of DNAPL or soils meeting one or more of the following criteria:

1) Visible tar or oil;

2) Over 1000 ppm total PAH, with the presence of sheens or odors, or;

3) Visible purifier waste, with reactive cyanide levels above 500 ppm and/or reactive sulfide levels above 250 ppm.

Excavation of approximately 104,000 cubic yards of soil would be required. An estimated 47,000 cubic yards would require off site treatment and/or disposal. The remaining material would be placed at the bottom of the excavation and covered with soils from off site sources which meet TAGM 4046 levels. The backfilled excavation would then be graded and seeded.

Because waste materials would remain on site following remediation, an ongoing monitoring program would be required. Tar recovery efforts in the bedrock would continue for as long as tar continues to move into the recovery wells.

Institutional controls (in the form of an environmental easement) would restrict future use of groundwater from the bedrock aquifer because this aquifer is known to be contaminated with tar and other site related contaminants. A soils management plan would be developed to address residually contaminated soils that may be excavated from the site during future development. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations. Development of the site would be restricted to industrial, commercial, or recreational land uses.

Alternative 3B: Excavation of Source Material, With Stabilization of Perimeter

Present Worth: $23,621,000
Capital Cost: $18,897,000
Annual OM&M:
Years 1-30: $20,000

This alternative is similar to Alternative 3A, with the exception that a perimeter zone of "remaining impacted" MGP soils surrounding the source material soils would be stabilized using soil auger mixing technology. The purpose of the stabilized perimeter would be to minimize the flow of contaminated groundwater away from the site. The physical extent of this alternative is shown on Figure 7.

"Remaining impacted" soils are those soils which would not qualify as "source material" (described in the previous section) but which have been impacted by MGP wastes so that they would meet one or more of the following criteria:

1) Sheens or odors are present, but PAH levels are below 1000 ppm;

2) Purifier waste is present, but reactive cyanide levels are below 500 ppm and reactive sulfide levels are below 250 ppm, or;

3) Soil staining (only) is present.

Soil auger mixing is an in-situ technology used to reduce the ability of contaminated soils to contaminate groundwater. In brief, the soil would be modified by the addition of small volumes of cement to create a solid mass with very little pore space. Overlapping, large-diameter auger holes would be drilled into the ground. A Portland cement slurry would be injected through the bottom of the augers as they are withdrawn. The augers would continue to turn, thoroughly mixing the wet cement with the soil. When the cement hardens, the resulting soil/cement mixture would form a solid mass with much lower permeability than the original soil. The decrease in permeability would inhibit both the migration of DNAPL and contaminated groundwater toward the Saranac River.

For planning purposes, it is assumed that the residually impacted perimeter zone exists only on the upgradient side of the source material. On the downgradient side, it is assumed that source material extends all the way to the river bank. A field investigation would be conducted during the remedial design phase to confirm or modify this assumption. Additional stabilization may be substituted for excavation on the downgradient side of the lagoon if source material does not extend all the way to the river.

Although the addition of a stabilized fringe around the source material excavation represents additional remediation work at the site, some of the extra cost is recovered by reducing or eliminating the need for steel sheeting surrounding the excavation. The stabilized perimeter would be constructed first, before excavation of the source material takes place, providing support and limiting the entry of groundwater into the source material excavation.

As with the other alternatives, the remediated area would be covered with a minimum two-foot thickness of soil which meets TAGM 4046 criteria, regraded and seeded with grass when the work is completed.

Because waste materials would remain on site following remediation, an ongoing monitoring program would be required. Tar recovery efforts in the bedrock would continue for as long as tar continues to move into the recovery wells.

Institutional controls, in the form of an environmental easement, would:

1) Restrict future use of groundwater from the bedrock aquifer because this aquifer is known to be contaminated with tar and other site related contaminants;

2) Require compliance with a soils management plan to address residual contaminated soils if they were excavated from the site during future development. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations;

3) Prohibit excavation of the stabilized perimeter soils, and;

4) Restrict development of the site to industrial, commercial, or recreational land uses.

Alternative 4: Stabilize Source Material

Present Worth: *$17,820,000*
Capital Cost: *$14,256,000*
Annual OM&M:
Years 1-30: *$20,000*

This alternative would employ the in-situ stabilization technique described in Alternative 3B on a larger scale, combined with a lesser amount of excavation and off site treatment. The extent of the proposed stabilization program is shown on Figure 8.

Approximately 180,200 cubic yards would be stabilized in place using auger mixing technology. A pre-design investigation would be required to verify the limits of the areas to be stabilized.

Due to access limitations and the bouldery nature of the stream bed, augering technology is not applicable at the river bank. Consequently, contaminated sections of the river bank and river bed would be excavated. The area beneath the existing electrical substation would also be excavated. In all, 29,600 cubic yards of soil would be excavated, with 17,700 cubic yards transported off site for proper treatment and/or disposal.

Addition of cement during the stabilization process would cause an increase in soil volume. Consequently, the average elevation of the ground surface following remediation would increase by roughly 1.7 feet.

Following completion of the stabilization and excavation work, the remediated area would be covered with a visual excavation barrier to warn against future excavation into the stabilized material. Above this, the visual barrier would be covered with topsoil and seeded with grass.

Because waste materials would remain on site following remediation, an ongoing monitoring program would be required. Tar recovery efforts in the bedrock would continue for as long as tar continues to move into the recovery wells.

Institutional controls, in the form of an environmental easement, would:

1) Restrict future use of groundwater from the bedrock aquifer because this aquifer is known to be contaminated with tar and other site related contaminants;

2) Prohibit excavation of the stabilized soils, and;

3) Restrict development of the site to industrial, commercial, or recreational land uses.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York State. 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 NYSDEC has determined to be applicable on a case-specific basis.

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

3. Short-term 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.

4. 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.

5. 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.

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 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. The costs for each alternative are presented in Table 2.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the NYSDEC addressed the concerns raised.

In general, public comments received were supportive of the selected remedy. Some comments, however, noted concerns with two aspects of the PRAP: 1) reuse of residually impacted soils as backfill and 2) testing and potential use of surfactant flushing in lieu of excavation in the area surrounding the city's electrical substation.

The PRAP included a proposal to conduct a test of in-situ surfactant flushing to remove tar from subsurface soils in the vicinity of the electrical substation on Saranac Street. If this testing had proven successful, it could have offered substantial cost savings be eliminating the need to relocate the substation. In response to comments from the public and the City of Plattsburgh, NYSEG and NYSDEC have withdrawn the proposal. The substation will be relocated and the soils beneath it will be excavated in conjunction with the rest of the excavation work. All references to this proposal have been removed from the body of the ROD. Some discussion is included in the Responsiveness Summary.

In response to comments regarding the use of residually impacted soils as backfill, the NYSDEC has reviewed alternative approaches and has concluded that such reuse is sufficiently protective of human health and the environment. Further discussion of this issue can be found in the Responsiveness Summary.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the NYSDEC has selected Alternative 3B, **Excavation of Source Material, With Stabilization of the Perimeter**, as the remedy for this site. The elements of this remedy are described at the end of this section.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS.

Alternative 3B was selected because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It will achieve the remediation goals for the site by removing the source material and soils which are contaminated at levels which pose a significant threat to human health and the environment due to their toxicity and mobility. The remaining, less contaminated material will be covered with uncontaminated soil, isolated from contact with groundwater by a low-permeability cover and a perimeter of stabilized soil, and protected from future disturbance by institutional controls which will prohibit excavation below the clean soil cover. All contaminated sediments, which currently cause violations of ambient Water Quality Standards, will be removed and replaced with uncontaminated materials. All subsurface soils which present a risk of generating mobile tar will be removed. Movement of this tar through the subsurface and into the Saranac River is the principal mechanism for human and ecological exposure at this site.

Alternative 1 has been rejected as a remedy since it would not satisfy the threshold criteria of being protective of public health and the environment; and complying with New York State standards, criteria and guidance. Under Alternative 1, the site would continue to discharge tar into the Saranac River, creating violations of ambient water quality standards indefinitely. Human exposure to tars along the banks of the river and in areas downstream would continue indefinitely.

Because Alternatives 2, 3A, 3B, and 4 all satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Alternatives 2, 3A, 3B, and 4 all would create short-term impacts which can be controlled. Alternative 2 would require a significantly increased amount of construction time with a resultant increase in short term risk. Alternative 2 would also require a much larger increase in truck traffic through the surrounding neighborhood, due to the larger volumes of soil to be excavated and transported off site.

Alternatives 2, 3A, and 3B would all be effective over the long term. All provide for the permanent removal of contaminated sediments in nearby portions of the Saranac River, permanent cessation of further tar discharges to the river, and permanent removal or isolation of contaminated soils from contact with human and ecological receptors. The alternatives differ in their approach to providing permanence, and in the degree to which they rely on institutional controls in achieving it. Alternative 2 would remove the maximum amount of material from the site, and thus would require the least amount of long term monitoring. Alternatives 3A and 3B would both remove enough material to eliminate the possibility of continued tar migration into the Saranac River, but would leave some contaminated material at depth. The remaining contaminated material would be isolated from direct contact by burial and/or stabilization. A minimum thickness of two feet of uncontaminated soil, meeting TAGM 4046 criteria, would cover the entire remediated area. Alternative 3A would still allow groundwater to come into contact with the remaining contaminated material, migrate, and discharge to the Saranac River. Alternative 3B will control this groundwater migration through the creation of a stabilized perimeter of lower permeability soils which will inhibit contact of groundwater with the remaining contaminated material. Alternative 4 calls for stabilization of heavily contaminated soils in the former lagoon and surrounding areas. Some of these soils contain mobile, liquid tar. The long term effectiveness of stabilization of grossly contaminated material such as this is less certain than it is for less contaminated materials.

The four alternatives would each reduce mobility, toxicity and/or volume of contaminated material. Alternative 2 would provide the greatest reduction, by removing all material contaminated above TAGM levels from the site. Alternative 3A would provide a lesser degree of reduction, allowing some contaminated material to remain on site, and would allow some of the contaminants to remain partially mobile, through the generation and movement of contaminated groundwater. This groundwater would continue to flow a short distance to the river bank and discharge to the Saranac River. Exposure to this groundwater, however, would be quite unlikely, and impacts of the contaminated discharge to water quality in the Saranac River should be minor. It appears that under current conditions, water quality impacts in the Saranac River result from the tar discharge, not contaminated groundwater discharge. No human consumption of contaminated groundwater is taking place currently, and all of the Alternatives provide for institutional controls to prohibit such consumption in the future. Alternative 3B will control the mobility of site contaminants in contaminated groundwater by surrounding the remaining residually impacted soils with a low-permeability cement/soil mixture. Contact with groundwater will be significantly reduced, as would the ability of this water to move through the subsurface. Alternative 4 would not reduce the volume of contaminated material (the volume following stabilization would actually increase somewhat); however, both mobility and toxicity would be reduced by stabilizing the soil with the addition of cement. The degree of toxicity and mobility reduction would be less, however, under Alternative 4 than under Alternatives 2, 3A, and 3B.

Each of the four alternatives appears to be technically implementable. Excavation work would be accomplished with standard construction machinery such as backhoes and dump trucks. The in-situ soil auger stabilization equipment called for in Alternatives 3B and 4 is somewhat more specialized, but readily available. However, the application of this technology in the former lagoon may present some difficulties. Large boulders and debris can limit the effectiveness of in situ auger mixing, and in some cases can stop the process altogether. Substantial amounts of building demolition debris appear to be present in the area of the former lagoon. The need to remove this material prior to auger mixing could raise the cost of this alternative, or in extreme cases render it unimplementable. It should be noted that no such debris has been found in the area intended for perimeter stabilization in Alternative 3B.

Cost estimates for the four alternatives vary from roughly $18 million for Alternative 4 to $71 Million for Alternative 2. The added level of protection offered by Alternative 2 is relatively modest and comes at an extremely high cost–it would be more than three times as expensive as the next most expensive alternatives, 3A and 3B. Alternatives 3A and 3B are similar in estimated cost ($23.2 Million and $23.6 Million, respectively); however, Alternative 3B offers a significantly higher level of protection against future groundwater contamination. Alternative 4 is the least costly alternative; however, there remains some doubt as to whether the presence of buried debris will increase this cost significantly. There are also some remaining questions on the long term stability of DNAPL-saturated soils which have been stabilized with cement.

The estimated present worth cost to implement the remedy is $23,621,000. The cost to construct the remedy is estimated to be $*18,897,000* and the estimated average annual operation, maintenance, and monitoring costs for 30 years is $20,000.

The elements of the selected remedy are as follows:

1. Stabilization of a band of residually impacted soils surrounding the source area near the former lagoon, using soil auger mixing technology.

2. Excavation of soils within the stabilized band, down to the upper surface of the glacial till.

3. Excavation of “stranded river deposits” from the area near the Broad Street Bridge. This material will be transported back to the Saranac Street site, where it will be subjected to segregation and handling along with similar materials excavated from the site.

4. Segregation of excavated soils on the basis of contaminant content. Soils determined to be “source material” (as described in Section 7.1) will be dewatered and prepared for off site transport. Soils determined to be “residually impacted” will be held for use as backfill.

5. Transportation of source material soils for proper off site treatment and disposal.

6. Replacement of residually impacted soils at the bottom of the excavation

7. Installation of a visual demarcation barrier to identify the residually impacted material.

8. Backfilling of the remaining excavation, followed by placement of topsoil and seeding to ensure a minimum of 2 feet of soil cover meeting TAGM 4046 limits.

9. Excavation of all Saranac River sediments and river bank materials which violate New York State Ambient Water Quality Standards (by creating a sheen when disturbed), as far downstream as the Broad Street Bridge. Contaminated sediments will be transported off site for proper off site treatment and disposal. All work related to excavation of river sediments and restoration of the stream bed and banks must meet the substantive technical requirements of 6 NYCRR Part 608 Use and Protection of Waters

10. Investigation and (if necessary) removal of waste beneath Saranac and Caroline Streets. As part of the investigation, an evaluation of soil gas will be performed.

11. Development of a site management plan to address residual contaminated soils that may be excavated from the site during future redevelopment. The plan will require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations. The site management plan will also require vapor intrusion in proposed site structures be appropriately evaluated and addressed prior to redevelopment due to the possible presence of volatile organic compounds from remaining contaminated soils.

12. The property owner will provide an annual certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department, which will certify that the institutional controls and engineering controls put in place, are unchanged from the previous certification and nothing has occurred that will impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with any operation an maintenance or soil management plan.

13. Imposition of an institutional control in form of an environmental easement that will: (a) require compliance with the approved site management plan, (b) limit the use and development of the property to commercial, industrial or recreational uses; (c) restrict use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Clinton County Department of Health; and, (d) require the property owner to complete and submit to the NYSDEC an annual certification.

14. Installation of at least two additional bedrock tar collection wells and continued monitoring and removal of tar from all bedrock wells which produce tar.

15. Continued groundwater monitoring of both overburden and bedrock aquifers .

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted:

Repositories for documents pertaining to the site were established at the local Public Library, at NYSEG's local office, and at the NYSDEC Regional Office in Warrensburg.

A public contact list, including nearby property owners and residents, elected officials, local media and other interested parties, was established.

A public meeting was held on February 23, 2004 to present and receive comment on the PRAP. Previous meetings to discuss ongoing progress during the Remedial Investigation had been held on April 18 and November 21, 2002.

A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.

TABLE 1
Nature and Extent of Contamination

WASTE	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Benzene	782	NA	NA
	Ethylbenzene	7850	NA	NA
	Toluene	3440	NA	NA
	Xylenes (total)	8390	NA	NA
Semivolatile Organic Compounds (SVOCs)	Total PAHs	276000	NA	NA

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Benzene	ND	.06	0 of 23
	Ethylbenzene	ND	1.5	0 of 23
	Toluene	ND	5.5	0 of 23
	Xylenes (total)	ND	1.2	0 of 23
Semivolatile Organic Compounds (SVOCs)	Total PAHs	1.8-278	500	0 of 23
Inorganic Compounds	Cyanide	ND-35	NA	NA

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Benzene	ND-810	.06	5 of 16
	Ethylbenzene	ND-200	1.5	6 of 16
	Toluene	ND-2,000	5.5	6 of 16
	Xylenes (total)	ND-1,020	1.2	7 of 16
Semivolatile Organic Compounds (SVOCs)	Total PAHs	ND-35,610	500	7 of 16

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Inorganic Compounds	Cyanide	ND-2	na	na

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Benzene	ND-6,000	1	14 of 32
	Ethylbenzene	ND-4,000	5	13 of 32
	Toluene	ND-1,900	5	11 of 32
	Xylenes (total)	ND-2,010	5	13 of 32
Semivolatile Organic Compounds (SVOCs)	Total PAHs	ND-6945	Various	
Inorganic Compounds	Cyanide	ND-702	200	6 of 32

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

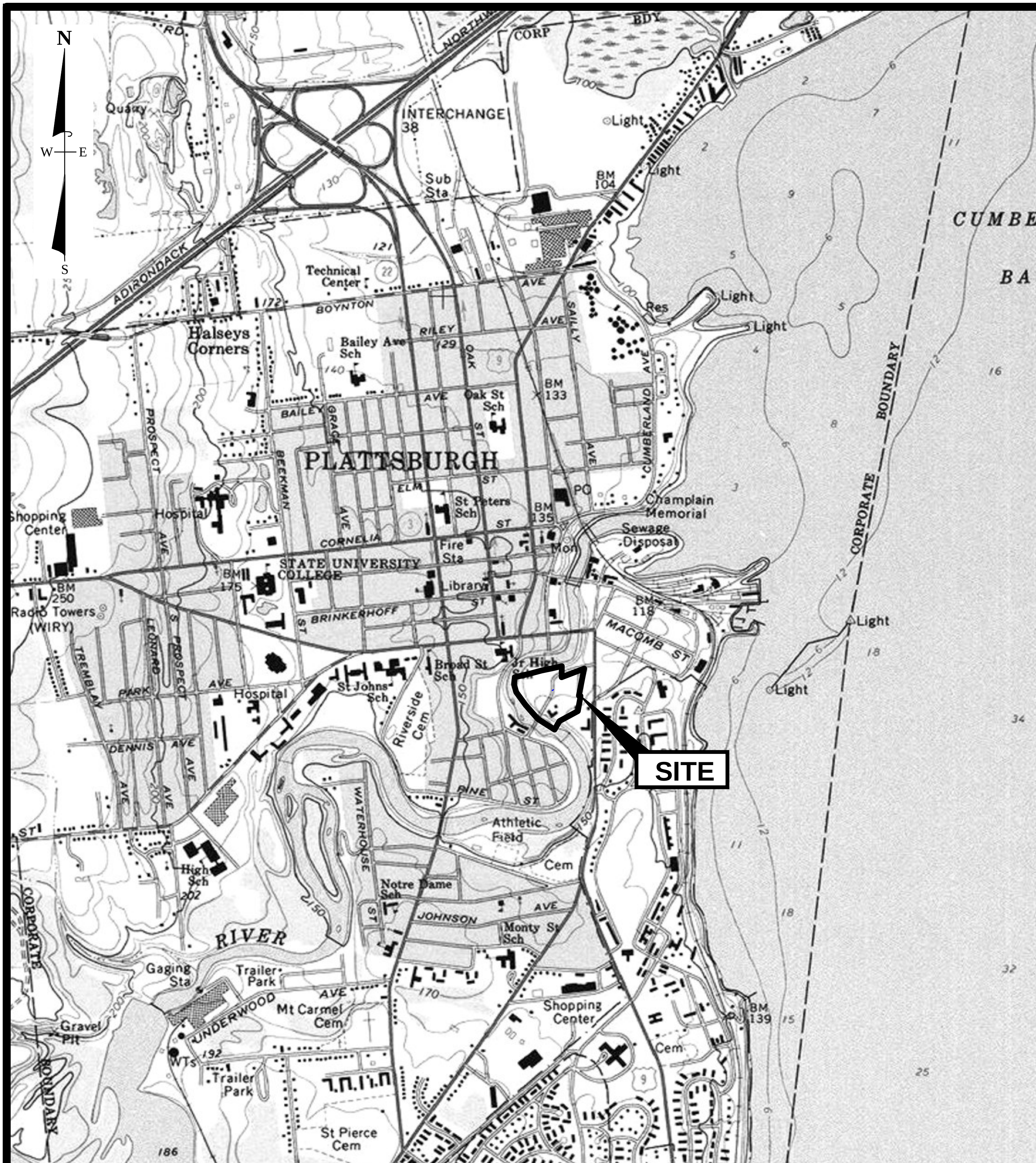
[b] SCG = standards, criteria, and guidance values;

ND = None Detected

This sample location was excavated during the IRM. Maximum PAH in surface soils still on site is 90.4 ppm

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
Alternative 1. No Action	$0	20,000	$140,000
Alternative 2. Excavation to TAGM Levels	57,318,000	5,400	$71,648,000
Alternative 3A Excavation of Source Material	$18,549,000	$20,000	$23,186,000
Alternative 3B Excavation of Source Material, With Stabilization of Fringe Soils.	$18,897,000	$20,000	$23,621,000
Alternative 4 Stabilization of Source Material	$14,256,000	$20,000	$17,820,000



2000 1000 0 2000 4000

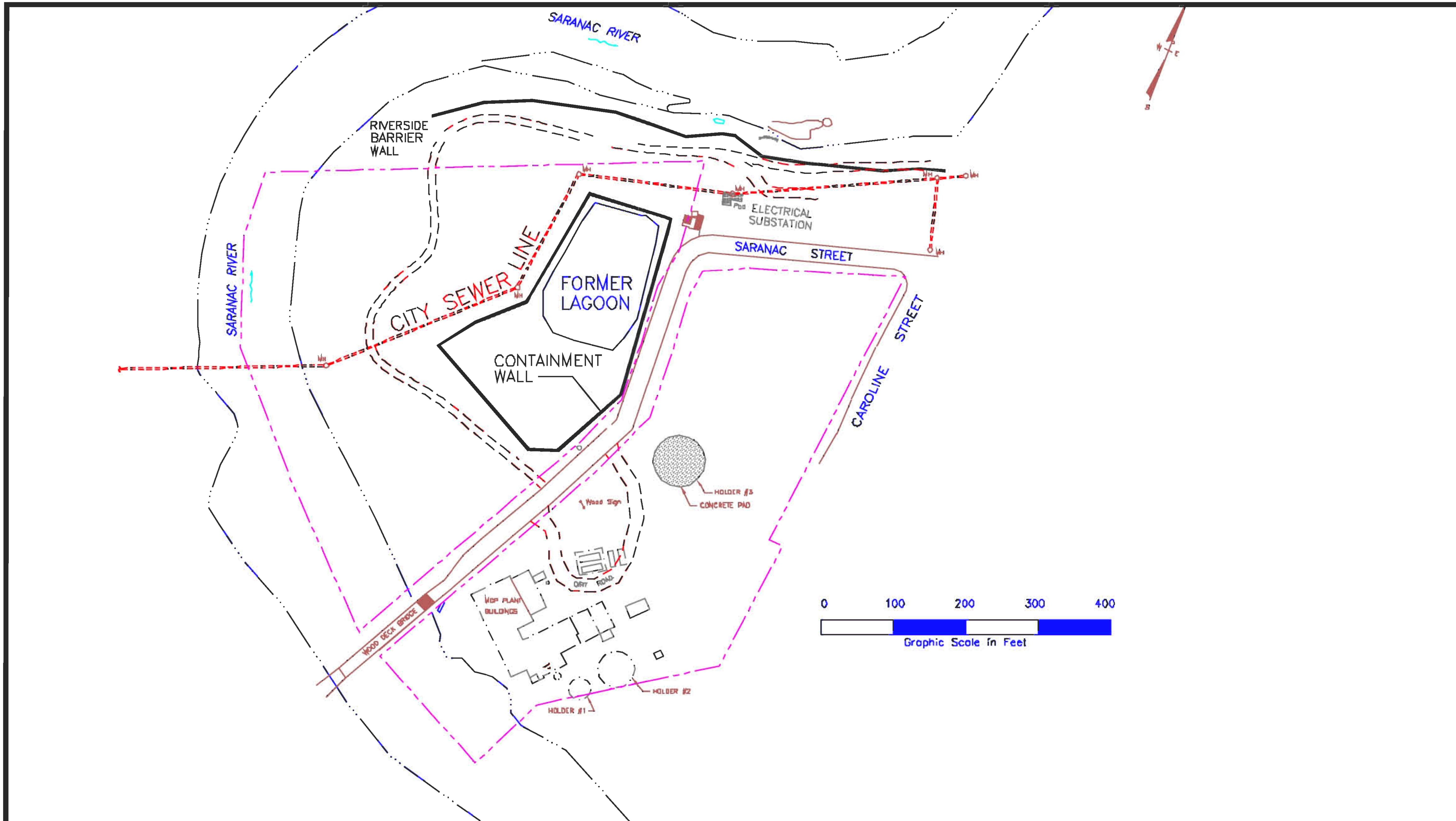
GRAPHIC SCALE IN FEET

SOURCE: USGS TOPOGRAPHIC MAP, PLATTSBURGH, N.Y.-VT., 1966

Φ GEI Consultants, Inc.

FIGURE 1
SITE LOCATION MAP

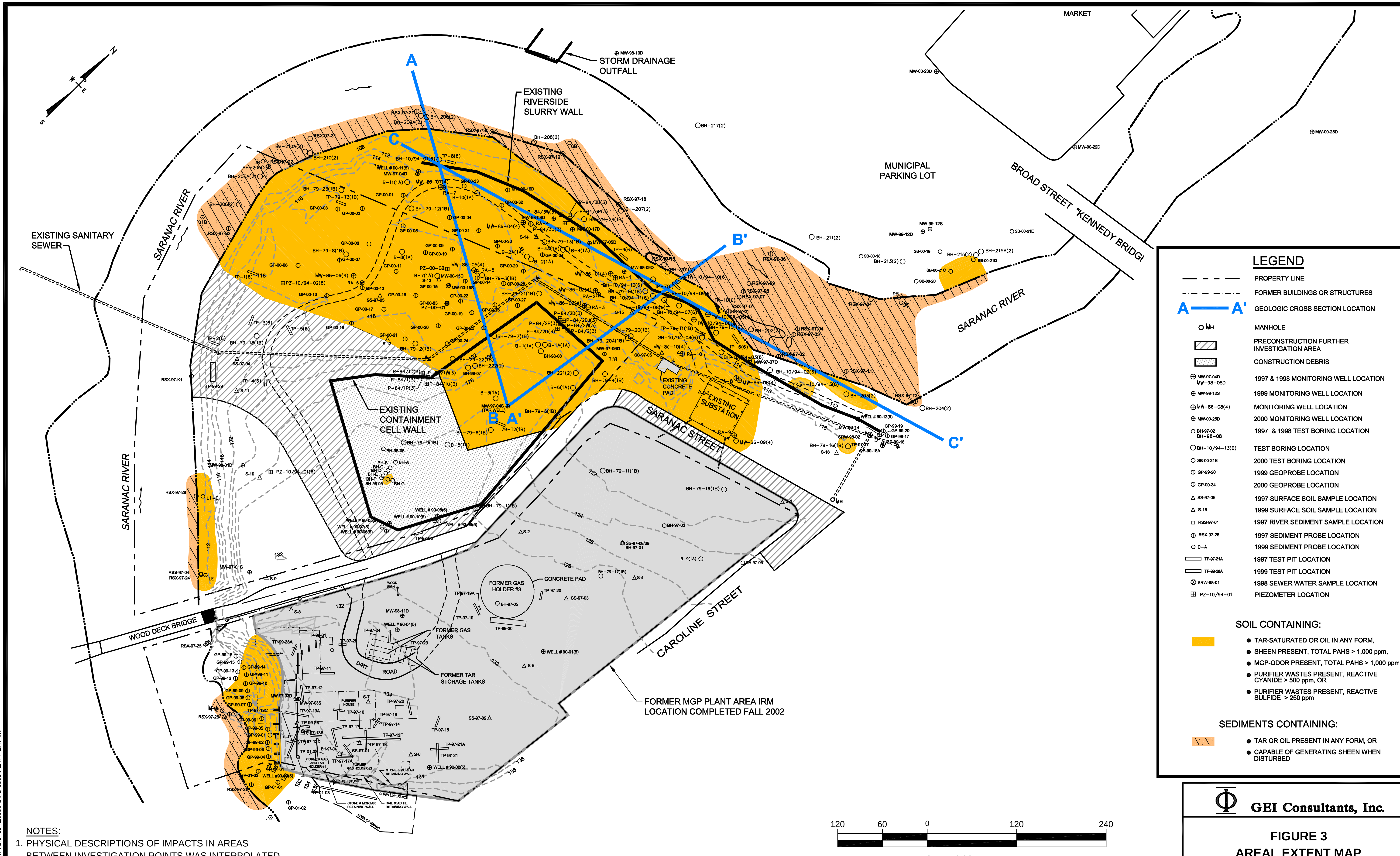
SARANAC STREET SITE
PLATTSBURGH, NEW YORK



NYSEG PLATTSBURGH (SARANAC STREET) FORMER MANUFACTURED GAS PLANT SITE
PLATTSBURGH (C), CLINTON COUNTY, NEW YORK
SITE NO. 5-10-007

SITE LAYOUT

FIGURE 2



NOTES:

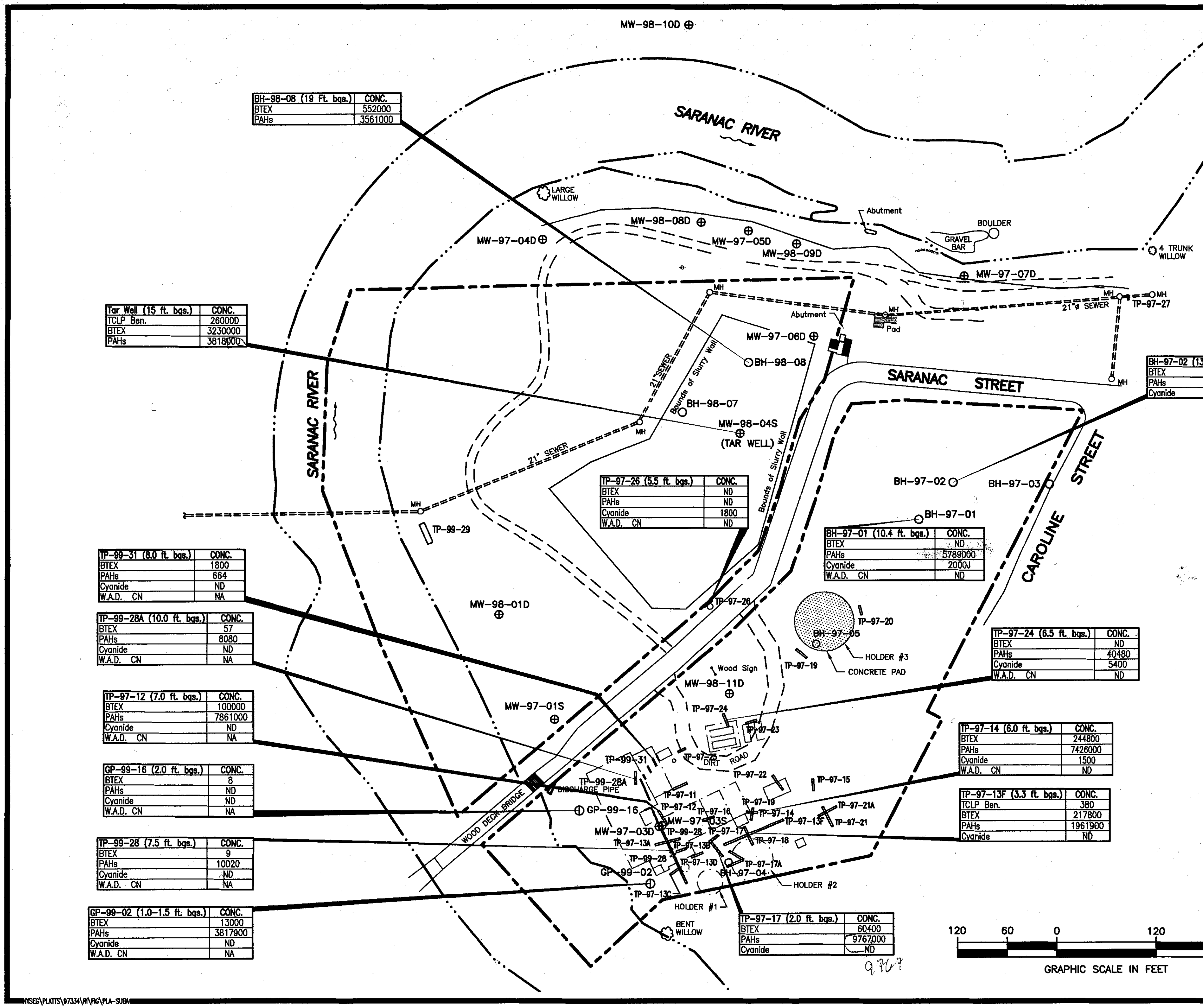
1. PHYSICAL DESCRIPTIONS OF IMPACTS IN AREAS BETWEEN INVESTIGATION POINTS WAS INTERPOLATED BASED ON CONSTRUCTABILITY ISSUES AND GEI'S EXPERIENCE OF LIKELY CONTAMINANT DISTRIBUTION.

GEI Consultants, Inc.

FIGURE 3
AREAL EXTENT MAP

SARANAC STREET
PLATTSBURGH, NEW YORK

GEI\NYSEG\PLATTS\973341005\FS\FS-0503\PLATT EXT-IMP



BH-98-08 (19 Ft. bgs.)	CONC.
BTEX	552000
PAHs	3561000

Tar Well (15 ft. bgs.)	CONC.
TCLP Ben.	26000D
BTEX	3230000
PAHs	3818000

BH-97-02 (13.2 ft. bgs.)	CONC.
BTEX	16
PAHs	400
Cyanide	ND

TP-97-26 (5.5 ft. bgs.)	CONC.
BTEX	ND
PAHs	ND
Cyanide	1800
W.A.D. CN	ND

BH-97-01 (10.4 ft. bgs.)	CONC.
BTEX	ND
PAHs	5789000
Cyanide	2000J
W.A.D. CN	ND

TP-99-31 (8.0 ft. bgs.)	CONC.
BTEX	1800
PAHs	664
Cyanide	ND
W.A.D. CN	NA

TP-99-28A (10.0 ft. bgs.)	CONC.
BTEX	57
PAHs	8080
Cyanide	ND
W.A.D. CN	NA

TP-97-24 (6.5 ft. bgs.)	CONC.
BTEX	ND
PAHs	40480
Cyanide	5400
W.A.D. CN	ND

TP-97-12 (7.0 ft. bgs.)	CONC.
BTEX	100000
PAHs	7861000
Cyanide	ND
W.A.D. CN	NA

TP-97-14 (6.0 ft. bgs.)	CONC.
BTEX	244800
PAHs	7426000
Cyanide	1500
W.A.D. CN	ND

GP-99-16 (2.0 ft. bgs.)	CONC.
BTEX	8
PAHs	ND
Cyanide	ND
W.A.D. CN	NA

TP-97-13F (3.3 ft. bgs.)	CONC.
TCLP Ben.	380
BTEX	217800
PAHs	1961900
Cyanide	ND

TP-99-28 (7.5 ft. bgs.)	CONC.
BTEX	9
PAHs	10020
Cyanide	ND
W.A.D. CN	NA

GP-99-02 (1.0-1.5 ft. bgs.)	CONC.
BTEX	13000
PAHs	3817900
Cyanide	ND
W.A.D. CN	NA

TP-97-17 (2.0 ft. bgs.)	CONC.
BTEX	60400
PAHs	9767000
Cyanide	ND

9767

LEGEND

(line symbol)	PROPERTY LINE
(line symbol)	HISTORIC STRUCTURE
O MH	MANHOLE
O BH-97-01	1997 TEST BORING LOCATION
O BH-98-06	1998 TEST BORING LOCATION
⊕ MW-97-05D	1997 MONITORING WELL LOCATION
⊕ MW-98-11D	1998 MONITORING WELL LOCATION
TP-97-21	1997 TEST PIT LOCATION
TP-99-28	1999 TEST PIT LOCATION
GP-99-02	1999 GEOPROBE SAMPLE LOCATION
(box)	ANALYTE CONCENTRATIONS EXCEED RSCOs

NOTES:
NA-NO DATA GENERATED
ND-NOT DETECTED
J-ESTIMATED VALUE

120 60 0 120 240
GRAPHIC SCALE IN FEET

Φ GEI Consultants, Inc.

FIGURE 4

ANALYTICAL RESULTS (ppb) FOR SUBSURFACE-SOIL SAMPLES

SARANAC STREET SITE
PLATTSBURGH, NEW YORK

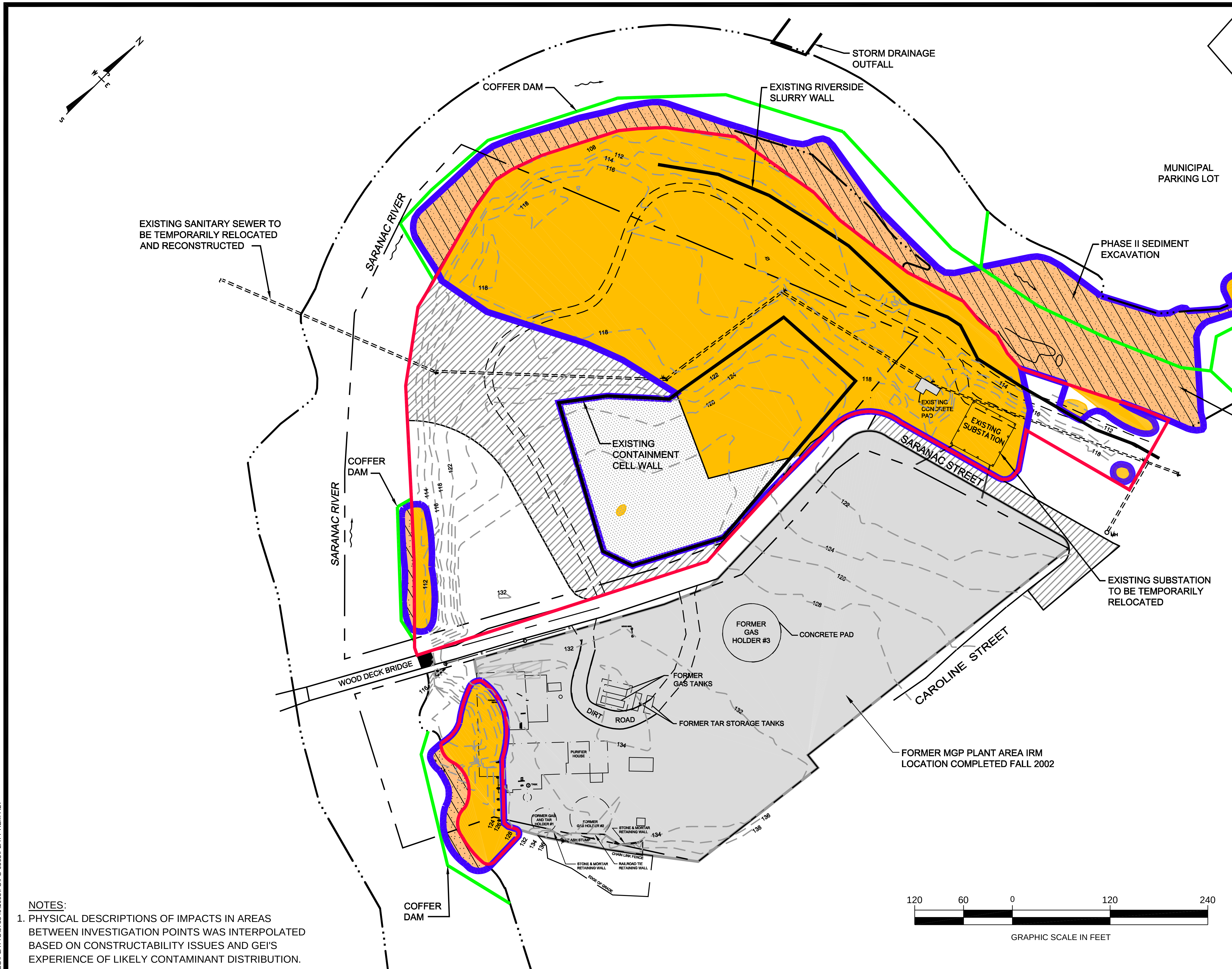
NYSEG\PLATTS\97334\RI\FIG\PLA-SUBA

NOTES:
1. PHYSICAL DESCRIPTIONS OF IMPACTS IN AREAS BETWEEN INVESTIGATION POINTS WAS INTERPOLATED BASED ON CONSTRUCTABILITY ISSUES AND GEI'S EXPERIENCE OF LIKELY CONTAMINANT DISTRIBUTION.

GEI Consultants, Inc.

Figure 5
REMEDIAL ALTERNATIVE 2 - EXCAVATE TO TAGM LEVELS

SARANAC STREET
PLATTSBURGH, NEW YORK



LEGEND

- SURFACE CAP
- EXCAVATION LIMITS
- COFFER DAM
- PROPERTY LINE
- FORMER BUILDINGS OR STRUCTURES
- MANHOLE
- PRECONSTRUCTION FURTHER INVESTIGATION AREA
- CONSTRUCTION DEBRIS

SOIL CONTAINING:

- TAR-SATURATED OR OIL IN ANY FORM,
- SHEEN PRESENT, TOTAL PAHS > 1,000 ppm,
- MGP-ODOR PRESENT, TOTAL PAHS > 1,000 ppm,
- PURIFIER WASTES PRESENT, REACTIVE CYANIDE > 500 ppm, OR
- PURIFIER WASTES PRESENT, REACTIVE SULFIDE > 250 ppm

SEDIMENTS CONTAINING:

- TAR OR OIL PRESENT IN ANY FORM, OR
- CAPABLE OF GENERATING SHEEN WHEN DISTURBED

120 60 0 120 240

GRAPHIC SCALE IN FEET

NOTES:

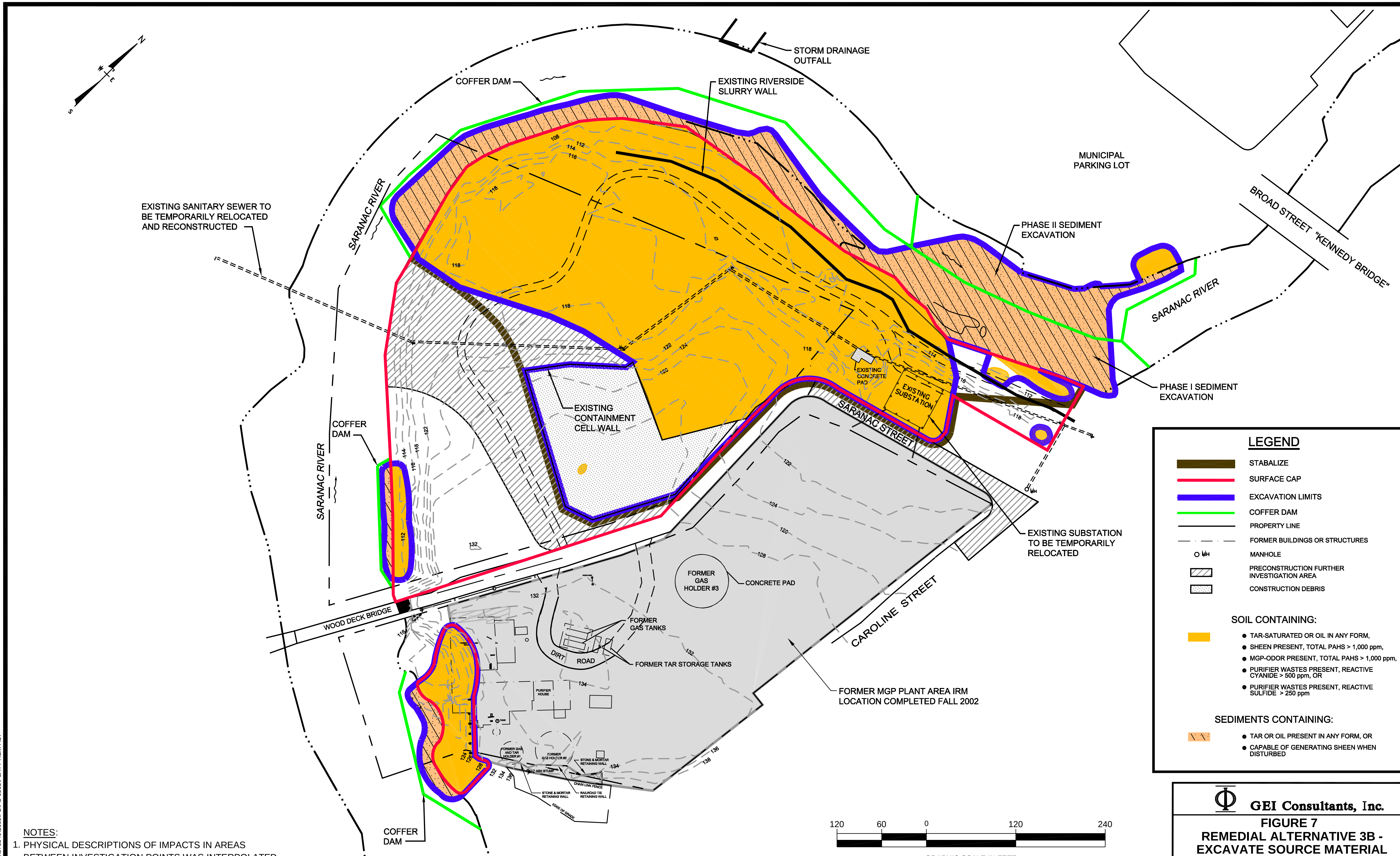
1. PHYSICAL DESCRIPTIONS OF IMPACTS IN AREAS BETWEEN INVESTIGATION POINTS WAS INTERPOLATED BASED ON CONSTRUCTABILITY ISSUES AND GEI'S EXPERIENCE OF LIKELY CONTAMINANT DISTRIBUTION.

GEI Consultants, Inc.

FIGURE 6
REMEDIAL ALTERNATIVE 3A - EXCAVATE SOURCE MATERIAL

SARANAC STREET
PLATTSBURGH, NEW YORK

NYSEG\PLATTS\973340\1005\FS\FS-0503\PLATT REM-ALT



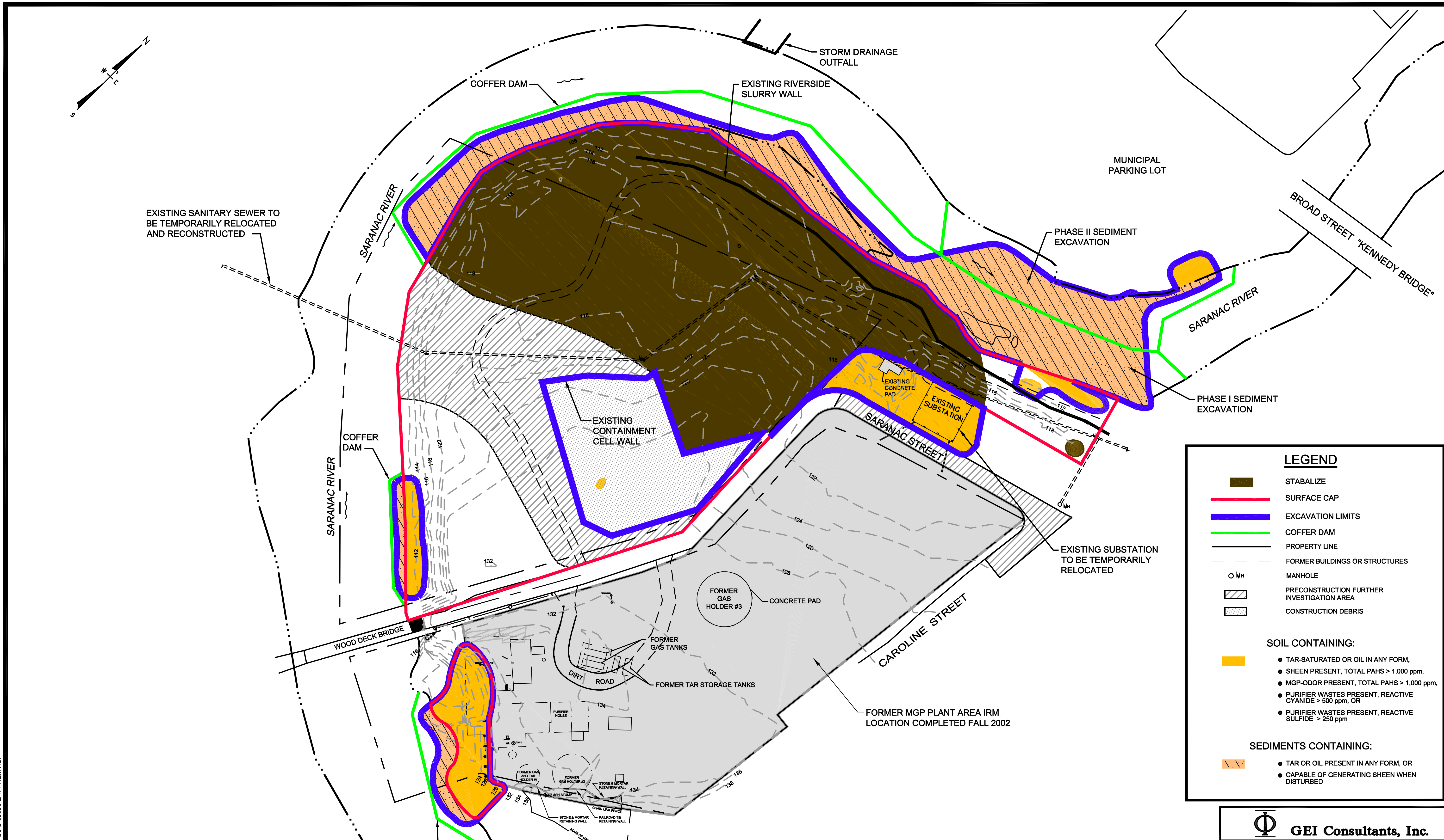
NOTES:
1. PHYSICAL DESCRIPTIONS OF IMPACTS IN AREAS BETWEEN INVESTIGATION POINTS WAS INTERPOLATED BASED ON CONSTRUCTABILITY ISSUES AND GEI'S EXPERIENCE OF LIKELY CONTAMINANT DISTRIBUTION.

GEI Consultants, Inc.

FIGURE 7
REMEDIAL ALTERNATIVE 3B - EXCAVATE SOURCE MATERIAL AND STABILIZE FRINGE

SARANAC STREET
PLATTSBURGH, NEW YORK

NYSEG\PLATTS\97334\01005\FS\FS-0503\PLATT REM-ALT



NOTES:
1. PHYSICAL DESCRIPTIONS OF IMPACTS IN AREAS BETWEEN INVESTIGATION POINTS WAS INTERPOLATED BASED ON CONSTRUCTABILITY ISSUES AND GEI'S EXPERIENCE OF LIKELY CONTAMINANT DISTRIBUTION.

120 60 0 120 240
GRAPHIC SCALE IN FEET

GEI Consultants, Inc.

FIGURE 8
REMEDIAL ALTERNATIVE 4 - STABILIZE SOURCE MATERIAL

SARANAC STREET
PLATTSBURGH, NEW YORK

NYSEG\PLATTS\973340\1005\FS\FS-0503\PLATT REM-ALT

RESPONSIVENESS SUMMARY

Plattsburgh (Saranac Street) MGP Site
Operable Unit No. 1
Plattsburgh (C) Clinton County, New York
Site No. 5-10-007

The Proposed Remedial Action Plan (PRAP) for the Plattsburgh (Saranac Street) MGP Site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 9th. The PRAP outlined the remedial measure proposed for the contaminated soil, sediments and groundwater at the Saranac Street site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on February 23, which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 8th 2004.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with NYSDEC's responses:
The following comments were received from the City of Plattsburgh, in the form of a Common Council Resolution dated February 23, 2004:

Comment 1: *"... the proposed remedial action appears to leave in place materials that exceed the recommended soil cleanup objectives in TAGM 4046–including tar blebs, tar lenses, visibly stained and odorous material-and leaves a degree of uncertainty that all present sources of gas works contamination will not be resolved at its proposed termination."*

Response 1: This statement is only partially correct. The PRAP does allow for material to be left in place (or returned to the excavation) which could exceed TAGM 4046 levels. However, the PRAP (see Section 7.1) specifically calls for removal of soils which contain tar blebs and tar lenses. Such soils (indeed, any soils which contain visible tar) would be classified as "source material" and transported off site for proper treatment and disposal.

Soils with lower levels of contamination, including potentially "visibly stained and odorous" materials could be returned to the lower portion of the excavation, provided that they meet the other criteria (containing less than 1000 ppm total PAH, reactive sulfide below 500 ppm and reactive cyanide below 500 ppm). This material would be placed at the bottom of the excavation, covered with a demarcation barrier to guard against direct exposure from inadvertent excavation in the future, then covered with low permeability soils, and further protected from contact with groundwater by the surrounding fringe of cement-stabilized soil.

The most significant human and environmental exposures at this site result from the discharge of tar into the Saranac River; consequently, stopping this discharge is the highest priority for the proposed remediation. Tar is relatively easy to identify visually, so NYSDEC has chosen to use visual inspection of soils as the principal means for identifying which soils need to be removed. There will be a backup system of "confirmation samples" taken for chemical analysis when the excavation is complete, to document what is being left behind.

In the case of tar contamination in coarse-grained soils such as gravels and sands, this visual approach can be more protective than chemical analysis would be. It is essential for contaminated coarse-grained materials such as these to be removed, since sand and gravel functions both as a tar reservoir and as a conduit for the movement of tar. However, tar impacts can be difficult to identify using chemical analysis alone. Tar and tar-water emulsions contained in coarse-grained soils often drain away as the soil sample is recovered from the ground and placed in a container. The remaining soil sample will retain enough tar to be noted visually, but sometimes not enough to produce a high PAH analysis.

Even in cases where no visible tar is present, soils with over 1000 ppm PAH will still be considered "source material" and removed from the site. This will remove the bulk of the most seriously odorous material.

Comment 2: *"... the proposed remedial action recommends the utilization of unproven surfactant technology to address the contamination north of Saranac Street at and beneath the Plattsburgh Municipal Light Department (PMLD) substation, as well as utilization of contaminated-soil stabilization technology that does not guarantee long term success or permanence..."*

Response 2
NYSDEC accepts that the application of surfactant flushing technology to MGP tars remains unproven at this time. This technology has been tested successfully in the laboratory, but has not been widely applied in the field. The proposed testing of this innovative technology at the Saranac Street site was partially intended to provide the sort of field testing that is currently lacking.

However, based on a variety of factors including this comment from the City of Plattsburgh, NYSDEC has eliminated the testing of surfactant flushing as a component of the final remedy.

The electrical substation will be either temporarily or permanently relocated, and the soils beneath the substation site will be subject to the same excavation and perimeter stabilization program selected for the rest of the site.

Comment 3: *"...said Remedial Goal must be carried further to include...That no gas manufacturing or post-manufacturing residuals or wastes be left remaining at the site, other than as are found in bedrock, and that there will be no question but that this is the case."*

Response 3: Full removal of all contaminated soils was evaluated in Alternative 2. The volume of soil to be shipped off site is far higher (140,000 cubic yards, vs 47,000 cubic yards) than with the selected remedy. This additional excavation would dramatically extend the construction schedule and increase truck traffic through the surrounding residential neighborhood, both to remove soil from the site and to haul in backfill. Total estimated costs would rise three-fold (from roughly $24 million to roughly $ 72 million), without a corresponding increase in protection of human health or the environment.

Comment 4: *"...said Remedial Goal must be carried further to include that there be no post-remediation releases of gas works contaminants to the environment."*

Response 6: The selected remedy seeks to achieve this result. It will eliminate the most significant release to the environment (the discharge of coal tar to the Saranac River and to the underlying bedrock) by removing the tar-bearing soils which are releasing and transporting the tar.

Some residual level of groundwater contamination will remain in the immediate vicinity of the lagoon. However, once the remaining contaminated soils are covered by low-permeability soils and surrounded by cement-stabilized soils, the mobility of this groundwater will be sharply reduced. The soluble components of MGP tar (BTEX compounds and naphthalene) are readily consumed by bacteria found in soils and surface water. Even under current conditions, there has been minimal measurable impact on water quality in the Saranac River. With tar discharges cut off and tar-contaminated sediments removed from the river bed, this condition should improve even further. Consequently, human and environmental exposures to contaminated groundwater are expected to be minimal

Comment 5: *"...The Remedial Action must include: Assurance of careful excavation, close and attentive inspection, recording, sampling and analysis of literally all unremediated portions of the ground surface remaining at the site."*

Response 5: All work will be conducted in accordance with an approve Health and Safety Plan and Community Air Monitoring Plan to ensure proper protection of on site workers and neighboring residents. Above and beyond this, NYSDEC provides on-site inspection of remedial actions at MGP sites. Close contact is maintained with the project manager at all times.

Following remediation, the selected remedy calls for a soil cover over virtually the entire ground surface west of Saranac Street. The final ground surface would then consist of a minimum of two feet of soils from off site sources which meet TAGM 4046 criteria. East of Saranac Street, the ground surface where the 2002 IRM took place is already covered with two feet of TAGM-compliant materials. This area may be used as a staging area during implementation of the selected remedy; following this, it will be restored in accordance with TAGM 4046 as well.

Comment 6: *"...the Remedial Action must include: Removal of all material exhibiting odor or visual evidence of contamination from gas works residuals and wastes, or post-operational wastes, or which has TPAH concentrations greater than 100 ppm, including "remaining impacted soil."*

Response 6: As discussed in Response 3, meeting this cleanup level would significantly increase the volume of material to be transported off site and thus increase both the short term impacts due to truck traffic and total project costs. The environmental and human health benefits are not commensurate.

Although some stained and/or odorous soils may be returned to the excavation, it is NYSDEC's experience that the remaining contamination in such soils is largely immobile. Exposure to these soils will be minimal, due to their depth of burial in the excavation, combined with the previously mentioned measures to isolate them from contact with human and ecological receptors.

Comment 7: *"...the Remedial Action must include: Construction of an engineered barrier, with collection and treatment system to prevent the migration and discharge of contamination remaining in the bedrock below the site."*

Response 7: Two forms of MGP related contamination will remain in the bedrock following remediation–MGP tar and contaminated groundwater.

During the Remedial Investigation, the only evidence of tar contamination in the bedrock was found at elevations beneath the level of the river bed. Tar was typically found in widely spaced fractures in otherwise uncontaminated bedrock. The location of this contamination, and the fact that the tar is more dense than water, has led NYSDEC to conclude that the tar found in bedrock is largely moving downward from the lagoons and the river bed into the bedrock.

There may be some exceptions to this, particularly in the area between the lagoon and the electrical substation. The additional tar collection wells called for in the remedy are meant to address this possibility. If large quantities of tar are found in this area, or if tar production in bedrock wells continues after the source area soils have been removed, the selected remedy allows for additional wells to be installed. The remedy seeks to collect as much of the tar as possible from the bedrock It should be possible to prevent movement of tar from the bedrock into the river (if any such movement is taking place now), but some tar will doubtlessly remain at depth.

It should be noted that, while there is clearly mobile tar in the bedrock, there does not appear to be very much pore space available for the bedrock to *store* tar. Only a few, small bedding-plane fractures have been encountered. Once the source areas are removed and stop leaking tar into the bedrock, there should only be a small amount of tar remaining in the bedrock.

MGP contaminants dissolved in groundwater may continue to enter the river following remediation. However, the concentrations of contaminants in the groundwater are far lower than in the tar, so the total contaminant loading to the river will be extremely small. After implementation of the remedy, the impact to water and sediment quality in the river will be negligible. Even under current conditions, with tar entering the river daily and tar deposits commonly found exposed on the river bottom, there appears to be minimal impact on overall water quality in the river–the primary impact is to sediments. With tar removed, this situation will only improve.

NYSDEC does not believe that a physical barrier in the bedrock is appropriate or implementable at this site. The only in-situ "engineered barrier" applicable to the bedrock would be pressure grouting of the bedrock fractures. In this process, grout would be injected through wells to seal off fractures and block flow of tar. This process is quite difficult to control. The grouting would need to be essentially perfect in order to have the desired effect. However, if excessive amounts of grout were to be injected into the rock, it is quite likely that some of the grout would discharge into the river, causing undesirable impacts on aquatic life.

Any other subsurface barriers in the bedrock (for example, a subsurface barrier wall) would require drilling and blasting of the rock prior to construction. This could be self-defeating, in that the blasting would likely create fractures where none exist currently, and thus create transport pathways around the barrier.

Comment 8: *"The Remedial Action must include: Relocation of the OMLD substation, and removal and disposal of all contaminated material that now remain in its vicinity."*

Response 8: As noted above, NYSEG and NYSDEC have withdrawn its proposal to evaluate surfactant flushing in this area. Instead, the substation will be relocated, with the contamination beneath it handled in the same manner as the rest of the site.

Comment 9: *"The Remedial Action must include: Further subsurface investigation of the South Durkee Street parking lot to ensure that this site has been adequately characterized, and that any gas works residuals or wastes that may be discovered at this location be removed.*

Response 9: Although no evidence has been found to indicate that this property was used for MGP waste disposal, NYSEG has agreed to pay for six additional borings in the South Durkee Street parking lot so that construction of the City's proposed parking garage can proceed with minimal delay. A letter to this effect was sent from NYSEG to the City on February 26, 2004.

Comment 10: *"The Remedial Action must include: Thorough screening of all residential land to the east of the site and on both sides of Saranac Street, for the possible presence of gas works contamination.*

Response 10: As noted in the PRAP, additional investigative work will be undertaken along Saranac Street and Caroline Street to establish the limits of the purifier waste deposit which was not fully removed during the 2002 IRM. At the point where excavation was terminated along the eastern (Caroline Street) side of the site, the waste layer was less than a foot thick and approximately ten feet below the ground surface.

During the Remedial Design phase, borings will be drilled farther to the east, either in Caroline Street or along the east side of it, to determine whether the waste layer continues, and if it does, what its limits are. Soil vapor samples will also be collected to determine whether soil vapor intrusion into homes in this area could present a risk of human exposure. Similar measures will be undertaken along and north of Saranac Street.

Comment 11: *"The Remedial Action must include: Continued, agreed-upon NYSEG responsibility and a specific mechanism for addressing such future environmental issues that may arise in connection with past operations of the gas works."*

Response 11: Under the terms of the existing Order on Consent, NYSEG remains responsible for operation and maintenance of any remedial systems installed at the site, and for monitoring the effectiveness of those systems over time.

NYSDEC knows of no other environmental issues associated with the former gas works operations; if such issues arise in the future, NYSDEC retains all of its legal rights to pursue a resolution.

The following comments were received in the form of a letter from the Lake Champlain Committee, in a letter dated March 5, 2004

Comment 12: *"...despite assurances that coal tar remaining in joints beneath the area of intermediate remediation will not migrate to the Saranac River, some coal tar will indefinitely be present at the site following remediation. The final remedial action plan must allow for contingencies whereby NYSEG accepts responsibility for any coal tar remaining at the site in the event that the substances pose a future environmental or human health problem."*

Response 12: See response 11 above.

Comment 13: " *"The final plan should also include off site mitigation efforts to compensate for environmental damage that could not be redressed on site."*

Response 13: Only the first operable unit is being addressed at this time. Off site investigation and remediation, most notably the impacts to fish and wildlife resources in the Saranac River and Lake Champlain, are still under investigation, so it is not yet possible to determine what off site mitigation efforts might be appropriate.

The following questions and answers are summarized from the February 23 public meeting. Comments which duplicate written comments above have not been included.

Question 14: You said there were twenty or thirty other NYSEG sites in other communities. Where are they in the process, and what remediation is being done?

Answer 14: NYSEG has thirty four sites under their consent order. Investigations are under way at 15 of them, and remediation is largely complete at an additional 4. By and large, the remedies have consisted of excavation of gas holders, tar wells, and other structures. But this site is a bit different, in that the biggest source of tar was an open lagoon, rather than a gas holder or tar well. We know of only a few other lagoons in New York State– NYSEG only has one.

Question 15: And where is that one?

Answer 15: It's in Elmira, and it's very early in the process. It's not located on a river, so there hasn't been any tar discharge discovered so far. NYSEG is finishing up a holder excavation down there now, but we haven't yet determined exactly where the lagoon was at that site.

Question 16: How will you avoid disturbances in the Saranac River when you excavate there?

Answer 16: The river can't be turned off during the excavation, so we will have to do the excavation in two pieces. First, we would block off half the river with temporary dams, and divert the water to the other side of the channel while we excavate. Once the first area was finished and the sediments were replaced, the process would be reversed.

Remediation of the river will be required to conform to the substantive technical requirements of New York State's stream disturbance regulations, which are found in 6 NYCRR Part 608, entitled "Use and Protection of Waters." Measures would be taken to minimize the amount of water coming into the excavation, and to minimize the amount of water and sediment that would flow out also. There will probably be seasonal restrictions on when the work can be done, to minimize potential impacts on migratory fish. We have already had to observe seasonal limits such as this during sampling in the river.

Question 17: Have you noticed any improvement in water quality in the wells on the site following the remedial work that's been done so far?

Answer 17: No, but we would not expect to see an improvement yet. We haven't removed the largest portion of the waste mass from the site yet. Based on studies from other sites, you've got to get a very large portion of the total waste mass out before you see any real improvement in water quality.

Question 18: Would the proposed surfactant flushing program deal with any of the other contaminants that might be at the site from later operations, like PCBs?

Answer 18: We have looked for PCB on the site and haven't found very much–certainly not the kind of contamination where you would see free product PCB oil. Even if liquid PCB were present, we would expect it to behave in the subsurface similarly to coal tar–it is more dense than water, and we would expect the surfactant flushing to recover it along with the tar.

We need to emphasize that this proposal has been withdrawn

Question 19: Could you describe in detail how the surfactant flushing would work? Is this really the right place to try a technique like this?

Answer 19: Surfactants are compounds that act like detergents, but the materials that would be used here are not ordinary detergents. They're called "food grade" which means they're safe to eat, typically used in the food service industry to make cream sauces creamier. The idea is to introduce the surfactant into the groundwater and flush it through the contaminated area. In that area, some of the soil pore spaces are filled with groundwater, and some are filled with tar. The surfactant reduces the surface tension between the water and the tar, and allows the tar to be carried along so we can capture it with wells. We would pump more water out of the ground than we are putting in, in order to make sure we capture it all.

Yes, we did think this would have been a pretty good place to try. Based on the information we have so far, the tar appears to be moving beneath the substation in an old stream channel which is largely filled with sandy soils. The sides of the stream channel are made of low-permeability glacial till, so the tar is moving through a small, well contained zone.

Again, we need to emphasize that this proposal has been withdrawn

Question 20: When the remediation is over, what uses could the land be used for? How would the restrictions be applied?

Answer 20: The land is to be restricted to recreational (open space) or commercial uses. The intent is to restrict residential development with an environmental easement. The easement could not be removed by the owner without permission from NYSDEC.

Question 21: How long would you continue monitoring the site?

Answer 21: Typically in the Superfund program, we use thirty years as a figure for estimating costs. That sounds pessimistic, but we have to acknowledge that realistically, sites that are contaminated with dense, non-aqueous liquids generally stay contaminated and require some degree of ongoing monitoring indefinitely. The scheduling and frequency of that monitoring will be established in an Operations and Maintenance Plan, which can be revised (or extended) in the future in response to changes in site conditions.

Question 22: Would the sign (advising against fishing) come down when the remediation is finished?

Answer 22: First, we should clarify that NYSEG placed the sign voluntarily. Yes, once the tar discharges cease and the contaminated sediments have been removed, the sign could come down.

Question 23: I have some concerns that the property directly across the river to the north (the City's Durkee Street parking lot) may have been used as an MGP dump at some point in the past. Many MGPs disposed of waste in open dumps nearby.

Answer 23: We have no reason to suspect that this area was used as a dump. However, NYSEG has agreed to fund up to six soil borings in this lot, which is being considered for a multi-level parking structure.

Administrative Record

Plattsburgh (Saranac Street) MGP Site
Operable Unit No.1
Site No. 5-10-007

16. Proposed Remedial Action Plan for the Plattsburgh (Saranac Street) MGP Site, Operable Unit 1, dated February, 2004, prepared by the NYSDEC.

17. Order on Consent, Index No. D0-0002-9309, between NYSDEC and New York State Electric and Gas Corporation, executed on March 30, 1994.

18. "Remedial Investigation at the Saranac Street Former MGP Site, Plattsburgh, New York-Work Plan", 1997 Prepared by GEI Atlantic

19. "Final Report, Remedial Investigation, Plattsburgh Former MGP Site Operable Unit 1 (OU1) Saranac Street Plattsburgh, New York August 9, 2002" Prepared by GEI Atlantic

20. "Final Focused Feasibility Study Saranac Street Former MGP Site Operable Unit 1 (OU1) Plattsburgh, New York NYSEG" September 3, 2003" Prepared by GEI Atlantic

21. "Interim Remedial Measures Final Engineering Report for Activities at Plattsburgh Saranac Street Former Manufactured Plant Site City of Plattsburgh, Clinton County, New York" May 2003 Prepared by NYSEG

22. Letter dated February 23, 2004 from Office of the City Clerk, City of Plattsburgh, containing a Common Council resolution commenting on the PRAP.

23. Letter dated March 5, 2004 from the Lake Champlain Committee.