



Site Management Periodic Review Report (2025) Site No. 915141B

NFG - Iroquois Gas/Westwood Pharmaceutical Riparian Site,
Buffalo, New York

Submitted to:

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
Buffalo, New York

Submitted by:

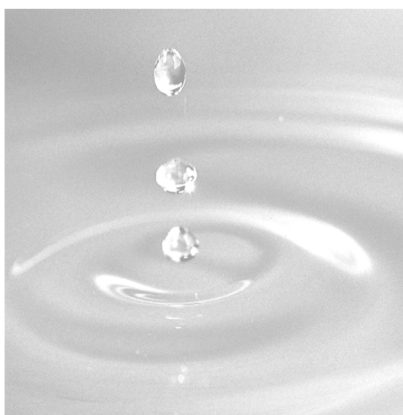
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On behalf of:

National Fuel Gas Distribution Corporation
Williamsville, New York 14221

January 2026

Project No. 1403480-1000



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1. Executive Summary

GEI Consultants, Inc., P.C. (GEI) was retained by National Fuel Gas Distribution Corporation (National Fuel) to conduct the Site Management Periodic Review Report (PRR) submittal for the Iroquois Gas/Westwood Pharmaceutical Riparian Site located in Buffalo, New York (Site). This PRR summarizes compliance of NYSDEC-approved activities described in the Operation and Maintenance (O&M) Plan and activities approved in prior PRR submittals conducted at the site for the reporting period between January 1, 2025 and December 31, 2025 referred to hereafter as the 2025 monitoring period.

This PRR submission follows the NYSDEC's denial of the 2020 PRR (in correspondence dated April 29, 2021) and placement of the Site into Corrective Measures. Pursuant to direction from NYSDEC, National Fuel continued to implement O&M activities, and each was documented in subsequent PRRs which did not include certification forms of Institutional and Engineering Controls (IC/ECs). The submission of uncertified PRRs was mutually agreed upon as the rationale for the NYSDEC denial of the 2020 PRR was in dispute. According to NYSDEC correspondence dated July 17, 2025, the Site remains in Corrective Measures. That correspondence requested a continuation of enhanced DNAPL recovery. A NYSDEC email dated September 10, 2025 also specified the exclusion of the New York State PE certification of IC/ECs forms with the PRRs until Remedial Investigation/Feasibility Studies (RI/FS) activities being completed under a Great Lakes Legacy Act (GLLA) Project Agreement between USEPA Great Lakes National Program Office (GLNPO) and the NYSDEC in the Lower Scajaquada Creek area are conducted.

NYSDEC provided acceptance of the 2024 PRR in a letter dated December 18, 2025. In that letter, NYSDEC agreed with a conclusion presented in the 2024 PRR that enhanced NAPL recovery efforts should continue as part of ongoing Corrective Measures. PE certification of IC/ECs are therefore not included with the 2025 PRR.

Routine O&M activities include visual inspections of the Scajaquada Creek sediment cap, the creek banks and site restoration elements, and maintenance checks on the Northern and Southern DNAPL recovery systems following the completion of remedy implementation in 2003.

In conducting this periodic review, GEI determined the components of the O&M Plan dated February 8, 2005 (which serves as the Site Management Plan or {SMP}), and amended frequencies of inspections as agreed to in NYSDEC correspondence dated December 2, 2009, were in compliance during the 2025 reporting period:

- ICs/ECs have been in place and effective.
- Inspections were performed as required and identified the need for maintenance of the erosion armor stone in select areas (repairs completed in 2024). No other deficiencies were identified.
- The two DNAPL collection systems functioned as designed during the reporting period; however, the rate of collection has substantially decreased during the certifying reporting period. Testing completed in 2025 indicates a significant reduction in volume of mobile DNAPL in the area of the collection systems.

A Site Characterization was completed in the lower portion of Scajaquada Creek in 2022 by GEI on behalf of National Fuel under a Consent Decree. The investigation did not identify DNAPL presence in sediment boring LSC-SED-8 located immediately downstream from the West Avenue bridge (closest sediment boring downstream from the Riparian Site). No evidence of a continued release from the Riparian Site was observed. Based upon the inspections and compliance with the O&M Plan and investigation completed thus far, the site remedy continues to function to meet the remedial objectives for the site. Further assessment of source control is ongoing by National Fuel during the RI of the Lower Scajaquada Creek OU GLLA project.

Details of the 2025 PRR reporting period are provided in the following sections with recommendations for O&M in 2026.

2. Site Overview

2.1. Site Description

The Scajaquada Creek Site is the riparian portion of the Iroquois Gas/Westwood Pharmaceutical (IG/WP) Site and is situated in a mixed industrial and residential area of Buffalo, New York. The site comprises approximately 2.5 acres along a 1,600-foot-long reach of Scajaquada Creek. The Site location and Site layout are shown on Figure 1 and Figure 2, respectively. Manufactured gas plant (MGP) operations were conducted at a former Iroquois Gas facility situated adjacent to the Site on property at 100 Forest Avenue from the 1890s to the 1950s and gas storage continued until 1972. Investigations indicated that soil and groundwater were impacted with chemicals associated with gas manufacturing processes and that constituents were migrating into the creek. Remedial activities (i.e., sheet pile wall installation, sediment excavation, capping, and installation and operation of dense non-aqueous phase liquid (DNAPL) recovery systems) have been performed since 1999 to address these impacts.

2.2. Site Remedial Program Summary

In 1996, National Fuel constructed a sheet pile wall along the eastern bank of the creek, adjacent to the IG/WP property. The sheet pile wall was an initial component of the remedial action which separates the terrestrial remedial action (the responsibility of others) from the riparian remedial action. National Fuel conducted the riparian remedial action in two phases: 1. Sediment and soil removal and capping in Scajaquada Creek; and 2. DNAPL collection and removal from permeable soil below the creek sediment cap. The riparian remedial design was conducted in 1997/1998 and received approval in June 1998. Remedial excavation and capping began in July 1998 and completed in May 1999. Installation and startup of the southern DNAPL recovery system was completed in June 1999. Following completion of property access agreements, installation, and startup of the northern DNAPL recovery system was completed in August 2001. In summary, the components of the selected remedy include:

- Installation of a sheet pile barrier wall beneath a 70-foot width of the creek, close to West Avenue bridge.
- Installation of approximately 450 linear feet of a steel sheet pile barrier along the east bank of the creek (bordering property of former MGP operations).
- Excavation of the creek bottom and off-site disposal of 18,976 cubic yards of contaminated sediment and debris. The overall goal of excavation was to remove sediments with concentrations of PAHs greater than 50 mg/kg within the site boundary, considering the physical limitations at the site.
- Capping of the creek bottom resulting in a horizontal barrier (cap) along the 1,600-foot reach of Scajaquada Creek. The cap consists of geosynthetic clay liner (GCL), angular sand, geotextile, and anchoring (armor) stone.
- Installation of two DNAPL recovery systems near the West Avenue Bridge and the Conrail railroad bridge.

- Implementation of an O&M Plan as an institutional control to verify and ensure the performance of the remedial systems.

Excluding O&M activities (i.e., rip rap armor placement in 2015 and 2020 in select areas to protect the sediment cap from erosion), no significant changes have been made to the remedy since remedy selection. Details of the Remedial Action are presented in the Final Engineering Report (FER), prepared by ThermoRetec (August 2000) with a supplemental FER prepared by RETEC (November 2001).

In a letter dated February 12, 2021, NYSDEC formally requested National Fuel to voluntarily agreed to commit to investigate and remediate properties downstream of the Riparian Site which exhibited impacts from coal tar based on NYSDEC investigations. In the letter, NYSDEC indicated that a continuing release of contamination from the remediated Riparian Site may be occurring via a preferential pathway in creek bed sediments which may impact downstream sections of the creek. The properties listed in the February 12, 2021, letter included a downstream parcel formerly owned by a predecessor to National Fuel (identified as the “P-Site) and the lower portion of Scajaquada Creek and lands directly bordering the creek not owned by National Fuel.

After National Fuel’s receipt of the request to investigate downstream areas and the submittal of the 2020 PRR to NYSDEC on March 12, 2021, the NYSDEC denied the 2020 PRR in a letter dated April 29, 2021, based on information provided in the February 12, 2021 correspondence placing the Riparian Site into Corrective Measures. As described in the 2021 PRR, GEI’s engineer of record responded to the denial of the 2020 PRR on May 4, 2021 and stated that inspections described in the 2020 PRR concluded that each remedy component of the O&M Plan (SMP) was in compliance during the 2020 reporting period (i.e., no deficiencies in the capping system, no sheen observed in surface water, and north and south DNAPL recovery systems functioning properly). Following guidance from NYSDEC, PRRs were submitted for the 2021 and 2022 reporting periods (submittal dates February 10, 2023, and April 3, 2023, respectively) but did not include certification of the IC/ECs. The 2023 PRR retroactively provided certification of the 2020 through 2023 reporting periods. Based on NYSDEC correspondence dated July 17, 2025, the site remained in Corrective Measures status and IC/EC certification forms were excluded from the 2024 PRR. The correspondence also agreed with the recommendation of the 2024 PRR to continue enhanced DNAPL recovery efforts as described in Section 3.2.2.

National Fuel entered into an Order on Consent (Order or OC) with the NYSDEC which was signed by the NYSDEC Director of Environmental Remediation on June 23, 2021. National Fuel prepared a Site Characterization Scope of Work (SOW) to investigate the P-Site and the Lower Scajaquada Creek dated August 2021 which was approved by NYSDEC on October 5, 2021. The SOW was implemented between 2021 and 2022, the results of which were documented in a June 2022 Report (revised October 2022) entitled “Site Characterization - Former Buffalo Gaslight Iroquois Gas Corp Site and Lower Scajaquada Creek, Buffalo, New York”. The findings of the investigation, which are pertinent to the NYSDEC’s concern for failure of the remedy, are as follows:

- The sediment boring LSC-SED-8, positioned directly downstream from the West Avenue bridge (the nearest sediment boring downstream from the Riparian Site), did not identify DNAPL presence. This observation supports the conclusion that a continuous pathway for ongoing migration beyond the containment measures of the Riparian Site was not identified.

- The presence of DNAPL observed further downstream above a deeper widespread clay layer, suggests that this DNAPL presence is historical and a result of transport that occurred before the remedial controls were installed at the Westwood Terrestrial and Riparian Sites.

To further address NYSDEC's concern, a Phased Scope of Work (SOW) for a Remedial Investigation/Feasibility Study (RI/FS) was agreed to between National Fuel and the Department in May 2022 to evaluate the full nature, extent, fate, and transport of impacts of historic DNAPL associated with former MGP operations, including the area downstream/downgradient from the Riparian Site. In 2024, preparation of a RI/FS Work Plan was initiated for the Lower Scajaquada Creek OU and includes investigation in the area of source control near the downgradient area of the Westwood Terrestrial/Riparian sites through the PA under the GLLA program. The work plan was approved by the NYSDEC in July 2025. The RI was initiated in May 2025 with the majority of the field investigation completed in December 2025. The RI is expected to be completed by late 2026. The RI will assess the adequacy of existing engineering controls at the Riparian site to contain DNAPL at the West Avenue bridge.

2.3. O&M Plan

O&M requirements for the Site are documented in the NYSDEC-approved O&M Plan dated February 8, 2005 (O&M Plan) and a modification of monitoring frequency as described in a correspondence prepared by AECOM dated July 9, 2009, and approved by the NYSDEC by letter dated December 2, 2009. These documents serve as the Site Management Plan (SMP) for the site. Components of the SMP for the Scajaquada Creek Site include:

- inspection of the Scajaquada Creek sediment cap;
- inspection of the DNAPL recovery systems;
- maintenance checks on the operation of the DNAPL recovery systems with enhanced recovery testing methods to assess DNAPL mobility;
- maintenance and repair of engineering controls; and
- field observations and reporting.

Each of these elements was conducted during the 2025 monitoring period.

3. Remedy Performance Evaluation

The remedial performance is evaluated based on the following:

1. Periodic inspection and maintenance of the Scajaquada Creek sediment cap.
2. Periodic inspection and maintenance of the DNAPL recovery systems including enhanced DNAPL recovery testing completed in 2025 on a quarterly basis.

Remedy performance evaluations for the 2025 reporting period are described below.

3.1. Scajaquada Creek Sediment Cap Annual Inspections

To evaluate the effectiveness of the sediment cap remedy in protecting human health and the environment, a visual inspection is performed annually. The annual visual inspection of the sediment cap for the 2025 reporting period was completed by Frank Clougherty, G.I.T., and Richard Frappa, P.G., of GEI on April 24, 2025. Weather conditions were clear skies with temperatures in the mid-50s Fahrenheit. Observations of low creek water levels were made by referencing markings on both the rip rap along the creek bank and the New York State Route 198 Scajaquada Expressway support piers. Photographs were taken during the inspection using the GIS referencing software ArcGIS Survey123®. Upon completion, Mr. Kelly McIntosh, P.E., of GEI reviewed the photographs.

The sediment cap remains in good condition and appears to be effective in preventing sheen generation from ebullition transport. No sheens were observed during the inspection, and none were identified during any DNAPL recovery system maintenance checks in 2025. No deficiencies were identified during the 2025 visual inspection of the sediment cap and creek bank. The documentation for the annual visual inspection of the sediment cap for the 2025 reporting period is included in Appendix A.

3.2. DNAPL Recovery Systems

Recovery of mobile DNAPL in coarse-grained creek sediments at the Riparian Site occurs through gravity drainage to sumps constructed in DNAPL recovery wells located at the South and North DNAPL recovery vaults (see Figure 2). Collected DNAPL (and groundwater) is pumped using peristaltic pumping systems and conveyed to storage tanks located in each collection system vault having an approximate 2,100-gallon capacity.

The DNAPL recovery systems were checked during the reporting period and additional testing was initiated in 2023 continued in 2026 to enhance DNAPL recovery in each DNAPL recovery well. Enhanced recovery involved using a portable centrifugal pump for groundwater withdrawal at higher pumping rates to actively collect groundwater and potentially mobilize DNAPL if present. Gravity and enhanced collected DNAPL in 2025 is detailed below..

3.2.1. DNAPL Recovery System Inspections/Measurements

The Southern and Northern DNAPL recovery systems were checked approximately monthly by National Fuel staff with Sun Environmental facilitating confined space entry during the 2025 reporting period. GEI

frequently supported monthly system checks and provided recommended improvements in system function focusing on maximizing DNAPL volume collection while minimizing water volume collection. A 5-gallon bucket is suspended in each water/DNAPL collection tank receiving discharge from the peristaltic pumps. The bucket allows for rapid observation of pump performance between tank measurements prior to overtopping into the vault's storage tank. Monthly system checks for the Southern and Northern DNAPL recovery systems included timer and pump function, tank measurements, and equipment maintenance (i.e., tubing changes, pump maintenance, etc.). DNAPL recovery system 2025 maintenance details are included in Appendix B.

Southern DNAPL Recovery System

Monthly systems checks were completed in 2025. Liquid level measurements were recorded periodically from the collection tank of the Southern DNAPL recovery system. During monthly inspection events conducted with GEI staff, depth to water and DNAPL thickness in the tank was recorded and is summarized in Appendix B1. Volumes were calculated by taking measurements in the tanks with a water level meter, measuring the length of DNAPL staining on a PVC rod lowered to the tank bottom and totaling DNAPL volumes present in the bucket hung in the tank. Maintenance activities performed on the southern DNAPL recovery system during this period included adjustments or replacement of flexible tubing or changes near the pump head during each gauging event.

No DNAPL was recovered in the southern DNAPL recovery system during the 2025 monitoring period, whether through routine peristaltic pumping or quarterly enhanced recovery testing. Since operation startup in 1999, approximately 3,557 gallons of DNAPL have been collected by the Southern DNAPL recovery system. A summary of historical calculated quantities is reported on the DNAPL recovery system monitoring log in Appendix B2. As shown in Appendix B2, the DNAPL volume recovered from the South Vault significantly decreased over the past several years to a negligible amount in 2024 and 2025.

Northern DNAPL Recovery System

Maintenance activities performed on the Northern DNAPL recovery system during this period included adjustments of flexible tubing or changes near the pump head during each gauging event. No pump run time adjustments were performed during the 2025 PRR period. Liquid level measurements were recorded periodically from the collection tank of the Northern DNAPL recovery system. During monthly inspection events conducted with GEI staff, depth to water and DNAPL thickness was recorded and presented in Appendix B1. Volumes were calculated by taking liquid level tank measurements using a water level meter, measuring the length of DNAPL staining on a PVC rod or weighted white cotton rope lowered to the tank bottom and totaling DNAPL volumes present in the bucket hung in the tank.

The DNAPL volume recorded for the 2025 monitoring period was approximately 8 gallons and is inclusive of enhanced recovery efforts described in Section 3.2.2. Monthly inspections of the Northern DNAPL recovery system indicate that minimal DNAPL (between one-eighth and one-quarter gallon) is being collected each month via the low flow rate peristaltic pumping method. Since operation startup in 2001, approximately 1,054 gallons of DNAPL have been collected by the Northern DNAPL recovery system. A summary of historical calculated quantities are reported on the DNAPL recovery system monitoring log in Appendix B3.

3.2.2. Enhanced DNAPL Recovery Testing

National Fuel Gas and GEI initiated an enhanced recovery strategy at both the Northern and Southern DNAPL recovery systems to test for mobile DNAPL presence in the area near each recovery well. This strategy involved the use of a compact, gas-powered transfer pump, capable of pumping approximately 2 to 3 gallons per minute (gpm) of groundwater. The increased groundwater flow velocity in the area of the recovery well would induce the recovery of mobile DNAPL present near the well screen. The pump intake was directly connected to the existing down-hole recovery tubing in each system.

During the 2025 monitoring period, quarterly enhanced recovery pumping events were conducted on March 28, 2025, June 20, 2025, September 19, 2025, and November 25, 2025. Each event lasted approximately one hour at each vault location with observations of discharge. The material produced during the testing was either collected in 5-gallon buckets and moved to the storage tank or directly discharged into the storage tank at each location. Specific observations for each recovery system and each test event are described below and details can be found in the field observation reports provided in Appendix C.

3.2.2.1. Southern DNAPL Recovery System

March 28, 2025 - The Southern DNAPL recovery system was pumped at a rate of approximately 2.5 gpm for a period of one hour. The pump discharge was initially clear to slightly silty brown water with a slight hydrogen sulfide (H₂S)/septic-like odor which became a strong odor after the first 20 minutes of pumping. Approximately 180 gallons of groundwater were pumped, with no observations of DNAPL in the recovered water. Further details are included in Appendix C1.

June 20, 2025 - The recovery system was pumped at a rate of approximately 2.5 gpm for a period of one hour. The pump discharge was clear with a strong hydrogen sulfide odor. No NAPL sheens were observed in the discharge stream. Approximately 150 gallons of water and no DNAPL were recovered. Further details are included in Appendix C2.

September 19, 2025 - The recovery system was pumped at an average rate of approximately 2.5 gpm for a period of one hour. The initial pump discharge was silty black water with a strong H₂S odor. The discharge water became less silty and was clear after 30 minutes of pumping. Approximately 150 gallons of water and no DNAPL were recovered. Further details are included in Appendix C3.

November 25, 2025 - The recovery system was pumped at a rate of approximately 2.0 gpm for a period of one hour. The initial pump discharge was clear water with a strong H₂S odor which was consistent throughout the remainder of the test. Approximately 120 gallons of water and no DNAPL were recovered. Further details are included in Appendix C4.

3.2.2.2. Northern DNAPL Recovery System

March 28, 2025 - The Northern DNAPL recovery system was pumped at an average rate of 3.0 gpm for a period of one hour. The pump discharge was initially a water/DNAPL mix with an estimated 10-20% coal tar discharge component for the first 15 gallons which then transitioned to mainly clear water with a

moderate sheen and coal tar-like odor for the duration of pumping. Approximately 180 gallons of water and an estimated 2 gallons of DNAPL were recovered. Further details are included in Appendix C1.

June 20, 2025 - The recovery system was pumped at a rate of 3.5 gpm for a period of one hour. The initial discharge is 10-20% DNAPL/ with the balance being silty water for approximately the first 20 gallons of discharge. The discharge then clears significantly with a strong NAPL sheen and moderate coal tar-like odor. DNAPL component decreases toward the end of testing with the water only exhibiting a slight sheen and coal-tar like odor.. Approximately 210 gallons of water and an estimated 2 gallons of DNAPL were recovered. Further details are included in Appendix C2.

September 19, 2025 - The recovery system was pumped at a rate of 3.0 gpm for a period of one hour. The initial pump discharge contained an estimated 10% DNAPL for approximately the first 10-15 gallons. The discharge then became significantly clearer after with estimated less than 10% DNAPL with heavy sheen and strong coal tar-like odor. After 40 minutes, the discharge water became clear with moderate to heavy sheen and strong coal tar-like odor. Approximately 165 gallons of water and an estimated 1.5 gallons of DNAPL were recovered. Further details are included in Appendix C3.

November 25, 2025 – The recovery system was pumped at a rate of 2.5 gpm for a period of one hour. The initial water quality was approximately 80% water/20% DNAPL for the first several gallons and then transitioned to mainly clear water with a strong sheen and coal tar-like odor. Approximately 180 gallons of water and an estimated 2 gallons of DNAPL were recovered. Further details are included in Appendix C4.

4. IC/EC Compliance

4.1. IC/EC Requirements

ICs include the following;

- Implementation of Site O&M Plan.
- Monitoring and inspection to assess the performance and effectiveness of the remedy.

The Site is a New York State waterway and property use is limited to its function as a conveyance of surface water in the City of Buffalo.

ECs include the following;

- Sediment cap consisting of GCL overlain by sand, geotextile, and anchoring/armor stone.
- Collection of mobile DNAPL below the sediment cap.
- Maintenance of the creek sediment cap and operation and maintenance of the DNAPL collection systems.

4.2. IC/EC Compliance

The NYSDEC-approved O&M Plan is in place. All required inspections and O&M activities were performed during this reporting period in accordance with the plan.

4.3. IC/EC Certification

The 2025 PRR excludes IC/ECs certification forms as the site is in Corrective Measures until RI activities are completed under the GLLA Project Agreement with USEPA GLNPO and NYSDEC.

5. Conclusions and Recommendations

Each component of the Routine O&M Plan dated February 8, 2005, and amended frequencies of inspections as agreed to in NYSDEC correspondence dated December 2, 2009, collectively regarded as the SMP, were in compliance during the reporting period from January 1, 2025, through December 31, 2025. The Southern and Northern DNAPL recovery systems were maintained and included quarterly enhanced recovery tests in 2025 to remove mobile DNAPL. DNAPL collection volumes have decreased substantially since 2023 at each recovery system location. No DNAPL was removed from the Southern DNAPL recovery system in 2025 (by gravity flow or enhanced recovery) which is consistent with the recovery results for the previous year. The Northern DNAPL recovery system recovered approximately 8 gallons in 2025 through both recovery methods.

The sediment cap remains in good condition and is effective in preventing sheen generation from ebullition transport. The riprap armor above the cap is in good condition following repairs performed in April 2024, and petroleum-type sheens were not observed on the creek water surface upstream of the West Avenue bridge in the inspection area. The ICs/ECs have been in place and are operating effectively during the reporting period.

Other activities conducted during the 2025 reporting period outside of the Routine O&M scope of work concluded the following:

- The results of the enhanced DNAPL recovery testing conducted in 2025 suggest that the mobile DNAPL volume is becoming depleted at both the Northern and Southern DNAPL recovery system. This conclusion is supported by the low or zero DNAPL quantities collected by the routine gravity/peristaltic collection methods at each location. At the Northern collection system, approximately 1 gallon of DNAPL was collected throughout 2025 via the routine collection methods. At the Southern collection system, no DNAPL was collected from operation of the routine collection method during the 2025 monitoring period. Based on the vault assessments performed on a monthly basis since 2020, adjusting peristaltic pumping rates or pumping frequency have little to no effect on the DNAPL recovery quantities at either collection location, and the bulk of DNAPL collection, albeit only at the Northern collection system, is achieved through enhanced recovery pumping.
- Based on these decreased DNAPL recovery results, it is recommended that the routine gravity/peristaltic DNAPL collection methods be temporarily discontinued at each vault location for the 2026 monitoring period. Furthermore, it is recommended that enhanced recovery efforts continue to be performed on a quarterly basis during the 2026 PRR period to further assess DNAPL depletion and the effect, if any, that the temporary discontinuation of peristaltic pumping collection methods have on DNAPL recovery. Following the enhanced DNAPL recovery actions to be completed in 2026 the effectiveness of continued DNAPL recovery at the Riparian Site will be reevaluated.
- The RI/FS that is being implemented throughout 2026 with US EPA and NYSDEC under a PA for IRM and the RI/FS for the Black Rock Canal and Lower Scajaquada Creek AOC under the GLLA will

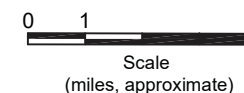
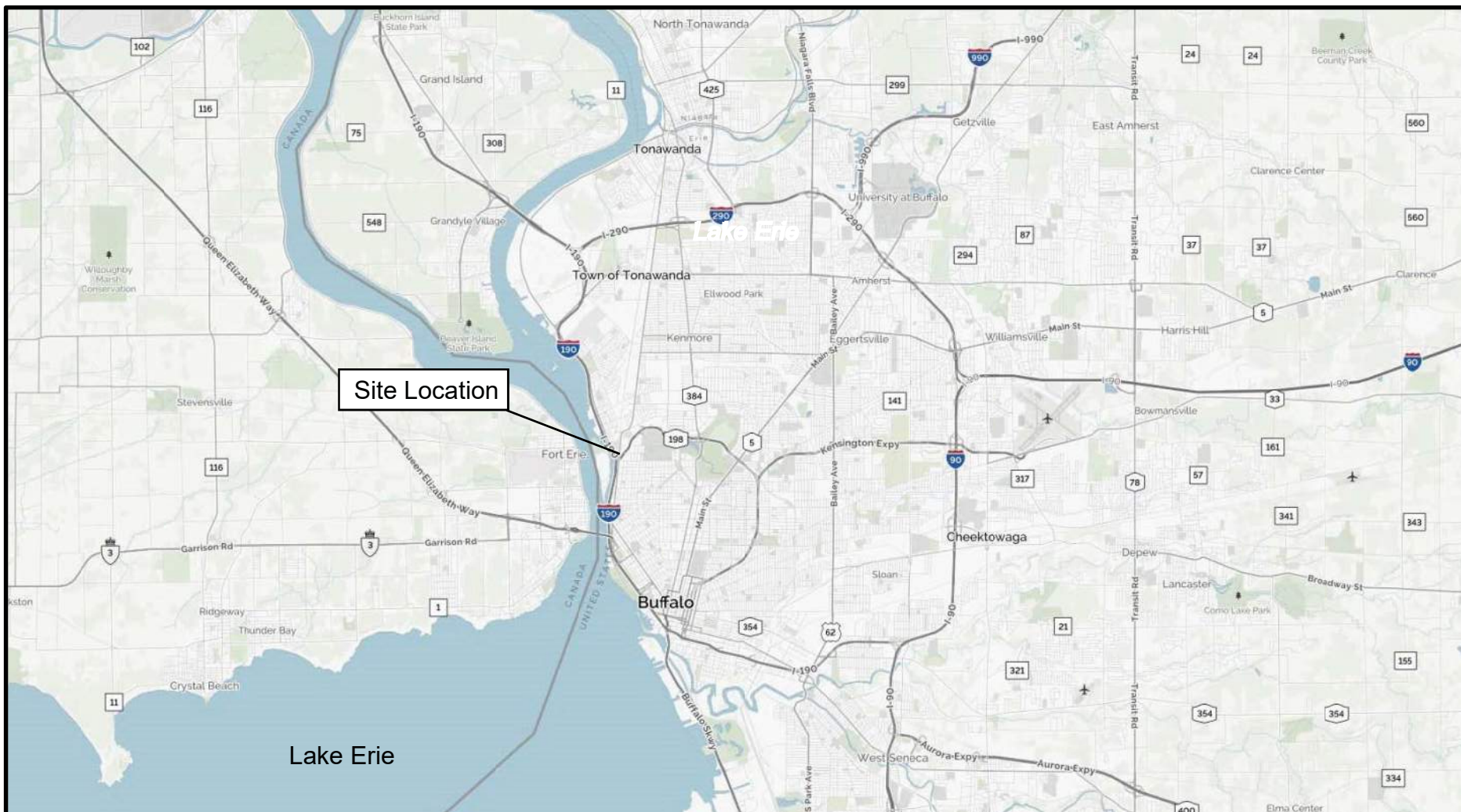
investigate the adequacy of existing IC/ECs for source control at the Westwood Riparian and Terrestrial Sites.

- The O&M activities for the Riparian Site will be reviewed following continued enhanced recovery testing in 2026 and GLLA RI findings.

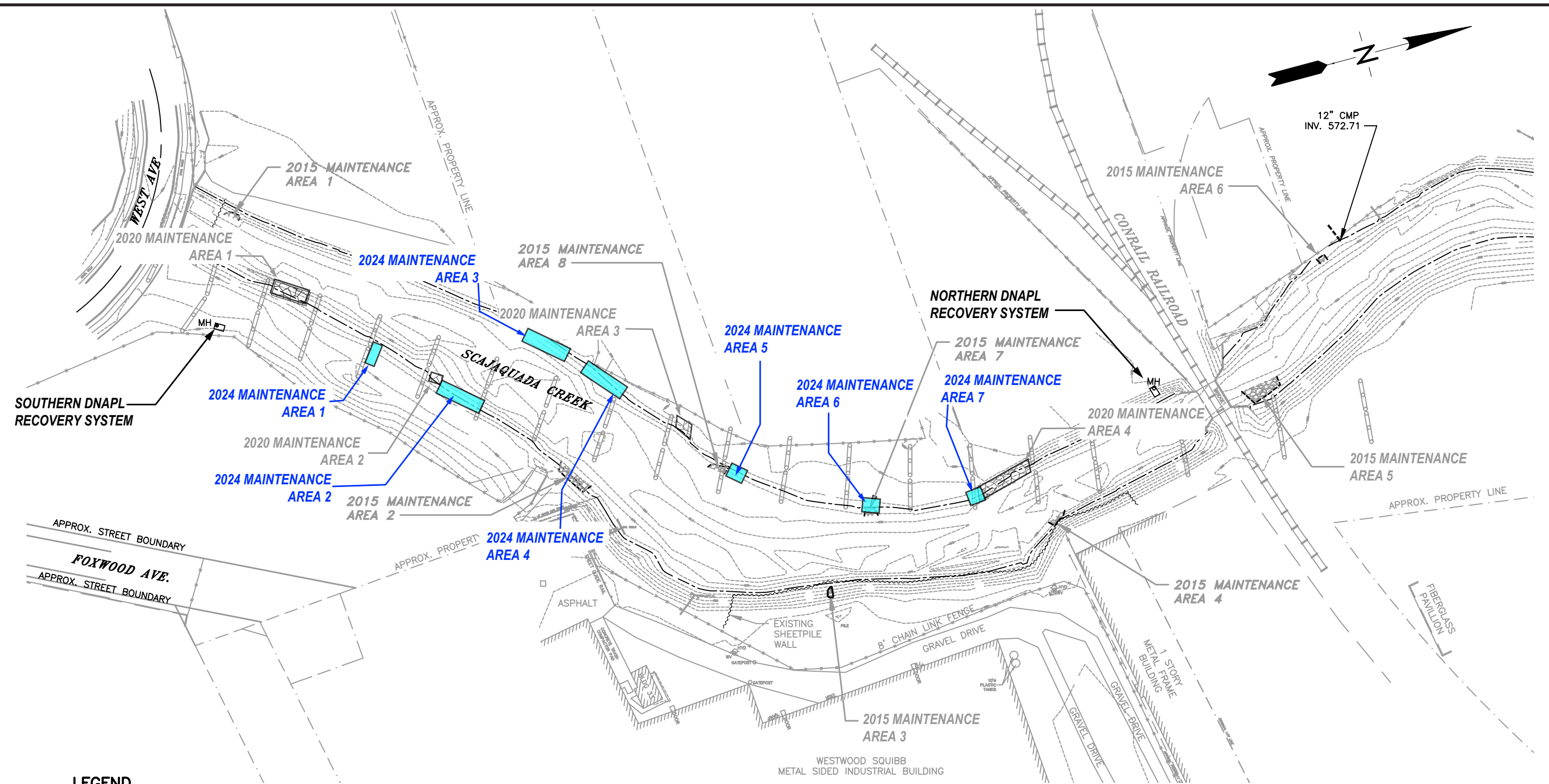
Figures

Figure 1. Site Location

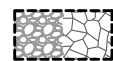
Figure 2. Site Layout



National Fuel Gas Corporation		SITE LOCATION SCAJAQUADA CREEK SITE	
Buffalo, New York		Project 1403480	January 2026 Figure 1



LEGEND



Approximate area of maintenance activities performed
Nov. 18-20, 2015 and Feb. 10 and 11, 2020
Upland Boundary Surveyed



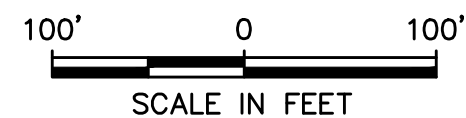
Approximate limits of Dredge Cap. (Approximated from
"Sediment Remediation" Drawings, RETEC Engineering,
P.C., June 1998)



COMPLETED 2024 CAP MAINTENANCE AREA

NOTES:

1. Base modified from original figure prepared by Clough, Harbour & Associates from a September 1995 field survey and presented by AECOM in the Summary of 2016 Site Inspection Activities Report.
2. Property lines shown hereon are for information purposes only, and should not be used for the transfer of property. The property lines shown are depicted from a partial field boundary survey, record deeds and map information.



National Fuel Gas Corporation

Buffalo, New York



Project 1403480

SITE LAYOUT

January 2026

Figure 2

Appendix A Scajaquada Creek Cap Inspection Photographs and Observations (April 14, 2025)

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation

GEI Proj. No.: 1403480

PHOTOGRAPH NO: 1	DATE: April 24, 2025	LATITUDE: 42.93033263091523	LONGITUDE: -78.89572056620851
DIRECTION: Northwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: Northwest bank			
PHOTO BY: RICK FRAPPA, P.G.			
PHOTOGRAPH NO: 2	DATE: April 24, 2025	LATITUDE: 42.93027287020491	LONGITUDE: -78.89561000730554
DIRECTION: Southeast	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION:			
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation

GEI Proj. No.: 1403480

PHOTOGRAPH NO: 3	DATE: April 24, 2025	LATITUDE: 42.93057436609936	LONGITUDE: -78.89534171037705
DIRECTION: East	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: East bank			
PHOTO BY: RICK FRAPPA, P.G.			
PHOTOGRAPH NO: 4	DATE: April 24, 2025	LATITUDE: 42.93081425998168	LONGITUDE: -78.89495964769989
DIRECTION: East	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: West bang repair area 6			
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log



Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation

GEI Proj. No.: 1403480

PHOTOGRAPH NO: 5	DATE: April 24, 2025	LATITUDE: 42.93078873006766	LONGITUDE: -78.89496317049144
DIRECTION: Southeast	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION:			
PHOTO BY: RICK FRAPPA, P.G.			
PHOTOGRAPH NO: 6	DATE: April 24, 2025	LATITUDE: 42.93092261487518	LONGITUDE: -78.89474755049012
DIRECTION: South	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: West Bank repair 4			
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation

GEI Proj. No.: 1403480

PHOTOGRAPH No: 7	DATE: April 24, 2025	LATITUDE: 42.93124498513206	LONGITUDE: -78.89435073210217
DIRECTION: North	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: East bank view			
PHOTO BY: RICK FRAPPA, P.G.			
PHOTOGRAPH No: 8	DATE: April 24, 2025	LATITUDE: 42.93131701869014	LONGITUDE: -78.89425540905096
DIRECTION: North	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: West Bank			
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log



Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation

GEI Proj. No.: 1403480

PHOTOGRAPH No: 9	DATE: April 24, 2025	LATITUDE: 42.93135311194023	LONGITUDE: -78.89432307011549
DIRECTION: East	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: West Bank downspout			
PHOTO BY: RICK FRAPPA, P.G.			
PHOTOGRAPH No: 10	DATE: April 24, 2025	LATITUDE: 42.9313099024708	LONGITUDE: -78.89395576671666
DIRECTION: Southwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: Outfalls			
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation

GEI Proj. No.: 1403480

PHOTOGRAPH No: 11	DATE: April 24, 2025	LATITUDE: 42.93133854209825	LONGITUDE: -78.89330616529709
DIRECTION: Southeast	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION:			
PHOTO BY: RICK FRAPPA, P.G.			
PHOTOGRAPH No: 12	DATE: April 24, 2025	LATITUDE: 42.93180788779919	LONGITUDE: -78.89316354754241
DIRECTION: Southwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: Shherpile			
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log



Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation

GEI Proj. No.: 1403480

PHOTOGRAPH No: 13	DATE: April 24, 2025	LATITUDE: 42.93182713734564	LONGITUDE: -78.8931671571217
DIRECTION: North	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: Repair area 2024 area 7			
PHOTO BY: RICK FRAPPA, P.G.			
PHOTOGRAPH No: 14	DATE: April 24, 2025	LATITUDE: 42.93186746216419	LONGITUDE: -78.89340819374989
DIRECTION: South	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: 			
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation

GEI Proj. No.: 1403480

PHOTOGRAPH No: 15	DATE: April 24, 2025	LATITUDE: 42.9324845998281	LONGITUDE: -78.89334722055794
DIRECTION: Northeast	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION:			
PHOTO BY: RICK FRAPPA, P.G.			
PHOTOGRAPH No: 16	DATE: April 24, 2025	LATITUDE: 42.93257837371932	LONGITUDE: -78.89322280209416
DIRECTION: Northwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION:			
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation

GEI Proj. No.: 1403480

PHOTOGRAPH No: 17	DATE: April 24, 2025	LATITUDE: 42.93140716421917	LONGITUDE: -78.8933042473397
DIRECTION: Southwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: Creek viewed			
PHOTO BY: RICK FRAPPA, P.G.			
PHOTOGRAPH No: OUTFALL	DATE: April 24, 2025	LATITUDE: 42.9310633569585	LONGITUDE: -78.89359558972006
DIRECTION: North	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: Outfall			
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log



Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation

GEI Proj. No.: 1403480

PHOTOGRAPH No: 19	DATE: April 24, 2025	LATITUDE: 42.93108173770593	LONGITUDE: -78.89360062589962
DIRECTION: South	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: 2015 Maintenance Area 2	 A photograph showing a creek with several concrete pillars or pilings in the water. The water is calm, reflecting the sky and the pillars. The left bank is rocky and has some bare trees and shrubs. The right bank is also visible, with more water and a distant shoreline.		
PHOTO BY: RICK FRAPPA, P.G.			
PHOTOGRAPH No: 20	DATE: April 24, 2025	LATITUDE: 42.930519764089	LONGITUDE: -78.8948524561176
DIRECTION: Northwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: 2024 Area 3	 A photograph showing a creek with several concrete pillars or pilings in the water. The water is calm, reflecting the sky and the pillars. The left bank is grassy and has some bare trees and shrubs. The right bank is also visible, with more water and a distant shoreline.		
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log



Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation

GEI Proj. No.: 1403480

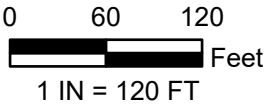
PHOTOGRAPH No: 21	DATE: April 24, 2025	LATITUDE: 42.9302024302363	LONGITUDE: -78.89556078681984
DIRECTION: West	SITE LOCATION: SCAJAUQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: Downspout flow area near bridge			
PHOTO BY: RICK FRAPPA, P.G.			



LEGEND:

● Photo Location Points

Spatial Reference
NAD 1983 2011 StatePlane New York West FIPS 3103 Ft US



Annual Site Inspection 2025
Scajaquada Creek Riparian Site
National Fuel Gas Distribution Corporation

Buffalo, New York



ANNUAL SITE INSPECTION
PHOTOGRAPH LOCATIONS

Project 1403480

June 2025

Fig. 1

Appendix B 2025 DNAPL Recovery System Maintenance

Appendix B.1. 2024 NAPL Monitoring Log

Appendix B.2. Historical Summary- South Vault DNAPL Recovery Monitoring System

Appendix B.3. Historical Summary- North Vault DNAPL Recovery Monitoring System

Appendix B.1. 2025 NAPL Monitoring Log

NORTH VAULT Scajaquada Creek Riparian Site NAPL Collection Vault Gauging

Date	North Vault					Comments
	(A) Depth Manhole Rim to Water/LNAPL (feet)	(B) Depth Manhole Rim to Tank bottom (feet)	(C) DNAPL Thickness (feet)	(D) Calculation - Depth to Top of DNAPL (B - C = D)	(D) Check Is A< D? Y or N	
1/17/2025	8.7	9	0.1	8.9	Y	Bucket hung in tank is full with clear water and approximately 0.1 gallons of coal tar. Advanced tubing in pump.
2/28/2025	8.62	9.2	0.1	9.1	Y	Bucket hung in tank is full with clear water and approximately a quart of coal tar. Advance tubing in pump.
3/27/2025	8.50	9.2	0.1	9.1	Y	Bucket hung in tank is full with clear water and approximately a pint of coal tar. First Quarter 2025 Enhanced Recovery performed on this date. Pump a total of 180 gallons into tank. Final depth to top of water after pumping is 7.9'.
4/25/2025	7.85	9.2	0.1	9.1	Y	Bucket hung in tank is full with clear water and approximately a quart of coal tar. Advance tubing in pump.
5/16/2025	7.80	9.2	0.1	9.1	Y	Bucket hung in tank is full with clear water and approximately a quart of coal tar. Advance tubing in pump.
6/20/2025	7.72	9.2	0.1	9.1	Y	Bucket hung in tank is full with clear water and approximately a pint of coal tar. Second Quarter 2025 Enhanced Recovery performed on this date. Pump a total of 210 gallons into tank. Final depth to top of water after pumping is 7.30'.
7/17/2025	7.25	9.2	0.1	9.1	Y	Bucket hung in tank is full with clear water and approximately a quart of coal tar. Advance tubing in pump.
8/8/2025	--	--	--	--	--	No tank measurements taken on this date. Bucket hung in tank is full of clear water with approximately a pint of coal tar.
9/19/2025	7.00	9.2	0.1	9.1	Y	Bucket hung in tank is full with clear water and approximately a pint of coal tar. Third Quarter 2025 Enhanced Recovery performed on this date. Pump a total of 150 gallons into tank. Final depth to top of water after pumping is 6.53'.
10/17/2025	6.40	9.2	0.1	9.1	Y	Bucket hung in tank is full with clear water and approximately 0.5 pint of coal tar. Advance tubing in pump.
11/25/2025	6.40	9.2	0.2	9.0	Y	Bucket hung in tank is full with clear water and approximately a pint of coal tar. Fourth Quarter 2025 Enhanced Recovery performed on this date. Pump a total of 180 gallons into tank. Final depth to top of water after pumping is 5.90'.
12/12/2025	5.90	9.2	0.2	9.0	Y	Bucket hung in tank is full with clear water and approximately 0.5 pint of coal tar. Advance tubing in pump.

Notes:

SOUTH VAULT Scajaquada Creek Riparian Site NAPL Collection Vault Gauging

Date	South Vault					Comments
	(A) Depth Manhole Rim to Water/LNAPL (feet)	(B) Depth Manhole Rim to Tank bottom (feet)	(C) DNAPL Thickness (feet)	(D) Calculation - Depth to Top of DNAPL (B - C = D)	(D) Check Is A< D? Y or N	
1/17/2025	8.7	8.81	0	8.81	Y	Bucket hung in tank is full with clear water. Advanced tubing in pump.
2/28/2025	8.5	9.1	0	9.1	N	Bucket hung in tank is full with clear water. Advance tubing in pump
3/28/2025	8.5	9.1	0	9.1	y	Hose was pinched in pump head. No water in bucket, no measurement taken initially. First Quarter 2025 Enhanced Recovery performed on this date. Pump a total of 150 gallons into tank. Final depth to top of water after pumping is 8.1'.
4/25/2025	8.1	9.1	0	9.1	y	Bucket hung in tank is full with clear water. Advance tubing in pump.
5/16/2025	8.1	9.1	0	9.1	y	Empty bucket, pump failure. Pump function restored and turned on manually to pump 2.5 gallons of clear water in ~30 minutes. Pump subsequently removed for maintenance.
6/20/2025	8	9.1	0	9.1	Y	No measurments taken prior to 2nd quarter high rate extraction (waiting on replacement pump). Second Quarter 2025 Enhanced Recovery performed on this date. Pump a total of 150 gallons into tank. Final depth to top of water after pumping is 7.6'.
7/17/2025	7.6	9.1	0	9.1	Y	No new measurments taken. Peristaltic pump replaced on this date and confirmed operational.
8/8/2025	--	--	--	--	--	No new measurments taken. Bucket hung in tank is full with clear water. Advance tubing in pump.
9/19/2025	7.5	9.1	0	9.1	Y	Bucket hung in tank is full of clear water. Third Quarter 2025 Enhanced Recovery performed on this date. Pump a total of 150 gallons into tank. Final depth to top of water after pumping is 7.15.
10/17/2025	7.1	9.1	0	9.1	Y	Bucket hung in tank is full with clear water. Advance tubing in pump.
11/25/2025	7.01	9.1	0	9.1	Y	Bucket hung in tank is full of clear water. Fourth Quarter 2025 Enhanced Recovery performed on this date. Pump a total of 120 gallons into tank. Final depth to top of water after pumping is 6.70.
12/12/2025	6.6	9.1	0	9.1	Y	Bucket hung in tank is full with clear water. Advance tubing in pump.

Notes:

Appendix B.2. Historical Summary- South Vault DNAPL Recovery Monitoring System

APPENDIX B2 - SOUTHERN DNAPL RECOVERY SYSTEM

Date	Initials	Field Measurements (by OWI probe)				Calculations (total tank contents) *				Calculations (this period recovery highlighted)					Operator's Notes
		Manhole rim to top of LNAPL (ft)	Manhole rim to top of Water (ft) (estimated)	Manhole rim to top of DNAPL (ft)	Manhole rim to bottom of Tank (ft)	LNAPL (gal)	Water (gal)	DNAPL (gal)	Total (gal)	Water Increase (gal)	NAPL Increase (gal)	% NAPL	NAPL (gpd)	Ave Recovery in GPD	
24-Jun-99	mrh	9.05	9.05	9.05	9.05	0	0	0	0	0	0	0%		0	90% construction complete, begin initial testing
29-Jun-99	mrh/day	6.80	6.80	9.05	9.05	0	695	0	695	695	0	0%		139	Complete initial system test, PW2003 has silt damage
23-Jul-99	mrh/day	6.80	6.80	9.05	9.05	0	695	0	695	0	0	0%		0	Recommence shakedown with peristaltic pump
30-Jul-99	day	6.34	6.34	8.95	9.05	0	806	31	837	111	31	22%	4.41	20	Shakedown, flow adjustment
26-Aug-99	jhe	5.90	5.90	8.73	9.05	0	874	99	973	68	68	50%	2.52	5	Routine system check, slow drip from tank bung noted (0.5 gpd?)
16-Sep-99	mrh/bdc	5.79	5.80	8.75	9.05	3	911	93	1007	37	-3	---		2	Significant (2 gpd?) DNAPL loss through bung drip, PW2003 reinstalled
28-Sep-99	mrh/cc	3.30	3.32	8.61	9.05	6	1633	136	1775	723	46	6%	3.86	64	Tank emptied (was full, pump off), bung replaced,
28-Sep-99	mrh/cc	9.05	9.05	9.05	9.05	0	0	0	0	0	0	0%		0	vault cleaned, flow setting reduced to 4.5
3-Oct-99	mrh	8.75	8.75	9.03	9.05	0	86	6	93	86	6	7%	1.24	19	Measurements are visual estimates only, flow setting reduced to 3.5
11-Oct-99	cc	8.75	8.75	9.03	9.05	0	86	6	93	0	0	0%		0	No flow observed, flow setting increased to 5.0
29-Oct-99	cc	6.81	6.81	8.98	9.05	0	670	22	692	584	15	3%	0.86	33	Flow setting decreased to 4.0
2-Dec-99	mrh/day	6.09	6.10	8.77	9.05	3	824	86	914	154	68	31%	2.00	7	Flow setting increased to 4.7 (24 gpd), timer installed/set for 1pm to 2pm operation
16-Dec-99	cc	---	---	---	---	---	---	---	---	---	---	---		---	Pump running but no flow, Timer reset for 3 hr per day operation
9-Mar-00	mrh/day	6.09	6.10	8.89	9.05	3	861	49	914	37	-37	---		0	PW2000 running but no flow, Peristaltic installed (2 hr/day), DNAPL thickened over time
11-Apr-00	mrh/day	4.71	4.73	8.82	9.05	6	1263	71	1340	401	25	6%	0.75	13	New peristaltic purchased/installed. Flow setting #7 (for 2 hr/day).
1-May-00	mrh/dms	4.62	4.64	8.80	9.05	6	1284	77	1368	22	6	22%	0.31	1	No flow (tubing collapsed). Repaired.
4-May-00	day/jc	4.62	4.64	8.80	9.05	6	1284	77	1368	0	0	0%		0	No flow (tubing leak). Tank emptied. System turned off.
8-May-00	mrh/jtf	9.05	9.05	9.05	9.05	0	0	0	0	0	0	0%		0	Original tubing replaced with silicon. System restarted at flow setting #3 (for 2 hr/day).
8-Jun-00	mrh/day	8.55	8.56	8.98	9.05	3	130	22	154	130	25	16%	0.80	5	Backfill settled around vault. Total depth shallow; measurements estimated. Tubing adjusted.
10-Jul-00	mrh/dms	8.10	8.11	8.90	9.05	3	244	46	293	114	25	18%	0.77	4	Tubing was worn; adjusted.
25-Aug-00	day	7.30	7.31	8.80	9.05	3	460	77	540	216	31	12%	0.67	5	Tubing adjusted.
20-Oct-00	mrh	6.25	6.26	8.64	9.05	3	735	127	865	275	49	15%	0.88	6	Tubing worn; adjusted.
30-Nov-00	mrh	5.75	5.77	8.55	9.05	6	858	154	1019	124	31	20%	0.75	4	Tubing worn; adjusted. Flow rate setting reduced from 3.0 to 1.5; timer not changed.
18-Jan-01	mrh	5.75	5.77	8.55	9.05	6	858	154	1019	0	0	---		0	Pump starts rough and sounds bad. Pump removed and sent in for repairs.
7-Feb-01	mrh/hs	5.75	5.77	8.55	9.05	6	858	154	1019	0	0	0%		0	Temporary FloJet pump installed but insufficient NPSH due to low creek elevation.
30-Mar-01	mrh	5.75	5.77	8.55	9.05	6	858	154	1019	0	0	0%		0	Peristaltic (geopump) installed, full speed, 600 rpm, system OK. NAPL is hi viscosity/settled.
10-Apr-01	mrh	5.70	5.72	8.51	9.05	6	861	167	1034	3	12	80%	1.12	1.4	3/16" id tubing replaced with 3/8" id tubing. Float switch replaced (plus relay).
18-May-01	dms/jc	5.65	5.68	8.52	9.05	9	877	164	1050	15	0	0%	0.00	0.4	Tubing worn and soft; adjusted.
30-Aug-01	mrh/hs	5.53	5.55	8.39	9.05	6	877	204	1087	0	37	100%	0.36	0.4	NAPL appears to be accumulated in well. Timer set to 3 hrs/day. Original peristaltic re-installed.
3-Oct-01	hs/jc	5.46	5.48	8.35	9.05	6	886	216	1108	9	12	57%	0.36	0.6	NAPL may still be accumulated in well. Timer increased to 4 hrs/day.
6-Nov-01	hs/jc	5.30	5.32	8.27	9.05	6	911	241	1158	25	25	50%	0.73	1.5	Additional NAPL purged from well after readings taken. Timer decreased to 3 hrs/day.
7-Feb-02	hs/jc	3.89	3.91	8.22	9.05	6	1331	256	1593	420	15	4%	0.17	4.7	Adjusted peristaltic tubing.
8-Mar-02	hs/jc	3.81	3.83	8.17	9.05	6	1340	272	1618	9	15	62%	0.53	0.9	Adjusted peristaltic tubing.
10-Apr-02	mrh	3.43	3.45	7.88	9.05	6	1368	361	1735	28	90	76%	2.71	3.6	Adjusted tubing. Installed piston pump for one day test (then removed). Timer increased to 4 hrs.
7-May-02	hs/jc	3.15	3.17	7.82	9.05	6	1436	380	1822	68	19	21%	0.69	3.2	Tank full.
7-May-02		9.05	9.05	9.05	9.05	0	0	0	0	---	---	---	---	---	Tank pumped out.
25-Jun-02	cd	6.00	6.02	9.02	9.05	6	926	9	942	926	15	2%	0.32	19.2	Depth's estimated. Pump set at #4, 3 hrs/day
2-Aug-02	mrh/jc	3.15	3.17	9.00	9.05	6	1800	15	1822	874	6	1%	0.16	23.2	Tank full, mostly water.
6-Sep-02	jc	3.15	3.17	9.00	9.05	6	1800	15	1822	0	0	0%	---	0.0	Tank Emptied.
6-Sep-02		9.05	9.05	9.05	9.05	0	0	0	0	0	0	---	---	---	
8-Oct-02	mrh/jc	8.98	8.98	8.98	9.05	0	0	22	22	0	22	100%	0.68	0.7	Pump removed for repair
18-Nov-02	cd	8.98	8.98	8.98	9.05	0	0	22	22	0	0	0%	---	0.0	Pump reinstalled
4-Feb-03	mrh/jc	4.32	4.32	8.95	9.05	0	1430	31	1460	1430	9	1%	0.12	18.4	Tank again full of mostly water (timer was left on manual?). Tank emptied.
4-Feb-03		9.05	9.05	9.05	9.05	0	0	0	0	---	---	---	---	---	
12-Mar-03	jc	9.00	9.00	9.00	9.05	0	0	15	15	0	15	100%	0.43	0.4	Pump running fast, so removed for evaluation/repair.
10-Apr-03	mrh/jc	9.00	9.00	9.00	9.05	0	0	15	15	0	0	0%		0.0	Pump reinstalled: runs fast/variable with no load, runs OK with flow load. Timer set to 30 min/day, speed 8.
23-Jul-03	mrh/jc	8.78	8.78	8.78	9.05	0	0	83	83	0	68	100%	0.51	0.7	Additional system checks/adjustments made by J Clark on 5/5, 5/20, 6/12, and 6/24.
23-Apr-04	mrh	8.05	8.06	8.55	9.05	3	151	154	309	151	74	33%	0.27	0.8	Additional system checks/adjustments made by NFG on 8/01, 8/06, 9/05, 9/08, 9/11, 9/17, 9/25, 10/30, 11/18.
24-Nov-04	jl,jc	7.31	7.32	8.54	9.05	3	377	157	537	225	3	1%	0.01	1.1	O/W Interface probe not acting precisely, actual DNAPL volume probably greater.
19-Apr-05	mh,jc,jl,sh	7.19	7.20	8.43	9.05	3	380	191	574	3	34	92%	0.23	0.3	Additional system checks/adjustments made by J Clark on 11/24, 1/20/2005, 3/7, 3/11, 4/12, 4/18.
27-Oct-05	mrh, jc	6.96	6.97	8.20	9.05	3	380	262	645	0	71	100%	0.37	0.4	New OWI probe, but readings inconsistent with previous readings. System checks by NFG 5/11, 6/24, 7/28, 8/25, 10/06.
22-Mar-06	mrh, jc	6.78	6.79	8.02	9.05	3	380	318	701	0	56	100%	0.38	0.4	Additional system checks by NFG 10/26/05, 12/14/05, 1/6/06, 2/24/06.
24-Oct-06	mrh, jc	4.90	4.91	7.38	9.05	3	763	516	1281	383	198	34%	0.91	2.7	Depth to NAPL reading is approximate. Additional system checks by NFG 5/11, 6/29, 7/26, 9/07.
2-Mar-07	jc, cb	3.36	3.37	7.15	9.05	3	1167	587	1757	404	71	15%	0.55	3.7	Pump turned off 3/02/07 because tank near full. Readings taken 4/25/07 . Depth to DNAPL reading is approximate.
23-Jun-07		9.05	9.05	9.05	9.05	0	0	0	0	---	---	---	---	---	Tank pumped out.
30-Oct-07	dms, jc	8.55	8.56	9.01	9.05	3	139	12	154	139	15	10%	0.06	1.2	Depth to DNAPL reading is approximate.

APPENDIX B2 - SOUTHERN DNAPL RECOVERY SYSTEM

Date	Initials	Field Measurements (by OWI probe)				Calculations (total tank contents) *				Calculations (this period recovery highlighted)					Operator's Notes
		Manhole rim to top of LNAPL (ft)	Manhole rim to top of Water (ft) (estimated)	Manhole rim to top of DNAPL (ft)	Manhole rim to bottom of Tank (ft)	LNAPL (gal)	Water (gal)	DNAPL (gal)	Total (gal)	Water Increase (gal)	NAPL Increase (gal)	% NAPL	NAPL (gpd)	Ave Recovery in GPD	
13-May-08	dms, jc	---	---	---	---	---	---	---	---	---	---	---	---	---	Data appears to be invalid.
25-Mar-09	jl, dz	7.90	7.91	8.90	9.05	3	306	46	355	167	34	17%	0.07	0.4	O/W interface probe is working accurately
10-Jul-09	tr, jc	7.73	7.74	8.71	9.05	3	300	105	408	300	108	27%	1.01	0.2	O/W interface probe is working accurately
6-Oct-09	tr, jc	7.23	7.24	9.04	9.05	3	556	3	562	556	6	1%	0.07	0.2	A skim of LNAPL and DNAPL were present, the thickness (not measureable) is estimated to be 0.01 ft.
21-Apr-10	tr, jc	6.30	6.31	8.40	9.05	3	645	201	849	645	188	23%	0.96	0.3	A skim of LNAPL was present, the thickness (not measureable) is estimated to be 0.01 ft.
7-Apr-11	tr, jc	5.40	5.40	8.05	9.05	0	818	309	1127	173	105	38%	0.30	0.8	A skim of LNAPL was present, the thickness (not measureable) is estimated to be 0.01 ft.
16-Jun-11	jc	9.05	9.05	9.05	9.05	0	0	0	0	---	---	---	---	---	Tank pumped out. Water and NAPL shipped offsite for disposal.
18-Apr-12	el	6.60	6.60	8.50	9.05	0	587	170	756	587	170	22%	0.55	2.5	Corrected depth to top of DNAPL and depth to bottom of tank measurements
29-Apr-13	tr, jc	6.12	6.12	8.50	9.05	0	735	170	905	148	0	0%	0	0.4	DNAPL measurement duplicated and accurate. Corrected depth to bottom of tank measurement.
23-May-13	jc	---	---	---	---	0	0	0	0	---	---	---	---	---	Tank pumped out. Water and NAPL shipped offsite for disposal.
23-Apr-14	el, jc	8.38	8.40	8.40	9.10	6	0	216	222	0	222	100%	0.66	0.7	Corrected depth to bottom of tank measurement.
21-May-15	kh	8.28	8.30	8.30	9.06	6	0	235	241	0	19	100%	0.05	0.0	Measurements by Op-Tech
20-Apr-16	kh	6.55	6.55	7.96	9.16	0	435	371	806	435	148	29%	0.20	0.39	Measurements by Op-Tech: weighted rope indicates 1.2 ft of DNAPL in tank. OWI probe did not sense DNAPL
20-Apr-17	kh, rf	6.55	6.55	7.73	9.06	0	364	411	775	435	188	29%	0.17	0.39	Measurements by GEI using weighted cotton string and measured stain height.
16-May-17	mc	---	---	---	---	---	---	---	---	---	---	---	---	---	Removed approximately 90 feet of collection tubing in the recovery with new 0.5 inch diameter PEX tubing . Pumped 4 gallons of water from well.
29-Jun-17	mc	---	---	---	---	---	---	---	---	---	---	---	---	---	High pressure jet cleaning (water lance) used to clean/improve hydraulic communication in well screen. NAPL collection tank emptied by Allied Env. Services, collection piping and vault flooring walls cleaned.
28-Sep-17	mc	8.86	8.86	8.86	9.06	0	0	62	62	0	62	100%	0.12	2.39	Measurements by GEI using weighted cotton string and measured stain height. Differentiation between water and NAPL difficult with this small of a quantity
26-Oct-17	mc	8.86	8.86	8.86		---	---	---	---	---	---	---	---	---	No measurements by GEI. A hole is burned through tubing at pump head. Tubing is replaced, and pumping 100% tar when started back up. Change pump sched to DST.
15-Feb-18	mc	8.86	8.86	8.86	9.06	0	0	62	62	0	trace	100%	trace	0.00	Measurements by GEI using weighted cotton string and measured stain height. Pump malfunction and less than 1/4 gallon DNAPL collected. Pump repaired.
26-Apr-18	mc	5.40	5.40	8.86	9.06	0	1068	67	1130	1	4	100%	trace	15.26	Measurements by GEI using weighted cotton string and measured stain height. 5 gal. liquid in hung bucket, ~4 gal DNAPL. >1000 gal pumped since 3/1. Turn pump rate down by 50%. Will check and re-evaluate.
12-Jul-18	mc	--	--	--	9.06	---	---	5.00	---	trace	5.00	100%	---	---	No measurements by GEI. National Fuel states approximately 5 gallons of NAPL accumulated in bucket hung in tank with bucket overflowing into tank.
16-Aug-18	mc	--	--	--	9.06	---	---	5.00	---	trace	5.00	100%	---	---	No measurements by GEI. National Fuel states approximately 5 gallons of NAPL accumulated in bucket hung in tank with bucket overflowing into tank.
20-Sep-18	mc	9.05	9.05	9.05	9.06	0	0	0	3	trace	trace	trace	trace	0.02	Measurements by GEI. No NAPL accumulated in bucket. Pump rate increased from "30" to "60". (NAPL Storage tank pumped May 2018)
25-Oct-18	mc	--	--	--	9.06	0	0	5	--	trace	5.0	trace	--	--	No measurements by GEI. National Fuel states approximately 5 gallons of NAPL accumulated in bucket hung in tank with bucket overflowing into tank.
16-Jan-19	mc	9.05	9	9.05	9.06	0	15	3	3	15	69.0	100%	0.58	0.03	Measurements by GEI. 5gal of NAPL in bucket hung in tank with bucket overflowing into tank. No adjustments to the system are recommended.
28-Feb-19	mc	8.8	8.8	8.85	9.06	0	15	65	80	0	64.8	84%	1.51	1.87	Measurements by GEI. 5gal of NAPL in bucket hung in tank with bucket overflowing into tank. No adjustments to the system are recommended.
28-Mar-19	mc	7.8	7.8	7.9	9.06	0	31	358	389	15	135.9	44%	4.85	13.89	Measurements by GEI. 5gal of NAPL in bucket hung in tank with bucket overflowing into tank. No adjustments to the system are recommended.
23-May-19	mc	7.4	7.4	7.5	9.06	0	31	482	513	0	240.8	100%	4.30	9.15	Measurements by GEI. 5gal of NAPL in bucket hung in tank with bucket overflowing into tank. No adjustments to the system are recommended.
27-Jun-19	mc	--	--	--	--	0	31	482	513	0.0	0.0	--	--	--	No measurements by GEI. National Fuel personnel states that 5 gallons of NAPL present in bucket hung in tank.
18-Jul-19	mc	7.5	7.5	7.5	9.06	0	31	482	513	0	0.0	0%	0	9.16	Measurements by GEI. Bucket hung in tank contains ~ 1 gallon NAPL (minimal water). Peristaltic tubing found to be flat and inoperational. Replaced and operating correctly following inspection.
16-Nov-19	mc	7.3	7.3	7.4	9.06	0	31	513	543	0	30.9	101%	0.22	3.83	Measurements by GEI. Bucket hung in tank contains ~4.50 gallons of water and 0.25 gallons of DNAPL. (NAPL storage tank pumped on this date.)
23-Jan-20	mc	9	9	9.03	9.06	0	9	9	19	9	9.0	100%	0.05	0.10	Measurements by GEI. Bucket hung in tank contains ~4.50 gallons of water and 0.25 gallons of DNAPL.
4-Apr-20	mc	9	9	9.03	9.06	0	9	9	19	0	0.0	0%	0	0.13	Measurements by GEI. Bucket hung in tank contains approximately 2 gallons of water and 3 gallons of DNAPL. Tubing replaced in each peristaltic pump head. Suspected tank shift following 11/2019 alternating total tank depth measurment.
25-Jun-20	mc	8.9	8.9	9	9.06	0	31	19	49	22	9.3	30%	0.06	0.32	Measurements by GEI. Bucket hung in tank contains approximately 1.5 gallons of water and 3.5 gallons of DNAPL. Peristaltic tubing in good condition.
27-Aug-20	mc	8.8	8.8	8.8	9.06	0	33	80	80	2	61.8	100%	0.43	0.55	Measurements by GEI. Bucket hung in tank contains approximately 1.5 gallons of water and 3.5 gallons of DNAPL. Peristaltic tubing in good condition.
26-Oct-20	mc	8.7	8.7	8.7	9.06	0	36	111	111	3	30.9	50%	0.25	0.90	Measurements by GEI. Bucket hung in tank contains approximately 1.0 gallons of water and 4.0 gallons of DNAPL. Peristaltic tubing in good condition.
12-Jan-21	mc	8.1	8.1	8.2	9.06	0	38	266	296	2	154.4	83%	1.98	3.80	Measurements by GEI. Bucket hung in tank contains approximately 3.0 gallons of water and 2.0 gallons of DNAPL. Tubing replaced in peristaltic pump head.
2-Mar-21	mc	NA	NA	7.68	9.06	NA	NA	426	426	NA	161	NA	3.28	2.65	Measurements by GEI. Bucket hung in tank contains approximately 2.5 gallons of water and 2.5 gallons of DNAPL. Tubing replaced in peristaltic pump head.
16-Apr-21	mc	NA	NA	NA	9.06	NA	NA		0	NA	NA	NA	NA	NA	Measurements by GEI. Bucket hung in tank contains approximately 2.5 gallons of water and 2.5 gallons of DNAPL. Tubing replaced in peristaltic pump head.
19-May-21	mc	NA	NA	7.56	9.06	NA	NA	463	463	NA	37	NA	1.12	0.09	Measurements by GEI. Bucket hung in tank contains approximately 3.0 gallons of water and 2.0 gallons of DNAPL. Tubing replaced in peristaltic pump head.
24-Jun-21	mc	NA	NA	7.56	9.06	NA	NA	463	463	NA	2	NA	0.06	0.00	Measurements by GEI. Bucket hung in tank contains approximately 3.0 gallons of water and 2.0 gallons of DNAPL. Tubing replaced in peristaltic pump head.
20-Aug-21	mc	7.50	7.50	7.46	9.06	0	53	494	547	3.0	2	NA	0.04	1.47	Measurements by GEI. Bucket hung in tank contains approximately 3.0 gallons of water and 2.0 gallons of DNAPL. Tubing replaced in peristaltic pump head.
2-Sep-21	rf	--	--	--	--	--	--	--	--	--	--	NA			No measurments made. Vault cleaned and downhole tubing replaced by SUN Environmental.
5-Oct-21	mc	7.40	7.40	7.46	9.06	0	57	495	552	4.0	1	NA	0.02	0.11	Measurements by GEI. Bucket hung in tank contains approximately 4 gallon of water and 1 gallon of DNAPL. Tubing replaced in peristaltic pump head.
5-Nov-21	rf	7.30	7.30	7.46	9.06	0	60	496	556	1.5	1	NA	0.02	0.13	Measurements by GEI. Bucket hung in tank contains approximately 1.5 gallon of water and 1.0 gallons of DNAPL. Tubing replaced in peristaltic pump head.
14-Jan-22	mc	--	--	--	--	--	--	--	--	--	--	--	--	--	Bucket is empty. Failure of peristaltic tubing. Tubing replaced and pump function verified.
3-Feb-22	mc	--	--	--	--	--	--	--	--	--	--	--	--	--	No measurments made. Exhaust vent installed to mitigate moisture buildup in vault.
17-Feb-23	rf	6.12	6.12	7.46	9.06	NM	414	499	913	353.8	5	<1	<0.01	<0.001	See Appendix B1 for details of 2022 Observations, measurements, adjustments
31-Dec-23	mc	7.20	7.20	8.96	9.06	0	580	3	583	580.0	3	<1	<0.01	<0.001	See Appendix B1 for details of 2023 Observations, measurements, adjustments. Measured volumes include water/DNAPL generated during enhanced recovery testing.
13-Dec-24	mc	4.60	4.60	8.96	9.06	0	1230	0	1230	1230.0	0	<1	<0.01	<0.001	See Appendix B1 for details of 2024 Observations, measurements, adjustments. Measured volumes include water/DNAPL generated during enhanced recovery testing.
12-Dec-25	mc	6.60	6.60	8.96	9.06	0	780	0	780	780.0	0	<1	<0.01	<0.001	See Appendix B1 for details of 2025 Observations, measurements, adjustments. Measured volumes include water/DNAPL generated during enhanced recovery testing.

NM - Not Measurable

Cumulative gallons : 15,356 3,557

Appendix B.3. Historical Summary- North Vault DNAPL Recovery Monitoring System

APPENDIX B3 - NORTHERN DNAPL RECOVERY SYSTEM

Date	Initials	Field Measurements (by OWI probe)				Calculations (total tank contents) *				Calculations (this period recovery highlighted)					Operator's Notes
		Manhole rim to top of LNAPL (ft)	Manhole rim to top of Water (ft) (estimated)	Manhole rim to top of DNAPL (ft)	Manhole rim to bottom of Tank (ft)	LNAPL (gal)	Water (gal)	DNAPL (gal)	Total (gal)	Water Increase (gal)	DNAPL Increase (gal)	% NAPL	NAPL (gpd)	Ave. Recovery in GPD	
28-Nov-01	mrh/cd	8.89	8.89	8.89	8.89	0	0	0	0	0	0	0%	0.00	0.0	Develop well with hand operated diaphragm pump. Measurements are approximate.
7-Feb-02	hs/jc	8.62	8.62	8.85	8.89	0	71	12	83	71	12	15%	0.17	1.2	Pump well by hand.
8-Mar-02	hs/jc	8.61	8.61	8.85	8.89	0	74	12	86	3	0	0%	0.00	0.1	Pump well by hand.
10-Apr-02	mrh	8.59	8.59	8.84	8.89	0	77	15	93	3	3	50%	0.09	0.2	Pump well by hand.
7-May-02	hs/jc	8.51	8.51	8.83	8.89	0	99	19	117	22	3	12%	0.11	0.9	Hand pump not working well.
25-Jun-02	cd	8.51	8.51	8.83	8.89	0	99	19	117	0	0	0%	0.00	0.0	Hand pump not working. Discarded.
2-Aug-02	mrh/jc	8.51	8.51	8.83	8.89	0	99	19	117	0	0	0%	0.00	0.0	Begin peristaltic startup. Setting #6.5, 2hr 15 min per day
8-Oct-02	mrh/jc	7.43	7.44	8.55	8.89	3	343	105	451	244	90	27%	1.34	5.0	Additional system checks/adjustments made by J Clark on 8/15, 8/21, 8/27, 9/09, and 9/12.
4-Feb-03	mrh/jc	7.36	7.37	8.52	8.89	3	355	114	472	12	9	43%	0.08	0.2	Numbers approximate. Surface of contents frozen. Turn on heat.
10-Apr-03	mrh/jc	7.28	7.29	8.50	8.89	3	374	120	497	19	6	25%	0.10	0.4	Pumping mostly water, changed timer to 30 min/week.
23-Jul-03	mrh	7.05	7.06	8.49	8.89	3	442	124	568	68	3	4%	0.03	0.7	Additional system checks/adjustments made by J Clark on 5/5, 5/20, 6/12, and 6/24.
23-Apr-04	mrh	6.90	6.91	8.42	8.89	3	466	145	614	25	22	47%	0.08	0.2	Additional system checks/adjustments made by NFG on 8/01, 8/06, 9/05, 9/08, 9/11, 9/17, 9/25, 10/30, 11/18.
24-Nov-04	jl, jc	6.66	6.67	8.41	8.89	3	537	148	689	71	3	4%	0.01	0.3	OWI interface probe not working accurately, depth of DNAPL is estimated.
19-Apr-05	mh,jc,jl,sh	6.45	6.46	8.39	8.89	3	596	154	753	59	6	10%	0.04	0.4	Additional system checks/adjustments made by J Clark on 11/24, 1/20/2005, 3/7, 3/11, 4/12, 4/18.
26-Oct-05	mrh, jc	6.33	6.34	8.30	8.89	3	605	182	790	9	28	75%	0.15	0.2	New OWI probe, but readings inconsistent with previous readings. System checks by NFG 5/11, 6/24, 7/28, 8/25, 10/06.
22-Mar-06	mrh, jc	6.20	6.21	8.23	8.89	3	624	204	831	19	22	54%	0.15	0.3	Additional system checks by NFG 10/26/05, 12/14/05, 1/6/06, 2/24/06.
24-Oct-06	mrh, jc	5.20	5.21	7.89	8.89	3	828	309	1139	204	105	34%	0.49	1.4	Depth to NAPL reading is approximate. Additional system checks by NFG 5/11, 6/29, 7/26, 9/07.
25-Apr-07	mrh, jc	4.90	4.91	7.80	8.89	3	892	337	1232	65	28	30%	0.15	0.5	Depth to NAPL reading is approximate. Additional system checks by NFG 10/31/2006, 11/16/2006, 3/02/2007.
30-Oct-07	dms, jc	4.68	4.69	7.70	8.89	3	929	367	1300	37	31	45%	0.16	0.4	Depth to NAPL reading is approximate. Tubing changed out.
13-May-08	dms, jc	3.46	3.47	7.65	8.89	3	1291	383	1677	361	15	4%	0.08	1.9	Depth of DNAPL is estimated. Additional system checks by NFG on 1/08/08, 3/20/08 and 5/08/08. Tank pumped out.
25-Mar-09	jl, dz	8.75	8.76	8.88	8.89	3	37	3	43	34	9	20%	0.03	0.1	Data for depth to DNAPL changed to prevent table indicating a reduction in NAPL volume. Actual measurement 8.87.
8-Jun-09	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Covered exposed fabric on the bank and on the creek bed with angular stone.
10-Jul-09	tr, jc	8.46	8.47	8.88	8.89	3	127	3	133	90	0	0%	0.00	0.8	OWI interface probe is working accurately
23-Sep-09	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	J Clark changed pum run time from 45 minutes to 30 minutes.
6-Oct-09	tr, jc	8.08	8.09	8.88	8.89	3	244	3	250	117	0	0%	0.00	1.3	A skim of LNAPL and DNAPL were present, the thickness (not measureable) is estimated to be 0.01 ft.
14-Jan-10	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	J. Clark repaired air vent hose.
24-Feb-10	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Repaired hose.
26-Mar-10	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Fabric visible on east side of creek.
21-Apr-10	tr, jc, tc	8.00	8.01	8.88	8.89	3	269	3	275	25	0	0%	0.00	0.1	A skim of LNAPL and DNAPL were present, the thickness (not measureable) is estimated to be 0.01 ft. Damage to armor stone observed by sheet pile wall.
21-Aug-10	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Changed tubing.
21-Oct-10	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Reset time.
	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Additional checks made by J. Clark on 5/20, 6/24, 7/22, 9/16, 11/18, 12/17, and 1/27/11. No adjustments made.
7-Apr-11	tr, jc	4.27	4.28	8.88	8.89	3	1420	3	1427	1152	0	0%	0.00	3.3	A skim of LNAPL and DNAPL were present, the thickness (not measureable) is estimated to be 0.01 ft.
16-Jun-11	jc	8.89	8.89	8.89	8.89	0	0	0	0	---	---	---	---	---	Tank pumped out. NAPL and water transported to offsite treatment facility.
18-Apr-12	el, jc	8.85	8.85	8.83	8.89	0	-6	19	12	-6	10	81%	0.03	0.0	Measured water and NAPL levels. Corrected depth to top of DNAPL and depth to bottom of tank measurements.
29-Apr-13	tr, jc	2.87	2.87	8.83	8.89	0	1840	19	1859	1846	1	0%	0.00	4.9	Estimate approximately 1/2 inch DNAPL. Corrected depth to bottom of tank measurement.
23-May-13	jc	---	---	---	---	0	0	0	0	---	---	---	---	---	Tank pumped out. NAPL and water transported to offsite treatment facility.
23-Apr-14	el, jc	7.58	7.58	8.82	8.89	0	383	22	404	383	22	5%	0.06	1.2	Estimate approximately 3/4 inch DNAPL. Corrected depth to bottom of tank measurement.
21-May-15	kh	6.95	6.95	8.80	8.88	0	571	25	596	188	3	2%	0.01	0.5	Measurements by Op-Tech
20-Apr-16	kh,rw	6.55	6.55	8.77	8.88	0	685	34	719	114	9	7%	0.03	0.4	Measurements by Op-Tech
20-Apr-17	kh, rf	6.49	6.49	8.71	8.88	0	685	52	738	0	19	100%	0.05	0.1	Measurements by GEI weighted cotton string (stain height). Changed 62 ft of discharge tubing.
29-Jun-17	mc	---	---	---	---	---	---	---	---	---	---	---	---	---	NAPL collection tank emptied by Allied Env. Services,
29-Sep-17	mc	8.60	8.60	8.60	8.88	0	0	86	86	0	86	100	0.93	4	Measurements by GEI using weighted cotton string and measured stain height. Differentiation between water and NAPL difficult with this small of a quantity
26-Oct-17	mc	8.60	8.60	8.60	8.88	0				0	2				Measurements by GEI. Bucket hung in tank contains ~3.5 gallons, approximately 50% of which is NAPL, 50% water. Change pump sched to DST.
15-Feb-18	mc	8.60	8.60	8.60	8.88	0	0	86	86	4.5	0.25	0%	0.00	0.0	Measurements by GEI. Bucket hung in tank contains 4.5 gallons of water and 0.25 gallons of DNAPL.
26-Apr-18	mc	8.20	8.20	8.60	8.88	0	124	86	210	4.5	0.25	5%	0.00	1.2	Measurements by GEI. Bucket hung in tank contains ~4.75 gallons of water and 0.25 gallons of DNAPL.
12-Jul-18	mc	--	--	--	8.88	---	2.00	2	4.00	2.00	2.00	50%	---	---	No measurements by GEI. National Fuel personnel states that 3-5 gallons of oil/water (50%/50%) mixture present in bucket hung in tank.
16-Aug-18	mc	--	--	--	8.88	---	2.00	2	4.00	2.00	2.00	50%	---	---	No measurements by GEI. National Fuel personnel states that 3-5 gallons of oil/water (50%/50%) mixture present in bucket hung in tank.
20-Sep-18	mc	8.76	8.76	8.76	8.88	0	2	2	4	1.5	2.00	43%	--	--	Measurements by GEI. Bucket hung in tank contains ~1.5 gallons of water and 2 gallons of DNAPL. (NAPL storage tank pumped May 2018)
25-Oct-18	mc	--	--	--	---	---	2	2	4	2.00	2.00	50%	--	--	No measurements by GEI. National Fuel personnel states that 3-5 gallons of oil/water (50%/50%) mixture present in bucket hung in tank.
16-Jan-19	mc	8.76	8.76	8.76	8.88	0	2	3	3	2.0	2.50	100%	0.02	0.8	Measurements by GEI. Bucket hung in tank contains ~2.5 gallons of NAPL. Pump was not running during inspection, but breaker was reset and was running at the close of the inspection. Consider increasing pump speed.
28-Feb-19	mc	7.80	7.80	8.60	8.88	0	247	86	333	245.0	84	25%	-	0.1	Measurements by GEI. Bucket hung in tank contains 5 gallons of NAPL. Pump was not running during inspection. Relay reset but only works momentarily and runs pump controller at "600" setting. Pump controller removed for inspection/repair.
28-Mar-19	mc	--	--	--	---	---	---	---	---	---	---	---	--	--	No measurements made. Peristaltic pump out for repair. Rental pump acquired and placed in service on this date.
23-May-19	mc	7.80	7.80	8.60	8.88	0	247	86	333	0.0	0	0%	-	0.0	Measurements by GEI. Bucket hung in tank contains ~ 4 gallons NAPL (minimal water). Pump was repaired and placed back in service on May 16 (double check). Increase pump speed from 80 to 100.
27-Jun-19	mc	--	--	--	---	---	---	---	333	---	---	---	-	--	No measurements by GEI. National Fuel personnel states that 5 gallons of NAPL present in bucket hung in tank.
18-Jul-19	mc	7.75	7.75	8.55	8.88	0	247	102	349	1.0	15	100%	-	-	Measurements by GEI. Bucket hung in tank contains ~ 5 gallons NAPL (minimal water).
26-Nov-19	mc	7.70	7.70	8.51	8.88	0	250	114	364	3.1	12	100%	-	-	Measurements by GEI. Bucket hung in tank contains ~4.50 gallons of water and 0.25 gallons of DNAPL. NAPL storage tank pumped on this date.
23-Jan-20	mc	8.80	8.80	8.80	8.88	0	5	0	5	5.0	0	--	0.00	-	Measurements by GEI. Bucket hung in tank contains ~4.50 gallons of water and 0.25 gallons of DNAPL.
4-Apr-20	mc	8.80	8.80	8.88	8.88	0	25	0	25	19.7	0	0%	-	-	Measurements by GEI. Bucket hung in tank contains approximately 2 gallons of water and 3 gallons of DNAPL. Tubing replaced in the peristaltic pump head. Suspected tank shift following 11/2019 alternating total tank depth measurement.
25-Jun-20	mc	8.80	8.80	8.88	8.88	0	25	0	25	0.0	0	0%	-	-	Measurements by GEI. Bucket hung in tank contains minimal water and 2 gallons of DNAPL. Tubing replaced in the peristaltic pump head.
27-Aug-20	mc	---	---	---	---	---	---	---	---	---	---	---	--	--	North vault could not be accessed due to a broken key.
26-Oct-20	mc	8.00	8.00	8.58	8.88	0	179	93	272	154.4	93	34%	-	-	Measurements by GEI. Bucket hung in tank contains approximately 1 gallon of water and 4 gallons of DNAPL. Tubing replaced in the peristaltic pump head.
23-Nov-20	mc	--	--	--	---	---	---	---	---	---	---	---	--	--	No measurements made. Inspection of creek banks following Lake Erie seche event and high water along creek corridor.
28-Dec-20	mc	--	--	--	---	---	---	---	---	---	---	---	--	--	No measurements made. Inspection of creek banks following Lake Erie seche event and high water along creek corridor.
12-Jan-21	mc	7.80	7.80	8.58	8.88	0	241	93	333	61.8	0	28%	-	-	Measurements by GEI. Bucket hung in tank contains approximately 2 gallon of water and 1 gallon of DNAPL. Tubing replaced in the peristaltic pump head.
2-Mar-21	mc	--	--	--	---	---	---	---	---	---	---	---	--	--	Peristaltic pump replacement following pump failure in February 2021. No new measurements made.
16-Apr-21	mc	8.00	8.00	8.58	8.88	0	243	96	339	2.0	3	28%	--	--	Measurements by GEI. Bucket hung in tank contains approximately 3 gallons of DNAPL and 2 gallons of water. Tubing replaced in the peristaltic pump head.
19-May-21	mc	7.95	7.95	8.58	8.88	0	246	99	345	2.5	3	29%	--	--	Measurements by GEI. Bucket hung in tank contains approximately 2.5 gallons of DNAPL and 2.5 gallons of water. Tubing replaced in the peristaltic pump head.
24-Jun-21	mc	--	--	--	---	---	---	---	---	---	---	---	--	--	Bucket fell in tank and was replaced. NAPL thickness measured at 0.3'.
20-Aug-21	mc	7.70	7.70	8.58	8.88	0	247	101	348	1.0	2	29%	--	--	Measurements by GEI. Bucket hung in tank contains approximately 2 gallons of DNAPL and 1 gallon of water. Tubing replaced in the peristaltic pump head. (1)
2-Sep-21	rf	--	--	--	---	---	---	---	---	---	---	---	--	--	No measurements made. Vault cleaned and tank emptied and downhole tubing replaced by SUN Environmental.
5-Oct-21	mc	8.70	8.70	8.74	8.88								--	--	Measurements by GEI. Bucket hung in tank contains approximately 2 gallons of DNAPL and 3 gallon of water. Tubing replaced in the peristaltic pump head.(1)
5-Nov-21	rf	8.70	8.70	8.70	8.88	0	0	67	67	0.0	67	100%	--	--	Measurements by GEI. Bucket hung in tank contains approximately 1 gallon of DNAPL and 0.5 gallon of water. Tubing replaced in the peristaltic pump head. (1) Corrected on 3-24-23 for transcription error.
14-Jan-22	mc	--	--	--	---	---	---	---	---	---	---	---	--	--	Bucket is empty. The power supply to the peristaltic pump failed due to excessive moisture. Active venting of both vaults recommended.
3-Feb-22	mc	---	---	---	---	---	---	---	---	---	---	---	--	--	Exhaust vent installed to mitigate moisture buildup in vault.
22-Apr-22	mc	8.15	8.15	8.23	8.88	0	25	201	225	25	134	--	--	--	Full bucket with only a trace of DNAPL. Advanced tubing in pump.
17-Feb-23	rf	7.35	7.35	8.08	8.88	0	225	247	472	225	46	--	--	--	See Appendix B1 for details of 2022 Observations, measurements, adjustments
21-Dec-23	mc	7.15	7.15	9.10	9.2	0	640	18	658	640	18	--	--	--	See Appendix B1 for details of 2023 Observations, measurements, adjustments. Measured volumes include water/DNAPL generated during enhanced recovery testing.
13-Dec-24	mc	9.20	4.60	9.10	9.2	0	1435	12.9	1435	1435	12.9	--	--	--	See Appendix B1 for details of 2024 Observations, measurements, adjustments. Measured volumes include water/DNAPL generated during enhanced recovery testing.
12-Dec-25	mc	5.85	5.85	9.10	9.06	0	1045	0	1045	1045.0	8	--	--	--	See Appendix B1 for details of 2025 Observations, measurements, adjustments. Measured volumes include water/DNAPL generated during enhanced recovery testing.
Cumulative gallons :										8048	1054				

Note: (1) DNAPL volume estimates were adjusted for 2021 to correct an error in volume calculation for Aug 20 2021 and measurements recorded in Oct and Nov '21 after tank was emptied in Oct 2021

Appendix C 2025 Enhanced Recovery Field Reports

Appendix C.1. March 29, 2025, Field Report

Appendix C.2. June 20, 2025, Field Report

Appendix C.3. August 19, 2025, Field Report

Appendix C.4. November 25, 2025, Field Report

Site Management Periodic Review Report (2025)

Site No. 915141B

NFG - Iroquois Gas/Westwood Pharmaceutical Riparian Site, Buffalo, New York

January 2026

Appendix C.1. March 29, 2025, Field Report

Daily Field Notes



Project Name: Scajaquada- Riparian Site	Date: 3/28/2025
Project Number: 1403480	Purpose of Site Visit: Pumping tests (High-Rate) of DNAPL collection system in north and south vaults.
Site Name/Address: West Ave, Buffalo NY	
Arrival Time: 07:45 A.M	Departure Time: 11:45 A.M.

Weather:	
Temperature: 30 °F	Sky Condition: Partly Cloudy
Wind: 5-10 mph	Precipitation: None

GEI Representatives	Onsite Personnel	Company
Michael Cummings, P.G.	Gary, Austin, Don	Sun Environmental (Sun)
Josh Prygon	Katie Hoelscher	National Fuel Gas

Field Equipment	Equipment Make	Equipment Model	Serial #	Calibration Date	Calibration Time
Trash pump	Predator	NA	NA	NA	NA
Water level meter	Solinst	NA	NA	NA	NA
5-Gallon Buckets	NA	NA	NA	NA	NA

Time	Notes	Photographs
0830 AM (beginning of high rate extraction)	All personnel on Site-begin High Rate Extraction at 8:30 AM Initial depth to water is 8.5' Water quality is lightly silty brown with light H₂S odor. No other odors or sheens noted. Initial flow rate is 2.75 gpm.	No photographs taken during South Vault extraction event.
0840	Discharge water is silty black with strong H ₂ S odor. Flow rate is 2.5 gpm. No other odors or sheens noted.	

Daily Field Notes

0855	Discharge water is lightly silty with strong H2S odor. Flow rate is 2.5 gpm. No other odors or sheens noted.	
0915	No change in discharge water quality. Flow rate is 2.5 gpm.	
0930	Enhanced Recovery pumping complete at south vault. Final water quality is clear with moderate H2S odor, no other odors or sheens noted. Final DTW in South vault is: 8.1'. Approximately 150 gallons pumped into storage tank in the vault during testing.	

1015	Begin Enhanced Recovery pumping at the North Vault. Initial water quality is very silty black with 10-20% coal tar like material, strong coal tar like odor, separate NAPL phase. This water quality observations persist for approximately the first 15 gallons of discharge. Flow rate is 3.0 gpm.	Photograph 2: Initial discharge at North Vault 
1030	Water quality becoming clear to slightly silty with moderate to strong sheen and moderate coal tar like odor. Flow rate is 3.0 gpm.	

Daily Field Notes

1045	Discharge water quality is clear with slight sheen and coal tar like odor.	
1115	Final water quality is clear with slight sheen and coal tar like odor. End of Enhanced Recovery testing at 11:05. Final Depth to water in tank is 7.9'. Approximately 180 gallons pumped into north vault storage tank.	

Signed By: Michael A. Cummings, P.G.	Date/Time:
	3/28/2025 15:00

Appendix C.2. June 20, 2025, Field Report

Daily Field Notes

Project Name: Scajaquada- Riparian Site	Date: 6/20/2025
Project Number: 1403480	Purpose of Site Visit: Pumping tests (High-Rate) of DNAPL collection system in north and south vaults.
Site Name/Address: West Ave, Buffalo NY	
Arrival Time: 07:45 A.M	Departure Time: 11:45 A.M.

Weather:	
Temperature: 70°F	Sky Condition: Clear Skies
Wind: 0-5 mph	Precipitation: None

GEI Representatives	Onsite Personnel	Company
Michael Cummings, P.G.	Gary, Austin, Don	Sun Environmental (Sun)
Rick Frappa, P.G.	Katie Hoelscher	National Fuel Gas

Field Equipment	Equipment Make	Equipment Model	Serial #	Calibration Date	Calibration Time
Trash pump	Predator	NA	NA	NA	NA
Water level meter	Solinst	NA	NA	NA	NA
5-Gallon Buckets	NA	NA	NA	NA	NA

Time	Notes	Photographs
0830 AM (beginning of high rate extraction)	All personnel on Site-begin High Rate Extraction at 8:30 AM Peristaltic pump in the south vault malfunctioned in May 2025 and will be replaced. No measurements of water quantity in the tank were taken. Water quality is lightly silty brown with light H2S odor. No other odors or sheens noted. Initial flow rate is 3.0 gpm.	 Photograph 1: Initial water quality in south vault.

0840	Discharge water is silty black with strong H ₂ S odor. Flow rate is 2.5 gpm. No other odors or sheens noted.	 Photograph 2: Pumping at South Vault
0855	Discharge water is lightly silty with strong H ₂ S odor. Flow rate is 2.5 gpm. No other odors or sheens noted.	
0915	No change in discharge water quality. Flow rate is 2.5 gpm.	
0930	Enhanced Recovery pumping complete at south vault. Final water quality is clear with moderate H₂S odor, no other odors or sheens noted. Final DTW in South vault is 7.6' Approximately 150 gallons pumped into storage tank in the vault during testing.	

1005	Begin Enhanced Recovery pumping at the North Vault. Initial water quality is very silty black with 10-20% coal tar like material, strong coal tar like odor. This water quality observations persist for approximately the first 20 gallons of discharge. Flow rate is 3.5 gpm.	 Photograph 2: Discharge at North Vault
1020	Water quality becoming clear to slightly silty with moderate to strong sheen and moderate coal tar like odor. Flow rate is 3.5 gpm.	 Photograph 3: Discharge at North Vault after 15 minutes of pumping.

Daily Field Notes

1040	Discharge water quality is clear with slight sheen and coal tar like odor.	 Photograph 4: Pumping at North Vault.
1105	Final water quality is clear with slight sheen and coal tar like odor. End of Enhanced Recovery testing at 11:05. Final Depth to water in tank is 7.3'. Approximately 210 gallons pumped into north vault storage tank.	

Signed By: Michael A. Cummings, P.G.	Date/Time:
	6/20/2025 15:00

Appendix C.3. August 19, 2025, Field Report

Daily Field Notes

Project Name: Scajaquada- Riparian Site	Date: 9/19/2025
Project Number: 1403480	Purpose of Site Visit: Pumping tests (High-Rate) of DNAPL collection system in north and south vaults.
Site Name/Address: West Ave, Buffalo NY	
Arrival Time: 07:45 A.M	Departure Time: 11:45 A.M.

Weather	
Temperature: 60-70°F	Sky Condition: Overcast
Wind: 0-10 mph	Precipitation: None

GEI Representatives	Onsite Personnel	Company
Michael Cummings, P.G.	Gary, Tim, Brett	Sun Environmental (Sun)
Jessica Paskie	Katie Hoelscher	National Fuel Gas

Field Equipment	Equipment Make	Equipment Model	Serial #	Calibration Date	Calibration Time
Trash pump	Predator	NA	NA	NA	NA
Water level meter	Solinst	NA	NA	NA	NA
5-Gallon Buckets	NA	NA	NA	NA	NA

Time	Notes	Photographs
0830 (beginning of high-rate extraction)	High-rate extraction began at 8:30 A.M. Initial depth to water is 7.6 feet.	
0835	Discharge water is silty black with strong H ₂ S odor. Flow rate is 2.75 gal/min. No other odors or sheens noted.	 Photograph 1: Pumping at South Vault
0840	Discharge water has slight coal tar like odor and light sheen.	
0850	Discharge water is medium gray and becoming less silty.	
0855	Discharge water is clear.	

0900	Discharge water is clear with a strong H₂S odor. Flow rate is 2.5 gal/min.	 Photograph 2: Discharge at South Vault.
0930	Enhanced Recovery pumping complete at south vault. Final water quality is clear with moderate H₂S odor, no other odors or sheens noted. Final depth to water is 7.15 feet. Approximately 150 gallons pumped into storage tank in the vault during testing.	
1005	Begin Enhanced Recovery pumping at the North Vault. Initial water quality is very silty black with 20% separate phase coal tar like material, strong coal tar like odor, heavy staining for the first 10-15 gallons. Initial depth to water is 7.0 feet.	 Photograph 3: Initial water quality at North Vault

1010	Test stopped due to low/no flow. This was discovered to be the result of tubing that was poorly sealed.	
1015	Tubing resealed and Enhanced Recovery pumping restarted at the North Vault.	
1020	Discharge water is very silty black with 25% separate phase coal tar like material, strong coal tar like odor, heavy NAPL sheen. Flow rate is 2.5 gal/min.	 Photograph 4: Discharge at North Vault
1025	Discharge water is medium brown, lightly silty with <10% coal tar like material, strong coal tar like odor, heavy NAPL sheen.	 Photograph 5: Discharge at North Vault after 10 minutes of pumping.

1030	Discharge water is lightly silty with 1% coal tar like material, strong coal tar like odor, heavy NAPL sheen. Flow rate is 2.5 gal/min.	 Photograph 6: Discharge at North Vault after 15 minutes of pumping
1045	Discharge water is clear, heavy NAPL sheen. Flow rate is 2.75 gal/min.	 Photograph 7: Discharge water at North Vault after 30 minutes of pumping
1115	Enhanced Recovery pumping complete at North Vault. Final water quality is clear with slight sheen and coal tar like odor. Flow rate is 2.75 gal/min. Final depth to water is 6.53 feet. Approximately 165 gallons pumped into north vault storage tank.	 Photograph 8: Final water quality at North Vault

Daily Field Notes



Signed By: Michael A. Cummings, P.G.	Date/Time:
	9/19/2025 15:00

Appendix C.4. November 25, 2025, Field Report

Daily Field Notes



Project Name: Scajaquada- Riparian Site	Date: 11/25/2025
Project Number: 1403480	Purpose of Site Visit: Pumping tests (High-Rate) of DNAPL collection system in north and south vaults.
Site Name/Address: West Ave, Buffalo NY	
Arrival Time: 07:45 A.M	Departure Time: 11:45 A.M.

Weather	
Temperature: 40°F	Sky Condition: Overcast
Wind: 0-5 mph	Precipitation: None

GEI Representatives	Onsite Personnel	Company
Michael Cummings, P.G.	Gary, Tim, Brett	Sun Environmental (Sun)
Jessica Paskie	Katie Hoelscher	National Fuel Gas

Field Equipment	Equipment Make	Equipment Model	Serial #	Calibration Date	Calibration Time
Trash pump	Predator	NA	NA	NA	NA
Water level meter	Solinst	NA	NA	NA	NA
5-Gallon Buckets	NA	NA	NA	NA	NA

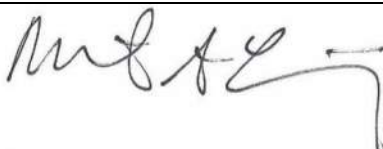
Time	Notes	Photographs
0830 (beginning of high-rate extraction)	High-rate extraction began at 8:30 A.M. Initial depth to water is 7.01 feet.	
0835	Discharge water is clear with strong H ₂ S odor. Flow rate is 2.5 gal/min.	
0845	Flow rate is 2.0 gpm, water quality as above	
0900	Discharge water is clear with strong H ₂ S odor	
0915	Discharge water is clear with a strong H ₂ S odor. Flow rate is 2.0 gal/min.	
0930	Enhanced Recovery pumping complete at south vault. Final water	

Daily Field Notes

	quality is clear with moderate H₂S odor, no other odors or sheens noted. Final depth to water is 6.70 feet. Approximately 120 gallons pumped into storage tank in the vault during testing.	
1000	Begin Enhanced Recovery pumping at the North Vault. Initial water quality is very silty black with 20% separate phase coal tar like material, strong coal tar like odor, heavy staining. Flow rate is 2.5 gpm. Initial depth to water is 6.40 feet.	
1015	Discharge water is slightly turbid with heavy NAPL sheen and strong coal tar like odor. Flow rate is 2.5 gal/min.	

Daily Field Notes

1030	Discharge water quality as above, flow rate 2.5 gpm.	
1045	Discharge water is quality as above, Flow rate is 2.5 gal/min.	
1100	Enhanced Recovery pumping complete at North Vault. Final water quality is clear with heavy sheen and coal tar like odor. Flow rate is 2.5 gal/min. Final depth to water is 5.90 feet. Approximately 180 gallons pumped into north vault storage tank.	

Signed By: Michael A. Cummings, P.G.	Date/Time:
	11/25/2025 15:00