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Chelmsford, MA 01824
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March 7, 2012

Mr. Glenn May, C.P.G.
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, NY 14203

Subject: 2011 Periodic Review Report
Scajaquada Creek Site (#915141B), Buffalo, NY

Dear Mr. May,

National Fuel Gas Distribution Corporation (NFG) completed construction on the remedial action for the Scajaquada Creek site in August 2002. Since then, NFG has performed operations and maintenance (O&M) activities for the remedy for the site in accordance with the 2005 O&M Plan for the site. Those activities have included preparation of semi-annual reports. In a letter dated July 9, 2009, NFG proposed modification to the O&M Plan, which included decreasing the frequency of O&M reporting from semi-annual to annual and decreasing the frequency of DNAPL measurements from quarterly to annually. The New York State Department of Environmental Conservation (NYSDEC) agreed upon these changes in a letter dated December 2, 2009. Because of changes in NYSDEC reporting requirements, AECOM has prepared this Periodic Review Report (PRR) on behalf of NFG rather than an O&M Report to meet the reporting requirements of the O&M Plan. This PRR summarizes activities that have occurred from February 2011 to February 2012. The required Institutional and Engineering Controls Certification Form is included in Attachment 1.

1.0 Introduction

The Scajaquada Creek site is the riparian portion of the Iroquois Gas/Westwood Pharmaceutical (IG/WP) site in a mixed industrial and residential area of Buffalo, New York. The site comprises a 1,600-foot long reach of Scajaquada Creek. Manufactured gas plant (MGP) operations were conducted on the site from the 1890's 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 contaminants were migrating into the creek. Remedial activities (i.e., sheet pile wall installation, sediment excavation, capping and installation of DNAPL recovery systems) have been performed since 1999 to address these impacts.

This PRR presents and evaluates the results of O&M activities performed at the site over the past year and since the remedial action was completed in 2002. The O&M activities include inspections of the cap, the creek banks, and the site restoration elements and maintenance checks on the northern and southern DNAPL systems. Data collection during performance of these activities is presented in Attachment 2 and evaluation of the effectiveness of the remedy is presented below.

The remedial action has been operated in accordance with the provisions of the O&M Plan and engineering controls remain intact and effective except as noted below. During this year's annual inspection, significant maintenance requirements for the sediment cap, which were originally

observed in 2010, were still present. Even so, observations show that the cap continues to be effective in preventing human and environmental contact with contaminants related to past MGP operations. Maintenance and repair activities for the sediment cap which took place since February 2011 are described in this report. The DNAPL recovery program continues and both recovery systems continue to function properly. DNAPL recovery has reduced significantly from original flows at system startup.

2.0 Site Overview

The Scajaquada Creek site lies in an industrial area of Buffalo. The site comprises a 1,600-foot long reach of Scajaquada Creek extending from a location about 400 feet northeast of the former (abandoned) Conrail Railroad Bridge downstream to the West Avenue Bridge. The site comprises an area of about 2.5 acres. Much of the site is bounded by steep banks. Portions of the site are beneath the elevated I-198 Scajaquada Expressway. The Expressway is supported by concrete piers which are set in the creek bed and along the banks.

The creek flows through a zone of active and inactive industrial facilities upstream and downstream of the site. Untreated sewage has been observed flowing into Scajaquada Creek from combined sewers in upstream locations and through the outfall on the east bank of the site. The creek normally flows southwest into the Black Rock Canal of the Niagara River, approximately one-half mile downstream. When the level of the Black Rock Canal rises above the creek level, however, the flow direction at the site is reversed.

In 1996, NFG constructed a sheet pile wall along the southern bank of the creek, adjacent to the IG/WP property. The sheet pile wall was an initial component of the remedial action. NFG conducted the sediment remedial design in 1997/1998 and received approval for the design in June 1998. Remedial excavation and capping was started in July 1998 and completed in May 1999. Installation and startup of the southern DNAPL recovery system was completed in June 1999. Installation and startup of the northern DNAPL recovery system was completed in August 2002. In summary, the components of the selected remedy included:

- Installation of a sheet pile wall across the 70 foot width of the creek close to West Avenue. Approximately 2,500 square feet of steel sheet piling was installed.
- 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, taking into account the physical limitations at the site.
- Capping of the creek bottom resulted in a horizontal barrier along the 1,600 foot reach of Scajaquada Creek. The cap consists of geosynthetic clay liner (GCL), angular sand, geotextile, and anchoring stone.
- Installation of two DNAPL recovery systems near the West Avenue Bridge and the Railroad Bridge.
- Implementation of an O&M Plan as an institutional control to verify and ensure the performance of the remedial systems.

No significant changes have been made to the remedy since remedy selection.

3.0 Evaluate Remedy Performance, Effectiveness, and Protectiveness

The overall goal of the remedial work at the Scajaquada Creek site was to provide a remedy which:

- Was protective of human health and the environment
- Did not damage structures or properties; and
- Was financially practicable.

The objectives of the excavation operation were to remove the required sediments without releasing contaminants outside of the work area. The remedy integrated removal and isolation technologies to achieve this goal.

Preventing human contact with the impacted material was addressed by excavating sediments from the creek; capping areas where impacted material was left in place; and providing protection for workers. The effectiveness of the remedial action in meeting these objectives is evaluated by performing an annual inspection to verify that engineering controls remain intact and that site use has not changed. The results of this year's inspection, described in the next section, identified significant maintenance issues that need to be addressed. It also found that the cap remains intact and that the remedy continues to be effective and protective.

Preventing leaching of impacted material to the site was addressed by installing a sheet pile wall; capping areas where impacted material was left in place; and installing two DNAPL recovery systems. The effectiveness of the remedial action in meeting these objectives is evaluated by performing an annual inspection on the cap and the recovery systems. As described above, the site inspection found that engineering controls, including the sediment cap and NAPL collection systems, remain intact and effective, although maintenance and repair is required.

DNAPL volumes collected since the recovery systems have been installed have decreased significantly over time. DNAPL volumes have been collected from June 24, 1999 through 2011. This data is presented in Attachment 2. DNAPL flow in the Southern System has reduced from the original flows at system startup, approximately 4.4 gallons per day (gpd) to 0.3 gpd. There is currently no measureable flow of NAPL from the Northern System. The original flow at startup of the Northern System startup was approximately 0.17 gpd.

4.0 O&M Plan Compliance Report

The components of the O&M program for the Scajaquada Creek site include inspections of the cap and DNAPL recovery systems, maintenance checks on the DNAPL recovery systems, maintenance and repair of engineering controls, field observations and reporting. Details of this program are described in the February 8, 2005 O&M Plan and a letter from NYSDEC dated December 2, 2009 approving changes in the O&M program. This report summarizes O&M activities performed at the site from February 2011 to February 2012.

O&M activities completed from February 2011 through February 2012 include:

- An annual site inspection performed on April 26, 2011
- Operation of the DNAPL recovery system
- Monthly inspections of the DNAPL recovery system and sediment cap
- Completion of the following activities to address observed damage to armor stone installed on the sediment cap next to the sheet pile wall:
  - Obtained a modification to the Army Corps of Engineers permit for the armor work
  - Completed armor repair construction at the site between August 9 and September 29, 2011.
  - The tanks in both NAPL recovery systems were emptied.

Constructed Sediment Cap Observations

A site inspection was conducted on April 26, 2011 by Thomas Clark, P.E. of AECOM. During the inspection, damage to the armor stone layer along the sheet pile wall on the east side of the river which was observed during the 2010 inspection was still present. The damage did not appear to have changed significantly since the last inspection. The photographs included in Attachment 3 show the damaged area. In addition, disruption of three small areas, two on the east side of the river and one on the west, were observed.

In order to address this damage to the sediment cap armor layer, NFG has completed repairs to the cap. The re-construction of the armored bank was completed using excavators stationed at the top of the bank and divers working in the creek. During construction, all machinery was located landward of the top of the bank. Activities completed during the work include the following:

- Sediment and erosion controls, including a turbidity curtain were installed in the creek before work in the river began.
- The creek bank was cleared to provide access to the work area. Clearing, including tree or shrub removal behind the sheet pile wall to allow the machinery to gain access to the bank was minimized by creating access points in several locations along the bank while leaving most of the vegetation in place.
- All debris, trash, and deadwood were removed from the cleared areas but roots were left in place to help hold the soil in place. Vegetation growing in the creek where the armor repairs took place was removed to the extent practical.
- Existing stone armoring was removed and redistributed in areas which were damaged using an excavator and by hand.
- Geotextile originally placed beneath the armor layer was pulled back in place, repaired or replaced as needed, and secured in place using pins prior to armor stone installation.

- Six inch polyethylene geocell material was installed to provide support for placement of new armor stone. The geocell was secured to the bank using fiber tendons attached to the sheet pile wall and steel pins as recommended by the geocell manufacturer.
- Angular stone up to 3 inches was placed into the geocell using an excavator with a concrete bucket stationed at the top of the bank.
- Two gabions, wire baskets filled with stone, were installed at the outfall where damage to the armor stone has been identified.
- Armor stone was placed in the three small disrupted areas observed during the April 26, 2011 inspection.
- When work in the creek was complete, erosion control blankets were pinned in place in locations where clearing was necessary in order to hold the soil in place until the vegetative cover can replace itself.
- During installation of the geocell, NAPL was observed seeping through the sheet pile wall at the location of a pre-existing lifting hole in the sheeting. NYSDEC was notified of the seep on September 8, 2012 and the hole in the sheeting was sealed with hydraulic cement.

Photographs of construction activities and the completed armor are included in Attachment 3. Work in the creek was performed under the provisions of a Protection of Waters permit (Permit No. 9-1402-00813/00003) issued by NYSDEC and an approval by the Army Corps to perform the work under the provisions of Nationwide Permit No. 3. In May 2011, NFG applied for and received a modification to the Army Corps approval to allow repair of the three small disrupted areas identified during the April 26, 2011 inspection.

DNAPL Systems Operations

The Northern and Southern DNAPL collection systems were checked monthly by National Fuel Gas staff between February 2011 and February 2012. During these visits the automatic timer was adjusted to maximize the flow of DNAPL while minimizing the flow of groundwater, and tubing was advanced as needed to optimize the performance of the system's peristaltic pump.

The Southern DNAPL collection system was observed to function properly during the period of this report. Maintenance activities performed on the Southern System during this period include the following:

- March 31, 2011 – Reset clock
- April 7, 2011 – Measured NAPL levels
- June 16, 2011 – Emptied tanks
- February 2, 2012 – Observed damaged power line. Power restored to the system on February 9, 2012.

The Northern DNAPL collection system was observed to function properly during the period of this report except as noted below. Maintenance activities performed on the Northern System during this period include the following:

- March 31, 2011 – Reset clock and replaced bulb
- April 7, 2011 – Measured NAPL levels
- June 16, 2011 – Emptied tanks
- October 6, 2011 – Pump not running. Restarted.
- November 18, 2011 – Electric meter missing
- December 19, 2011 – Electric meter replaced

Based on measurements made on April 26, 2011, no measurable DNAPL was recovered by the Northern or Southern DNAPL collection systems. Volumes were calculated by taking measurements in the tanks with an oil/water interface probe. The volumes of DNAPL recovered to date were determined to be approximately 1,606 gallons by the Southern System and 395 gallons by the Northern System. System monitoring logs are included in Attachment 2. Note that the total volume of NAPL collected by the Southern System is a reduction from the value reported last year. This was caused by corrections to the summary table.

Conclusions

The O&M program at the Scajaquada Creek site is being implemented in accordance with the provisions of the O&M Plan. The results of the site inspection indicate that engineering and institutional controls continue to be effective in meeting remedial objectives. At the time of the first site inspection in April, the sediment cap in the vicinity of the site sheet pile wall required significant maintenance and repairs. Repairs to the cap armor which took place in August and September 2011 will ensure that the cap will continue to be effective in the future. Inspections completed since the repair work was completed indicates that repaired areas are still in place and sediment and erosion controls are still effective.

5.0 Overall PRR Conclusions and Recommendations

As discussed above, the O&M program is being implemented in accordance with the provisions of the O&M Plan, including the July 2009 modification . The results of the site inspection indicate that engineering and institutional controls remain intact and continue to be effective in meeting remedial objectives.

As the DNAPL measurements described above indicate, no significant quantity of DNAPL is currently being recovered by the Northern DNAPL recovery system. Since the system continues to operate effectively, this change is caused by the reduction in recoverable DNAPL in the subsurface. For that reason, NFG has reduced the frequency of DNAPL pumping in the Northern system from weekly to monthly. Once a month the system will be run for at least half an hour and until no significant additional quantity of DNAPL is recovered.

Please call Thomas Clark with questions at 978-905-2161.

Regards,

Thomas P. Clark, P.E.
Senior Engineer

Attachments:
Attachment 1 – Institutional and Engineering Controls Certification Form
Attachment 2 – sSystem Monitoring Logs
Attachment 3 – Photographs

CC: B. Sadowski – NYSDEC, Buffalo
J. Clark, T. Alexander – NFG
K. Hogan – PLHB&B

Attachment 1
Institutional and Engineering Controls Certification Form

Enclosure 2
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

Site Details **Box 1**

Site No. 915141B

Site Name NFG - Iroquois Gas/Westwood Pharm. Riparian

Site Address: Scajaquada Creek, Upstream of West Ave. Bridge Zip Code: 14213
City/Town: Buffalo
County: Erie
Site Acreage: 2.5

Reporting Period: February 15, 2011 to February 15, 2012

	YES	NO
1. Is the information above correct?	☒	☐
If NO, include handwritten above or on a separate sheet.		
2. Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period?	☐	☒
3. Has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))?	☐	☒
4. Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period?	☒	☐
If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.	Documentation is provided in the PRR text.	
5. Is the site currently undergoing development?	☐	☒

Box 2

	YES	NO
6. Is the current site use consistent with the use(s) listed below? Commercial and Industrial	☒	☐
7. Are all ICs/ECs in place and functioning as designed?	☒	☐

IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

_____ _____
Signature of Owner, Remedial Party or Designated Representative Date

SITE NO. 915141B **Box 3**

Description of Institutional Controls

Parcel	Owner	Institutional Control
	No Owner	O&M Plan

Box 4

Description of Engineering Controls

Parcel	Engineering Control
	Cover System Groundwater Treatment System Subsurface Barriers

Engineering Control Details for Site No. 915141B

Parcel:

In March 1994, a Record of Decision (ROD) was issued for this site. The remedial action at this site was completed between 1998 and 2001. Engineering controls for a section of Scajaquada Creek include: (1) 1,600 feet of 18-inch thick stream bed cap consisting of a geo-synthetic clay liner overlain by sand, geotextile and stone; and (2) two DNAPL extraction wells to recover DNAPL from the substrata of the creek. Post-closure maintenance of the cap, creek banks and pumping systems are required to ensure long term effectiveness of the remedy. There is no SBL identification for this parcel.

Box 5

Periodic Review Report (PRR) Certification Statements

1. I certify by checking "YES" below that:

   a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

   b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and compete.

YES	NO
☒	☐

2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:

   (a) the Institutional Control and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

   (b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

   (c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

   (d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

   (e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

YES	NO
☒	☐

IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

_____ _____

Signature of Owner, Remedial Party or Designated Representative Date

IC CERTIFICATIONS
SITE NO. 915141B

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1,2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Jay W Lesch (print name) at 6363 Main St Williamsville NY (print business address),

am certifying as National Fuel Gas (Owner or Remedial Party)

for the Site named in the Site Details Section of this form.

LCM

Signature of Owner, Remedial Party, or Designated Representative Rendering Certification — Date 3/2/12

IC/EC CERTIFICATIONS

Box 7

Professional Engineer Signature

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Thomas P. Clark (print name) at AECOM, 250 Apollo Dr., Chelmsford, MA 01824 (print business address),

am certifying as a Professional Engineer for the National Fuel Gas Distribution Corp. (Owner or Remedial Party)

Signature of Professional Engineer, for the Owner or Remedial Party, Rendering Certification

Stamp (Required for PE)

Date 2/21/12

Attachment 2
System Monitoring Logs

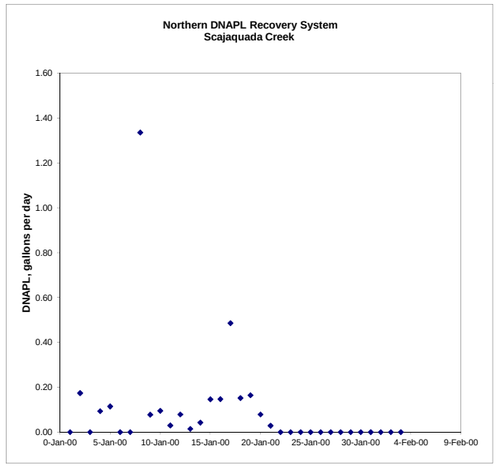
Scajaquada Creek DNAPL System Monitoring Log

National Fuel Gas
ENSR/AECOM
04870-024-750

NORTHERN SYSTEM

Date	Initials	Field Measurements (by OWI probe)				Calculations (total tank contents) *				Calculations (this period recovery)					Operator's Notes	Transporter	Disposal Facility
		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)	Total Flow (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	O/W 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	O/W 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.	---	---
Various	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.		
Input values						Cumulative gallons :				2708	395						
										Water	NAPL						

* 309 gallons per foot of tank height



Scajaquada Creek DNAPL System Monitoring Log

National Fuel Gas
The RETEC Group
NFGD 1-02111-750

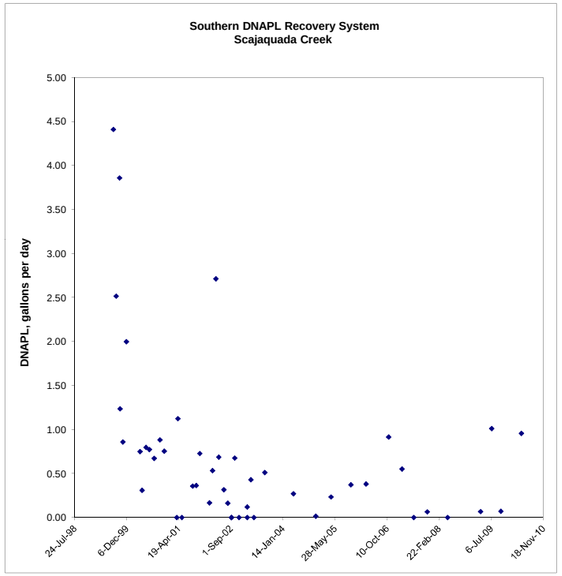
SOUTHERN SYSTEM

Date	Initials	Field Measurements (by OWI probe)				Calculations (total tank contents) *				Calculations (this period recovery)					Operator's Notes	Transporter	Disposal Facility
		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)	Total Flow (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,	IWR / BFC	Research Oil
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.	IWR / BFC	Puretech Systems
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 viscocity/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.	Frank's Vacuum	Chemtron
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.	Frank's Vacuum	Clean Harbors, MD
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.	Frank's Vacuum	Clean Harbors, MD
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.	---	---
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.		

Input values

Cumulative gallons : 10,557 (Water) 1,606 (NAPL)

* 309 gallons per foot of tank height



Attachment 3
Photographs

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
National Fuel Gas Distribution Corp.	Scajaquada Creek Former MGP Site, Buffalo, New York	60137321.750

Photo No.	Date:
1	4/26/11

Direction Photo Taken:

West to east

Description:

Damage to subaqueous cap armor

Photo No.	Date:
2	4/26/11

Direction Photo Taken:

West to east

Description:

Damage to subaqueous cap armor

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
National Fuel Gas Distribution Corp.	Scajaquada Creek Former MGP Site, Buffalo, New York	60137321.750

Photo No.	Date:
3	9/6/11

Direction Photo Taken:

South to north

Description:

Geocell installed

Photo No.	Date:
4	9/20/11

Direction Photo Taken:

Northwest to southeast

Description:

Placement of armor stone in geocell

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
National Fuel Gas Distribution Corp.	Scajaquada Creek Former MGP Site, Buffalo, New York	60137321.750

Photo No.	Date:
5	9/21/11

Direction Photo Taken:

West to east

Description:

Completed armor repair

Photo No.	Date:
6	9/21/11

Direction Photo Taken:
East to west

Description:

Erosion control blanket on east side of river