August 3, 2009
Project 091220

Mr. William Ottaway, P.E.
MGP Remedial Section
Division of Environmental Remediation
New York State Department of Environmental Conservation
Remedial Bureau C, 11th Floor
625 Broadway
Albany, NY 12233-7014

Re: Remedial Action Work Plan Addendum – Tar Tank
Former Gastown Manufactured Gas Plant Site
Tonawanda, New York
Order No. A9-0599-05-08
Site No. 9-15-171

Dear Mr. Ottaway:

On behalf of National Fuel Gas Distribution Corporation (National Fuel), GEI Consultants, Inc. (GEI) has prepared this Remedial Action Work Plan (RAWP) Addendum for a non-emergency Interim Remedial Measure (IRM) to be implemented at the Former Gastown Manufactured Gas Plant (MGP) site (the Site) located at 126 East Niagara Street in Tonawanda, New York (Fig. 1) addressing the removal of an underground storage tank (UST) containing tar (tar tank). A Draft RAWP was submitted to the New York State Department of Environmental Conservation (NYSDEC) in September 2008. The NYSDEC issued a conditional approval of the Draft RAWP in a letter to National Fuel, dated February 3, 2009. The conditional approval addressed implementation of an investigative test pit effort related to the tar tank.

The purpose of this RAWP Addendum is to summarize information gathered during the May 2009 investigation of the tar tank and present the procedures for the proposed removal of the tar tank. The work proposed in this RAWP Addendum will be conducted in accordance with the September 2008 Draft RAWP, including the Quality Assurance Project Plan (QAPP), Field Sampling Plan (FSP), and site-specific Health and Safety Plan (HASP).

Background

During previous investigations, a steel UST for tar storage was encountered at the northeastern portion of the Site. As part of the Record of Decision (ROD) for the Site, issued in March 2007, the selected remedy required the removal of the tar tank, which has been expedited in relation to the major components of the remedial program. The approximate location of the tar tank is show in Fig. 2.

The proposed methods for investigating the tar tank and characterizing the contents were presented in the Draft RAWP. Tar tank investigation activities commenced on May 26, 2009. Ontario Specialty Contracting, Inc. (OSC) of Buffalo, New York was contracted as the excavation contractor.

Tar Tank Investigation Summary

A plan of the investigation area is presented in Fig. 3 and photographs taken during the investigation are in Appendix A. The investigation was conducted in general accordance with the scope and procedure presented in the Draft RAWP. All samples submitted for laboratory analyses were submitted to TestAmerica Laboratories, Inc. (TestAmerica) in Shelton, Connecticut. The Chains of Custody and laboratory analytical reports for samples collected during the investigation are in Appendix B and results are summarized in Tables 1 through 4. Excess sample volume collected during the investigation is stored on Site, pending future off-site disposal.

Utility Clearance

On May 19, 2009, OSC notified Dig Safely New York to clear the investigation area and identify potential utility conflicts emanating from the property line. No active subsurface utilities were encountered during the tar tank investigation.

May 26, 2009 – Mobilization

GEI and OSC mobilized staff and equipment to the Site. OSC secured the perimeter of the work zone with a temporary fence. The steel plates and approximately two feet of soil covering the top of the tank were temporarily moved to briefly investigate the size and condition of the tank.

May 27, 2009 – Interior Tar Tank Investigation

The remaining soil above the tank was removed to expose the top of the tank. Several holes and an approximately 1-ft diameter manway were observed in the tank cover. It appeared that soil and gravel overlying the tank had fallen in through these openings. One to two feet of liquid was observed inside the tank above a gravel-like material.

GEI monitored ambient air for oxygen, carbon monoxide, hydrogen cyanide, lower explosion limit, and volatile organic compounds (VOCs) using a MultiRAE Plus handheld meter. Temporary decontamination and waste storage areas were established within the work zone and the steel plates and soil were removed from the top of the tank. After exposing the rim of the tank, the shape of the tank appeared almost circular and approximately12 ft in diameter.

A sample of the liquid supernatant from inside the tank (sample: GT-Tar Tank-01) was collected through an existing opening in the top of the tank using a bailer and was submitted for laboratory analyses. Analytical results of the tar tank liquid sample are summarized in Table 1.

The top of the steel tank (bent, but intact) was removed using the teeth of the excavator bucket and was staged near the excavation. Brown to black gravel with some tar was observed in the tank below the one to two feet of liquid supernatant. Poly sheeting was placed on the ground adjacent to the tank for storage of excavated tank materials, with the liquids able to drain back into the tar tank. Material, predominantly gravel with brick, wood, and tar stringers, was removed from the tank with the excavator bucket to a depth of about eight feet below the top of the tank. Samples of tar (sample: GT-Tar Tank-02) and gravel (sample: GT-Tar Tank-03) from the 2 to 8 ft interior depth interval were collected and submitted for laboratory analyses. Near the bottom of the tank, the material was a cohesive, semi-solid mixture of tar and gravel. A sample of the tar-gravel mix from the bottom (sample: GT-Tar Tank-04) was collected and submitted for laboratory analyses. Analytical results for the samples of solid material in the tank are summarized in Table 2. Additional material from approximately 2 to 8 ft and 8 to 9 ft below grade was collected in 5-gallon buckets for field stabilization tests the following day.

The material removed from the tank was placed back in the tank; steel plates were placed over the uncovered tank, and the area backfilled to grade with the excavated surface soil. The cover of the tank was bent and crushed and later placed in the test pit (performed the following day) adjacent to the tar tank and near the top of tank elevation.

<u>May 27, 2009 – Test Pit Exploration Adjacent to Tar Tank</u>

Test Pit 104 was installed adjacent to the north side of the tar tank (Fig. 3). Poly sheeting was placed on the ground adjacent to the proposed test pit area for staging the soil excavated by the backhoe. The test pit was excavated to a depth of 13 ft and a test pit exploration log is presented in Appendix A. Layers of sand, sandy silt, and silt or clay were encountered in the test pit. Some groundwater accumulated at the bottom of the test pit.

A slight petroleum odor was observed in samples from the 4 to 8 ft depth interval. Results of jar headspace screening of samples using a photo ionization detector (PID) ranged from less than 1 part-per-million (ppm) at 2 to 4 ft deep to 42 ppm at 6 to 7 ft deep.

Three soil samples were collected from the east test pit sidewall at depth intervals of 2 to 4 ft (sample: GT-TP-104(2-4)), 6 to 7 ft (sample: GT-TP-104(6-7)), and 9 to 10 ft (sample: GT-TP-104(9-10)). Analytical results of the test pit samples are summarized in Table 3. The concentrations of calcium and magnesium in the yellow/white colored soil sample from 2 to 4 ft deep suggest a potential lime-based material.

The adjacent tar tank was visible through the south wall of the test pit excavation. The top of the tank was approximately 2 ft below grade and the bottom of the tank was observed at a depth of about 10 ft below grade. The 8-ft tank wall appeared to be constructed from two plates of steel, riveted together along a horizontal seam. The tank appeared to be structurally sound and no holes in the tank wall or direct evidence of leakage from the tank were observed. No piping connected to the tank was encountered by the test pit exploration. Based on an average tank diameter of 12 ft and depth of 8 ft, the estimated capacity of the tank is about 6,800 gallons.

The test pit was backfilled with the excavated material in the approximate reverse order it was removed. On May 28, 2009, final grading of the backfilled test pit was completed and restored to its original condition as a parking area.

May 28, 2009 – Field Stabilization Tests

To assess disposal options for the tank contents, three small-scale field stabilization tests were conducted to evaluate the method for stabilizing the tank contents for acceptance by facilities unable to accept wastes containing free liquid. Type I/II Portland cement and fly ash from the Huntley coal-burning power plant in Tonawanda, New York were obtained for the tests. The materials and quantities (fluid ounces) of each test are presented in the table below.

Material	**Test 1A (fl. oz.)**	**Test 1B (fl. oz.)**	**Test 2 (fl. oz.)**
Tank gravel, wet, from 0 to 7 ft deep	128	128	128
Fly Ash	40	100	-
Portland Type I/II cement	-	-	40
Water	-	20	-

The results of each test produced a modified material without obvious free liquids. Twenty ounces of water was added during Test 1B to simulate the presence of the supernatant liquid in the tank, if it were not removed prior to stabilization of the overall tank contents.

Based on the estimated tank capacity of 6,800 gallons (1,700 gallons supernatant, 5,100 gallons solids, with 1,000 gallons of pore water in the gravel matrix assuming a porosity of 20 percent), at least 1,600 gallons of fly ash or cement would be required to stabilize the tank solids (i.e. gravel/tar). An additional 8,100 gallons of fly ash would be needed to stabilize the supernatant and pore water if not removed prior to stabilization.

Proposed Tar Tank Removal Procedure

Based on the results of the field stabilization tests, stabilizing the tank contents would require a significant quantity of fly ash or cement and increase the volume for disposal or treatment. Therefore, we propose to separate the liquids from solids to the extent practicable and manage the materials as separate waste streams.

The tar tank removal work will include excavating overlying or adjacent soil to expose the underground tank, removing and disposing of the tank contents, removing the tank from the excavation, disposing of the tank, and backfilling the excavation. The removal of the tar tank and tank contents will be conducted in accordance with the general criteria presented in the September 2008 Draft RAWP and the detailed procedure presented below. A conceptual layout of the tank removal work zone is shown in Fig. 4.

Because the tar tank is predominantly located within the proposed excavation limits of the future Site-wide soil remediation, the standard sampling locations and frequency normally required for UST closure will not be performed. Also, Long-Term Institutional and Engineering Controls, and an Operations Monitoring and Maintenance (OM&M) plan will not be addressed in this document. They will be addressed with the Site-wide RDWP program.

However, the excavation to the east may extend to, or beyond, the proposed limits of the major remedy excavation to an anticipated clean face (along the NFTA property line). If any portion of the tank excavation is outside of or abuts the remedial design excavation limits, sidewall samples will be collected at a frequency of one (1) sidewall soil sample for every 30 linear feet of wall biased on visual and olfactory impacts. A minimum of two (2) sidewall samples will be collected. If the floor of the excavation is dry, a biased floor soil sample will also be collected within five feet of the wall face. The sample results will be used in evaluating the final site-wide remedial excavation limits.

The proposed tar tank removal program is as follows:

1. The excavation and tar tank removal process will be photographed and logged and the results reported to the NYSDEC.

2. Two utility poles with overhead electrical transformers are located close to the tar tank removal area (Fig. 4). Prior to mobilization, we will contact the utility company (National Grid) to discuss whether the poles should be temporarily braced or moved a safe distance from the proposed excavation limits. Bracing or moving the utility poles will be performed in accordance with the requirements of National Grid.

3. Temporary decontamination and waste storage areas will be constructed near the tar tank area for good housekeeping practices and to manage excavated soil and tank contents.

4. In accordance with the Draft RAWP, air monitoring will be conducted in the work zone, and upwind and downwind of the work zone, for total VOCs, respirable particulate matter less than 10 microns (RPM_{10}), and odors. Monitoring will commence prior to starting intrusive work and continue until on-site waste materials have been contained. The Contractor will maintain sufficient materials on Site (e.g., foam, plastic sheeting) to control potential odors generated during the work.

5. The soil overlying the tar tank (approximately two feet deep) will be removed and the soil around the perimeter of the tank will be excavated down to the first riveted horizontal seam of the tank wall, approximately 6 ft below grade. The excavated soil will be temporarily staged on plastic sheeting in the waste storage area(s), and covered with plastic sheeting, pending reuse as deep backfill in the excavation.

6. The supernatant liquid inside the tank will be pumped from the top of the tank to adjacent liquid-tight trucks or sludge boxes, pending off-Site transport to an appropriately permitted and licensed facility. Pore water from the tar tank solids may also be removed to the extent practical. As shown in Table 1, based on the results of VOC analysis from the May 2009 tar tank investigation and comparison to the U.S. Environmental Protection Agency toxicity characteristic criteria, the liquid removed from the tank is categorized as non-hazardous waste. Prior to mobilization, additional analyses will be conducted on tar tank liquid samples to complete the disposal characterization and waste profile. CWM Chemical Services, located in Model City, New York, is the facility proposed to accept the tar tank wastewater for treatment. Liquid waste removed from the tank will not be stored on-Site overnight.

7. The remaining tar tank contents will be removed by excavator bucket or vacuum, and transferred to a liquid-tight roll-off or truck pending off-Site transport to an appropriately permitted and licensed facility. Excavated soil may also be added to the truck beds to absorb excess liquid that may drain from the tank solids. Covanta Niagara Company (Covanta), in Niagara Falls, New York, is the facility proposed to accept the solid tank contents for treatment by thermal desorption, consistent with the results of the laboratory analyses of the May 2009 investigation (Table 2).

8. When the contents of the tar tank have been removed, the empty tank and accessible piping will be inspected, noting any areas of questionable integrity. The tank and any associated piping will be photographed.

9. The empty tank will be removed from the excavation using the excavator bucket, or similar means, and placed in a roll-off dumpster(s) for temporary containment. The tank material will be cut into pieces less than 2-ft by 3-ft across and secured for shipment to Covanta for thermal desorption treatment and ultimately metal recycling. To the extent feasible, the tank material will be cut to size using either hydraulic shears, cold chisel, or similar low-sparking methods, to minimize flammability concerns of the tar adhered to the inside of the tank. No open flame cutting will be allowed.

10. After removing the tank from the excavation, under the conditions for east wall sampling only discussed above, bottom and sidewall soil samples will be collected and field-screened with a PID to assess the presence of residual contamination. Contaminated soil that may remain after removal of the tank will be documented and addressed as part of the future Site-wide remediation.

11. The excavated soil will be placed back into the excavation and compacted with the excavator bucket in approximately 2-ft lifts. Clean fill will be imported and used to fill the remainder of the excavation to the surface. The clean fill will be separated from the surrounding soils by a geotextile demarcation barrier and compacted in approximately 2-ft lifts. The current surface of the excavation area will be replaced in kind. Imported clean fill will be obtained from either a virgin New York State Department of Transportation (NYSDOT)-approved borrow source or other approved source(s).

12. Excavation and tank removal equipment will be decontaminated at the temporary decontamination pad or above the excavation prior to backfilling with clean fill, in accordance with the Draft RAWP. Sampling equipment used for sample collection (e.g., sample spoons, hand trowels) will be decontaminated prior to use and reuse or disposable sampling equipment will be used.

13. Decontamination waste will be collected and contained within the excavation or placed in 55-gallon United Sates Department of Transportation (USDOT) approved drums pending off-Site disposal at an appropriately permitted and licensed facility.

14. The approximate horizontal limits of the tar tank excavation will be marked on the restored surface and surveyed by a licensed New York State Licensed Land Surveyor. All locations and elevations will be referenced to the New York State Plane Western Zone (3103) North American Datum 1983 (NAD 83) and North American Vertical Datum 1988 (NAVD 88). Depth measurements recorded during the excavation will be used in conjunction with the surveyed limits to determine the three dimensional extent of the excavation.

Schedule

We estimate that one week will be required to remove the tar tank. A conceptual daily progress schedule, subject to change, is summarized in the table below. The utility poles adjacent to the tar tank area will be relocated or braced prior to mobilizing for the tank removal, in accordance with the requirements of National Grid.

Workday	**Activities**
Monday	Equipment and staff mobilization. Secure work zone perimeter and establish waste management and decontamination areas.
Tuesday	Commence air monitoring. Excavate soil from above the tank and from the tank perimeter to the depth of the first seam, approximately 6 feet. Pump liquid supernatant and accessible pore water from the tank into liquid-tight vehicles or containers for same day off-site treatment.
Wednesday	Transfer tank contents to liquid-tight trucks for off-Site thermal desorption treatment. Remove tank and stage steel pieces in roll-off container. Backfill tank excavation.
Thursday	Cut tank pieces into acceptable size for off-site thermal desorption treatment. Restore work area.
Friday	Equipment and staff demobilization.

The contractor will be mobilized for the removal of the tar tank after NYSDEC approval of this RAWP Addendum, bracing or relocation of the utility poles per National Grid's requirements, and obtaining the local UST removal permit. The NYSDEC, NYSDOH, and affected property owners will be notified at least 10 days in advance of the commencement of Site activities.

If you have any questions or require additional information, please feel free to contact me at (973) 509-9650 x-8117 or by e-mail at MZukauskas@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

Michael D. Zukauskas, P.E.
Project Engineer

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License No. 085111

LJW/MDZ/bdp
Attachments

c: T. Alexander – National Fuel Gas
Chris Trejchel – National Fuel Gas
Maureen Krowicki – National Fuel Gas
R. Schick – NYSDEC
Gardiner Cross – NYSDEC
Corbin Gosier – NYSDEC DFWMR
Glenn May – NYSDEC Region 9
Greg Sutton – NYSDEC Region 9
Cameron O'Connor – NYSDOH
Rich Fedigan – NYSDOH
Jason LaMonaco, P.E. – Tonawanda City Engineer

Appendix A

Field Investigation Documentation

TEST PIT LOG

TP104

Project	Gastown Former MGP	**PG.**	1 OF 1
City/Town	Tonawanda, New York	**Location**	126 East Niagara Street
Client	National Fuel Gas		
Contractor	Ontario Specialty Contracting, Inc.	**Ground El.**	NM
Equipment/Reach	Backhoe	**Datum**	NA
Operator	Jason Yensen **GEI Rep** T. Daigle	**GEI Proj. No.**	091220
Weather	60's F, Cloudy	**Date**	5/27/2009

Depth	Sample No. and Type	Sample Depth (ft)	Soil Description
	no sample	NA	WIDELY GRADED SAND WITH GRAVEL (SW) ~60% mostly fine to medium sand, ~40% gravel, greenish gray / brown, odorless.
2.0	GT-TP-104(2-4)	2-4	WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM) ~70% mostly fine to medium sand, ~20% sub-angular gravel up to 0.5 inch, ~10% silt, mostly yellowish / white with lenses of black coal-like sand, roots present, slight sulfur odor. Jar headspace = 0.1 ppm
4.0			
6.0	GT-TP-104(6-7)	6-7	SANDY SILT (ML) ~70% silt, ~30% mostly fine sand, black / dark gray with some small (< 1 cm) greenish lenses, slight petroleum / coal tar odor. Jar headspace = 42.2 ppm
8.0			
10.0	GT-TP-104(9-10)	9-10	SILT (ML) ~90% silt, ~10% fine sand, greenish / black very fine grained, small pellets (< 1 cm) of black silt present, odorless. Jar headspace = 8.1 ppm
12.0			
14.0			Bottom of test pit around 13 ft. UST exposed on southern wall of test pit at 2-10 ft.

Notes:

Very small amount of water (< 6 inches) accumulated at the bottom of the pit. Not confirmed to be groundwater.

Test pit backfilled with excavated soil upon completion.

Pit Dimensions (ft)

length	10
width	5
depth	13

GEI Consultants

Tar Tank Test Pit: (May 27, 2009)

Sampling supernatant through lid of UST.
8:40 AM

Peeling back steel lid of UST
9:00 AM

Surface contents of UST prior to excavation.
9:30 AM

Excavated contents of UST from ~5-8 ft.
12:00 PM

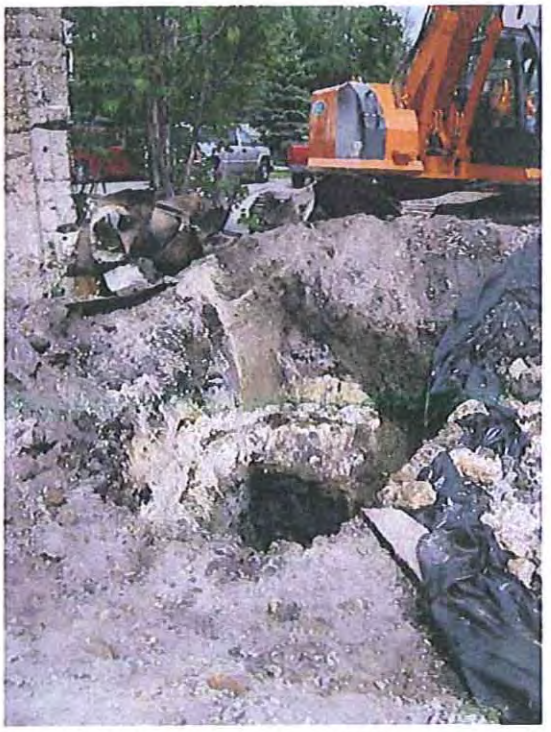
Begin test pit on north side of tank. Covered tank with steel plates (right).
3:15 PM

North side of test pit (opposite of tank). About 13 ft deep.
3:30 PM

North side of tar tank resting on silt
3:40 PM

Tar tank about 8 ft tall with rivets at 4 ft.
3:45 PM

Bottom of test pit. Tar tank to right.
3:45 PM



Surface view of test pit prior to backfilling. Tar tank to right.
3:50 PM

Appendix B

Laboratory Analytical Reports

Table 1. Tar Tank Liquid Sample Analytical Results
Gastown Former MGP Site
Tonawanda, New York

Sample Name: / Sample Date:	Toxicity Characteristic Criteria	GT-TAR TANK-01 05/27/09
BTEX (ug/L)		
Benzene(1)	500	6.4
Toluene	NE	6.6
Ethylbenzene	NE	2.6 J
Xylene, total	NE	9.0
Other VOCs (ug/L)		
Acetone	NE	9.9 J
Carbon disulfide	NE	6.2
Styrene	NE	1.1 J

Notes:

Data for these sampling events have not been validated.

Qualifiers are Lab Qualifiers.

Only analytes detected in at least one sample are reported here.
For a complete list of analytes see the laboratory data sheets.

ug/L - micrograms per liter or parts per billion (ppb)

BTEX - benzene, toluene, ethylbenzene, and xylenes

VOCs - volatile organic compounds

Toxicity characteristic criteria from U.S. Environmental Protection Agency regulation 40 CFR 261.24.

NE - No toxicity characteristic criteria established

Laboratory Qualifiers:

J - estimated value

Table 2. Tar Tank Solid Samples Analytical Results
Former Gastown MGP Site
Tonawanda, New York

Sample Name: / Sample Date:	GT-TAR TANK-02 5/29/2009	GT-TAR TANK-03 5/27/2009	GT-TAR TANK-04 5/27/2009
BTEX (mg/kg)			
Benzene(1)	9.5	0.0058 U	9.8
Toluene	27	0.0023 J	31
Ethylbenzene	3.9	0.0017 J	4.7
Xylene, total	89	0.016	110
Other VOCs (mg/kg)			
Acetone	3 U	0.048 *	2.7 U
Methylene chloride	0.59 J	0.014 J B	0.54 J
Styrene	29	0.0025 J	35
Non-carcinogenic PAHs (mg/kg)			
Acenaphthene	230 J	3.7 J	240 J
Acenaphthylene	1100	21	1100
Anthracene	1000	23	940
Benzo[g,h,i]perylene	380	20	350
Fluoranthene	2000	71	1900
Fluorene	1000	17	890
Methylnaphthalene,2-	1300	15 J	1200
Naphthalene	5500	61	5200
Phenanthrene	3300	68	3000
Pyrene	1600	63	1400
Carcinogenic PAHs (mg/kg)			
Benz[a]anthracene	780	33	720
Benzo[a]pyrene	710	31	660
Benzo[b]fluoranthene	650	29	580
Benzo[k]fluoranthene	270 J	13 J	250 J
Chrysene	670	27	590
Dibenz[a,h]anthracene	120 J	4.3 J	110 J
Indeno[1,2,3-cd]pyrene	440	21	410
Other SVOCs (mg/kg)			
Carbazole	440	7.9 J	420
Dibenzofuran	920	14 J	810
Dimethylphenol, 2,4-	180 J	15 U	200 J
Methylphenol, 4-	390	15 U	250 J
Methylphenol,2-	160 J	15 U	110 J
Phenol	160 J	15 U	95 J
PCBs (mg/kg)			
Aroclor 1260	0.02	0.019 U	0.018 U
Metals (mg/kg)			
Aluminum	1880	5020	1350
Arsenic	4.4 J	6.4	5 J
Barium	15.4	29.6	12.2
Beryllium	0.16 J	0.3 J	0.093 J
Cadmium	1.2 J	1.4 U	1.4 U
Calcium	138000	112000	123000
Chromium	3.1	6.9	2.9
Cobalt	1.4 J	3.3	1.3 J
Copper	9.6	36.1	6.9
Iron	5510	11300	5410
Lead	38.9	43.8	43.6
Magnesium	31600	41100	46900
Manganese	255	386	364
Mercury	0.053 J	0.075	0.042 J
Nickel	4.6	9.3	3.7
Potassium	527	783	640
Sodium	307	304	345
Thallium	2.3 J	2.8 J	2.6 J
Vanadium	4.6	9.4	3.7

Table 2. Tar Tank Solid Samples Analytical Results
Former Gastown MGP Site
Tonawanda, New York

Sample Name: / Sample Date:	GT-TAR TANK-02 5/29/2009	GT-TAR TANK-03 5/27/2009	GT-TAR TANK-04 5/27/2009
Zinc	383	91	85.2
Cyanides (mg/kg)	ND	ND	ND
Disposal (mm/sec)			
Ignitibility	Neg	Neg	Neg
Other			
Specific Gravity (g/ml)	2.02	1.84	1.87
Temperature at Analysis (deg f)	1890	1890	1890

Notes:

Data for these sampling events have not been validated. Qualifiers are Lab Qualifiers.

Samples 02, 03, 04 are supplemented by samples 02a, 03a, 04a-please see lab results for individual sample results

mg/L - milligrams/Liter
mg/kg - milligrams/kilogram or parts per million (ppm)
mm/sec - millimeter per second
g/ml - grams per milliter
deg f - degrees fahrenheit
BTEX - benzene, toluene, ethylbenzene, and xylenes
VOCs - volatile organic compounds
PAHs - polycyclic aromatic hydrocarbons
SVOCs - semivolatile organic compounds
PCBs - Polychlorinated Biphenyls
NA - not analyzed
NE- not established
ND - not detected
(1) - Benzene is exempt from hazardous waste limits, according to NYSDEC draft DER-10, Technical Guidance for Site Investigation and Remediation, December 2002.

Laboratory Qualifiers:

J - estimated value
U - indicates not detected at or above the reporting limit shown.
Neg - not ignitable
JB - estimated value; analyte detected in the associated method blank
* - Duplicate analysis not within control limits

Table 3. Test Pit Samples Analytical Results
Former Gastown MGP Site
Tonawanda, New York

Sample Name:	GT-TP-104	GT-TP-104	GT-TP-104
Sample Interval (feet):	(2-4)	(6-7)	(9-10)
Sample Date:	5/27/2009	5/27/2009	5/27/2009
BTEX (mg/kg)	ND	ND	ND
Other VOCs (mg/kg)			
Acetone	0.03 J *	0.51	0.033 B
Methylene chloride	0.021 J B	0.025 J B	0.0053 J B
Non-carcinogenic PAHs (mg/kg)			
Acenaphthene	0.087 J	0.59	0.15 J
Acenaphthylene	0.4 J	0.12 J	0.11 J
Anthracene	0.16 J	0.29 J	0.047 J
Benzo[g,h,i]perylene	4.9	0.24 J	0.34 U
Fluoranthene	1.1	1.2	0.059 J
Fluorene	0.036 J	0.22 J	0.028 J
Methylnaphthalene,2-	0.097 J	0.046 J	0.012 J
Naphthalene	0.54	0.52	0.086 J
Phenanthrene	0.47 J	0.17 J	0.064 J
Pyrene	1.5	1.5	0.049 J
Carcinogenic PAHs (mg/kg)			
Benz[a]anthracene	0.86	0.3 J	0.032 J
Benzo[a]pyrene	1.4	0.37	0.031 J
Benzo[b]fluoranthene	1.8	0.26 J	0.031 J
Benzo[k]fluoranthene	0.69	0.1 J	0.34 U
Chrysene	1.1	0.33 J	0.34 U
Dibenz[a,h]anthracene	0.46 J	0.07 J	0.34 U
Indeno[1,2,3-cd]pyrene	3.7	0.23 J	0.033 J
Other SVOCs (mg/kg)			
Carbazole	0.058 J	0.16 J	0.056 J
Dibenzofuran	0.072 J	0.35 U	0.03 J
Metals (mg/kg)			
Aluminum	6630	11500	9400
Arsenic	6.6 J	6.8 U	2.7 J
Barium	9.4	93.3	58.6
Beryllium	0.52 J	0.72 J	0.61 J
Calcium	184000	6570	7670
Chromium	6.8	13.6	13.9
Cobalt	1.6 J	4.4	6
Copper	6.9	20.3	16.3
Iron	5250	15500	16700
Lead	11.3	10.7	9.6
Magnesium	77600	2930	8170
Manganese	180	232	159
Mercury	0.12	0.055 J	0.038 J
Nickel	4.6	15.1	17.3
Potassium	453	692	1140
Sodium	161	100	88.4
Thallium	3.6 J	4.8 U	4.6 U
Vanadium	12	17.5	20.1
Zinc	20.9	61.1	51

Table 3. Test Pit Samples Analytical Results
Former Gastown MGP Site
Tonawanda, New York

Sample Name:	GT-TP-104	GT-TP-104	GT-TP-104
Sample Interval (feet):	(2-4)	(6-7)	(9-10)
Sample Date:	5/27/2009	5/27/2009	5/27/2009
Cyanides (mg/kg)			
Free Cyanide	0.276 J	0.0521 J	0.255 U

Notes:
Data for these sampling events have not been validated. Qualifiers are Lab Qualifiers.
Only analytes detected in at least one sample are reported here. For a complete list of analytes, see the laboratory data sheets.
mg/kg - milligrams/kilogram or parts per million (ppm)
BTEX - benzene, toluene, ethylbenzene, and xylenes
VOCs - volatile organic compounds
PAHs - polycyclic aromatic hydrocarbons
SVOCs - semivolatile organic compounds
ND - not detected

Laboratory Qualifiers:
J - estimated value
U - indicates not detected at or above the reporting limit shown.
B - Analyte detected in the associated method blank
* - Duplicate analysis not within control limits
JB - estimated value; analyte detected in the associated method blank

Table 4. Tar Tank Stabilization Tests Analytical Results
Former Gastown MGP Site
Tonawanda, New York

Sample Name: / Sample Date:	GT-Tar Tank-Fieldtest 1 5/29/2009	GT-Tar Tank-Fieldtest 2 5/29/2009
BTEX (mg/kg)		
Toluene	0.00057 J	0.0053 J
Xylene, total	0.0071	0.052
Other VOCs (mg/kg)		
Acetone	0.022 J	0.25
Methylene chloride	0.016 J B	0.042 J B
Styrene	0.00056 J	0.012 J
Non-carcinogenic PAHs (mg/kg)		
Acenaphthene	8.1 J	3.2 J
Acenaphthylene	30	16
Anthracene	41	18
Benzo[g,h,i]perylene	19	13
Fluoranthene	96	47
Fluorene	34	14
Methylnaphthalene,2-	32	14
Naphthalene	100	58
Phenanthrene	130	54
Pyrene	78	37
Carcinogenic PAHs (mg/kg)		
Benz[a]anthracene	36	19
Benzo[a]pyrene	35	18
Benzo[b]fluoranthene	32	16
Benzo[k]fluoranthene	14 J	6.2 J
Chrysene	30	16
Dibenz[a,h]anthracene	4.5 J	3.2 J
Indeno[1,2,3-cd]pyrene	21	14
Other SVOCs (mg/kg)		
Carbazole	12 J	6.1 J
Dibenzofuran	30	13
Isophorone	15 U	8.8
PCBs (mg/kg)		
Aroclor 1260	0.013 J	0.018 U
Metals (mg/kg)		
Aluminum	37900	9310
Arsenic	9.2	6.9
Barium	2320	66.2
Beryllium	3.3	0.69 J
Calcium	141000	219000
Chromium	27.9	12.2
Cobalt	10	3.4
Copper	77	19.2
Iron	21300	13600
Lead	37.1	38.4
Magnesium	29500	40400
Manganese	239	375

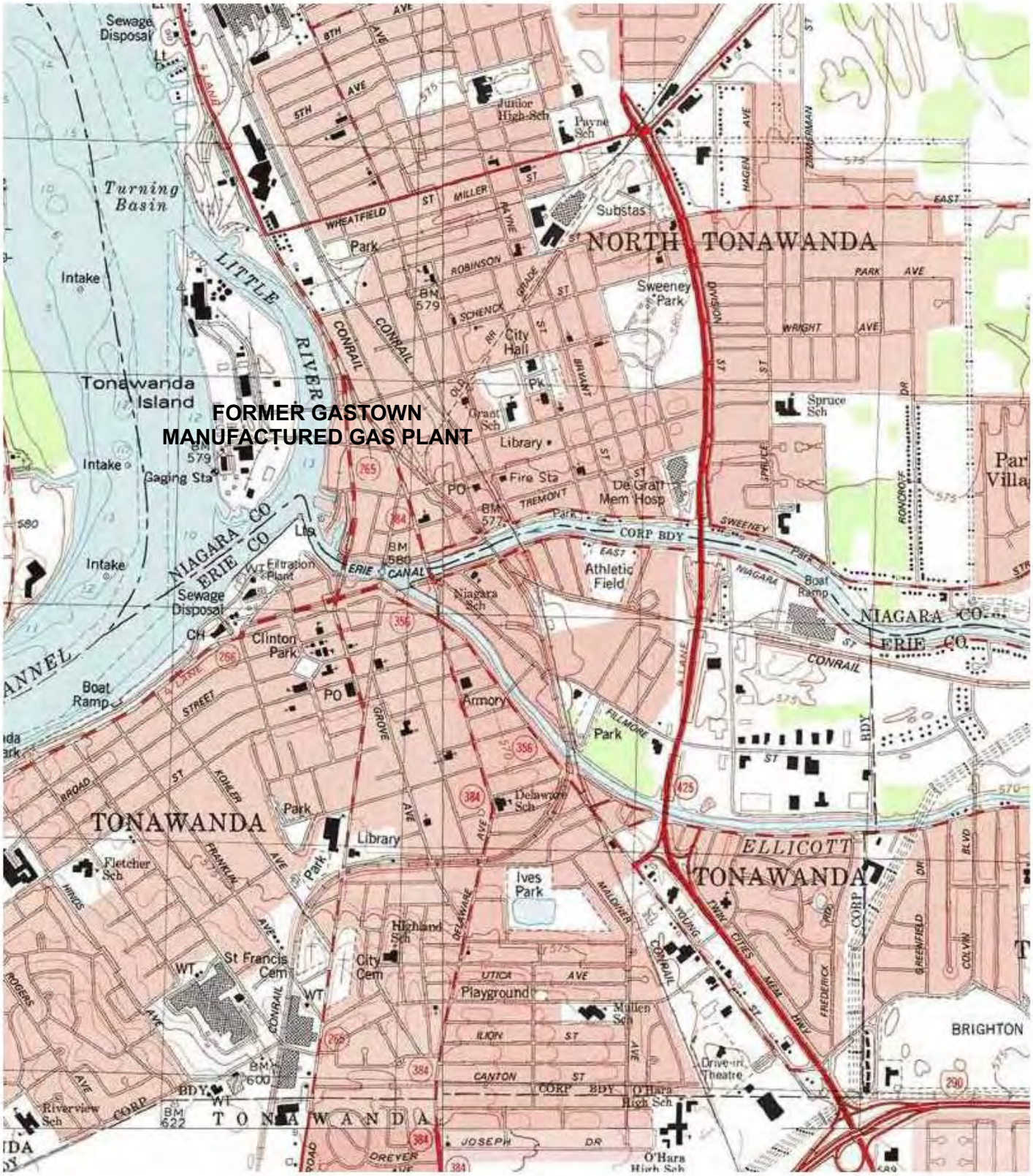
Table 4. Tar Tank Stabilization Tests Analytical Results
Former Gastown MGP Site
Tonawanda, New York

Sample Name: / Sample Date:	GT-Tar Tank-Fieldtest 1 5/29/2009	GT-Tar Tank-Fieldtest 2 5/29/2009
Mercury	0.49	0.16
Nickel	23.9	9.6
Potassium	1260	3470
Sodium	4440	780
Thallium	4.2 U	2.2 J
Vanadium	92.8	15
Zinc	187	87.3
Cyanides (mg/kg)		
Free Cyanide	0.224 U	0.211 U
Disposal		
Ignitibility	Neg	Neg
Other		
Specific Gravity (g/ml)	2.15	2.4
Temperature at Analysis (deg f)	1890	1890

Notes:
Data for these sampling events have not been validated. Qualifiers are Lab Qualifiers.
Only analytes detected in at least one sample are reported here. For a complete list of analytes, see the l data sheets.
mg/L - milligrams/Liter
mg/kg - milligrams/kilogram or parts per million (ppm)
g/ml - grams per mililiter
deg f - degrees fahrenheit
BTEX - benzene, toluene, ethylbenzene, and xylenes
VOCs - volatile organic compounds
PAHs - polycyclic aromatic hydrocarbons
SVOCs - semivolatile organic compounds
PCBs - Polychlorinated Biphenyls

Laboratory Qualifiers:
J - estimated value
U - indicates not detected at or above the reporting limit shown.
JB - estimated value; analyte detected in the associated method blank
Neg - not ignitable

Figures



SOURCE:
Map created with TOPO! ® ©2001 National Geographic
(www.nationalgeographic.com/topo).

REMEDIAL ACTION WORK PLAN ADDENDUM
FORMER GASTOWN MGP SITE
TONAWANDA, NEW YORK

NATIONAL FUEL GAS DISTRIBUTION COMPANY

SITE LOCATION MAP

Project 091220 August 2009 Figure 1

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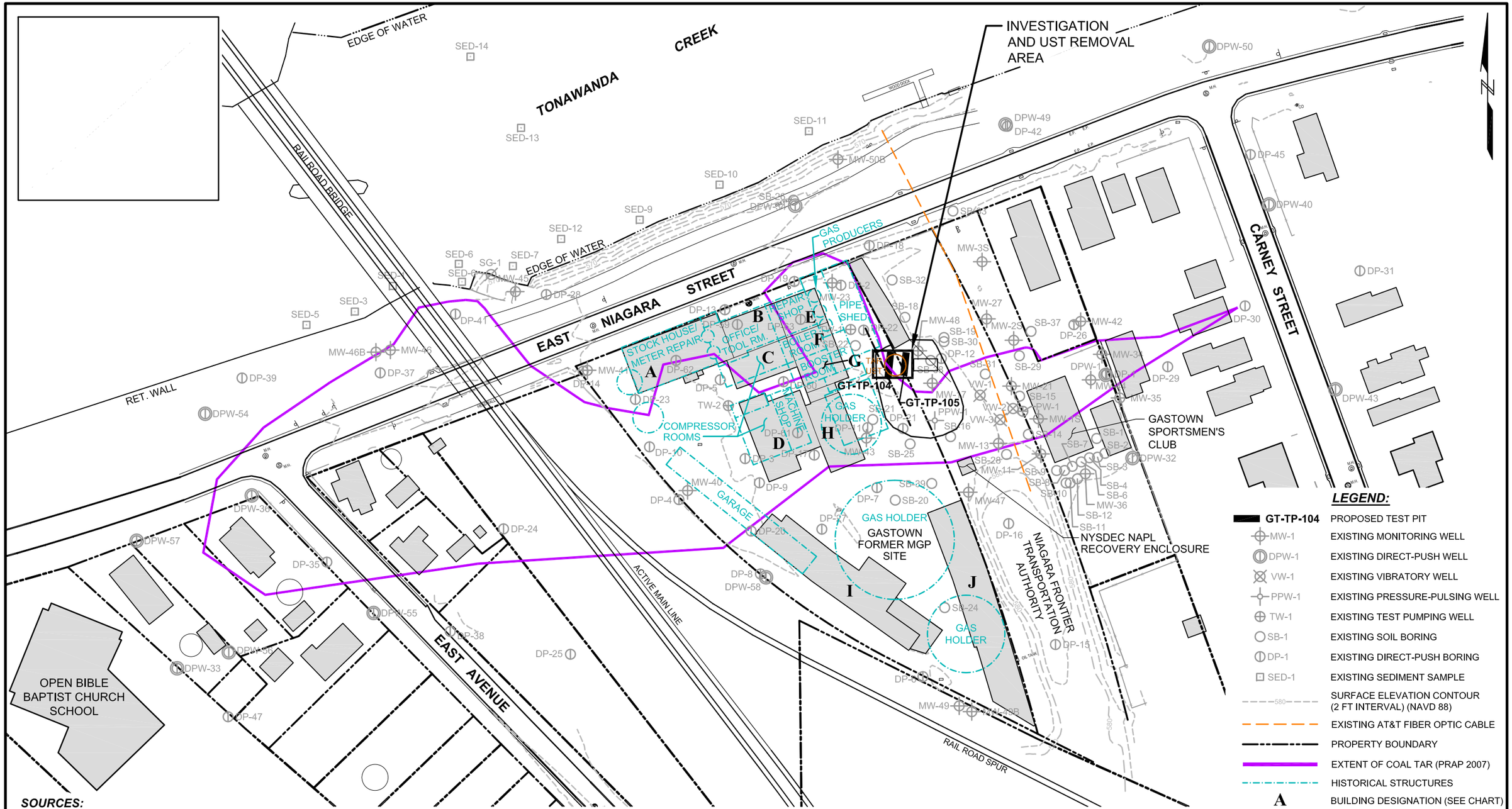

LEGEND:

GT-TP-104	PROPOSED TEST PIT
MW-1	EXISTING MONITORING WELL
DPW-1	EXISTING DIRECT-PUSH WELL
VW-1	EXISTING VIBRATORY WELL
PPW-1	EXISTING PRESSURE-PULSING WELL
TW-1	EXISTING TEST PUMPING WELL
SB-1	EXISTING SOIL BORING
DP-1	EXISTING DIRECT-PUSH BORING
SED-1	EXISTING SEDIMENT SAMPLE
580	SURFACE ELEVATION CONTOUR (2 FT INTERVAL) (NAVD 88)
	EXISTING AT&T FIBER OPTIC CABLE
	PROPERTY BOUNDARY
	EXTENT OF COAL TAR (PRAP 2007)
	HISTORICAL STRUCTURES
A	BUILDING DESIGNATION (SEE CHART)
	EXISTING SIGN
	EXISTING MANHOLE
	EXISTING STORM DRAIN

SOURCES:

1. PLAN BASED ON ELECTRONIC SURVEY FILE PREPARED BY OM P. POPLI, P.E., P.C., SURVEY DATE: SEPT. 6, 2001.
2. *SITE PLAN, GASTOWN FORMER MGP SITE, TONAWANDA, NEW YORK,* SHEET 2, DRAWING NUMBER 19800209, PREPARED BY WSP ENGINEERING OF NEW YORK FOR NATIONAL FUEL GAS DISTRIBUTION CORPORATION, WILLIAMSVILLE, NEW YORK.
3. SOME BUILDING LOCATIONS FROM ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm) PHOTO DATE: 2005, ACCESSED 8/01/08.
4. HISTORICAL STRUCTURES FROM *FIGURE 1-3 HISTORIC SITE LAYOUT* OF *REMEDIAL INVESTIGATION REPORT, GASTOWN FORMER MGP SITE, SITE NO. 9-15-171, TONAWANDA, ERIE COUNTY, NY,* PREPARED BY EARTH TECH NORTHEAST, INC., LATHAM, NY., DATE: DEC. 2004.
5. SOME PROPERTY BOUNDARIES FROM TAX MAP 039.38, CITY OF TONAWANDA, ERIE COUNTY, NY., TOWNSHIP 12, RANGE 8, UPDATED: 1/28/03, SCALE: 1" = 50'.

NOTES:

1. LOCATION OF TAR UST IS APPROXIMATE.
2. OWNER OR OCCUPANT INFORMATION IS BASED ON AN UNDATED DRAWING PROVIDED BY JACK HOLLER AND AUGUST 5, 2008 SITE VISIT.

0 80 160

SCALE, FEET

REMEDIAL ACTION WORK PLAN ADDENDUM
FORMER GASTOWN MGP SITE
TONAWANDA, NEW YORK

NATIONAL FUEL GAS DISTRIBUTION COMPANY

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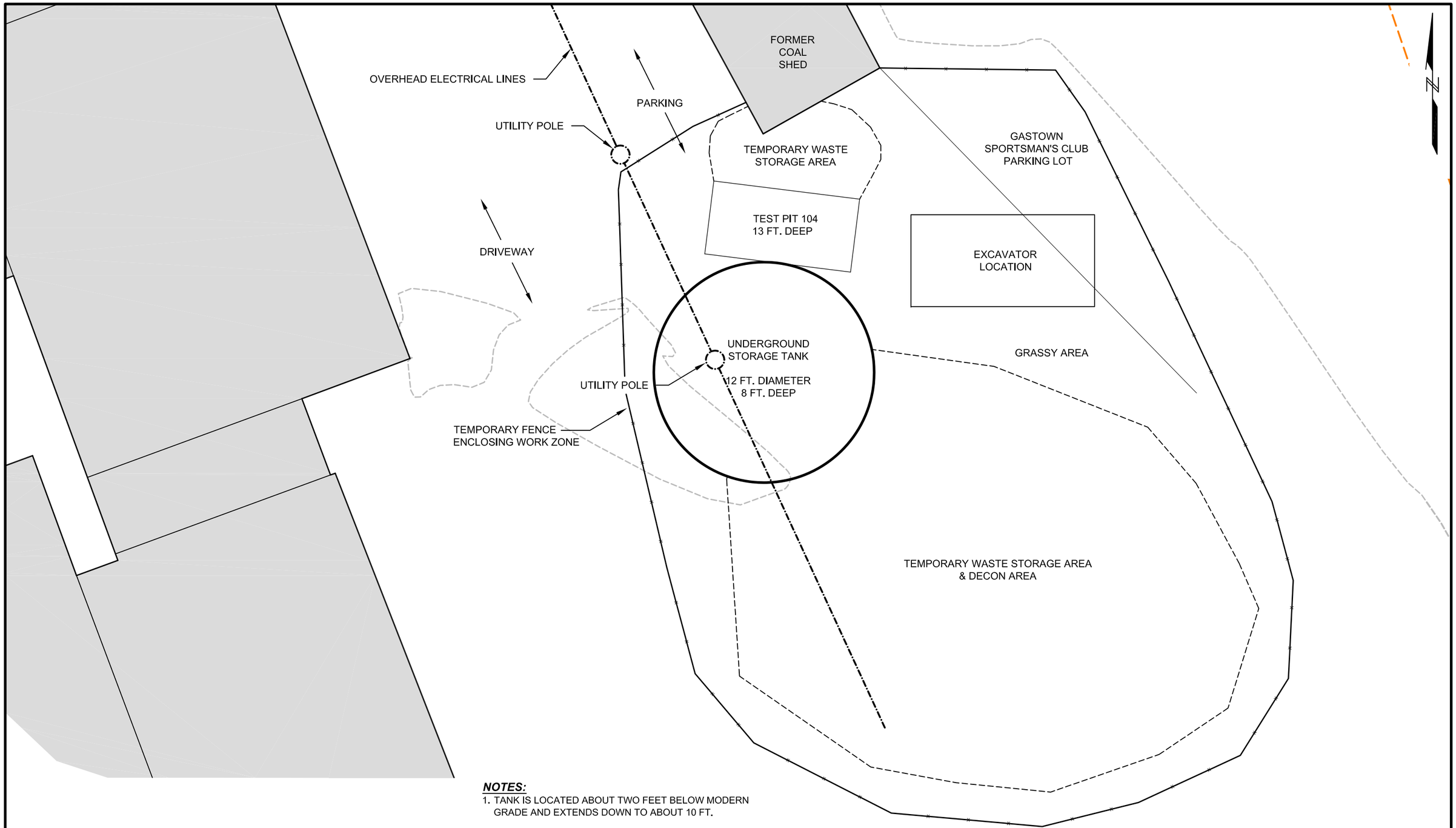
PROPOSED IRM UST REMOVAL

August 2009 Figure 2

H:\TECH\project\National_Fuel_Gas-Gastown\#Drafting\09122-0\ 091220-02-03 Fig 2-4 Tar Tank.dwg \Aug 03, 2009



NOTES:

1. TANK IS LOCATED ABOUT TWO FEET BELOW MODERN GRADE AND EXTENDS DOWN TO ABOUT 10 FT.

0 5 10

SCALE, FEET

REMEDIAL ACTION WORK PLAN ADDENDUM
FORMER GASTOWN MGP SITE
TONAWANDA, NEW YORK

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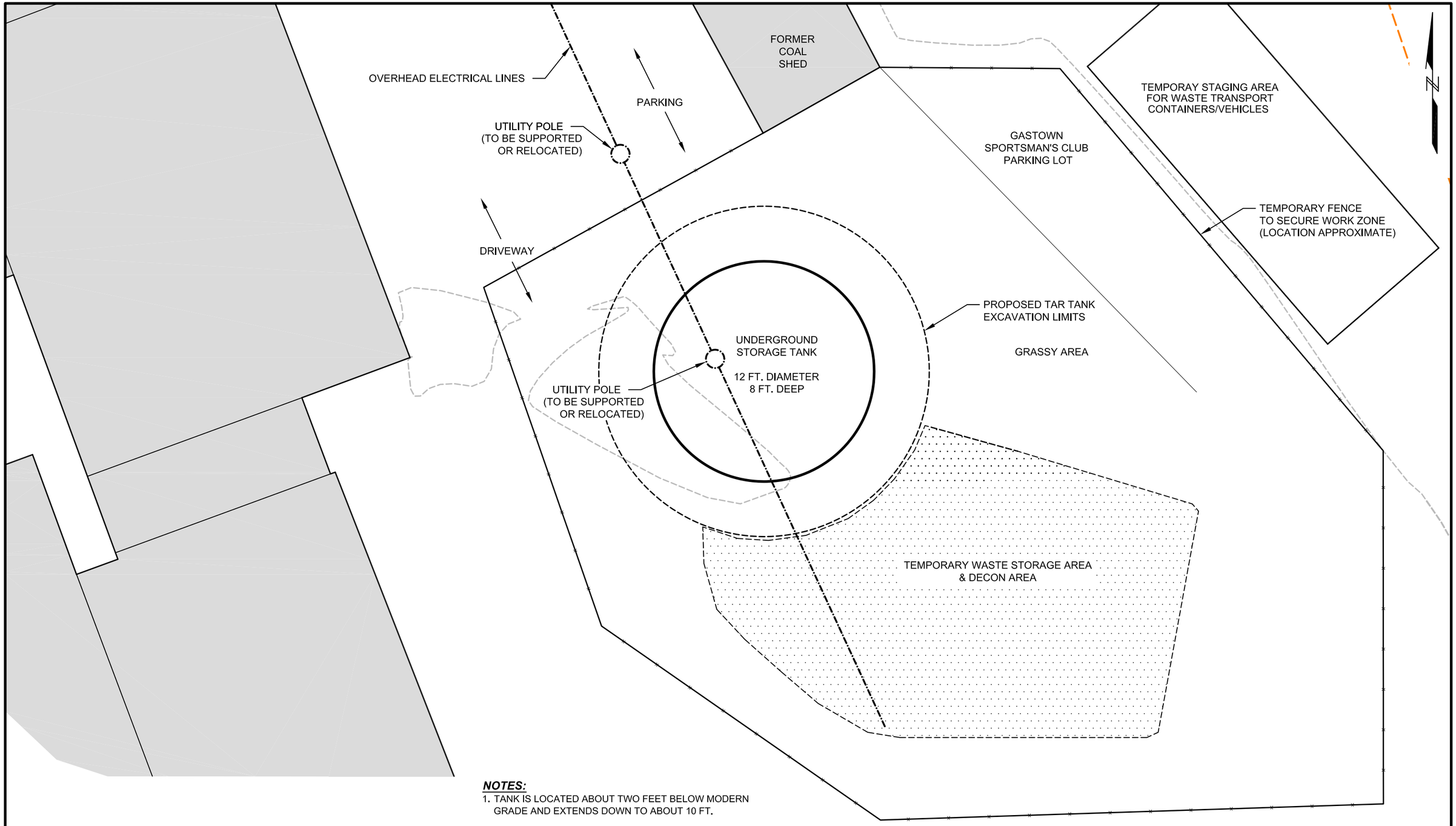
TAR TANK INVESTIGATION SUMMARY

August 2009 Figure 3

H:\TECH\project\National_Fuel_Gas-Gastown\#Drafting\09122-0\ 091220-02-03 Fig 2-4 Tar Tank.dwg \Aug 03, 2009



NOTES:

1. TANK IS LOCATED ABOUT TWO FEET BELOW MODERN GRADE AND EXTENDS DOWN TO ABOUT 10 FT.

0 5 10

SCALE, FEET

REMEDIAL ACTION WORK PLAN ADDENDUM
FORMER GASTOWN MGP SITE
TONAWANDA, NEW YORK

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PROPOSED TAR TANK REMOVAL

August 2009 Figure 4

H:\TECH\project\National_Fuel_Gas-Gastown\#Drafting\09122-0\ 091220-02-03 Fig 2-4 Tar Tank.dwg \Aug 03, 2009